We encourage everyone to view the meeting live via YouTube.

Leavenworth County
Board of County Commissioners
Regular Meeting Agenda

300 Walnut Street, Suite 225
Leavenworth, KS 66048
June 3, 2026
9:00 a.m.

I. CALL TO ORDER

II. PLEDGE OF ALLEGIANCE/MOMENT OF SILENT PRAYER

III. ROLL CALL

IV. PUBLIC COMMENT: Public Comment shall be allowed at the beginning of each meeting and opened again at the end of the meeting after all regularly scheduled agenda items. Comments shall be limited to five minutes per person; however, commenters may speak for up to five minutes at both the beginning and end of each meeting. There should be no expectation of interaction by the Commission during this time. Everyone wishing to make comments either on items on the agenda or not are encouraged to provide their comments in writing no later than 8:00 a.m. the Monday immediately preceding the meeting. These comments will be included in the agenda packet for everyone to access and review. This allows the Commission to have time to fully consider input and request follow-up if needed prior to the meeting. During times when the Courthouse is closed to the general public anyone wishing to make public comment will provide their comments in writing no later than 8:00 a.m. the Monday immediately preceding the meeting. The comments will be included and distributed with the normal meeting packet.

V. ADMINISTRATIVE BUSINESS:

a) County Clerk report

VI. CONSENT AGENDA: The items on the Consent Agenda are considered by staff to be routine business items. Approval of the items may be made by a single motion, seconded, and a majority vote with no separate discussion of any item listed. Should a member of the Governing Body desire to discuss any item, it will be removed from the Consent Agenda and considered separately.

a) Approval of the minutes of the meeting of May 27, 2026

b) Approval of the minutes of the budget presentations of May 27, 2026

c) Approval of the schedule for the week of June 8, 2026

d) Approval of the check register

e) Approve and sign the OCB's

VII. FORMAL BOARD ACTION:

a) **Resolution 2026-9, a request for a special use permit for Tillman Infrastructure, LLC**

- Consider a motion to find that the request for a special use permit as outlined in Case DEV-26-015 complies with the Golden Factors and move to adopt Resolution 2026-9 and conditionally approve the special use permit as outlined in Case DEV-26-015 based on the recommendation and findings of the Planning Commission and the findings set forth in the staff report as amended by the Planning Commission and as substantiated by the facts, testimony and evidence presented at the public hearing. **OR**

- Consider a motion to find that the request for a special use permit outlined in Case DEV-26-015 does not comply with the Golden Factors **(list the Golden Factors)** and move that the proposed special use permit as outlined in Case DEV-26-015 be denied based on the recommendation and findings of the Planning Commission on the Golden Factors and as substantiated by the facts, testimony and evidence presented at the public hearing. **OR**

- Consider a motion to find that the special use permit outlined in Case DEV-25-015 complies with the Golden Factors and move to adopt Resolution 2026-9 and conditionally approve the special use permit as outlined in Case DEV-25-015 based on the findings as set forth in the staff report and information presented at the public hearing subject to the following additional conditions **(list conditions or modifications). OR**

- Consider a motion to reman Case DEV-25-015 back to the Planning Commission for additional review due to **(state the reasons the matter is being sent back).**

b) **Resolution 2026-7, a request for a special use permit for Kaw Valley Companies, LLC**

- Consider a motion to find that the request for a special use permit outlined in Case DEV-25-021 complies with the Golden Factors, including 1 and 6 and move to adopt Resolution 2026-7 and conditionally approve the special use permit as outlined in Case DEV-25-021 based on the facts set forth in the staff report and as amended by the Commission. **OR**

- Consider a motion to find that the request for a special use permit outlined in Case DEV-25-021 does not comply with the Golden Factors **(list the Golden Factors)** and move that the proposed special use permit as outlined in Case DEV-25-021 be denied based on the recommendation and findings of the Planning Commission on the Golden Factors and as substantiated by the facts, testimony and evidence presented at the public hearing. **OR**

- Consider a motion to find that the special use permit outlined in Case DEV-25-021 complies with the Golden Factors including Factors 1 and 6 and move to adopt Resolution 2026-7 and conditionally approve the special use permit as outlined in Case DEV-25-021 based on the findings as set forth in the staff report and information presented at the public hearing subject to the following additional conditions **(list conditions or modifications). OR**

c) Consider a motion to review the proposed Development and Road Improvement Agreement between Kaw Valley, Inc. and the County and take action as desired.

d) **Resolution 2026-10, proposed amendment to the Leavenworth County Comprehensive Plan**

- Consider a motion to approve the recommendation of the Planning Commission as outlined in Case DEV-26-048 and move to adopt Resolution 2026-10, amendment to the Leavenworth County Comprehensive Plan. OR

- Consider a motion to deny the recommendation of the Planning Commission as outlined in Case DEV-26-048 and remand back to the Planning Commission for further consideration based on **(list reasons for denial and list modifications).**

e) Consider a motion to approve the 1302 Project Programming request form for the CDS project on 235th St. with KDOT.

f) Consider a motion to approve the agreement for the relocation of the waterline north of Dempsey Road on 235th St. with Rural Water District #9.

g) Consider a motion to approve the construction contract with Norfolk Contracting for the replacement of bridge HP-51 on Jamison Road and bridge T-31 on Fairmount Road in the amount of $593,000.00 with a 10% contingency.

h) Consider a motion to accept the bid from Foley Equipment for the purchase of a trench roller in the amount of $37,000.00.

VIII. PRESENTATIONS AND DISCUSSION ITEMS: presentations are materials of general concern where no action or vote is requested or anticipated.

a) Executive session if needed

IX. ADJOURNMENT

Budget Presentations

EMS

Health Department

Administration

County Counselor

Coroner

LEAVENWORTH COUNTY COMMISSIONERS
MEETING SCHEDULE

Monday, June 1, 2026

Tuesday, June 2, 2026

Wednesday, June 3, 2026

9:00 a.m. Leavenworth County Commission meeting
• Commission Meeting Room, 300 Walnut, Leavenworth KS

Thursday, June 4, 2026

Friday, June 5, 2026

ALL SUCH OTHER BUSINESS THAT MAY COME BEFORE THE COMMISSION

ALL MEETINGS ARE OPEN TO THE PUBLIC

COMMENTS SHOULD BE OF GENERAL INTEREST OF THE PUBLIC AND SUBJECT TO THE RULES OF DECORUM

*******May 27, 2026 ********

The Board of County Commissioners met in regular session on Wednesday, May 27, 2026. Commissioner Smith, Commissioner Culbertson, Commissioner Reid, Commissioner Dove and Commissioner Stieben are present; Also present: Mark Loughry, County Administrator;

PUBLIC COMMENT:

Wally Ridgestone, Dee Karleskint, Mary Bowes, Lisa Thorn, Tyler Carpenter, Brian Morley, Nanette Hope and Nancy Carpenter commented.

ADMINISTRATIVE BUSINESS:

Mark Loughry commented on the city of Leavenworth's Opportunity 2.0 zone letter of support.

A motion was made by Commissioner Smith and seconded by Commissioner Dove to sign the letter of support for Opportunity Zone 2.0 for the city of Leavenworth.

Motion passed, 5-0.

A motion was made by Commissioner Stieben and seconded by Commissioner Culbertson to have the meeting next week at 6:00 p.m.

Commissioner Stieben withdrew his motion.

A motion was made by Commissioner Dove and seconded by Commissioner Reid to bring the moratorium back up for discussion.

Motion passed, 3-2 Commissioners Smith and Stieben voting nay.

A brief discussion took place regarding submission of written public comment.

A motion was made by Commissioner Culbertson and seconded by Commissioner Smith to accept the consent agenda for Wednesday, May 27, 2026, as presented.

Motion passed, 5-0.

Commissioner Stieben will be speaking the Tonganoxie Public Library on Thursday at 6:00 p.m. about data centers.

A motion was made by Commissioner Culbertson and seconded by Commissioner Smith to adjourn.

Motion passed, 5-0.

The Board adjourned at 10:10 a.m.

Draft

*******May 27, 2026 ********

The Board of County Commissioners met to hear budget presentations on Wednesday, May 27, 2026. Commissioner Smith, Commissioner Reid, Commissioner Culbertson, Commissioner Stieben and Commissioner Dove are present; Also present: Mark Loughry, County Administrator

The Board heard budget presentations from Council on Aging, District Court, Human Resources, Information Systems, Community Corrections/Juvenile Detention, Leavenworth County Sheriff and Emergency Management/911 Operations.

The Board ended the presentations at 11:34 a.m.

Draft

LEAVENWORTH COUNTY COMMISSIONERS
MEETING SCHEDULE

Monday, June 8, 2026

Tuesday, June 9, 2026

1:30 p.m. Adult Community Corrections Advisory Board meeting
• Community Corrections Board Room

Wednesday, June 10, 2026

9:00 a.m. Leavenworth County Commission meeting
• Commission Meeting Room, 300 Walnut, Leavenworth KS

Thursday, June 11, 2026

12:00 p.m. LCDC meeting

3:00 p.m. Juvenile Corrections Advisory Board meeting
• Justice Center Conference Room-Basement

Friday, June 12, 2026

ALL SUCH OTHER BUSINESS THAT MAY COME BEFORE THE COMMISSION

ALL MEETINGS ARE OPEN TO THE PUBLIC

COMMENTS SHOULD BE OF GENERAL INTEREST OF THE PUBLIC AND SUBJECT TO THE RULES OF DECORUM

START DATE: 05/22/2026 END DATE: 05/28/2026

TYPES OF CHECKS SELECTED: * ALL TYPES
CHECK RANGE SELECTED: * No Check Range Selected

WARRANT NUMBER	CHK TYPE	WARRANT DATE	VEND #/ PCH DOC #	VENDOR NAME/ ACCOUNT NUMBER	DESCRIPTION	AMOUNT	TOTAL
821		05/22/2026	70	FREESTATE ELECTRIC COOPERATIVE			
			141347	6-133-5-00-251	18673 MCLOUTH RD	82.16	
					WARRANT TOTAL		82.16
822		05/22/2026	1123	POMP'S TIRE SERVICE INC			
			141355	6-133-5-00-309	TIRES	840.00	
			141367	6-137-5-00-321	TIRES	2,043.40	
			141367	6-137-5-00-321	TIRES	705.00	
					WARRANT TOTAL		3,588.40
823		05/22/2026	8103	CHARTER COMMUNICATIONS			
			141321	6-001-5-07-219	INTERNET SERVICE	183.10	
					WARRANT TOTAL		183.10
824		05/22/2026	8686	EVERGY KANSAS CENTRAL INC			
			141328	6-001-5-05-215	STATION 1	490.02	
			141348	6-133-5-00-251	ELECTRIC SERVICES	673.46	
			141348	6-133-5-00-251	ELECTRIC SERVICES	201.93	
			141348	6-133-5-00-251	ELECTRIC SERVICES	27.49	
			141348	6-133-5-00-251	ELECTRIC SERVICES	50.10	
			141348	6-133-5-00-251	ELECTRIC SERVICES	28.42	
					WARRANT TOTAL		1,471.42
825		05/26/2026	70	FREESTATE ELECTRIC COOPERATIVE			
			141398	6-174-5-00-210	ELECTRIC USAGE	751.23	
					WARRANT TOTAL		751.23
826		05/26/2026	6055	FLEETHOSTER			
			141393	6-001-5-05-271	APRIL FLEETHOSTER	100.00	
			141393	6-001-5-06-222	APRIL FLEETHOSTER	19.95	
			141393	6-001-5-11-271	APRIL FLEETHOSTER	19.95	
			141393	6-001-5-31-230	APRIL FLEETHOSTER	59.85	
			141393	6-001-5-41-271	APRIL FLEETHOSTER	100.00	
			141393	6-001-5-53-220	APRIL FLEETHOSTER	99.75	
			141393	6-108-5-00-213	APRIL FLEETHOSTER	39.90	
			141393	6-127-5-00-2	APRIL FLEETHOSTER	20.00	
			141393	6-133-5-00-229	APRIL FLEETHOSTER	998.80	
			141393	6-136-5-00-221	APRIL FLEETHOSTER	40.00	
			141393	6-137-5-00-229	APRIL FLEETHOSTER	300.00	
			141393	6-145-5-00-230	APRIL FLEETHOSTER	678.70	
			141393	6-160-5-00-215	APRIL FLEETHOSTER	119.80	
					WARRANT TOTAL		2,596.70
827		05/26/2026	8103	CHARTER COMMUNICATIONS			
			141401	6-001-5-12-216	MONTHLY PAYMENT FOR SPECTRUM B	84.99	
					WARRANT TOTAL		84.99
828		05/26/2026	516725	ENTERPRISE FM TRUST			
			141396	6-001-5-05-271	APRIL ENTERPRISE	4,376.51	
			141396	6-001-5-06-222	APRIL ENTERPRISE	315.52	
			141396	6-001-5-11-271	APRIL ENTERPRISE	385.26	
			141396	6-001-5-31-230	APRIL ENTERPRISE	2,778.58	
			141396	6-001-5-41-271	APRIL ENTERPRISE	4,680.84	
			141396	6-001-5-53-220	APRIL ENTERPRISE	2,335.12	
			141396	6-126-5-00-221	APRIL ENTERPRISE	14.77	
			141396	6-133-5-00-229	APRIL ENTERPRISE	14,637.48	
			141396	6-136-5-00-221	APRIL ENTERPRISE	1,238.52	

START DATE: 05/22/2026 END DATE: 05/28/2026

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CHECK RANGE SELECTED: * No Check Range Selected

WARRANT NUMBER	CHK TYPE	WARRANT DATE	VEND #/ PCH DOC #	VENDOR NAME/ ACCOUNT NUMBER	DESCRIPTION	AMOUNT	TOTAL
			141396	6-145-5-00-230	APRIL ENTERPRISE	20,117.44	
			141396	6-160-5-00-215	APRIL ENTERPRISE	1,149.88	
					WARRANT TOTAL		52,029.92
829		05/26/2026	276	WEX BANK			
			141419	6-001-5-11-253	WEX FOR MARCH 23-APRIL 23	188.81	
			141419	6-001-5-12-304	WEX FOR MARCH 23-APRIL 23	166.98	
			141419	6-001-5-14-331	WEX FOR MARCH 23-APRIL 23	9,178.61	
			141419	6-001-5-14-332	WEX FOR MARCH 23-APRIL 23	3,835.65	
			141419	6-001-5-14-334	WEX FOR MARCH 23-APRIL 23	342.65	
			141419	6-001-5-14-335	WEX FOR MARCH 23-APRIL 23	60.61	
			141419	6-001-5-14-901	WEX FOR MARCH 23-APRIL 23	135.70-	
			141419	6-108-5-00-304	WEX FOR MARCH 23-APRIL 23	48.09	
			141419	6-108-5-00-606	WEX FOR MARCH 23-APRIL 23	123.33	
			141419	6-108-5-00-610	WEX FOR MARCH 23-APRIL 23	45.94	
			141419	6-125-5-00-211	WEX FOR MARCH 23-APRIL 23	50.28	
			141419	6-127-5-00-3	WEX FOR MARCH 23-APRIL 23	19.67	
			141419	6-133-5-00-304	WEX FOR MARCH 23-APRIL 23	442.01	
			141419	6-136-5-00-208	WEX FOR MARCH 23-APRIL 23	19.67	
			141419	6-138-5-00-227	WEX FOR MARCH 23-APRIL 23	50.29	
			141419	6-145-5-00-304	WEX FOR MARCH 23-APRIL 23	4,809.77	
					WARRANT TOTAL		19,246.66
830		05/28/2026	648	COMMERCE BANK-COMMERCIAL CARDS			
			141448	5-144-5-00-2	MAY CC STATEMENT COA	474.01	
			141448	5-144-5-00-3	MAY CC STATEMENT COA	1,116.08	
			141447	6-001-5-01-202	MAY CC STATEMENT MATZEDER	150.00	
			141447	6-001-5-01-212	MAY CC STATEMENT MATZEDER	75.10	
			141447	6-001-5-01-213	MAY CC STATEMENT MATZEDER	168.84	
			141413	6-001-5-02-301	MAY CC STATEMENT SLOOP	51.98	
			141415	6-001-5-02-301	MAY CC STATEMENT KEPPLER	49.49	
			141413	6-001-5-02-302	MAY CC STATEMENT SLOOP	72.35	
			141412	6-001-5-03-301	MAY CC STATEMENT TREAS	268.37	
			141430	6-001-5-04-202	MAY CC STATEMENT TODD	1,474.00	
			141430	6-001-5-04-211	MAY CC STATEMENT TODD	527.43	
			141430	6-001-5-04-301	MAY CC STATEMENT TODD	300.15	
			141430	6-001-5-04-302	MAY CC STATEMENT TODD	156.00	
			141391	6-001-5-05-203	MAY CC STATEMENT MILLER	420.00	
			141397	6-001-5-05-209	MAY CC STATEMENT EMS	55.00	
			141397	6-001-5-05-210	MAY CC STATEMENT EMS	253.00	
			141397	6-001-5-05-215	MAY CC STATEMENT EMS	154.48	
			141446	6-001-5-05-215	MAY CC STATEMENT HEALTH DEPT	60.43	
			141397	6-001-5-05-216	MAY CC STATEMENT EMS	388.36	
			141397	6-001-5-05-282	MAY CC STATEMENT EMS	411.61	
			141397	6-001-5-05-301	MAY CC STATEMENT EMS	49.68	
			141394	6-001-5-05-306	MAY CC STATEMENT JOHNSON	77.52	
			141395	6-001-5-05-306	MAY CC STATEMENT LEFTWICH	155.92	
			141397	6-001-5-05-306	MAY CC STATEMENT EMS	745.68	
			141397	6-001-5-05-350	MAY CC STATEMENT EMS	10.59	
			141397	6-001-5-05-381	MAY CC STATEMENT EMS	6,152.93	
			141392	6-001-5-05-383	MAY CC STATEMENT STRANGE	14.99	
			141395	6-001-5-05-383	MAY CC STATEMENT LEFTWICH	35.82	

START DATE: 05/22/2026 END DATE: 05/28/2026

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			141397	6-001-5-05-383	MAY CC STATEMENT EMS	272.52	
			141424	6-001-5-07-202	MAY CC STATEMENT SO	475.00	
			141424	6-001-5-07-203	MAY CC STATEMENT SO	350.00	
			141427	6-001-5-07-203	MAY CC STATEMENT SO	144.00	
			141424	6-001-5-07-208	MAY CC STATEMENT SO	45.00	
			141423	6-001-5-07-210	MAY CC STATEMENT MCCALLY	48.49	
			141425	6-001-5-07-210	MAY CC STATEMENT DEDEKE	4,391.84	
			141427	6-001-5-07-211	MAY CC STATEMENT SO	606.52	
			141423	6-001-5-07-218	MAY CC STATEMENT MCCALLY	48.03	
			141424	6-001-5-07-254	MAY CC STATEMENT SO	573.74	
			141427	6-001-5-07-265	MAY CC STATEMENT SO	95.00	
			141423	6-001-5-07-301	MAY CC STATEMENT MCCALLY	395.43	
			141427	6-001-5-07-302	MAY CC STATEMENT SO	17.64	
			141423	6-001-5-07-355	MAY CC STATEMENT MCCALLY	216.63	
			141423	6-001-5-07-356	MAY CC STATEMENT MCCALLY	264.81	
			141427	6-001-5-07-356	MAY CC STATEMENT SO	101.78	
			141424	6-001-5-07-357	MAY CC STATEMENT SO	64.47	
			141423	6-001-5-07-359	MAY CC STATEMENT MCCALLY	1,004.57	
			141424	6-001-5-07-359	MAY CC STATEMENT SO	262.15	
			141447	6-001-5-09-203	MAY CC STATEMENT MATZEDER	594.00	
			141447	6-001-5-09-301	MAY CC STATEMENT MATZEDER	63.16	
			141431	6-001-5-11-202	MAY CC STATEMENT THOMPSON	531.40	
			141432	6-001-5-11-202	MAY CC STATEMENT LAYLA	200.00	
			141433	6-001-5-11-213	MAY CC STATEMENT FILBERT	21.65	
			141432	6-001-5-11-301	MAY CC STATEMENT LAYLA	1,469.74	
			141433	6-001-5-11-301	MAY CC STATEMENT FILBERT	1,805.07	
			141434	6-001-5-18-202	MAY CC STATEMENT MARTIN	1,250.21	
			141434	6-001-5-18-254	MAY CC STATEMENT MARTIN	2,417.95	
			141417	6-001-5-19-205	MAY CC STATEMENT CROSSLAND	70.46	
			141418	6-001-5-19-213	MAY CC STATEMENT WEISHAAR	2,184.74	
			141422	6-001-5-19-217	MAY CC STATEMENT CLEMENS	243.30	
			141417	6-001-5-19-301	MAY CC STATEMENT CROSSLAND	174.00	
			141416	6-001-5-23-202	MAY CC STATEMENT SCHERMBECK	75.00	
			141413	6-001-5-23-301	MAY CC STATEMENT SLOOP	26.09	
			141416	6-001-5-23-301	MAY CC STATEMENT SCHERMBECK	39.97	
			141390	6-001-5-28-215	MAY CC STATEMENT HR	425.31	
			141435	6-001-5-31-209	MAY CC STATEMENT CUMMINGS	287.89	
			141444	6-001-5-31-293	MAY CC STATEMENT B&G	1,362.00	
			141444	6-001-5-31-296	MAY CC STATEMENT B&G	160.80	
			141444	6-001-5-31-297	MAY CC STATEMENT B&G	97.00	
			141444	6-001-5-31-301	MAY CC STATEMENT B&G	68.33	
			141435	6-001-5-31-312	MAY CC STATEMENT CUMMINGS	1,093.03	
			141436	6-001-5-31-312	MAY CCC STATEMENT TOMLIN	384.60	
			141444	6-001-5-31-312	MAY CC STATEMENT B&G	218.92	
			141435	6-001-5-31-317	MAY CC STATEMENT CUMMINGS	82.91	
			141444	6-001-5-31-383	MAY CC STATEMENT B&G	95.52	
			141444	6-001-5-31-384	MAY CC STATEMENT B&G	321.38	
			141444	6-001-5-31-390	MAY CC STATEMENT B&G	400.80	
			141444	6-001-5-31-391	MAY CC STATEMENT B&G	321.38	
			141444	6-001-5-32-296	MAY CC STATEMENT B&G	992.75	

START DATE: 05/22/2026 END DATE: 05/28/2026

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CHECK RANGE SELECTED: * No Check Range Selected

WARRANT NUMBER	CHK TYPE	WARRANT DATE	VEND #/ PCH DOC #	VENDOR NAME/ ACCOUNT NUMBER	DESCRIPTION	AMOUNT	TOTAL
			141444	6-001-5-32-297	MAY CC STATEMENT B&G	981.57	
			141435	6-001-5-32-391	MAY CC STATEMENT CUMMINGS	441.30	
			141436	6-001-5-32-391	MAY CCC STATEMENT TOMLIN	354.98	
			141443	6-001-5-32-391	MAY CC STATEMENT TIMON	6.72	
			141444	6-001-5-32-391	MAY CC STATEMENT B&G	4,240.88	
			141421	6-001-5-33-296	MAY CC STATEMENT FARR	55.94	
			141444	6-001-5-33-296	MAY CC STATEMENT B&G	606.44	
			141435	6-001-5-33-391	MAY CC STATEMENT CUMMINGS	562.12	
			141436	6-001-5-33-391	MAY CCC STATEMENT TOMLIN	70.47	
			141444	6-001-5-33-391	MAY CC STATEMENT B&G	414.62	
			141426	6-001-5-41-201	MAY CC STATEMENT MURRAY	33.75	
			141426	6-001-5-41-202	MAY CC STATEMENT MURRAY	627.47	
			141420	6-001-5-41-211	MAY CC STATEMENT APPRAISERS	1,021.02	
			141426	6-001-5-41-301	MAY CC STATEMENT MURRAY	43.99	
			141426	6-001-5-41-371	MAY CC STATEMENT MURRAY	587.65	
			141407	6-001-5-42-215	MAY CC STATEMENT SAN	1,269.06	
			141407	6-001-5-42-285	MAY CC STATEMENT SAN	250.00	
			141415	6-001-5-49-202	MAY CC STATEMENT KEPPLER	148.39	
			141413	6-001-5-49-240	MAY CC STATEMENT SLOOP	261.77	
			141410	6-001-5-53-207	MAY CC STATEMENT PW	153.41	
			141410	6-001-5-53-301	MAY CC STATEMENT PW	562.54	
			141410	6-001-5-53-307	MAY CC STATEMENT PW	29.98	
			141432	6-104-5-00-212	MAY CC STATEMENT LAYLA	416.25	
			141440	6-106-5-00-300	MAY CC STATEMENT HARDISON	411.82	
			141446	6-108-5-00-204	MAY CC STATEMENT HEALTH DEPT	229.82	
			141446	6-108-5-00-211	MAY CC STATEMENT HEALTH DEPT	30.39	
			141446	6-108-5-00-213	MAY CC STATEMENT HEALTH DEPT	72.00	
			141446	6-108-5-00-219	MAY CC STATEMENT HEALTH DEPT	146.25	
			141446	6-108-5-00-280	MAY CC STATEMENT HEALTH DEPT	1,185.52	
			141446	6-108-5-00-301	MAY CC STATEMENT HEALTH DEPT	802.53	
			141446	6-108-5-00-380	MAY CC STATEMENT HEALTH DEPT	1,099.75	
			141446	6-108-5-00-384	MAY CC STATEMENT HEALTH DEPT	453.00	
			141446	6-108-5-00-601	MAY CC STATEMENT HEALTH DEPT	664.17	
			141445	6-108-5-00-606	MAY CC STATEMENT HAMMERSCHMIDT	111.03	
			141446	6-108-5-00-606	MAY CC STATEMENT HEALTH DEPT	466.98	
			141446	6-108-5-00-610	MAY CC STATEMENT HEALTH DEPT	539.54	
			141446	6-108-5-00-613	MAY CC STATEMENT HEALTH DEPT	2,385.00	
			141446	6-112-5-00-256	MAY CC STATEMENT HEALTH DEPT	150.10	
			141441	6-126-5-00-321	MAY CC STATEMENT BERRY	50.05	
			141437	6-127-5-00-3	MAY CC STATEMENT HERRERA	160.00	
			141438	6-127-5-00-3	MAY CC STATEMENT SKAGGS	87.97	
			141440	6-127-5-00-3	MAY CC STATEMENT HARDISON	100.00	
			141441	6-127-5-00-3	MAY CC STATEMENT BERRY	262.54	
			141404	6-133-5-00-201	MAY CC STATEMENT SESE & PW	9.38	
			141404	6-133-5-00-208	MAY CC STATEMENT SESE & PW	55.89	
			141404	6-133-5-00-214	MAY CC STATEMENT SESE & PW	523.37	
			141400	6-133-5-00-301	MAY CC STATEMENT WILLIMAS & AR	41.48	
			141404	6-133-5-00-301	MAY CC STATEMENT SESE & PW	562.15	
			141405	6-133-5-00-301	MAY CC STATEMENT PW	741.90	
			141400	6-133-5-00-309	MAY CC STATEMENT WILLIMAS & AR	133.99	

START DATE: 05/22/2026 END DATE: 05/28/2026

TYPES OF CHECKS SELECTED: * ALL TYPES
CHECK RANGE SELECTED: * No Check Range Selected

WARRANT NUMBER	CHK TYPE	WARRANT DATE	VEND #/ PCH DOC #	VENDOR NAME/ ACCOUNT NUMBER	DESCRIPTION	AMOUNT	TOTAL
			141400	6-133-5-00-311	MAY CC STATEMENT WILLIMAS & AR	1,253.78	
			141400	6-133-5-00-325	MAY CC STATEMENT WILLIMAS & AR	174.24	
			141405	6-133-5-00-327	MAY CC STATEMENT PW	35.45	
			141400	6-133-5-00-360	MAY CC STATEMENT WILLIMAS & AR	4,657.39	
			141400	6-133-5-00-362	MAY CC STATEMENT WILLIMAS & AR	726.18	
			141404	6-133-5-00-362	MAY CC STATEMENT SESE & PW	171.64	
			141405	6-133-5-00-362	MAY CC STATEMENT PW	166.83	
			141400	6-133-5-00-363	MAY CC STATEMENT WILLIMAS & AR	97.99	
			141400	6-133-5-00-364	MAY CC STATEMENT WILLIMAS & AR	219.78	
			141404	6-133-5-00-364	MAY CC STATEMENT SESE & PW	1,524.44	
			141400	6-133-5-00-365	MAY CC STATEMENT WILLIMAS & AR	84.85	
			141405	6-133-5-00-365	MAY CC STATEMENT PW	668.89	
			141437	6-135-5-00-200	MAY CC STATEMENT HERRERA	55.46	
			141438	6-135-5-00-200	MAY CC STATEMENT SKAGGS	56.30	
			141439	6-135-5-00-200	MAY CC STATEMENT VANHOUTEN	632.40	
			141441	6-135-5-00-200	MAY CC STATEMENT BERRY	146.97	
			141442	6-135-5-00-200	MAY CC STATEMENT IANNONE	19.10	
			141437	6-136-5-00-207	MAY CC STATEMENT HERRERA	140.00	
			141442	6-136-5-00-207	MAY CC STATEMENT IANNONE	235.71	
			141441	6-136-5-00-301	MAY CC STATEMENT BERRY	50.05	
			141406	6-137-5-00-320	PW MAY CC STATEMENT WILLIAMS &	2,691.44	
			141440	6-138-5-00-227	MAY CC STATEMENT HARDISON	361.83	
			141439	6-139-5-00-201	MAY CC STATEMENT VANHOUTEN	67.61	
			141441	6-139-5-00-301	MAY CC STATEMENT BERRY	14.64	
			141384	6-144-5-00-2	MAY CC STATEMENT CAMPBELL	560.79	
			141380	6-144-5-00-3	MAY CC STATEMENT HARMON	208.00	
			141384	6-144-5-00-3	MAY CC STATEMENT CAMPBELL	242.17	
			141381	6-145-5-00-201	MAY CC STATEMENT COA	37.50	
			141385	6-145-5-00-210	MAY CC STATEMENT RICHARDSON	30.00	
			141387	6-145-5-00-252	MAY CC STATEMENT MCINTYRE	25.00	
			141389	6-145-5-00-252	MAY CC STATEMENT HOWARD	51.96	
			141381	6-145-5-00-253	MAY CC STATEMENT COA	1,230.85	
			141388	6-145-5-00-253	MAY CC STATEMENT KELLOGG	49.44	
			141380	6-145-5-00-254	MAY CC STATEMENT HARMON	79.95	
			141381	6-145-5-00-254	MAY CC STATEMENT COA	2,043.75	
			141388	6-145-5-00-254	MAY CC STATEMENT KELLOGG	7.96	
			141381	6-145-5-00-260	MAY CC STATEMENT COA	178.20	
			141381	6-145-5-00-301	MAY CC STATEMENT COA	162.23	
			141381	6-145-5-00-303	MAY CC STATEMENT COA	110.27	
			141381	6-145-5-00-345	MAY CC STATEMENT COA	260.42	
			141381	6-145-5-00-750	MAY CC STATEMENT COA	2,193.24	
			141386	6-145-5-00-750	MAY CC STATEMENT PETERSEN	100.00	
			141388	6-145-5-00-750	MAY CC STATEMENT KELLOGG	558.38	
			141389	6-145-5-00-750	MAY CC STATEMENT HOWARD	255.83	
			141412	6-146-5-00-301	MAY CC STATEMENT TREAS	76.22	
			141428	6-160-5-00-201	MAY CC STATEMENT ANDERSON	169.99	
			141428	6-160-5-00-213	MAY CC STATEMENT ANDERSON	357.54	
			141429	6-160-5-00-213	MAY CC STATEMENT SALDIVAR	1,162.08	
			141428	6-160-5-00-301	MAY CC STATEMENT ANDERSON	136.60	
			141429	6-160-5-00-301	MAY CC STATEMENT SALDIVAR	795.87	

START DATE: 05/22/2026 END DATE: 05/28/2026

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WARRANT NUMBER	CHK TYPE	WARRANT DATE	VEND #/ PCH DOC #	VENDOR NAME/ ACCOUNT NUMBER	DESCRIPTION	AMOUNT	TOTAL
			141429	6-160-5-00-303	MAY CC STATEMENT SALDIVAR	190.43	
			141428	6-160-5-00-304	MAY CC STATEMENT ANDERSON	110.85	
			141429	6-160-5-00-305	MAY CC STATEMENT SALDIVAR	475.36	
			141421	6-212-5-00-2	MAY CC STATEMENT FARR	4.47	
			141444	6-212-5-00-2	MAY CC STATEMENT B&G	2,195.00	
			141444	6-212-5-00-3	MAY CC STATEMENT B&G	126.51	
					WARRANT TOTAL		93,783.56
831		05/28/2026	8686	EVERGY KANSAS CENTRAL INC			
			141478	6-160-5-00-210	APRIL 21 MAY 20 SERVICE	28.86	
			141478	6-160-5-00-210	APRIL 21 MAY 20 SERVICE	164.57	
			141478	6-160-5-00-210	APRIL 21 MAY 20 SERVICE	289.07	
					WARRANT TOTAL		482.50
*1842	AP	05/22/2026	1351	LEAVENWORTH ASPHALT MATERIALS			
			141377	6-171-5-10-303	SEVEN SISTER DUST ABATEMENT	69,749.55	
					WARRANT TOTAL		69,749.55
1843	AP	05/22/2026	122	PFEFFERKORN ENGINEERING & ENVI			
			141375	6-171-5-04-201	PROFESSIONAL SERVICES	48,337.24	
			141376	6-171-5-04-201	PROFESSIONAL SERVICES	27,344.56	
					WARRANT TOTAL		75,681.80
1844	AP	05/26/2026	1079	EARTH RISING INC			
			141414	6-171-5-08-301	PERMANENT EASEMENT, FENCING 2	2,401.00	
			141414	6-171-5-08-301	PERMANENT EASEMENT, FENCING 2	9,026.00	
					WARRANT TOTAL		11,427.00
1845	AP	05/26/2026	1351	LEAVENWORTH ASPHALT MATERIALS			
			141411	6-171-5-10-303	SEVEN SISTERS DUST ABATEMENT	58,880.25	
			141411	6-171-5-10-303	SEVEN SISTERS DUST ABATEMENT	66,826.50	
					WARRANT TOTAL		125,706.75
1846	AP	05/26/2026	3	PLANNING AND ZONING			
			141409	6-171-5-08-303	PROCEDURES AND APPLICATION PER	300.00	
					WARRANT TOTAL		300.00
*120136	AP	05/22/2026	66366	KANSAS GAS SERVICE			
			141266	6-001-5-14-220	725 LAMING RD	326.32	
					WARRANT TOTAL		326.32
120137	AP	05/22/2026	989	MODRN HEALTH, INC			
			141254	6-112-5-00-256	LAB SERVICE AND CLINIC SUPPLIE	267.03	
					WARRANT TOTAL		267.03
120138	AP	05/22/2026	1351	LEAVENWORTH ASPHALT MATERIALS			
			141311	6-133-5-00-362	ASPHALT AND SEAL	3,289.83	
			141311	6-133-5-00-362	ASPHALT AND SEAL	46,734.65	
					WARRANT TOTAL		50,024.48
120139	AP	05/22/2026	4120	AAA LAUNDRY & LINEN SUPPLY CO			
			141371	6-001-5-53-215	UNIFORM RENTALS	107.46	
			141364	6-133-5-00-215	UNIFORM RENTALS	354.83	
			141364	6-133-5-00-312	UNIFORM RENTALS	260.48	
			141369	6-137-5-00-203	UNIFORM RENTALS	103.62	
					WARRANT TOTAL		826.39
120140	AP	05/22/2026	20588	ADVANTAGE PRINTING			
			141336	6-001-5-19-301	CSO BUSINESS CARDS	85.00	
					WARRANT TOTAL		85.00
120141	AP	05/22/2026	18634	AMERICAN EQUIPMENT CO			

START DATE: 05/22/2026 END DATE: 05/28/2026

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WARRANT NUMBER	CHK TYPE	WARRANT DATE	VEND #/ PCH DOC #	VENDOR NAME/ ACCOUNT NUMBER	DESCRIPTION	AMOUNT	TOTAL
			141363	6-133-5-00-360	YOKE ENDSM ROD, HOOK , CONNECT	158.64	
			141363	6-133-5-00-360	YOKE ENDSM ROD, HOOK , CONNECT	143.36	
					WARRANT TOTAL		302.00
120142	AP	05/22/2026	2541	BEST PLUMBING SPECIALTIES,INC			
			141323	6-001-5-07-357	JAIL PLUMBING SUPPLIES	475.98	
			141323	6-001-5-07-359	JAIL PLUMBING SUPPLIES	16.24	
					WARRANT TOTAL		492.22
120143	AP	05/22/2026	24545	CDW GOVERNMENT INC			
			141320	6-001-5-07-362	LOGITECH MXC KEYS MINI QTY 30	3,002.70	
			141320	6-001-5-07-362	LOGITECH MXC KEYS MINI QTY 30	1,025.00-	
					WARRANT TOTAL		1,977.70
120144	AP	05/22/2026	5637	CLEARWATER ENTERPRISES,LLC			
			141335	6-001-5-14-220	601 S 3RD ST	771.49	
			141335	6-001-5-32-392	601 S 3RD ST	1,644.30	
			141332	6-001-5-33-392	711 MARSHALL FACILITY 1 AND 2	389.52	
			141332	6-001-5-33-392	711 MARSHALL FACILITY 1 AND 2	16.05	
			141346	6-133-5-00-304	GAS FOR COUNTY SHOP	123.99	
			141333	6-195-5-00-290	216 WALNUT ST	12.84	
					WARRANT TOTAL		2,958.19
120145	AP	05/22/2026	385	CNH INDUSTRIAL CAPITAL AMERICA			
			141374	6-153-5-00-3	OUR 14 09 20254 CASE SV340B SK	14,830.25	
					WARRANT TOTAL		14,830.25
120146	AP	05/22/2026	571	QUIKRETE HOLDINGS			
			141343	6-133-5-00-325	CULVERTS	149.60	
			141343	6-133-5-00-325	CULVERTS	299.20	
			141343	6-133-5-00-325	CULVERTS	31.00	
					WARRANT TOTAL		479.80
120147	AP	05/22/2026	21300	TOM WEISHAAR			
			141338	6-001-5-19-213	MILEAGE	168.20	
					WARRANT TOTAL		168.20
120148	AP	05/22/2026	119	FINNEY & TURNIPSEED TRANSPORTA			
			141373	6-220-5-11-400	BASIC SERVICES	78,500.00	
					WARRANT TOTAL		78,500.00
120149	AP	05/22/2026	2588	FOLEY EQUIPMENT			
			141362	6-133-5-00-360	GP SENSOR	261.91	
					WARRANT TOTAL		261.91
120150	AP	05/22/2026	774	G W VAN KEPPEL			
			141361	6-133-5-00-360	BRACKET SKIRTBOARD	940.99	
					WARRANT TOTAL		940.99
120151	AP	05/22/2026	4465	GRONIS HARDWARE INC			
			141322	6-001-5-07-359	BOLTS FOR MOUNT TV AND NUTS AN	3.52	
			141322	6-001-5-07-359	BOLTS FOR MOUNT TV AND NUTS AN	21.26	
					WARRANT TOTAL		24.78
120152	AP	05/22/2026	2505	INTRINSIC INTERVENTIONS			
			141316	6-127-5-00-3	UA TEST CUPS	1,857.50	
			141317	6-127-5-00-3	LAB COST	370.00	
			141317	6-127-5-00-3	LAB COST	50.00	
			141317	6-127-5-00-3	LAB COST	50.00	
			141317	6-127-5-00-3	LAB COST	75.00	
			141317	6-127-5-00-3	LAB COST	25.00	

START DATE: 05/22/2026 END DATE: 05/28/2026

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WARRANT NUMBER	CHK TYPE	WARRANT DATE	VEND #/ PCH DOC #	VENDOR NAME/ ACCOUNT NUMBER	DESCRIPTION	AMOUNT	TOTAL
			141317	6-127-5-00-3	LAB COST	25.00	
			141317	6-127-5-00-3	LAB COST	25.00	
			141317	6-127-5-00-3	LAB COST	25.00	
			141317	6-127-5-00-3	LAB COST	25.00	
			141317	6-127-5-00-3	LAB COST	25.00	
			141337	6-196-5-00-201	DRUG TESTEST PANEL CUPS	1,945.00	
					WARRANT TOTAL		4,497.50
120153	AP	05/22/2026	966	ATCHISON AUTO PARTS LLC DBA NA			
			141357	6-133-5-00-312	SHOP SUPPLIESM AND PARTS	17.18	
			141357	6-133-5-00-312	SHOP SUPPLIESM AND PARTS	85.86	
			141357	6-133-5-00-312	SHOP SUPPLIESM AND PARTS	237.24	
			141357	6-133-5-00-360	SHOP SUPPLIESM AND PARTS	2,348.00	
			141368	6-137-5-00-320	OIL SEAL	12.12	
					WARRANT TOTAL		2,700.40
120154	AP	05/22/2026	24445	JOHNSON CO GOVERNMENT			
			141331	6-210-5-00-2	JCW VARIOUS TEST	192.32	
			141330	6-212-5-00-2	JCW VARIOUS TEST	192.34	
			141329	6-218-5-00-2	JCW VARIOUS TEST	192.34	
					WARRANT TOTAL		577.00
120155	AP	05/22/2026	99				
			141312	6-001-5-19-205	JURY FEE	25.00	
					WARRANT TOTAL		25.00
120156	AP	05/22/2026	66366	KANSAS GAS SERVICE			
			141327	6-001-5-05-215	STATION 1 SERVICE DATE 04	14.54	
					WARRANT TOTAL		14.54
120157	AP	05/22/2026	227	LABORATORY CORPORATION OF AMER			
			141319	6-001-5-07-219	LABWORD FOR INMATE	97.95	
					WARRANT TOTAL		97.95
120158	AP	05/22/2026	1351	LEAVENWORTH ASPHALT MATERIALS			
			141360	6-133-5-00-362	ASPHALT AND SEAL	309.39	
					WARRANT TOTAL		309.39
120159	AP	05/22/2026	537	CHERRYROAD MEDIA INC			
			141359	6-133-5-00-209	1 YEAR SUBSCRIPTION RENEWAL	216.50	
					WARRANT TOTAL		216.50
120160	AP	05/22/2026	26952	LEGAL LANGUAGE SERVICES			
			141339	6-001-5-19-221	INTERPRETER	276.25	
					WARRANT TOTAL		276.25
120161	AP	05/22/2026	2111	LIFTOFF,LLC			
			141314	6-126-5-00-223	M365 APPS GCC 3WS 00001 13 LIC	1,029.60	
			141315	6-136-5-00-202	M365 APPS GCC 3WS 001 13 LICEN	1,029.60	
					WARRANT TOTAL		2,059.20
120162	AP	05/22/2026	2419	MCKESSON MEDICAL SURGICAL			
			141325	6-001-5-07-219	INMATE HEALTH SERVICE	22.27	
			141325	6-001-5-07-219	INMATE HEALTH SERVICE	43.29	
			141325	6-001-5-07-219	INMATE HEALTH SERVICE	10.18	
			141325	6-001-5-07-219	INMATE HEALTH SERVICE	12.64	
					WARRANT TOTAL		88.38
120163	AP	05/22/2026	232	MHC KENWORTH-OLATHE			
			141358	6-133-5-00-360	MOUNTHING FRON KIT AND FENDER	1,307.75	
					WARRANT TOTAL		1,307.75

START DATE: 05/22/2026 END DATE: 05/28/2026

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WARRANT NUMBER	CHK TYPE	WARRANT DATE	VEND #/ PCH DOC #	VENDOR NAME/ ACCOUNT NUMBER	DESCRIPTION	AMOUNT	TOTAL
120164	AP	05/22/2026	2666	CODY KOCH			
			141342	6-133-5-00-364	REIMBURSEMENT OF SAFETY BOOTS	165.00	
					WARRANT TOTAL		165.00
120165	AP	05/22/2026	2666	BILL NOLL			
			141345	6-133-5-00-201	KCHA CONFERENCE MILEAGE	323.35	
					WARRANT TOTAL		323.35
120166	AP	05/22/2026	24	NATL SIGN CO INC			
			141356	6-133-5-00-363	SIGN MATERIAL	2,337.80	
					WARRANT TOTAL		2,337.80
120167	AP	05/22/2026	60	NUTRIEN AG SOLUTIONS,INC			
			141370	6-001-5-53-305	ALLIGARE 2.4 AND MAD DOG	19,908.00	
					WARRANT TOTAL		19,908.00
120168	AP	05/22/2026	639	KRISTEN B PATTY			
			141313	6-001-5-09-231	CONTRACTURAL ATTORNEY	630.40	
			141313	6-001-5-09-231	CONTRACTURAL ATTORNEY	1,040.00	
			141313	6-001-5-09-231	CONTRACTURAL ATTORNEY	650.00	
					WARRANT TOTAL		2,320.40
120169	AP	05/22/2026	122	PFEFFERKORN ENGINEERING & ENVI			
			141372	6-220-5-17-400	CULVERTS	24,000.00	
					WARRANT TOTAL		24,000.00
120170	AP	05/22/2026	418	PENSKE COMMERCIAL VEHICLES US			
			141341	6-133-5-00-360	BLOWER ASSY	133.08	
			141354	6-133-5-00-360	ROCKER SWITCH	47.18	
					WARRANT TOTAL		180.26
120171	AP	05/22/2026	224	PRIME HEALTHCARE SERVICES			
			141318	6-001-5-07-219	INMATE MEDICAL BILL	120.28	
					WARRANT TOTAL		120.28
120172	AP	05/22/2026	26523	GARY SERVAES ENTERPRISES			
			141352	6-133-5-00-361	ROCK	816.85	
					WARRANT TOTAL		816.85
120173	AP	05/22/2026	6148	LEAV CO SHERIFF DEPT			
			141324	6-001-5-07-211	REGISTRATION FOR NEW UNIT 14,	86.10	
			141324	6-001-5-07-213	REGISTRATION FOR NEW UNIT 14,	33.75	
			141324	6-001-5-07-218	REGISTRATION FOR NEW UNIT 14,	22.07	
					WARRANT TOTAL		141.92
120174	AP	05/22/2026	1793	ST JOHN HOSPITAL			
			141326	6-001-5-07-219	INMATE MEDICAL BILL	29.22	
					WARRANT TOTAL		29.22
120175	AP	05/22/2026	668	TIREHUB INC			
			141340	6-133-5-00-309	TIRES	271.06	
			141351	6-133-5-00-309	TIRES	277.38	
					WARRANT TOTAL		548.44
120176	AP	05/22/2026	7512	UNITED ROTARY BRUSH CORP			
			141350	6-133-5-00-360	BROOM REFILLS	1,929.90	
					WARRANT TOTAL		1,929.90
120177	AP	05/22/2026	2007	WIRENUTS			
			141349	6-133-5-00-207	MONTHLY MONITORING RATES FOR N	89.85	
			141349	6-133-5-00-207	MONTHLY MONITORING RATES FOR N	89.85	
					WARRANT TOTAL		179.70
120178	AP	05/26/2026	18253	AT&T MOBILITY			

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WARRANT NUMBER	CHK TYPE	WARRANT DATE	VEND # / PCH DOC #	VENDOR NAME / ACCOUNT NUMBER	DESCRIPTION	AMOUNT	TOTAL
			141382	6-001-5-05-210	AT & T SUP 1 AND PAR 2 BILLS	91.84	
					WARRANT TOTAL		91.84
120179	AP	05/26/2026	1737	AT&T			
			141402	6-174-5-00-210	EASTON , LEAVENWORTH AND FT LE	15.62	
			141402	6-174-5-00-210	EASTON , LEAVENWORTH AND FT LE	78.88	
			141402	6-174-5-00-210	EASTON , LEAVENWORTH AND FT LE	78.89	
					WARRANT TOTAL		173.39
120180	AP	05/26/2026	2621	TERRY BOOKER			
			141379	6-145-5-00-256	MEALS FOR WEEK 5.1 THRU 5.15	2,944.50	
			141379	6-145-5-00-256	MEALS FOR WEEK 5.1 THRU 5.15	15,463.50	
			141379	6-145-5-00-256	MEALS FOR WEEK 5.1 THRU 5.15	15,528.50	
					WARRANT TOTAL		33,936.50
120181	AP	05/26/2026	559	CLAY E COBURN III			
			141378	6-145-5-00-213	VEHICLE FLEET WASHES	44.00	
			141378	6-145-5-00-213	VEHICLE FLEET WASHES	39.00	
					WARRANT TOTAL		83.00
120182	AP	05/26/2026	243	GEOTAB USA INC			
			141383	6-001-5-05-271	GEO LOCATION	264.18	
			141383	6-001-5-06-222	GEO LOCATION	16.33	
			141383	6-001-5-11-271	GEO LOCATION	16.33	
			141383	6-001-5-31-230	GEO LOCATION	48.99	
			141383	6-001-5-41-271	GEO LOCATION	81.65	
			141383	6-001-5-53-220	GEO LOCATION	81.65	
			141383	6-108-5-00-213	GEO LOCATION	37.74	
			141383	6-127-5-00-2	GEO LOCATION	16.33	
			141383	6-133-5-00-229	GEO LOCATION	1,158.61	
			141383	6-136-5-00-221	GEO LOCATION	32.66	
			141383	6-137-5-00-229	GEO LOCATION	269.50	
			141383	6-145-5-00-230	GEO LOCATION	522.56	
			141383	6-160-5-00-215	GEO LOCATION	97.98	
					WARRANT TOTAL		2,644.51
120183	AP	05/26/2026	1991	MID-AMERICA REGIONAL COUNCIL			
			141399	6-174-5-00-210	911 EQUIPMENT MAY	33,263.55	
					WARRANT TOTAL		33,263.55
120184	AP	05/26/2026	632	RURAL WATER DIST NO 8			
			141403	6-133-5-00-214	WATER METER SERVICE AT THE SHO	138.75	
			141403	6-133-5-00-214	WATER METER SERVICE AT THE SHO	807.41	
					WARRANT TOTAL		946.16
120185	AP	05/28/2026	2138	ABSOLUTE COMFORT TECHNOLOGIES			
			141450	6-174-5-00-210	MAINTENANCE , HVAC, SITE LEAK,	395.00	
			141450	6-174-5-00-210	MAINTENANCE , HVAC, SITE LEAK,	175.00	
			141450	6-174-5-00-210	MAINTENANCE , HVAC, SITE LEAK,	325.00	
			141450	6-174-5-00-210	MAINTENANCE , HVAC, SITE LEAK,	245.00	
			141450	6-174-5-00-210	MAINTENANCE , HVAC, SITE LEAK,	365.00	
					WARRANT TOTAL		1,505.00
120186	AP	05/28/2026	22331	JOSEPH ROTH			
			141449	6-001-5-41-270	COMMERCIAL APPRAISAL 32000@1.0	1,920.00	
					WARRANT TOTAL		1,920.00
120187	AP	05/28/2026	268	GEN DIGITAL, INC.			
			141452	6-510-2-00-941	05/2026 PREMIUMS	2,066.28	

START DATE: 05/22/2026 END DATE: 05/28/2026

TYPES OF CHECKS SELECTED: * ALL TYPES
CHECK RANGE SELECTED: * No Check Range Selected

WARRANT NUMBER	CHK TYPE	WARRANT DATE	VEND #/ PCH DOC #	VENDOR NAME/ ACCOUNT NUMBER	DESCRIPTION	AMOUNT	TOTAL
					WARRANT TOTAL		2,066.28
120188	AP	05/28/2026	56	THE TONGANOXIE MIRROR			
			141456	6-001-5-12-209	ANNUAL SUBSCRIPTION RENEWAL FO	42.00	
					WARRANT TOTAL		42.00
120189	AP	05/28/2026	770	BASEHOR UNITED METHODIST CHURC			
			141454	6-145-5-00-246	JUNE 2026 UTILITY	110.00	
			141454	6-145-5-05-202	JUNE 2026 UTILITY	52.00	
			141454	6-145-5-07-202	JUNE 2026 UTILITY	38.00	
					WARRANT TOTAL		200.00
120190	AP	05/28/2026	865	WEST HAVEN BAPTIST CHURCH			
			141453	6-145-5-00-246	JUNE 2026 UTILITY RENT	110.00	
			141453	6-145-5-05-202	JUNE 2026 UTILITY RENT	52.00	
			141453	6-145-5-07-202	JUNE 2026 UTILITY RENT	38.00	
					WARRANT TOTAL		200.00
120191	AP	05/28/2026	5555	MIKE STIEBEN			
			141451	6-001-5-01-205	MILEAGE REIMBURSEMENT FOR MARC	471.25	
					WARRANT TOTAL		471.25
120192	AP	05/28/2026	100				
			141457	6-001-5-14-221	WITNESS FEE AND MILEAGE	72.27	
					WARRANT TOTAL		72.27
120193	AP	05/28/2026	100				
			141458	6-001-5-14-221	WITNESS FEE AND MILEAGE	69.95	
					WARRANT TOTAL		69.95
120194	AP	05/28/2026	100				
			141459	6-001-5-14-221	WITNESS FEE AND MILEAGE	33.70	
					WARRANT TOTAL		33.70
120195	AP	05/28/2026	100				
			141460	6-001-5-14-221	WITNESS FEE AND MILEAGE	25.00	
					WARRANT TOTAL		25.00
120196	AP	05/28/2026	100				
			141461	6-001-5-14-221	WITNESS FEE	25.00	
					WARRANT TOTAL		25.00
120197	AP	05/28/2026	100				
			141462	6-001-5-14-221	WITNESS FEE	25.00	
					WARRANT TOTAL		25.00
120198	AP	05/28/2026	100				
			141463	6-001-5-14-221	WITNESS FEE	25.00	
					WARRANT TOTAL		25.00
120199	AP	05/28/2026	100				
			141464	6-001-5-14-221	WITNESS FEE	25.00	
					WARRANT TOTAL		25.00
120200	AP	05/28/2026	4938	BUILDING & GROUNDS		1,183.78	
			141475	6-108-5-00-219	JANITORIAL SERVICES AND S KARR	394.60	
			141475	6-108-5-00-606	JANITORIAL SERVICES AND S KARR		1,578.38
					WARRANT TOTAL		
120201	AP	05/28/2026	1004	ASHLEY BULLOCK LLC			
			141476	6-108-5-00-206	MEDICAL DIRECTOR FEE	1,500.00	
					WARRANT TOTAL		1,500.00
120202	AP	05/28/2026	1219	CLERK OF DIST COURT-LEAV			
			141479	6-001-5-11-501	MAY 2026 DISTRICT COURT COST	35.00	

START DATE: 05/22/2026 END DATE: 05/28/2026

TYPES OF CHECKS SELECTED: * ALL TYPES
CHECK RANGE SELECTED: * No Check Range Selected

WARRANT NUMBER	CHK TYPE	WARRANT DATE	VEND #/ PCH DOC #	VENDOR NAME/ ACCOUNT NUMBER	DESCRIPTION	AMOUNT	TOTAL
			141479	6-001-5-11-501	MAY 2026 DISTRICT COURT COST	108.00	
			141479	6-001-5-11-501	MAY 2026 DISTRICT COURT COST	158.00	
			141479	6-001-5-11-501	MAY 2026 DISTRICT COURT COST	108.00	
			141479	6-001-5-11-501	MAY 2026 DISTRICT COURT COST	108.00	
			141479	6-001-5-11-501	MAY 2026 DISTRICT COURT COST	193.00	
			141479	6-001-5-11-501	MAY 2026 DISTRICT COURT COST	158.00	
			141479	6-001-5-11-501	MAY 2026 DISTRICT COURT COST	108.00	
			141479	6-001-5-11-501	MAY 2026 DISTRICT COURT COST	108.00	
			141479	6-001-5-11-501	MAY 2026 DISTRICT COURT COST	108.00	
			141479	6-001-5-11-501	MAY 2026 DISTRICT COURT COST	488.00	
			141479	6-001-5-11-501	MAY 2026 DISTRICT COURT COST	130.00	
			141479	6-001-5-11-501	MAY 2026 DISTRICT COURT COST	120.00	
			141479	6-001-5-11-501	MAY 2026 DISTRICT COURT COST	108.00	
			141479	6-001-5-11-501	MAY 2026 DISTRICT COURT COST	56.00	
			141479	6-001-5-11-501	MAY 2026 DISTRICT COURT COST	108.00	
			141479	6-001-5-11-501	MAY 2026 DISTRICT COURT COST	200.00	
			141479	6-001-5-11-501	MAY 2026 DISTRICT COURT COST	180.00	
			141479	6-001-5-11-501	MAY 2026 DISTRICT COURT COST	31.00	
			141479	6-001-5-11-501	MAY 2026 DISTRICT COURT COST	108.00	
			141479	6-001-5-11-501	MAY 2026 DISTRICT COURT COST	108.00	
			141479	6-001-5-11-501	MAY 2026 DISTRICT COURT COST	131.00	
			141479	6-001-5-11-501	MAY 2026 DISTRICT COURT COST	108.00	
			141479	6-001-5-11-501	MAY 2026 DISTRICT COURT COST	200.00	
			141479	6-001-5-11-501	MAY 2026 DISTRICT COURT COST	80.00	
			141479	6-001-5-11-501	MAY 2026 DISTRICT COURT COST	25.00	
			141479	6-001-5-11-501	MAY 2026 DISTRICT COURT COST	158.00	
					WARRANT TOTAL		3,531.00
120203	AP	05/28/2026	9762	LEAVENWORTH POLICE DEPT			
			141473	6-001-5-11-503	PYLE AND SOWELL	100.00	
			141473	6-001-5-11-503	PYLE AND SOWELL	100.00	
					WARRANT TOTAL		200.00
120204	AP	05/28/2026	537	CHERRYROAD MEDIA INC			
			141465	6-001-5-11-209	SUBSCRIPTION RENEWAL IN 251366	216.50	
					WARRANT TOTAL		216.50
120205	AP	05/28/2026	2059	MIDWEST OFFICE TECHNOLOGY INC			
			141466	6-001-5-11-303	COPIER COST OVERAGE 4-19. 5-18	58.53	
					WARRANT TOTAL		58.53
120206	AP	05/28/2026	103	JOSPEH COFRANCISO			
			141468	6-001-5-11-502	RESTITUTION MAY 2026	280.00	
					WARRANT TOTAL		280.00
120207	AP	05/28/2026	103	BENJAMIN AVENENTI			
			141469	6-001-5-11-502	RESTITUTION MAY 2026	280.00	
					WARRANT TOTAL		280.00
120208	AP	05/28/2026	103	CVS			
			141470	6-001-5-11-502	RESTITUTION MAY 2026	350.00	
					WARRANT TOTAL		350.00
120209	AP	05/28/2026	103	DOLLAR GENERAL			
			141471	6-001-5-11-502	RESTITUTION MAY 2026	200.00	
					WARRANT TOTAL		200.00
120210	AP	05/28/2026	103	11WORTH LIQUORS			

START DATE: 05/22/2026 END DATE: 05/28/2026

TYPES OF CHECKS SELECTED: * ALL TYPES
CHECK RANGE SELECTED: * No Check Range Selected

WARRANT NUMBER	CHK TYPE	WARRANT DATE	VEND #/ PCH DOC #	VENDOR NAME/ ACCOUNT NUMBER	DESCRIPTION	AMOUNT	TOTAL
			141472	6-001-5-11-502	RESTITUTION MAY 2026	101.40	
					WARRANT TOTAL		101.40
120211	AP	05/28/2026	6917	RURAL WATER DIST #1			
			141477	6-160-5-00-210	WATER METER CHARGE	28.34	
					WARRANT TOTAL		28.34
120212	AP	05/28/2026	6148	LEAV CO SHERIFF DEPT			
			141474	6-001-5-11-503	ELLIS AND SCHOENHAL	100.00	
			141474	6-001-5-11-503	ELLIS AND SCHOENHAL	42.00	
					WARRANT TOTAL		142.00
					GRAND TOTAL		761,112.53

START DATE: 05/22/2026 END DATE: 05/28/2026

TYPES OF CHECKS SELECTED: * ALL TYPES
CHECK RANGE SELECTED: * No Check Range Selected

FUND SUMMARY

001	GENERAL	119,247.37
104	DRUG PROSECUTOR'S FUND	416.25
106	OPIOID SETTLEMENT	411.82
108	COUNTY HEALTH	11,559.36
112	EMPLOYEE BENEFIT	417.13
125	CPJJ	50.28
126	COMM CORR ADULT	1,094.42
127	COMM CORR ADULT NON GRANT	3,219.01
133	ROAD & BRIDGE	95,687.94
135	COMM CORR OPIOID	910.23
136	COMM CORR JUVENILE	2,786.21
137	LOCAL SERVICE ROAD & BRIDGE	6,125.08
138	JUV INTAKE & ASSESSMENT	412.12
139	JDC: FAMILY STRONG	82.25
144	PALS (PETS AND LOVING SENIORS	2,601.05
145	COUNCIL ON AGING	67,922.95
146	COUNTY TREASURER SPECIAL	76.22
153	PUBLIC WORKS,EQUIP.RESERVE FUND	14,830.25
160	SOLID WASTE MANAGEMENT	5,277.22
171	S TAX CAP RD PROJ: BONDS	282,865.10
174	911	35,693.17
195	JUVENILE DETENTION	12.84
196	DRUG TEST & SUPERVISION FEES	1,945.00
210	SEWER DISTRICT 1: HIGH CREST	192.32
212	SEWER DISTRICT 2: TIMBERLAKES	2,518.32
218	SEWER DIST #5	192.34
220	CAP IMPR: RD & BRIDGE	102,500.00
510	PAYROLL CLEARING	2,066.28
	TOTAL ALL FUNDS	761,112.53

Leavenworth County
Request for Board Action
Resolution 2026-09
Special Use Permit Tillman Infrastructure, LLC

Date: June 3, 2026
To: Board of County Commissioners
From: Planning & Zoning Staff

Department Head Review: John Jacobson, Reviewed

Additional Reviews as needed:

Budget Review ☐ Administrator Review ☒ Legal Review ☒

Action Requested:

Chairman, I find that this request for a Special Use Permit complies with the Golden Factors and move to adopt Resolution 2026-09 and conditionally approve the Special Use Permit as outlined in Case DEV-26-015 based on the recommendation and conditions of the Planning Commission and the findings as set forth in the Staff Report as amended by the Planning Commission and as substantiated by the facts, testimony, and evidence presented at the public hearing.

Analysis: The applicant is proposing to install a 195 ft (plus 4 ft lightning rod) telecommunications tower within a 100 ft. by 100 ft. leased area in the northwest corner of 15076 214th Street. The telecommunications tower is a self-supporting tower that can support antenna arrays at three different locations on the tower and can accommodate three separate carriers. The applicant is proposing to construct a gravel driveway with access to 214th Street being shared through the existing entrance. The tower site shall be surrounded by a 6-foot screening fence and landscaping to reduce the visual impact from the right-of-way and adjoining property owners. The tower will be active 24/7, with anticipated maintenance occurring approximately once a month. Utility upgrades (electric) will be needed to support the tower. The applicant has been in contact with Evergy which has indicated that all upgrades will be the responsibility of the applicant. No additional utilities are anticipated for the tower.

Planning Commission Recommendation: The Planning Commission voted 8-0 (1 absent) to recommend approval of Resolution 2026-09 (Case No. DEV-26-015) for a Special Use Permit for Tillman Infrastructure, LLC, with conditions, as stated in the staff report.

Alternatives:

1. Approve Case DEV-26-015 (Resolution 2026-09), Special Use Permit for a Telecommunication Facility (Communication Tower) for Tillman Infrastructure, LLC, with Findings of Fact, and with or without conditions; or

   Motion: Chairman, I find that this request for a Special Use Permit complies with the Golden Factors and move to adopt Resolution 2026-09 and conditionally approve the Special Use Permit as outlined in Case DEV-26-015 based on the recommendation and

conditions of the Planning Commission and the findings as set forth in the Staff Report as amended by the Planning Commission and as substantiated by the facts, testimony, and evidence presented at the public hearing.

2. Deny Case DEV-26-015 (Resolution 2026-09), Special Use Permit for a Telecommunication Facility (Communication Tower) for Tillman Infrastructure, LLC, with Findings of Fact; or

   Motion: Chairman, I find that this request for a Special Use Permit does not comply with Golden Factors (LIST FACTORS) and move to deny Resolution 2026-09 and deny the Special Use Permit as outlined in Case DEV-26-015.

3. Revise or Modify the Planning Commission Recommendation to Case DEV-26-015 (Resolution 2026-09), Special Use Permit for a Telecommunication Facility (Communication Tower) for Tillman Infrastructure, LLC, with Findings of Fact; or

   Motion: : Chairman, I find that this request for a Special Use Permit complies with the Golden Factors and move to adopt Resolution 2026-09 and conditionally approve the Special Use Permit as outlined in Case DEV-26-015 based on the recommendation and conditions of the Planning Commission and the findings as set forth in the Staff Report as amended by the Planning Commission and as substantiated by the facts, testimony, and evidence presented at the public hearing subject to the following additional conditions: (LIST CONDITIONS OR MODIFICATIONS).

4. Remand the case back to the Planning Commission with a statement specifying the basis for the Board failure to approve or disapprove.

   Motion: Chairman, I move to remand Case No. DEV-26-015 back to the Planning Commission for additional review due to (STATE THE REASON(S) THE BOCC CANNOT APPROVE OR DISAPPROVE THE MATTER).

Budgetary Impact:

☒ Not Applicable
☐ Budgeted item with available funds
☐ Non-Budgeted item with available funds through prioritization
☐ Non-Budgeted item with additional funds requested

Total Amount Requested:
$0.00

Additional Attachments: Staff Report, Planning Commission Minutes, Proposed Resolution

LEAVENWORTH COUNTY
PLANNING COMMISSION
STAFF REPORT

CASE NO: DEV-26-015 Tillman Infrastructure Telecommunications Tower — May 13, 2026

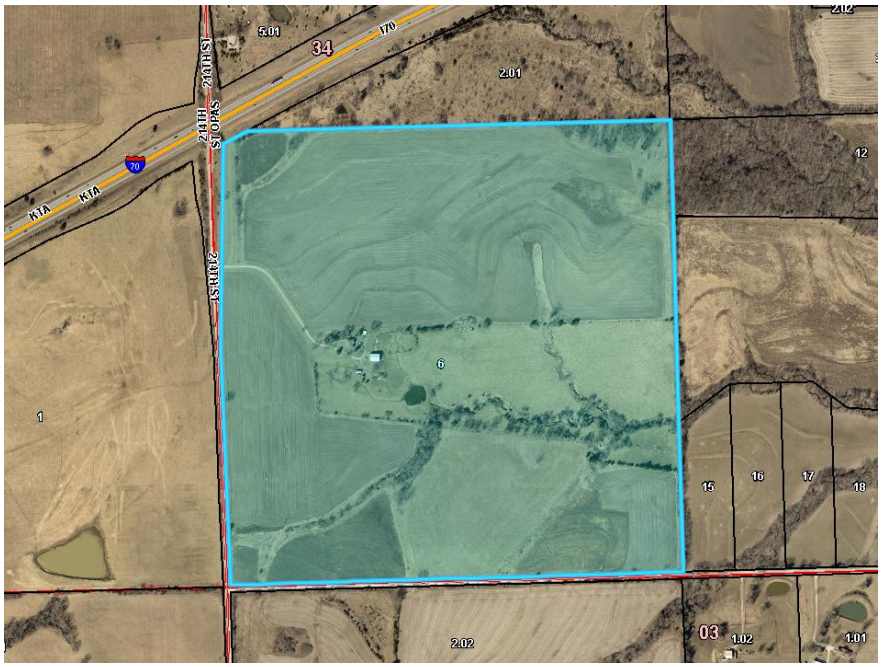
REQUEST: ***Public Hearing Required***

☐ Zoning Amendment ☒ Special Use Permit

☐ Temporary Special Use Permit

STAFF REPRESENTATIVE:
Amy Allison
Deputy Director

SUBJECT PROPERTY: 15076 214th Street



APPLICANT/APPLICANT AGENT:
Patrick Erwin
Skyward Land Services, Inc.
PO Box 25783
Overland Park, KS 66226

Tillman Infrastructure, LLC
152 West 57th Street
New York, NY 10019

PROPERTY OWNER:
Everett J Oelschlaeger Trust
15076 214th Street
Tonganoxie, KS 66086

CONCURRENT APPLICATIONS:
N/A

LAND USE

ZONING: RR-5

FUTURE LAND USE DESIGNATION:
RESIDENTIAL (2.5-acre min)

LEGAL DESCRIPTION:
The Southwest Quarter of Section 34, Township 11 South, Range 21 East of the 6th P.M., Leavenworth County, Kansas

SUBDIVISION: N/A

FLOODPLAIN: N/A

STAFF RECOMMENDATION: APPROVAL with Conditions

PROPERTY INFORMATION

ACTION OPTIONS:

1. Recommend approval of Case No. DEV-26-015, Special Use Permit for Tillman Infrastructure for a Wireless Communication Facility (Telecommunications Tower), to the Board of County Commission, with or without conditions; or
2. Recommend denial of Case No. DEV-26-015, Special Use Permit for Tillman Infrastructure for a Wireless Communication Facility (Telecommunications Tower), to the Board of County Commission for the following reasons; or
3. Continue the hearing to another date, time, and place.

PARCEL SIZE: 157.80 Acres

PARCEL ID NO:
198-34-0-00-00-006.00

BUILDINGS:
Single-family residence with accessory structures

PROJECT SUMMARY:
Request for Special Use Permit to operate a Telecommunications Tower for Tillman Infrastructure on the property located at 15076 214th Street.

ACCESS/STREET:
214th Street, local, gravel ±30' WIDE,

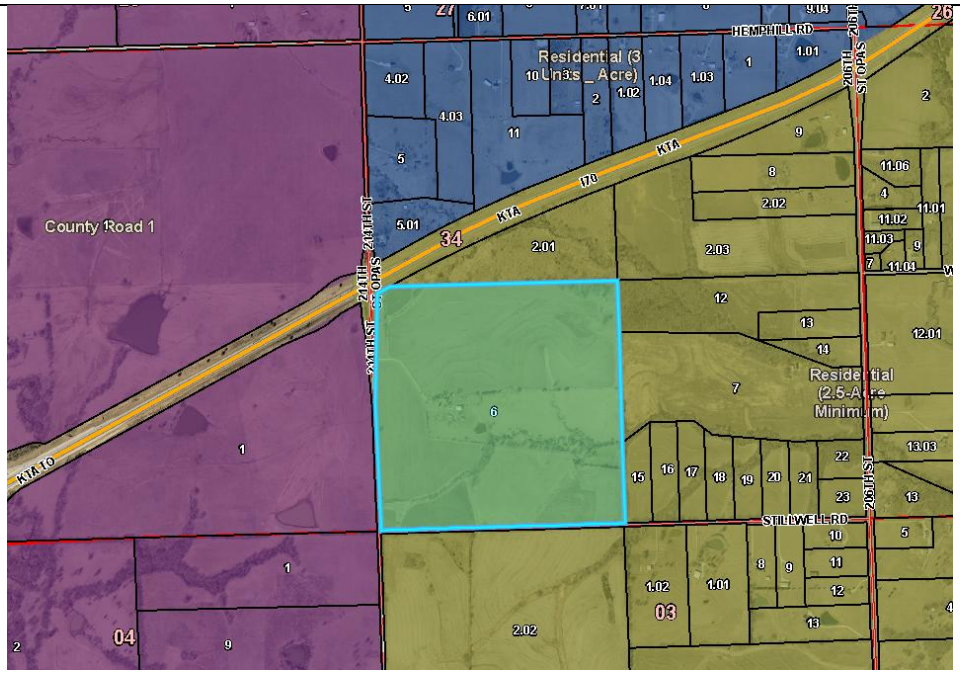
Location Map: (see next page)

UTILITIES

SEWER: SEPTIC

FIRE: Fire District #2

WATER: n/a



ELECTRIC: EVERGY

NOTICE & REVIEW:

STAFF REVIEW: 4/16/2026

NEWSPAPER NOTIFICATION: 4/18/2022

NOTICE TO SURROUNDING PROPERTY OWNERS: 4/21/2026

FACTORS TO BE CONSIDERED:

The following factors are to be considered by the Planning Commission and the Board of County Commissioners when approving or disapproving this Special Use Permit request:	**Met**	**Not Met**
1. Character of the Neighborhood: *Density:* The surrounding area is not densely developed. Parcels range in size from 6.4 to over 150 acres. *Nearby City Limits: The City of Tonganoxie is located more than 2 miles to the northwest.* *Initial Growth Management Area: This parcel is located within the Rural Growth Area.*	✓	
2. Zoning and uses of nearby property: *Adjacent Uses: Most of the adjacent parcels are residential and agricultural in nature. A cell tower is located approximately 900 ft to the north of the leased area.* *Adjacent Zoning: All adjacent properties are zoned RR-5 and MXD (Mixed Planned District)*	✓	
3. Suitability of the Property for the uses to which it has been restricted: *The property is **over 150 acres**. The property is suitable as a rural residence, for agricultural use and the proposed use is allowed with a Special Use Permit.*	✓	
4. Extent to which removal of the restrictions will detrimentally affect nearby property: *The use is unlikely to detrimentally impact neighboring parcels.* *Noise: There may be a slight increase in noise during construction of the tower, however, during regular operation noise is typically not impactful to surrounding property owners.*	✓	

Traffic: Traffic to the site will be limited. After construction is completed, traffic to the site will be limited to on-going maintenance, approximately once a month.	✓	
Lighting: No overhead lighting is proposed beyond those statutorily required for a communication facility of this nature.	✓	
Outdoor Storage: No outdoor storage is proposed beyond facility equipment.	✓	
Parking: Parking is provided and is adequate for the proposed use.	✓	
Visitors/Employees: No customers will visit the site. Staff will visit the site for on-going maintenance which is anticipated to be approximately once a month.	✓	
Waste: The applicant does not store chemicals, lubricants, oils or other chemicals on the property. Any waste generated from the property must be disposed of in compliance with all applicable local, state and federal laws.	✓	
5. Length of time the property has been vacant as zoned: ☐*Vacant:* ☒ *Not Vacant: The property is currently being used for agricultural purposes and has a single-family residence.*	✓	
6. Relative gain to economic development, public health, safety and welfare: *The proposed application would allow for expansion of utility services within Leavenworth County. There does not appear to be any detrimental effects to the public health, safety or welfare.*	✓	
7. Conformance to the Comprehensive Plan: *Future Land Use Map: Residential (2.5-acre min)*		✓

STAFF COMMENTS:

The applicant is proposing to install a 195 ft (plus 4 ft lightning rod) telecommunications tower within a 100 ft. by 100 ft. leased area in the northwest corner of 15076 214th Street. The telecommunications tower is a self-supporting tower that can support antenna arrays at three different locations on the tower and can accommodate three separate carriers. The applicant is proposing to construct a gravel driveway with access to 214th Street being shared through the existing entrance. The tower site shall be surrounded by a 6-foot screening fence and landscaping to reduce the visual impact from the right-of-way and adjoining property owners. The tower will be active 24/7, with anticipated maintenance occurring approximately once a month. Utility upgrades (electric) will be needed to support the tower. The applicant has been in contact with Evergy who has indicated that all upgrades will be the responsibility of the applicant. No additional utilities are anticipated for the tower.

The Leavenworth County Zoning & Subdivision Regulations has adopted use restrictions for Wireless Communication Facilities. Since the adoption of these regulations, the State of Kansas has enacted statutes that limits local land use control for wireless communication facilities per K.S.A. 66-2019 (see attached). The County's regulations for such facilities are as follows:

1. *Applicants must provide documentation acceptable to the Planning Commission that existing structures within an approximate one (1) mile radius of the proposed location are not available for collocation.*

Per K.S.A 66-2019 local jurisdictions cannot require an applicant to submit information about or evaluate an applicant's business decisions with respect to the applicant's designed service, customer demand for service or quality of the applicant's service to or from a particular area or site. An authority may require an applicant filing an application for a new wireless support structure to state in such application such application that the applicant has conducted an analysis of available collocation opportunities on existing wireless support structure within the same search ring defined by the applicant, solely for the purpose of confirming that an applicant undertook such analysis. The applicant has provided a letter with from an RF Engineer stating that analysis was carried out of all available collocation opportunities and that the proposed location is the best location to support their customers.

2. *All proposed towers 150 feet or less, not including lightning rod, shall be designed to accommodate at least one (1) additional PCS/Cellular platform. All proposed towers in excess of 150 feet shall be designed to accommodate at least two (2) additional PCS/Cellular platforms.*

   The applicant has indicated that there is additional room within the proposal to accommodate three carriers.

3. *Any application for a tower in excess of 150 feet in height shall include supported testimony of an RF engineer, or other licensed Professional Engineer, substantiating the need for the requested height.*

   Per K.S.A. 66-2019, the statute limits local jurisdiction's ability to require additional information regarding business decisions for coverage or to dictate the type of transmission equipment or technology use for the facility.

4. *The minimum setback from adjoining property lines shall be the height of the tower plus twenty (20) feet. And that setbacks may, on a case by case basis, be considered for a variance and the applicant shall provide such documents for such.*

   The proposed tower is 199 ft total height with the inclusion of the lighting rod. The proposed setback from to the west right-of-way line is 223 ft and 289' to the north property line. Both setbacks exceed the required setback of total tower height plus twenty feet. Staff recommend placing a condition on the permit requiring the setback.

5. *The tower and accessory equipment must meet all requirements of the Federal Communication Commission and the Federal Aviation Administration.*

   The applicant has submitted the plans for the proposed telecommunications tower to the FAA for approval. Staff recommend placing a condition that confirmation of approval from both the FCC and FAA must be obtained prior to the tower being constructed.

6. *Any tower that is not operated for a continuous period of two (2) years shall be considered abandoned, and the owner of such tower shall remove same within ninety (90) days of receipt of notice from the governing authority notifying the owner of such abandonment. If such tower is not removed within said ninety (90) days, the governing authority may remove such tower at the owner's expense.*

   Staff recommend placing this requirement as a condition of approval.

7. *Pad sites and guy wire locations must be surrounded by a minimum of a six-foot tall fence that may use screening inserts or other material that block direct view of the site.*

The applicant's site plans indicate that the tower will be surrounded by an aluminum fence, however the narrative indicates a 6 ft. chain link with slat fence shall be installed. Staff recommend a condition be placed that a 6 ft. tall fence solid fence be installed in compliance with this requirement. The applicant has also proposed installing landscaping, a mixture of American Arborvitae and Eastern white Pine around the perimeter of the fence.

8. *Vegetation must be removed from around the pad site and controlled on the rest of the property if the property is not used for agricultural purposes.*

   The applicant has indicated that they will spray for weeds and other unwanted vegetation along the proposed access road and fenced-in area biannually. Staff recommend placing this as a condition of approval with minor alteration.

9. *Prior to the issuance of a building permit, the applicant must file and receive approval of a site plan. Such application may be submitted concurrently with the application of a Special Use Permit.*

   The applicant has submitted their site plan for consideration with the required Special Use Permit.

STAFF RECOMMENDED CONDITIONS:

Staff recommends approval of DEV-26-015 with the following conditions:

1. The SUP is considered a Type 2 permit and shall be limited to a period of twenty (20) years.
2. No limit on hours of operation.
3. The Special Use Permit shall be subject to the written narrative and site plan provided on April 6, 2016, and April 13, 2026.
4. The applicant shall provide a certificate of general liability insurance in the amount of $1,000,000 and shall indicate Leavenworth County as the certificate holder prior to commencement of activities on the site.
5. The applicant shall provide confirmation of both the FCC and FAA approval of the telecommunications tower to the Planning & Zoning Department prior to a building permit being issued and construction commencing.
6. A copy of the executed lease agreement must be obtained prior to a building permit being issued.
7. A building permit shall be obtained prior to commencement of construction.
8. A 24-hour emergency contact number shall be posted at the facility in the event of an emergency.
9. Must provide updated plans in compliance with all outstanding review comments made by County Staff prior to any acceptance being issued.
10. The applicant shall contact the Emergency Management Department and Fire District #2 with an Emergency Plan. Confirmation of the final approved plan must be submitted to the Planning & Zoning Department prior to issuance of a building permit.
11. The proposed telecommunications tower shall maintain a required setback of the total tower height plus 20 feet to all property lines and right-of-way lines.
12. Applicant shall file and maintain a security bond, letter of credit or other such security acceptable to the County. Such security shall be in the amount equal to twenty (20) percent of the cost of construction to the tower as disclosed by the applicant. Such security shall be used to pay for removal of the tower if the owner fails to remove the tower as provided in #14. The security shall be returned to the applicant upon proper removal of the tower.
13. Any tower that is not operated for a continuous period of two (2) years shall be considered abandoned, and the owner of such tower shall remove same within ninety (90) days of receipt of notice from the governing authority notifying the owner of such abandonment. If such tower is not removed within said ninety (90) days, the governing authority may remove such tower at the owner's expense.
14. Pad sites and guy wire locations must be surrounded by a minimum of a six-foot tall fence that may use screening inserts or other material that block direct view of the site.

15. Vegetation must be removed from around the pad site and controlled on the leased area of the property.
16. No signage shall be allowed in the right-of-way. Sign permits shall be required for any on-site or off-site signage. The applicant shall provide an owner authorization form for any off-site signs. All signage shall comply with Article 25, Sign Regulations of the Leavenworth County Zoning and Subdivision Regulations.
17. No on-street parking shall be allowed and traffic shall not queue onto the public road network when entering the site.
18. Lighting generated from proposed use shall be limited to 0.00 foot-candles net gain, as measured at the property line.
19. Noise shall be limited to 65 dBs along property lines adjacent to Residentially Zoned Parcels.
20. All areas disturbed during construction shall be either sodded or seeded within a year of completion of construction.
21. That the conditional Special Use Permit granted herein is subject to revocation upon the breaching of the conditions set forth herein, or any substantial change in the use of the subject property. The Tillman Infrastructure LLC, and its assigns or successors in interest, hereby consent to, and authorize, entry onto the subject property by employees or agents of the county for the purpose of inspecting the subject property for compliance with the conditions set forth herein.
22. This SUP is subject to revocation upon the violation or, or failure to comply with, any condition stated herein.
23. Applicant shall not cause or allow any public nuisance to exist on the subject property
24. This SUP shall comply with all local, state, and federal rules and regulations that may be applicable.

ATTACHMENTS:

A: Application & Narrative

B: Zoning Map

C: Memorandums

SPECIAL USE PERMIT APPLICATION

Leavenworth County Planning Department
300 Walnut, St., Suite 212
County Courthouse
Leavenworth, Kansas 66048
913-684-0465

APPLICANT/AGENT INFORMATION	OWNER INFORMATION (If different)
NAME Tillman Infrastructure, LLC	NAME The Everett J. Oelschlaeger Trust
ADDRESS 152 W 57th Street	ADDRESS 15076 214th Street
CITY/ST/ZIP New York, NY 10009	CITY/ST/ZIP Tonganoxie, KS 66806
PHONE 913-626-4440	PHONE 913-375-7910
EMAIL erwin@skywardsite.com	EMAIL
CONTACT PERSON Patrick Erwin	CONTACT PERSON Dennis L. Oelschlaeger

PROPERTY INFORMATION

PID: 052-198-34-0-00-00-006.00-0 Zoning District: Leavenworth County

Address of property 15076 214th St. Parcel size 157.02

Current use of the property Agricultural Use/Farm Homesite

Does the owner live on the property? ☒ Yes ☐ No

Proposed Special Use To erect a 195' Self-Support Tower with a 4' Lightning Rod on a 100' x 100' lease portion of the parcel.

TAX ASSESSEMENT STATEMENT

Upon the granting of a Special Use Permit by the Leavenworth County Board of County Commissioners, the assessable nature of the above referenced property and structures on the property may result in a change of the Appraised Class and Value and in the next year's Tax Assessment.

I, the applicant, have read and understand that there may be a change in the appraised value of my property due to the presence of a Special Use Permit for my property. (Check one) ☒ Yes ☐ No

I, the undersigned am the *(circle one) owner, duly authorized agent,* of the aforementioned property situated in the unincorporated portion of Leavenworth County, Kansas. By execution of my signature, I do hereby officially apply for a Special Use Permit and acknowledge the potential of a change in the Appraised Value of my property as indicated above. **I hereby agree to "cease and desist" the operation of the activity upon denial of the permit by the Board of County Commissioners.**

Signature Dennis Oelschlaeger Date 4-13-26

ATTACHMENT A

PROPOSED SPECIAL USE PERMIT INFORMATION

Name of Business Tillman Infrastructure

Existing and Proposed Structures 1 proposed

Number of structures used for Special Use Permit 1

Will the use require parking? ☒ Yes ☐ No How many parking spaces are proposed/available? 1

Is the proposed use seasonal? ☐ Yes ☒ No

If yes, what months will the use be active? _____ (Month) through _____ (Month)

Reason for requesting a Special Use Permit: Communication Tower to serve the surrounding area

Estimated Traffic

In this section, you are determining the impact your proposed use will have on the county roadways. A vehicle visiting your site is to be considered two trips because the visitor/employee/user will use the roadways twice. If you are planning to expand the use that may generate additional traffic during the duration of the permit, provide the traffic generation for the full expansion.

How many total Passenger vehicle trips (both entering and exiting) will be generated by the Special Use Permit?

Daily _____ Weekly _____ Monthly 1

If applicable, how many total Commercial (delivery, heavy trucks, equipment, etc.) vehicle trips (both entering and exiting) will be generated by the Special Use Permit?

Daily _____ Weekly _____ Monthly 1

If applicable, describe Seasonal trips not accounted for above: What type (Passenger and Commercial) vehicle trips, how many trips per vehicle type in the seasonal timeframe, and describe the seasonal time frame (months, weeks, or days) in a calendar year.

Passenger: Months _____ Weeks _____ Days _____

Commercial: Months _____ Weeks _____ Days _____

When are trips to the site expected to occur (i.e. throughout the day, limited certain hours, etc.)? If applicable, separate occurrences by vehicle type (Passenger, Commercial, Seasonal Passenger, and Seasonal Commercial):

Unpredictable, could be anytime, day or night

What is the anticipated route(s) from the nearest State Highway to the Site? From I-70, to Northbound 222nd st, to to Hemphill Road to the east, then south on 214th Street to the site.

Special Use Permit Renewal

Describe any change to operations since the SUP was last issued including traffic trips compared to this SUP:

Have you added any buildings since the SUP was last issued? ☐Yes ☐ No Any parking? ☐Yes ☐ No

ATTACHMENT B

SPECIAL USE PERMIT APPLICATION

PROPOSED WIRELESS TELECOMMUNICATIONS FACILITY AT:

15076 214TH St.

Tonganoxie, Leavenworth County, KS 66086

FILED ON BEHALF OF TILLMAN INFRASTRUCTURE, LLC BY:

SKYWARD LAND SERVICES, INC.

PATRICK ERWIN

TABLE OF CONTENTS

1. LETTER OF APPLICATION
2. PROPERTY OWNER SIGNED SPECIAL USE APPLICATION
3. SUPPLEMENTAL NARRATIVE
4. DEED COVERING THE SUBJECT PROPERTY
5. PROJECT DRAWINGS

April 13, 2026

Amy Allison
Deputy Director, Planning and Zoning
300 Walnut St.
Leavenworth, KS 66048
913-684-0465

RE: Proposed Wireless Communications Facility
15076 214TH St.
Tonganoxie, Leavenworth County, KS 66086

Dear Ms. Allison:

Skyward Land Services, on behalf of Tillman Infrastructure (Tillman), files this Special Use Application to allow the construction of a wireless telecommunications facility at the above referenced property. Tillman has finalized a lease agreement with the owner(s) of the property, Dennis L. Oelschlaeger, Laura E. Gleeson aka Laura E. McDonald and Linda E. Shipman, Co-Trustees of the Everett J. Oelschlaeger Revocable Intervivos Trust. The proposed facility is designed to accommodate multiple carriers and will provide the technology needed to provide clear and uninterrupted wireless telecommunications services to the residents of Leavenworth County.

The proposed wireless telecommunications facility will consist of a 195' tall self-supporting tower with a 4' lightning rod to be located within a 100'-0" x 100'-0" lease area. Future expansion of the lease area can be accommodated, if needed, for multiple carrier's ground equipment. The proposed tower will be erected, owned and managed by Tillman. The facility will be unstaffed and will only require carrier service technicians, in a pick-up/van sized vehicle, to visit the site approximately once per month.

The facility is proposed in the RR-5 (Rural Residential – 5 acres) zone. Pursuant to Article 19 of the Leavenworth County Land Development Code, and confirmed by phone conversation on December 23, 2024, towers are allowed in the by Special Use Permit approval by the Planning Commission.

On behalf of Tillman Infrastructure, I herewith submit all required documentation for the consideration of conditional use permit approval in accordance with Leavenworth County's Zoning Ordinance.

Should you have any questions please feel free to contact me. I look forward to working with you.

Sincerely,

Patrick Erwin
Skyward Land Services, Inc.
913-626-4440

APPLICATION FOR A NEW WIRELESS COMMUNICATIONS FACILITY

Submitted to Leavenworth County, KS

GENERAL INFORMATION

Applicant:	Tillman Infrastructure, LLC 152 West 57th Street New York, NY 10019
Applicant's Representative:	Skyward Land Services, Inc. Patrick Erwin PO Box 25783 Overland Park, KS 66226 erwin@skywardsite.com 913.626.4440
Project Address:	15076 214th St. Tonganoxie, KS 66086
Property Owner(s):	The Everett J. Oelschlaeger Revocable Intervivos Trust
Map/Tax Lot Number:	052-198-34-0-00-00-006.00-0 Sec 34 Twn 11 Rng 21E
Land Use Designation:	Rural Residential – 5 acres
Zoning Classification:	RR-5
Parcel Size:	157.8 acres (without right of way)

INTRODUCTION

Tillman Infrastructure, LLC (Tillman) proposes to construct a new telecommunications tower in Leavenworth County Kansas. The proposed site will allow wireless carriers to improve the quality of services for their customers in Leavenworth County and the City of Tonganoxie. The tower is designed to accommodate three (3) carriers.

As shown in this application narrative, Tillman's proposal meets the Leavenworth County code criteria. The selected site is zoned RR-5, and 157.8 acres, where towers are allowed are allowed zoned by Special Use permit approval by the Planning Official. The proposal meets all the County's criteria for development in the RR-5 zone, including height and setbacks. Tillman respectfully requests that the County approve the new facility as proposed.

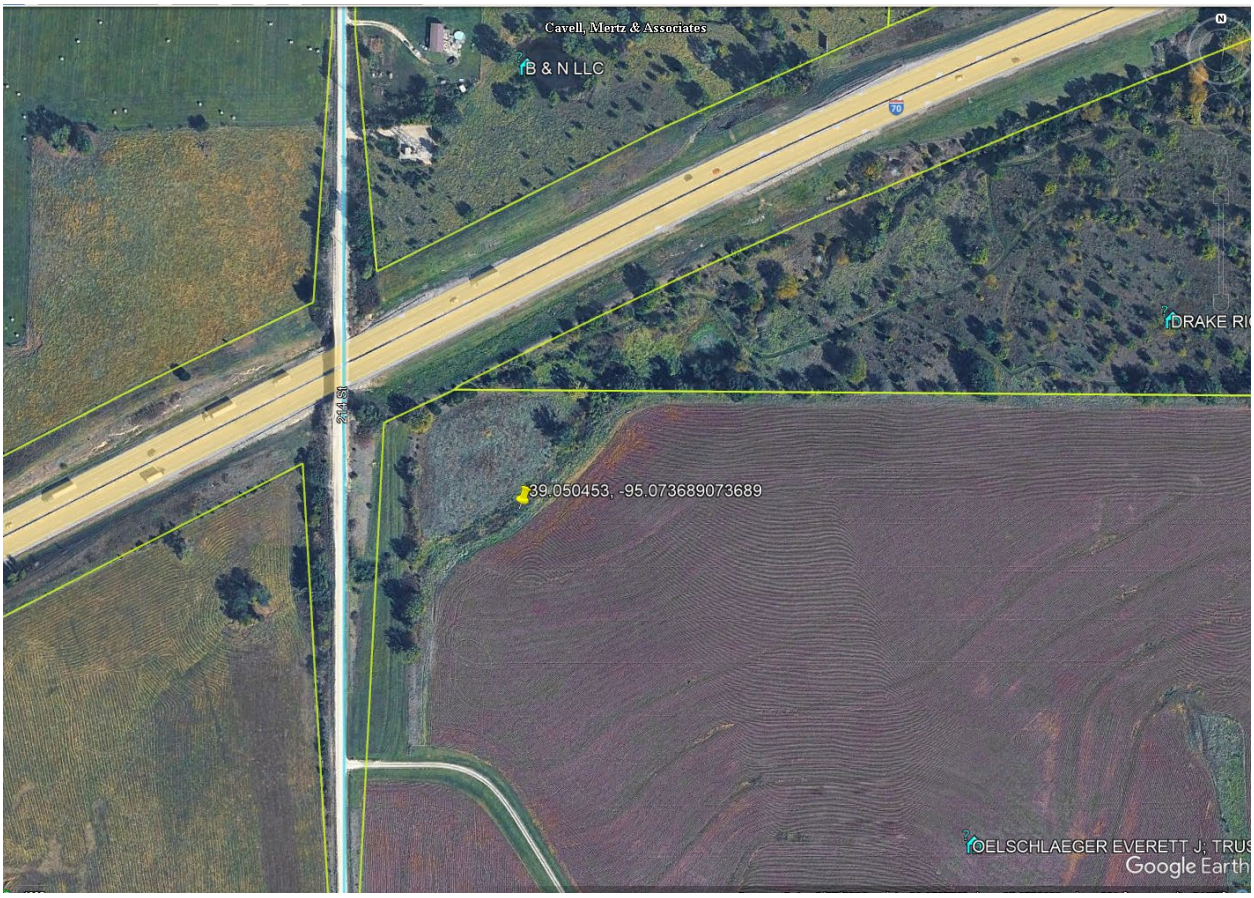
PROPOSAL

Tillman proposes a new support tower for wireless telecommunications be constructed on a parcel at 15076 214th St., Leavenworth County, Tonganoxie, KS (the "Property"). The Property is currently undeveloped. The proposal consists of a 195'-0" tall self-support tower with a 4-0' lightning rod. Antenna arrays can be located at three (3) different locations on the tower, to accommodate up to three (3) different carriers. The facility, inclusive of chain link fence, will initially comprise a 100' x 100' area. Space is available for future expansion, if needed. A new 12' wide gravel access road, running from the existing road at the east right of way (214th Street) to the compound, will be added. Power and fiber will run underground from the nearest utility pole to the fenced lease area.

The proposed site will include:

	Proposed Site
Tower	195' tall self-supporting tower with a 4' lightning rod
Location	NW corner of the property
Lease area	100' x 100' compound
Fencing	6' tall chain link fence surrounding compound with road gate at entrance for signage
Access	12' wide gravel driveway from 214th Street to the compound
Utilities	Power and fiber will run within an easement, underground from the site to the nearest utility pole

General Area



SUBMITTAL REQUIREMENTS

The proposed Tillman facility complies with the applicable requirements of the Leavenworth County Zoning Ordinance. The requirements of **Article 19 of the Zoning & Subdivision Regulations** are addressed in the following order:

** Towers, radio antennas, commercial satellite earth stations and similar appurtenances, subject to the following conditions.

a. Applicant must provide documentation acceptable to the Planning Commission that existing structures within an approximate one (1) mile radius or the proposed location are not available for collocation.

Applicant Response:
This section is not valid as it is superseded by Kansas State Statute (KSA 66-2019) which states that a local jurisdiction cannot consider the availability of other structures to co-locate on when considering an application. However, Tillman infrastructure and AT&T have done an extensive search of the area and evaluated all possible structures and properties.

b. All proposed tower 150 feet of less, not including lightning rod, shall be designed to accommodate at least one (1) additional PCS/Cellular platform. All proposed towers in excess of 150 feet shall be designed to accommodate at least two (2) additional PCS/Cellular platforms.

Applicant Response:

The proposed site is designed to accommodate at least three carriers. This is evidenced by the attached engineer stamped drawings.

c. Any application for a tower in excess of 150 feet in height shall include supported testimony of an RF engineer, or other licensed Professional Engineer, substantiating the need for the requested height.

Applicant Response:

This section is not valid as it is superseded by Kansas State Statute (KSA 66-2019) (f) (2) which in summary states, an authority shall not require information that concerns the specific need for the wireless support structure, including if the service to be provided from the wireless support structure is to add additional wireless coverage or additional wireless capacity.

d. The minimum setback from adjoining property lines shall be the height of the tower plus twenty (20) feet. And that setbacks may, on a case-by-case basis, be considered for a variance and the applicant shall provide such documents for such.

Applicant Response:

The proposed tower has a total height, including the lightning rod, of 199'. The nearest property line to the west is 223' away from the tower. The next closest property line is to the north which is 289' away from the tower. Therefore, the setback requirements are met, these distances are in the engineer stamped drawings submitted with this application.

e. The tower and accessory equipment must meet all requirements of the Federal Communication Commission and the Federal Aviation Administration.

Applicant Response:

Application to the FAA has been made and we estimate the approval to arrive in February of 2026. However, we do not anticipate that this tower will need FAA lighting as it is under the 200' threshold.

f. Any Tower that is not operated for a continuous period of two (2) years shall be considered abandoned, and the owner of such tower shall remove same within ninety (90) days of receipt of notice from the governing authority notifying the owner of such abandonment. If such tower is not removed within said ninety (90) days, the governing authority may remove such tower at the owner's expense.

Applicant Response:

The agreement between Tillman and the underlying landowner provides that Tillman will remove the tower including the removal of the foundation below grade at the end of the contract.

g. Pad sites and guy wire locations must be surrounded by a minimum of six-foot tall fence that may use screening inserts or other material that block direct view of the site.

Applicant Response:
There are no guy wires on this tower, but the compound area where the tower and equipment will be located is secured with a chain link fence with screening slats inserted. This can be seen on page Z-4 of the engineer stamped drawings attached to the application.

h. Vegetation must be removed from around the pad site and controlled on the rest of the property if the property is not used for agricultural purposes.

Applicant Response:
Tillman will spray for weds and other unwanted vegetation along the proposed access road and the fenced in area of the compound biannually.

Miscellaneous Reponses to Questions from staff to letter from February 19, 2026:

1) Hours of Operation:

Applicant Response
The site will operate 24 hours a day, seven days a week.

2) Signage:

Applicant Response
On the gate to the fenced area there will be signage with the Tower Owner's contact information, FAA and FCC registration number, Radio Frequency safety signage, competent climber, no trespassing, and livestock present signage. Please see page E3.2 of the submitted engineer stamped drawings.

Outdoor lighting:

Applicant Response
There will not be any overhead lighting.

3) Outdoor Displays:

Applicant Response
There will not be any outdoor displays.

4) Odors or Fumes:

Applicant Response
There will not be any odors or fumes present at the site.

5) Retail Sales:

Applicant Response
There will not be any retail sales occurring at this site.

6) Food or Alcohol:

Applicant Response
There will not be any food or alcohol sales occurring at this site.

7) Will customers be visiting the site?

Applicant Response

No

8) Are there any chemicals or hazardous materials proposed to be used or stared at the site?

Applicant Response

Only Diesel fuel for the back-up generator. Please see page C5.1 and C5.2 of the submitted engineer stamped drawings.

9) Are any oil, lubricants, or fluids proposed to be used or stared at the site?

Applicant Response

Only Diesel fuel for the back-up generator, as previously mentioned. Please see pages C5.1 and 5.2 of the submitted engineer stamped drawings.

10) Information on proposed platforms:

Applicant Response:

The equipment platforms will be on the ground and will house equipment cabinets. Please see page C 5.0 of the submitted engineer stamped drawings.

CONCLUSION

The proposed wireless telecommunications facility meets or exceeds all requirements of Leavenworth County's land use ordinances. We respectfully request that the County approve the proposal as designed, subject only to the County's standard conditions of approval.

See Attachments

UNOFFICIAL COPY

2015R00876 1
Doc #: 2015R00876
STACY R. DRISCOLL/REGISTER OF DEEDS
LEAVENWORTH COUNTY
RECORDED ON
02/12/2015 10:32AM
RECORDING FEE: 12.00
INDEBTEDNESS: 0.00
PAGES: 1

Entered in the transfer record in my office this
12 day of Feb, 2015
Grant Klaassen
County Clerk
by B. Jones

QUIT CLAIM DEED

EVERETT J. OELSCHLAEGER,

QUIT CLAIM TO:

EVERETT J. OELSCHLAEGER REVOCABLE INTERVIVOS TRUST, as grantee beneficiary to the following described interest in real estate located in Leavenworth County, Kansas:

The Southwest Quarter (SW ¼) of Section Thirty-four (34), Township Eleven (11) South of Range Twenty-one (21) East of the 6th Principal Meridian except public highways.

FOR THE CONSIDERATION OF: No Consideration and Exemption No. 7

DATED: 2/3/2015, 2015.

Everett J Oelschlaeger
EVERETT J. OELSCHLAEGER

STATE OF KANSAS)
) ss:
COUNTY OF LEAVENWORTH)

BE IT REMEMBERED that on this 3rd day of February, 2015, before me, the undersigned, a notary public in and for the County and State aforesaid, came EVERETT J. OELSCHLAEGER, who is personally known to me to be the same persons who executed the within instrument of writing, and duly acknowledged the execution thereof.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my seal the day and year last above written.

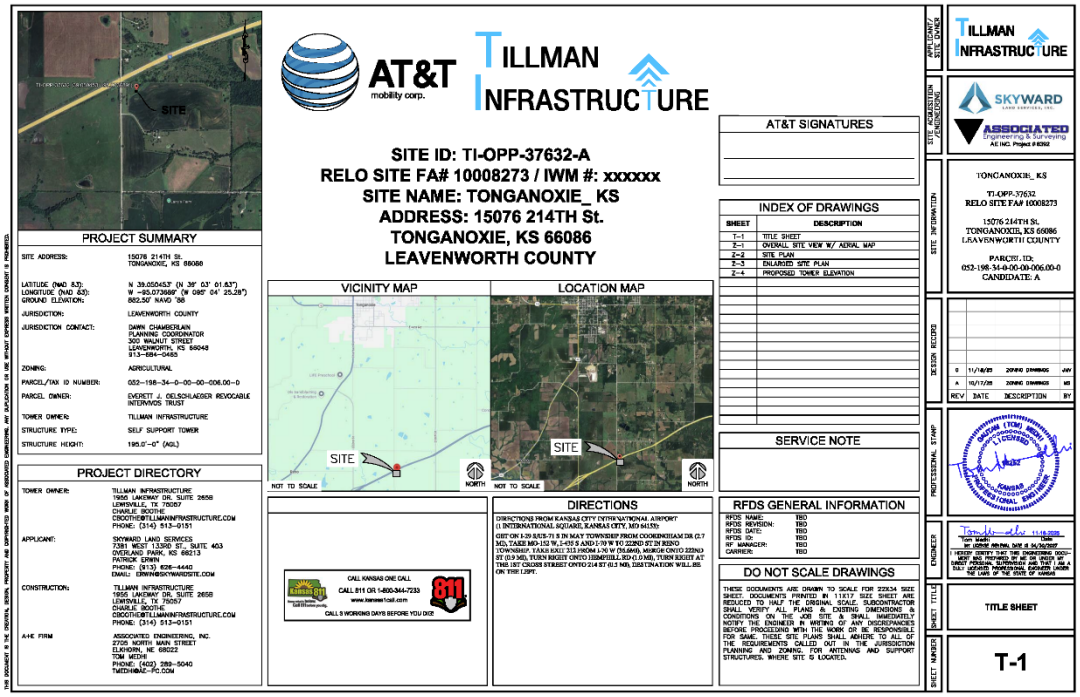
JEFFERY A. SUTTON
Notary Public
State of Kansas
My Commission Expires 06/25/17

Notary Public

1

Sutton Law 4/12

ZONING DRAWINGS



AT&T mobility corp.

TILLMAN INFRASTRUCTURE

SITE ID: TI-OPP-37632-A
RELO SITE FA# 10008273 / IWM #: xxxxxx
SITE NAME: TONGANOXIE_ KS
ADDRESS: 15076 214TH St.
TONGANOXIE, KS 66086
LEAVENWORTH COUNTY

PROJECT SUMMARY

SITE ADDRESS:	15076 214TH St. TONGANOXIE, KS 66086
LATITUDE (NAD 83):	N 39.050453° (N 39° 03' 01.63")
LONGITUDE (NAD 83):	W -95.073689° (W 095° 04' 25.28")
GROUND ELEVATION:	882.50' NAVD '88
JURISDICTION:	LEAVENWORTH COUNTY
JURISDICTION CONTACT:	DAWN CHAMBERLAIN PLANNING COORDINATOR 300 WALNUT STREET LEAVENWORTH, KS 66048 913-684-0465
ZONING:	AGRICULTURAL
PARCEL/TAX ID NUMBER:	052-198-34-0-00-00-006.00-0
PARCEL OWNER:	EVERETT J. DELSCHLAEGER REVOCABLE INTERVIVOS TRUST
TOWER OWNER:	TILLMAN INFRASTRUCTURE
STRUCTURE TYPE:	SELF SUPPORT TOWER
STRUCTURE HEIGHT:	195.0'-0" (AGL)

PROJECT DIRECTORY

TOWER OWNER:	TILLMAN INFRASTRUCTURE 1955 LAKEWAY DR, SUITE 265B LEWISVILLE, TX 75057 CHARLIE BOOTHE CBOOTHE@TILLMANINFRASTRUCTURE.COM PHONE: (314) 513-9151
APPLICANT:	SKYWARD LAND SERVICES 7381 WEST 133RD ST., SUITE 403 OVERLAND PARK, KS 66213 PATRICK ERWIN PHONE: (913) 626-4440 EMAIL: ERWIN@SKYWARDSITE.COM
CONSTRUCTION:	TILLMAN INFRASTRUCTURE 1955 LAKEWAY DR, SUITE 265B LEWISVILLE, TX 75057 CHARLIE BOOTHE CBOOTHE@TILLMANINFRASTRUCTURE.COM PHONE: (314) 513-9151
A+E FIRM	ASSOCIATED ENGINEERING, INC. 2705 NORTH MAIN STREET ELKHORN, NE 68022 TOM MEDHI PHONE: (402) 289-5040 TMEDHI@AE-PC.COM

VICINITY MAP

LOCATION MAP

AT&T SIGNATURES

INDEX OF DRAWINGS

SHEET	DESCRIPTION
T-1	TITLE SHEET
Z-1	OVERALL SITE VIEW W/ AERIAL MAP
Z-2	SITE PLAN
Z-3	ENLARGED SITE PLAN
Z-4	PROPOSED TOWER ELEVATION

SERVICE NOTE

DIRECTIONS

RFDS GENERAL INFORMATION

RFDS NAME:	TBD
RFDS REVISION:	TBD
RFDS DATE:	TBD
RFDS ID#:	TBD
RF MANAGER:	TBD
CARRIER:	TBD

DO NOT SCALE DRAWINGS

THESE DOCUMENTS ARE DRAWN TO SCALE FOR 22X34 SIZE SHEET. DOCUMENTS PRINTED IN 11X17 SIZE SHEET ARE REDUCED TO HALF THE ORIGINAL SCALE. SUBCONTRACTOR SHALL VERIFY ALL PLANS & EXISTING DIMENSIONS & CONDITIONS ON THE JOB SITE & SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME. THESE SITE PLANS SHALL ADHERE TO ALL OF THE REQUIREMENTS CALLED OUT IN THE JURISDICTION PLANNING AND ZONING. FOR ANTENNAS AND SUPPORT STRUCTURES. WHERE SITE IS LOCATED.

CALL KANSAS ONE CALL
CALL 811 OR 1-800-344-7233
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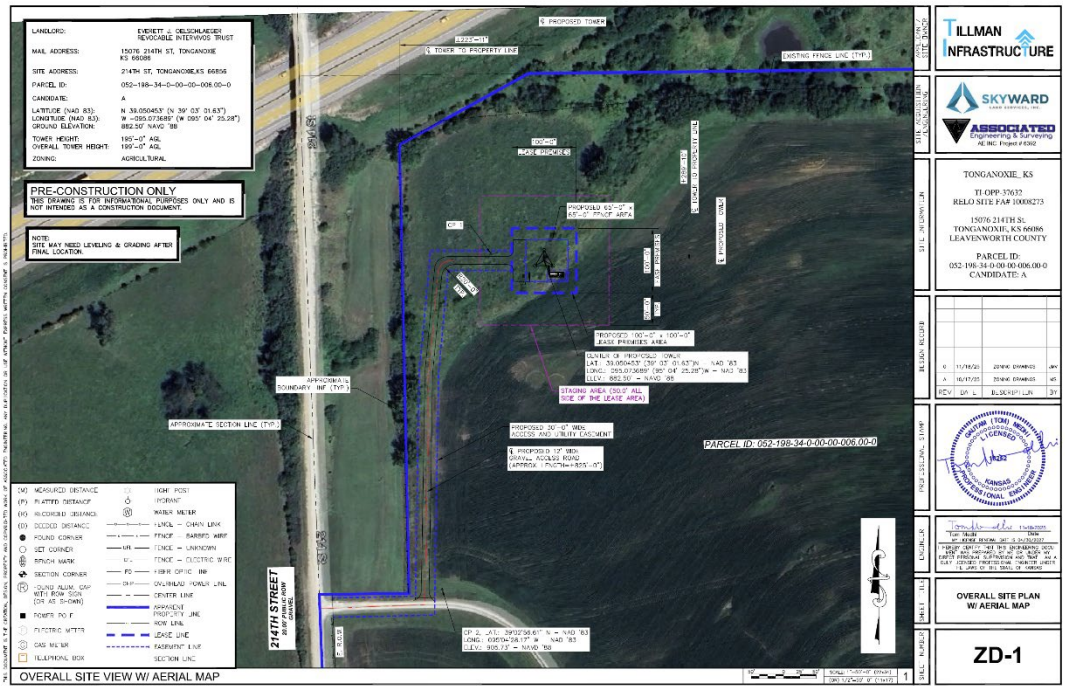
811
CALL 5 WORKING DAYS BEFORE YOU DIG!

TONGANOXIE_ KS
TI-OPP-37632
RELO SITE FA# 10008273
15076 214TH St.
TONGANOXIE, KS 66086
LEAVENWORTH COUNTY
PARCEL ID: 052-198-34-0-00-00-006.00-0
CANDIDATE: A

REV	DATE	DESCRIPTION	BY
0	11/16/23	ZONING DRAWINGS	JAV
A	10/17/25	ZONING DRAWINGS	MS

TITLE SHEET

T-1



LANDLORD: EVERETT J. DELSCHLAEGER REVOCABLE INTERVIVOS TRUST
MAIL ADDRESS: 15076 214TH ST, TONGANOXIE KS 66086
SITE ADDRESS: 214TH ST, TONGANOXIE,KS 66086
PARCEL ID: 052-198-34-0-00-00-006.00-0
CANDIDATE: A
LATITUDE (NAD 83): N 39.050453° (N 39° 03' 01.63")
LONGITUDE (NAD 83): W -095.073689° (W 095° 04' 25.28")
GROUND ELEVATION: 882.50' NAVD '88
TOWER HEIGHT: 195'-0" AGL
OVERALL TOWER HEIGHT: 199'-0" AGL
ZONING: AGRICULTURAL

PRE-CONSTRUCTION ONLY
THIS DRAWING IS FOR INFORMATIONAL PURPOSES ONLY AND IS NOT INTENDED AS A CONSTRUCTION DOCUMENT.

NOTE:
SITE MAY NEED LEVELING & GRADING AFTER FINAL LOCATION

PROPOSED 60'-0" x 60'-0" LEASE AREA

PROPOSED 100'-0" x 100'-0" LEASE PREMISES AREA

CENTER OF PROPOSED TOWER
LAT: 39.050453° (39° 03' 01.63")N NAD '83
LONG: -095.073689° (95° 04' 25.28")W = NAD '83
ELEV: 882.50' = NAVD '88

STAGING AREA (50.0' ALL SIDE OF THE LEASE AREA)

PROPOSED 30'-0" WIDE ACCESS AND UTILITY EASEMENT

PROPOSED 12' WIDE GRAVEL ACCESS ROAD (APPROX. LENGTH=855'-0")

PARCEL ID: 052-198-34-0-00-00-006.00-0

APPROXIMATE BOUNDARY INF (TYP.)

APPROXIMATE SECTION LINE (TYP.)

214TH STREET
20.00' PUBLIC ROW
PAVED

CP 2: LAT: 39°03'56.67" N = NAD '83
LONG: -095°04'28.17" W = NAD '83
ELEV: 905.73' = NAVD '88

(M) MEASURED DISTANCE
(P) PLATTED DISTANCE
(R) RECORDED DISTANCE
(D) DEEDED DISTANCE
FOUND CORNER
SET CORNER
BENCH MARK
SECTION CORNER
FOUND ALUM. CAP WITH ROW SIGN (OR AS SHOWN)
POWER POLE
ELECTRIC METER
GAS METER
TELEPHONE BOX
LIGHT POST
HYDRANT
WATER METER
FENCE - CHAIN LINK
FENCE - BARBED WIRE
FENCE - UNKNOWN
FENCE - ELECTRIC WIRE
FIBER OPTIC LINE
OVERHEAD POWER LINE
CENTER LINE
PERMANENT PROPERTY LINE
ROW LINE
LEASE LINE
EASEMENT LINE
SECTION LINE

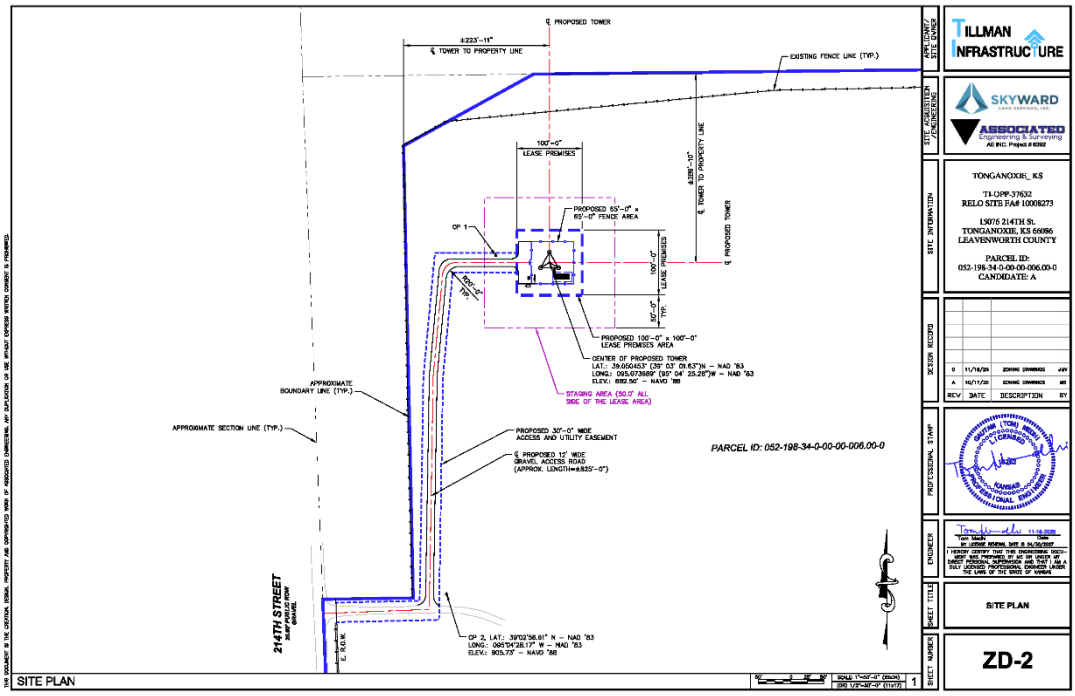
OVERALL SITE VIEW W/ AERIAL MAP

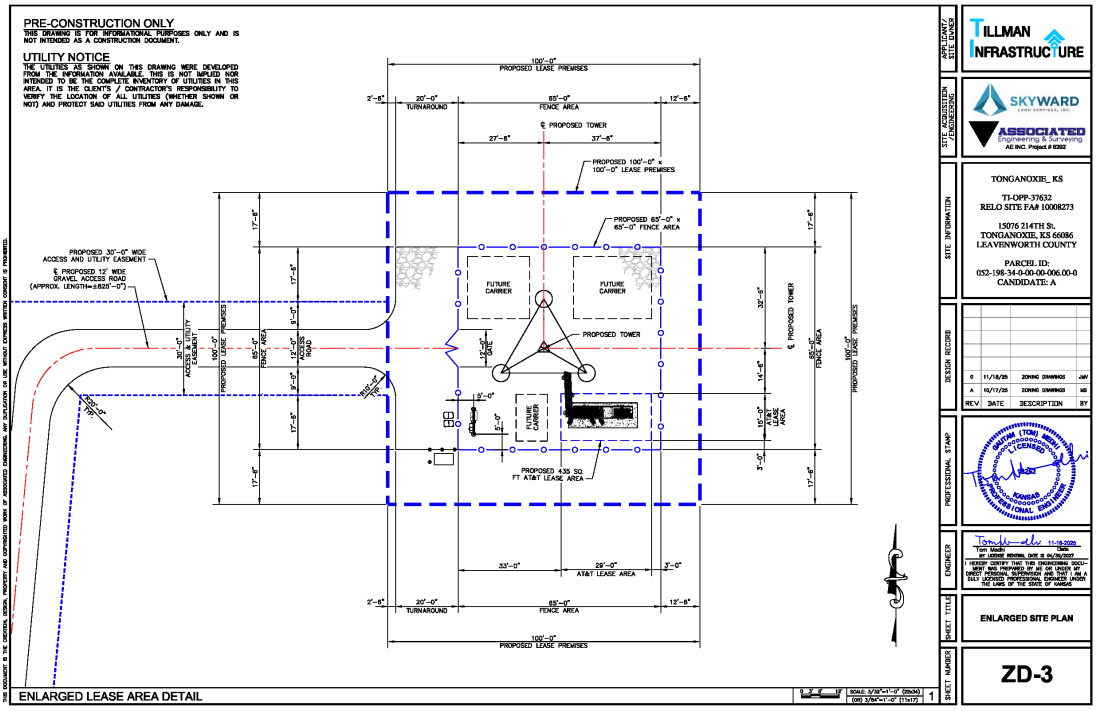
TONGANOXIE_ KS
TI-OPP-37632
RELO SITE FA# 10008273
15076 214TH St.
TONGANOXIE, KS 66086
LEAVENWORTH COUNTY
PARCEL ID: 052-198-34-0-00-00-006.00-0
CANDIDATE: A

REV	DATE	DESCRIPTION	BY
0	11/16/23	ZONING DRAWINGS	JAV
A	10/17/25	ZONING DRAWINGS	MS

OVERALL SITE PLAN W/ AERIAL MAP

ZD-1


℄ PROPOSED TOWER
422'-11"
℄ TOWER TO PROPERTY LINE
EXISTING FENCE LINE (TYP.)
100'-0"
LEASE PREMISES
839'-10"
℄ TOWER TO PROPERTY LINE
PROPOSED 65'-0" x 65'-0" FENCE AREA
CP 1
100'-0"
LEASE PREMISES
25'-0"
TYP.
℄ PROPOSED TOWER
PROPOSED 100'-0" x 100'-0" LEASE PREMISES AREA
CENTER OF PROPOSED TOWER
LAT.: 39.050453° (39° 03' 01.63")N – NAD '83
LONG.: 095.073689° (95° 04' 25.28")W – NAD '83
ELEV.: 892.50' – NAVD '88
STAGING AREA (50.0' ALL SIDE OF THE LEASE AREA)
APPROXIMATE BOUNDARY LINE (TYP.)
APPROXIMATE SECTION LINE (TYP.)
PROPOSED 30'-0" WIDE ACCESS AND UTILITY EASEMENT
℄ PROPOSED 12' WIDE GRAVEL ACCESS ROAD (APPROX. LENGTH=±825'-0")
PARCEL ID: 052-198-34-0-00-00-006.00-0
214TH STREET
CP 2, LAT.: 39°03'56.61" N – NAD '83
LONG.: 095°04'28.17" W – NAD '83
ELEV.: 905.73' – NAVD '88
SITE PLAN
SCALE: 1"=50'-0" (22x34)
(ID) 1/2"=50'-0" (11x17)
TILLMAN INFRASTRUCTURE
SKYWARD
ASSOCIATED Engineering & Surveying
AE INC. Project # 6282
TONGANOXIE, KS
TI-OPP-37632
RELO SITE FA# 10008273
15076 214TH St.
TONGANOXIE, KS 66086
LEAVENWORTH COUNTY
PARCEL ID:
052-198-34-0-00-00-006.00-0
CANDIDATE: A
REV DATE DESCRIPTION BY
0 11/18/25 ZONING DRAWINGS AM
A 10/17/25 ZONING DRAWINGS MS
SITE PLAN
ZD-2


PRE-CONSTRUCTION ONLY
THIS DRAWING IS FOR INFORMATIONAL PURPOSES ONLY AND IS NOT INTENDED AS A CONSTRUCTION DOCUMENT.
UTILITY NOTICE
THE UTILITIES AS SHOWN ON THIS DRAWING WERE DEVELOPED FROM THE INFORMATION AVAILABLE. THIS IS NOT IMPLIED NOR INTENDED TO BE THE COMPLETE INVENTORY OF UTILITIES IN THIS AREA. IT IS THE CLIENT'S / CONTRACTOR'S RESPONSIBILITY TO VERIFY THE LOCATION OF ALL UTILITIES (WHETHER SHOWN OR NOT) AND PROTECT SAID UTILITIES FROM ANY DAMAGE.
100'-0" PROPOSED LEASE PREMISES
20'-0" TURNAROUND
65'-0" FENCE AREA
12'-8"
℄ PROPOSED TOWER
27'-8"
37'-5"
PROPOSED 100'-0" x 100'-0" LEASE PREMISES
PROPOSED 65'-0" x 65'-0" FENCE AREA
PROPOSED 30'-0" WIDE ACCESS AND UTILITY EASEMENT
℄ PROPOSED 12' WIDE GRAVEL ACCESS ROAD (APPROX. LENGTH=±825'-0")
FUTURE CARRIER
PROPOSED TOWER
PROPOSED 4.35 SQ. FT AT&T LEASE AREA
AT&T LEASE AREA
33'-0"
29'-0"
3'-0"
ENLARGED LEASE AREA DETAIL
SCALE: 3/32"=1'-0" (22x34)
(ID) 3/64"=1'-0" (11x17)
TILLMAN INFRASTRUCTURE
SKYWARD
ASSOCIATED Engineering & Surveying
AE INC. Project # 6282
TONGANOXIE, KS
TI-OPP-37632
RELO SITE FA# 10008273
15076 214TH St.
TONGANOXIE, KS 66086
LEAVENWORTH COUNTY
PARCEL ID:
052-198-34-0-00-00-006.00-0
CANDIDATE: A
REV DATE DESCRIPTION BY
0 11/18/25 ZONING DRAWINGS AM
A 10/17/25 ZONING DRAWINGS MS
ENLARGED SITE PLAN
ZD-3

UTILITY NOTICE

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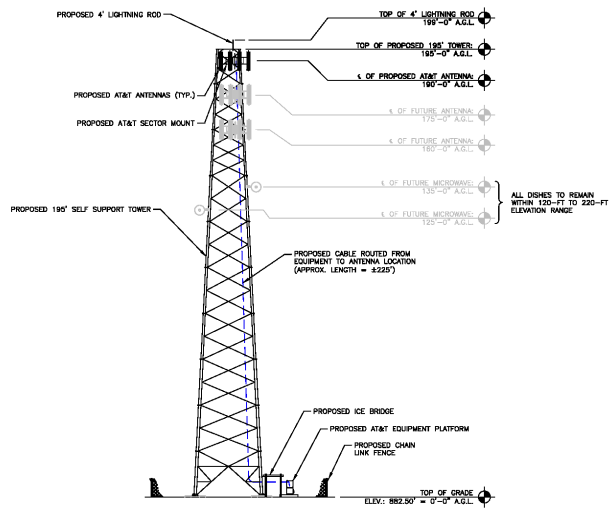

TOWER ELEVATION

0 4' 8' 16' SCALE: 1"=16'-0" (22x34) (ORI)/32"=1'-0" (11x17) 1

APPLICANT/ SITE OWNER: TILLMAN INFRASTRUCTURE

SITE ACQUISITION /ENGINEERING: SKYWARD LAND SERVICES, INC. ASSOCIATED Engineering & Surveying AE INC. Project # 6392

SITE INFORMATION:
TONGANOXIE_ KS
TI-OPP-37632
RELO SITE FA# 10008273
15076 214TH St.
TONGANOXIE, KS 66086
LEAVENWORTH COUNTY
PARCEL ID:
052-198-34-0-00-00-006.00-0
CANDIDATE: A

DESIGN RECORD

REV	DATE	DESCRIPTION	BY
0	11/18/25	ZONING DRAWINGS	JAV
A	10/17/25	ZONING DRAWINGS	MS

PROFESSIONAL STAMP: GAUTAM (TOM) MEDHI LICENSED 2027 KANSAS PROFESSIONAL ENGINEER

ENGINEER: Tom Medhi 11-18-2025 Date
MY LICENSE RENEWAL DATE IS 04/30/2027
I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF KANSAS

SHEET TITLE: TOWER ELEVATION

SHEET NUMBER: ZD-4

THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF ASSOCIATED ENGINEERING. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS PROHIBITED.

EVERETT J. OELSCHLAEGER REVOCABLE INTERVIVOS TRUST

THIS DECLARATION OF TRUST is made by EVERETT J. OELSCHLAEGER of Tonganoxie, Kansas, acting herein both as the "Grantor" and as the "Trustee."

WITNESSETH:

WHEREAS, I wish to create a trust of certain property for the benefit of myself and others, such property being described in Schedule A attached hereto and having been delivered this date to me as Trustee of the trust created hereunder; and,

WHEREAS, I or another person or persons may wish to add other property to the trust at a later date by gift, devise or bequest under the terms of a Last Will and Testament or otherwise by depositing such other property with me, as Trustee, or with any successor Trustee or Trustees; and,

WHEREAS, I am willing to perform the duties of Trustee in accordance with the terms and conditions and within the powers and limitations hereinafter set forth in this instrument;

NOW, THEREFORE, I agree to hold such property and any other property acceptable to me that any other person or persons may add to the trust by will or otherwise, all of which is hereinafter referred to as the "trust property," and to manage, invest and reinvest the same *in trust* for the following uses and purposes:

Article I. DECLARATIONS

Name of Trust. This Trust shall be designated as the "EVERETT J. OELSCHLAEGER REVOCABLE INTERVIVOS TRUST."

Marital Status - Children. I declare that I am a widow, as of the date of this instrument. I further declare that I have three (3) children, namely: DENNIS L. OELSCHLAEGER, LAURA E. MCDONALD AND LINDA E. SHIPMAN.

Article II. DISPOSITION OF TRUST PROPERTY DURING MY LIFETIME

General Provisions. If any property is transferred to the trust during my lifetime, then I shall receive, hold and manage the same; shall invest and reinvest such property, other than life insurance policies; shall collect the income, if any, and the proceeds thereof; and shall distribute to myself or others so much of the net income and principal thereof as I, in my sole discretion, shall decide from time to time, provided I am not incapacitated within the meaning set forth in paragraph B of this Article II. If I become incapacitated

including the personal representative of my estate or any beneficiary named herein. Upon my death, this instrument shall become irrevocable.

(vii) Use of Words and Captions. Wherever the context so requires, words used herein in one gender shall be applicable to all genders, words used in the singular shall include the plural, and words used in the plural shall include the singular. The use of captions are for reference only and are not meant to govern or affect the interpretation of any part of this instrument.

(viii) Savings Clause. If it is determined that any provision contained in this instrument violates any applicable law, then such determination shall not impair the validity of the remaining provisions of this instrument.

(ix) Counterparts. This instrument may be executed in one or more copies, and any copy so executed shall be considered an original. Moreover, anyone may rely upon a copy, certified by a notary public, to be a true copy of this instrument (and of the writings, if any, endorsed thereon or attached thereto) to the same effect as if it were an original copy, and anyone may rely upon any statement of fact certified by a Trustee hereunder.

(x) Governing Law. This instrument shall be construed and regulated in all respects by the laws of the State of Kansas.

(xi) Effective Date. This Trust shall be effective as of the date this instrument is signed.

IN WITNESS WHEREOF, I have signed this Declaration of Trust on the 3rd day of February, 2015.

Signed and delivered in the presence of:

Dana R Bye
Witness

Everett J Oelschlaeger
EVERETT J. OELSCHLAEGER,
Grantor

Jenny J
Witness

Date: 2/3/2015

Initials: E, J, O.

Witness

EVERETT J. OELSCHLAEGER,
Trustee

Witness

STATE OF KANSAS)
) ss.
COUNTY OF LEAVENWORTH)

City of Basehor Leavenworth County, this 3rd day of February, 2015.

Personally appeared EVERETT J. OELSCHLAEGER, known to me (or satisfactorily proven) to be the person whose name is subscribed to the within instrument and acknowledged that he executed the same, both as Grantor and as Trustee, for the purposes therein contained.

JEFFERY A. SUTTON
Notary Public
State of Kansas
My Commission Expires 06/25/17

Notary Public

OWNER AUTHORIZATION

I/WE Everett Oelschlaeger Revocable Trust, hereby referred to as the "Undersigned", being of lawful age, do hereby on this 10th day of December, 2025, make the following statements, to wit:

1. I/We the Undersigned, on the date first above written, am the lawful, owner(s) in fee simple absolute of the following described real property

   See Attachment "A" attached hereto and incorporated herein by reference.

2. I/We the undersigned, have previously authorized and hereby authorize Patrick Erwin/Tillman Infrastructure (Hereinafter referred to as "Applicant"), to act on my/our behalf for the purpose of making application with the Planning Office of Leavenworth County, Kansas, 15076 214th St. (common address) the subject real property, or portion thereof, and which authorization includes, but is not limited to, all acts or things whatsoever necessarily required of Applicant in the application process.

3. I/We the Undersigned, hereby agree to protect, defend, indemnify and hold the Board of County Commissioners of Leavenworth County, Kansas, its officers employees and agents (hereinafter collectively referred to as the "County"), free and harmless from and against any and all claims, losses, penalties, damages, settlements, costs, charges, professional fees or other expenses or liabilities, whether false, fraudulent, meritless or meritorious, of every kind and character arising out of or relating to any and all claims, liens, demands, obligations, actions, proceedings, or causes of action of every kind and character (hereinafter "claims"), in connection with, relating to, or arising directly or indirectly out of this authorization and the actions taken by the Applicant and the County in reliance thereof. I, the Undersigned, hereby further agree to investigate, handle, respond to, provide defense for and defend any such claims at my sole expense and agree to bear all other costs at my sole expense and agree to bear all other costs and expenses related thereto, even if such claims are groundless, false or fraudulent.

4. It is understood that in the event the Undersigned is a corporation or partnership then the individual whose signature appears below for and on behalf of the corporation or partnership has in fact the authority to so bind the corporation or partnership to the terms and statements contained within this instrument.

IN WITNESS THEREOF, I, the Undersigned, have set my hand and seal below.

Dennis Oelschlaeger Trustee
Owner

Owner

STATE OF KANSAS
COUNTY OF LEAVENWORTH

The foregoing instrument was acknowledged before me on this 10 day of 12, 2025
by Heather M. McGill

My Commission Expires:
11/15/2028

Heather M. McGill
Notary Public

HEATHER M MCGILL
My Appointment Expires
11/15/2028

March 5, 2026

Amy Allison AICP
Deputy Director
Leavenworth County, Kansas

RE: 15076 214th St. Tonganoxie, KS , AT&T Communication Facility (195' Self Support Tower)

Dear Ms. Allison,

AT&T has conducted a thorough analysis of all available collocation opportunities on existing structures within the same search area for the above-referenced proposed tower. It is our determination to continue providing the latest technology and the best service to our customers and first responders that rely on our service, the location at 15076 214th Street is the best option. In coming to this conclusion, we examined all engineering and financial data available to us.

Sincerely,

Ron Humphrey

Ron Humphrey

AT&T RF Engineering

RELO SITE FA: XXXXX / SITE ID: TI-OPP-37632
RELO SITE FA# 10008273/RFDs NAME: XXXX
IWM #: XXXXXX
SITE NAME: TONGANOXIE_ KS
PROJECT: NEW SITE BUILD

ADDRESS: 15076 214TH St.
TONGANOXIE, KS 66086 / LEAVENWORTH COUNTY

SITE INFORMATION

SITE ADDRESS:	15076 214TH St. TONGANOXIE, KS 66086
LATITUDE (NAD 83):	N 39.050453° (N 39° 03' 01.63")
LONGITUDE (NAD 83):	W -95.073689° (W 095° 04' 25.28")
GROUND ELEVATION:	882.50' NAVD '88
JURISDICTION:	LEAVENWORTH COUNTY
JURISDICTION CONTACT:	DAWN CHAMBERLAIN PLANNING COORDINATOR 300 WALNUT STREET, LEAVENWORTH, KS 66048 (913) 684-0465
BLOCK:	XXX
LOT:	XXX
ZONING:	R1-15
PARCEL/MAP NUMBER:	052-198-34-0-00-00-006.00-0
PARCEL OWNER:	EVERETT J. OELSCHLAEGER REVOCABLE INTERVIVOS TRUST
TOWER OWNER:	TILLMAN INFRASTRUCTURE
STRUCTURE TYPE:	SELF SUPPORT TOWER
STRUCTURE HEIGHT:	195'-0" (AGL)
POWER SUPPLIER:	EVERGY (888) 471-5275
TELCO SUPPLIER:	AT&T (800) 288-2020
GAS SUPPLIER:	T.B.D.

PROJECT TEAM

CARRIER:	AT&T MOBILITY
PROJECT MANAGEMENT FIRM / APPLICANT:	TILLMAN INFRASTRUCTURE 152 WEST 57TH STREET 27TH FLOOR NEW YORK, NY 10019 (314) 513-0151
A+E FIRM:	ASSOCIATED ENGINEERING, INC. CA # 4387 2705 NORTH MAIN STREET ELKHORN, NE 68022 (402) 289-5040

VICINITY MAP



DIRECTIONS

DIRECTIONS FROM KANSAS CITY INTERNATIONAL AIRPORT
(1 INTERNATIONAL SQUARE, KANSAS CITY, MO 64153):

GET ON I-29 S/US-71 S IN MAY TOWNSHIP FROM COOKINGHAM DR (2.7 MI), TAKE MO-152 W, I-435 S AND I-70 W TO 222ND ST IN RENO TOWNSHIP. TAKE EXIT 212 FROM I-70 W (36.6MI), MERGE ONTO 222ND ST (0.9 MI), TURN RIGHT ONTO HEMPHILL RD (1.0 MI), TURN RIGHT AT THE 1ST CROSS STREET ONTO 214 ST (0.5 MI), DESTINATION WILL BE ON THE LEFT.

CODE COMPLIANCE

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO LATEST EDITIONS OF THE FOLLOWING CODES.

- INTERNATIONAL BUILDING CODE
- NATIONAL ELECTRICAL CODE
- NFPA 101, LIFE SAFETY CODE
- INTERNATIONAL FIRE CODE
- AMERICAN CONCRETE INSTITUTE
- AMERICAN INSTITUTE OF STEEL CONSTRUCTION
- MANUAL OF STEEL CONSTRUCTION 13TH EDITION
- ANSI/TIA-222-G
- TIA-607
- IEEE STANDARD 81
- IEEE STANDARD C2 NATIONAL ELECTRICAL SAFETY CODE
- TELECORDIA GR-1275
- ANSI/T 311

DRAWING INDEX

SHT NO.	SHEET TITLE	DISC.
T-1.0	TITLE SHEET	C/E
	SURVEY (BY OTHERS)	
C-0.0	OVERALL SITE PLAN W/ AERIAL MAP	C
C-1.0	SITE PLAN	C
C-1.1	COMPOUND SITE PLAN W/ GRADING	C
C-1.2	AT&T EQUIPMENT LAYOUT	C
C-1.3	PROPOSED LANDSCAPING	
C-2.0	TOWER ELEVATION & ANTENNA PLAN	C
C-3.0	FENCE DETAIL	C
C-4.0	COMMON UTILITY RACK DETAILS	C/E
C-5.0	WALK UP CABINET DETAILS	C
C-5.1	GENERATOR DETAILS	C
C-5.2	CONCRETE PAD & RAIL PLATFORM DETAILS	C
C-6.0 / C-6.1	EQUIPMENT DETAILS	C
C-7.0	RF PLUMBING DIAGRAM	C
E-1.0	OVERALL UTILITY PLAN	E
E-1.1	COMPOUND UTILITY PLAN	E
E-2.0	ELECTRICAL ONE-LINE DIAGRAM	E
E-2.1	FIBER SYSTEM DIAGRAM	E
E-2.2	DC WIRING DIAGRAM	E
E-3.0	UTILITY DETAILS	E
E-3.1	HANDHOLE DETAILS	C/E
E-3.2	TILLMAN SIGNAGE	C/E
G-1.0	COMPOUND GROUNDING PLAN	E
G-1.1	AT&T GROUNDING LAYOUT	E
G-2.0	GROUNDING RISER DIAGRAM	E
G-3.0	GROUNDING DETAILS (1 OF 3)	E
G-3.1	GROUNDING DETAILS (2 OF 3)	E
G-3.2	GROUNDING DETAILS (3 OF 3)	E
SP (1.0 - 1.4)	SPECIFICATIONS (1 TO 5 OF 7)	C
SP (2.0 -2.1)	SPECIFICATIONS (6 TO 7 OF 7)	E

DRAWING SCALE

THESE DRAWINGS ARE SCALED TO FULL SIZE 22"X34" AND HALF SIZE AT 11"X17". CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE DESIGNER/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR MATERIAL ORDERS OR BE RESPONSIBLE FOR THE SAME. CONTRACTOR SHALL USE BEST MANAGEMENT PRACTICE TO PREVENT STORM WATER POLLUTION DURING CONSTRUCTION.

SCOPE OF WORK

THIS PROJECT CONSISTS OF:

- NEW 65'-0"x65'-0" FENCED COMPOUND & 100'-0"x100'-0" LEASE AREA
- NEW 195'-0" TALL SELF SUPPORT TOWER
- NEW AT&T EQUIPMENT WALK UP CABINET ON NEW 3'-7"x19'-0" WUC & GENERATOR RAIL PLATFORM
- NEW AT&T 8'-0"x22'-0" CONCRETE PAD
- NEW AT&T ANTENNAS ON SELF SUPPORT TOWER
- NEW (1) H-FRAME W/ UTILITY EQUIPMENT.
- NEW POWER AND TELCO UTILITY SERVICES.
- NEW GROUNDING SYSTEM.
- CONSTRUCT 12' WIDE GRAVEL ACCESS ROAD.

☒ 1C ☒ 2C ☒ 3C ☒ 4C ☒ 5C

APPLICANT/ SITE OWNER

TILLMAN INFRASTRUCTURE

SITE ACQUISITION /ENGINEERING

SKYWARD LAND SERVICES, INC.

ASSOCIATED Engineering, Inc.
AE INC. Project # 6392

SITE INFORMATION

TONGANOXIE_ KS

TI-OPP-37632
RELO SITE FA# 10008273

15076 214TH St.
TONGANOXIE, KS 66086
LEAVENWORTH COUNTY

PARCEL ID:
052-198-34-0-00-00-006.00-0
CANDIDATE: A

DESIGN RECORD

REV	DATE	DESCRIPTION	BY
A	04/02/26	FINAL DRAWINGS	JMV

PROFESSIONAL STAMP

GAUTAM (TOM) MEDHI
LICENSED
18252
KANSAS
PROFESSIONAL ENGINEER

ENGINEER

Tom Medhi 04-02-2026
Tom Medhi Date
MY LICENSE RENEWAL DATE IS 04/30/2027

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF KANSAS

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1.0
51

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LOCATION MAP

LEGEND

(M)	MEASURED DISTANCE	T	TELEPHONE PEDESTAL
(P)	PLATTED DISTANCE		LIGHT POST
(R)	RECORDED DISTANCE		HYDRANT
(D)	DEEDED DISTANCE	W	WATER METER
	FOUND CORNER	O—O	FENCE – CHAIN LINK
	SET CORNER	X—X	FENCE – BARBED WIRE
BM	BENCH MARK	UFO—UFO	FIBER OPTIC LINE
	SECTION CORNER	OHP	OVERHEAD POWER LINE
R	ROW MARKER	UGP	UNDERGROUND ELECTRICAL LINE
	POWER POLE		APPARENT PROPERTY LINE
E	ELECTRIC METER		LEASED PREMISES LINE
G	GAS METER		EASEMENT LINE
			CENTER LINE
			SECTION LINE
		ROW	ROW LINE

NOTES

1. Parcel No. 052–198–34–0–00–00–006.00–0
   Owner: EVERETT J. OELSCHLAEGER REVOCABLE INTERVIVOS TRUST
   Address: 15076 214TH STREET
   TONGANOXIE, KS 66086
2. THE FLOOD INSURANCE RATE MAP SHOWS THAT THE PROPERTY DESCRIBED HEREIN IS FALLING WITHIN ZONE X (UNSHADED), FEMA INTERACTIVE MAP 20103C0325G, LEAVENWORTH COUNTY, KS, MAP EFFECTIVE DATE OF JULY 16, 2015. ZONE X (UNSHADED) IS AN AREA OF MINIMAL FLOOD HAZARD.
3. DATUM BENCHMARK: TOP OF GRAVEL AT THE SW CORNER OF SECTION 34, T11S, R21E. ELEV.: 905 FEET – NAVD '88. SITE BENCHMARK: "X" CUT ON BRIDGE DECK AT THE NORTHWEST CORNER OF THE SOUTHWEST QUARTER OF SECTION 34, T11S, R12E. ELEV.: 925.26 FEET – NAVD '88.
4. THE LEASED PREMISES IS CONTIGUOUS ALONG ITS COMMON BOUNDARIES TO THE ACCESS AND UTILITY EASEMENT, WHICH IN TURN IS CONTIGUOUS ALONG ITS COMMON BOUNDARIES WITH 214TH STREET RIGHT OF WAY, AND THERE ARE NO GAPS, GORES, SPACES OR OVERLAPS BETWEEN OR AMONG ANY OF SAID PARCELS OF LAND.
5. NO WETLANDS AREAS HAVE BEEN INVESTIGATED BY THIS SURVEY.
6. THE UTILITIES AS SHOWN ON THIS DRAWING WERE DEVELOPED FROM THE INFORMATION AVAILABLE. THIS IS NOT IMPLIED NOR INTENDED TO BE THE COMPLETE INVENTORY OF UTILITIES IN THIS AREA. IT IS THE CLIENT'S / CONTRACTOR'S RESPONSIBILITY TO VERIFY THE LOCATION OF ALL UTILITIES (WHETHER SHOWN OR NOT) AND PROTECT SAID UTILITIES FROM ANY DAMAGE.

PRE-CONSTRUCTION ONLY

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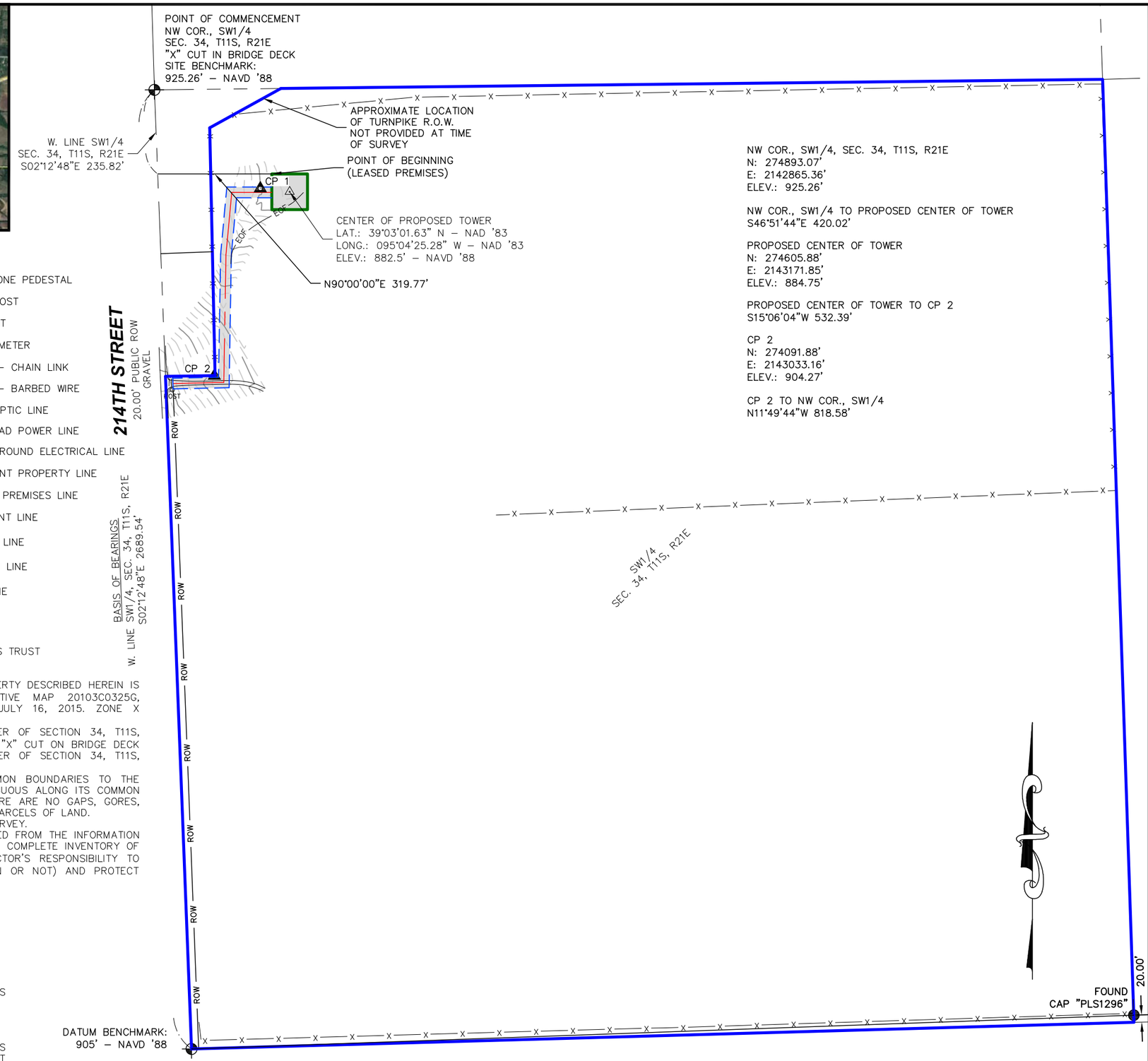
BOUNDARY NOTICE

PARENT PARCEL(S) BOUNDARY LINES SHOWN ON THESE DRAWINGS ARE CALCULATED FROM RECORDED DOCUMENTS AND ARE NOT INTENDED TO BE USED FOR BOUNDARY LOCATIONS.



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OVERALL PLAN VIEW

0 75 150 300

SCALE: 1" = 300' (11 x 17)
OR SCALE: 1" = 150' (22 x 34)

1

TILLMAN INFRASTRUCTURE
152 W. 57th STREET
NEW YORK, NEW YORK 10019
TEL: 212-706-1677

SKYWARD LAND SERVICES, INC.
7381 WEST 133RD STREET
SUITE 403
OVERLAND PARK, KS 66213

ASSOCIATED Engineering & Surveying
2705 N. Main Street
Omaha, NE 68022
Ph: (402) 289–5040
Fax: (402) 289–5045
AE & Survey, Project # 6392

BRYAN WIEGERT LICENSED 1454 KANSAS LAND SURVEYOR

REVISIONS			
REV.	DATE	DESCRIPTION	INITIALS
A	10/06/25	PRELIMINARY	BKW
0	10/16/25	FINAL	BKW

SITE NAME:
TONGANOXIE_KS

SITE ID:
TI-OPP-37632
SITE ADDRESS:
15076 214TH STREET
LEAVENWORTH COUNTY
TONGANOXIE, KS 66086
CANDIDATE A
RELO SITE FA#
10008273

PARCEL ID
052-198-34-0-00-00-006.00-0

SHEET NUMBER
SS-1

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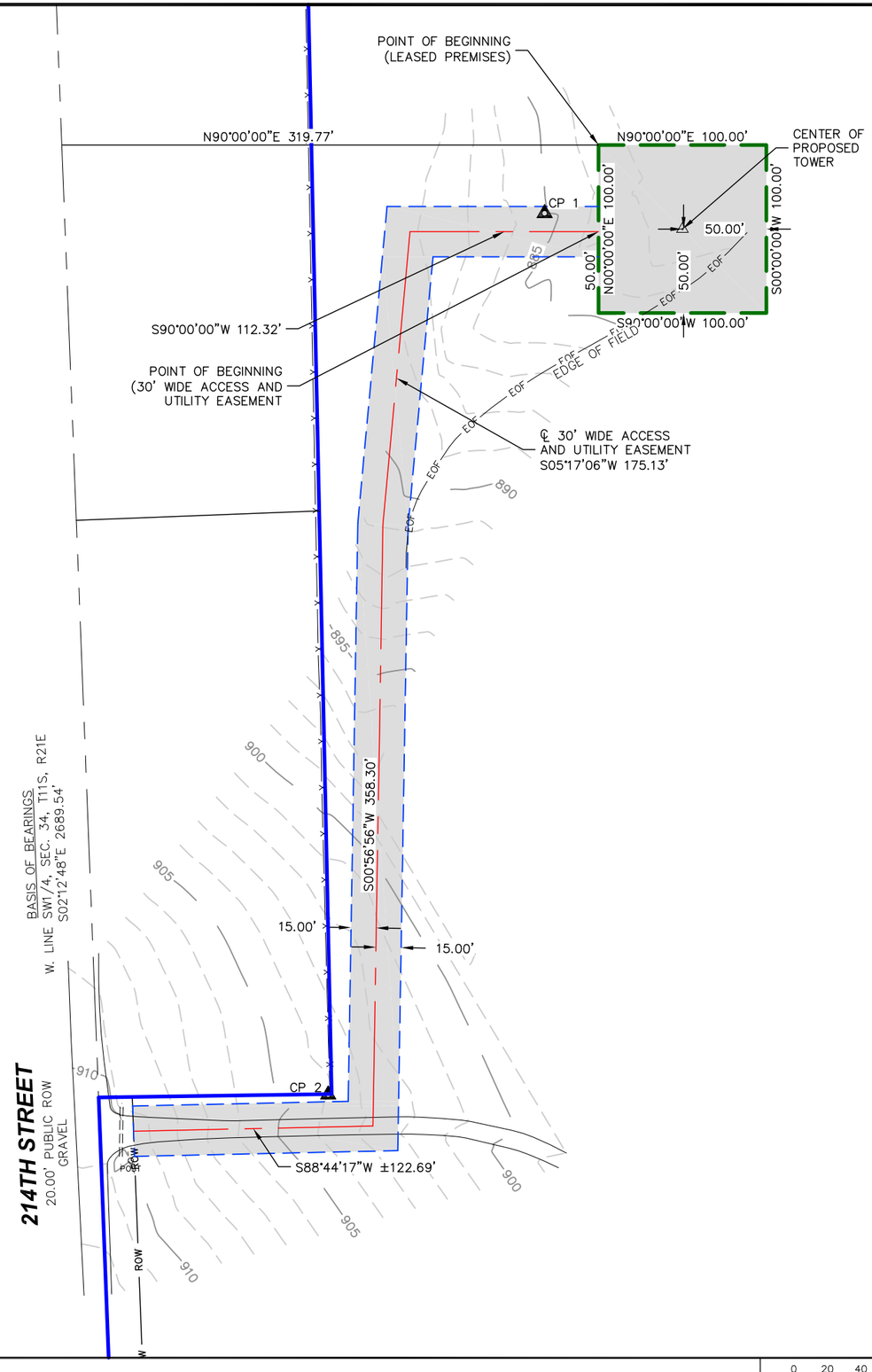

UTILITY NOTICE

THE UTILITIES AS SHOWN ON THIS DRAWING WERE DEVELOPED FROM THE INFORMATION AVAILABLE. THIS IS NOT IMPLIED NOR INTENDED TO BE THE COMPLETE INVENTORY OF UTILITIES IN THIS AREA. IT IS THE CLIENT'S / CONTRACTOR'S RESPONSIBILITY TO VERIFY THE LOCATION OF ALL UTILITIES (WHETHER SHOWN OR NOT) AND PROTECT SAID UTILITIES FROM ANY DAMAGE.

PRE-CONSTRUCTION ONLY

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BOUNDARY NOTICE

PARENT PARCEL(S) BOUNDARY LINES SHOWN ON THESE DRAWINGS ARE CALCULATED FROM RECORDED DOCUMENTS AND ARE NOT INTENDED TO BE USED FOR BOUNDARY LOCATIONS.

LEASED PREMISES AND EASEMENT DETAIL

0 20 40 80

SCALE: 1" = 80' (11 x 17)
OR SCALE: 1" = 40 (22 x 34)

1

TILLMAN INFRASTRUCTURE
152 W. 57th STREET
NEW YORK, NEW YORK 10019
TEL: 212-706-1677

SKYWARD LAND SERVICES, INC.
7381 WEST 133RD STREET
SUITE 403
OVERLAND PARK, KS 66213

ASSOCIATED Engineering & Surveying
2705 N. Main Street
Omaha, NE 68022
Ph: (402) 289-5040
Fax: (402) 289-5045
AE & Survey, Project # 6392

BRYAN WIEGERT
LICENSED
1454
KANSAS
LAND SURVEYOR

REVISIONS			
REV.	DATE	DESCRIPTION	INITIALS
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0	10/16/25	FINAL	BKW

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CANDIDATE A
RELO SITE FA#
10008273

PARCEL ID
052-198-34-0-00-00-006.00-0

SHEET NUMBER
SS-2

TITLE EXCEPTIONS

THIS DOCUMENT WAS COMPLETED BY THE AID OF TITLE WORK PREPARED BY WESCOR LAND TITLE INSURANCE COMPANY, COMMITMENT DATE OF JUNE 6, 2025, BEING FILE NUMBER TIL-211898-C, FOR THE SUBJECT PROPERTY, TO DETERMINE THE IMPACTS OF EXISTING TITLE EXCEPTIONS.

SCHEDULE B, PART II - SPECIAL EXCEPTIONS:

NO SURVEY ITEMS IN SUPPORTING DOCUMENTS.

PARENT PARCEL DESCRIPTION

THE SOUTHWEST QUARTER (SW ¼) OF SECTION THIRTY–FOUR (34), TOWNSHIP ELEVEN (11) SOUTH OF RANGE TWENTY–ONE (21) EAST OF THE 6TH PRINCIPAL MERIDIAN EXCEPT PUBLIC HIGHWAYS.

PARCEL ID: 052–198–34–0–00–00–006.00–0 OWNER: EVERETT J. OELSCHLAEGER REVOCABLE INTERVIVOS TRUST DEED: INSTRUMENT 2015R00876 COUNTY / STATE: LEAVENWORTH COUNTY, KANSAS

LEASED PREMISES DESCRIPTION

A LEASED PREMISES OVER AND ACROSS PART OF THE SOUTHWEST QUARTER (SW ¼) OF SECTION THIRTY–FOUR (34), TOWNSHIP ELEVEN (11) SOUTH OF RANGE TWENTY–ONE (21) EAST OF THE 6TH PRINCIPAL MERIDIAN EXCEPT PUBLIC HIGHWAYS, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT AN EXISTING "X" CUT ON BRIDGE DECK AT THE NORTHWEST CORNER OF SAID SOUTHWEST QUARTER (SW ¼) OF SECTION THIRTY–FOUR (34); THENCE S02°12'48"E ALONG THE WEST LINE OF SAID SOUTHWEST QUARTER (SW ¼) OF SECTION THIRTY–FOUR (34), A DISTANCE OF 235.82 FEET; THENCE N90°00'00"E, A DISTANCE OF 319.77 FEET TO THE POINT OF BEGINNING; THENCE CONTINUING N90°00'00"E, A DISTANCE OF 100.00 FEET; THENCE S00°00'00"W, A DISTANCE OF 100.00 FEET; THENCE S90°00'00"W, A DISTANCE OF 100.00 FEET; THENCE N00°00'00"E, A DISTANCE OF 100.00 FEET TO THE POINT OF BEGINNING, CONTAINING AN AREA OF 10,000 SQUARE FEET OR 0.230 ACRES.

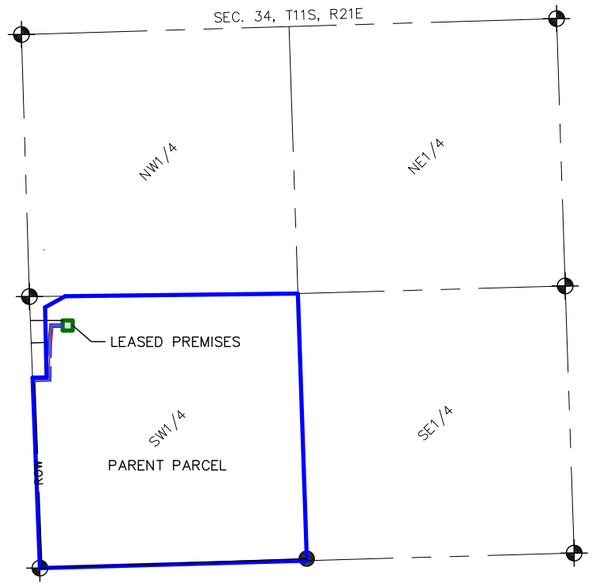
PARCEL ID: 052–198–34–0–00–00–006.00–0 OWNER: EVERETT J. OELSCHLAEGER REVOCABLE INTERVIVOS TRUST DEED: INSTRUMENT 2015R00876 COUNTY / STATE: LEAVENWORTH COUNTY, KANSAS

30 FOOT WIDE ACCESS AND UTILITY EASEMENT DESCRIPTION

AN ACCESS AND UTILITY EASEMENT OVER AND ACROSS PART OF THE SOUTHWEST QUARTER (SW ¼) OF SECTION THIRTY–FOUR (34), TOWNSHIP ELEVEN (11) SOUTH OF RANGE TWENTY–ONE (21) EAST OF THE 6TH PRINCIPAL MERIDIAN EXCEPT PUBLIC HIGHWAYS, BEING 30.00 FEET IN WIDTH, 15.00 FEET ON EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE:

COMMENCING AT AN EXISTING "X" CUT ON BRIDGE DECK AT THE NORTHWEST CORNER OF SAID SOUTHWEST QUARTER (SW ¼) OF SECTION THIRTY–FOUR (34); THENCE S02°12'48"E ALONG THE WEST LINE OF SAID SOUTHWEST QUARTER (SW ¼) OF SECTION THIRTY–FOUR (34), A DISTANCE OF 235.82 FEET; THENCE N90°00'00"E, A DISTANCE OF 319.77 FEET; THENCE CONTINUING N90°00'00"E, A DISTANCE OF 100.00 FEET; THENCE S00°00'00"W, A DISTANCE OF 100.00 FEET; THENCE S90°00'00"W, A DISTANCE OF 100.00 FEET; THENCE N00°00'00"E, A DISTANCE OF 50.00 FEET TO THE POINT OF BEGINNING; THENCE S90°00'00"W, A DISTANCE OF 112.32 FEET; THENCE S05°17'06"W, A DISTANCE OF 175.13 FEET; THENCE S00°56'56"W, A DISTANCE OF 358.30 FEET; THENCE S88°44'17"W, A DISTANCE OF 122.69 FEET, MORE OR LESS, TO A POINT ON THE EAST RIGHT–OF–WAY LINE OF 214TH STREET, SAID RIGHT–OF–WAY BEING 20.00 FEET IN WIDTH, CONTAINING A NET AREA OF 21,482 SQUARE FEET OR 0.493 ACRES.

PARCEL ID: 052–198–34–0–00–00–006.00–0 OWNER: EVERETT J. OELSCHLAEGER REVOCABLE INTERVIVOS TRUST DEED: INSTRUMENT 2015R00876 COUNTY / STATE: LEAVENWORTH COUNTY, KANSAS



PARENT PARCEL DETAIL

UTILITY NOTICE

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PRE-CONSTRUCTION ONLY

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SURVEYOR'S CERTIFICATE

THIS SURVEY WAS COMPLETED WITH THE AID OF TITLE WORK PREPARED BY WESCOR LAND TITLE INSURANCE COMPANY, COMMITMENT DATE OF JUNE 6, 2025, BEING FILE NUMBER TIL–211898–C, FOR THE SUBJECT PROPERTY, TO DETERMINE THE IMPACTS OF EXISTING TITLE EXCEPTIONS.

I HEREBY CERTIFY THAT THIS SURVEY, PLAN OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED LAND SURVEYOR UNDER THE LAWS OF THE STATE OF MISSOURI.

DATED THIS 16TH DAY OF OCTOBER, 2025.

BRYAN WIEGERT
MISSOURI LICENSE NO. 2682

DESCRIPTIONS

0 375 750 1500

SCALE: 1" = 1500' (11 x 17)
OR SCALE: 1" = 750' (22 x 34)

1

TILLMAN INFRASTRUCTURE
152 W. 57th STREET
NEW YORK, NEW YORK 10019
TEL: 212-706-1677

SKYWARD LAND SERVICES, INC.
7381 WEST 133RD STREET
SUITE 403
OVERLAND PARK, KS 66213

ASSOCIATED Engineering & Surveying
2705 N. Main Street
Omaha, NE 68022
Ph: (402) 289–5040
Fax: (402) 289–5045
AE & Survey, Project # 6392

BRYAN WIEGERT LICENSED 1454 KANSAS LAND SURVEYOR

REVISIONS			
REV.	DATE	DESCRIPTION	INITIALS
A	10/06/25	PRELIMINARY	BKW
0	10/16/25	FINAL	BKW

SITE NAME:
TONGANOXIE_KS

SITE ID:
TI-OPP-37632
SITE ADDRESS:
15076 214TH STREET
LEAVENWORTH COUNTY
TONGANOXIE, KS 66086
CANDIDATE A
RELO SITE FA#
10008273

PARCEL ID
052-198-34-0-00-00-006.00-0

SHEET NUMBER
SS-3

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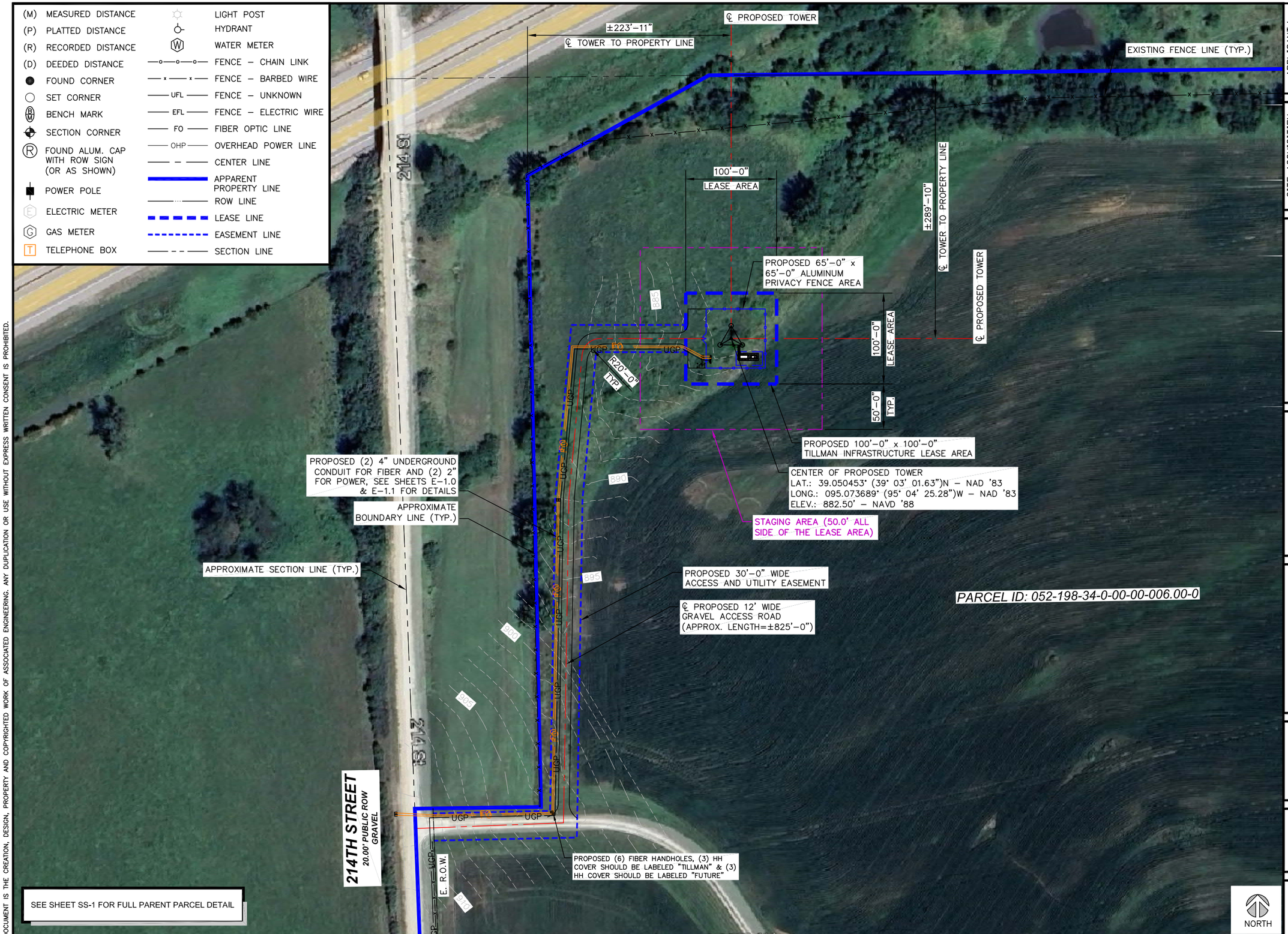

OVERALL SITE PLAN W/ AERIAL MAP

50' 0 25' 50'

SCALE: 1"=50'–0" (22x34)
(OR) 1/2"=50'–0" (11x17)

1

THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF ASSOCIATED ENGINEERING. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS PROHIBITED.

APPLICANT/ SITE OWNER

TILLMAN INFRASTRUCTURE

SITE ACQUISITION /ENGINEERING

SKYWARD LAND SERVICES, INC.

ASSOCIATED Engineering, Inc.
AE INC. Project # 6392

SITE INFORMATION

TONGANOXIE_ KS

TI-OPP-37632
RELO SITE FA# 10008273

15076 214TH St.
TONGANOXIE, KS 66086
LEAVENWORTH COUNTY

PARCEL ID:
052-198-34-0-00-00-006.00-0
CANDIDATE: A

DESIGN RECORD

REV	DATE	DESCRIPTION	BY
A	04/02/26	FINAL DRAWINGS	JMV

PROFESSIONAL STAMP

GAUTAM (TOM) MEDHI
LICENSED
18252
KANSAS
PROFESSIONAL ENGINEER

ENGINEER

Tom Medhi 04-02-2026
Tom Medhi Date
MY LICENSE RENEWAL DATE IS 04/30/2027

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF KANSAS

SHEET TITLE

OVERALL SITE PLAN W/ AERIAL MAP

SHEET NUMBER

C-0.0

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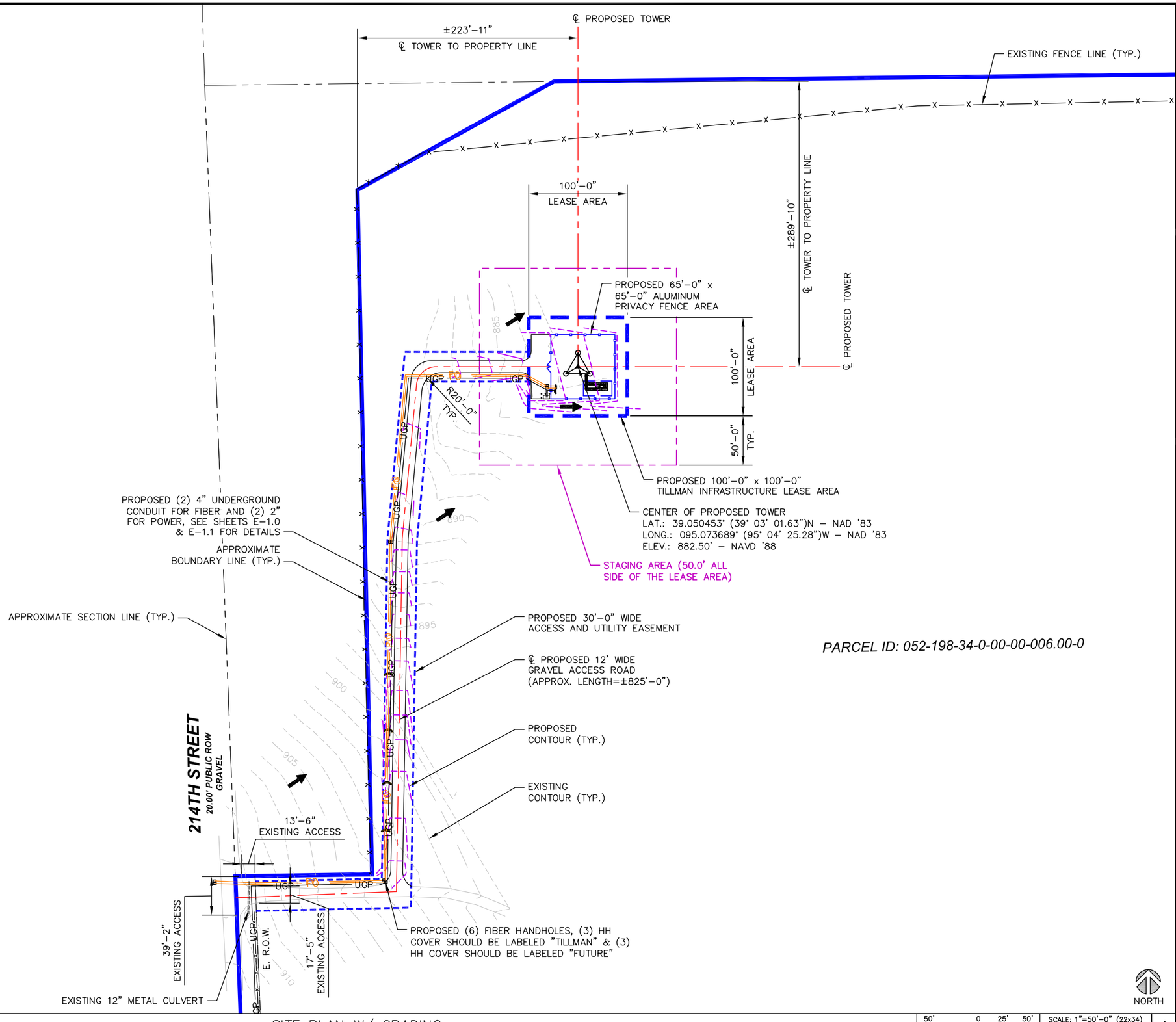

PARCEL ID: 052-198-34-0-00-00-006.00-0

SITE PLAN W/ GRADING

50' 0 25' 50'

SCALE: 1"=50'-0" (22x34)
(OR) 1/2"=50'-0" (11x17)

1

APPLICANT/ SITE OWNER

TILLMAN INFRASTRUCTURE

SITE ACQUISITION /ENGINEERING

SKYWARD LAND SERVICES, INC.

ASSOCIATED Engineering, Inc.
AE INC. Project # 6392

SITE INFORMATION

TONGANOXIE_ KS

TI-OPP-37632
RELO SITE FA# 10008273

15076 214TH St.
TONGANOXIE, KS 66086
LEAVENWORTH COUNTY

PARCEL ID:
052-198-34-0-00-00-006.00-0
CANDIDATE: A

DESIGN RECORD

REV	DATE	DESCRIPTION	BY
A	04/02/26	FINAL DRAWINGS	JMV

PROFESSIONAL STAMP

GAUTAM (TOM) MEDHI
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KANSAS
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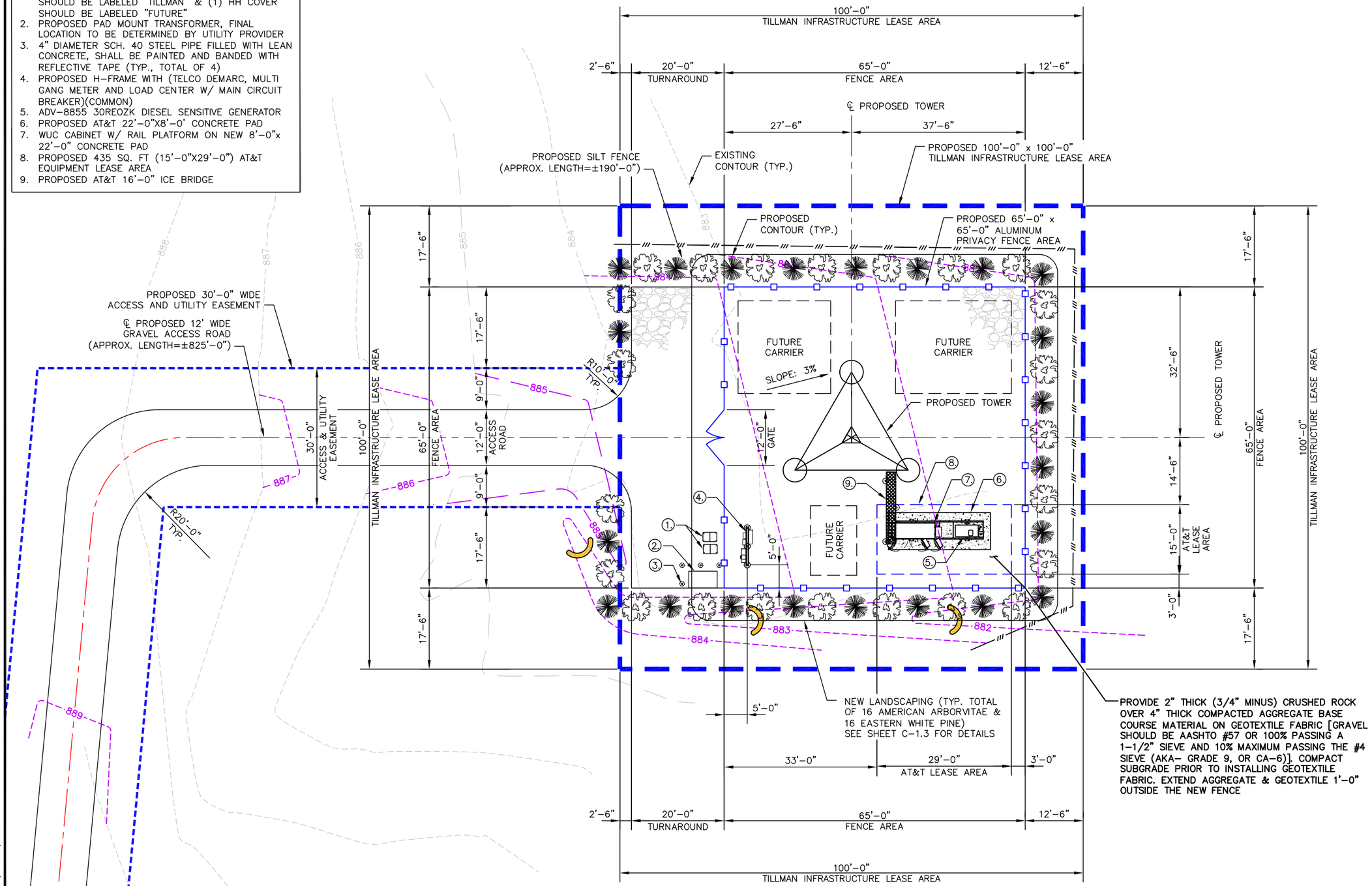
SHEET TITLE

SITE PLAN W/ GRADING

SHEET NUMBER

C-1.0

1. PROPOSED (2) FIBER HANDHOLES, (1) HH COVER SHOULD BE LABELED "TILLMAN" & (1) HH COVER SHOULD BE LABELED "FUTURE"
2. PROPOSED PAD MOUNT TRANSFORMER, FINAL LOCATION TO BE DETERMINED BY UTILITY PROVIDER
3. 4" DIAMETER SCH. 40 STEEL PIPE FILLED WITH LEAN CONCRETE, SHALL BE PAINTED AND BANDED WITH REFLECTIVE TAPE (TYP., TOTAL OF 4)
4. PROPOSED H-FRAME WITH (TELCO DEMARC, MULTI GANG METER AND LOAD CENTER W/ MAIN CIRCUIT BREAKER)(COMMON)
5. ADV-8855 30REOZK DIESEL SENSITIVE GENERATOR
6. PROPOSED AT&T 22'-0"X8'-0" CONCRETE PAD
7. WUC CABINET W/ RAIL PLATFORM ON NEW 8'-0"x 22'-0" CONCRETE PAD
8. PROPOSED 435 SQ. FT (15'-0"X29'-0") AT&T EQUIPMENT LEASE AREA
9. PROPOSED AT&T 16'-0" ICE BRIDGE



NORTH

COMPOUND SITE PLAN W/ GRADING

0 3' 6' 12'

SCALE: 3/32"=1'-0" (22x34)
(OR) 3/64"=1'-0" (11x17)

1

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APPLICANT/ SITE OWNER

TILLMAN INFRASTRUCTURE

SITE ACQUISITION /ENGINEERING

SKYWARD LAND SERVICES, INC.

ASSOCIATED Engineering, Inc.
AE INC. Project # 6392

SITE INFORMATION

TONGANOXIE_ KS

TI-OPP-37632
RELO SITE FA# 10008273

15076 214TH St.
TONGANOXIE, KS 66086
LEAVENWORTH COUNTY

PARCEL ID:
052-198-34-0-00-00-006.00-0
CANDIDATE: A

DESIGN RECORD

REV	DATE	DESCRIPTION	BY
A	04/02/26	FINAL DRAWINGS	JMV

PROFESSIONAL STAMP

GAUTAM (TOM) MEDHI
LICENSED
18252
KANSAS
PROFESSIONAL ENGINEER

ENGINEER

Tom Medhi 04-02-2026
Tom Medhi Date
MY LICENSE RENEWAL DATE IS 04/30/2027

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SHEET TITLE

COMPOUND
SITE PLAN W/ GRADING

SHEET NUMBER

C-1.1

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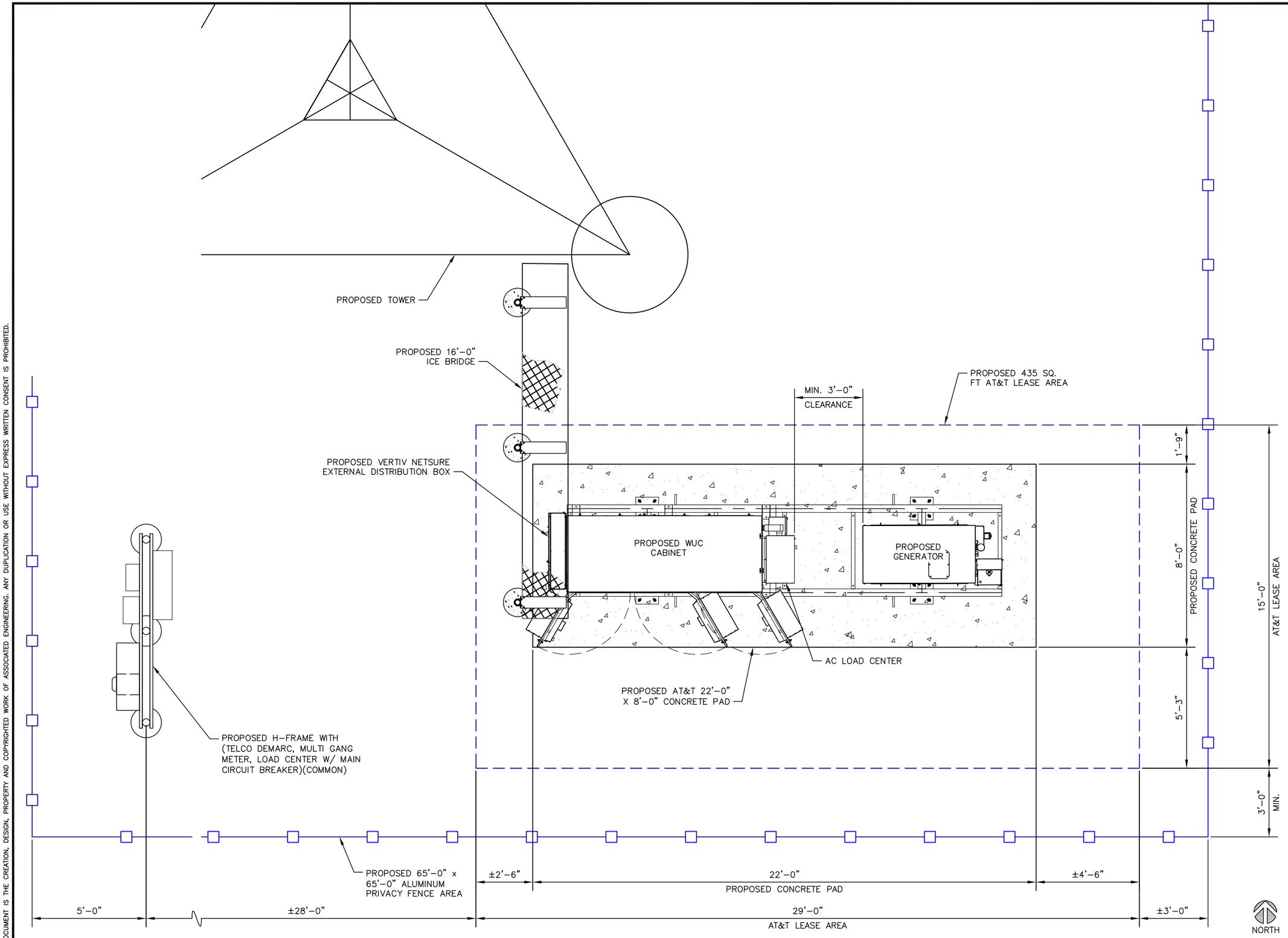

AT&T EQUIPMENT LAYOUT

0 6" 1' 2'

SCALE: 1/2"=1'–0" (22x34)
(OR) 1/4"=1'–0" (11x17)

1

APPLICANT/ SITE OWNER

TILLMAN INFRASTRUCTURE

SITE ACQUISITION /ENGINEERING

SKYWARD LAND SERVICES, INC.

ASSOCIATED Engineering, Inc.
AE INC. Project # 6392

SITE INFORMATION

TONGANOXIE_ KS

TI-OPP-37632
RELO SITE FA# 10008273

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LEAVENWORTH COUNTY

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DESIGN RECORD

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A	04/02/26	FINAL DRAWINGS	JMV

PROFESSIONAL STAMP

GAUTAM (TOM) MEDHI
LICENSED
18252
KANSAS
PROFESSIONAL ENGINEER

ENGINEER

Tom Medhi 04-02-2026
Tom Medhi Date
MY LICENSE RENEWAL DATE IS 04/30/2027

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SHEET TITLE

AT&T
EQUIPMENT LAYOUT

SHEET NUMBER

C-1.2

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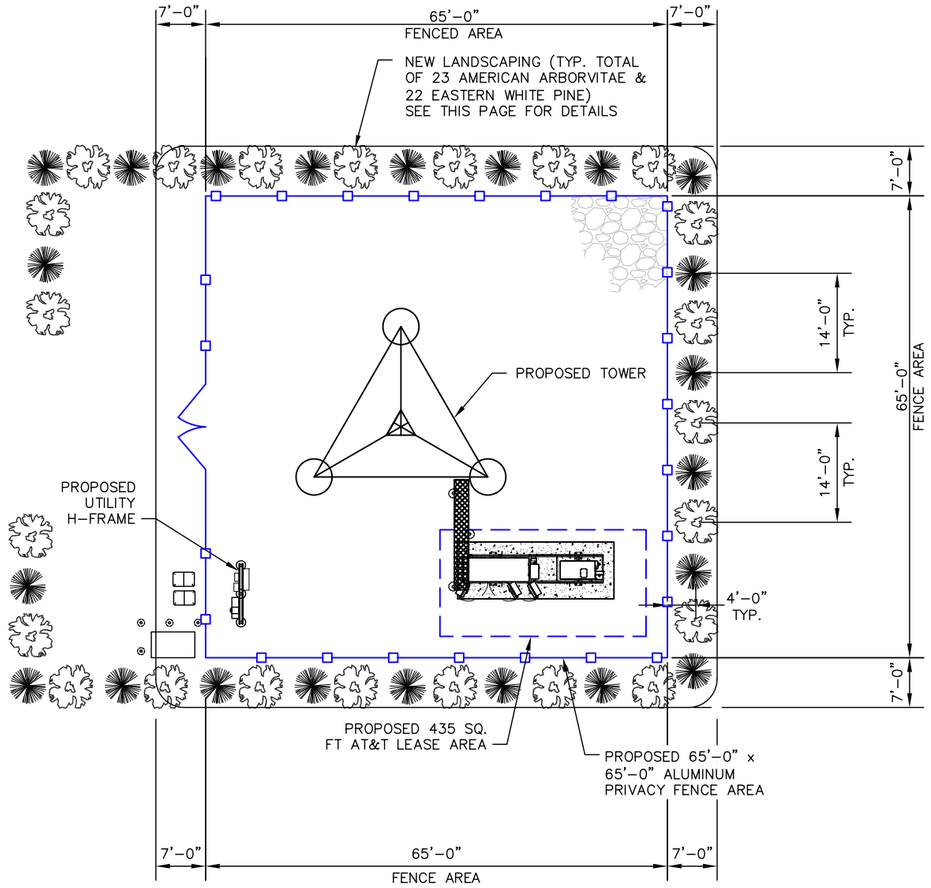


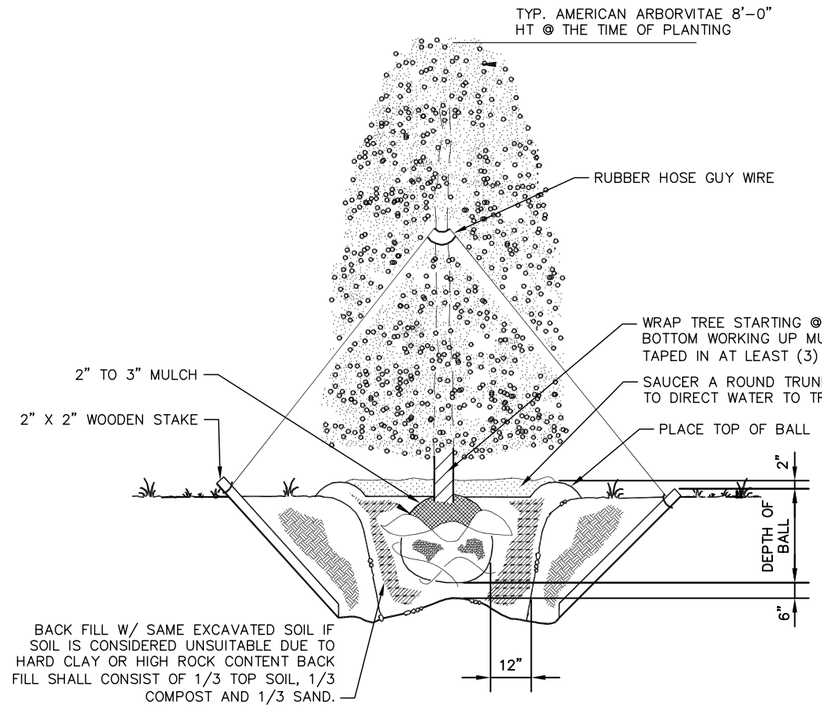
NORTH

LANDSCAPING (PLAN VIEW)

0 3' 6' 12'

SCALE: 3/32"=1'-0" (22x34)
(OR) 3/64"=1'-0" (11x17)

1



QUANTITY	COMMON NAME	BOTANICAL NAME	TRUNK CALIPER	PLANTING SIZE	PLANTING METHOD	DESIGN SIZE	
						SPREAD	HEIGHT
23	AMERICAN ARBORVITAE	THUJA OCCIDENTALIS	3 1/2" MIN.	8'-0"	B & B	6'-0"	8'-0"
22	EASTERN WHITE PINE	PINUS STROBUS (NANA GROUP)	1 1/2" MIN.	3'-0"	1 GAL POT	8'-0"	9'-0"

DETAILS

SCALE N.T.S.

2

APPLICANT/ SITE OWNER

TILLMAN INFRASTRUCTURE

SITE ACQUISITION /ENGINEERING

SKYWARD LAND SERVICES, INC.

ASSOCIATED Engineering, Inc.
AE INC. Project # 6392

SITE INFORMATION

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DESIGN RECORD

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A	04/02/26	FINAL DRAWINGS	JMV

PROFESSIONAL STAMP

GAUTAM (TOM) MEDHI LICENSED 18252 KANSAS PROFESSIONAL ENGINEER

ENGINEER

Tom Medhi 04-02-2026
Tom Medhi Date
MY LICENSE RENEWAL DATE IS 04/30/2027

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SHEET TITLE

LANDSCAPING

SHEET NUMBER

C-1.3

59

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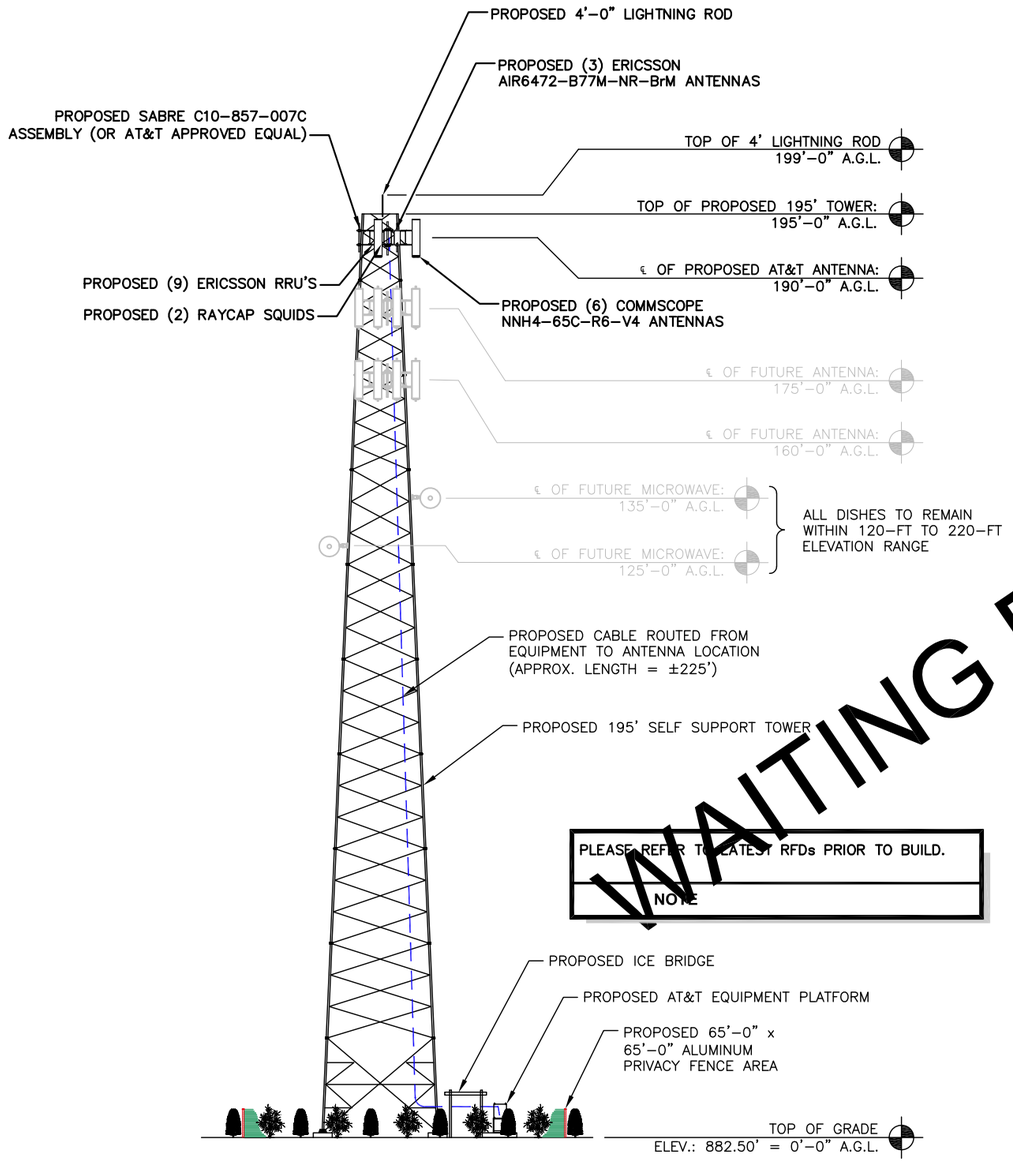
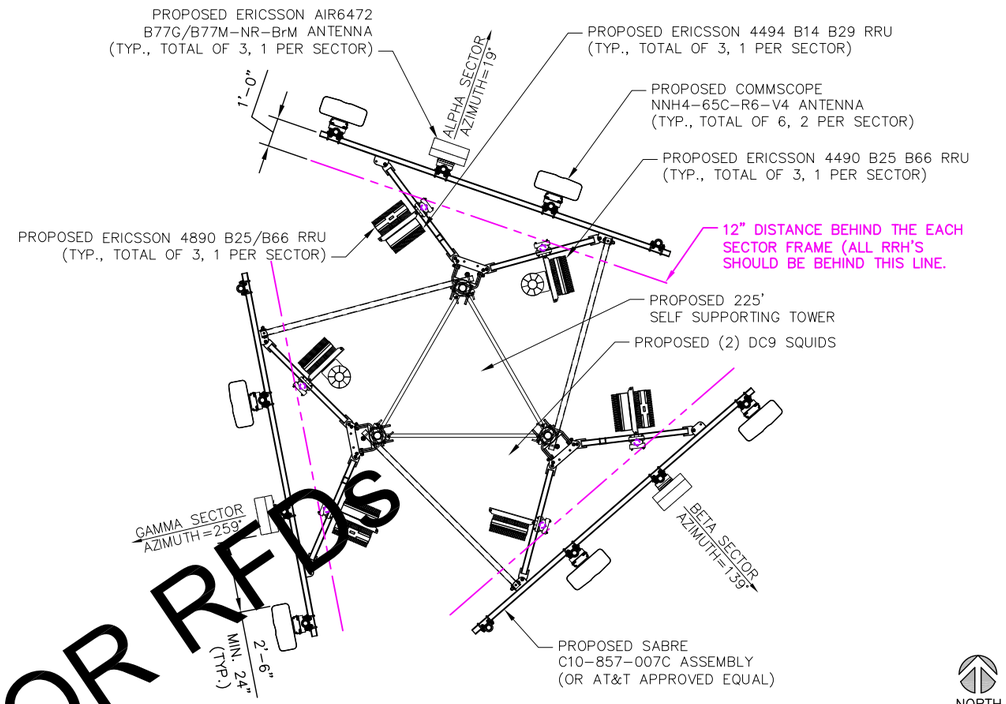


PLEASE REFER TO LATEST RFDs PRIOR TO BUILD.
NOTE

WAITING FOR RFDS

TOWER ELEVATION | 3



ANTENNA PLAN | 1

ANTENNA AND RRH SCHEDULE

SECTOR	ANTENNA MODEL	TECHNOLOGY	AZIMUTH	ANTENNA HEIGHT	MECH. TILT	RRU MODEL
ALPHA	COMMSCOPE NNH4-65C-R6-V4	LTE 700/PCS/AWS	19°	190'±	0	4494 B14/B29 4890 B25/B66
	ERICSSON-AIR6472 B77G B77M	5G C-BAND	19°	190'±	0	B77G/B77M
	COMMSCOPE NNH4-65C-R6-V4	LTE 700/850	19°	190'±	0	4490 B5/B12
	-	-	-	-	-	-
BETA	COMMSCOPE NNH4-65C-R6-V4	LTE 700/PCS/AWS	100°	190'±	0	4494 B14/B29 4890 B25/B66
	ERICSSON-AIR6472 B77G B77M	5G C-BAND	100°	190'±	0	B77G/B77M
	COMMSCOPE NNH4-65C-R6-V4	LTE 700/850	100°	190'±	0	4490 B5/B12
	-	-	-	-	-	-
GAMMA	COMMSCOPE NNH4-65C-R6-V4	LTE 700/PCS/AWS	259°	190'±	0	4494 B14/B29 4890 B25/B66
	ERICSSON-AIR6472 B77G B77M	5G C-BAND	259°	190'±	0	B77G/B77M
	COMMSCOPE NNH4-65C-R6-V4	LTE 700/850	259°	190'±	0	4490 B5/B12
	-	-	-	-	-	-

CABLE COUNT

QTY	CABLE TYPE
6	WR-VG66ST-BRD DC TRUNK
2	FB-L98B-235 FIBER TRUNK

SQUID COUNT

QTY	MODEL
1	DC9-48-60-24-8C-EV

BBU COUNT

QTY	MODEL
1	RAN PROCESSOR 6672

ANTENNA KEY | 2

APPLICANT / SITE OWNER

TILLMAN INFRASTRUCTURE

SITE ACQUISITION /ENGINEERING

SKYWARD LAND SERVICES, INC.

ASSOCIATED Engineering, Inc.
AE INC. Project # 6392

SITE INFORMATION

TONGANOXIE_ KS

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RELO SITE FA# 10008273

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TONGANOXIE, KS 66086
LEAVENWORTH COUNTY

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CANDIDATE: A

DESIGN RECORD

REV	DATE	DESCRIPTION	BY
A	04/02/26	FINAL DRAWINGS	JMV

PROFESSIONAL STAMP

GAUTAM (TOM) MEDHI LICENSED 18252 KANSAS PROFESSIONAL ENGINEER

ENGINEER

Tom Medhi 04-02-2026
Tom Medhi Date
MY LICENSE RENEWAL DATE IS 04/30/2027

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF KANSAS

SHEET TITLE

TOWER ELEVATION & ANTENNA PLAN

SHEET NUMBER

C-2.0

60

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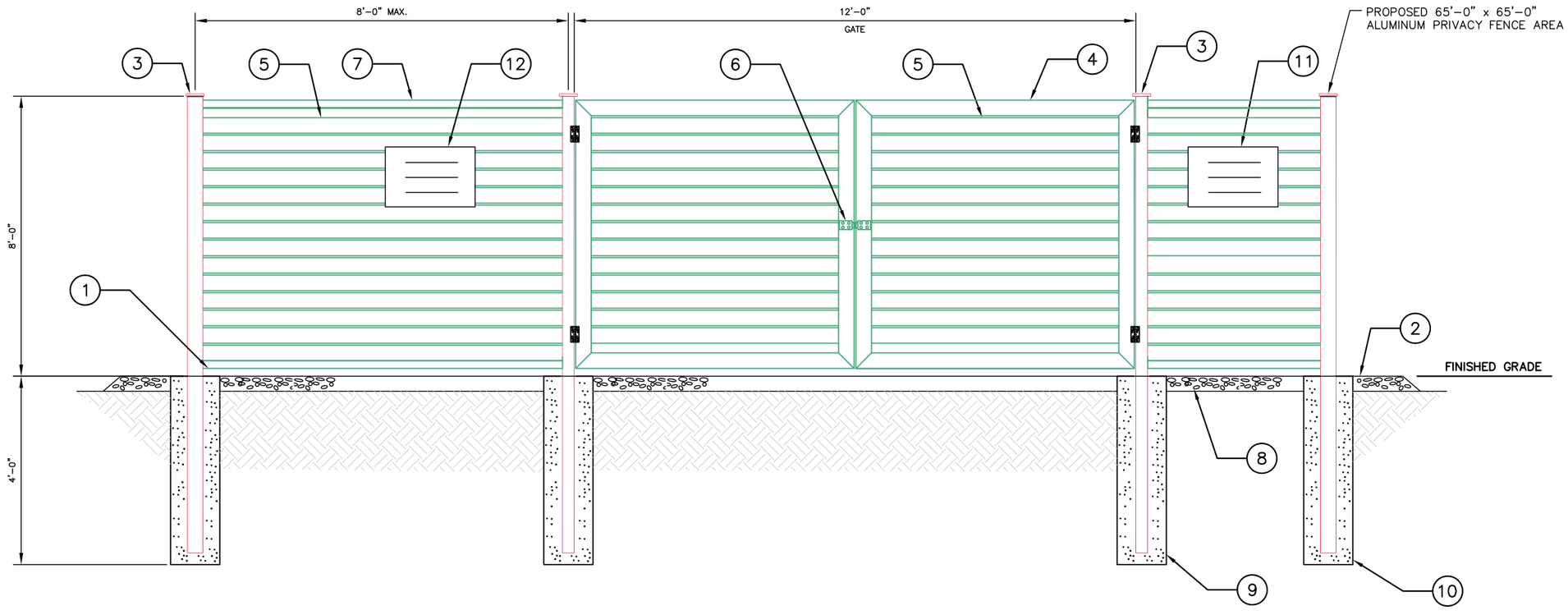

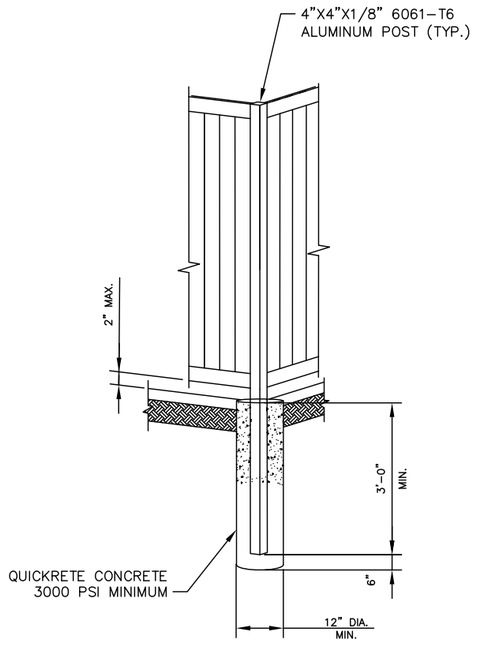

FENCE POST SUPPORT OPTIONS:

A. USE (2) PIECES OF 1/2" REBAR IN HINGE, LATCH AND END POSTS. POSITION REBAR IN OPPOSING CORNERS OF EACH POST WITH REBAR SEPARATOR CLIPS PER MANUFACTURER RECOMMENDATIONS.

B. INSERT ALUMINUM GATE POST STIFFENER INSIDE POST FOR FASTER, CLEANER INSTALLATION PER MANUFACTURER RECOMMENDATIONS.

FENCE NOTE:

1. THIS HANDOUT IS INTENDED ONLY AS A GUIDE. IT SHALL NOT BE CONSIDERED A COMPLETE SET OF REQUIREMENTS.
2. MATERIALS AND INSTALLATION MUST COMPLY WITH THE CURRENT KANSAS STATE BUILDING CODE AND THE MANUFACTURERS' INSTALLATION SPECIFICATIONS FOR EACH PRODUCT.
3. LENGTH OF THE FENCE WILL DETERMINE BY GC.

REFERENCE NOTES:

1. 2" (MAX) CLEARANCE FROM GRADE
2. FINISHED GRADE SHALL BE UNIFORM AND LEVEL
3. 4"X4"X1/8" 6061-T6 ALUMINUM POST W/ CAP (TYP.)
4. ALUMINUM GATE FRAME (4"X2"X1/8" 6061-T6)
5. 4"X1" ALUMINUM RAIL(6061-T6 MIN TYP.)
6. SELF-LOCKING GATE LATCH HEAVY DUTY
7. 2"X2" ALUMINUM RAIL(6061-T6, TYP.)
8. GEOTEXTILE FABRIC
9. CORNER POST: CONCRETE FOUNDATION (MIN 2000 PSI @ 28 DAYS)
10. GATE POST: CONCRETE FOUNDATION (MIN 2000 PSI @ 28 DAYS)
11. 1'-0" x 1'-6" EMPLOYEE NOTICE SIGN
12. 1'-0" x 1-6" DANGER HIGH VOLTAGE/NO TRESPASSING SIGN (TYPICAL ALL SIDES OF FENCED COMPOUND)

FENCE, GATE, AND COMPOUND CROSS SECTION

APPLICANT/ SITE OWNER

TILLMAN INFRASTRUCTURE

SITE ACQUISITION /ENGINEERING

SKYWARD LAND SERVICES, INC.

ASSOCIATED Engineering, Inc.
AE INC. Project # 6392

SITE INFORMATION

TONGANOXIE_ KS

TI-OPP-37632
RELO SITE FA# 10008273

15076 214TH St.
TONGANOXIE, KS 66086
LEAVENWORTH COUNTY

PARCEL ID:
052-198-34-0-00-00-006.00-0
CANDIDATE: A

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SHEET TITLE

FENCE DETAIL

SHEET NUMBER

C-3.0

61

KEYED NOTES:

1. FURNISH AND INSTALL 600A 3 GANG, 120/240V, 1ϕ, 3W MAIN TERMINAL BOX (SQUARE D OR APPROVED EQUAL).
2. FURNISH AND INSTALL 600A 3 GANG, 120/240V, 1ϕ, 3W METER STACK (SQUARE D OR APPROVED EQUAL).
2A. TILLMAN UTILITY METER (BY UTILITY COMPANY) (CONTRACTOR TO PROVIDE PLASTIC PLACARD INDICATING "TILLMAN" METER).
2B. TILLMAN 100AMP CIRCUIT BREAKER (BY CONTRACTOR)
2C. AT&T UTILITY METER (BY UTILITY COMPANY) (CONTRACTOR TO PROVIDE PLASTIC PLACARD INDICATING "AT&T" METER).
2D. AT&T 200AMP CIRCUIT BREAKER (BY CONTRACTOR)
2E. CONTRACTOR TO PROVIDE COVERS FOR UNUSED METER BASE.
3. FURNISH AND INSTALL TELCO ENCLOSURE (HOFFMAN 48"x48"x14" OR APPROVED EQUAL) INSTALL 3/4" PLYWOOD BACKBOARD INSIDE ENTIRE ENCLOSURE.
4. 12–POSITION, 200A, 240/240V, 1ϕ, 3W LOAD CENTER W/ (1) 200A/2P MAIN CIRCUIT BREAKER.

GENERAL NOTE:

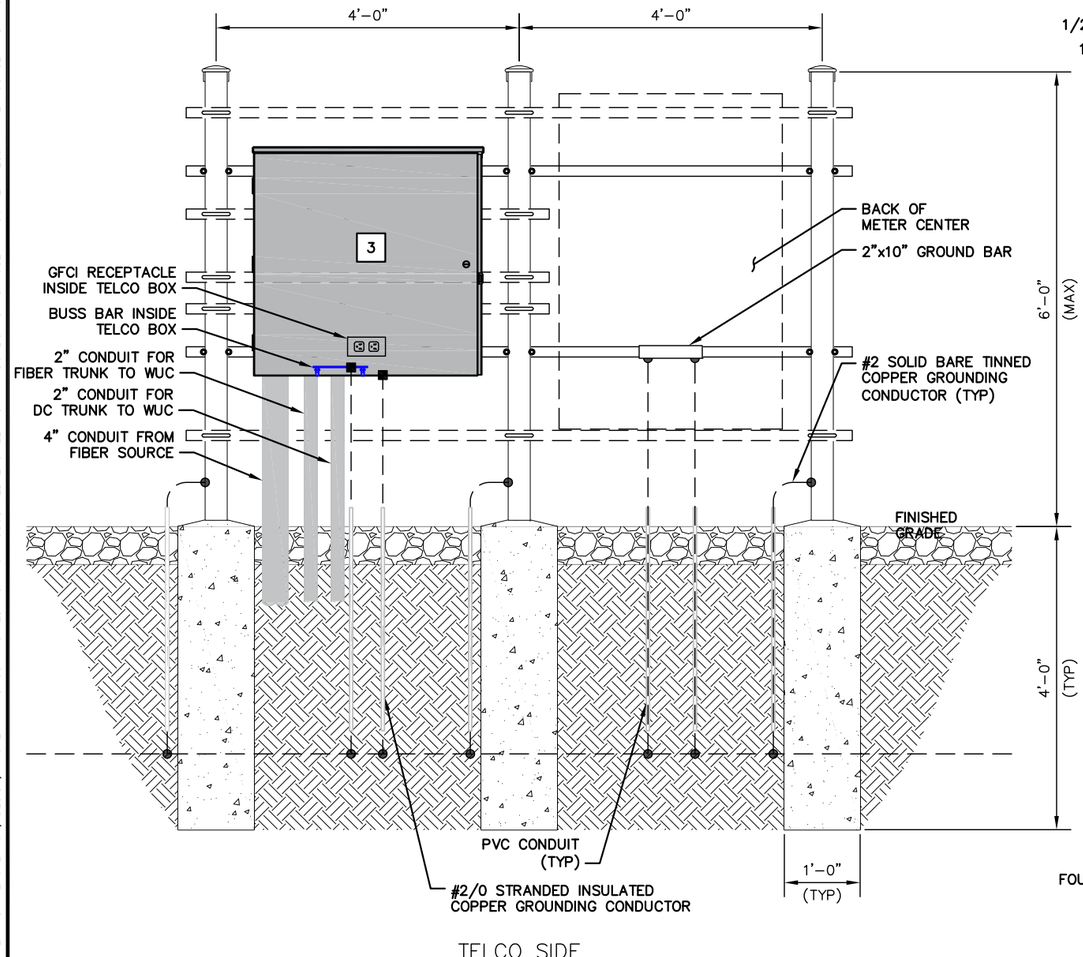
1. SEE SHEET E–2.0 FOR WIRING QUANTITIES AND SIZES.

NOTE:

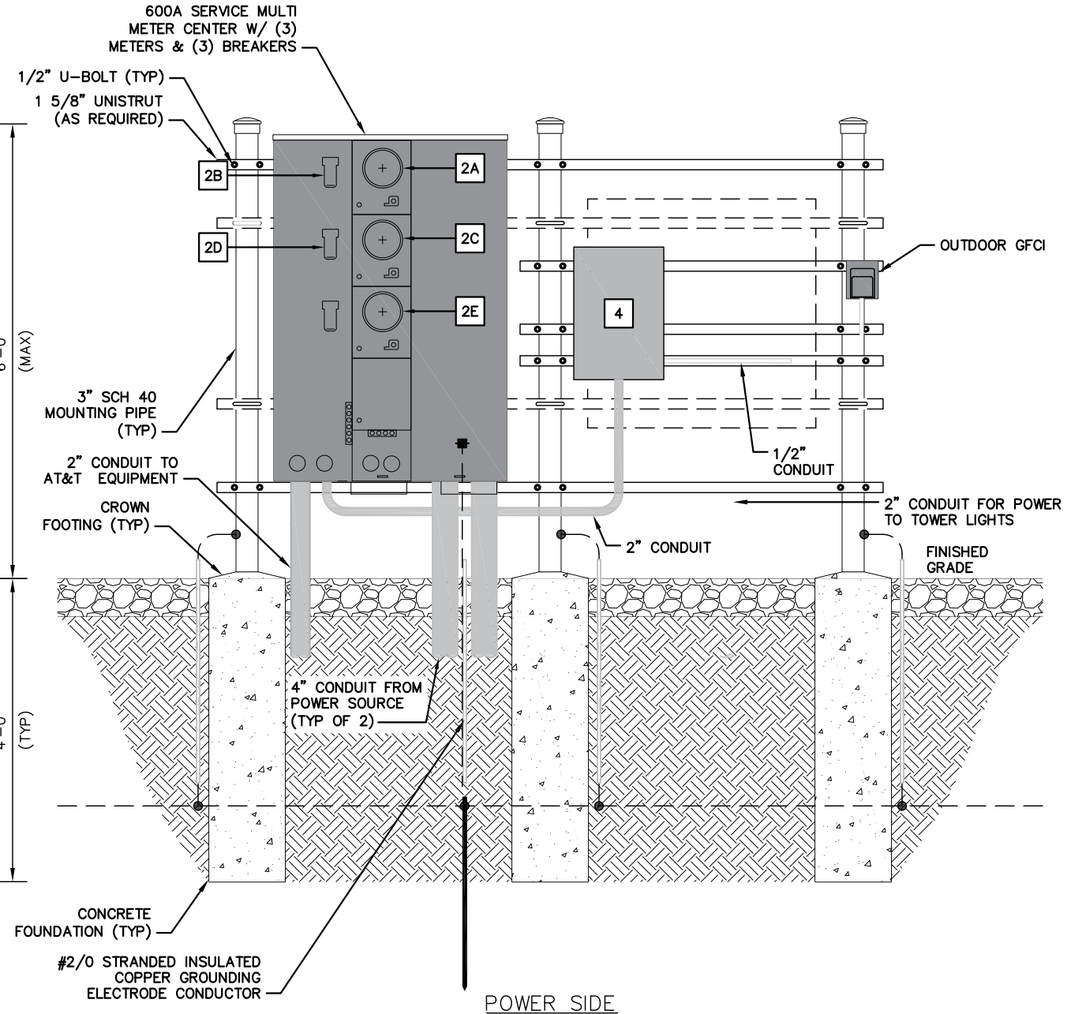
CONTRACTOR SHALL VERIFY METER GANG AND TELCO ENCLOSURE SIZE WITH TILLMAN BEFORE INSTALLATION.

ROUTE OF LIGHTING CONDUIT IN COMPOUND:

WHEN THE TOWER IS REQUIRED HAVE AVIATION LIGHTING THE ELECTRIC CABLE FROM THE CONTROLLER TO THE TOWER SHALL BE RUN IN 2" SCHEDULE 40 GREY PVC CONDUIT WITH WEATHER HEADS AT EACH END (MIN 24" ABOVE FINISHED GRADE) AND SHALL BE ROUTED UNDERGROUND TO AVOID BEING BELOW FUTURE CARRIER EQUIPMENT. DO NOT ROUTE THE CONDUIT DIAGONALLY ACROSS THE SITE OR ALONG THE FENCE.



TELCO SIDE



POWER SIDE

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AE INC. Project # 6392

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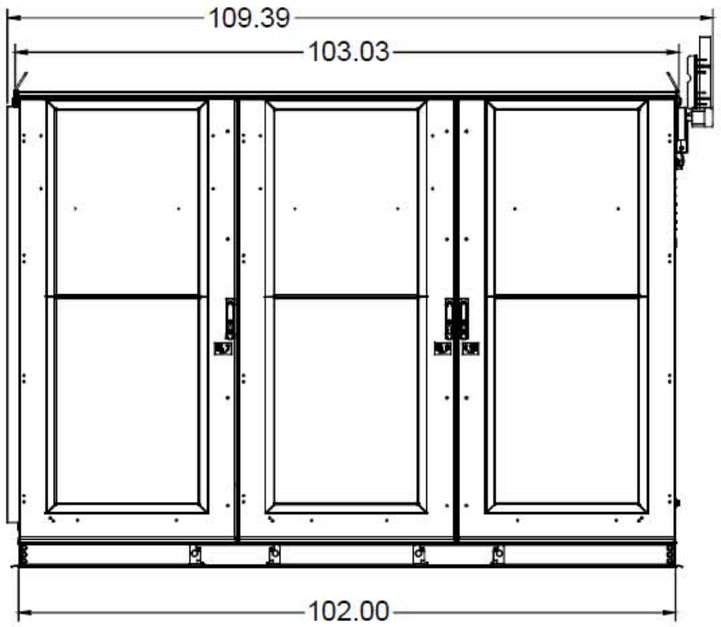
SHEET TITLE

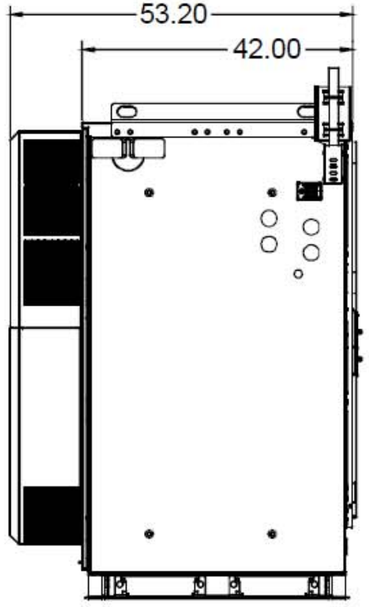
COMMON UTILITY RACK DETAILS

SHEET NUMBER

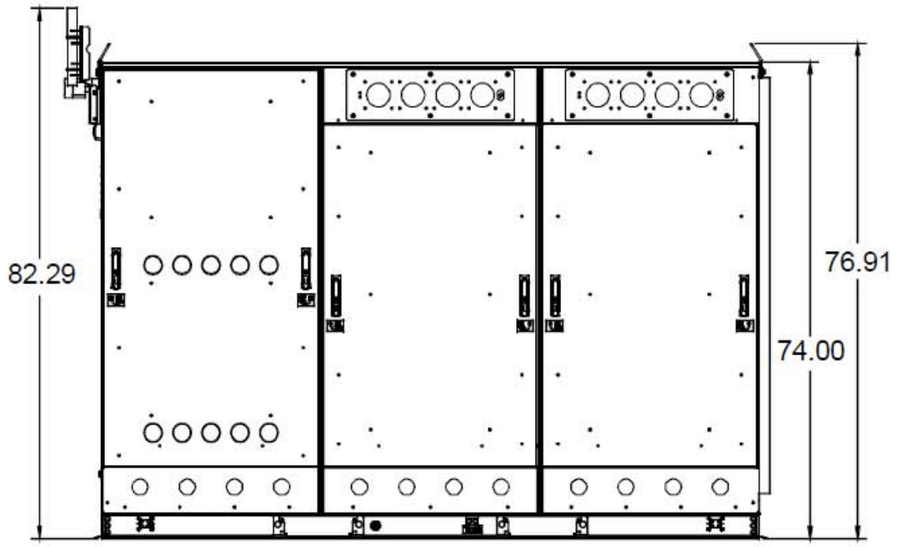
C-4.0
62



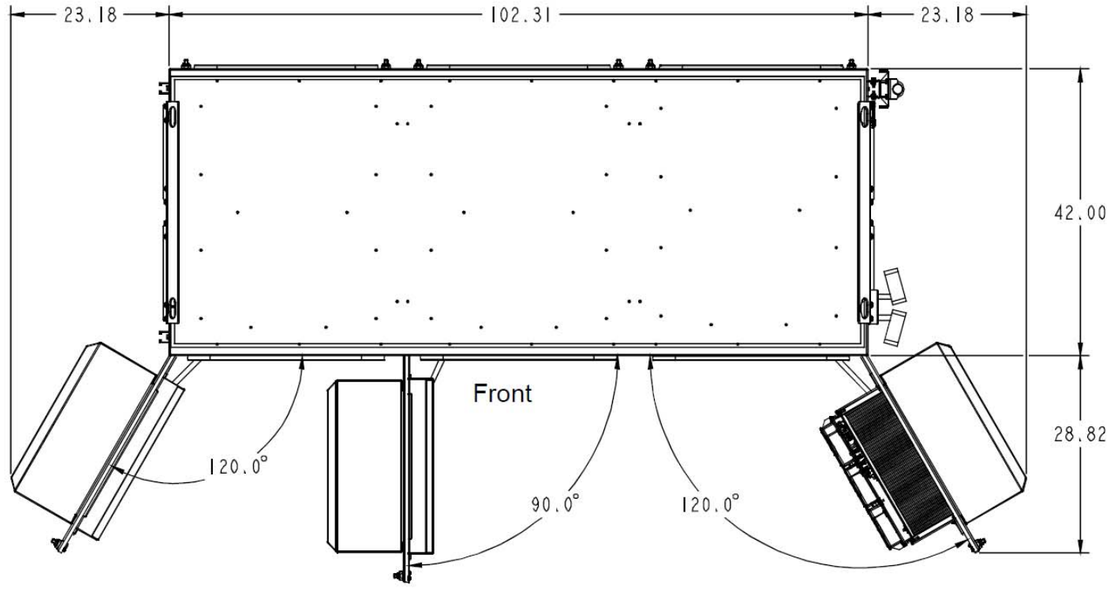
Front



Right Side



Rear



SPECIFICATIONS:

VENDOR:	VERTIV
MODEL #:	F2020030
DIMENSIONS (HxWxD):	103.03" x 76.91" x 53.20"

(EXCLUDING BATTERIES, POWER SUPPLY & LOAD EQUIPMENT)

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ASSOCIATED Engineering, Inc.
AE INC. Project # 6392

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18252
KANSAS
PROFESSIONAL ENGINEER

ENGINEER

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Tom Medhi Date
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SHEET TITLE

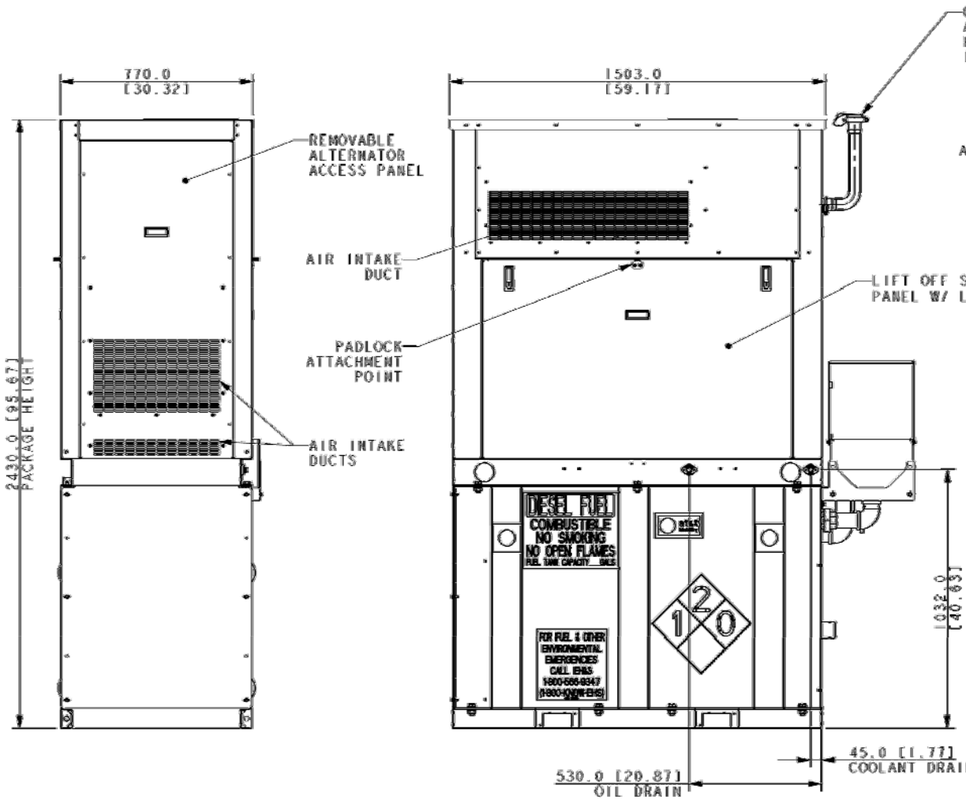
WALK UP CABINET DETAILS

SHEET NUMBER

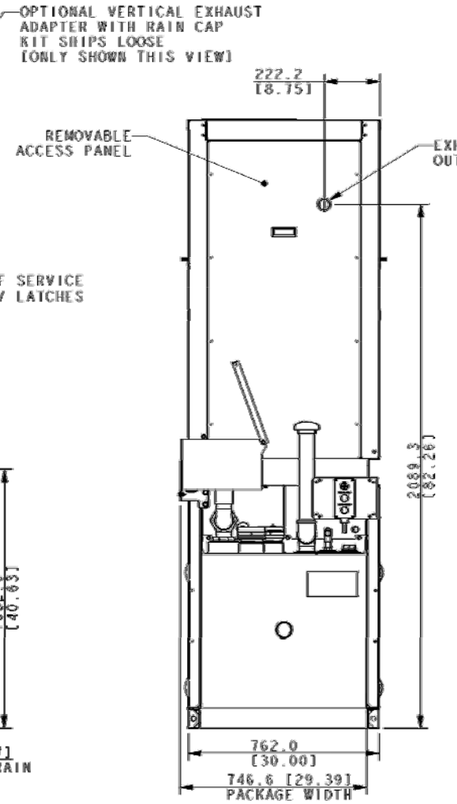
C-5.0

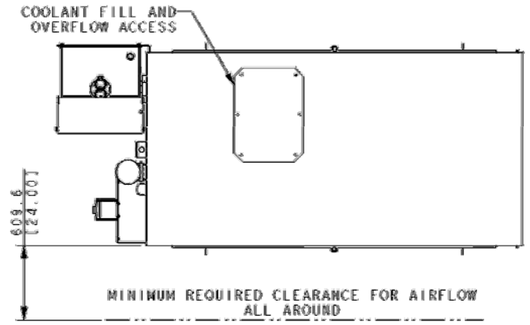
63

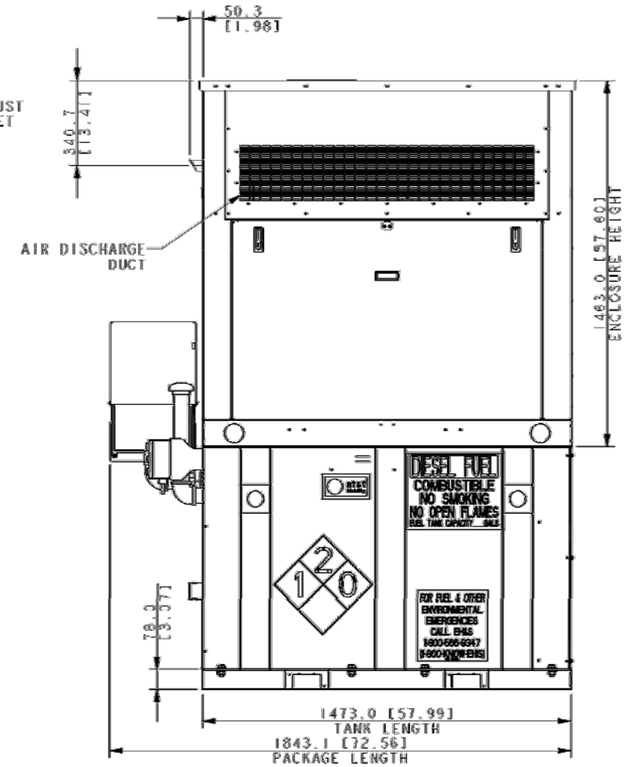
NOTES:
1. ALL SIDES OF THE GENERATOR ARE SERVICE ACCESSIBLE. RIGHT SIDE IS PRIMARY SERVICE SIDE.
2. 6 AMP BATTERY CHARGER.
3. 120VAC ENGINE BLOCK HEATER.
4. 120VAC 80W BATTERY HEATER.
5. GENERATOR MUST BE GROUNDED.
6. SOUND ATTENUATED ENCLOSURE STANDARD WITH GENERATOR.
7. MUST ALLOW FREE FLOW OF DISCHARGE AIR AND EXHAUST.
8. MUST ALLOW FREE FLOW OF INTAKE AIR.
9. BASE TANK REQUIRES ALL STUB-UPS TO BE IN THE REAR TANK STUB-UP AREA.
10. TANK EQUIPPED WITH FIRE SAFETY VALVE ON FUEL SUPPLY LINE.
11. IT IS THE RESPONSIBILITY OF THE INSTALLATION TECHNICIAN TO ENSURE THAT THE GENERATOR INSTALLATION COMPLIES WITH ALL APPLICABLE CODES, STANDARDS, AND REGULATIONS.
12. GENERATOR IS INSTALLED ON A UL-142 RATED DOUBLE WALL SUBBASE FUEL TANK.



RIGHT SIDE
[SERVICE SIDE]







TOTAL PACKAGE WEIGHT: 982 KG [2164 LBS]

AT&T 20KW KOHLER DIESEL
COMPACT SOUND ENCLOSURE
W/ 105 GAL STATE TANK

REV	DATE	ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL	BY
-	3-22-18	NEW DRAWING [GT185308]	JMR

DO NOT SCALE. REFERENCE THE MODEL FOR ALL UNSPECIFIED DIMENSIONS

UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN MILLIMETERS [DECIMAL DIMENSIONS]: X.XX ± 0.25, X.X ± 1.0, ANGLES ± 0°30'. SURFACE FINISH: 3.2 MAX.

THIRD ANGLE PROJECTION

KOHLER. KOHLER, WISCONSIN 53044

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APPROVALS	DATE
DRAWN JMR	3-22-18
CHECKED JMR	3-22-18
APPROVED LBD	3-22-18

TITLE: DIMENSION PRINT, 20KW STATE TANK, ENCL

SCALE 0.60 | DWG NO. ADV-9064 | SHEET 1 OF 3 | D

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SHEET TITLE

GENERATOR DETAILS

SHEET NUMBER

C-5.1
64

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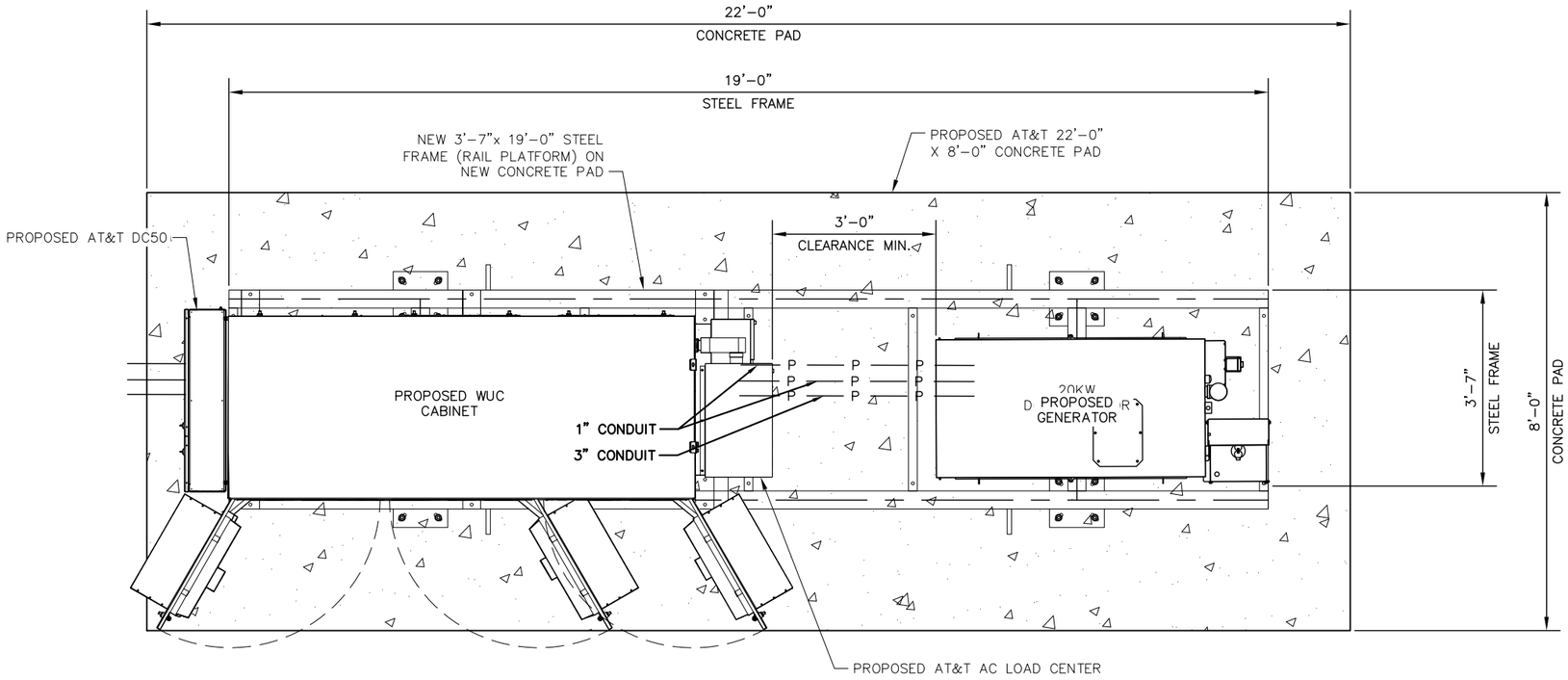
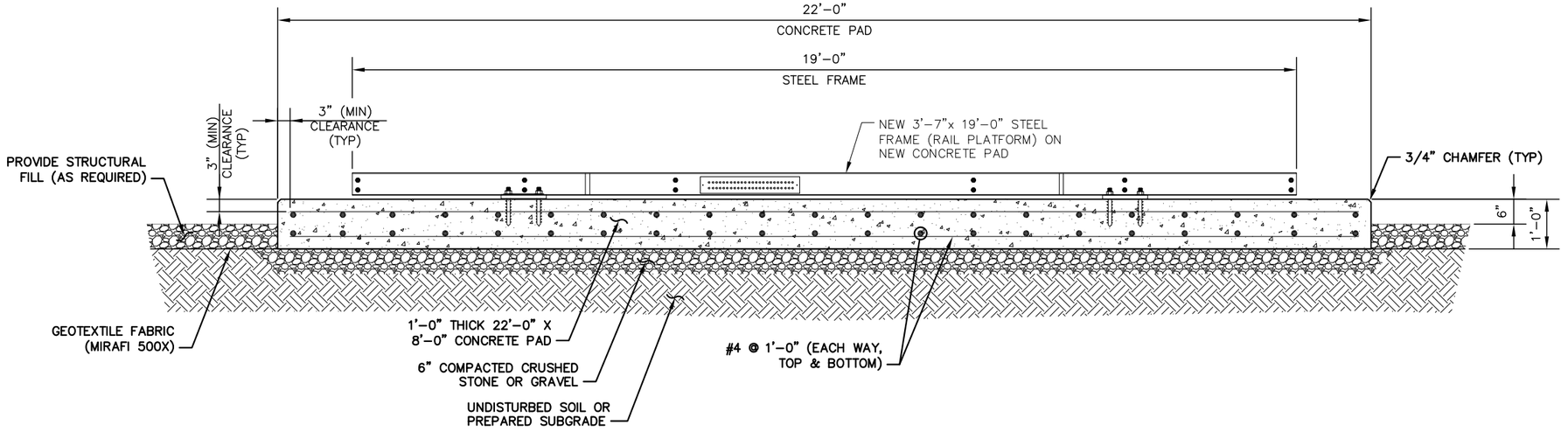


PLAN VIEW



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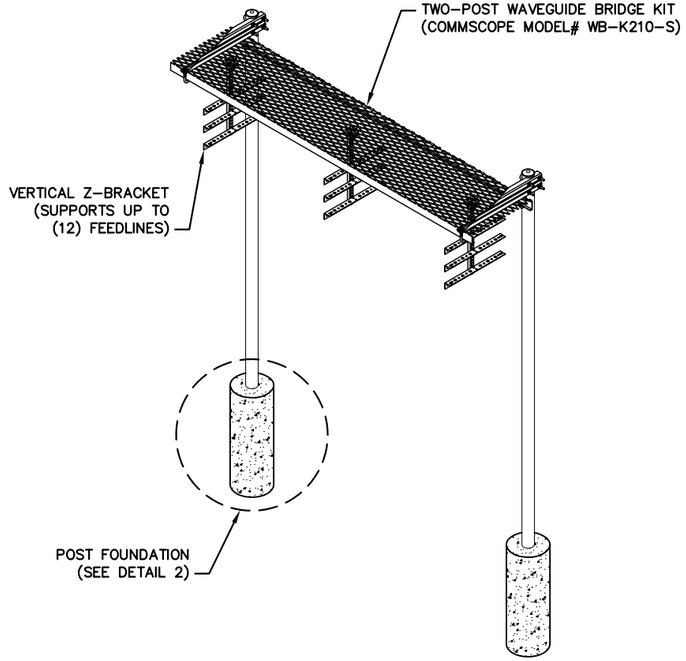
SHEET TITLE

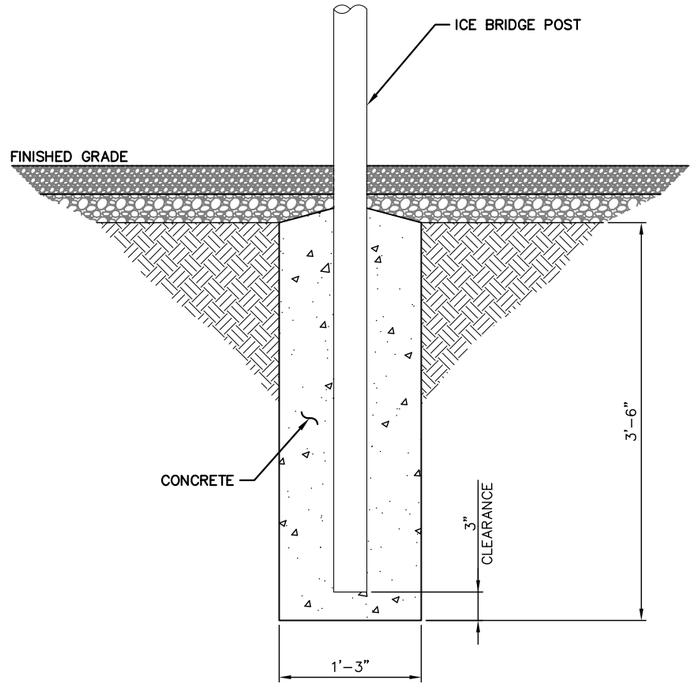
CONCRETE PAD & RAIL PLATFORM DETAILS

SHEET NUMBER

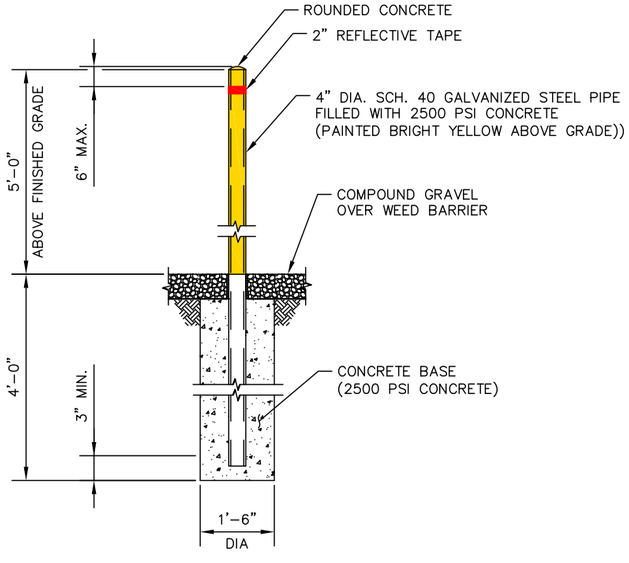
C-5.2
65



TWO–POST ICE BRIDGE KIT DETAIL | 1



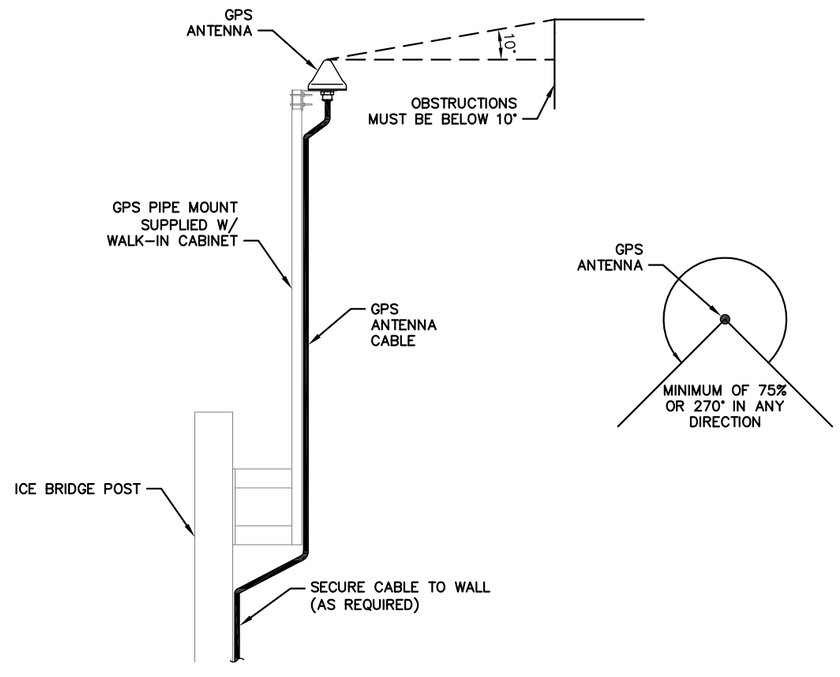
ICE BRIDGE POST FOUNDATION DETAIL | 2



NOTE:

BOLLARDS SHALL BE PAINTED AND BANDED WITH YELLOW AND BLACK REFLECTIVE TAPE ON THE UPPER 12" OF THE POST.

CONCRETE FILLED BOLLARD DETAIL | 4



GPS ANTENNA WALL MOUNT DETAIL | NO SCALE | 3

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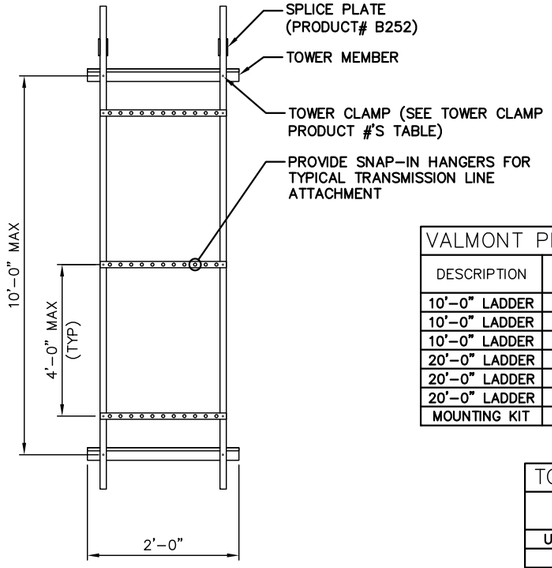
SHEET TITLE

EQUIPMENT DETAILS
(1 OF 2)

SHEET NUMBER

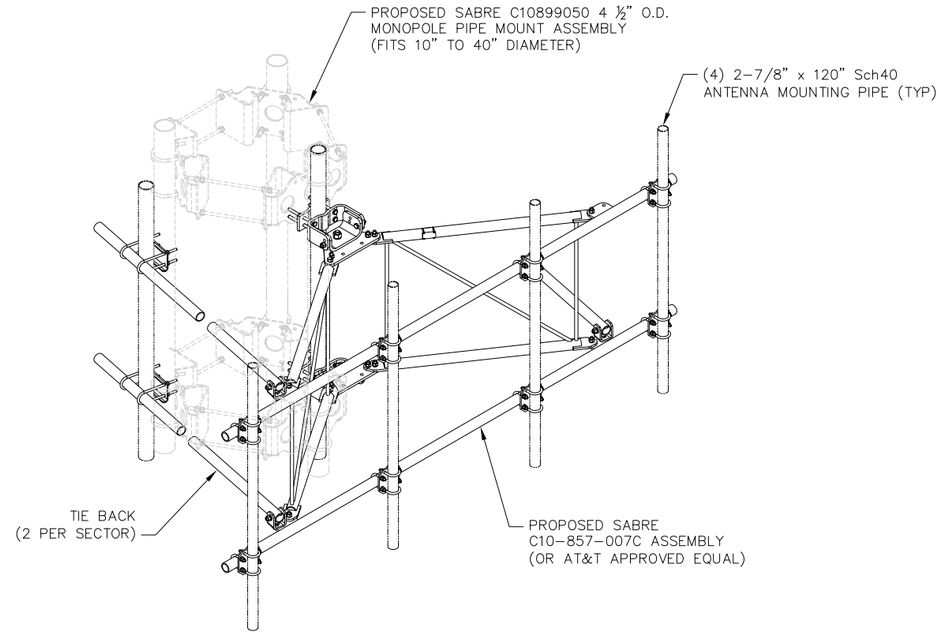
C-6.0
66



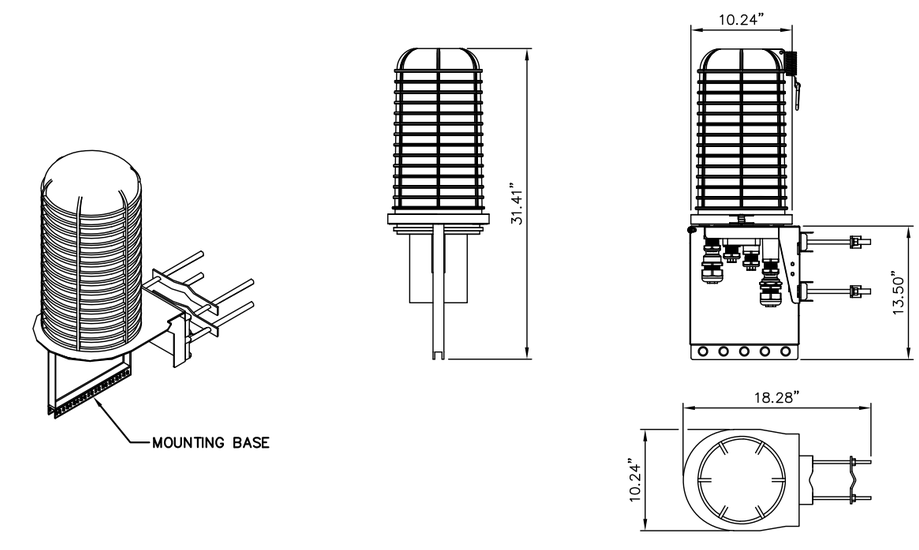
VALMONT PIROD OR APPROVED EQUAL			
DESCRIPTION	PRODUCT NUMBER	FEEDLINES SUPPORTED	WIDTH
10'-0" LADDER	860121	SIX	20 1/2"
10'-0" LADDER	860122	NINE	28"
10'-0" LADDER	860123	TWELVE	35 1/2"
20'-0" LADDER	860124	SIX	20 1/2"
20'-0" LADDER	860125	NINE	28"
20'-0" LADDER	860126	TWELVE	35 1/2"
MOUNTING KIT	860142		

TOWER CLAMP PRODUCT #'S	
DESCRIPTION	PRODUCT NUMBER
UNIVERSAL CLAMP	B1577
1/2" BOLT	B682
CLIP	B297
SPRINT NUT	B262

CABLE LADDER SUPPORT DETAIL | 1



ANTENNA FRAME DETAIL | 2

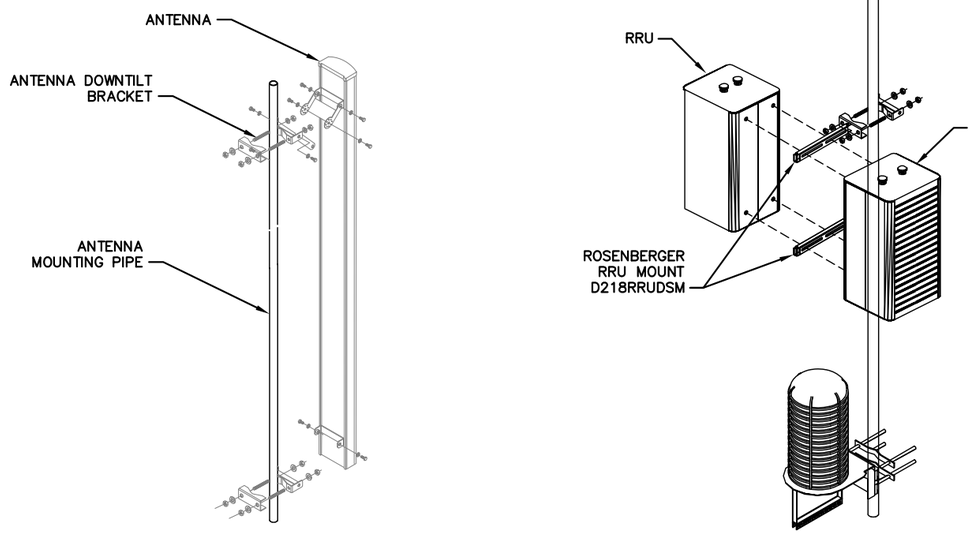


SPECIFICATIONS:	
VENDOR:	RAYCAP
MODEL #:	DC9-48-60-24-8C-EV
DIMENSIONS (HxWxD):	31.41" x 10.24" x 18.28"
TOTAL WEIGHT:	28.7lbs

NOTES:

1. CONTRACTOR TO USE "THREAD LUBRICANT" ON MOUNTING BOLTS DURING INSTALLATION.
2. SECURE FIBER WIRES TO MOUNTING BASE W/ VELCRO WRAPS.
3. SECURE DC POWER CABLES TO MOUNTING BASE W/ HOSE CLAMPS.

SURGE SUPPRESSOR DETAIL | 4



RRH MOUNTING DETAIL | 3

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APPLICANT/ SITE OWNER

TILLMAN INFRASTRUCTURE

SITE ACQUISITION /ENGINEERING

SKYWARD LAND SERVICES, INC.

ASSOCIATED Engineering, Inc.
AE INC. Project # 6392

SITE INFORMATION

TONGANOXIE_ KS

TI-OPP-37632
RELO SITE FA# 10008273

15076 214TH St.
TONGANOXIE, KS 66086
LEAVENWORTH COUNTY

PARCEL ID:
052-198-34-0-00-00-006.00-0
CANDIDATE: A

DESIGN RECORD

REV	DATE	DESCRIPTION	BY
A	04/02/26	FINAL DRAWINGS	JMV

PROFESSIONAL STAMP

GAUTAM (TOM) MEDHI
LICENSED
18252
KANSAS
PROFESSIONAL ENGINEER

ENGINEER

Tom Medhi 04-02-2026
Tom Medhi Date
MY LICENSE RENEWAL DATE IS 04/30/2027

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF KANSAS

SHEET TITLE

EQUIPMENT DETAILS
(2 OF 2)

SHEET NUMBER

C-6.1
67

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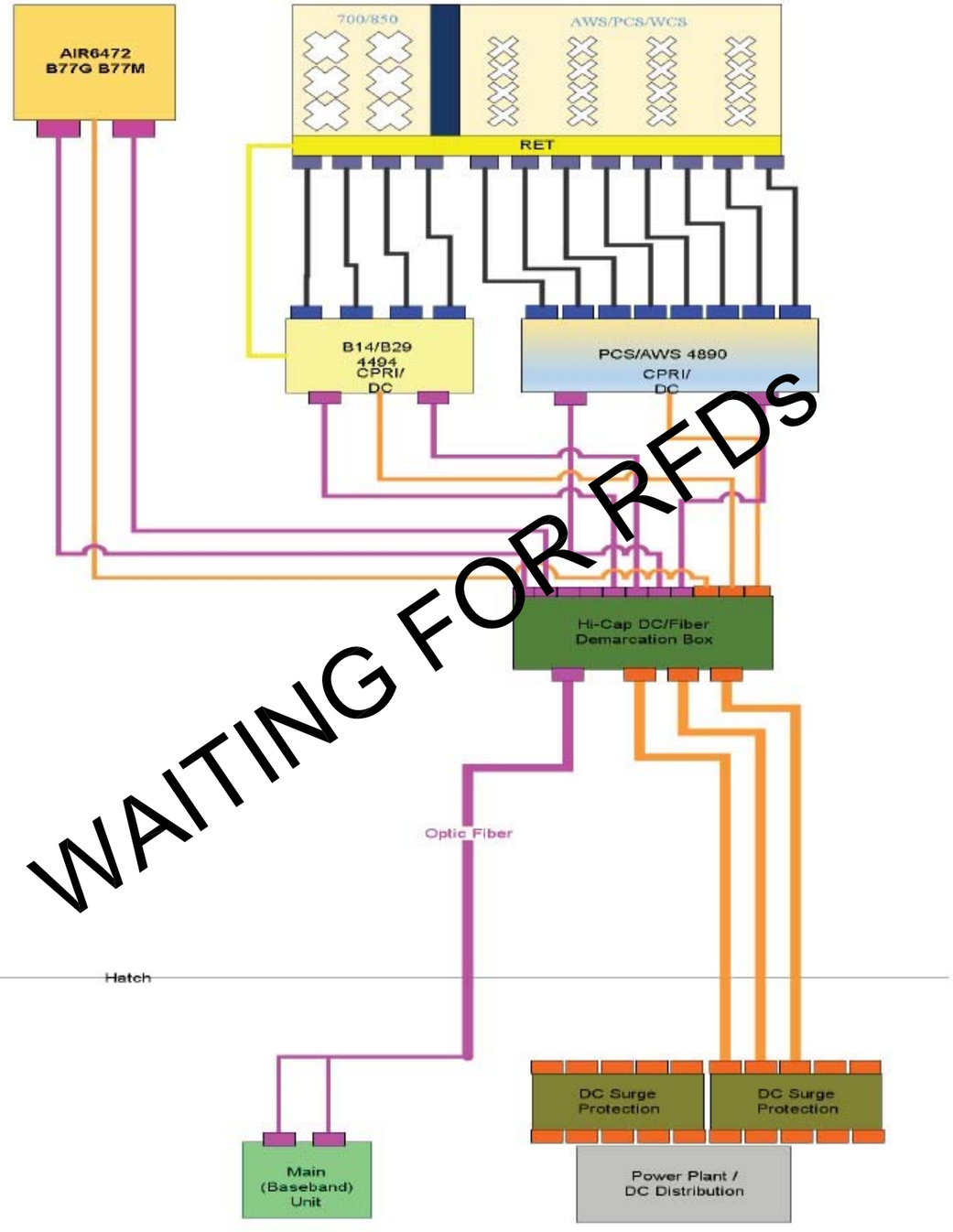

WAITING FOR RFDs

PLEASE REFER TO LATEST RFDs PRIOR TO BUILD.

NOTE

NOTE:

DETAIL PROVIDED BY APPLICANT & REPRODUCED ON THIS SHEET AS REQUESTED BY APPLICANT.

SECTOR PLUMBING DIAGRAM | 1

APPLICANT/ SITE OWNER

TILLMAN INFRASTRUCTURE

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RF PLUMBING DIAGRAM

SHEET NUMBER

C-7.0

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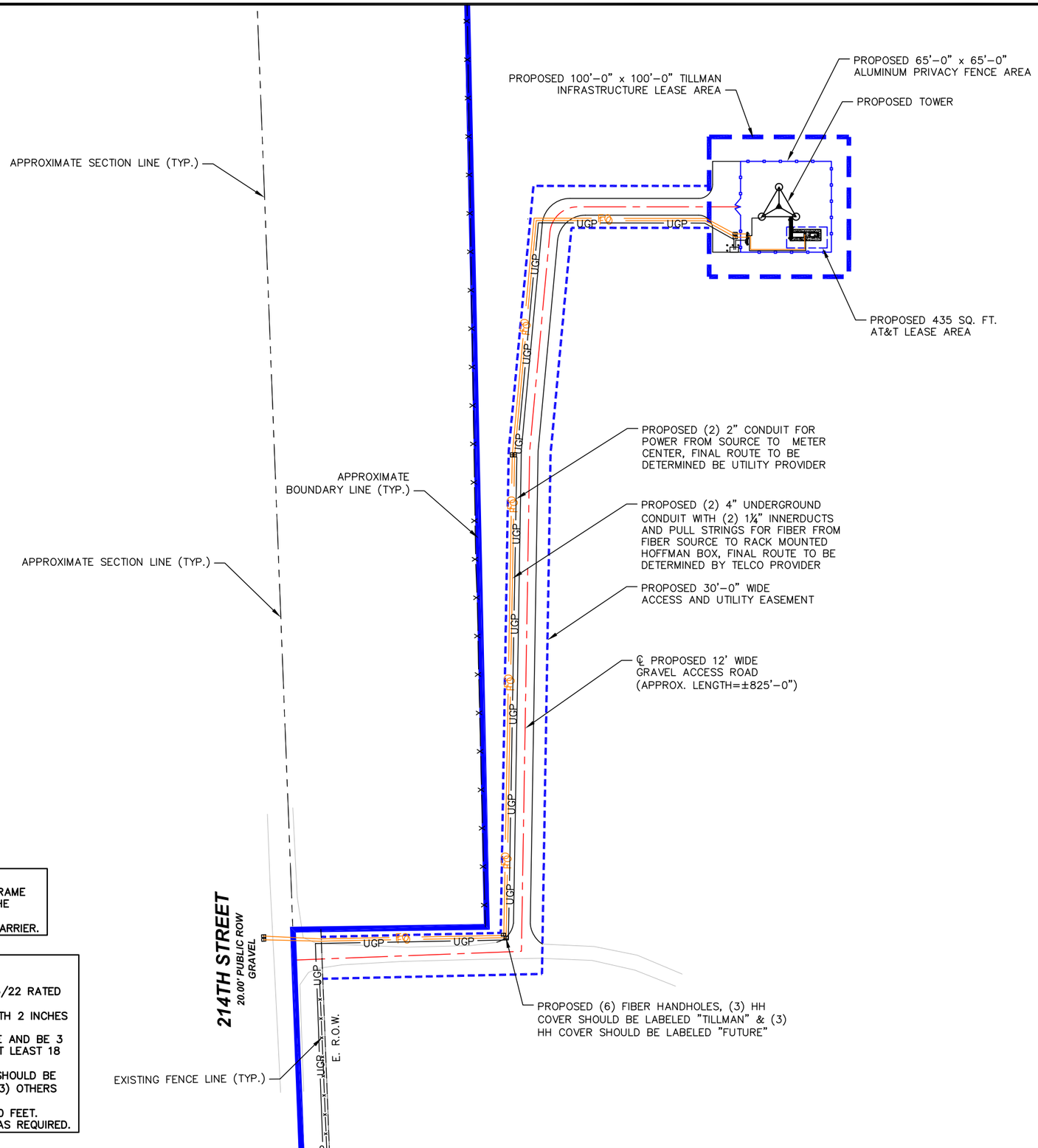

GENERAL NOTES:

- TILLMAN HH LABELED TILLMAN THIS GOES TO THE H-FRAME AND FUTURE HH LABELED FUTURE STOPS SHORT AT THE COMPOUND.
- INSTALL HH's EVERY 300' FOR TILLMAN AND FUTURE CARRIER.

HANDHOLES STANDARD:

1. 24W X 36L X 24 D POLYMER CONCRETE WITH TIER 15/22 RATED LIDS AND LABEL AS "TELECOMMUNICATIONS"
2. THE BOTTOM OF THE HANDHOLE SHOULD BE LINED WITH 2 INCHES OF CLEAN # 57 GRAVEL.
3. THE CONDUIT SHOULD ENTER AT A 45-DEGREE ANGLE AND BE 3 INCHES FROM THE TOP OF THE GRAVEL, PROVIDING AT LEAST 18 INCHES OF CLEARANCE TO THE BOTTOM OF THE LID.
4. SITES BUILT FOR AT&T OR OTHER CARRIERS (3) HH SHOULD BE STENCILED TILLMAN WITH 3-INCH LETTERS AND THE (3) OTHERS STENCILED "FUTURE" WITH 3-INCH LETTERS.
5. SPACING OF HANDHOLE SHALL BE NO MORE THEN 300 FEET. CONTRACTOR SHALL PROVIDE ADDITIONAL HANDHOLE AS REQUIRED.

OVERALL UTILITY PLAN

20' 0 10' 20'

SCALE: 1"=20'-0" (22x34)
(OR) 1/2"=20'-0" (11x17)

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TILLMAN INFRASTRUCTURE

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SHEET TITLE

OVERALL UTILITY PLAN

SHEET NUMBER

E-1.0

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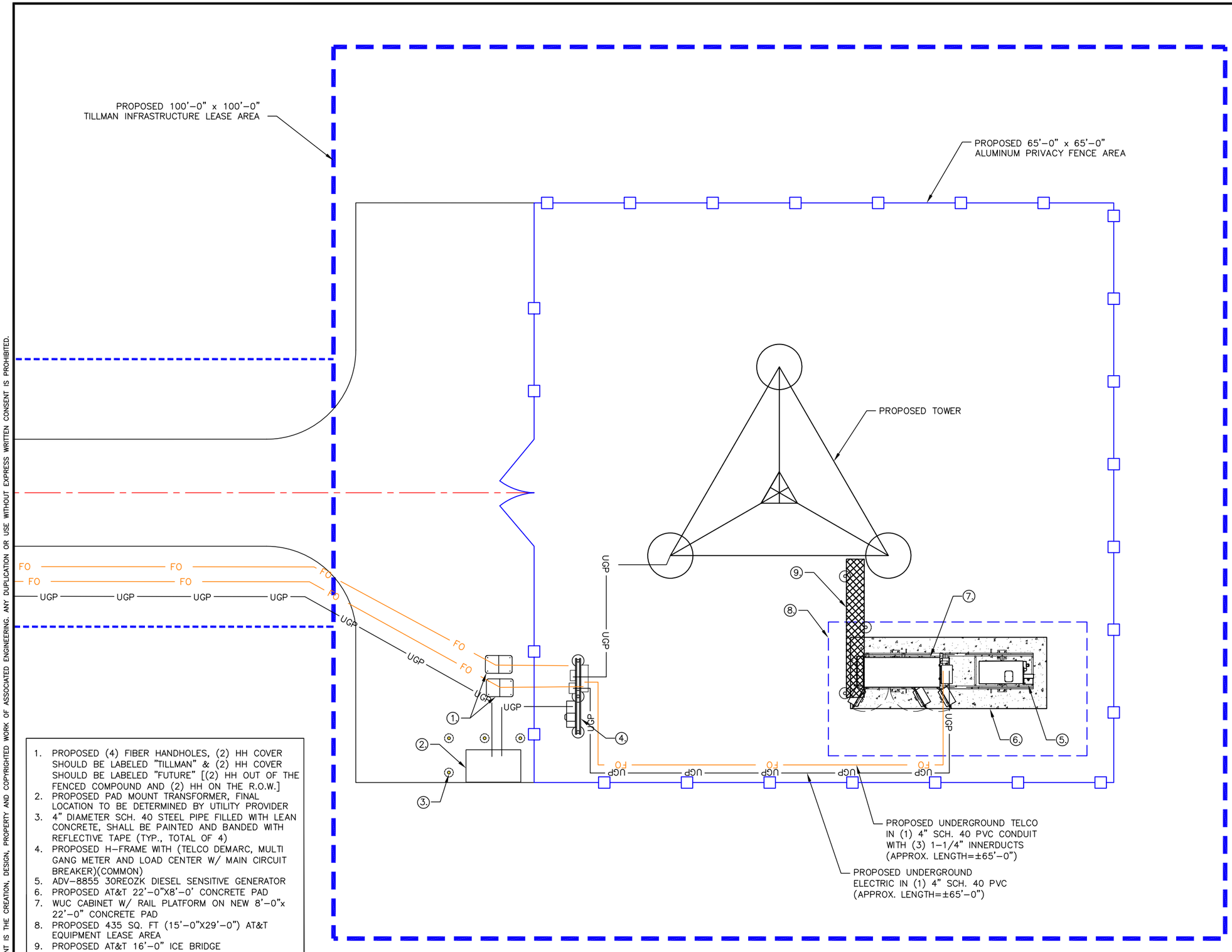

1. PROPOSED (4) FIBER HANDHOLES, (2) HH COVER SHOULD BE LABELED "TILLMAN" & (2) HH COVER SHOULD BE LABELED "FUTURE" [(2) HH OUT OF THE FENCED COMPOUND AND (2) HH ON THE R.O.W.]
2. PROPOSED PAD MOUNT TRANSFORMER, FINAL LOCATION TO BE DETERMINED BY UTILITY PROVIDER
3. 4" DIAMETER SCH. 40 STEEL PIPE FILLED WITH LEAN CONCRETE, SHALL BE PAINTED AND BANDED WITH REFLECTIVE TAPE (TYP., TOTAL OF 4)
4. PROPOSED H–FRAME WITH (TELCO DEMARC, MULTI GANG METER AND LOAD CENTER W/ MAIN CIRCUIT BREAKER)(COMMON)
5. ADV–8855 30REOZK DIESEL SENSITIVE GENERATOR
6. PROPOSED AT&T 22'–0"X8'–0' CONCRETE PAD
7. WUC CABINET W/ RAIL PLATFORM ON NEW 8'–0"x 22'–0" CONCRETE PAD
8. PROPOSED 435 SQ. FT (15'–0"X29'–0") AT&T EQUIPMENT LEASE AREA
9. PROPOSED AT&T 16'–0" ICE BRIDGE

NORTH

COMPOUND UTILITY PLAN

0 2' 4' 8'

SCALE: 1/8"=1'–0" (22x34)
(OR) 1/16"=1'–0" (11x17)

1

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SHEET TITLE

COMPOUND UTILITY PLAN

SHEET NUMBER

E-1.1

70

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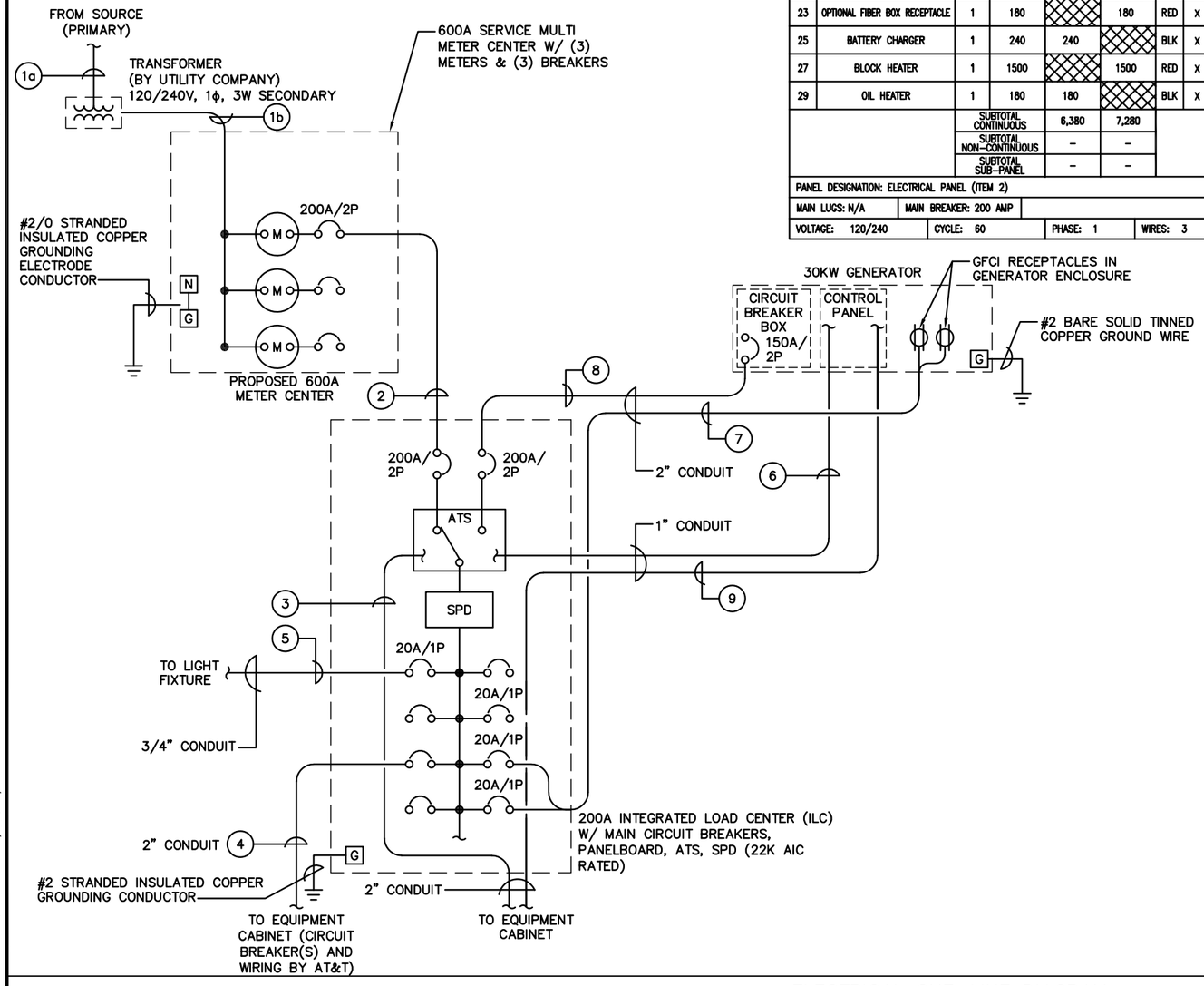

INTEGRATED LOAD CENTER

LOAD DESCRIPTION	QTY.	UNIT V.A.	LOAD PER PHASE (VA) A	LOAD PER PHASE (VA) B	WIRE COLOR	LOADS CONTINUOUS	LOADS NON-CONTINUOUS	LOADS SUB-PANEL	WIRE SIZE	GROUNDING WIRE SIZE	TRIP	TRIP	GROUNDING WIRE SIZE	WIRE SIZE	LOADS SUB-PANEL	LOADS NON-CONTINUOUS	LOADS CONTINUOUS	WIRE COLOR	LOAD PER PHASE (VA) A	LOAD PER PHASE (VA) B	LOAD UNIT V.A.	LOAD QTY.	LOAD DESCRIPTION
1 RECTIFIER #1	1	1400	1400		BLK	X			8	(10)	40	40	(10)	8			X	BLK	1400		1400	1	RECTIFIER #5 2
3	1	1400		1400	RED													RED		1400	1400	1	4
5 RECTIFIER #2	1	1400	1400		BLK	X			8	(10)	40	40	(10)	8			X	BLK	1400		1400	1	RECTIFIER #6 6
7	1	1400		1400	RED													RED		1400	1400	1	8
9 RECTIFIER #3	1	1400	1400		BLK	X			8	(10)	40	40	(10)	8			X	BLK	1400		1400	1	RECTIFIER #7 10
12	1	1400		1400	RED													RED		1400	1400	1	12
13 RECTIFIER #4	1	1400	1400		BLK	X			8	(10)	40	40	(10)	8			X	BLK	1400		1400	1	RECTIFIER #8 14
15	1	1400		1400	RED													RED		1400	1400	1	16
17					BLK													BLK					18
19					RED	X			12	12	20							RED					20
21 GFCI RECEPTACLES	2	180	360		BLK	X			12	(12)	20							BLK					22
23 OPTIONAL FIBER BOX RECEPTACLE	1	180		180	RED	X			12	12	20							RED					24
25 BATTERY CHARGER	1	240	240		BLK	X			12	12	20							BLK					26
27 BLOCK HEATER	1	1500		1500	RED	X			12	12	20							RED					28
29 OIL HEATER	1	180	180		BLK	X			12	12	20							BLK					30
	SUBTOTAL CONTINUOUS		6,380	7,280															5,600	5,600	SUBTOTAL CONTINUOUS		TOTAL KVA CONTINUOUS x 1.25 31.075
	SUBTOTAL NON-CONTINUOUS		–	–															–	–	SUBTOTAL NON-CONTINUOUS		TOTAL KVA NON-CONTINUOUS –
	SUBTOTAL SUB-PANEL		–	–															–	–	SUBTOTAL SUB-PANEL		TOTAL KVA SUB-PANEL –

PANEL DESIGNATION: ELECTRICAL PANEL (ITEM 2)

MAIN LUGS: N/A | MAIN BREAKER: 200 AMP | BRANCH BREAKER TYPE: SIEMENS – BL

VOLTAGE: 120/240 | CYCLE: 60 | PHASE: 1 | WIRES: 3 | MAIN COPPER BUS: 200 AMPS | NEUTRAL: 200 AMPS

TOTAL KVA 31.075

TOTAL AMPS 129.48

CIRCUIT SCHEDULE

NO.	FROM	TO	CONFIGURATION	FUNCTION
1a	SOURCE	TRANSFORMER	3"C (CONDUCTORS BY UTILITY COMPANY)	PRIMARY
1b	TRANSFORMER	METER CENTER	(2) 3–350 KCMIL, EACH IN 4"C	SERVICE LATERAL
2	METER CENTER	ILC	3#3/0, 1#6G, 2"C	NORMAL POWER FEEDER TO ILC
3	ILC	EQUIPMENT CABINET	(2) CAT5 CABLES	ATS STATUS AND ALARM WIRING CAT5 – TRANSFER (SWITCH) COMPLETE – UTILITY FAIL, SPD FAIL
4	ILC	EQUIPMENT CABINET	FURNISHED BY AT&T	POWER FEEDERS TO EQUIPMENT CABINET
5	ILC	LIGHT FIXTURE VIA TIMER & RECEPTACLE	2#12, 1#12G	POWER CIRCUIT TO LIGHT FIXTURES & RECEPTACLE
6	ILC	GENERATOR	2#14, 1#14G	GENERATOR START CIRCUIT
7	ILC	GFCI RECEPTACLES IN GENERATOR	4#12, 1#12G	AUXILIARY GENERATOR LOADS (BATTERY CHARGER & JACKET WATER HEATER)
8	GENERATOR	ILC	3#3/0, 1#6G	EMERGENCY POWER FEEDER TO ATS
9	GENERATOR	EQUIPMENT CABINET (VIA ILC)	(2) CAT 5 CABLES	GENERATOR STATUS & ALARM WIRING

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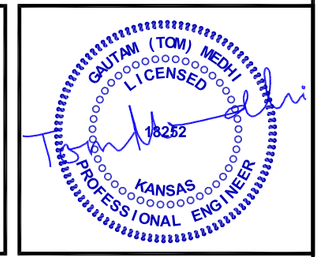

ENGINEER

Tom Medhi 04-02-2026
Tom Medhi Date
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SHEET TITLE

ELECTRICAL ONE-LINE DIAGRAM

SHEET NUMBER

E-2.0

71

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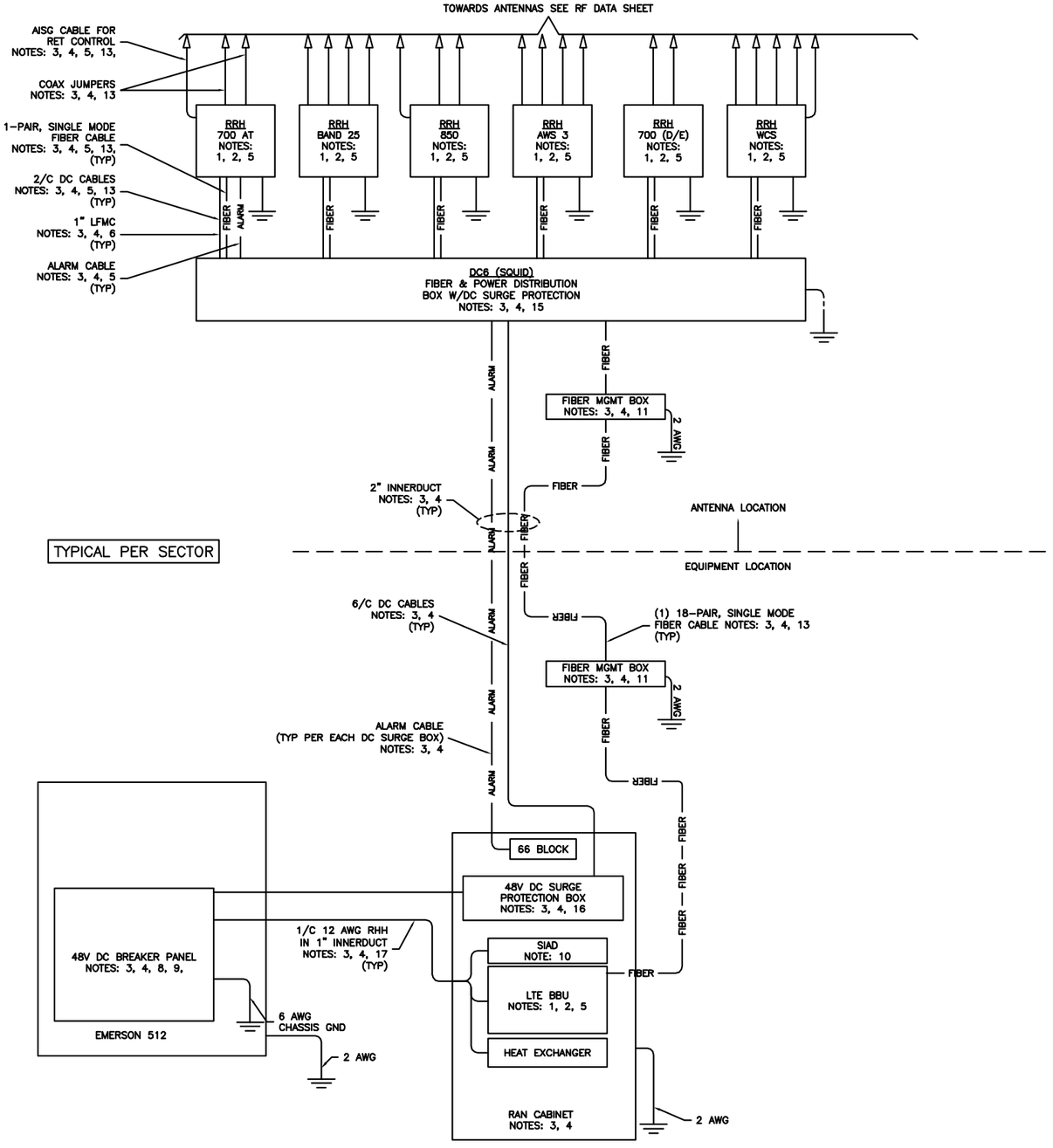

NOTES:

1. FURNISHED BY OEM/AT&T.
2. INSTALLED BY OEM OR AS SCOPED BY MARKET.
3. FURNISHED BY OTHERS
4. INSTALLED BY OTHERS
5. FINAL CONNECTION BY OEM OR AS SCOPED BY MARKET.
6. OPEN END OF LFMC TO BE LEFT WEATHERPROOFED UNTIL TERMINATED.
7. DELETED.
8. BREAKERS SPECIFIED SOLD SEPERATELY.
9. BREAKERS TO BE TAGGED AND LOCKED OUT.
10. SIAD IS FURNISHED AND INSTALLED BY OTHERS AND INCLUDES POWER CONNECTIONS AND FIBER TO THE UNIT OR AS SCOPED BY MARKET. INSTALL 10 AWG CHASSIS GROUND, PROVIDE (2) 10A BREAKERS FROM A 24V DC POWER SOURCE OR (2) 5A BREAKERS FROM A 48V DC POWER SOURCE AND CONNECT USING MFR POWER CABLE WITH SPECIAL CONNECTOR.
11. FIBER MANAGEMENT BOX IS J-SOURCE MODEL 12126FM4SEC.
12. LEC TO FURNISH AND INSTALL NETWORK INTERFACE DEVICE.
13. LEAVE COILED AND PROTECTED UNTIL TERMINATED.
14. SEE DETAIL 1408 FOR DC POWER CABLE SIZES.
15. FIBER AND POWER DISTRIBUTION BOX 4/48V SURGE SHALL BE RAYCAP MODEL DC6-48-60-18-8F.
16. POWER DISTRIBUTION W/DC SURGE PROTECTION BOX SHALL BE RAYCAP MODEL DC6-48-60-0-18.
17. SINGLE-CONDUCTOR DC POWER CABLES SHALL BE TELCOFLEX OR KS24194, COPPER, UL LISTED RHH NON-HALOGEN, LOW SMOKE WITH BRAIDED COVER, TYPE TC (1/0 AND LARGER). UNLESS OTHERWISE NOTED, STRANDING SHALL BE CLASS B (TYPE III) FOR CABLES SIZES 14, 12 & 10 AWG AND CLASS 1 (TYPE IV) FOR SIZES 8 AWG AND LARGER. CABLES SHALL BE COLOR CODED RED FOR +24V, BLUE FOR -48V AND GRAY FOR 24V AND 48V RETURN CONDUCTORS. MULTI-CONDUCTOR DC POWER CABLES SHALL COPPER, CLASS B STRANDED WITH FLAME RETARDANT PVC JACKET, TYPE TC, UL LISTED FOR 90°C DRY/ 75°C WET INSTALLATION.
18. 10A FUSE FOR HEAT EXCHANGER FURNISHED AND INSTALLED BY OTHERS.
19. DELETED
20. GROUNDING WIRES SHALL BE COPPER, GREEN THHN/THWN UL LISTED FOR 90°C DRY/75°C WET INSTALLATION. MINIMUM SIZE IS 6 AWG UNLESS NOTED OTHERWISE.
21. RET CONTROL FROM THE RRH IS AN OPTIONAL METHOD OF CONNECTION. REFER TO RF DATA SHEET FOR APPLICABILITY.
22. DELETED.
23. FIBER AND POWER DISTRIBUTION BOX 4/48V SURGE SHALL BE RAYCAP MODEL DC6-48-60-0-1E.
24. FIBER MANAGEMENT BOX IS COMMSCOPE MODEL FB 18188.
25. FIBER AND POWER DISTRIBUTION BOX 4/48V SURGE SHALL BE RAYCAP MODEL DC12-48-60-0-25E.

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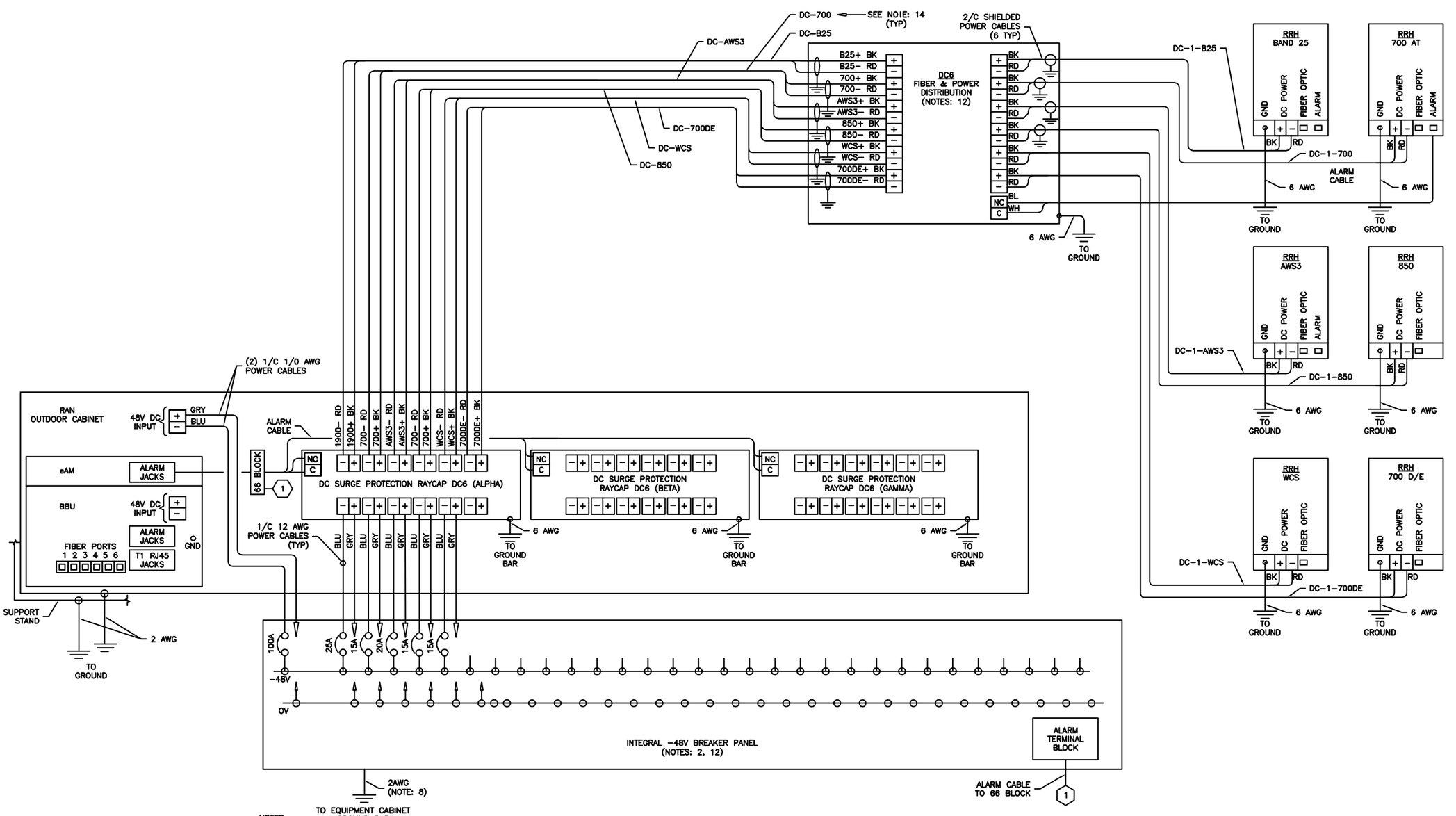
SHEET TITLE

FIBER SYSTEM DIAGRAM

SHEET NUMBER

E-2.1
72



NOTES

1. LABEL THE DC POWER CABLES AT BOTH ENDS OF EVERY WIRE AND IN ANY PULL BOX IF USED. LABEL SHALL BE DURABLE, SELF ADHESIVE, WRAPPED LONGITUDINALLY ALONG THE CABLE AND STATE THE SECTOR, FREQUENCY BAND AND POLARITY; I.E. A-AWS+ .
2. INSTALL ON IN AUXILIARY EQUIPMENT CABINET.
3. CABLE TERMINALS FOR +24V INPUT FEED A, FEED B AND REFERENCE GROUND SHALL BE 2-HOLE: 3/8" ON 1" CENTER.
4. INSTALL CABLE TERMINALS FOR FEED A AND FEED B RETURN BACK-TO-BACK ON OPPOSITE SIDES OF PAD USING 1-HOLE 3/8" TERMINALS.
5. CABLE TERMINALS FOR CHASSIS GROUND SHALL BE 2-HOLE, 1/4" ON 5/8" CENTER.
6. WHEN DISTRIBUTION BOX IS NOT USED, INSTALL 3 RUNS OF (2) 2/C CABLES IN CONDUIT, 1 EACH FROM DC SURGE SHELF TO DC6s.
7. A JUNCTION BOX IS REQUIRED WHEN FIBER OPTIC CABLES ARE INSTALLED IN CONDUIT AS SCOPED BY MARKET.
8. CONVERTER REFERENCE GROUND IS NOT REQUIRED WHEN CONVERTER AND 24V DC POWER PLANT ARE ON THE SAME RACK OR ENCLOSURE.
9. THE BARE GROUND WIRE OF EACH MULTI-CONDUCTOR CABLE AND DRAIN WIRE WHEN A SHIELDED CABLE IS USED, SHALL BE CONNECTED TO THE EQUIPMENT CABINET GROUND BAR.
10. SEE ALARM BLOCK ASSIGNMENT DETAIL FOR ALARM CABLE CONNECTIONS.
11. PROVIDE A JUNCTION BOX, AS SCOPED BY MARKET, TO COIL EXCESS DC POWER AND OPTICAL FIBER CABLES (FIBER CALES NOT SHOWN FOR CLARITY)
12. NOTED EQUIPMENT MAY BE COMMON TO LTE AND UMTS SYSTEMS.
13. CABLE GROUND WIRE AND SHIELD DRAIN WIRE TO BE LEFT UN-TERMINATED AT RRH.
14. WHEN AN RRH IS USED INSTEAD OF AN AWS RRH CABLE, LABELS SHOULD REFLECT CORRECT FREQUENCY BAND.

TYPICAL PER SECTOR

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SHEET TITLE

DC WIRING DIAGRAM

SHEET NUMBER

E-2.2
73

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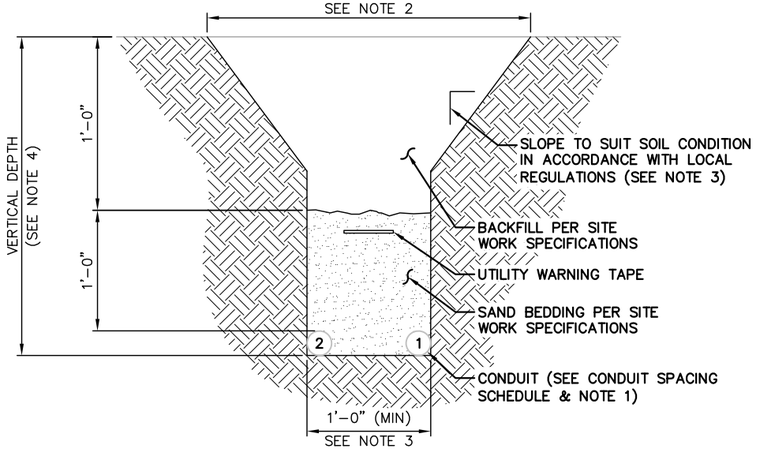
DETAIL NOT USED | 1

NOT USED | 2



NOTES:

1. (2) CONDUITS ARE SHOWN IN TRENCH DETAIL. MULTIPLE CONDUITS CAN BE PLACED IN THE SAME TRENCH. A MINIMUM SEPARATION IS REQUIRED PER THE LOCAL JURISDICTIONS & UTILITY COMPANIES. IN ALL OTHER CASES, USE THE CONDUIT SPACING SCHEDULE TO MAINTAIN MINIMUM CONDUIT SEPARATION.
2. CONTRACTOR SHALL RESTORE TRENCH TO ITS ORIGINAL CONDITION BY EITHER SEEDING OR SODDING GRASS AREAS, OR REPLACING ASPHALT OR CONCRETE AREA TO ITS ORIGINAL CROSS SECTION.
3. TRENCHING SAFETY: INCLUDING, BUT NOT LIMITED TO SOIL CLASSIFICATIONS, SLOPING & SHORING, SHALL BE SHALL BE GOVERNED BY THE CURRENT OSHA TRENCHING & EXCAVATION SAFETY STANDARDS.
4. ALL CONDUITS SHALL BE INSTALLED IN COMPLIANCE W/ THE NATIONAL ELECTRIC CODE (NEC) OR AS REQUIRED BY THE LOCAL JURISDICTION.

CONDUIT SPACING SCHEDULE

CONDUIT #1	CONDUIT SEPARATION	CONDUIT #2
POWER	6 INCHES	POWER
POWER	12 INCHES	TELCO COMMUNICATIONS & CONTROL CIRCUITS
TELCO COMMUNICATIONS & CONTROL CIRCUITS	6 INCHES	TELCO COMMUNICATIONS & CONTROL CIRCUITS

TRENCH DETAILS | 3

APPLICANT/ SITE OWNER

TILLMAN INFRASTRUCTURE

SITE ACQUISITION /ENGINEERING

SKYWARD LAND SERVICES, INC.

ASSOCIATED Engineering, Inc.
AE INC. Project # 6392

SITE INFORMATION

TONGANOXIE_ KS

TI-OPP-37632
RELO SITE FA# 10008273

15076 214TH St.
TONGANOXIE, KS 66086
LEAVENWORTH COUNTY

PARCEL ID:
052-198-34-0-00-00-006.00-0
CANDIDATE: A

DESIGN RECORD

REV	DATE	DESCRIPTION	BY
A	04/02/26	FINAL DRAWINGS	JMV

PROFESSIONAL STAMP

GAUTAM (TOM) MEDHI
LICENSED
18252
KANSAS
PROFESSIONAL ENGINEER

ENGINEER

Tom Medhi 04-02-2026
Tom Medhi Date
MY LICENSE RENEWAL DATE IS 04/30/2027

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF KANSAS

SHEET TITLE

UTILITY DETAILS

SHEET NUMBER

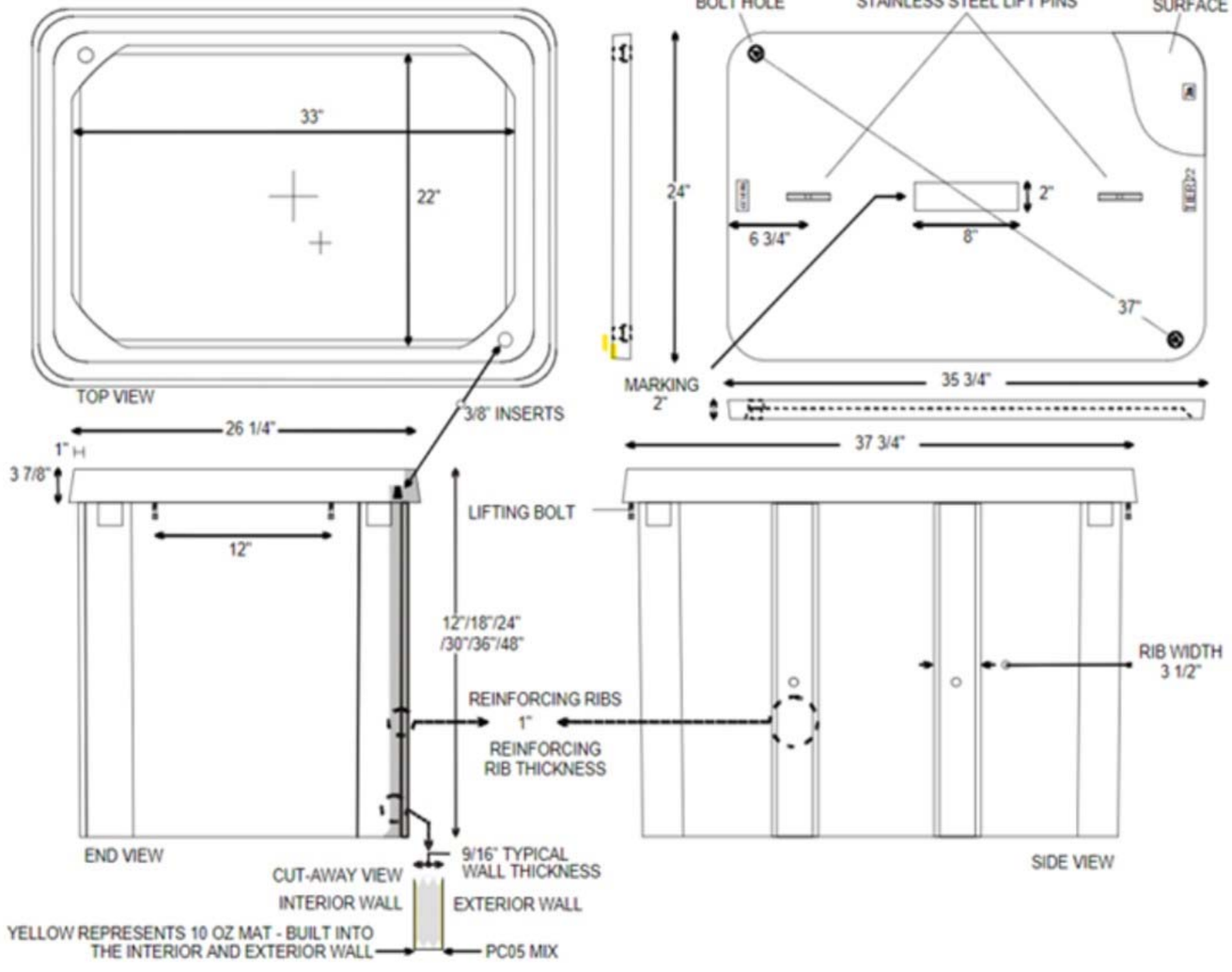
E-3.0

74

HANDHOLES STANDARD:

1. 24W X 36L X 24 D POLYMER CONCRETE WITH TIER 15/22 RATED LIDS AND LABEL AS "TELECOMMUNICATIONS"
2. THE BOTTOM OF THE HANDHOLE SHOULD BE LINED WITH 2 INCHES OF CLEAN # 57 GRAVEL.
3. THE CONDUIT SHOULD ENTER AT A 45–DEGREE ANGLE AND BE 3 INCHES FROM THE TOP OF THE GRAVEL, PROVIDING AT LEAST 18 INCHES OF CLEARANCE TO THE BOTTOM OF THE LID.
4. SITES BUILT FOR AT&T OR OTHER CARRIERS (3) HH SHOULD BE STENCILED TILLMAN WITH 3–INCH LETTERS AND THE (3) OTHERS STENCILED "FUTURE" WITH 3–INCH LETTERS.
5. SPACING OF HANDHOLE SHALL BE NO MORE THEN 300 FEET. CONTRACTOR SHALL PROVIDE ADDITIONAL HANDHOLE AS REQUIRED.

2436 POLYMER CONCRETE SERIES / TIER 15 & 22



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HANDHOLE DETAILS

SHEET NUMBER

E-3.1

75

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SITE INFO SIGN DETAIL

SCALE: N.T.S.

NOTE:
TILLMAN SHALL PROCURE & PROVIDE .063" RUST FREE ALUMINUM SIGNS WITH 1 YEAR WARRANTY FOR ALL SIGNS



CATTLE SIGN DETAIL

SCALE: N.T.S.





RF FIELD SIGN DETAIL

SCALE: N.T.S.



FCC INFO SIGN DETAIL

SCALE: N.T.S.



TOWER CLIMBING SIGN DETAIL

SCALE: N.T.S.

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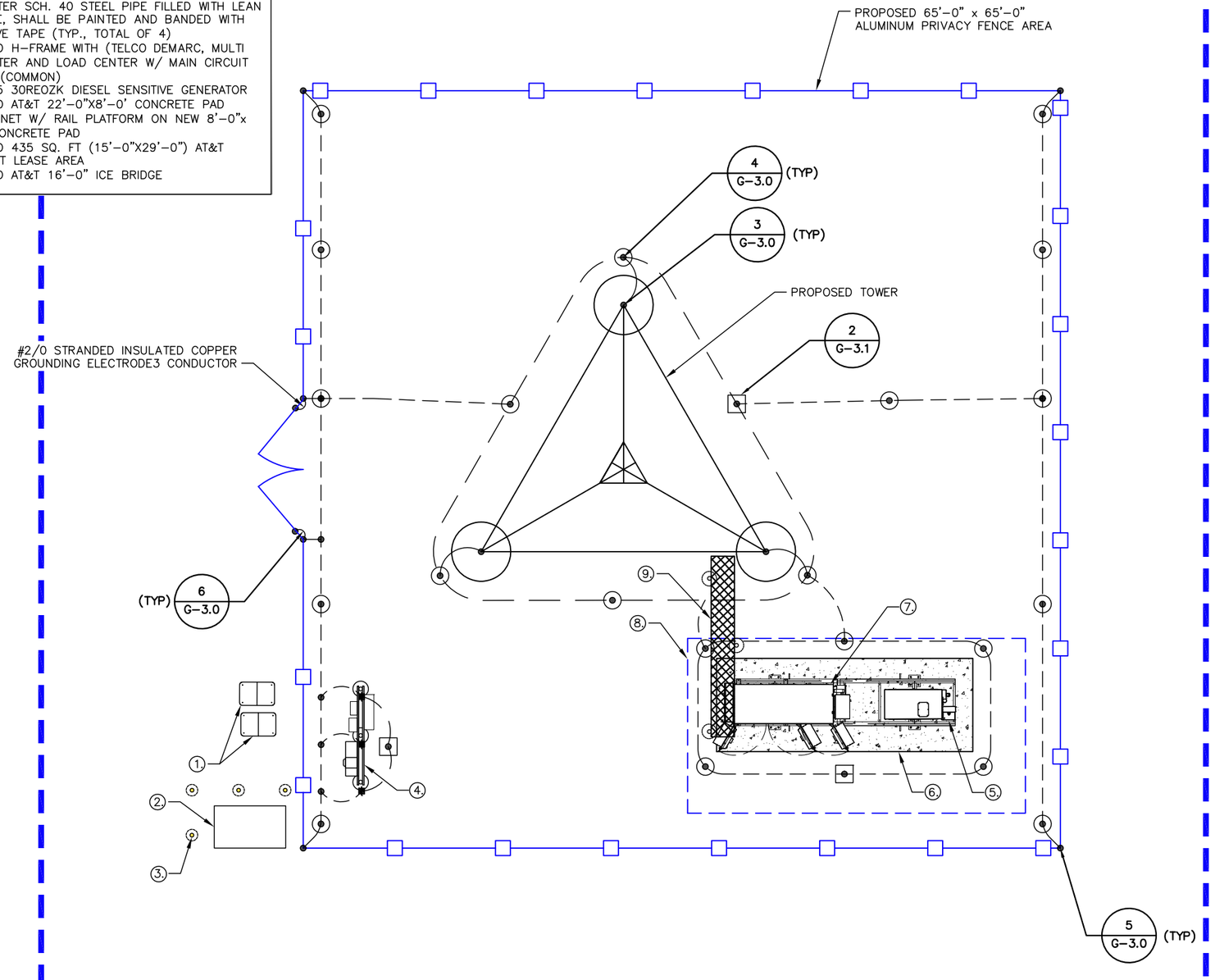
SHEET TITLE

TILLMAN SIGNAGE

SHEET NUMBER

E-3.2
76

1. PROPOSED (4) FIBER HANDHOLES, (2) HH COVER SHOULD BE LABELED "TILLMAN" & (2) HH COVER SHOULD BE LABELED "FUTURE" [(2) HH OUT OF THE FENCED COMPOUND AND (2) HH ON THE R.O.W.]
2. PROPOSED PAD MOUNT TRANSFORMER, FINAL LOCATION TO BE DETERMINED BY UTILITY PROVIDER
3. 4" DIAMETER SCH. 40 STEEL PIPE FILLED WITH LEAN CONCRETE, SHALL BE PAINTED AND BANDED WITH REFLECTIVE TAPE (TYP., TOTAL OF 4)
4. PROPOSED H-FRAME WITH (TELCO DEMARC, MULTI GANG METER AND LOAD CENTER W/ MAIN CIRCUIT BREAKER)(COMMON)
5. ADV-8855 30REOZK DIESEL SENSITIVE GENERATOR
6. PROPOSED AT&T 22'-0"X8'-0' CONCRETE PAD
7. WUC CABINET W/ RAIL PLATFORM ON NEW 8'-0"x 22'-0" CONCRETE PAD
8. PROPOSED 435 SQ. FT (15'-0"X29'-0") AT&T EQUIPMENT LEASE AREA
9. PROPOSED AT&T 16'-0" ICE BRIDGE



GROUNDING LEGEND

- #2 GROUNDING CONDUCTOR ABOVE GROUND (UNLESS NOTED OTHERWISE)
- #2 GROUNDING CONDUCTOR UNDER GROUND (UNLESS NOTED OTHERWISE)
- GND BAR / GND COND — GROUND BAR WITH COMPRESSION CONNECTION
- EXOTHERMIC CONNECTION
- MECHANICAL CONNECTION
- GROUND ROD
- GROUND INSPECTION / TESTWELL

NORTH

COMPOUND GROUNDING PLAN

0 1.5' 3' 5'

SCALE: 3/16"=1'-0" (22x34)
(OR) 3/32"=1'-0" (11x17)

1

APPLICANT/ SITE OWNER

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SHEET TITLE

COMPOUND GROUNDING PLAN

SHEET NUMBER

G-1.0

77

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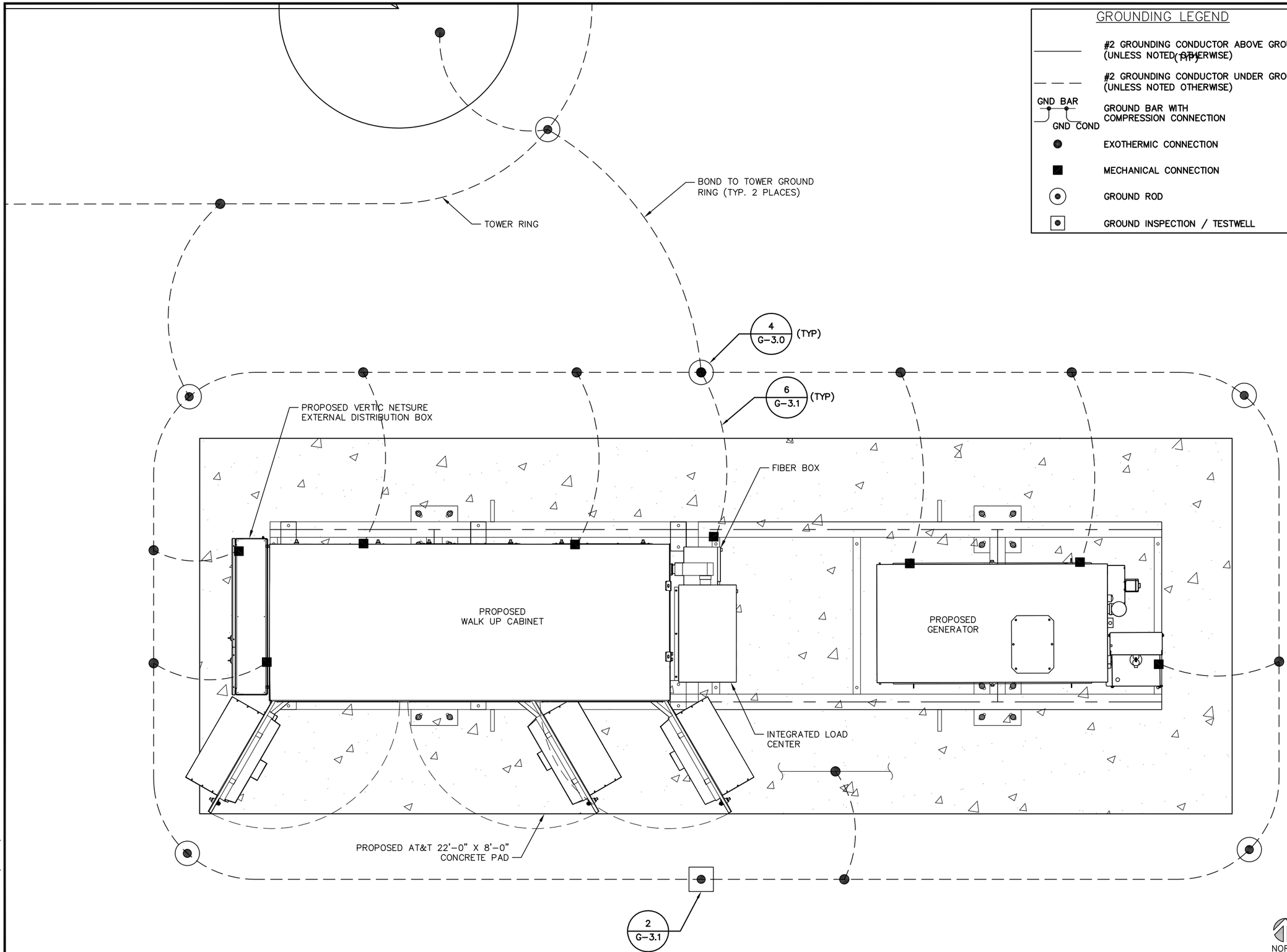

GROUNDING LEGEND

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- #2 GROUNDING CONDUCTOR UNDER GROUND (UNLESS NOTED OTHERWISE)
- GND BAR / GND COND — GROUND BAR WITH COMPRESSION CONNECTION
- EXOTHERMIC CONNECTION
- MECHANICAL CONNECTION
- GROUND ROD
- GROUND INSPECTION / TESTWELL

AT&T GROUNDING LAYOUT

0 3" 6" 1' | SCALE: 1"=1'-0" (22x34) (OR) 1/2"=1'-0" (11x17) | 1

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SHEET TITLE

AT&T
GROUNDING LAYOUT

SHEET NUMBER

G-1.1
78

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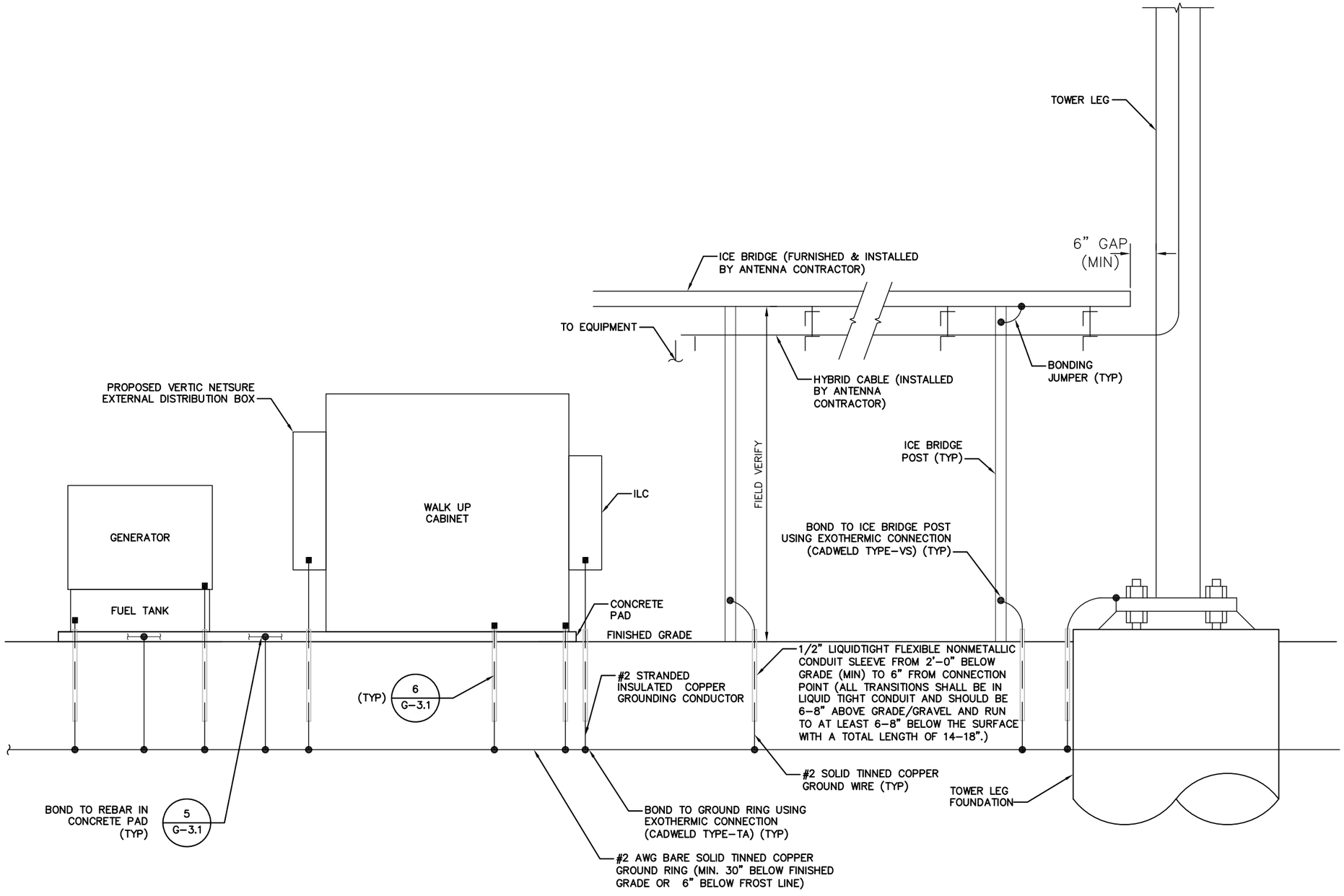

GROUNDING RISER DIAGRAM

APPLICANT/ SITE OWNER

TILLMAN INFRASTRUCTURE

SITE ACQUISITION /ENGINEERING

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SHEET TITLE

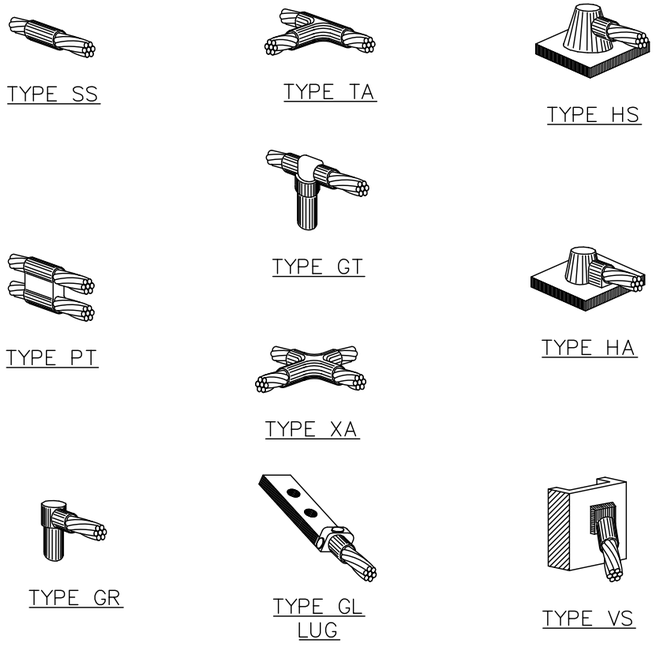
GROUNDING RISER DIAGRAM

SHEET NUMBER

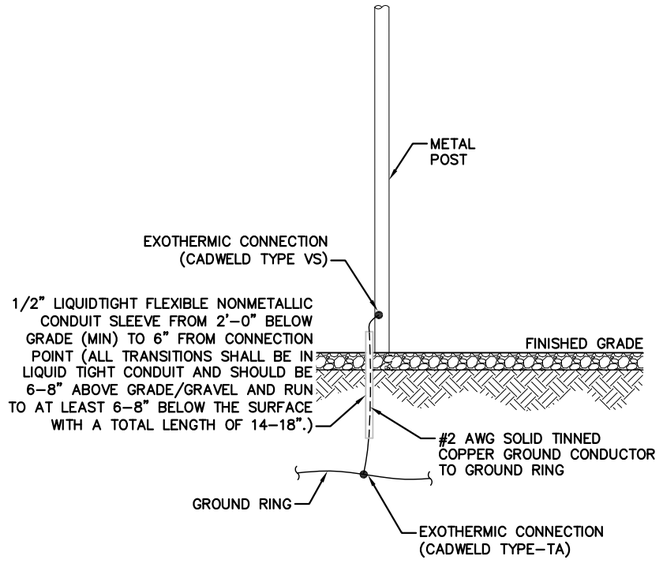
G-2.0

NOTE:

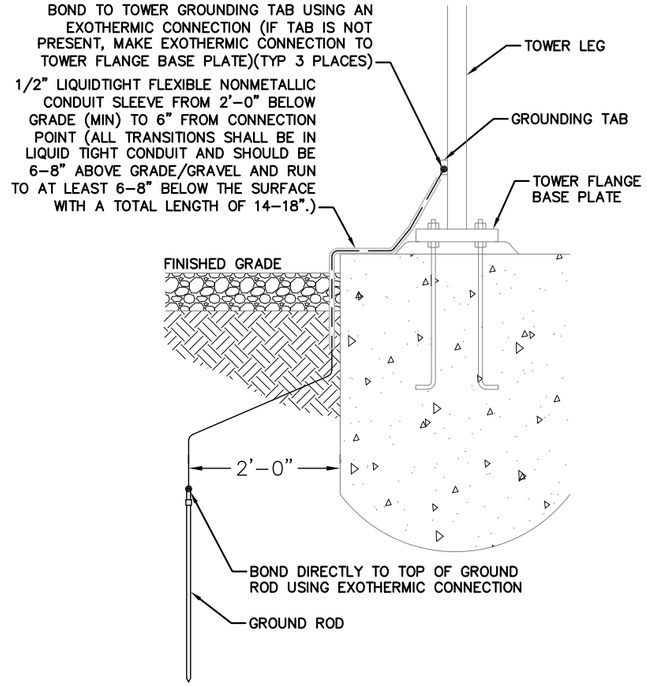
ALL TYPE CLASSIFICATIONS ARE CADWELD.



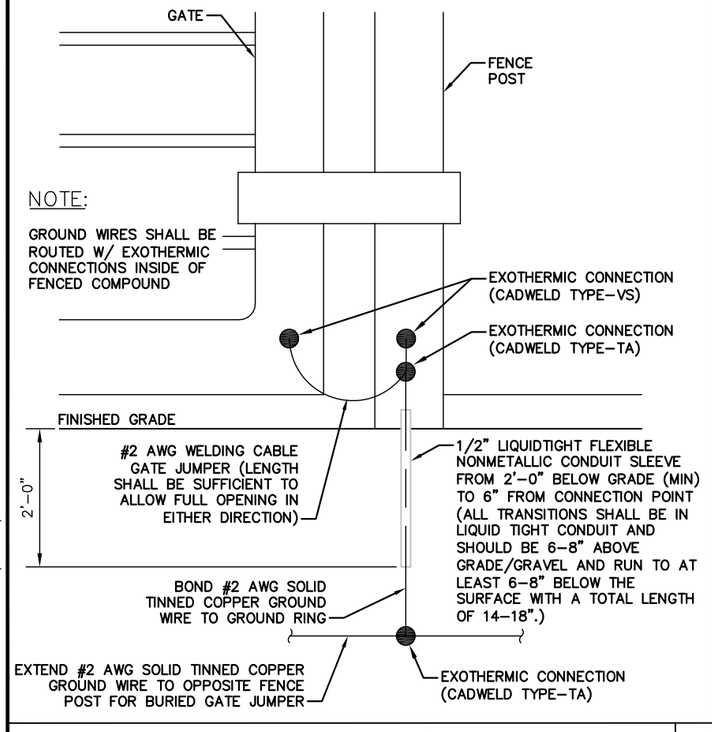
EXOTHERMIC CONNECTION DETAILS | 1



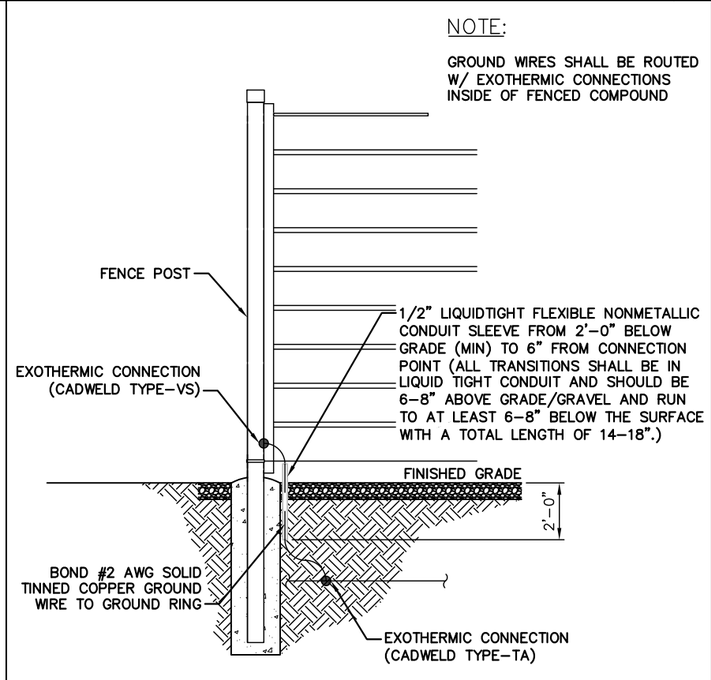
POST GROUNDING DETAIL | 2



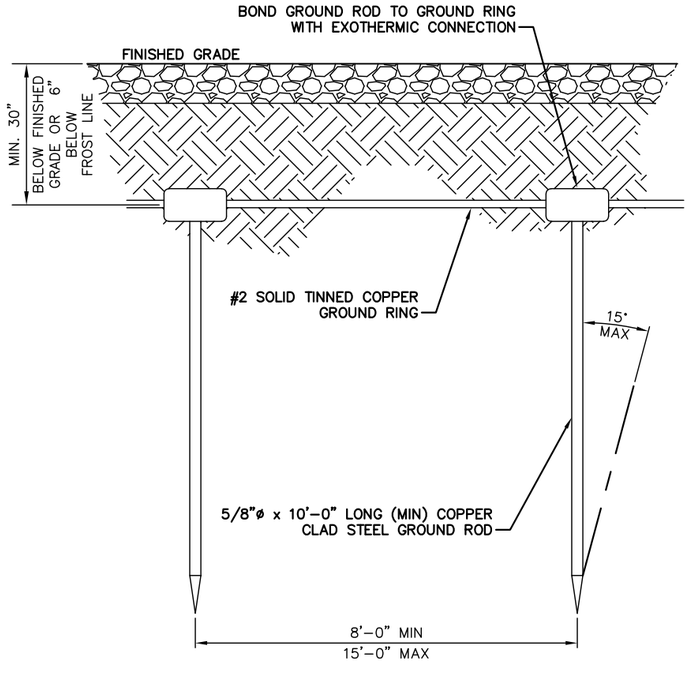
TOWER GROUNDING DETAIL | 3



FENCE GATE GROUNDING DETAIL | 6



FENCE POST GROUNDING DETAIL | 5



GROUND RING DETAIL | 4

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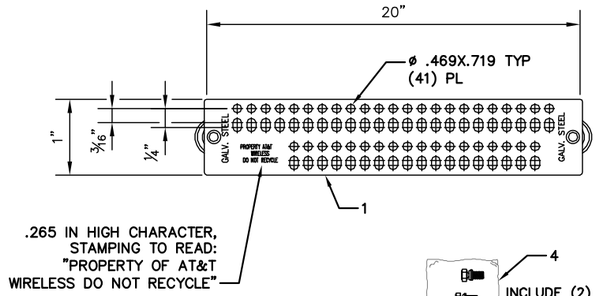
SHEET TITLE

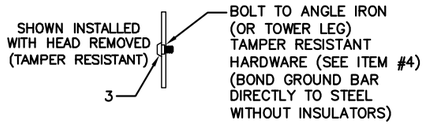
GROUNDING DETAILS
(1 OF 3)

SHEET NUMBER

G-3.0
80





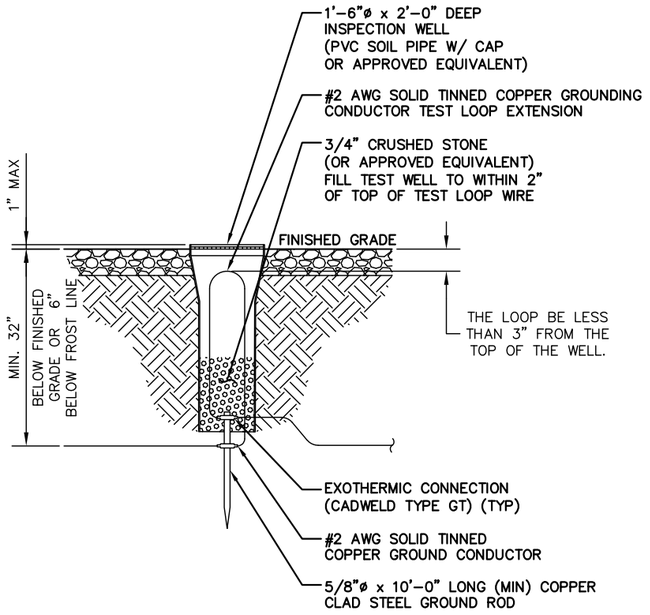


ELECTRIC MOTION CO., INC.
110 CROPPO DR./ BOX 626
WINSTED, CT 06098

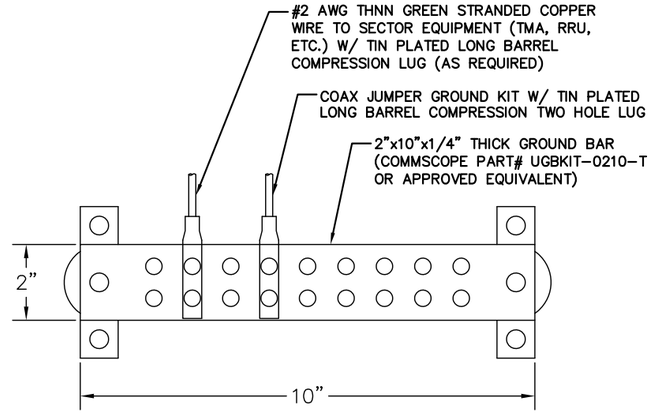
PART #EM SGM420-BI-NR

ITEM	PART NO.	DESCRIPTION	REQ
4	02-009-0663-000 (SUB ASSEMBLY)	3/8-16x5/8" TORQUE SHEAR HEAD BOLT IN A STANDARD 4x6 BAG INCLUDES: (2) 3/8-16x5/8" TORQUE SHEAR HEAD BOLT (NON-REMOVABLE) WITH VIBRSEAL; STAINLESS STEEL (303) P/N 02-009-0603-000 (1) STANDARD 4"x6" BAG (P/N 03-009-0209-00)	1
3	02-009-0633-000	3/8-16x5/8" TORQUE SHEAR HEAD BOLT (NON-REMOVABLE) WITH VIBRSEAL; STAINLESS STEEL (303)	2
1	02-009-0672-000	20" GROUND BAR; STEEL; GALVANIZED	1

TOWER GROUND BAR DETAIL | 1



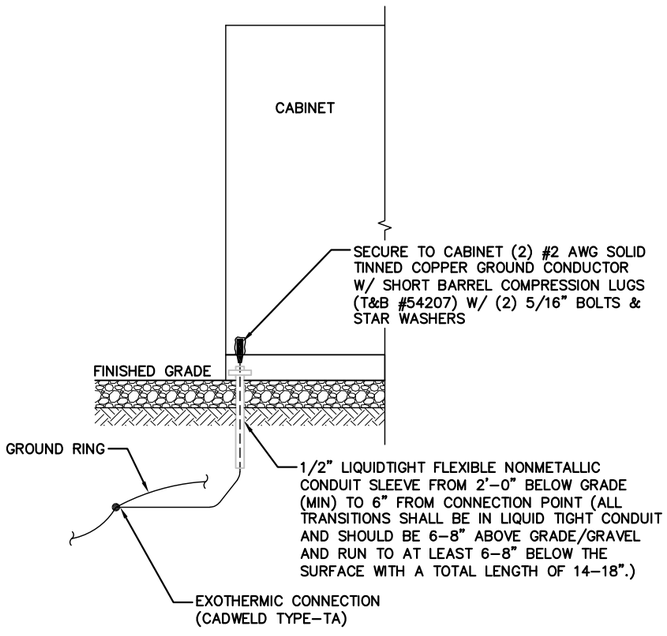
INSPECTION/TEST WELL DETAIL | 2



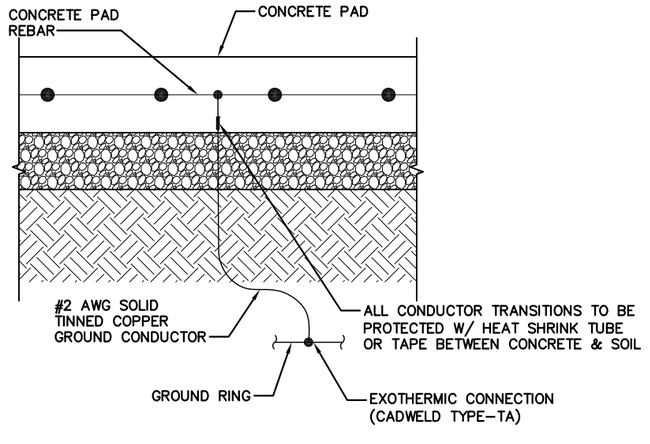
NOTES:

1. ALL HARDWARE SHALL BE 18-8 STAINLESS STEEL INCLUDING BELLEVILLE WASHERS, COAT ALL SURFACES WITH KOPR-SHIELD BEFORE MATING.
2. STEEL BONDING ONLY ONLY: INSERT A TOOTH WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH KOPR-SHIELD.
3. USE A THIN COAT OF ANTI-CORROSION GREASE AT THESE CONNECTIONS.
4. INSTALL WITHIN 12" OF END OF COAX TO COAX JUMPER CONNECTION.
5. DIMPLE OR MECHANICAL CRIMP LUGS WILL NOT BE PERMITTED.

ANTENNA GROUND BAR DETAIL | 3



CABINET GROUNDING DETAIL | 6



CONCRETE PAD GROUNDING DETAIL | 5

DETAIL NOT USED | 4

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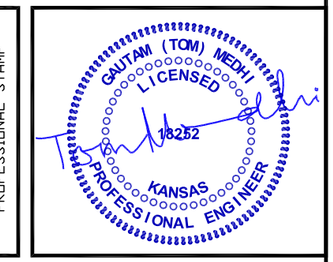

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SHEET TITLE

GROUNDING DETAILS
(2 OF 3)

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81

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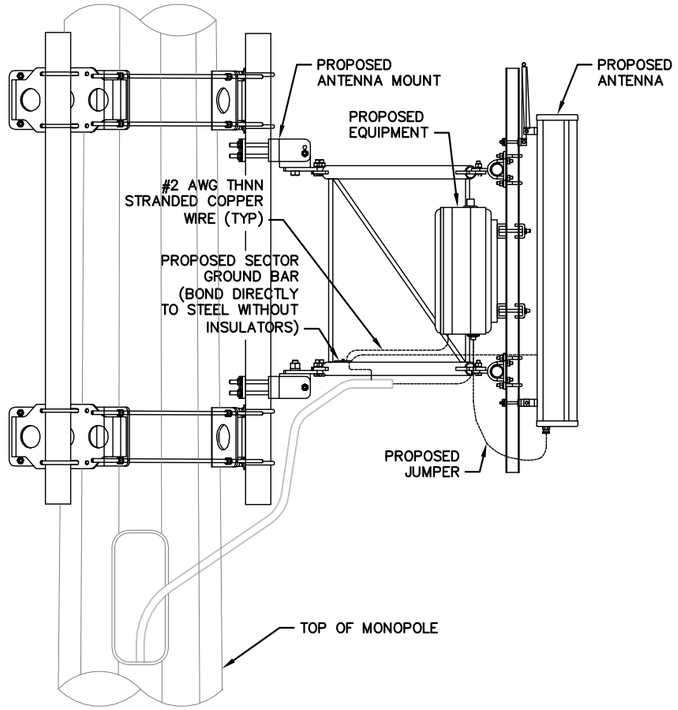
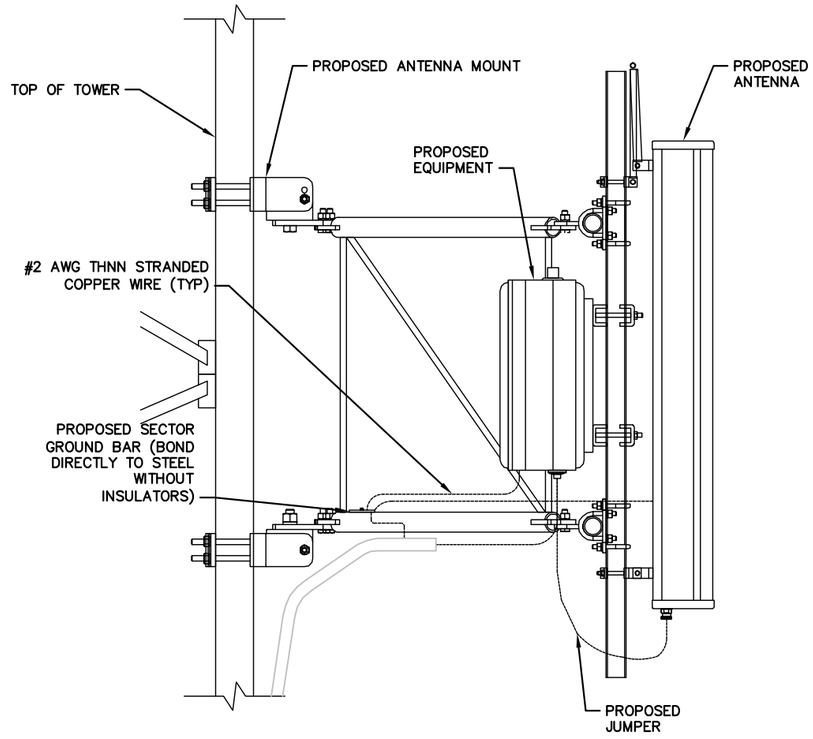


(MONOPOLE) ANTENNA & CABLE GROUNDING | 1



(LATTICE & GUYED TOWER) ANTENNA & CABLE GROUNDING | 2

GROUNDING NOTES:

1. GROUNDING SHALL COMPLY WITH ARTICL.E 250 OF THE NATIONAL ELECTRICAL CODE.
2. ALL GROUNDING DEVICES SHALL BE U.L APPROVED OR LISTED FOR THEIR INTENDED USE.
3. ALL WIRES SHALL BE AWG THHN/THWN COPPER UNLESS N0TED OTHERWISE.
4. GROUNDING CONNECTIONS TO GROUND RODS, GROUND RING WIRE. TOWER BASE AND FENCE POSTS SHALL BE EXOTHERMIC ("CADWELDS") UNLESS NOTED OTHERWISE. CLEAN SURFACES TO SHINY METAL WHERE GROUND WIRES ARE CADWELDED TO GALVANIZED SURFACES, SPRAY CADWELD WITH GALVANIZING PAINT.
5. GROUNDING CONNECTIONS T0 GROUND BARS ARE TO BE TWO-HOLE BRASS MECHANICAL CONNECTORS WITH STAINLESS STEEL HARDWARE (INCLUDING SCREW SET) CLEAN GROUND BAR 10 SHINY METAL AFTER MECHANICAL CONNECTION, TREAT WITH PROTECTIVE ANTIOXIDANT COATING.
6. GROUND COAXIAL CABLE SHIELDS AT BOTH ENDS WITH MANUFACTURER'S GROUNDING KITS.
7. ROUTE GROUNDING CONDUCTORS THE SHORTEST AND STRAIGHTEST PATH POSSIBLE. BEND GROUNDING LEADS WITH A MINIMUM 12" RADIUS.
8. INSTALL #2 AWG GREEN-INSULATED STRANDED WIRE FOR ABOVE GRADE GROUNDING AND #2 BARE TINNED COPPER WIRE FOR BELOW GRADE GROUNDING UNLESS OTHERWISE NOTED.
9. REFER TO GROUNDING PLAN FOR GROUND BAR LOCATIONS. GROUNDING CONNECTIONS SHALL BE EXOTHERMIC TYPE ("CADWELDS") TO ANTENNA MOUNTS AND GROUND RING. REMAINING GROUNDING CONNECTIONS SHALL BE COMPRESSION FITTINGS. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO-HOLE LUGS.
10. THE GROUND ELECTRODE SYSTEM SHALL CONSIST OF DRIVEN GROUND RODS POSITION ACCORDING TO GROUNDING PLAN. THE GROUND RODS SHALL BE 5/8"X10'-0" COPPER CLAD STEEL INTERCONNECTED WITH #2 BARE TINNED COPPER WIRE BURIED 36" BELOW GRADE. BURY GROUND RODS A MAXIMUM OF 15' APART AND A MINIMUM OF 8' APART.
11. IF ROCK IS ENCOUNTERED GROUND RODS SHALL BE PLACED AT AN OBLIQUE ANGLE NOT TO EXCEED 45°.
12. EXOTHERMIC WELDS SHALL BE MADE IN ACCORDANCE WITH ERICO PRODUCTS BULLETIN A-AT.
13. CONSTRUCTION OF GROUND RING AND CONNECTIONS TO EXISTING GROUND RING SYSTEM SHALL BE DOCUMENTED WITH PHOTOGRAPHS PRIOR TO BACKFILLING SITE. PROVIDE PHOTOS TO THE AT&T WIRELESS CONSTRUCTION MANAGER.
14. ALL GROUND LEADS EXCEPT THOSE TO THE EQUIPMENT ARE TO BE #2 BARE TINNED COPPER WIRE. ALL EXTERIOR GROUND BARS TINNED COPPER.
15. PRIOR TO INSTALLING LUGS ON GROUND WIRES, APPLY THOMAS & BETTS KOPR-SHIELD (TM OF JET LUBE INC.) PRIOR TO BOLTING GROUND WIRE LUGS TO GROUND BARS, APPLY KOPR-SHIELD OR EQUAL.
16. ENGAGE AN INDEPENDENT ELECTRICAL TESTING FIRM TO TEST AND VERIFY THAT IMPEDANCE DOES NOT EXCEED FIVE OHMS TO GROUND BY MEANS OF "FALL OF POTENTIAL TEST". TEST SHALL BE WITNESSED BY AN AT&T REPRESENTATIVE, AND RECORDED ON THE "GROUND RESISTANCE TEST" FORM.
17. WHERE BARE COPPER GROUND WIRES ARE ROUTED FROM ANY CONNECTION ABOVE GRADE TO GROUND RING, INSTALL WIRE IN 3/4" PVC SLEEVE, FROM 1' BELOW GRADE AND SEAL TOP WITH SILICONE MATERIAL
18. PREPARE ALL BONDING SURFACES FOR GROUNDING CONNECTIONS BY REMOVING ALL PAINT AND CORROSION DOWN TO SHINY METAL. FOLLOWING CONNECTION, APPLY APPROPRIATE ANTI-OXIDIZATION PAINT.
19. ANY SITE WHERE THE EQUIPMENT (BTS, CABLE BRIDGE, PPC, GENERATOR, ETC.) IS LOCATED WITHIN 6 FEET OF METAL FENCING, THE GROUND RING SHALL BE BONDED TO THE NEAREST FENCE POST USING (3) RUNS OF #2 BARE TINNED COPPER WIRE

GROUNDING NOTES | 3

APPLICANT/ SITE OWNER

TILLMAN INFRASTRUCTURE

SITE ACQUISITION /ENGINEERING

SKYWARD LAND SERVICES, INC.

ASSOCIATED Engineering, Inc.
AE INC. Project # 6392

SITE INFORMATION

TONGANOXIE_ KS

TI-OPP-37632
RELO SITE FA# 10008273

15076 214TH St.
TONGANOXIE, KS 66086
LEAVENWORTH COUNTY

PARCEL ID:
052-198-34-0-00-00-006.00-0
CANDIDATE: A

DESIGN RECORD

REV	DATE	DESCRIPTION	BY
A	04/02/26	FINAL DRAWINGS	JMV

PROFESSIONAL STAMP

GAUTAM (TOM) MEDHI
LICENSED
18252
KANSAS
PROFESSIONAL ENGINEER

ENGINEER

Tom Medhi 04-02-2026
Tom Medhi Date
MY LICENSE RENEWAL DATE IS 04/30/2027

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF KANSAS

SHEET TITLE

GROUNDING DETAILS
(3 OF 3)

SHEET NUMBER

G-3.2
82

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GENERAL REQUIREMENTS

PART 1: GENERAL

1.1 INTENT:

A. THESE SPECIFICATIONS AND CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE DONE AND THE MATERIALS TO BE FURNISHED FOR CONSTRUCTION. PLANS ARE NOT TO BE SCALED.
B. THE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO BE FULLY EXPLANATORY AND SUPPLEMENTARY, HOWEVER, SHOULD ANYTHING BE SHOWN, INDICATED OR SPECIFIED ON ONE AND NOT THE OTHER, IT SHALL BE DONE THE SAME AS IF SHOWN, INDICATED OR SPECIFIED IN BOTH.
C. THE INTENTION OF DOCUMENTS IS TO INCLUDE ALL LABOR AND MATERIALS REASONABLY NECESSARY FOR THE PROPER EXECUTION AND COMPLETION OF THE WORK AS STIPULATED IN THE CONTRACT.
D. CONFLICTS: THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL MEASUREMENTS AT THE SITE BEFORE ORDERING MATERIALS OR DOING ANY WORK. NO COMPENSATION SHALL BE ALLOWED DUE TO DIFFERENCES BETWEEN ACTUAL DIMENSIONS AND THOSE ON THE DOCUMENTS. ANY DISCREPANCY SHALL BE REPORTED TO THE OWNER OR THEIR AGENT FOR CONSIDERATION.

1.2 LICENSING REQUIREMENTS:

A. THE CONTRACTOR IS RESPONSIBLE FOR PROCUREMENT AND MAINTAINING ALL APPLICABLE LICENSES AND BONDS.

1.3 STORAGE:

A. ALL MATERIALS MUST BE STORED IN A LEVEL AND DRY FASHION THAT DOES NOT OBSTRUCT THE FLOW OF OTHER WORK. ANY STORAGE METHOD MUST MEET ALL RECOMMENDATIONS OF THE ASSOCIATED MANUFACTURER.

1.4 CLEAN UP:

A. THE CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATION OF WASTE MATERIALS OR RUBBISH AT ALL TIMES.

1.5 QUALITY ASSURANCE:

A. ALL WORK SHALL BE IN ACCORDANCE WITH APPLICABLE LOCAL, STATE, AND FEDERAL REGULATIONS.

PART 2: PRODUCTS – NOT APPLICABLE TO THIS SECTION

PART 3: EXECUTION – NOT APPLICABLE TO THIS SECTION

END OF SECTION

COMMUNICATIONS/ANTENNA'S

PART 1: GENERAL

1.1 WORK INCLUDED:

A. ANTENNA AND FEEDLINE CABLES ARE FURNISHED BY OWNER UNDER SEPARATE CONTRACT. THE CONTRACTOR SHALL ASSIST ANTENNA INSTALLATION CONTRACTOR IN TERMS OF COORDINATION AND SITE ACCESS. ERECTION SUBCONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF PERSONNEL AND PROPERTY FROM HAZARDOUS EXPOSURE TO OVERHEAD DANGER.

B. INSTALL ANTENNAS AS INDICATED ON DRAWINGS AND OWNER SPECIFICATIONS.

C. INSTALL GALVANIZED STEEL ANTENNA MOUNTS AS INDICATED ON DRAWINGS.

D. INSTALL FURNISHED GALVANIZED STEEL WAVEGUIDE LADDER AS INDICATED ON DRAWINGS.

E. THE CONTRACTOR SHALL PROVIDE FREQUENCY DOMAIN REFLECTOMETER (FDR) TEST RESULTS TO THE CONSTRUCTION MANAGER AND OWNER WITHIN ONE WEEK OF COMPLETION.

F. INSTALL FEEDLINE CABLES AND TERMINATORS BETWEEN ANTENNAS AND EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. WEATHERPROOF ALL CONNECTORS BETWEEN THE ANTENNA AND EQUIPMENT PER MANUFACTURER'S REQUIREMENTS. TERMINATE ALL FEEDLINE CABLE THREE (3) FEET IN EXCESS OF ENTRY PORT LOCATION UNLESS OTHERWISE STATED.

G. ANTENNA AND FEEDLINE CABLE GROUNDING:

1. ALL FEEDLINE CABLE GROUNDING CONNECTIONS ARE TO BE WEATHER SEALED WITH ANDREW CONNECTOR/SPLICE WEATHERPROOFING KITS OR APPROVED EQUAL.

2. ALL FEEDLINE CABLE GROUNDING KITS ARE TO BE INSTALLED ON STRAIGHT RUNS OF FEEDLINE CABLE (NOT WITHIN BENDS)

1.2 RELATED WORK:

A. FURNISH THE FOLLOWING WORK AS SPECIFIED UNDER CONSTRUCTION DOCUMENTS, BUT COORDINATE WITH OTHER TRADES PRIOR TO BID:

1. FLASHING OF OPENING INTO OUTSIDE WALLS.

2. SEAL AND CAULK ALL OPENINGS.

3. PAINTING.

4. CUTTING AND PATCHING.

1.3 REQUIREMENTS OF REGULATOR AGENCIES:

A. FURNISH UL LISTED EQUIPMENT WHERE SUCH LABEL IS AVAILABLE, INSTALL IN CONFORMANCE WITH UL STANDARDS WHERE APPLICABLE.

B. INSTALL ANTENNA, ANTENNA CABLES, AND GROUNDING SYSTEM IN ACCORDANCE WITH DRAWINGS AND SPECIFICATIONS IN EFFECT AT PROJECT LOCATION AND RECOMMENDATIONS OF STATE AND LOCAL BUILDING CODES, AND ANY SPECIAL CODES HAVING JURISDICTION OVER SPECIFIC PORTIONS OF WORK. THIS INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING:

1. TIA–222 (TELECOMMUNICATIONS INDUSTRY ASSOCIATION) – STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES.

2. FAA (FEDERAL AVIATION ADMINISTRATION ADVISORY) – CIRCULAR AC 70/7460–1K, OBSTRUCTION MARKING AND LIGHTING.

3. FCC (FEDERAL COMMUNICATIONS COMMISSION) – RULES AND REGULATIONS OBSTRUCTION MARKING AND LIGHTING SPECIFICATIONS FOR ANTENNA STRUCTURES AND HIGH INTENSITY OBSTRUCTION LIGHTING SPECIFICATIONS FOR ANTENNA STRUCTURES.

4. AISC (AMERICAN INSTITUTE OF STEEL CONSTRUCTION) – SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS.

5. NEC (NATIONAL ELECTRICAL CODE) – FOR TOWER LIGHTING KITS.

6. UL (UNDERWRITERS LABORATORIES) – APPROVED ELECTRICAL PRODUCTS.

7. IN ALL CASES, THE FAA RULES AND THE FCC RULES ARE APPLICABLE AND IN THE EVENT OF CONFLICT, SUPERSEDE ANY OTHER STANDARDS OR SPECIFICATIONS.

8. LIFE SAFETY CODE NFPA, LATEST EDITION.

PART 2: PRODUCTS – NOT APPLICABLE TO THIS SECTION

PART 3: EXECUTION – NOT APPLICABLE TO THIS SECTION

END OF SECTION

SITE CLEARING/EROSION CONTROL

PART 1: GENERAL

1.1 SUMMARY:

A. PROVIDE SITE–CLEARING AS REQUIRED TO COMPLETE WORK AS SHOWN ON CONTRACT DOCUMENTS INCLUDING CLEARING, GRUBBING, STRIPPING, EROSION AND SILTATION CONTROL, AND PROTECTION OF LANDSCAPE MATERIALS DESIGNATED TO BE PROTECTED DURING CONSTRUCTION.

1.2 QUALITY ASSURANCE:

A. COMPLY WITH GOVERNING CODES AND REGULATIONS.

B. SITE PROTECTION: PROVIDE ALL NECESSARY JOB SITE MAINTENANCE FROM COMMENCEMENT OF WORK UNTIL COMPLETION OF THE SUBCONTRACT

C. AVOID DAMAGE TO THE SITE AND TO EXISTING FACILITIES, STRUCTURES, TREES, AND SHRUBS DESIGNATED TO REMAIN. TAKE PROTECTIVE MEASURES TO PREVENT EXISTING FACILITIES THAT ARE NOT DESIGNATED FOR REMOVAL FROM BEING DAMAGED BY THE WORK.

PART 2: PRODUCTS

2.1 MATERIALS:

A. TREE PROTECTION, EROSION CONTROL, SILTATION CONTROL, AND DUST CONTROL MATERIALS SUITABLE FOR SITE CONDITIONS.

PART 3: EXECUTION

3.1 SITE CLEARING OPERATIONS:

A. PROTECTION OF EXISTING TREES, VEGETATION, LANDSCAPING, AND SITE IMPROVEMENTS NOT SCHEDULED FOR CLEARING WHICH MIGHT BE DAMAGED BY CONSTRUCTION ACTIVITIES.

B. TRIMMING OF EXISTING TREES AND VEGETATION AS RECOMMENDED BY ARBORIST FOR PROTECTION DURING CONSTRUCTION ACTIVITIES.

C. CLEARING AND GRUBBING OF STUMPS AND VEGETATION, AND REMOVAL AND DISPOSAL OF DEBRIS, RUBBISH, DESIGNATED TREES, AND SITE IMPROVEMENTS.

D. TOPSOIL STRIPPING AND STOCKPILING.

E. TEMPORARY EROSION CONTROL, SILTATION CONTROL, AND DUST CONTROL.

F. TEMPORARY PROTECTION OF ADJACENT PROPERTY, STRUCTURES, BENCHMARKS, AND MONUMENTS.

G. WATERING OF TREES AND VEGETATION DURING CONSTRUCTION ACTIVITIES.

H. REMOVAL AND LEGAL DISPOSAL OF CLEARED MATERIALS.

I. MAINTAIN ALL EXISTING FENCING AND GATES TO MAINTAIN A SECURE SITE AT ALL TIMES.

J. PROVIDE AND MAINTAIN ALL TEMPORARY FENCING, BARRICADES, WARNING SIGNALS AND SIMILAR DEVICES NECESSARY TO PROTECT LIFE AND PROPERTY DURING THE ENTIRE PERIOD OF CONSTRUCTION. REMOVE ALL SUCH DEVICES UPON COMPLETION OF THE WORK.

3.2 CLEARING:

A. PREVENT DAMAGE TO EXISTING IMPROVEMENTS INDICATED TO REMAIN, INCLUDING ON AND OFF SITE. PROTECT EXISTING TREES AND VEGETATION INDICATED TO REMAIN. DO NOT STOCKPILE MATERIALS AND RESTRICT TRAFFIC WITHIN DRIP LINE OF EXISTING TREES TO REMAIN OR THAT INTERFERE WITH ACCESS TO SITE. PROVIDE AND MAINTAIN TEMPORARY GUARDS TO ENCIRCLE TREES OR GROUPS OF TREES TO REMAIN; OBTAIN APPROVAL BEFORE BEGINNING WORK.

B. WATER VEGETATION AS REQUIRED TO MAINTAIN HEALTH. COVER TEMPORARILY EXPOSED ROOTS WITH WET BURLAP AND BACKFILL AS SOON AS POSSIBLE. COAT CUT PLANT SURFACES WITH APPROVED EMULSIFIED ASPHALT PLANT COATING.

C. REPAIR OR REPLACE VEGETATION DESIGNATED FOR REUSE, WHICH HAS BEEN DAMAGED. REMOVE HEAVY GROWTHS OF GRASS BEFORE STRIPPING. STOCKPILE SATISFACTORY TOPSOIL CONTAINING NO LARGE STONES, FOREIGN MATTER AND WEEDS ON SITE FOR REUSE.

D. COMPLETELY REMOVE ALL IMPROVEMENTS, STUMPS AND DEBRIS EXCEPT FOR THOSE INDICATED TO REMAIN. REMOVE BELOW GRADE IMPROVEMENTS AT LEAST 12" BELOW FINISH GRADE SO AS NOT TO INTERFERE WITH NEW CONSTRUCTION. REMOVE ABANDONED MECHANICAL AND ELECTRICAL WORK AS REQUIRED.

E. PREVENT EROSION AND SILTATION OF STREETS, CATCH BASINS AND PIPING. CONTROL WINDBLOWN DUST. REMOVE WASTE MATERIALS AND UNSUITABLE SOIL FROM SITE AND DISPOSE OF IN A LEGAL MANNER.

F. EXCEPT WHERE EXCAVATION TO GREATER DEPTH IS INDICATED, FILL DEPRESSIONS RESULTING FROM CLEARING, GRUBBING AND DEMOLITION WORK COMPLETELY WITH SUITABLE FILL AND COMPACT AS REQUIRED.

3.3 EROSION CONTROL:

A. PROVIDE EROSION AND SILTATION CONTROL AS REQUIRED TO MEET ALL LOCAL AND STATE REQUIREMENTS.
B. EROSION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO ANY EARTHWORK OR GRUBBING.

END OF SECTION

APPLICANT/ SITE OWNER

TILLMAN INFRASTRUCTURE

SITE ACQUISITION /ENGINEERING

SKYWARD LAND SERVICES, INC.

ASSOCIATED Engineering, Inc.
AE INC. Project # 6392

SITE INFORMATION

TONGANOXIE_ KS

TI-OPP-37632
RELO SITE FA# 10008273

15076 214TH St.
TONGANOXIE, KS 66086
LEAVENWORTH COUNTY

PARCEL ID:
052-198-34-0-00-00-006.00-0
CANDIDATE: A

DESIGN RECORD

REV	DATE	DESCRIPTION	BY
A	04/02/26	FINAL DRAWINGS	JMV

PROFESSIONAL STAMP

GAUTAM (TOM) MEDHI
LICENSED
18252
KANSAS
PROFESSIONAL ENGINEER

ENGINEER

Tom Medhi 04-02-2026
Tom Medhi Date
MY LICENSE RENEWAL DATE IS 04/30/2027

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF KANSAS

SHEET TITLE

SPECIFICATIONS
(1 OF 7)

SHEET NUMBER

SP-1.0

CAST-IN-PLACE-CONCRETE

PART 1: GENERAL

1.1 SUMMARY:

A. FURNISH AND INSTALL ALL CAST-IN-PLACE CONCRETE, REINFORCING AND ACCESSORIES, AS SPECIFIED HEREIN AND AS SHOWN ON THE DRAWINGS.

1.2 SUBMITTALS:

A. PRODUCT DATA: SUBMIT MANUFACTURER'S PRODUCT DATA AND INSTALLATION INSTRUCTIONS FOR EACH MATERIAL AND PRODUCT USED.

B. SHOP DRAWINGS: SUBMIT SHOP DRAWINGS INDICATING MATERIAL CHARACTERISTICS, DETAILS OF CONSTRUCTION, CONNECTIONS, AND RELATIONSHIP WITH ADJACENT CONSTRUCTION.

1. SHOP DRAWINGS SHALL BE PREPARED AND STAMPED BY A QUALIFIED ENGINEER LICENSED IN THE JURISDICTION OF THE PROJECT.

C. MIX DESIGN: SUBMIT FOR APPROVAL MIX DESIGN PROPOSED FOR USE.

1.3 QUALITY ASSURANCE:

A. COMPLY WITH GOVERNING CODES AND REGULATIONS. PROVIDE PRODUCTS OF ACCEPTABLE MANUFACTURERS, WHICH HAVE BEEN IN SATISFACTORY USE IN SIMILAR SERVICE FOR A MINIMUM OF THREE YEARS. USE EXPERIENCED INSTALLERS. DELIVER, HANDLE, STORE MATERIALS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

B. TESTING: EMPLOY AN INDEPENDENT TESTING AGENCY ACCEPTABLE TO OWNER TO DESIGN CONCRETE MIXES AND TO PERFORM MATERIAL EVALUATION TESTS. PROVIDE 4 AND 28 DAY CYLINDER TESTS. COMPLY WITH ASTM C 143, C 173, C 31 AND C 39.

C. STANDARDS

1. ACI 301, SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS.

2. ACI 318, BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE, AND CRSI MANUAL OF STANDARD PRACTICE.

PART 2: PRODUCTS

2.1 MATERIALS:

A. MATERIALS SHALL CONFORM TO THE RESPECTIVE PUBLICATIONS AND OTHER REQUIREMENTS SPECIFIED HEREIN.

B. CEMENT: CEMENT SHALL CONFORM TO ASTM C150, TYPE 1. CEMENT MAY BE BAGGED OR BULK. CEMENT SHALL BE USED FROM ONLY ONE MILL THROUGHOUT PROJECT.

C. FINE AGGREGATE: FINE AGGREGATE SHALL CONFORM TO ASTM C33-08 AND SHALL BE UNIFORMLY GRADED, CLEAN, SHARP, WASHED MATERIAL OR CRUSHED SAND, FREE FROM ORGANIC IMPURITIES.

D. COURSE AGGREGATE: COURSE AGGREGATE SHALL CONFORM TO ASTM C33-08 AND SHALL BE NATURAL WASHED GRAVEL OR WASHED CRUSHED ROCK HAVING HARD, STRONG, DURABLE PIECES, FREE FORM ADHERENT COATINGS, THE MAXIMUM SIZE OF COARSE AGGREGATE SHALL BE 3/4" IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM C33-08; GRADATION SIZE NO. 67.

E. WATER: WATER USED IN THE CONCRETE MIX SHALL BE POTABLE, CLEAN, AND FREE FROM OILS, ACIDS, SALTS, CHLORIDES, ALKALI, SUGAR, VEGETABLE, OR OTHER INJURIOUS SUBSTANCES.

F. REINFORCING STEEL: ALL BARS ARE TO BE NEW BILLET STEEL CONFORMING TO ASTM A615, GRADE 60. BENDING DETAILS ARE TO CONFORM TO THE STANDARDS OF ACI 318.

G. FORMS: THE FORMS SHALL BE TRUE AND RIGID AND CONFORM TO SHAPE, LINE AND DIMENSIONS AS SHOWN ON THE DRAWINGS. ALL FORMS SHALL BE RIGIDLY CONSTRUCTED, BRACED AND TIED TO PREVENT ANY DEFLECTION OR DISPLACEMENT DURING PLACING OF CONCRETE. ALL EXPOSED CORNERS AND EDGES SHALL HAVE 3/4" FILLETS. ALL JOINTS SHALL BE MORTAR TIGHT; OPEN JOINTS SHALL BE SEALED AS REQUIRED.

H. CONCRETE:

1. PROPORTIONING: CONCRETE SHALL CONFORM TO THE FOLLOWING:

a. CEMENT-6 SACKS PER CUBIC YARD, MINIMUM

b. WATER SHALL BE KEPT TO AN ABSOLUTE MINIMUM TO MAINTAIN SLUMP AS SPECIFIED

c. AGGREGATE; SAND FACTOR SHALL BE AS REQUIRED TO GIVE THE BEST WORKABLE MIX WITHIN THE RANGE OF 46% TO 52% OF TOTAL AGGREGATE.

d. STRENGTH-4,000 PSI AT 28 DAYS, UNLESS NOTED OTHERWISE

e. ALL CONCRETE SHALL CONTAIN A WATER-REDUCING AGENT AND SHALL HAVE THREE (3) TO FIVE (5) PERCENT ENTRAINED AIR.

2.2 SLUMP:

A. THE MAXIMUM SLUMP SHALL NOT EXCEED 3" EXCEPT FOR CONCRETE TO BE PLACED IN FORMS 8" WIDE OR LESS, WHERE THE MAXIMUM SLUMP SHALL BE 4".

B. THE DETERMINATION OF SLUMP SHALL CONFORM TO ASTM C143.

2.3 MIXING:

A. THE CONTRACTOR SHALL USE READY-MIXED CONCRETE, MIXED AND DELIVERED IN CONFORMANCE WITH ASTM C94.

2.4 MIXTURES:

A. THE CONCRETE SHALL CONTAIN AN AIR-ENTRAINING ADMIXTURE COMPLYING WITH THE REQUIREMENTS OF ASTM C-260 AND ACI 212.1R AND A WATER-REDUCING ADMIXTURE COMPLYING WITH THE REQUIREMENTS OF ASTM C-494 AND ACI 212.1R. ADMIXTURES SHALL BE PURCHASE AND BATCHED IN LIQUID SOLUTION. THE USE OF CALCIUM CHLORIDE OR AN ADMIXTURE CONTAINING CALCIUM CHLORIDE IS PROHIBITED.

B. ADMIXTURES SHALL BE OF THE SAME MANUFACTURER TO ASSURE COMPATIBILITY.

C. ACCEPTABLE MANUFACTURERS ARE:

1. W.R. GRACE 3. MASTER BUILDERS

2. SIKA GROUP 4. EUCLID CHEMICAL CO

2.5 CURING COMPOUNDS:

A. CURING COMPOUNDS SHALL CONFORM TO ASTM C309, TYPE 1, ID, CLASS A AND B AND ASTM C171 AS APPLICABLE

PART 3: EXECUTION

3.1 GENERAL:

A. CONSTRUCT AND ERECT FORMWORK IN ACCORDANCE WITH ACI 301 ACI 347.

B. COLD-WEATHER CONCRETING SHALL BE IN ACCORDANCE WITH ACI 306.

C. HOT-WEATHER CONCRETING SHALL BE IN ACCORDANCE WITH ACI 305.

3.2 INSERTS, EMBEDDED COMPONENTS AND OPENINGS:

A. CONTRACTOR SHALL CHECK ALL CIVIL, ARCHITECTURAL, STRUCTURAL, AND ELECTRICAL DRAWINGS FOR OPENINGS, SLEEVES, ANCHOR BOLTS, INSERTS AND OTHER ITEMS TO BE BUILT INTO THE CONCRETE WORK.

B. COORDINATE THE WORK OF OTHER SECTIONS IN FORMING AND SETTING OPENINGS, RECESSES, SLOTS, CHASES, ANCHORS, INSERTS AND OTHER ITEMS TO BE EMBEDDED.

C. EMBEDDED ITEMS SHALL BE SET ACCURATELY IN LOCATION, ALIGNMENT, ELEVATION, AND PLUMBNESS. LOCATE AND MEASURE FROM ESTABLISHED SURVEYED REFERENCE BENCHMARKS.

D. EMBEDDED ITEMS SHALL BE ANCHORED INTO PLACE AS REQUIRED TO PREVENT MOVEMENT DURING CONCRETE PLACEMENT AND CONSOLIDATION. COMPONENTS FORMING A PART OF A COMPLETE ASSEMBLY SHALL BE ALIGNED BEFORE ANCHORING. PROVIDE TEMPORARY BRACING, ANCHORAGE, AND TEMPLATES AS REQUIRED TO MAINTAIN THE SETTING AND ALIGNMENT.

3.3 REINFORCEMENT PLACEMENT:

A. REINFORCEMENT SHALL BE PLACED IN ACCORDANCE WITH CHECKED AND RELEASED DRAWINGS AND ACI 301 AND ACI 315; SECURELY WIRE-TIE REINFORCEMENT AT ALL INTERSECTIONS.

B. ACCURATELY POSITION, SUPPORT AND SECURE REINFORCEMENT AGAINST DISPLACEMENT FROM FORMWORK CONSTRUCTION OR CONCRETE PLACEMENT AND CONSOLIDATION. REINFORCING SHALL BE SUPPORTED ON METAL CHAIRS, RUNNERS, BOLSTERS, SPACERS, AND HANGERS.

C. SPLICES OF REINFORCING BARS SHALL BE CLASS B UNLESS SHOWN OTHERWISE. SPLICES SHALL BE STAGGERED. FULL DEVELOPMENT LENGTH SHALL BE PROVIDED ACROSS JOINTS.

D. LOCATE REINFORCING TO PROVIDE CONCRETE COVER AND SPACING SHOWN ON THE DRAWINGS. MINIMUM COVER SHALL BE AS REQUIRED BY ACI 318.

E. WELDING OF AND TO ANY REINFORCING MATERIALS INCLUDING TACK WELDING OF CROSSING BARS IS STRICTLY PROHIBITED. BARS SHALL BE FREE OF FLAKY OR SCALY RUST AT THE TIME THE CONCRETE IS PLACED.

3.4 CONCRETE PLACEMENT:

A. PRIOR TO PLACING CONCRETE, FORMS AND REINFORCEMENT SHALL BE THOROUGHLY INSPECTED. ALL WOOD CHIPS, DIRT, ETC., AS WELL AS ALL TEMPORARY BRACING, TIES, AND CLEATS REMOVED, AND ALL OPENINGS FOR UTILITIES PROPERLY BOXED, ALL FORMS SHALL BE PROPERLY SECURED IN THEIR CORRECT POSITION AND MADE TIGHT. ALL REINFORCING AND EMBEDDED ITEMS SHALL BE SECURED IN THEIR PROPER LOCATIONS.. ALL OLD AND DRY CONCRETE AND DIRT SHALL BE CLEANED AND ALL STANDING WATER AND OTHER FOREIGN MATTER REMOVED.

B. PLACING CONCRETE SHALL BE IN ACCORDANCE WITH ACI 301 AND ACI 304 AND SHALL BE CARRIED OUT AT SUCH A RATE THAT THE CONCRETE PREVIOUSLY PLACED IS STILL PLASTIC AND INTEGRATED WITH THE FRESHLY PLACE CONCRETE. CONCRETING, ONCE STARTED, SHALL BE CARRIED ON AS A CONTINUOUS OPERATION UNTIL THE SECTION IS COMPLETED. NO COLD JOINTS SHALL BE ALLOWED.

C. CONSTRUCTION JOINTS: USE KEYWAYS, CONTINUE REINFORCEMENT THROUGH JOINT.

D. EXPANSION JOINTS: FOR EXTERIOR WORK, LOCATE AT 30'-0" O.C. MAXIMUM, AT APPROVED LOCATIONS. PROVIDE SMOOTH DOWELS ACROSS JOINT WHICH PERMIT 1" HORIZONTAL MOVEMENT AND NO VERTICAL SHEAR MOVEMENT.

E. ISOLATION JOINTS: PROVIDE BETWEEN SLABS AND VERTICAL ELEMENTS SUCH AS COLUMNS AND STRUCTURAL WALLS.

F. CONTROL JOINTS: PROVIDE SAWN OR TOOLED JOINTS OR REMOVABLE INSERT STRIPS; DEPTH EQUAL TO 1/4" SLAB THICKNESS. SPACING SHALL BE AS REQUIRED AND APPROVED.

G. ALL CONCRETE SHALL BE THOROUGHLY CONSOLIDATED AND COMPACTED BY VIBRATION, SPADING, RODDING, OR FORKING DURING THE OPERATION OF PLACING AND DEPOSITING IN ACCORDANCE WITH ACI 309. THE CONCRETE SHALL BE WORKED AROUND REINFORCEMENT, EMBEDDED ITEMS, AND INTO THE CORNERS OF THE FORMS SO AS TO ELIMINATE ALL AIR AND STONE POCKETS.

3.5 FINISHING:

A. FINISHING OF ALL SLABS SHALL BE IN ACCORDANCE WITH ACI 302.1; SECTION 7.2 WITH A MINIMUM OF THREE TROWELINGS.

1. INTERIOR SLAB FINISH TOLERANCE AS MEASURED IN ACCORDANCE WITH ASTM E 1155, SHALL HAVE AN OVERALL TEST F NUMBER FOR FLATNESS, FF=20 AND FOR LEVEL, FL=15. THE MINIMUM LOCAL NUMBER FOR FLATNESS, FF=15 AND FOR LEVEL, FL=10.

2. EXTERIOR SLAB FINISH SHALL BE FLAT (FF=20) AND SHALL BE SLOPED A MINIMUM OF 1/8" PER FOOT TO A MAXIMUM OF 1/4" PER FOOT TO PREVENT PONDING WATER.

B. SURFACES OF SLABS SHALL RECEIVE TWO COATS OF CLEAR SEALER/HARDNER.

C. ABOVE GRADE WALL SURFACES SHALL HAVE A SMOOTH FORM FINISH AS DEFINED IN CHAPTER 10 OF ACI 301.

3.6 CURING:

A. FRESHLY DEPOSITED CONCRETE SHALL BE PROTECTED FROM PREMATURE DRYING AND EXCESSIVELY HOT OR COLD TEMPERATURES AND SHALL BE MAINTAINED WITH MINIMAL MOISTURE LOSS AT A RELATIVELY CONSTANT TEMPERATURE FOR A PERIOD OF TIME NECESSARY FOR THE HYDRATION OF THE CEMENT AND PROPER HARDENING OF THE CONCRETE.

B. CURING SHALL IMMEDIATELY FOLLOW THE FINISH OPERATION. CONCRETE SHALL BE KEPT CONTINUOUSLY MOIST AT LEAST OVERNIGHT, IMMEDIATELY FOLLOWING THE INITIAL CURING. BEFORE THE CONCRETE HAS DRIED, ADDITIONAL CURING SHALL BE ACCOMPLISHED BY ONE OF THE FOLLOWING MATERIALS OR METHODS:

1. PONDING OR CONTINUOUS SPRINKLING

2. ABSORPTIVE MAT OR FABRIC KEPT CONTINUOUSLY WET

3. NON-ABSORPTIVE FILM (POLYETHYLENE) OVER A PREVIOUSLY SPRINKLED SURFACE

4. SAND OR OTHER COVERING KEPT CONTINUOUSLY WET

5. CONTINUOUS STEAM (NOT EXCEEDING 150 DEGREES F) OR VAPOR MIST BATH.

6. SPRAYED-ON CURING COMPOUND APPLIED IN TWO COATES, SPRAYED IN PERPENDICULAR DIRECTIONS.

C. THE FINAL CURING SHALL CONTINUE UNTIL THE CUMULATIVE NUMBER OF DAYS OR FRACTION THEREOF, NOT NECESSARILY CONSECUTIVE, DURING WHICH TEMPERATURE OF THE AIR IN CONTACT WITH CONCRETE IS ABOVE 50 DEGREES F HAS TOTALED SEVEN (7) DAYS. CONCRETE SHALL NOT BE PERMITTED TO FREEZE DURING THE CURING PERIOD. RAPID DRYING AT THE END OF THE CURING PERIOD SHALL BE PREVENTED.

END OF SECTION

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APPLICANT/ SITE OWNER

TILLMAN INFRASTRUCTURE

SITE ACQUISITION /ENGINEERING

SKYWARD LAND SERVICES, INC.

ASSOCIATED Engineering, Inc.
AE INC. Project # 6392

SITE INFORMATION

TONGANOXIE_ KS

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PARCEL ID:
052-198-34-0-00-00-006.00-0
CANDIDATE: A

DESIGN RECORD

REV	DATE	DESCRIPTION	BY
A	04/02/26	FINAL DRAWINGS	JMV

PROFESSIONAL STAMP

GAUTAM (TOM) MEDHI LICENSED 18252 KANSAS PROFESSIONAL ENGINEER

ENGINEER

Tom Medhi 04-02-2026
Tom Medhi Date
MY LICENSE RENEWAL DATE IS 04/30/2027
I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF KANSAS

SHEET TITLE

SPECIFICATIONS
(2 OF 7)

SHEET NUMBER

SP-1.1

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UNIT MASONRY

PART 1: GENERAL

1.1 SUMMARY:

A. PROVIDE UNIT MASONRY CONSTRUCTION AS INDICATED ON THE DRAWINGS.

PART 2: PRODUCTS

2.1 MATERIALS:

A. CLAY MASONRY UNITS:

1. APPLICATION: BRICK AND CONCRETE BLOCK CAVITY WALLS.
2. SIZE: STANDARD MODULAR, 3-5/8" THICK BY 2-1/4" HIGH BY 7-5/8" LONG OR AS INDICATED ON DRAWINGS.
3. TYPE: ASTM C 216, TYPE FBS, FOR GENERAL EXPOSED USE, OR AS INDICATED ON DRAWINGS. GRADE SHALL BE SW, UNLESS NOTED OTHERWISE ON DRAWINGS.
4. SPECIAL SHAPES: AS REQUIRED BY BUILDING CONFIGURATION. OR AS INDICATED ON DRAWINGS
5. BOND PATTERN: RUNNING BOND

B. CONCRETE MASONRY UNITS:

1. CONCRETE MASONRY UNITS: HOLLOW, LOAD-BEARING, NORMAL WEIGHT, ASTM C 90, GRADE N, TYPE 1, 1500 F'M COMPRESSIVE STRENGTH:
   a. MEDIUM WEIGHT
2. SIZE: 7-5/8" HIGH BY 15-5/8" LONG BY EITHER 7-5/8" OR 11-5/8" THICK OR AS INDICATED ON DRAWINGS.
3. SPECIAL SHAPES: AS REQUIRED BY BUILDING CONFIGURATION.
4. BOND PATTERN: RUNNING BOND UNLESS NOTED OR SHOWN DIFFERENTLY ON DRAWINGS.

C. LIMESTONE/PRECAST TRIM UNITS:

1. GRADE AND COLOR: AS SHOWN ON DRAWINGS
2. FINISH: AS IDENTIFIED ON DRAWINGS

D. MORTAR AND GROUT FOR BRICK AND CONCRETE MASONRY UNIT ASSEMBLIES:

1. MORTAR MIX: ASTM C 270, TYPE S, FOR REINFORCED MASONRY, MASONRY BELOW GRADE AND MASONRY IN CONTACT WITH EARTH AND ASTM C 270, TYPE N, FOR ABOVE-GRADE LOADBEARING AND NONLOADBEARING WALLS. PORTLAND CEMENT SHALL CONFORM TO ASTM C150, TYPE 1. MASONRY CEMENT SHALL CONFORM TO ASTM C91. FINE AGGREGATE SHALL CONFORM TO ASTM C144.
2. MORTAR COLOR: NATURAL COLOR UNLESS NOTED OTHERWISE ON DRAWINGS.
3. GROUT: ALL GROUT FOR FILLING BOND BEAMS AND REINFORCED CELLS SHALL CONFORM TO NON-AIR ENTRAINED GROUT PER ASTM C476 WITH PORTLAND CEMENT PER ASTM C150, TYPE 1, AND INE AND COARSE AGGREGATE PER ASTM C404.

E. REINFORCING STEEL:

1. REINFORCING BARS: ASTM A 615, GRADE 60.
2. WELDED WIRE FABRIC: ASTM A 185, PLAIN.

F. REINFORCING: WELDED WIRE WITH DEFORMED SIDE RODS.

1. STEEL WIRE: 9 GAUGE (.1875 INCH) GALVANIZED STEEL.
2. TRUSS TYPE

G. TIES AND ANCHORS:

1. BENT WIRE TIES: GALVANIZED STEEL.
2. RIGID ANCHORS: GALVANIZED STEEL STRAPS.

PART 3: EXECUTION

3.1 INSTALLATION:

A. INSTALLATION OF MASONRY ASSEMBLIES:

1. COMPLY WITH PCA RECOMMENDED PRACTICES FOR LAYING CONCRETE BLOCK, BRICK INSTITUTE OF AMERICA BIA TECH NOTES, AND NCMA TEK BULLETINS.
2. COMPLY WITH COLD WEATHER AND WARM WEATHER PROTECTION PROCEDURES AS RECOMMENDED IN BIA TECH NOTES.

END OF SECTION

STRUCTURAL STEEL FRAMING

PART 1: GENERAL

1.1 SUMMARY:

A. PROVIDE STRUCTURAL STEEL ASSEMBLIES, FABRICATIONS, AND ERECTION OF STEEL AND OTHER ITEMS AS SHOWN ON THE DRAWINGS OR REQUIRED FOR A COMPLETE INSTALLATION.

1.2 QUALITY ASSURANCE:

A. COMPLY WITH ALL APPLICABLE GOVERNING CODES AND REGULATIONS. PROVIDE PRODUCTS OF ACCEPTABLE MANUFACTURERS, WHICH HAVE BEEN IN SATISFACTORY USE IN SIMILAR SERVICE FOR THREE YEARS. USE EXPERIENCED INSTALLERS. DELIVER, HANDLE, AND STORE MATERIALS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

B. STANDARDS: AISC, CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES, AND APPLICABLE REGULATIONS.

C. ARCHITECTURALLY EXPOSED STRUCTURAL STEEL: COMPLY WITH FABRICATION REQUIREMENTS, INCLUDING TOLERANCE LIMITS, AND INSTALLATION TOLERANCES OF AISC'S "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES" FOR STRUCTURAL STEEL.

D. ERECTION TOLERANCES: AISC STANDARDS.

1.3 SUBMITTALS:

A. SUBMIT FABRICATION AND ERECTION DRAWINGS SHOWING ALL DETAILS, CONNECTIONS, MATERIAL DESIGNATIONS, AND ALL TOP OF STEEL ELEVATIONS TO ENGINEER FOR APPROVAL.

B. WELDERS SHALL BE QUALIFIED AS PRESCRIBED IN AWS D1.1.

PART 2: PRODUCTS

2.1 MATERIALS:

A. STRUCTURAL STEEL:

1. STRUCTURAL STEEL SHAPES, PLATES, AND BARS: ASTM A 572, ASTM A-36.
2. COLD-FORMED STEEL TUBING: ASTM A 500, GRADE B.
3. STEEL PIPE: ASTM A 53, TYPE E OR S, GRADE B; OR ASTM A 501.
4. ANCHOR BOLTS: ASTM A 307, NON-HEADED TYPE
5. COMMON (MACHINE) BOLTS SHALL CONFORM TO ASTM A307 GRADE A AND NUTS TO ASTM A563. ONE COMMON BOLT ASSEMBLY SHALL CONSIST OF A BOLT, A HEAVY HEX NUT, AND A HARDENED WASHER. BOLTS AND NUTS TO BE HOT DIPPED GALVANIZED PER ASTM A153 IF EXPOSED.
6. HIGH STRENGTH BOLTS SHALL CONFORM TO ASTM A325 OR A490, AS APPLICABLE. ONE HIGH STRENGTH BOLT ASSEMBLY SHALL CONSIST OF A HEAVY HEX STRUCTURAL BOLT, A HEAVY HEX NUT, AND A HARDENED WASHER CONFORMING TO ASTM F436. THE HARDENED WASHER SHALL BE INSTALLED AGAINST THE ELEMENT TURNED IN TIGHTENING. BOLTS AND NUTS TO BE HOT-DIP GALVANIZED PER ASTM A153 IF EXPOSED.
7. AUXILIARY MATERIALS:
   a. DIRECT TENSION INDICATORS: ASTM A 959
   b. ELECTRODES FOR WELDING: AWS CODE; E70XX
8. GROUTS:
   a. CEMENT GROUT: PORTLAND CEMENT, SAND.
   b. METALLIC SHRINKAGE-RESISTANT GROUT: PREMIXED FERROUS AGGREGATE GROUTING COMPOUND ASTM C 1107.
   c. NONMETALLIC SHRINKAGE-RESISTANT GROUT: PREMIXED NONMETALLIC GROUTING COMPOUND, ASTM C 1107.

B. SHOP PAINTING

1. GENERAL: ALL STRUCTURAL STEEL MATERIALS EXPOSED TO THE ELEMENTS SHALL BE HOT DIPPED GALVANIZED PER ASTM 123. ALL OTHER STRUCTURAL STEEL SHALL BE SHOP PRIMED.
   a. DO NOT PAINT SURFACES TO BE WELDED OR HIGH-STRENGTH BOLTED WITH FRICTION-TYPE CONNECTIONS.
   b. DO NOT PAINT SURFACES SCHEDULED TO RECEIVE SPRAYED-ON FIREPROOFING.
2. STRUCTURAL STEEL FACTORY APPLIED PRIMER PAINT (FOR NON-GALVANIZED MATERIALS): STANDARD RED OXIDE, LEAD AND CHROMATE-FREE, NON-ASHPHALTIC, RUST-INHIBITING PRIMER COMPLYING WITH FS TT-P-664
3. ZINC COATED (HOT DIP GALVANIZED) PER ASTM A123 (AFTER FABRICATION): TOUCH-UP AFTER ERECTION: CLEAN AND WIRE BRUSH ANY ABRADED AND OTHER SPOTS WORN THROUGH ZINC COATING, INCLUDING THREADED PORTIONS OF BOLTS AND WELDS AND TOUCH-UP WITH GALVANIZING REPAIR PAINT.

C. FIELD PAINTING: REPAIR / TOUCH-UP OF DAMAGED GALVANIZED OR PRIMED SURFACES:

   a. FOR GALVANIZED SURFACES, USE ORGANIC ZINC-RICH COATING MATCHING THE APPEARANCE OF HOT-DIP GALVANIZING CONTAINING AT LEAST 65% - 69% OR ABOVE 92% METALLIC ZINC. BY WEIGHT IN THE DRY FILM, MEETING THE PERFORMANCE REQUIREMENTS OF THE FOLLOWING: ASTM A 780-01, DOD-P-21035B, MIL-P-46105, AND SSPC PS-12, PS-12.01, PS-20, PS-22, PS-29 AND PS-30
   b. FOR PRIMED SURFACES, CLEAN ALL SURFACES AND RE-PRIME PER RECOMMENDATIONS OF ORIGINAL PRIME MATERIALS.

PART 3: EXECUTION

3.1 FABRICATION:

A. SHOP FABRICATE AND ASSEMBLE MATERIALS AS SPECIFIED HEREIN:

1. FABRICATE ITEMS IN ACCORDANCE WITH THE AISC-ASD SPECIFICATIONS
2. ALL EXPOSED STRUCTURAL STEEL SHALL BE HOT DIP GALVANIZED PER ASTM A123
3. PROPERLY MARK AND MATCH-MARK MATERIALS FOR FIELD ASSEMBLY AND FOR IDENTIFICATION AS TO LOCATION FOR WHICH INTENDED
4. FABRICATE AND DELIVER IN A SEQUENCE WHICH WILL EXPEDITE ERECTION AND MINIMIZE FIELD HANDLING OF MATERIALS.
5. PROVIDE FINISH SURFACE OF MEMBERS EXPOSED IN THE FINAL STRUCTURE FREE FROM MARKINGS, BURRS, AND OTHER DEFECTS.

B. CONNECTIONS

1. PROVIDE BOLTS AND WASHERS OF TYPES AND SIZE REQUIRED FOR COMPLETION OF FIELD ERECTION. USE 3/4" DIAMETER A325 N BOLTS UNLESS NOTED OTHERWISE.
2. INSTALL HIGH STRENGTH THREADED FASTENERS IN ACCORDANCE WITH RCSC "SPECIFICATIONS FOR STRUCTURAL JOINTS" USING ASTM A325 N OR ASTM A490 BOLTS.
3. WELDED CONSTRUCTION SHALL COMPLY WITH AWS D1.1 FOR PROCEDURES, APPEARANCE, QUALITY OF WELDS, AND METHODS USED IN CORRECTING WELDED WORK.
4. THE FABRICATOR SHALL FURNISH AND INSTALL ERECTION CLIPS FOR FIT-UP OF WELDED CONNECTIONS.
5. DOUBLE ANGLE MEMBERS SHALL HAVE WELDED FILLERS SPACED IN ACCORDANCE WITH CHAPTER E4 OF THE AISC-ASD SPECIFICATION.
6. GUSSET AND STIFFENER PLATES SHALL BE 3/8" THICK MINIMUM.

3.2 INSTALLATION:

A. INSTALLATION OF STRUCTURAL STEEL SHALL COMPLY WITH AISC "CODE OF STANDARD PRACTICE".

B. STRUCTURAL FIELD WELDING SHALL BE DONE BY THE ELECTRIC SUBMERGED OR SHIELDED METAL ARC PROCESS. WELDED CONSTRUCTION SHALL COMPLY WITH AWS D1.1

C. PROVIDE TEMPORARY SHORING AND BRACING WITH CONNECTIONS OF SUFFICIENT STRENGTH TO BEAR IMPOSED LOADS. REMOVE WHEN FINAL CONNECTIONS HAVE BEEN MADE.

D. ALIGN AND ADJUST MEMBERS AS REQUIRED PRIOR TO FINAL INSPECTION.

E. INSTALL AND FULLY TENSION HIGH STRENGTH THREADED FASTENERS IN ACCORDANCE WITH RCSC, "SPECIFICATIONS FOR STRUCTURAL JOINTS" USING ASTM A 325 N OR ASTM A 490 BOLTS.

3.3 FINAL INSPECTION:

A. CLEAN ALL SURFACES UPON COMPLETION OF WORK.

B. COMPLY WITH AISC CODES AND SPECIFICATIONS, AND WITH AWS "STRUCTURAL WELDING CODE".

C. TOUCH-UP FIELD WELDS AND ABRADED AREAS AS REQUIRED.

END OF SECTION

APPLICANT / SITE OWNER

TILLMAN INFRASTRUCTURE

SITE ACQUISITION / ENGINEERING

SKYWARD LAND SERVICES, INC.

ASSOCIATED Engineering, Inc.

AE INC. Project # 6392

SITE INFORMATION

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DESIGN RECORD

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PROFESSIONAL STAMP

GAUTAM (TOM) MEDHI LICENSED 18252 KANSAS PROFESSIONAL ENGINEER

ENGINEER

Tom Medhi 04-02-2026
Tom Medhi Date
MY LICENSE RENEWAL DATE IS 04/30/2027

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF KANSAS

SHEET TITLE

SPECIFICATIONS
(3 OF 7)

SHEET NUMBER

SP-1.2

EARTH MOVING/EXCAVATION/BACKFILLING SECTION

PART 1: GENERAL

1.1 SUMMARY:

A. PROVIDE EARTHWORK OPERATIONS INCLUDING BUT NOT LIMITED TO EXCAVATION, GRADING, TRENCHING AND COMPACTION.

1.2 QUALITY ASSURANCE COMPACTION:

A. UNDER STRUCTURES, BUILDING SLABS, STEPS, PAVEMENTS, AND WALKWAYS, 95% MAXIMUM DENSITY, ASTM D 1557.

1. GRADING TOLERANCES:

a. LAWNS, UNPAVED AREAS, AND WALKS, PLUS OR MINUS 1".

b. KEEP SITE FREE FROM ANY PONDING WATER

c. GRADING TOLERANCE FOR FILL UNDER BUILDING OR EQUIPMENT SLABS: PLUS OR MINUS 1/4" MEASURED WITH 10'-0" STRAIGHTEDGE.

2. TESTING: FIELD TESTING OF EARTHWORK AND COMPACTION SHALL BE PERFORMED BY OWNER'S INDEPENDENT TESTING LAB. THIS WORK IS TO BE COORDINATED BY THE CONTRACTOR.

3. ALL WORK SHALL BE INSPECTED AND RELEASED BY THE OWNER OR HIS AGENT WHO SHALL CARRY OUT THE GENERAL INSPECTION OF THE WORK AS SPECIFIED AND/OR CALLED OUT BY THE CONSTRUCTION DOCUMENTS. PROVIDE A MINIMUM OF 48 HOURS NOTICE PRIOR TO ANY PLACEMENT OF CONCRETE OR BACKFILLING OF TRENCHES. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REQUEST TIMELY INSPECTIONS PRIOR TO PROCEEDING WITH FURTHER WORK THAT WOULD MAKE PARTS OF WORK INACCESSIBLE OR DIFFICULT TO INSPECT.

4. EXISTING UTILITIES: DO NOT INTERRUPT EXISTING UTILITIES SERVING FACILITIES OCCUPIED BY THE OWNER OR OTHERS, EXCEPT WHEN PERMITTED IN WRITING BY OWNER OR HIS AGENT AND THEN ONLY AFTER ACCEPTABLE TEMPORARY UTILITY SERVICES HAVE BEEN PROVIDED.

PART 2: PRODUCTS

2.1 GENERAL:

A. UTILITY TRENCH: PROVIDE WELL GRADED SAND (SW-SM) FROM BASE OF TRENCH TO MINIMUM ABOVE THE HIGHEST CONDUIT WITHIN TRENCH. REMAINDER OF TRENCH AREA CAN BE EITHER AB 3 OR CLEAN GRAVEL AS DESCRIBED HEREIN. COMPACT AS REQUIRED TO PREVENT SETTLING.

B. ACCESS ROADS: 6" MINIMUM (UNLESS NOTED OTHERWISE ON DRAWINGS) COMPACTED AB 3 OR APPROVED EQUAL (UNWASHED CRUSHED LIMESTONE GRAVEL CONSISTING OF MULTIPLE AGGREGATE SIZES, ROCK CHIPS, AND ROCK DUST.)

C. COMPOUND (NEW CONSTRUCTION): 2" THICK CLEAN GRAVEL, WITH 100% PASSING THROUGH A 1" SIEVE OVER 4" COMPACTED AB 3.

D. COMPOUND (EXISTING): PROVIDE CLEAN GRAVEL WITH 100% PASSING THROUGH A 1" SIEVE AS REQUIRED TO BRING COMPOUND TO PROPER GRADE OR REPAIR EXISTING DAMAGED AREAS.

E. STRUCTURAL FILL: PROVIDE 4" MINIMUM AB 3 BELOW STRUCTURES OR SLABS

2.2 MATERIALS:

A. GEOTEXTILE FABRIC: PROVIDE MIRAFI 500X OR APPROVED EQUAL.

B. PLASTIC MARKING TAPE: SHALL BE ACID AND ALKALI RESISTANT POLYETHYLENE FILM SPECIFICALLY MANUFACTURED FOR MARKING AND LOCATING UNDERGROUND UTILITIES, 6" WIDE WITH A MINIMUM THICKNESS OF 0.004". TAPE SHALL HAVE MINIMUM STRENGTH OF 1500 PSI IN BOTH DIRECTIONS AND MANUFACTURED WITH INTEGRAL WIRES OR OTHER MEANS TO ENABLE DETECTION BY A METAL DETECTOR WHEN BURIED UP TO 3'-0" DEEP. THE CORE OF THE TAPE SHALL BE ENCASED IN A PROTECTIVE JACKET OR OTHER MEANS TO PROTECT FROM CORROSION. TAPE COLOR SHALL BE RED FOR ELECTRIC UTILITIES AND ORANGE FOR TELECOMMUNICATION

PART 3: EXECUTION

3.1 INSTALLATION:

A. PRIOR TO EXCAVATING, THOROUGHLY EXAMINE AREA TO BE EXCAVATED AND/OR TRENCHED TO VERIFY THE LOCATIONS OF FEATURES ON THE DRAWINGS AND TO ASCERTAIN THE EXISTENCE OF ANY STRUCTURE NOT SHOWN THAT MIGHT INTERFERE WITH NEW CONSTRUCTION. NOTIFY THE OWNER OR HIS AGENT OF ANY OBSTRUCTIONS THAT WILL PREVENT ACCOMPLISHMENT OF THE WORK AS INDICATED ON THE DRAWINGS.

B. EXCAVATION IS UNCLASSIFIED AND INCLUDES EXCAVATION TO SUBGRADE REGARDLESS OF MATERIALS. REPAIR EXCAVATIONS BEYOND ELEVATIONS AND DIMENSIONS INDICATED AS REQUIRED.

C. MAINTAIN STABILITY OF EXCAVATIONS; COORDINATE SHORING AND BRACING AS REQUIRED BY AUTHORITIES HAVING JURISDICTION. PREVENT SURFACE AND SUBSURFACE WATER FROM ACCUMULATING IN EXCAVATIONS. STOCKPILE SATISFACTORY MATERIALS FOR REUSE, ALLOW FOR PROPER DRAINAGE.

D. COMPACT MATERIALS AT THE OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D 1557 BY AERATION OR WETTING TO 95% OF MAXIMUM DRY DENSITY TO SUITABLE DEPTH.

E. PLACE ACCEPTABLE MATERIALS IN LAYERS NOT MORE THAN 8" LOOSE DEPTH FOR MATERIALS COMPACTED BY HEAVY EQUIPMENT AND NOT MORE THAN 4" LOOSE DEPTH FOR MATERIALS COMPACTED BY HAND EQUIPMENT TO SUBGRADES INDICATED AS FOLLOWS:

1. STRUCTURAL FILL: USE UNDER FOUNDATIONS, SLABS ON GRADE IN LAYERS AS INDICATED.

2. DRAINAGE FILL: USE UNDER DESIGNATED BUILDING SLABS, AT FOUNDATION DRAINAGE AND ELSEWHERE AS INDICATED.

3. COMMON FILL: USE UNDER UNPAVED AREAS.

4. SUBBASE MATERIAL: USE UNDER GENERAL COMPOUND AREA. IF THICKNESS OF LIFT IS GREATER THAN 6 SPREAD AND COMPACT THE CRUSHED STONE IN MULTIPLE LIFTS OF EQUAL THICKNESS WITH A MAXIMUM LIFT OF 6"

F. GRADE TO 1/2" ABOVE OR BELOW REQUIRED SUBGRADE AND TO A TOLERANCE OF 1/4" IN 10'-0".

G. PROTECT NEWLY GRADED AREAS FROM TRAFFIC AND EROSION. RE-COMPACT AND RE-GRADE SETTLED, DISTURBED AND DAMAGED AREAS TO RESTORE QUALITY, APPEARANCE, AND CONDITION.

H. CONTROL EROSION TO PREVENT RUNOFF INTO SEWERS OR DAMAGE TO AREAS.

I. CONTROL DUST TO PREVENT HAZARDS TO ADJACENT PROPERTIES AND VEHICLES. IMMEDIATELY REPAIR OR REMEDY DAMAGE CAUSED BY DUST INCLUDING AIR FILTERS IN EQUIPMENT AND VEHICLES. CLEAN SOILED SURFACES.

J. DISPOSE OF WASTE AND UNSUITABLE MATERIALS OFF-SITE IN A LEGAL MANNER.

3.2 BACKFILL:

A. AS SOON AS PRACTICAL AFTER COMPLETING CONSTRUCTION OF THE RELATED STRUCTURE, INCLUDING THE SPECIFIED MINIMUM CURING PERIOD FOR CAST-IN-PLACE CONCRETE, BACKFILL THE EXCAVATION WITH APPROVED MATERIAL TO RESTORE THE REQUIRED FINISHED GRADE.

1. PRIOR TO PLACING BACKFILL AROUND STRUCTURES, ALL FORMS SHALL HAVE BEEN REMOVED AND THE EXCAVATION CLEANED OF ALL TRASH, DEBRIS, AND UNSUITABLE MATERIALS.

2. BACKFILL BY PLACING AND COMPACTING SUITABLE BACKFILL MATERIAL OR SELECT GRANULAR BACKFILL MATERIAL, WHEN REQUIRED IN UNIFORM HORIZONTAL LAYERS OF NO GREATER THAN 8" LOOSE THICKNESS. WHERE HAND OPERATED COMPACTORS ARE USED, THE FILL MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 4" IN LOOSE DEPTH.

3. IF THE DENSITY TESTING INDICATES THAT THE SPECIFIED DENSITY, THE SUCCEEDING LAYER SHALL NOT BE PLACED UNTIL THE SPECIFICATION REQUIREMENTS ARE MET UNLESS AUTHORIZED BY THE GEO-TECHNICAL ENGINEER. THE CONTRACTOR SHALL TAKE WHATEVER APPROPRIATE ACTION IS NECESSARY TO OBTAIN PROPER COMPACTION.

B. COMPACT EACH LAYER OF BACKFILL TO A MINIMUM OF 95% OF THE MAXIMUM DRY DENSITY AS PROVIDED BY THE STANDARD PROCTOR TEST, ASTM D 698.

3.3 TRENCH EXCAVATION:

A. UTILITY TRENCHES SHALL BE EXCAVATED TO THE LINES AND GRADES SHOWN ON THE DRAWINGS OR AS DIRECTED BY THE OWNER OR HIS AGENT. PROVIDE SHORING, SHEETING AND BRACING AS REQUIRED TO PREVENT CAVING OR SLOUGHING OF THE TRENCH WALLS.

B. EXTEND THE TRENCH WIDTH A MINIMUM OF 6" BEYOND THE OUTSIDE EDGE OF THE OUTER-MOST CONDUIT.

C. WHEN SOFT, YIELDING, OR OTHERWISE UNSTABLE SOIL CONDITIONS ARE ENCOUNTERED, BACKFILL AT THE REQUIRED TRENCH TO A DEPTH OF NO LESS THAN 12" BELOW THE REQUIRED ELEVATION AND BACKFILL WITH GRANULAR BEDDING MATERIAL.

3.4 TRENCH BACKFILL:

A. PROVIDE GRANULAR BEDDING MATERIAL (WELL GRADED SAND) IN ACCORDANCE WITH THE DRAWINGS AND THE UTILITY REQUIREMENTS.

B. NOTIFY THE OWNER OR HIS AGENT 24 HOURS IN ADVANCE OF BACKFILLING.

C. CONDUCT UTILITY CHECK TESTS BEFORE BACKFILLING. BACKFILL AND COMPACT TRENCH BEFORE ACCEPTANCE TESTING.

D. PLACE GRANULAR TRENCH BACKFILL UNIFORMLY ON BOTH SIDES OF THE CONDUITS IN 6" UNCOMPACTED LIFTS UNTIL 6" OVER THE CONDUITS. SOLIDLY RAM AND TAMP BACKFILL INTO SPACES AROUND CONDUITS.

E. PROTECT CONDUIT FROM LATERAL MOVEMENT, IMPACT DAMAGE, OR UNBALANCED LOADING.

F. ABOVE THE CONDUIT EMBEDMENT ZONE, PLACE AND COMPACT BACKFILL MATERIAL IN 8" MAXIMUM LOOSE THICKNESS LIFTS TO RESTORE THE REQUIRED FINISHED SURFACE GRADE.

G. COMPACT FINAL TRENCH BACKFILL TO A DENSITY EQUAL TO OR GREATER THAN EXISTING UNDISTURBED MATERIAL ADJACENT TO THE TRENCH BUT NO LESS THAN A MINIMUM OF 95% OF THE MAXIMUM DRY DENSITY AS PROVIDED BY THE STANDARD PROCTOR TEST, ASTM D 698.

3.5 AGGREGATE ACCESS ROAD (IF APPLICABLE):

A. CLEAR, GRUB, STRIP AND EXCAVATE FOR ACCESS ROAD TO THE LINES AND GRADES INDICATED ON DRAWINGS. SCARIFY TO A DEPTH OF 6" AND PROOF-ROLL ALL HOLES, RUTS, SOFT PLACES AND OTHER DEFECTS.

B. THE ENTIRE SUBGRADE SHALL BE COMPACTED TO NOT LESS THAN 95% OF THE MAXIMUM DRY DENSITY AS PROVIDED BY THE STANDARD PROCTOR TEST, ASTM D 1557.

C. AFTER PREPARATION OF THE SUBGRADE IS COMPLETE, THE GEOTEXTILE FABRIC (MIRAFI 500X) SHALL BE INSTALLED TO THE LIMITS INDICATED ON DRAWINGS BY ROLLING THE FABRIC OUT LONGITUDINALLY ALONG ROADWAY. THE FABRIC SHALL NOT BE DRAGGED ACROSS THE SUBGRADE. PLACE THE ENTIRE ROLL IN A SINGLE OPERATION, AS SMOOTHLY AS POSSIBLE.

1. OVERLAPS PARALLEL TO THE ROADWAY WILL BE PERMITTED AT THE CENTERLINE AND AT LOCATIONS BEYOND THE ROADWAY SURFACE WIDTH. NO LONGITUDINAL OVERLAPS SHALL BE LOCATED BETWEEN THE CENTERLINE AND THE SHOULDER. PARALLEL OVERLAPS SHALL BE A MINIMUM OF 3'-0" WIDE.

2. TRANSVERSE OR PERPENDICULAR OVERLAPS AT THE END OF A ROLL SHALL OVERLAP IN THE DIRECTION OF THE AGGREGATE PLACEMENT (PREVIOUS ROLL ON TOP) AND SHALL HAVE A MINIMUM LENGTH OF 3'-0".

3. ALL OVERLAPS SHALL BE PINNED WITH STAPLES OR NAILS BETWEEN 10" AND 12" LONG TO INSURE POSITIONING DURING PLACEMENT OF AGGREGATE. PIN LONGITUDINAL SEAMS AT 25'-0" O.C. AND TRANSVERSE SEAMS EVERY 5'-0" O.C.

D. THE AGGREGATE BASE AND SURFACE COURSES SHALL BE CONSTRUCTED IN LAYERS NOT MORE THAN 6" (COMPACTED) THICKNESS. AGGREGATE TO BE PLACED ON GEOTEXTILE FABRIC AND SHALL BE END-DUMPED ON THE FABRIC FROM THE FREE END OF THE FABRIC OR OVER PREVIOUSLY PLACED AGGREGATE. AT NO TIME SHALL EQUIPMENT BE PERMITTED ON THE ROADWAY WITH LESS THAN 6" OF MATERIAL COVERING THE FABRIC.

E. THE AGGREGATE SHALL BE IMMEDIATELY COMPACTED TO NOT LESS THAN 95% OF THE MAXIMUM DRY DENSITY AS PROVIDED BY THE PROCTOR TEST, ASTM D 1557 WITH A TAMPING ROLLER, A PNEUMATIC-TIRED ROLLER, OR WITH A VIBRATORY MACHINE OR ANY COMBINATION OF THE ABOVE. THE TOP LAYER SHALL BE GIVEN A FINAL ROLLING WITH A THREE-WHEEL OR TANDEM ROLLER.

3.6 FINISH GRADING:

A. PERFORM ALL GRADING TO PROVIDE SMOOTH, EVEN SURFACE DRAINAGE OF THE ENTIRE AREA WITHIN THE LIMITS OF CONSTRUCTION. GRADING SHALL BE COMPATIBLE WITH ALL SURROUNDING TOPOGRAPHY AND STRUCTURES.

B. UTILIZE SATISFACTORY FILL MATERIALS RESULTING FROM THE EXCAVATION WORK IN THE CONSTRUCTION OF FILLS, EMBANKMENTS AND FOR THE REPLACEMENT OF REMOVED UNSUITABLE MATERIALS.

C. ACHIEVE FINISHED GRADE BY PLACING A MINIMUM OF 6" OF AB 3 ON TOP OF SOIL STABILIZER FABRIC.

D. REPAIR ALL ACCESS ROADS AND SURROUNDING AREAS USED DURING THE COURSE OF THIS WORK TO THEIR ORIGINAL CONDITION.

E. A MINIMUM OF 2% SLOPE SHALL BE PROVIDED TO ENSURE POSITIVE DRAINAGE.

F. FINAL RESTORATION SHALL BE COMPLETED PRIOR TO CLOSEOUT, PROVIDING 6" OF TOPSOIL RAKED TO A UNIFORM SURFACE.

END OF SECTION

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APPLICANT/ SITE OWNER

TILLMAN INFRASTRUCTURE

SITE ACQUISITION /ENGINEERING

SKYWARD LAND SERVICES, INC.

ASSOCIATED Engineering, Inc.

AE INC. Project # 6392

SITE INFORMATION

TONGANOXIE_ KS

TI-OPP-37632
RELO SITE FA# 10008273

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PARCEL ID:
052-198-34-0-00-00-006.00-0
CANDIDATE: A

DESIGN RECORD

REV	DATE	DESCRIPTION	BY
A	04/02/26	FINAL DRAWINGS	JMV

PROFESSIONAL STAMP

GAUTAM (TOM) MEDHI LICENSED 18252 KANSAS PROFESSIONAL ENGINEER

ENGINEER

Tom Medhi 04-02-2026
Tom Medhi Date
MY LICENSE RENEWAL DATE IS 04/30/2027

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF KANSAS

SHEET TITLE

SPECIFICATIONS
(4 OF 7)

SHEET NUMBER

SP-1.3

FENCES AND GATES

PART 1: GENERAL

1.1 SUMMARY:

A. PROVIDE FENCING AND GATES INCLUDING ALL ASSOCIATED POSTS, RAILS, BRACES, TERMINAL POSTS, AND RELATED MATERIALS AS SHOWN ON DRAWINGS (PER TILLMAN FENCE DESIGN STANDARDS).

1. TYPE A: GALVANIZED CHAIN LINK FENCING AND GATES
2. TYPE B: GALVANIZED CHAIN LINK FENCING AND GATES WITH BARBED WIRE
3. TYPE C: TREATED WOOD FENCING AND GATES
4. MATCH EXISTING FENCE

B. TERMINOLOGY:

1. CHAIN LINK CLASSIFICATION: GALVANIZED (ZINC COATED).
2. TREATED LUMBER: TREATED LUMBER SHALL BE "ACQ" OR APPROVED EQUAL. CCA WILL NOT BE ACCEPTED.
3. O.D.: OUTSIDE DIMENSION

1.2 QUALITY ASSURANCE:

A. COMPLY WITH GOVERNING CODES AND REGULATIONS.

B. PROVIDE PRODUCTS OF ACCEPTABLE MANUFACTURERS, WHICH HAVE BEEN IN SATISFACTORY USE IN SIMILAR SERVICE FOR THREE YEARS. USE EXPERIENCED INSTALLERS.

1.3 SCHEDULING AND SEQUENCING:

A. CERTAIN PORTIONS OF THE WORK MAY BE SPECIFIED TO BE COMPLETED AND OPERATIONAL PRIOR TO COMPLETION OF ALL WORK. SEQUENCE AND PROPERLY PROTECT EQUIPMENT TO PREVENT CONTAMINATION OR DAMAGE TO EQUIPMENT IN ADJACENT WORK AREAS.

B. STORAGE AND PROTECTION: STORE MATERIALS A MINIMUM OF 12" ABOVE GROUND.

PART 2A: PRODUCTS – CHAIN LINK FENCES AND GATES

2A.1 PRODUCTS:

A. FENCE FABRIC, POSTS, TENSION WIRE, CORNER POSTS, AND APPURTENANCES SHALL CONFORM TO THE ASTM CODES AND STANDARDS FOR THE APPROPRIATE TYPE OF MATERIALS AS LISTED.

B. MATERIALS SHALL BE UNIFORM, CONSISTENT, AND MEET THE FOLLOWING REQUIREMENTS.

1. FENCE FABRIC: 6'–0" HIGH (UNLESS NOTED OTHERWISE), HEAVY GALVANIZED CHAIN LINK FENCE CONFORMING TO ASTM A392, CLASS 2, OF 2" MESH 9 GAGE WIRE (0.148" DIAMETER), WITH THE TOP TWISTED AND BARBED AND THE BOTTOM KNUCKLED.
2. LINE POSTS: FOR FABRIC UP TO AND INCLUDING 6'–0" IN HEIGHT, LINE POSTS SHALL BE GALVANIZED SCHEDULE 40 PIPE WITH 2.375" O.D. FOR FABRIC MORE THAN 8'–0" HIGH (IF REQUIRED TO MATCH EXISTING OR UNUSUAL SITE CONDITIONS), LINE POSTS SHALL BE GALVANIZED SCHEDULE 40 PIPE WITH 2.375" O.D COMPLY WITH ASTM F 1083.3.
3. END, CORNER, AND PULL POSTS: 3.5" O.D. GALVANIZED SCHEDULE 40 PIPE UP TO 6'–0" AND 3.55" O.D. FOR FENCES OVER 6'–0". COMPLY WITH ASTM F 1083. EXTEND POSTS 1'–0" INCLUDED THE METAL DOME CAP TO PROVIDE FOR ATTACHMENT OF THE BARBED WIRE.
4. GATE POSTS: GALVANIZED SCHEDULE 40 PIPE WITH 4.5" O.D. COMPLY WITH ASTM F 1083. EXTEND POSTS 1'–0" INCLUDED THE METAL DOME CAP TO PROVIDE FOR ATTACHMENT OF THE BARBED WIRE.
5. BRACE RODS (LOCATED ON EACH SIDE OF GATES AND EACH SIDE AT CORNERS): 1.625" O.D. GALVANIZED SCHEDULE 40.
6. TRUSS RODS/CROSS BRACING: ALL CORNER AND END PANELS SHALL HAVE A 3/8" TRUSS ROD WITH TURNBUCKLES AND BE BRACED WITH1–5/8" HORIZONTAL COMPRESSION MEMBERS, SECURELY ATTACHED WITH IRON FITTINGS.
7. TENSION WIRE: 7 GA. US STEEL WIRE GALVANIZED PER ASTM A116 COATING CLASS III ATTACHED 1" BELOW TOP SELVAGE AND 2'–0" ABOVE BOTTOM SELVAGE OF FABRIC BY MEANS OF BENT CLIPS ANT THE CORNER AND GATE POST. USE 6"X½" EYEBOLTS TO HOLD TENSION WIRE AT LINE POST.
8. APPURTENANCES SUCH AS BRACE BANDS, TENSION BANDS AND BARS: FABRICATED OF 1/8" BY 7/8" GALVANIZED STEEL WITH GALVANIZED STEEL CARRIAGE BOLTS AND NUTS PER ASTM A123. TENSION BARS SHALL BE 1/4" BY 3/4" GALVANIZED STEEL BAR PER ASTM A153.
9. FABRIC TIES: CLASS I GALVANIZED STEEL WIRE NO LESS THAN 9 GA.
10. POST TOPS: PROVIDED FOR EACH POST. MATERIALS SHALL BE PRESSED STEEL OR MALLEABLE IRON THAT PROVIDES WATERTIGHT CLOSURE CAP FOR TUBULAR POSTS AND SHALL BE GALVANIZED PER ASTM A153.
11. BARBED WIRE: BARBED WIRE SHALL CONSIST OF DOUBLE STRANDED, 12 GAUGE O.C. THE TOP 1'–0" WIRE ASTM A121, CLASS 3 WITH 14–GAUGE 4 POINT BARBS SPACED 5" OFF THE FENCE, SHALL CONSIST OF 3 STRANDS OF BARBED WIRE ATTACHED TO A 45 DEGREE ANGLE WITH HEAVY PRESSED ARMS CAPABLE OF WITHSTANDING, WITHOUT FAILURE 250 POUNDS DOWNWARD PULL AT THE OUTERMOST END OF THE ARM.
12. GATES
    a. GATE MATERIALS SUCH AS FABRIC, BOLTS, NUTS, AND TENSION BARS, SHALL BE CONSISTENT WITH FENCE MATERIALS. GATES SHALL CONSIST OF BOTH SINGLE AND DOUBLE SWING GATES AS SHOWN ON THE DRAWINGS.
    b. GATES SHALL BE MANUALLY OPERATED.
    c. GATE FRAMES SHALL BE FULLY WELDED AND HAVE A FULL HEIGHT VERTICAL BRACE AND A FULL WIDTH HORIZONTAL BRACE
    d. HINGES SHALL BE A MINIMUM OF 200 DEGREES WITH A HINGE ADAPTER.
    e. LATCHES, STOPS, AND KEEPERS SHALL BE PROVIDED FOR ALL GATES
    f. THE GUIDE LATCH ASSEMBLY SHALL BE TAMPER PROOF
    g. ALL STOPS AND DOUBLE GATES SHALL HAVE A FULL HEIGHT PLUNGE BAR WITH A METAL DOME CAP

PART 2B PRODUCTS: WOOD FENCES AND GATES

2B.1 PRODUCTS:

A. FENCE MATERIALS, INCLUDING POSTS, RAILS, CORNER POSTS, AND PICKETS SHALL BE AS FOLLOWS:

1. END CORNER, AND PULL POSTS 8'–0" HIGH OR LESS SHALL BE 3 1/2" NPS SCHEDULE 40 GALVANIZED STEEL PIPE PER ASTM A120. (OUTSIDE DIAMETER OF 3.5"). GATE POSTS 8'–0" HIGH OR LESS SHALL BE 4 1/2" NPS SCHEDULE 40 GALVANIZED STEEL PIPE PER ASTM A120. (OUTSIDE DIAMETER OF 4.5").
2. LINE POSTS UP TO 8'–0" HIGH, SHALL BE 2" NPS GALVANIZED COLD–FORMED AND WELDED STEEL PIPE COMPLYING WITH ASTM F 1043 WITH AN OUTSIDE DIAMETER OF 2.375" OR PER ASTM A120.
3. TOP, MIDDLE, AND BOTTOM RAILS SHALL BE 2'–0" x 4" TREATED LUMBER
4. PICKETS SHALL BE 1" x 6" TREATED LUMBER

B. TREATED LUMBER

1. ALL ABOVE GROUND MATERIALS SHALL BE TREATED WITH A MINIMUM OF .25 POUNDS OF PRESERVATIVE PER CUBIC FOOT OF MATERIAL.
2. TREATMENT FOR LUMBER SHALL BE APPROVED BY ALL GOVERNING BODIES.

C. GATES:

1. MANUALLY OPERATED WOOD GATES SHALL BE CONSTRUCTED WITH STEEL FRAME AND WOOD PICKETS. GATES SHALL BE SINGLE OR DOUBLE SWING AS INDICATED ON DRAWINGS.

D. PIPE GRIP TIES: PROVIDE PIPE GRIP TIES OF RECOMMENDED SIZE FOR USE WITH STEEL POSTS SIMPSON PGT'S. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.

PART 3: EXECUTION

3.1 INSTALLATION:

A. PHYSICAL LOCATIONS OF FEATURES SUCH AS FENCE LINES, GATES, TERMINAL POSTS SHALL BE PER THE PLANS.

B. INSTALL MATERIALS PER MANUFACTURER'S INSTRUCTIONS. COMPLY WITH ASTM F 567 FOR CHAIN LINK FENCES AND F 537 FOR WOOD FENCES. INSTALL MATERIALS WITH UNIFORM APPEARANCE. COORDINATE WITH OTHER SECTIONS.

C. PROVIDE A REASONABLY SMOOTH PROFILE AT FENCE LINE. BOTTOM OF FENCE SHALL NOT BE MORE THAN 2" ABOVE FINISHED GRADE. IF FENCE CROSSES EXTREME GRADE DEPRESSION, CONFORM THE FENCE TO THE GROUND CONTOUR, UNLESS NOTED OTHERWISE. CLOSE SPACE BELOW THE BOTTOM OF THE FENCE WITH ADDITIONAL FENCE MATERIALS WHILE MAINTAINING A UNIFORM TOP.

D. POST SPACING AND INSTALLATION

1. INSTALL LINE POSTS AND BRACE AT INTERVALS NOT TO EXCEED 10'–0" (8'–0" FOR WOOD FENCES). POSTS SHALL BE EVENLY SPACED. LOCATE CORNER AND TERMINAL POSTS PER DRAWINGS. INSTALL CORNER POSTS WHERE CHANGES IN GRADE EXCEED 30 DEGREES.
2. SET POSTS VERTICALLY IN CYLINDRICAL CONCRETE FOUNDATION PER THE SCHEDULE IN TABLE 1 AND IN ACCORDANCE WITH ASTM F567.

TABLE 1: LINE, TERMINAL, AND GATE POST INSTALLATION SCHEDULE

	FOUNDATION DIAMETER	FOUNDATION DEPTH	POST EMBEDMENT
LINE POST	0'–10"	3'–6"	3'–0"
TERMINAL POST	1'–0"	3'–6"	3'–0"
GATE POSTS	1'–6"	4'–0"	3'–6"

3. TOP SURFACE OF THE CONCRETE FOUNDATION SHALL BE SMOOTH 1/2" CROWN, SLOPING AWAY FROM THE POST AND BE A MINIMUM OF 4" BELOW GRADE. THE POST SHALL BE 6" FROM THE BOTTOM OF THE CONCRETE POUR.
4. HOLES MAY BE HAND AUGURED OR DRILLED. IF ROCK IS ENCOUNTERED, DRILL MIN. 12" FOR LINE POSTS AND 18" FOR CORNER, GATE, OR TERMINAL POSTS. DRILL HOLES 1" LARGER THAN SIZES IN TABLE 1. IF SOLID ROCK IS BELOW SOIL OVERBURDEN, DRILL TO FULL DEPTH REQUIRED, EXCEPT PENETRATION INTO ROCK NEED NOT EXCEED MINIMUM DEPTHS SPECIFIED.

E. SETTING POSTS

1. REMOVE ANY LOOSE AND FOREIGN MATERIALS FROM THE SIDES AND BOTTOMS OF THE HOLES; MOISTEN SOIL PRIOR TO PLACING THE CONCRETE. CENTER AND ALIGN POSTS, TAMP TO CONSOLIDATE, AND SECURE UNTIL CONCRETE IS FULLY CURED. POSTS SHALL HAVE A MINIMUM OF 6"OF CONCRETE UNDER THE LOWER MOST PORTION.
2. KEEP CONCRETE SURFACES MOIST FOR AT LEAST 7 DAYS AFTER PLACEMENT.
3. POSTS SET IN SLEEVED HOLES SHALL BE GROUTED IN PLACE USING A NON–SHRINK PORTLAND CEMENT GROUT APPROVED BY THE ENGINEER.
4. PRIOR TO PLACING COMPONENTS SUCH AS FABRIC, RAILS, TENSION WIRE, AND GATES, VERIFY THAT THE CONCRETE HAS REACHED AT LEAST 75% OF ITS DESIGN STRENGTH AS PRESCRIBED ON THE PLAN DETAILS, OR HAS CURED A MINIMUM OF 7 DAYS AFTER SETTING THE POSTS.
5. ALL POST SHALL HAVE AN MINIMUM OF 6" OF CONCRETE UNDER THE LOWER MOST PART.

F. BRACING (CHAIN LINK FENCE ONLY)

1. INSTALL TENSION WIRES PARALLEL TO THE LINE OF FABRIC BY WEAVING NO LESS THAN 7 GA. WIRE OF THE APPROPRIATE TYPE THROUGH FABRIC AND TYING TO EACH POST. INSTALL TENSION WIRE BEFORE STRETCHING FABRIC.
2. INSTALL HORIZONTAL PIPE BRACE AT MID–HEIGHT ON EACH SIDE OF TERMINAL POSTS. FIRMLY ATTACH WITH FITTINGS. INSTALL DIAGONAL TRUSS RODS AT THESE POINTS. ADJUST TRUSS ROD, ENSURING POSTS REMAIN PLUMB.

G. INSTALLING FABRIC (CHAIN LINK FENCE ONLY)

1. INSTALL THE CHAIN LINK FENCE FABRIC SO THAT THE POSTS ARE ENCLOSED. STRETCH THE FABRIC TAUT, APPROXIMATELY 2" ABOVE THE GROUND, AND SECURELY TO THE POSTS.
2. CUT FABRIC AND ATTACH EACH SPAN INDEPENDENTLY AT ALL TERMINAL AND CORNER POSTS. USE STRETCHER BARS WITH FABRIC BANDS SPACED AT MAX. 5" INTERVALS TO FASTEN FABRIC TO TERMINAL POSTS. USE TIE WIRE, METAL BANDS, OR OTHER APPROVED MATERIAL ATTACHED AT MAXIMUM 15" INTERVALS TO FASTEN FABRIC TO LINE POSTS, TOP RAIL OR BOTTOM TENSION WIRE.

H. INSTALLING GATES

1. INSTALL GATES ACCORDING TO THE LOCATIONS, TYPE, AND SIZE INDICATED ON THE PLANS.
2. GATES SHALL BE BRACED AND TRUSSED TO PREVENT SAGGING, BUCKLING, AND WEAVING, AND COVERED WITH SAME FABRIC AS THE FENCE, UNLESS NOTED OTHERWISE. FIXED END RATCHET BANDS SHALL BE FURNISHED FOR FASTENING. FURNISH GATES WITH ALL FITTINGS AND HARDWARE REQUIRED. HEAVY DUTY COMMERCIAL LATCHES PROVIDED FOR USE WITH PADLOCK AND HINGES SHALL ALLOW 180 DEGREE SWING. PROVIDE 3/8" DIAMETER CROSSBRACING.
3. INSTALL GATES PLUMB, LEVEL, AND SECURE FOR THE FULL OPENING WITHOUT INTERFERENCES
4. INSTALL ALL ITEMS PER MANUFACTURER'S RECOMMENDATIONS. INSPECT ALL PARTS AND ATTACHMENTS FOR DEFECTS, AND INSTALL, LUBRICATE, AND ADJUST EQUIPMENT TO ENSURE SMOOTH OPERATION.
5. INSTALL (WELD TO GATE FRAME) (2) 9" SECTIONS (ONE PER GATE) OF 3/8" NOMINAL WELDED, GRADE 30 MINIMUM GALVANIZED STEEL CHAIN JUST BELOW LATCH FOR PADLOCKS. VERIFY INSIDE DIMENSIONS OF CHAIN LINK WILL RECEIVE STANDARD PADLOCKS.

I. MISCELLANEOUS INSTALLATION (CHAIN LINK FENCE)

1. USE U–SHAPED TIE WIRES, CONFORMING TO THE DIAMETERS OF PIPE, THAT CLASP THE PIPE AND FABRIC FIRMLY WITH ENDS TWISTED AT LEAST 2 FULL TURNS.
2. INSTALL NUTS FOR FASTENERS ON TENSION BANDS AND HARDWARE BOLTS ON THE SIDE OF THE FENCE OPPOSITE THE FABRIC. THE ENDS OF BOLTS, ONCE SECURE AND CHECKED FOR SMOOTH OPERATION, SHALL BE PEENED TO PREVENT REMOVAL OF NUTS.

3.2 PROTECTION:

A. A GUARANTEE SHALL BE FURNISHED FOR ALL MATERIALS, INSTALLATION, AND WORKMANSHIP TO BE FREE OF DEFECTS FOR A PERIOD OF 1 YEAR FROM THE DATE OF ACCEPTANCE UNLESS NOTED OTHERWISE IN THE CONTRACT DOCUMENTS. ANY DEFECT IN INSTALLATION OR WORKMANSHIP SHALL BE REPAIRED, AND/OR REPLACED WITHOUT COST TO THE OWNER.

B. REPAIR COATINGS DAMAGED IN THE FIELD AS RECOMMENDED BY THE MANUFACTURER.

END OF SECTION

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TILLMAN INFRASTRUCTURE

SITE ACQUISITION /ENGINEERING

SKYWARD LAND SERVICES, INC.

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PROFESSIONAL STAMP

GAUTAM (TOM) MEDHI
LICENSED
18252
KANSAS
PROFESSIONAL ENGINEER

ENGINEER

Tom Medhi 04-02-2026
Tom Medhi Date
MY LICENSE RENEWAL DATE IS 04/30/2027

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF KANSAS

SHEET TITLE

SPECIFICATIONS
(5 OF 7)

SHEET NUMBER

SP-1.4

87

ELECTRICAL

PART 1: GENERAL

1.1 GENERAL CONDITIONS:

A. THE CONTRACTOR SHALL INSPECT THE SITE WHERE THIS WORK IS TO BE PERFORMED AND FULLY FAMILIARIZE HIMSELF WITH ALL CONDITIONS RELATED TO THIS PROJECT.

B. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS AND LICENSES AND SHALL MAKE ALL DEPOSITS AND PAY ALL FEES REQUIRED FOR THE PERFORMANCE OF WORK UNDER THIS SECTION.

C. DRAWINGS SHOW THE GENERAL ARRANGEMENT OF ALL SYSTEMS AND COMPONENTS COVERED UNDER THIS SECTION. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS. DRAWINGS SHALL NOT BE SCALED TO DETERMINE DIMENSIONS.

1.2 LAWS, REGULATIONS, ORDINANCES, STATUTES AND CODES:

A. ALL WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, AND ALL APPLICABLE LOCAL LAWS, REGULATIONS, ORDINANCES, STATUTES AND CODES.

1.3 REFERENCES:

A. THE PUBLICATIONS LISTED BELOW FORM PART OF THIS SPECIFICATION. EACH PUBLICATION SHALL BE THE LATEST REVISION AND ADDENDUM IN EFFECT ON THE DATE THIS SPECIFICATION IS ISSUED FOR CONSTRUCTION UNLESS NOTED OTHERWISE. EXCEPT AS MODIFIED BY THE REQUIREMENTS SPECIFIED HEREIN OR THE DETAILS OF THE DRAWINGS, WORK INCLUDED IN THIS SPECIFICATION SHALL CONFORM TO THE APPLICABLE PROVISIONS OF THESE PUBLICATIONS.

1. NEC (NATIONAL ELECTRICAL CODE)
2. ANSI/IEEE (AMERICAN NATIONAL STANDARDS INSTITUTE)
3. IEEE (INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS)
4. ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIALS)
5. ICEA (INSULATED CABLE ENGINEERS ASSOCIATION)
6. NEMA (NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION)
7. NFPA (NATIONAL FIRE PROTECTION ASSOCIATION)
8. OSHA (OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION)
9. UL (UNDERWRITERS LABORATORIES, INC.)

1.4 SCOPE OF WORK:

A. WORK UNDER THIS SECTION SHALL CONSIST OF FURNISHING ALL LABOR, MATERIAL AND ASSOCIATED SERVICES REQUIRED TO COMPLETELY CONSTRUCT AND LEAVE READY FOR OPERATION SYSTEMS AS SHOWN ON THE DRAWINGS AND HEREIN DESCRIBED.

B. ALL ELECTRICAL EQUIPMENT UNDER THIS CONTRACT SHALL BE PROPERLY TESTED, ADJUSTED, AND ALIGNED BY THE CONTRACTOR.

C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXCAVATING, DRAINING, TRENCHES, BACKFILLING, AND REMOVAL OF EXCESS DIRT.

D. THE CONTRACTOR SHALL FURNISH TO THE OWNER, CERTIFICATES OF FINAL INSPECTION AND APPROVAL FROM THE INSPECTION AUTHORITIES HAVING JURISDICTION.

PART 2: PRODUCTS

2.1 GENERAL:

A. ALL ITEMS OF MATERIALS AND EQUIPMENT SHALL BE NEW, FREE FROM DEFECTS AND OF THE BEST QUALITY NORMALLY USED FOR THE PURPOSE IN GOOD COMMERCIAL PRACTICE.

B. ALL MATERIALS AND EQUIPMENT SHALL BE ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION AS SUITABLE FOR THE USE INTENDED.

C. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE.

D. ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING RATING EQUAL TO OR GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 10,000 AIC MINIMUM. VERIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT.

2.2 MATERIALS AND EQUIPMENT:

A. CONDUIT:

1. RIGID GALVANIZED STEEL CONDUIT (RGS) SHALL BE HOT-DIP GALVANIZED INSIDE AND OUTSIDE INCLUDING ENDS AND THREADS AND ENAMELED OR LACQUERED INSIDE IN ADDITION TO GALVANIZING.
2. FLEXIBLE METAL CONDUIT SHALL BE GALVANIZED, ZINC-COATED STEEL, PVC COATED FOR OUTDOOR APPLICATIONS.
3. CONDUIT CLAMPS, STRAPS AND SUPPORTS SHALL BE STEEL OR MALLEABLE IRON. ALL FITTINGS SHALL BE COMPRESSION TYPE AND WATERTIGHT.
4. NON-METALLIC CONDUIT AND FITTINGS SHALL BE SCHEDULE 40 PVC, HEAVY-WALL RIGID WITH SOLVENT-CEMENT-TYPE JOINTS AS RECOMMENDED BY THE MANUFACTURER.

B. WIRE AND CABLE:

1. WIRE AND CABLE SHALL BE FLAME-RETARDANT, MOISTURE AND HEAT RESISTANT THERMOPLASTIC, SINGLE CONDUCTOR, COPPER, TYPE THHN/THWN, 600 VOLT, SIZES AS INDICATED, #12 AWG MINIMUM.
2. #10 AWG AND SMALLER CONDUCTORS SHALL BE SOLID AND #8 AWG AND LARGER CONDUCTORS SHALL BE STRANDED.
3. SOLDERLESS, PRESSURE-TYPE CONNECTORS CONSTRUCTED OF HIGH-STRENGTH, NON-CORRODIBLE, TIN-PLATED COPPER DESIGNED TO FURNISH HIGH-PULLOUT STRENGTH AND HIGH CONDUCTIVITY JOINTS SHALL BE USED.
4. SUPPORT GRIPS SHALL BE SINGLE WEAVE, CLOSED MESH, HIGH-GRADE, NON-MAGNETIC, TIN-COATED BRONZE CAPABLE OF SUPPORTING TEN TIMES THE CABLE DEAD WEIGHT, HUBBELL KELLEMS OR APPROVED EQUAL.

C. DISCONNECT SWITCHES:

1. DISCONNECT SWITCHES SHALL BE HEAVY DUTY, DEAD-FRONT, QUICK-MAKE, QUICK-BREAK, EXTERNALLY OPERABLE, HANDLE LOCKABLE AND INTERLOCKED WITH COVER IN CLOSED POSITION, RATING AS INDICATED, UL LABELED FURNISHED IN NEMA 3R ENCLOSURE, SQUARE D CLASS 3110 OR APPROVED EQUAL.

D. SYSTEM GROUNDING:

1. GROUNDING CONDUCTOR SHALL BE SOLID TINNED BARE COPPER, SIZE AS INDICATED, EXCEPT ABOVE GROUND GROUNDING CONDUCTORS SHALL BE STRANDED INSULATED.
2. GROUND BUSSES SHALL BE GALVANIZED STEEL BARS OF RECTANGULAR CROSS SECTION.
3. CONNECTORS SHALL BE HIGH-CONDUCTIVITY, HEAVY DUTY, LISTED AND LABELED AS GROUNDING CONNECTORS FOR THE MATERIALS USED. USE TWO-HOLE COMPRESSION LUGS WITH HEAT SHRINK FOR MECHANICAL CONNECTIONS.
4. EXOTHERMIC WELDED CONNECTIONS SHALL BE PROVIDED IN KIT FORM AND SELECTED FOR THE SPECIFIC TYPES, SIZES, AND COMBINATIONS OF CONDUCTORS AND OTHER ITEMS TO BE CONNECTED.
5. GROUND RODS SHALL BE COPPER-CLAD STEEL WITH HIGH-STRENGTH STEEL CORE AND ELECTROLYTIC-GRADE COPPER OUTER SHEATH, MOLTEN WELDED TO CORE, 3/4" x 10'-0".

E. OTHER MATERIALS:

1. THE CONTRACTOR SHALL PROVIDE OTHER MATERIALS, THOUGH NOT SPECIFICALLY DESCRIBED, WHICH ARE REQUIRED FOR A COMPLETELY OPERATIONAL SYSTEM AND PROPER INSTALLATION OF THE WORK.

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APPLICANT/ SITE OWNER

TILLMAN INFRASTRUCTURE

SITE ACQUISITION /ENGINEERING

SKYWARD LAND SERVICES, INC.

ASSOCIATED Engineering, Inc.
AE INC. Project # 6392

SITE INFORMATION

TONGANOXIE_ KS

TI-OPP-37632
RELO SITE FA# 10008273

15076 214TH St.
TONGANOXIE, KS 66086
LEAVENWORTH COUNTY

PARCEL ID:
052-198-34-0-00-00-006.00-0
CANDIDATE: A

DESIGN RECORD

REV	DATE	DESCRIPTION	BY
A	04/02/26	FINAL DRAWINGS	JMV

PROFESSIONAL STAMP

GAUTAM (TOM) MEDHI
LICENSED
18252
KANSAS
PROFESSIONAL ENGINEER

ENGINEER

Tom Medhi 04-02-2026
Tom Medhi Date
MY LICENSE RENEWAL DATE IS 04/30/2027

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF KANSAS

SHEET TITLE

SPECIFICATIONS
(6 OF 7)

SHEET NUMBER

SP-2.0

PART 3: EXECUTION

3.1 GENERAL:

A. ALL MATERIALS AND EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

B. EQUIPMENT SHALL BE TIGHTLY COVERED AND PROTECTED AGAINST DIRT OR WATER, AND AGAINST CHEMICAL OR MECHANICAL INJURY DURING INSTALLATION AND CONSTRUCTION PERIODS.

3.2 LABOR AND WORKMANSHIP:

A. ALL LABOR FOR THE INSTALLATION OF MATERIALS AND EQUIPMENT FURNISHED FOR THE ELECTRICAL SYSTEM SHALL BE DONE BY EXPERIENCED MECHANICS OF THE PROPER TRADES.

B. ALL ELECTRICAL EQUIPMENT FURNISHED SHALL BE ADJUSTED, ALIGNED AND TESTED BY THE CONTRACTOR AS REQUIRED TO PRODUCE THE INTENDED PERFORMANCE.

C. UPON COMPLETION OF THE WORK, THE CONTRACTOR SHALL THOROUGHLY CLEAN ALL EXPOSED EQUIPMENT, REMOVE ALL LABELS AND ANY DEBRIS, CRATING OR CARTONS AND LEAVE THE INSTALLATION FINISHED AND READY FOR OPERATION.

3.3 COORDINATION:

A. THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ELECTRICAL ITEMS WITH THE OWNER–FURNISHED EQUIPMENT DELIVERY SCHEDULE TO PREVENT UNNECESSARY DELAYS IN THE TOTAL WORK.

3.4 INSTALLATION:

A. CONDUIT:

1. ALL ELECTRICAL WIRING SHALL BE INSTALLED IN CONDUIT AS HEREIN SPECIFIED. NO CONDUIT OR TUBING OF LESS THAN 3/4" NOMINAL SIZE SHALL BE USED.
2. PROVIDE RGS CONDUIT FOR ALL EXPOSED, EXTERIOR CONDUIT.
3. PROVIDE SCHEDULE 40 PVC OR RGS CONDUIT BELOW GRADE, 1" MINIMUM, UNLESS NOTED OTHERWISE. ALL 90 DEGREE BENDS TO ABOVE GRADE SHALL BE RGS. MINIMUM BURIAL DEPTH SHALL BE 24" CLEAR TO TOP OF CONDUIT, UNLESS NOTED OTHERWISE.
4. USE GALVANIZED FLEXIBLE STEEL CONDUIT WHERE DIRECT CONNECTION IS NOT DESIRABLE FOR REASONS OF EQUIPMENT MOVEMENT, VIBRATION, OR FOR EASE OF MAINTENANCE. USE LIQUIDTIGHT, PVC COATED FLEXIBLE METAL CONDUIT FOR OUTDOOR APPLICATIONS.
5. INSTALL GALVANIZED FLEXIBLE STEEL CONDUIT AT ALL POINTS OF CONNECTION TO EQUIPMENT MOUNTED ON SUPPORTS TO ALLOW FOR EXPANSION AND CONTRACTION.
6. A RUN OF CONDUIT BETWEEN BOXES OR FITTINGS SHALL NOT CONTAIN MORE THAN THE EQUIVALENT OF FOUR QUARTER–BENDS INCLUDING THOSE BENDS LOCATED IMMEDIATELY AT THE BOX OR FITTING. THE RADIUS OF BENDS SHALL NEVER BE SHORTER THAN THAT OF THE CORRESPONDING TRADE ELBOW.
7. WHERE CONDUIT HAS TO BE CUT IN THE FIELD, IT SHALL BE CUT SQUARE WITH A PIPE CUTTER USING CUTTING KNIVES.
8. ALL CONDUITS SHALL BE SWABBED CLEAN BY PULLING AN APPROPRIATE SIZE MANDREL THROUGH THE CONDUIT BEFORE INSTALLATION OF WIRE OR CABLE. CLEAR ALL BLOCKAGES AND REMOVE BURRS, DIRT, AND DEBRIS.
9. INSTALL PULL STRINGS IN ALL EMPTY CONDUITS. IDENTIFY PULL STRINGS AT EACH END WITH ITS DESTINATION.
10. PROVIDE INSULATED GROUNDING BUSHINGS FOR ALL CONDUITS STUBBED INTO EQUIPMENT ENCLOSURES OR STUBBED OUT FOR FUTURE USE BY OTHERS.
11. CONTRACTOR IS RESPONSIBLE FOR PROTECTING ALL CONDUITS DURING CONSTRUCTION. TEMPORARY OPENINGS IN THE CONDUIT SYSTEM SHALL BE PLUGGED OR CAPPED TO PREVENT ENTRANCE OF MOISTURE OR FOREIGN MATTER. CONTRACTOR SHALL REPLACE ANY CONDUITS CONTAINING FOREIGN MATERIALS THAT CANNOT BE REMOVED.
12. INSTALL 2" ORANGE DETECTABLE TAPE 12" ABOVE ALL UNDERGROUND CONDUIT AND WIRE.
13. CONDUITS SHALL BE INSTALLED IN SUCH A MANNER AS TO INSURE AGAINST COLLECTION OF TRAPPED CONDENSATION.

B. WIRE AND CABLE:

1. ALL POWER WIRING SHALL BE COLOR CODED AS FOLLOWS:

DESCRIPTION	120/240V	208Y/120V	480Y/277V
PHASE A	BLACK	BLACK	BROWN
PHASE B	RED	RED	ORANGE
PHASE C		BLUE	YELLOW
NEUTRAL	WHITE	WHITE	GRAY
GROUND	GREEN	GREEN	GREEN

2. SPLICES SHALL BE MADE ONLY AT OUTLETS, JUNCTION BOXES, OR ACCESSIBLE RACEWAYS WITH PRESSURE–TYPE CONNECTORS.
3. PULLING LUBRICANTS SHALL BE SOAPSTONE POWDER, POWDERED TALC, OR A COMMERCIAL PULLING COMPOUND. NO SOAP SUDS, SOAP FLAKES, OIL, OR GREASE SHALL BE USED, AS THESE MAY BE HARMFUL TO CABLE INSULATION. CONTRACTOR SHALL USE NYLON OR HEMP ROPE FOR PULLING CABLE TO AVOID SCORING THE CONDUIT.
4. CABLES SHALL BE NEATLY TRAINED, WITHOUT INTERLACING, AND BE OF SUFFICIENT LENGTH IN ALL BOXES, EQUIPMENT, ETC. TO PERMIT MAKING A NEAT ARRANGEMENT. CABLES SHALL BE SECURED IN A MANNER TO AVOID TENSION ON CONDUCTORS OR TERMINALS, AND SHALL BE PROTECTED FROM MECHANICAL INJURY AND FROM MOISTURE. SHARP BENDS OVER CONDUIT BUSHINGS ARE PROHIBITED. DAMAGED CABLES SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE.

C. DISCONNECT SWITCHES:

1. INSTALL DISCONNECT SWITCHES LEVEL AND PLUMB. CONNECT TO WIRING SYSTEM AND GROUND AS INDICATED.

D. GROUNDING:

1. ALL METALLIC PARTS OF ELECTRICAL EQUIPMENT WHICH DO NOT CARRY CURRENT SHALL BE GROUNDED IN ACCORDANCE WITH THE REQUIREMENTS OF ARTICLE 250 OF THE NATIONAL ELECTRICAL CODE.
2. PROVIDE ELECTRICAL GROUNDING AND BONDING SYSTEMS INDICATED WITH ASSEMBLY OF MATERIALS, INCLUDING GROUNDING ELECTRODES, BONDING JUMPERS AND ADDITIONAL ACCESSORIES AS REQUIRED FOR A COMPLETE INSTALLATION.
3. ROUTE GROUNDING CONNECTIONS AND CONDUCTORS TO GROUND IN THE SHORTEST AND STRAIGHTEST PATHS POSSIBLE TO MINIMIZE TRANSIENT VOLTAGE RISES.
4. TIGHTEN GROUNDING AND BONDING CONNECTORS, INCLUDING SCREWS AND BOLTS, IN ACCORDANCE WITH MANUFACTURER'S PUBLISHED TORQUE TIGHTENING VALUES FOR CONNECTORS AND BOLTS. WHERE MANUFACTURER'S TORQUING REQUIREMENTS ARE NOT AVAILABLE, TIGHTEN CONNECTIONS TO COMPLY WITH TIGHTENING TORQUE VALUES SPECIFIED IN UL 486A TO ASSURE PERMANENT AND EFFECTIVE GROUNDING.
5. ALL UNDERGROUND GROUNDING CONNECTIONS SHALL BE MADE BY THE EXOTHERMIC WELD PROCESS AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
6. ALL GROUND CONNECTIONS SHALL BE INSPECTED FOR TIGHTNESS. EXOTHERMIC–WELDED CONNECTIONS SHALL BE APPROVED BY THE CONSTRUCTION INSPECTOR BEFORE BEING PERMANENTLY CONCEALED.
7. APPLY CORROSION–RESISTANT FINISH TO FIELD CONNECTIONS, AND PLACES WHERE FACTORY APPLIED PROTECTIVE COATINGS HAVE BEEN DESTROYED. USE COPPER–BASED "NO–OX" OR APPROVED EQUAL.
8. A SEPARATE, CONTINUOUS, INSULATED EQUIPMENT GROUNDING CONDUCTOR SHALL BE INSTALLED IN ALL FEEDER AND BRANCH CIRCUITS
9. BOND ALL INSULATED GROUNDING BUSHINGS WITH A BARE #6 AWG GROUNDING CONDUCTOR TO A GROUND BUS OR GROUNDING LUG IN ENCLOSURE.
10. DIRECT BURIED GROUND CONDUCTORS SHALL BE INSTALLED AT A NOMINAL DEPTH OF 30" BELOW GRADE, UNLESS NOTED OTHERWISE.
11. ALL GROUNDING CONDUCTORS EMBEDDED IN OR PENETRATING CONCRETE SHALL BE INSULATED OR INSTALLED IN PVC CONDUIT.
12. INSTALL ELECTROLYTIC GROUNDING SYSTEM IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. REMOVE SEALING TAPE FROM LEACHING AND BREATHER HOLES. INSTALL PROTECTIVE BOX FLUSH WITH GRADE.
13. DRIVE GROUND RODS UNTIL TOPS ARE 30" BELOW FINAL GRADE.
14. GROUNDING CONDUCTOR TO EQUIPMENT GROUND LUGS:
    a. BOLTED TO EQUIPMENT HOUSING WITH STAINLESS STEEL BOLTS AND LOCK WASHERS.
    b. ALL EQUIPMENT TO BE GROUNDED SHALL BE FREE OF PAINT OR ANY OTHER MATERIAL COVERING BARE METAL AT THE POINT OF CONNECTION.

3.5 ACCEPTANCE TESTING:

A. PROVIDE PERSONNEL AND EQUIPMENT, MAKE REQUIRED TESTS, AND SUBMIT TEST REPORTS UPON COMPLETION OF TESTS.

B. WHEN MATERIAL AND/OR WORKMANSHIP IS FOUND NOT TO COMPLY WITH THE SPECIFIED REQUIREMENTS, THE NONCOMPLIANT ITEMS SHALL BE REMOVED FROM THE JOBSITE AND REPLACED WITH ITEMS COMPLYING WITH THE SPECIFIED REQUIREMENTS PROMPTLY AFTER RECEIPT OF NOTICE OF SUCH NON–COMPLIANCE.

C. TEST PROCEDURES:

1. ALL FEEDERS SHALL HAVE THEIR INSULATION TESTED AFTER INSTALLATION, BUT BEFORE CONNECTION TO DEVICES. THE CONDUCTORS SHALL TEST FREE FROM SHORT CIRCUITS AND GROUNDS. TESTING SHALL BE FOR ONE MINUTE USING 1000V DC. INVESTIGATE ANY VALUES LESS THAN 50 MEGAOHMS.
2. PRIOR TO ENERGIZING CIRCUITRY, TEST WIRING DEVICES FOR ELECTRICAL CONTINUITY AND PROPER POLARITY CONNECTIONS.
3. MEASURE AND RECORD VOLTAGES BETWEEN PHASES AND BETWEEN PHASE WIRES AND NEUTRALS. SUBMIT A REPORT OF MAXIMUM AND MINIMUM VOLTAGES.
4. PERFORM GROUND TEST TO MEASURE GROUND RESISTANCE OF GROUNDING SYSTEM USING THE IEEE STANDARD 3–POINT "FALL–OF–POTENTIAL" METHOD. PROVIDE PLOTTED TEST VALUES & LOCATION SKETCH. NOTIFY THE ENGINEER IMMEDIATELY IF MEASURED VALUE IS OVER 5 OHMS.

END OF SECTION

END OF SPECIFICATION

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APPLICANT/ SITE OWNER

TILLMAN INFRASTRUCTURE

SITE ACQUISITION /ENGINEERING

SKYWARD LAND SERVICES, INC.

ASSOCIATED Engineering, Inc.

AE INC. Project # 6392

SITE INFORMATION

TONGANOXIE_ KS

TI-OPP-37632
RELO SITE FA# 10008273

15076 214TH St.
TONGANOXIE, KS 66086
LEAVENWORTH COUNTY

PARCEL ID:
052-198-34-0-00-00-006.00-0
CANDIDATE: A

DESIGN RECORD

REV	DATE	DESCRIPTION	BY
A	04/02/26	FINAL DRAWINGS	JMV

PROFESSIONAL STAMP

GAUTAM (TOM) MEDHI LICENSED 18252 KANSAS PROFESSIONAL ENGINEER

ENGINEER

Tom Medhi 04-02-2026
Tom Medhi Date
MY LICENSE RENEWAL DATE IS 04/30/2027

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF KANSAS

SHEET TITLE

SPECIFICATIONS
(7 OF 7)

SHEET NUMBER

SP-2.1

Allison, Amy

From: Matt Roecker <Matt.Roecker@evergy.com>
Sent: Wednesday, March 11, 2026 11:42 AM
To: erwin@skywardsite.com
Subject: Re: [EXTERNAL]Evergy Confirmation (15076 214th St.) (Leavenworth County)

Internal Use Only

Patrick,

Sorry for the delayed response, but we will be able to continue the line to the north to supply power to the tower. There might be a cost that with this job.

Thanks
Matt Roecker

Sr. Designer
o: 913 667-5116
matt.roecker@evergycom

23505 W. 86th Street
Shawnee, Ks 66227

From: erwin@skywardsite.com
Sent: Tuesday, March 10, 2026 3:23 PM
To: Matt Roecker
Subject: [EXTERNAL]Evergy Confirmation (15076 214th St.) (Leavenworth County)

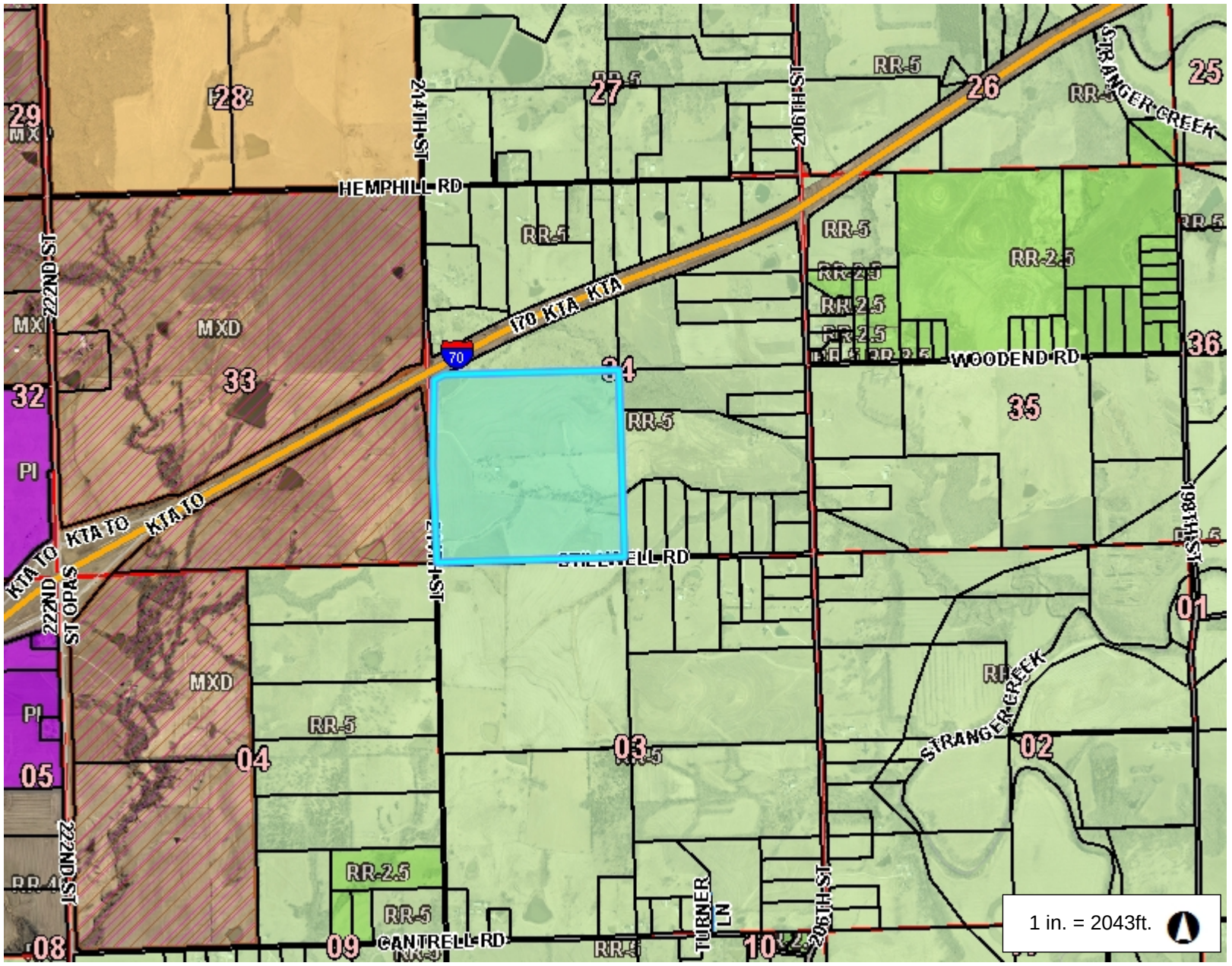
This Message Is From an External Sender
This message came from outside your organization.

Report Suspicious

Matt,
Per our conversation, can you please confirm that there is adequate power to be supplied to our project at the above referenced address?
Thanks,
Patrick Erwin

Skyward Land Services, Inc.
7381 West 133rd Street
Suite 403
Overland Park, KS 66213
(913) 626-4440

DEV-26-015 Tillman Infrastructure SUP





Legend

- Parcel
- City Limit Line
- Major Road
  - <all other values>
  - 70
- Road
  - <all other values>
  - PRIVATE
- Railroad
- Section
- Section Boundaries
- County Boundary
- Zoning
  - B-1
  - B-2
  - B-3
  - I-1
  - I-2
  - I-3
  - MXD
  - PC
  - PI
  - PR-1
  - PR-2
  - PR-3
  - PUD

Notes

4,085.6 0 2,042.78 4,085.6 Feet

This Cadastral Map is for informational purposes only. It does not purport to represent a property boundary survey of the parcels shown and shall not be used for conveyances or the establishment of property boundaries.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

Allison, Amy

From: Anderson, Kyle
Sent: Wednesday, February 18, 2026 10:16 AM
To: Allison, Amy
Subject: RE: RE: DEV-26015 Special Use Permit - Communications Tower - Part 2

We have not received any complaints on this property.

Kyle Anderson
Environmental Technician/Code Enforcement
Leavenworth County Planning & Zoning
300 Walnut St. Ste. 212
Leavenworth, KS 66048
913-684-1084

Disclaimer: This message and any attachments are intended only for the use of the recipient or their authorized representative. The information provided in this email is limited in scope and response detail by available information, current zoning and subdivision regulations. Depending on the level of development, the applicable regulations can change. Final approval cannot be granted until a complete application has been submitted, reviewed and approved by the governing body. Nothing in this message or its contents should be interpreted to authorize or conclude approval by Leavenworth County.

From: Allison, Amy <AAllison@leavenworthcounty.gov>
Sent: Monday, February 9, 2026 3:16 PM
To: Magaha, Chuck <cmagaha@lvsheriff.org>; Anderson, Kyle <KAnderson@leavenworthcounty.gov>; Miller, Jamie <JMiller@leavenworthcounty.gov>; Brown, Misty <MBrown@leavenworthcounty.gov>; 'Dedeke, Andrew' <adedeke@lvsheriff.org>; 'kritter@lvcofd2.com' <kritter@lvcofd2.com>; 'dritter@lvcofd2.com' <dritter@lvcofd2.com>; 'designgrouplawrenceservicecenter@evergy.com' <designgrouplawrenceservicecenter@evergy.com>
Subject: FW: RE: DEV-26015 Special Use Permit - Communications Tower - Part 2

From: Allison, Amy <AAllison@leavenworthcounty.gov>
Sent: Monday, February 9, 2026 3:13 PM
To: Magaha, Chuck <cmagaha@lvsheriff.org>; Anderson, Kyle <KAnderson@leavenworthcounty.gov>; Miller, Jamie <JMiller@leavenworthcounty.gov>; 'Dedeke, Andrew'; Brown, Misty <MBrown@leavenworthcounty.gov>; 'kritter@lvcofd2.com' <kritter@lvcofd2.com>; 'dritter@lvcofd2.com' <dritter@lvcofd2.com>; 'designgrouplawrenceservicecenter@evergy.com' <designgrouplawrenceservicecenter@evergy.com>
Cc: PZ <pz@leavenworthcounty.gov>
Subject: RE: DEV-26015 Special Use Permit - Communications Tower - Part 1

Good Afternoon,

The Department of Planning and Zoning has received a Special Use Permit application for a communication tower to be located on the property at 15080 214th Street (PID 198-34-0-00-00-006.00).

The Planning Staff would appreciate your written input in consideration of the above request. Please review the attached information and forward any comments to us by Friday, February 20, 2026.

If you have any questions or need additional information, please contact me at (913) 684-0465 or at pzmail@leavenworthcounty.gov

County of Leavenworth
Planning & Zoning Department
300 Walnut, Suite 212
Leavenworth, Kansas 66048
Phone: 913-684-0465

February 19, 2026, updated April 13, 2026

To: Erwin Patrick
Tillman Infrastructure
152 W 57th Street
New York, NY 10009

Re: Special Use Permit
DEV-26-015

Mr. Erwin,

Staff has reviewed the application and narrative for a Communication Tower, which was submitted on February 4, 2026.

Upon review of your application, staff has the following comments:

1. ~~Provide the Trustee Agreement Document verifying appointed trustees for the Oelshlaeger Trust property.~~
2. ~~Complete top section of Attachment B of the application form.~~
3. ~~Must provide an emergency plan and contact and comply with all requirements of the Leavenworth County Emergency Management Department, including notification signage of operation management.~~
4. ~~Provide statement that an analysis was performed for available collocation opportunities on existing wireless support structures within the search area of the proposed site per KSA 66-2019.~~
5. ~~Provide a signed Property Tax Verification Affidavit, attached.~~
6. ~~Confirmation from Evergy that power can be supplied to site for the proposed development.~~

Site Plan

1. ~~Proposed landscaping excludes west side of facility. Landscaping will be required along that side except from impacting any travel way or gate to the site.~~
2. ~~Label equipment along western side shown outside of the fenced area. Screening may be required depending on what equipment is located there.~~
3. "Add Dishes to remain within 120-ft to 220-ft elevation range" comment is included on sheet ZD-5. The maximum height for the proposed tower is 195 ft plus 4 ft lightning rod. This statement exceeds the maximum height proposed. Please specify this comment or amend to reflect proposed height of tower. – Now Sheet C-2.0
4. ~~Provide a fence detail for the proposed fencing around the lease area. County Regulations require a 6 ft. fence.~~ Fence Detail states a 6 ft aluminum panel fence but the specifications on page SP-1.4 outlines Chain-link, chain-link with barbed wire, wood fencing or match existing fences. Please update to match the detail provided in plans.

Narrative

1. ~~Provide hours of operation. If operating 24/7 please state in narrative.~~

2. ~~Signage: Please indicate what type of signage will be utilized on site and show on site plan if ground mounted.~~
3. ~~Provide information on any proposed outdoor or safety lighting on site.~~
4. ~~Will There be any outdoor storage or displays on site?~~
5. ~~Will the use produce odors or fumes?~~
6. ~~Please indicate if any retail sales are proposed.~~
7. ~~Please indicate if any food or alcohol sales are proposed.~~
8. ~~Will customers be visiting the site?~~
9. ~~Are any chemicals or hazardous materials proposed to be used or stored on-site?~~
10. ~~Are any oil, lubricants or fluids proposed to be used or stored on site?~~
11. ~~Provide information on proposed platforms, specifically are they pavilion style or closed cabinet structures.~~

Proposed Conditions of Approval – Conditions may change or be amended in the future. The inclusion of these conditions does not indicate staff recommendation of approval at this time.

1. A copy of the access and utility easement must be provided to the Planning & Zoning Department prior to construction beginning.
2. A copy of the lease agreement must be provided to the Planning & Zoning Department prior to construction beginning.
3. A utility address must be assigned for the proposed project.
4. Landscaping shall be installed in accordance with the approved plans. All landscaping must be installed within 6 months of the date of construction or as weather permits within reasonable timeframe.
5. A commercial building permit shall be obtained from Leavenworth County Planning & Zoning and construction documents, stamped by an engineer, and a letter of code compliance signed by the engineer or architect on records shall be submitted to the office for approval.
6. The tower and accessory equipment must meet all requirements of the FCC and FAA.
7. Any tower that is not operated for a continuous period of two (2) years shall be considered abandoned, and the owner of such tower shall remove same within ninety (90) days of receipt of the notice from the governing authority notifying the owner of such abandonment. If such tower is not removed within said ninety (90) days, the governing authority may remove such tower at the owner's expense.
8. Vegetation must be removed from around the pad site and controlled on the rest of the property if the property is not used for agricultural purposes, excluding the approved landscaping plan.
9. Must provide an emergency plan and contact and comply with all requirements of the Leavenworth County Emergency Management Department, including notification signage of operation management.

Your application is considered incomplete. Please provide the revisions and information requested in order to complete your application. Please refer to the Planning Commission Schedule for all applicable deadlines. If the information is not received and reviewed for compliance by the set deadline, it will be scheduled for the next available meeting.

If you have any questions or need additional information, please contact me at (913) 684-0465 or at pz@leavenworthcounty.gov

Respectfully,



County of Leavenworth
Planning & Zoning Department
300 Walnut, Suite 212
Leavenworth, Kansas 66048
Phone: 913-684-0465

Amy Allison

Amy Allison
Deputy Director
Planning and Zoning
Leavenworth County

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AT&T mobility corp.

TILLMAN INFRASTRUCTURE

04-14-26 Olsson Comments

04-14-26 Olsson Review. Olsson's review is limited to public roadways. No entrance to public roadway is being proposed.

RELO SITE FA: XXXXX / SITE ID: TI-OPP-37632
RELO SITE FA# 10008273/RFDs NAME: XXXX
IWM #: XXXXXX
SITE NAME: TONGANOXIE_ KS
PROJECT: NEW SITE BUILD

ADDRESS: 15076 214TH St.
TONGANOXIE, KS 66086 / LEAVENWORTH COUNTY

SITE INFORMATION

SITE ADDRESS:	15076 214TH St. TONGANOXIE, KS 66086
LATITUDE (NAD 83):	N 39.050453° (N 39° 03' 01.63")
LONGITUDE (NAD 83):	W -95.073689° (W 095° 04' 25.28")
GROUND ELEVATION:	882.50' NAVD '88
JURISDICTION:	LEAVENWORTH COUNTY
JURISDICTION CONTACT:	DAWN CHAMBERLAIN PLANNING COORDINATOR 300 WALNUT STREET, LEAVENWORTH, KS 66048 (913) 684-0465
BLOCK:	XXX
LOT:	XXX
ZONING:	R1-15
PARCEL/MAP NUMBER:	052-198-34-0-00-00-006.00-0
PARCEL OWNER:	EVERETT J. OELSCHLAEGER REVOCABLE INTERVIVOS TRUST
TOWER OWNER:	TILLMAN INFRASTRUCTURE
STRUCTURE TYPE:	SELF SUPPORT TOWER
STRUCTURE HEIGHT:	195'-0" (AGL)
POWER SUPPLIER:	EVERGY (888) 471-5275
TELCO SUPPLIER:	AT&T (800) 288-2020
GAS SUPPLIER:	T.B.D.

PROJECT TEAM

CARRIER:	AT&T MOBILITY
PROJECT MANAGEMENT FIRM / APPLICANT:	TILLMAN INFRASTRUCTURE 152 WEST 57TH STREET 27TH FLOOR NEW YORK, NY 10019 (314) 513-0151
A+E FIRM:	ASSOCIATED ENGINEERING, INC. CA # 4387 2705 NORTH MAIN STREET ELKHORN, NE 68022 (402) 289-5040

VICINITY MAP



DIRECTIONS

DIRECTIONS FROM KANSAS CITY INTERNATIONAL AIRPORT
(1 INTERNATIONAL SQUARE, KANSAS CITY, MO 64153):

GET ON I-29 S/US-71 S IN MAY TOWNSHIP FROM COOKINGHAM DR (2.7 MI), TAKE MO-152 W, I-435 S AND I-70 W TO 222ND ST IN RENO TOWNSHIP. TAKE EXIT 212 FROM I-70 W (36.6MI), MERGE ONTO 222ND ST (0.9 MI), TURN RIGHT ONTO HEMPHILL RD (1.0 MI), TURN RIGHT AT THE 1ST CROSS STREET ONTO 214 ST (0.5 MI), DESTINATION WILL BE ON THE LEFT.

CODE COMPLIANCE

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO LATEST EDITIONS OF THE FOLLOWING CODES.

- INTERNATIONAL BUILDING CODE
- NATIONAL ELECTRICAL CODE
- NFPA 101, LIFE SAFETY CODE
- INTERNATIONAL FIRE CODE
- AMERICAN CONCRETE INSTITUTE
- AMERICAN INSTITUTE OF STEEL CONSTRUCTION
- MANUAL OF STEEL CONSTRUCTION 13TH EDITION
- ANSI/TIA-222-G
- TIA-607
- IEEE STANDARD 81
- IEEE STANDARD C2 NATIONAL ELECTRICAL SAFETY CODE
- TELECORDIA GR-1275
- ANSI/T 311

DRAWING INDEX

SHT NO.	SHEET TITLE	DISC.
T-1.0	TITLE SHEET	C/E
	SURVEY (BY OTHERS)	
C-0.0	OVERALL SITE PLAN W/ AERIAL MAP	C
C-1.0	SITE PLAN	C
C-1.1	COMPOUND SITE PLAN W/ GRADING	C
C-1.2	AT&T EQUIPMENT LAYOUT	C
C-1.3	PROPOSED LANDSCAPING	
C-2.0	TOWER ELEVATION & ANTENNA PLAN	C
C-3.0	FENCE DETAIL	C
C-4.0	COMMON UTILITY RACK DETAILS	C/E
C-5.0	WALK UP CABINET DETAILS	C
C-5.1	GENERATOR DETAILS	C
C-5.2	CONCRETE PAD & RAIL PLATFORM DETAILS	C
C-6.0 / C-6.1	EQUIPMENT DETAILS	C
C-7.0	RF PLUMBING DIAGRAM	C
E-1.0	OVERALL UTILITY PLAN	E
E-1.1	COMPOUND UTILITY PLAN	E
E-2.0	ELECTRICAL ONE-LINE DIAGRAM	E
E-2.1	FIBER SYSTEM DIAGRAM	E
E-2.2	DC WIRING DIAGRAM	E
E-3.0	UTILITY DETAILS	E
E-3.1	HANDHOLE DETAILS	C/E
E-3.2	TILLMAN SIGNAGE	C/E
G-1.0	COMPOUND GROUNDING PLAN	E
G-1.1	AT&T GROUNDING LAYOUT	E
G-2.0	GROUNDING RISER DIAGRAM	E
G-3.0	GROUNDING DETAILS (1 OF 3)	E
G-3.1	GROUNDING DETAILS (2 OF 3)	E
G-3.2	GROUNDING DETAILS (3 OF 3)	E
SP (1.0 - 1.4)	SPECIFICATIONS (1 TO 5 OF 7)	C
SP (2.0 -2.1)	SPECIFICATIONS (6 TO 7 OF 7)	E

DRAWING SCALE

THESE DRAWINGS ARE SCALED TO FULL SIZE 22"X34" AND HALF SIZE AT 11"X17". CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE DESIGNER/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR MATERIAL ORDERS OR BE RESPONSIBLE FOR THE SAME. CONTRACTOR SHALL USE BEST MANAGEMENT PRACTICE TO PREVENT STORM WATER POLLUTION DURING CONSTRUCTION.

SCOPE OF WORK

THIS PROJECT CONSISTS OF:

- NEW 65'-0"x65'-0" FENCED COMPOUND & 100'-0"x100'-0" LEASE AREA
- NEW 195'-0" TALL SELF SUPPORT TOWER
- NEW AT&T EQUIPMENT WALK UP CABINET ON NEW 3'-7"x19'-0" WUC & GENERATOR RAIL PLATFORM
- NEW AT&T 8'-0"x22'-0" CONCRETE PAD
- NEW AT&T ANTENNAS ON SELF SUPPORT TOWER
- NEW (1) H-FRAME W/ UTILITY EQUIPMENT.
- NEW POWER AND TELCO UTILITY SERVICES.
- NEW GROUNDING SYSTEM.
- CONSTRUCT 12' WIDE GRAVEL ACCESS ROAD.

☒ 1C ☒ 2C ☒ 3C ☒ 4C ☒ 5C

APPLICANT/ SITE OWNER

TILLMAN INFRASTRUCTURE

SITE ACQUISITION /ENGINEERING

SKYWARD LAND SERVICES, INC.

ASSOCIATED Engineering, Inc.
AE INC. Project # 6392

SITE INFORMATION

TONGANOXIE_ KS

TI-OPP-37632
RELO SITE FA# 10008273

15076 214TH St.
TONGANOXIE, KS 66086
LEAVENWORTH COUNTY

PARCEL ID:
052-198-34-0-00-00-006.00-0
CANDIDATE: A

DESIGN RECORD

REV	DATE	DESCRIPTION	BY
A	04/02/26	FINAL DRAWINGS	JMV

PROFESSIONAL STAMP

GAUTAM (TOM) MEDHI LICENSED 18252 KANSAS PROFESSIONAL ENGINEER

ENGINEER

Tom Medhi 04-02-2026
Tom Medhi Date
MY LICENSE RENEWAL DATE IS 04/30/2027

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF KANSAS

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1.0
96



LOCATION MAP

LEGEND

(M)	MEASURED DISTANCE	T	TELEPHONE PEDESTAL
(P)	PLATTED DISTANCE		LIGHT POST
(R)	RECORDED DISTANCE		HYDRANT
(D)	DEEDED DISTANCE	W	WATER METER
	FOUND CORNER	o—o	FENCE – CHAIN LINK
	SET CORNER	x—x	FENCE – BARBED WIRE
BM	BENCH MARK	UFO—UFO	FIBER OPTIC LINE
	SECTION CORNER	OHP	OVERHEAD POWER LINE
R	ROW MARKER	UGP	UNDERGROUND ELECTRICAL LINE
	POWER POLE		APPARENT PROPERTY LINE
E	ELECTRIC METER		LEASED PREMISES LINE
G	GAS METER		EASEMENT LINE
			CENTER LINE
			SECTION LINE
		ROW	ROW LINE

NOTES

1. Parcel No. 052–198–34–0–00–00–006.00–0
   Owner: EVERETT J. OELSCHLAEGER REVOCABLE INTERVIVOS TRUST
   Address: 15076 214TH STREET
   TONGANOXIE, KS 66086
2. THE FLOOD INSURANCE RATE MAP SHOWS THAT THE PROPERTY DESCRIBED HEREIN IS FALLING WITHIN ZONE X (UNSHADED), FEMA INTERACTIVE MAP 20103C0325G, LEAVENWORTH COUNTY, KS, MAP EFFECTIVE DATE OF JULY 16, 2015. ZONE X (UNSHADED) IS AN AREA OF MINIMAL FLOOD HAZARD.
3. DATUM BENCHMARK: TOP OF GRAVEL AT THE SW CORNER OF SECTION 34, T11S, R21E. ELEV.: 905 FEET – NAVD '88. SITE BENCHMARK: "X" CUT ON BRIDGE DECK AT THE NORTHWEST CORNER OF THE SOUTHWEST QUARTER OF SECTION 34, T11S, R12E. ELEV.: 925.26 FEET – NAVD '88.
4. THE LEASED PREMISES IS CONTIGUOUS ALONG ITS COMMON BOUNDARIES TO THE ACCESS AND UTILITY EASEMENT, WHICH IN TURN IS CONTIGUOUS ALONG ITS COMMON BOUNDARIES WITH 214TH STREET RIGHT OF WAY, AND THERE ARE NO GAPS, GORES, SPACES OR OVERLAPS BETWEEN OR AMONG ANY OF SAID PARCELS OF LAND.
5. NO WETLANDS AREAS HAVE BEEN INVESTIGATED BY THIS SURVEY.
6. THE UTILITIES AS SHOWN ON THIS DRAWING WERE DEVELOPED FROM THE INFORMATION AVAILABLE. THIS IS NOT IMPLIED NOR INTENDED TO BE THE COMPLETE INVENTORY OF UTILITIES IN THIS AREA. IT IS THE CLIENT'S / CONTRACTOR'S RESPONSIBILITY TO VERIFY THE LOCATION OF ALL UTILITIES (WHETHER SHOWN OR NOT) AND PROTECT SAID UTILITIES FROM ANY DAMAGE.

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BOUNDARY NOTICE

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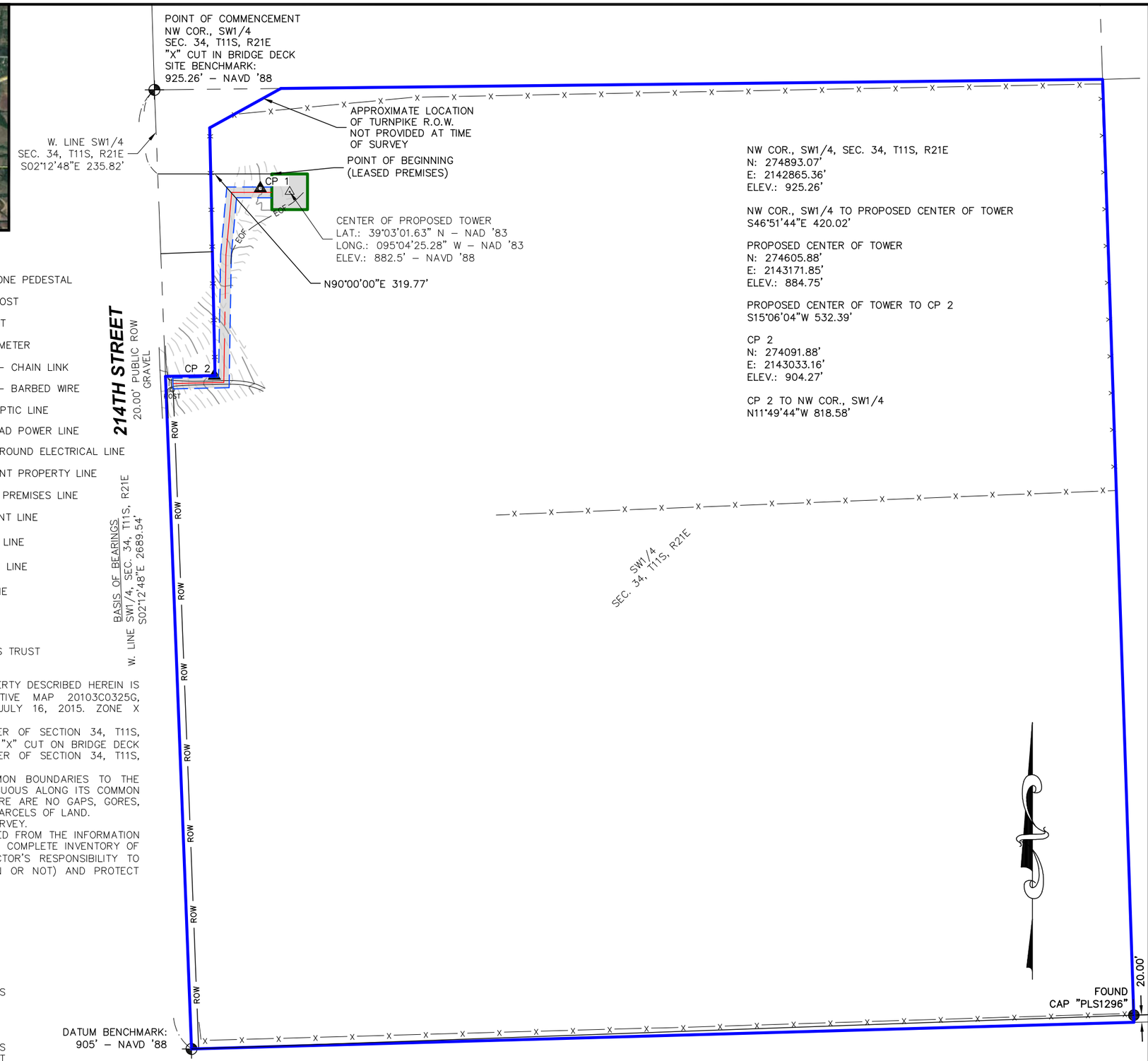

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TILLMAN INFRASTRUCTURE
152 W. 57th STREET
NEW YORK, NEW YORK 10019
TEL: 212-706-1677

SKYWARD LAND SERVICES, INC.
7381 WEST 133RD STREET
SUITE 403
OVERLAND PARK, KS 66213

ASSOCIATED Engineering & Surveying
2705 N. Main Street
Omaha, NE 68022
Ph: (402) 289–5040
Fax: (402) 289–5045
AE & Survey, Project # 6392

BRYAN WIEGERT
LICENSED
1454
KANSAS
LAND SURVEYOR

REVISIONS			
REV.	DATE	DESCRIPTION	INITIALS
A	10/06/25	PRELIMINARY	BKW
0	10/16/25	FINAL	BKW

SITE NAME:
TONGANOXIE_KS

SITE ID:
TI-OPP-37632
SITE ADDRESS:
15076 214TH STREET
LEAVENWORTH COUNTY
TONGANOXIE, KS 66086
CANDIDATE A
RELO SITE FA#
10008273

PARCEL ID
052-198-34-0-00-00-006.00-0

SHEET NUMBER
SS-1

OVERALL PLAN VIEW

0 75 150 300

SCALE: 1" = 300' (11 x 17)
OR SCALE: 1" = 150' (22 x 34)

1

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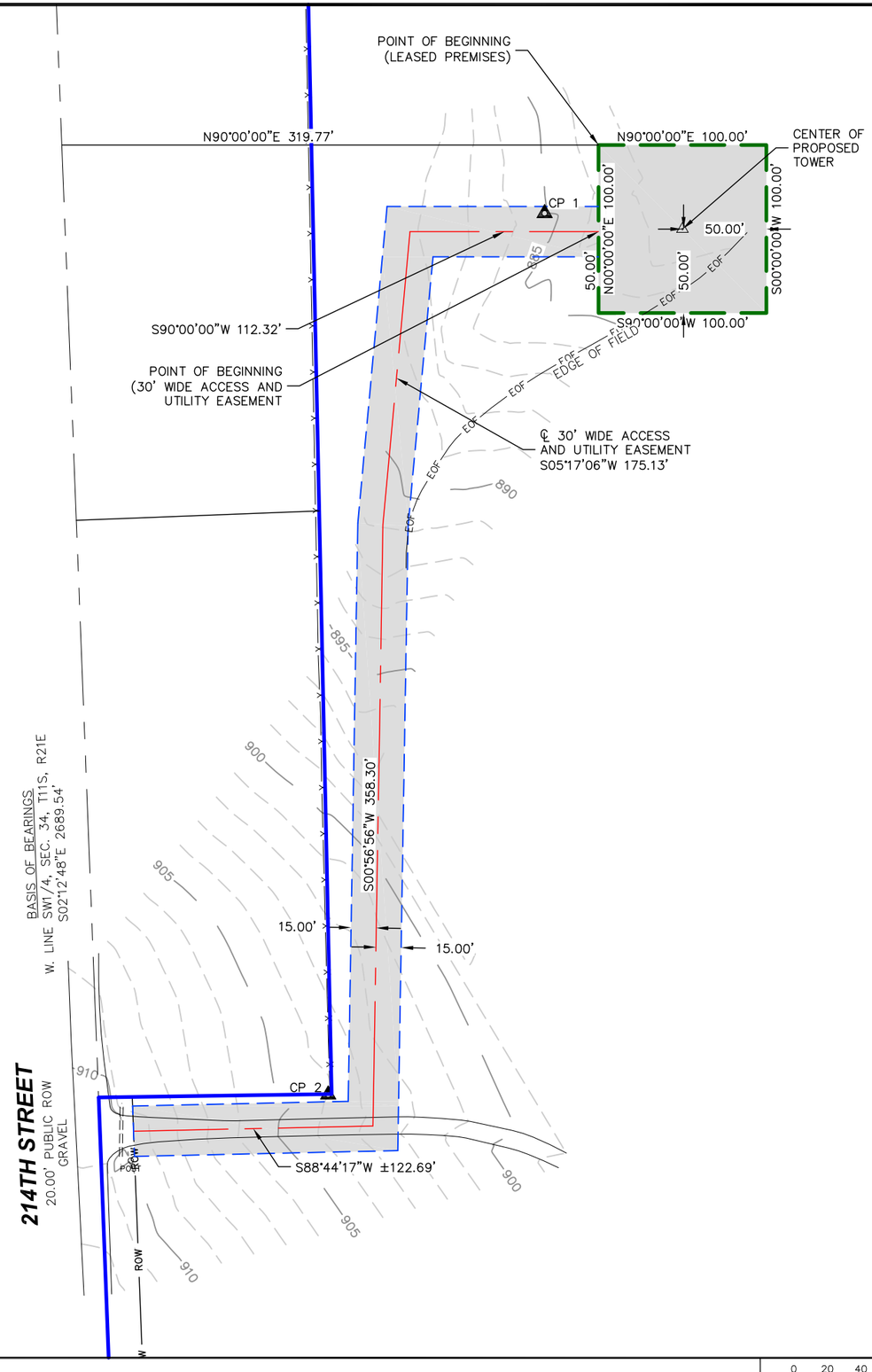

UTILITY NOTICE

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BOUNDARY NOTICE

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LEASED PREMISES AND EASEMENT DETAIL

0 20 40 80

SCALE: 1" = 80' (11 x 17)
OR SCALE: 1" = 40 (22 x 34)

1

TILLMAN INFRASTRUCTURE
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BRYAN WIEGERT
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REVISIONS			
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LEAVENWORTH COUNTY
TONGANOXIE, KS 66086
CANDIDATE A
RELO SITE FA#
10008273

PARCEL ID
052-198-34-0-00-00-006.00-0

SHEET NUMBER
SS-2

TITLE EXCEPTIONS

THIS DOCUMENT WAS COMPLETED BY THE AID OF TITLE WORK PREPARED BY WESCOR LAND TITLE INSURANCE COMPANY, COMMITMENT DATE OF JUNE 6, 2025, BEING FILE NUMBER TIL-211898-C, FOR THE SUBJECT PROPERTY, TO DETERMINE THE IMPACTS OF EXISTING TITLE EXCEPTIONS.

SCHEDULE B, PART II - SPECIAL EXCEPTIONS:

NO SURVEY ITEMS IN SUPPORTING DOCUMENTS.

PARENT PARCEL DESCRIPTION

THE SOUTHWEST QUARTER (SW ¼) OF SECTION THIRTY–FOUR (34), TOWNSHIP ELEVEN (11) SOUTH OF RANGE TWENTY–ONE (21) EAST OF THE 6TH PRINCIPAL MERIDIAN EXCEPT PUBLIC HIGHWAYS.

PARCEL ID: 052–198–34–0–00–00–006.00–0 OWNER: EVERETT J. OELSCHLAEGER REVOCABLE INTERVIVOS TRUST DEED: INSTRUMENT 2015R00876 COUNTY / STATE: LEAVENWORTH COUNTY, KANSAS

LEASED PREMISES DESCRIPTION

A LEASED PREMISES OVER AND ACROSS PART OF THE SOUTHWEST QUARTER (SW ¼) OF SECTION THIRTY–FOUR (34), TOWNSHIP ELEVEN (11) SOUTH OF RANGE TWENTY–ONE (21) EAST OF THE 6TH PRINCIPAL MERIDIAN EXCEPT PUBLIC HIGHWAYS, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT AN EXISTING "X" CUT ON BRIDGE DECK AT THE NORTHWEST CORNER OF SAID SOUTHWEST QUARTER (SW ¼) OF SECTION THIRTY–FOUR (34); THENCE S02°12'48"E ALONG THE WEST LINE OF SAID SOUTHWEST QUARTER (SW ¼) OF SECTION THIRTY–FOUR (34), A DISTANCE OF 235.82 FEET; THENCE N90°00'00"E, A DISTANCE OF 319.77 FEET TO THE POINT OF BEGINNING; THENCE CONTINUING N90°00'00"E, A DISTANCE OF 100.00 FEET; THENCE S00°00'00"W, A DISTANCE OF 100.00 FEET; THENCE S90°00'00"W, A DISTANCE OF 100.00 FEET; THENCE N00°00'00"E, A DISTANCE OF 100.00 FEET TO THE POINT OF BEGINNING, CONTAINING AN AREA OF 10,000 SQUARE FEET OR 0.230 ACRES.

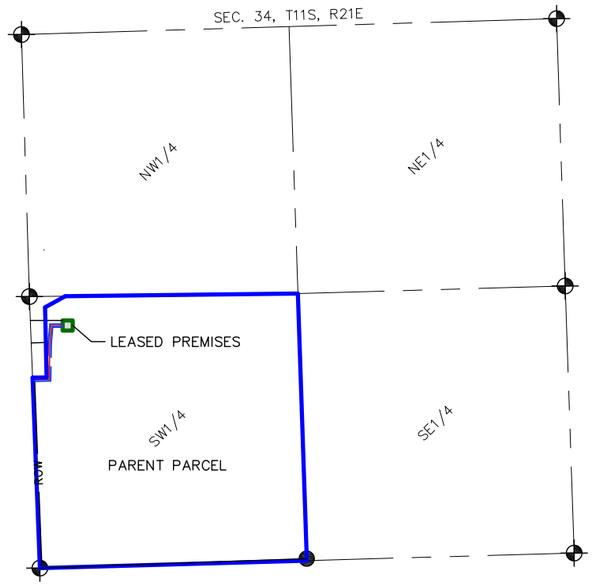
PARCEL ID: 052–198–34–0–00–00–006.00–0 OWNER: EVERETT J. OELSCHLAEGER REVOCABLE INTERVIVOS TRUST DEED: INSTRUMENT 2015R00876 COUNTY / STATE: LEAVENWORTH COUNTY, KANSAS

30 FOOT WIDE ACCESS AND UTILITY EASEMENT DESCRIPTION

AN ACCESS AND UTILITY EASEMENT OVER AND ACROSS PART OF THE SOUTHWEST QUARTER (SW ¼) OF SECTION THIRTY–FOUR (34), TOWNSHIP ELEVEN (11) SOUTH OF RANGE TWENTY–ONE (21) EAST OF THE 6TH PRINCIPAL MERIDIAN EXCEPT PUBLIC HIGHWAYS, BEING 30.00 FEET IN WIDTH, 15.00 FEET ON EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE:

COMMENCING AT AN EXISTING "X" CUT ON BRIDGE DECK AT THE NORTHWEST CORNER OF SAID SOUTHWEST QUARTER (SW ¼) OF SECTION THIRTY–FOUR (34); THENCE S02°12'48"E ALONG THE WEST LINE OF SAID SOUTHWEST QUARTER (SW ¼) OF SECTION THIRTY–FOUR (34), A DISTANCE OF 235.82 FEET; THENCE N90°00'00"E, A DISTANCE OF 319.77 FEET; THENCE CONTINUING N90°00'00"E, A DISTANCE OF 100.00 FEET; THENCE S00°00'00"W, A DISTANCE OF 100.00 FEET; THENCE S90°00'00"W, A DISTANCE OF 100.00 FEET; THENCE N00°00'00"E, A DISTANCE OF 50.00 FEET TO THE POINT OF BEGINNING; THENCE S90°00'00"W, A DISTANCE OF 112.32 FEET; THENCE S05°17'06"W, A DISTANCE OF 175.13 FEET; THENCE S00°56'56"W, A DISTANCE OF 358.30 FEET; THENCE S88°44'17"W, A DISTANCE OF 122.69 FEET, MORE OR LESS, TO A POINT ON THE EAST RIGHT–OF–WAY LINE OF 214TH STREET, SAID RIGHT–OF–WAY BEING 20.00 FEET IN WIDTH, CONTAINING A NET AREA OF 21,482 SQUARE FEET OR 0.493 ACRES.

PARCEL ID: 052–198–34–0–00–00–006.00–0 OWNER: EVERETT J. OELSCHLAEGER REVOCABLE INTERVIVOS TRUST DEED: INSTRUMENT 2015R00876 COUNTY / STATE: LEAVENWORTH COUNTY, KANSAS



PARENT PARCEL DETAIL

SURVEYOR'S CERTIFICATE

THIS SURVEY WAS COMPLETED WITH THE AID OF TITLE WORK PREPARED BY WESCOR LAND TITLE INSURANCE COMPANY, COMMITMENT DATE OF JUNE 6, 2025, BEING FILE NUMBER TIL–211898–C, FOR THE SUBJECT PROPERTY, TO DETERMINE THE IMPACTS OF EXISTING TITLE EXCEPTIONS.

I HEREBY CERTIFY THAT THIS SURVEY, PLAN OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED LAND SURVEYOR UNDER THE LAWS OF THE STATE OF MISSOURI.

DATED THIS 16TH DAY OF OCTOBER, 2025.

BRYAN WIEGERT
MISSOURI LICENSE NO. 2682

Need Kansas Seal

UTILITY NOTICE

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BOUNDARY NOTICE

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PRE-CONSTRUCTION ONLY

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DESCRIPTIONS

0 375 750 1500

SCALE: 1" = 1500' (11 x 17)
OR SCALE: 1" = 750' (22 x 34)

1

TILLMAN INFRASTRUCTURE
152 W. 57th STREET
NEW YORK, NEW YORK 10019
TEL: 212-706-1677

SKYWARD LAND SERVICES, INC.
7381 WEST 133RD STREET
SUITE 403
OVERLAND PARK, KS 66213

ASSOCIATED Engineering & Surveying
2705 N. Main Street
Omaha, NE 68022
Ph: (402) 289–5040
Fax: (402) 289–5045
AE & Survey, Project # 6392

BRYAN WIEGERT LICENSED 1454 KANSAS LAND SURVEYOR

REVISIONS			
REV.	DATE	DESCRIPTION	INITIALS
A	10/06/25	PRELIMINARY	BKW
0	10/16/25	FINAL	BKW

SITE NAME:
TONGANOXIE_KS

SITE ID:
TI-OPP-37632
SITE ADDRESS:
15076 214TH STREET
LEAVENWORTH COUNTY
TONGANOXIE, KS 66086
CANDIDATE A
RELO SITE FA#
10008273

PARCEL ID
052-198-34-0-00-00-006.00-0

SHEET NUMBER
SS-3

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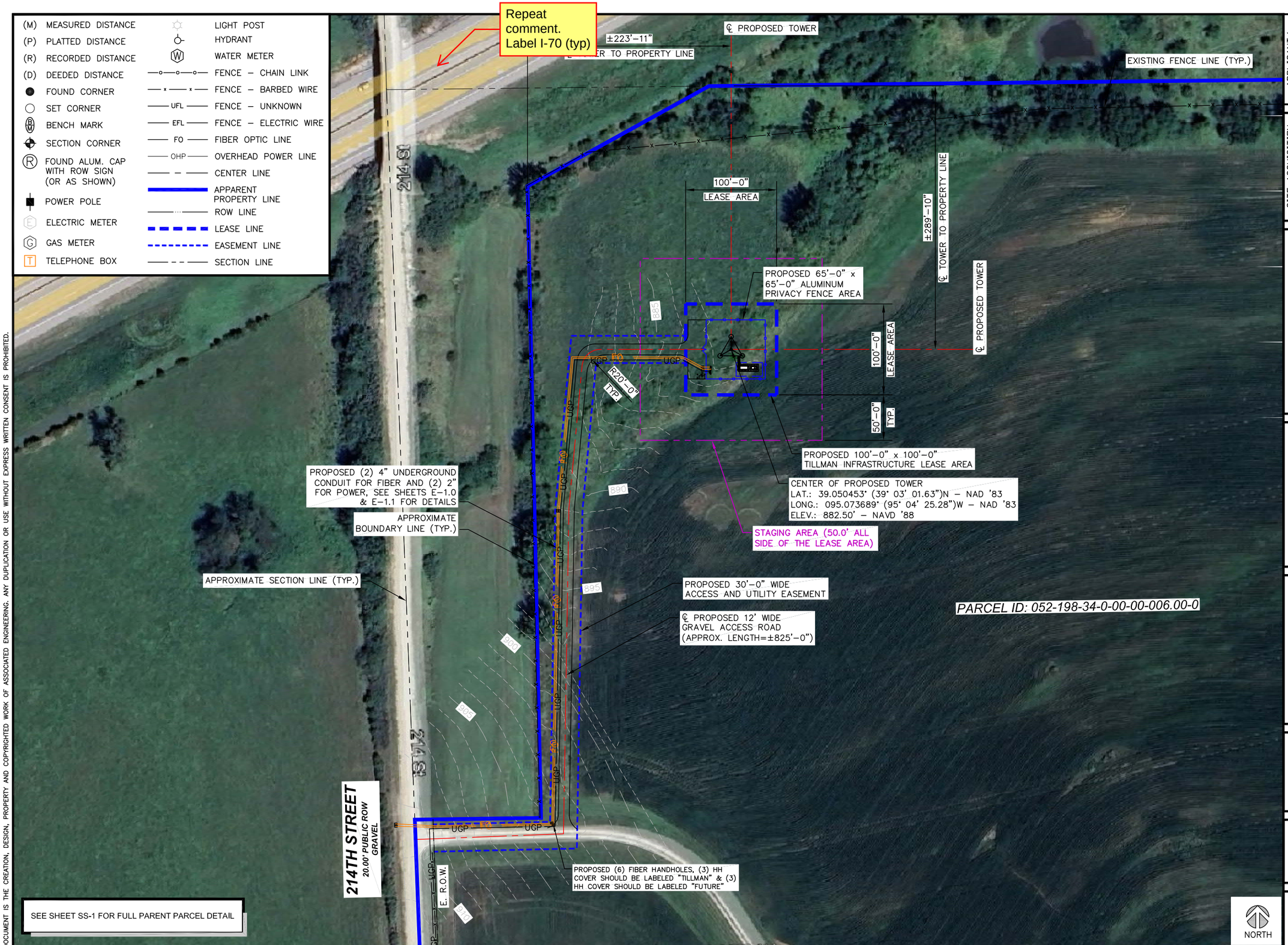

OVERALL SITE PLAN W/ AERIAL MAP

50' 0 25' 50'

SCALE: 1"=50'-0" (22x34)
(OR) 1/2"=50'-0" (11x17)

1

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APPLICANT/ SITE OWNER

TILLMAN INFRASTRUCTURE

SITE ACQUISITION /ENGINEERING

SKYWARD LAND SERVICES, INC.

ASSOCIATED Engineering, Inc.
AE INC. Project # 6392

SITE INFORMATION

TONGANOXIE_ KS

TI-OPP-37632
RELO SITE FA# 10008273

15076 214TH St.
TONGANOXIE, KS 66086
LEAVENWORTH COUNTY

PARCEL ID:
052-198-34-0-00-00-006.00-0
CANDIDATE: A

DESIGN RECORD

REV	DATE	DESCRIPTION	BY
A	04/02/26	FINAL DRAWINGS	JMV

PROFESSIONAL STAMP

GAUTAM (TOM) MEDHI
LICENSED
18252
KANSAS
PROFESSIONAL ENGINEER

ENGINEER

Tom Medhi 04-02-2026
Tom Medhi Date
MY LICENSE RENEWAL DATE IS 04/30/2027

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF KANSAS

SHEET TITLE

OVERALL SITE PLAN W/ AERIAL MAP

SHEET NUMBER

C-0.0

100

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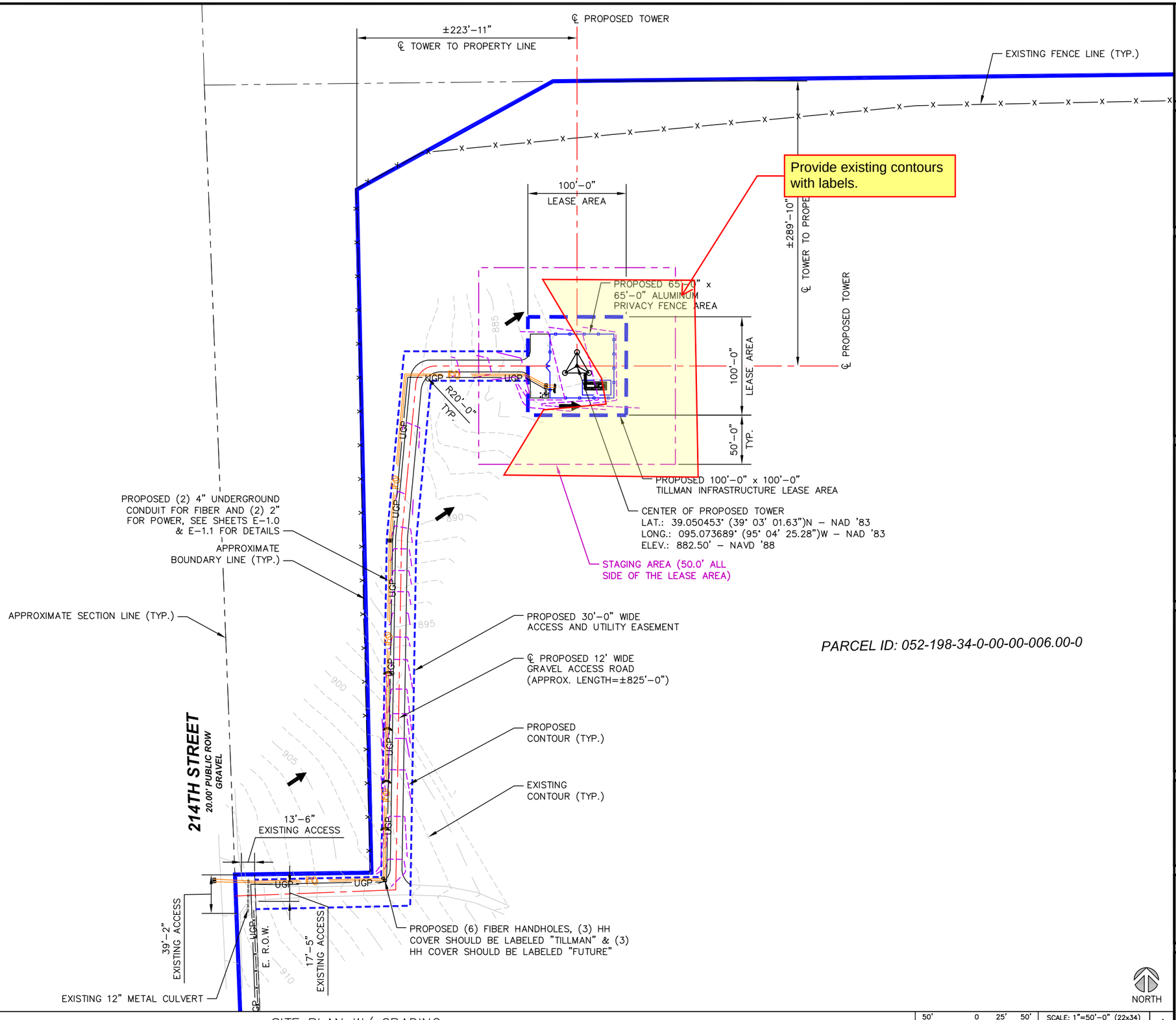

PARCEL ID: 052-198-34-0-00-00-006.00-0

NORTH

SITE PLAN W/ GRADING

50' 0 25' 50'

SCALE: 1"=50'-0" (22x34)
(OR) 1/2"=50'-0" (11x17)

1

APPLICANT/ SITE OWNER

TILLMAN INFRASTRUCTURE

SITE ACQUISITION /ENGINEERING

SKYWARD LAND SERVICES, INC.

ASSOCIATED Engineering, Inc.
AE INC. Project # 6392

SITE INFORMATION

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DESIGN RECORD

REV	DATE	DESCRIPTION	BY
A	04/02/26	FINAL DRAWINGS	JMV

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GAUTAM (TOM) MEDHI
LICENSED
18252
KANSAS
PROFESSIONAL ENGINEER

ENGINEER

Tom Medhi 04-02-2026
Tom Medhi Date
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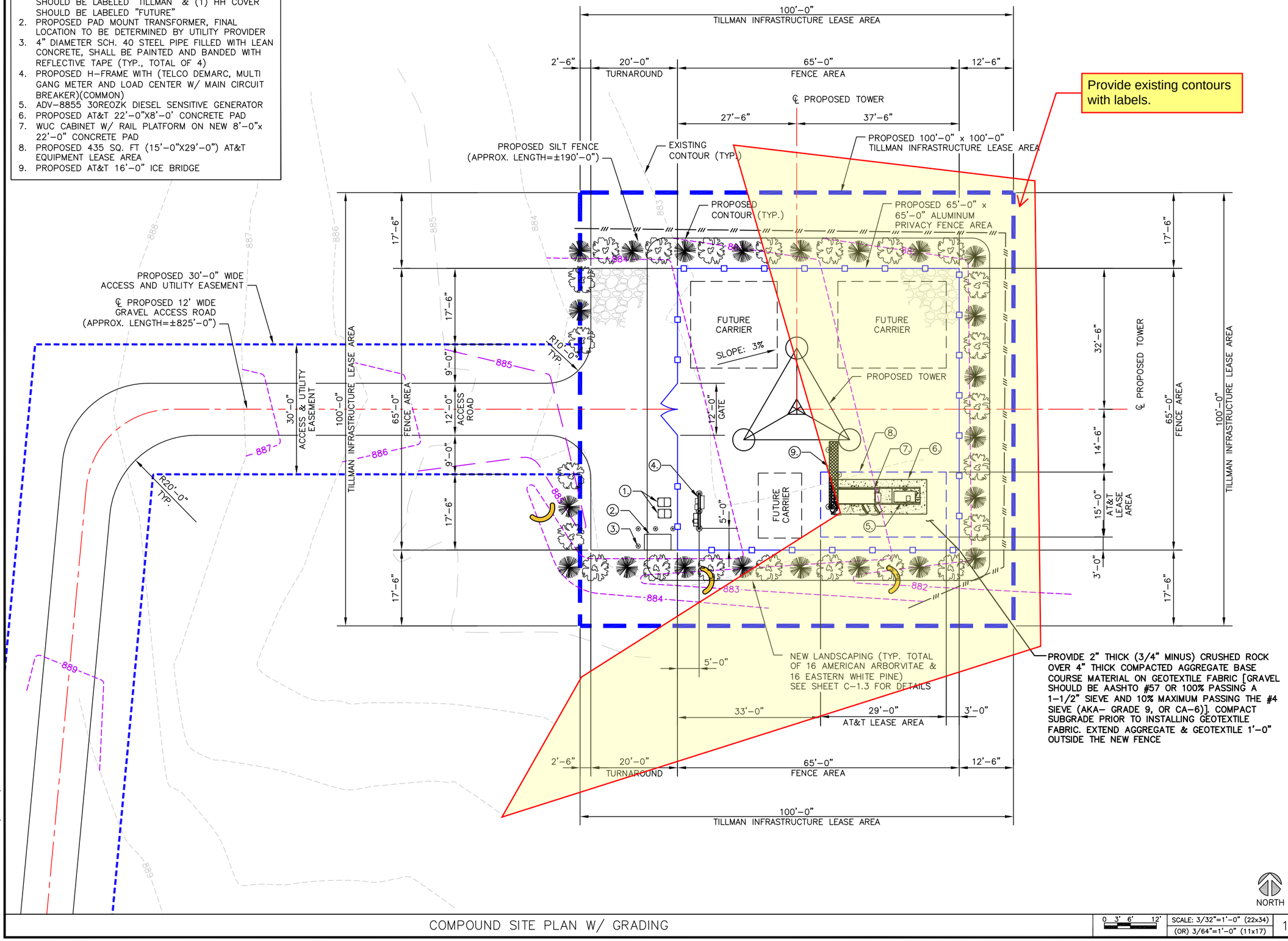
SHEET TITLE

SITE PLAN W/ GRADING

SHEET NUMBER

C-1.0
101

1. PROPOSED (2) FIBER HANDHOLES, (1) HH COVER SHOULD BE LABELED "TILLMAN" & (1) HH COVER SHOULD BE LABELED "FUTURE"
2. PROPOSED PAD MOUNT TRANSFORMER, FINAL LOCATION TO BE DETERMINED BY UTILITY PROVIDER
3. 4" DIAMETER SCH. 40 STEEL PIPE FILLED WITH LEAN CONCRETE, SHALL BE PAINTED AND BANDED WITH REFLECTIVE TAPE (TYP., TOTAL OF 4)
4. PROPOSED H-FRAME WITH (TELCO DEMARC, MULTI GANG METER AND LOAD CENTER W/ MAIN CIRCUIT BREAKER)(COMMON)
5. ADV-8855 30REOZK DIESEL SENSITIVE GENERATOR
6. PROPOSED AT&T 22'-0"X8'-0" CONCRETE PAD
7. WUC CABINET W/ RAIL PLATFORM ON NEW 8'-0"x 22'-0" CONCRETE PAD
8. PROPOSED 435 SQ. FT (15'-0"X29'-0") AT&T EQUIPMENT LEASE AREA
9. PROPOSED AT&T 16'-0" ICE BRIDGE



COMPOUND SITE PLAN W/ GRADING

0 3' 6' 12'

SCALE: 3/32"=1'-0" (22x34)
(OR) 3/64"=1'-0" (11x17)

1

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APPLICANT/ SITE OWNER

TILLMAN INFRASTRUCTURE

SITE ACQUISITION /ENGINEERING

SKYWARD LAND SERVICES, INC.

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SITE INFORMATION

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SHEET TITLE

COMPOUND
SITE PLAN W/ GRADING

SHEET NUMBER

C-1.1
102

04-14-26 Olsson Review
Revise report to meet the min. storm water report requirements.

General comments include:

Existing Conditions Section:
-Revise, GIS indicates existing homestead, pasture, and crop land.
-Provide a statement if a flood hazard exists on the property according to FEMA.
-Describe the different drainage areas and uses per drainage area within the tract.

Proposed Conditions Section:
-Provide a statement the proposed development includes a communication tower. Include a statement no other changes will be proposed within the tract.
-Table of analysis to include all drainage areas in the tract and composite runoff coefficient # for each drainage area (pre and post). Drainage areas are to be limited to within the tract to determine if an increase to off site per drainage area will be proposed.
-Also include a sample composite c formula.
-Provide source of runoff coefficients used and table of the coefficients from the source.

Runoff Summary Section:
Include peak flows for each drainage area.

Appendix Drainage Area Section:
-Depict and label all drainage areas within the tract in the drainage area section of the appendix.
-Depict tract limits.

Appendix Section:
Provide soils report including source of information.

SKYWARD
LAND SERVICES, INC.

eight]

KS
2
, KS
(NAD '83)
W (NAD '83)
D '88)

GAUTAM (TOM) MEDHI
LICENSED
18252
KANSAS
PROFESSIONAL ENGINEER

Date signed: April 04, 2026
License Renewal Date: April 30, 2027

ASSOCIATED Engineering Inc

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66-2019. Siting of wireless infrastructure; public lands and public right-of-way; wireless providers and governing bodies, rights and requirements for application process. (a) The Kansas legislature finds and declares that:

(1) The permitting, construction, modification, maintenance and operation of wireless facilities are critical to ensuring that all citizens in the state have true access to broadband and other advanced technology and information;

(2) these facilities are critical to ensuring that businesses and schools throughout the state remain competitive in the global economy;

(3) wireless telecommunications facilities that enable broadband services have a significant economic benefit; and

(4) the permitting, construction, modification, maintenance and operation of these facilities, to the extent specifically addressed in this section, are declared to be matters of statewide concern and interest.

(b) As used in this section:

(1) "Accessory equipment" means any equipment serving or being used in conjunction with a wireless facility or wireless support structure including, but not limited to, utility or transmission equipment, power supplies, generators, batteries, cables, equipment buildings, cabinets and storage sheds, shelters or similar structures.

(2) "Antenna" means communications equipment that transmits or receives electromagnetic radio signals used in the provision of wireless services.

(3) "Applicant" means any person or entity that is engaged in the business of providing wireless services or the wireless infrastructure required for wireless services and that submits an application.

(4) "Application" means a request submitted by an applicant to an authority for: (A) The construction of a new wireless support structure or new wireless facility;

(B) the substantial modification of a wireless support structure or wireless facility; or

(C) collocation of a wireless facility or replacement of a wireless facility.

(5) "Authority" means any governing body, board, agency, office or commission of a city, county or the state that is authorized by law to make legislative, quasi judicial or administrative decisions concerning an application. "Authority" shall not include any school district as defined in K.S.A. 72-6486, and amendments thereto, or any court having jurisdiction over land use, planning, zoning or other decisions made by an authority.

(6) "Base station" means a station that includes a structure that currently supports or houses an antenna, transceiver, coaxial cables, power cables or other associated equipment at a specific site that is authorized to communicate with mobile stations, generally consisting of radio transceivers, antennas, coaxial cables, power supplies and other associated electronics. "Base station" does not mean a tower or equipment associated with a tower and does not include any structure that, at the time the relevant application is filed with the authority, does not support or house equipment described in this paragraph.

(7) "Collocation" means the mounting or installation of wireless facilities on a building, structure, wireless support structure, tower, utility pole, base station or existing structure for the purposes of transmitting or receiving radio frequency signals for communication purposes.

(8) "Distributed antenna system" means a network that distributes radio frequency signals and consisting of: (A) Remote communications or antenna nodes deployed throughout a desired coverage area, each including at least one antenna for transmission and reception;

(B) a high capacity signal transport medium that is connected to a central communications hub site; and

(C) radio transceivers located at the hub's site to process or control the communications signals transmitted and received through the antennas to provide wireless or mobile service within a geographic area or structure.

(9) "Existing structure" means a structure that exists at the time an application to collocate wireless facilities on a structure is filed with an authority. The term includes any structure that is currently supporting or designed to support the attachment of wireless facilities, including, but not limited to, towers, buildings and water towers.

(10) "Public lands, buildings and facilities" does not include any real property, structures or facilities under the ownership, control or jurisdiction of the secretary of transportation.

(11) "Public right-of-way" means only the area of real property in which the authority has a dedicated or acquired right-of-way interest in the real property. It shall include the area on, below or above the present and future streets, alleys, avenues, roads, highways, parkways or boulevards dedicated or acquired as right-of-way. "Public right-of-way" does not include any state, federal or interstate highway right-of-way, which generally includes the area that runs contiguous to, parallel with, and is generally equidistant from the center of that portion of the highway improved, designed or ordinarily used for public travel.

(12) "Replacement" includes constructing a new wireless support structure of comparable proportions and of comparable height or such other height that would not constitute a substantial modification to an existing structure in

order to support wireless facilities or to accommodate collocation and includes the associated removal of the pre-existing wireless facilities, if any, or wireless support structure.

(13) "Search ring" means a shape drawn on a map to indicate the general area within which a wireless services support structure should be located to meet radio frequency engineering requirements, taking into account other factors, including topography and the demographics of the service area.

(14) "Small cell facility" means a wireless facility that meets both of the following qualifications: (A) Each antenna is located inside an enclosure of no more than six cubic feet in volume, or in the case of an antenna that has exposed elements, the antenna and all of the antenna's exposed elements could fit within an imaginary enclosure of no more than six cubic feet; and

(B) primary equipment enclosures that are no larger than 17 cubic feet in volume, or facilities comprised of such higher limits as the federal communications commission has excluded from review pursuant to 54 U.S.C. § 306108. Associated equipment may be located outside the primary equipment, and if so located, is not to be included in the calculation of equipment volume. Associated equipment includes, but is not limited to, any electric meter, concealment, telecommunications demarcation box, ground-based enclosures, back-up power systems, grounding equipment, power transfer switch, cut-off switch and vertical cable runs for the connection of power and other services.

(15) "Small cell network" means a collection of interrelated small cell facilities designed to deliver wireless service.

(16) "Substantial modification" means a proposed modification to an existing wireless support structure or base station that will substantially change the physical dimensions of the wireless support structure or base station under the objective standard for substantial change, established by the federal communications commission pursuant to 47 C.F.R. 1.40001.

(17) "Transmission equipment" means equipment that facilitates transmission for a wireless service licensed or authorized by the federal communications commission including, but not limited to, radio transceivers, antennas, coaxial or fiber optic cable and regular and backup power supply. "Transmission equipment" includes equipment associated with wireless services including, but not limited to, private, broadcast and public safety services such as wireless local area network services, and services utilizing a set of specifications developed by the institute of electrical and electronics engineers for interface between a wireless client and a base station or between two wireless clients, as well as unlicensed wireless services and fixed wireless services, such as microwave backhaul.

(18) "Wireless facility" means equipment at a fixed location that enables wireless communications between user equipment and a communications network, including, but not limited to: (A) Equipment associated with wireless services such as private, broadcast and public safety services, as well as unlicensed wireless services and fixed wireless services such as microwave backhaul; and

(B) radio transceivers, antennas, coaxial or fiber-optic cable, regular and backup power supplies and comparable equipment, regardless of technological configuration.

"Wireless facility" does not mean any wired connections from a wireless support structure or base station to a hub or switching location.

(19) "Wireless services" means "personal wireless services" and "personal wireless service facilities" as defined in 47 U.S.C. § 332(c)(7)(C), including commercial mobile services as defined in 47 U.S.C. § 332(d), provided to personal mobile communication devices through wireless facilities or any fixed or mobile wireless services provided using wireless facilities.

(20) "Wireless infrastructure provider" means any person that builds or installs transmission equipment, wireless facilities or wireless support structures, but that is not a wireless services provider.

(21) "Wireless support structure" means a freestanding structure, such as a monopole, guyed or self-supporting tower or other suitable existing or alternative structure designed to support or capable of supporting wireless facilities. "Wireless support structure" shall not include any telephone or electrical utility pole or any tower used for the distribution or transmission of electrical service.

(22) "Utility pole" means a structure owned or operated by a public utility as defined in K.S.A. 66-104, and amendments thereto, a municipality as defined in K.S.A. 75-6102, and amendments thereto, or an electric cooperative as defined in K.S.A. 17-4652, and amendments thereto, that is designed specifically for and used to carry lines, cables or wires for telecommunications, cable, electricity or to provide lighting.

(23) "Water tower" means a water storage tank or a standpipe, or an elevated tank situated on a support structure that was originally constructed for use as a reservoir or facility to store or deliver water.

(24) "Wireless services provider" means a provider of wireless services.

(c) (1) An authority shall not charge an application fee, consulting fee or other fee associated with the submission, review, processing and approval of an application that is not required for other wireless infrastructure providers or

wireline telecommunications or broadband providers within the authority's jurisdiction.

(2) An authority shall only assess fees or charges for the actual costs relating to the granting or processing of an application that are directly incurred by the authority and the authority shall not charge any market-based or value-based fees for the processing of an application. Such fees and charges shall be reasonably related in time to the occurrence of such costs.

(3) An authority or any third-party entity shall not include any travel expenses incurred in the review of an application for more than one trip per application to the authority's jurisdiction and an applicant shall not be required to pay or reimburse an authority for a consultant or other third-party fees based on a contingency-based or results-based arrangement. Any travel expenses included must be reasonable and directly related to the application.

(4) The total charges and fees assessed by the authority shall not exceed:

(A) $500 for a collocation application, that is not a substantial modification, small cell facility application or distributed antenna system application; or

(B) $2,000 for an application for a new wireless support structure or for a collocation application that is a substantial modification of a wireless support structure.

(d) (1) An authority may not charge a wireless services provider or wireless infrastructure provider any rental, license or other fee to locate a wireless facility or wireless support structure on any public right-of-way controlled by the authority, if the authority does not charge other telecommunications or video service providers, alternative infrastructure or wireless services providers or any investor-owned utilities or municipally-owned commercial broadband providers for the use of public right-of-way. If an authority does assess a charge, including a charge or rental fee for attachment to the facilities owned by the authority in the right-of-way, any such charge must be competitively neutral, with regard to other users of the public right-of-way, including investor-owned utilities or municipally-owned commercial broadband providers, and may not be unreasonable or discriminatory or violate any applicable state or federal law, rule or regulation.

(2) (A) Subject to the provisions of this subsection, a wireless services provider or wireless infrastructure provider, subject to an application, shall have the right to construct, maintain and operate wireless support structures, utility poles, small cell wireless facilities or distributed antenna systems along, across, upon, under or above the public right-of-way. The authority must be competitively neutral with regard to other users of the public right-of-way, may not be unreasonable or discriminatory and may not violate any applicable state or federal law, rule or regulation.

(B) Nothing in this subsection (d) shall be interpreted as granting a wireless services provider or wireless infrastructure provider the right to construct, maintain or operate any facility or related appurtenance on property owned by the authority outside of the public right-of-way.

(C) The right of a wireless services provider or wireless infrastructure provider to use and occupy the public right-of-way shall always be subject and subordinate to the reasonable public health, safety and welfare requirements and regulations of the authority. An authority may exercise its home rule powers in its administration and regulation related to the management of the public right-of-way provided that any such exercise must be competitively neutral and may not be unreasonable or discriminatory.

(D) The authority shall have the right to prohibit the use or occupation of a specific portion of public right-of-way by a provider due to a reasonable public interest necessitated by public health, safety and welfare so long as such interest is exercised in a competitively neutral manner and is not unreasonable or discriminatory.

(E) A wireless services provider or wireless infrastructure provider shall comply with all laws and rules and regulations governing the use of public right-of-way.

(F) An authority may require a wireless services provider or wireless infrastructure provider to repair all damage to a public right-of-way caused by the activities of that provider, or of any agent, affiliate, employee or subcontractor of that provider, while occupying, installing, repairing or maintaining facilities in a public right-of-way and to return the right-of-way to the condition in which it existed prior to the damage. If a wireless services provider or wireless infrastructure provider fails to make the repairs required by an authority, the authority may effect those repairs and charge the provider the reasonable cost of those repairs. If an authority incurs damages as a result of a violation of this paragraph, then the authority shall have a cause of action against a wireless services provider or wireless infrastructure provider for violation of this paragraph, and may recover its damages, including reasonable attorney fees, if such provider is found liable by a court of competent jurisdiction.

(G) If requested by an authority, in order to accomplish construction and maintenance activities directly related to improvements for the health, safety and welfare of the public, a wireless services provider or wireless infrastructure provider shall relocate or adjust its facilities within the public right-of-way at no cost to the authority, as long as such request similarly binds all users of such right-of-way. Such relocation or adjustment shall be completed as soon as reasonably possible within the time set forth in any written request by the authority for such relocation or adjustment, as long as the authority provides the wireless services provider or wireless infrastructure provider with a minimum of

180 days advance written notice to comply with such relocation or adjustment, unless circumstances beyond the authority's control require a shorter period of advance notice. If any such relocation or adjustment is for private benefit, the provider shall not bear the cost of the relocation or adjustment to the extent of such private benefit and the provider shall not be obligated to commence the relocation or adjustment until receipt of funds for such relocation or adjustment. The provider shall have no liability for any delays caused by a failure to receive funds for the cost of such relocation or adjustment and the authority shall have no obligation to collect such funds.

(H) Wireless services providers and wireless infrastructure providers shall indemnify and hold the authority and its officers and employees harmless against any and all claims, lawsuits, judgments, costs, liens, losses, expenses, fees to include reasonable attorney fees and costs of defense, proceedings, actions, demands, causes of action, liability and suits of any kind and nature, including personal or bodily injury or death, property damage or other harm for which recovery of damages is sought, to the extent that it is found by a court of competent jurisdiction to be caused by the negligence of the wireless services provider or wireless infrastructure provider, any agent, officer, director, representative, employee, affiliate or subcontractor of the provider, or their respective officers, agents, employees, directors or representatives, while installing, repairing or maintaining facilities in a public right-of-way. The indemnity provided by this paragraph does not apply to any liability resulting from the negligence of an authority, its officers, employees, contractors or subcontractors. If a provider and the authority are found jointly liable by a court of competent jurisdiction, liability shall be apportioned comparatively in accordance with the laws of this state, without waiving any governmental immunity available to the authority under state law and without waiving any defenses of the parties under state or federal law. This paragraph is solely for the benefit of the authority and the wireless services provider or wireless infrastructure provider and does not create or grant any rights, contractual or otherwise, to any other person or entity.

(I) A wireless services provider or wireless infrastructure provider or authority shall promptly advise the other in writing of any known claim or demand against the provider or the authority related to or arising out of the provider's activities in a public right-of-way.

(3) The provisions of this subsection shall not apply to or affect any authority's jurisdiction over the activities of wireless services providers or wireless infrastructure providers in public utility easements, private easements or on privately owned property.

(4) Nothing in this subsection shall be construed to prevent wireless structures and wireless facilities from being located on state, federal or interstate highway right-of-way in accordance with reasonable policies and procedures adopted by the manager of the state, federal and interstate highway right-of-way under applicable federal and state law.

(e) (1) An authority may enter into a lease with an applicant for the applicant's use of public lands, buildings and facilities. When entering into a lease for use of publicly owned lands, an authority shall offer leases or contracts for applicants to use publicly owned lands that are at least 10 years in duration, unless otherwise agreed to by both the applicant and the authority, and at market rates. Any lease renewals shall be negotiated in good faith. Due to the benefit of increased broadband and wireless services to the citizens of the authority, an authority may choose not to charge for the placement of wireless facilities on public lands. If an authority does charge, any such charges for use of publicly owned lands and facilities must be competitively neutral with regard to other users of the publicly owned lands and facilities, including any investor-owned utilities or municipally owned commercial broadband providers, may not be unreasonable or discriminatory and may not violate any applicable state or federal law, rule or regulation.

(2) If the applicant and the authority do not agree on the applicable market rate for the use or lease of public land and are unable to agree on a process to determine the applicable market rate for any such public land, then the market rate will be determined by a panel of three appraisers. The panel will consist of one appraiser appointed by each party and a third appraiser selected by the two appointed appraisers. Each appraiser will independently appraise the appropriate lease rate and the market rate shall be set at the mean between the highest and lowest market rates among all three independent appraisals, unless the mean between the highest and lowest appraisals is greater than or less than 10% of the appraisal of the third appraiser chosen by the parties' appointed appraisers, in which case the third appraisal will determine the rate for the lease. The appraisal process shall be concluded within 150 calendar days from the date the applicant first tenders a proposed lease rate to the authority. Each party will bear the cost of the party's own appointed appraiser, and the parties shall share equally the cost of the third appraiser chosen by the two appointed appraisers.

(3) Nothing in this subsection shall be construed to prevent wireless structures and wireless facilities from being located on real property, structures or facilities under the ownership, control or jurisdiction of the secretary of transportation in accordance with reasonable policies and procedures adopted by the secretary of transportation under applicable federal and state law.

(4) This subsection (e) shall not apply to public rights-of-way governed by subsection (d).

(f) To ensure uniformity across the state with respect to consideration of every application, an authority shall not:

(1) Require an applicant to submit information about, or evaluate an applicant's business decisions with respect to, the applicant's designed service, customer demand for service or quality of the applicant's service to or from a particular area or site. An authority may require an applicant filing an application for a new wireless support structure to state in such application that the applicant conducted an analysis of available collocation opportunities on existing wireless support structures within the same search ring defined by the applicant, solely for the purpose of confirming that an applicant undertook such analysis;

(2) require information that concerns the specific need for the wireless support structure, including if the service to be provided from the wireless support structure is to add additional wireless coverage or additional wireless capacity. An authority may not require proprietary, confidential or other business information to justify the need for the new wireless support structure, including propagation maps and telecommunications traffic studies;

(3) evaluate an application based on the availability of other potential locations for the placement of wireless support structures or wireless facilities including, but not limited to, the option to collocate, instead of construct, a new wireless support structure or for substantial modifications of a support structure;

(4) dictate the type of transmission equipment or technology to be used by the applicant including, but not limited to, requiring an applicant to construct a distributed antenna system or small cell facility in lieu of constructing a new wireless support structure or discriminate between different types of infrastructure or technology;

(5) require the removal of existing wireless support structures or wireless facilities, wherever located, as a condition for approval of an application. This paragraph shall not preclude an authority from adopting reasonable rules with respect to the removal of abandoned wireless support structures or wireless facilities;

(6) impose any restrictions at or near civilian airports with respect to objects in navigable airspace height limitations, proximity to civilian airports or markings and lighting on wireless support structures or base stations that are greater than, or in conflict with, any restrictions imposed by the federal aviation administration, except that this paragraph shall not be construed so as to impact any existing height restrictions adopted by an authority as of the effective date of this section on wireless support structures or base stations located at or near civilian airports;

(7) establish or enforce regulations or procedures for radio frequency signal strength or the adequacy of service quality;

(8) impose surety requirements, including bonds, escrow deposits, letters of credit or any other type of financial surety to ensure that abandoned or unused facilities can be removed, unless the authority imposes similar requirements on other permits for other types of commercial development or land uses, and any such instrument cannot exceed a reasonable estimate of the direct cost of the removal of the facility. If surety requirements are imposed, any such requirements shall be competitively neutral, non-discriminatory, reasonable in amount and commensurate with the historical record for local facilities and structures that are abandoned;

(9) discriminate or create a preference on the basis of the ownership of any property, structure, base station or wireless support structure when promulgating rules or procedures for siting wireless facilities or for evaluating applications or require the placement of wireless support structures or wireless facilities on property owned or leased by the authority, but an authority may develop a process to encourage the placement of wireless support structures or wireless facilities on property owned or leased by the authority, including an expedited approval process. Nothing in this subsection shall be construed to hinder or restrict the siting of public safety communications towers, including, but not limited to, police and fire;

(10) impose any unreasonable requirements or obligations regarding the presentation, appearance or function of the wireless facilities and equipment including, but not limited to, those relating to any kinds of materials used and those relating to arranging, screening or landscaping of facilities. In developing such a requirement or obligation for wireless facilities located on a public right-of-way, the authority shall consider input from property owners adjoining the affected public right-of-way;

(11) impose any requirements that an applicant purchase, subscribe to, use or employ facilities, networks or services owned, provided or operated by an authority, in whole or in part, or by any entity in which the authority has a competitive, economic, financial, governance or other interest;

(12) impose environmental testing, sampling or monitoring requirements that exceed federal law;

(13) impose any compliance measures for radio frequency emissions or exposure from wireless facilities that exceed the requirements of the federal communications commission rules for radio frequency;

(14) in conformance with 47 U.S.C. § 332(c)(7)(B)(iv), reject an application, in whole or in part, based on perceived or alleged environmental effects of radio frequency emissions or exposure;

(15) prohibit the use of emergency power systems that comply with federal and state environmental requirements and do not violate local health and safety requirements and local noise control ordinances, but no local regulations shall prevent the provision of emergency power during an actual emergency;

(16) condition or require the approval of an application based on the applicant's agreement to permit any wireless facilities provided or operated, in whole or in part, by an authority or by any other entity to be placed at, or collocated with, the applicant's wireless support structure;

(17) impose a greater setback or fall-zone requirement for a wireless support structure than for other types of commercial structure of a similar size; or

(18) limit, for less than 10 years, the duration of the approval of an application. Any renewals shall be negotiated in good faith. Construction of the approved structure or facilities shall commence within one year of final approval and shall be diligently pursued to completion.

(g) An applicant for a small cell network involving no greater than 25 individual small cell facilities of a substantially similar design within the jurisdiction of a single authority shall be permitted, upon request by the applicant, to file a consolidated application and receive a single permit for the installation, construction, maintenance and repair of a small cell network instead of filing separate applications for each individual small cell facility, except that the authority may require a separate application for any small cell facilities that are not of a substantially similar design. The authority shall render a decision no later than 60 days after the submission of an application regarding small cell facilities that satisfies the authority's requirements in a single administrative proceeding.

(h) (1) Within 150 calendar days of receiving an application for a new wireless support structure and within 90 calendar days of receiving an application for a substantial modification to an existing wireless support structure or base station, or any other application for placement, installation or construction of transmission equipment that does not constitute an eligible facilities request as defined by 47 U.S.C. § 1455(a), an authority shall: (A) Review the application in light of the application's conformity with applicable local zoning regulations;

(B) make a final decision to approve or disapprove the application; and

(C) advise the applicant in writing of the authority's final decision, supported by substantial evidence contained in a written record and issued contemporaneously. If an authority denies an application, there must be a reasonable basis for the denial. An authority may not deny an application if such denial discriminates against the applicant with respect to the placement of the facilities of other investor-owned utilities, wireless service providers, wireless infrastructure providers or wireless carriers.

(2) (A) The time period for approval of applications shall begin when the application is submitted and may be tolled within the first 30 days after the submission of the application if the authority notifies the applicant that such application is incomplete, identifies all missing information and specifies the code provision, ordinance, application instruction or otherwise publicly stated procedures that require the information to be submitted.

(B) The time period for approval of applications shall begin running again when the applicant provides the necessary supplemental information. Additionally, the time period for approval of applications may be tolled by the express agreement in writing by both the applicant and the authority.

(3) An application shall be deemed approved if an authority fails to act on an application for a: (A) New wireless support structure within the 150-calendar day review period specified; or

(B) substantial modification to an existing wireless support structure or base station or any other applications for placement, installation or construction of transmission equipment that does not constitute an eligible facilities request as defined by 47 U.S.C. § 1455(a) within the 90 calendar days review period specified.

(4) An authority shall approve applications for eligible facilities requests, as defined by 47 U.S.C. § 1455(a), within 60 days according to the procedures established by federal law under 47 C.F.R. 1.40001.

(5) An application shall be deemed approved once an applicant has provided notice to the authority that the applicable time periods provided in this section have lapsed.

(6) Within 30 days of the notice provided pursuant to subsection (h)(5), a party aggrieved by the final action of an authority, either by the authority affirmatively denying an application or by the authority's inaction, may bring an action for review in any court of competent jurisdiction.

(i) An authority may not institute any moratorium on the filing, consideration or approval of applications, permitting or the construction of new wireless support structures, substantial modifications of wireless support structures or collocations.

(j) Subject to the provisions of this section and applicable federal law, an authority may continue to exercise zoning, land use, planning and permitting authority within the authority's territorial boundaries with regard to the siting of new or the modification of wireless support structures, wireless facilities, small cell facilities or utility poles, except that no authority shall have or exercise any zoning or siting jurisdiction, authority or control over the construction, installation or operation of any small cell facility or distributed antennae system located in an interior structure or upon the site of any campus, stadium or athletic facility.

(k) Nothing in this section shall be construed to apply to military installations.

(l) The provisions of this section shall take effect and be in force on and after October 1, 2016.

History: L. 2016, ch. 40, § 1; July 1.

RESOLUTION 2026-09

A resolution of the Leavenworth County Kansas Board of County Commissioners, conditionally issuing a Special Use Permit for Wireless Communication Facility (Telecommunications Tower) – Tillman Infrastructure, LLC on the following described property:

The Southwest Quarter (SW ¼) of Section Thirty-four (34), Township Eleven (11) South of Range Twenty-one (21) East of the 6th Principal Meridian except public highways.

WHEREAS, a request for a Special Use Permit as described above was filed with the Secretary of the Leavenworth County Planning Commission, on the 13th day of April, 2026, and

WHEREAS, the Leavenworth County Planning Commission, after notice as required by law, did conduct a public hearing upon the granting of such request for a Special Use Permit on the 13th day of May, 2026; and

WHEREAS, the Leavenworth County Planning Commission, based upon specific findings of fact incorporated by reference herein, did recommend that the Special Use Permit be approved, subject to special conditions as set forth; and

WHEREAS, the Board of County Commissioners considered, in session on the 3rd day of June, 2026, the recommendation of the Leavenworth County Planning Commission.

NOW, THEREFORE, BE IT RESOLVED by the Board of County Commissioners of Leavenworth County, that:

I. Based upon the findings as set forth in the staff report and the findings of fact adopted by the Board of County Commissioners on the 3rd Day of June, 2026, and incorporated herein by reference, Case No. DEV-26-015, Special Use Permit (SUP) for a Wireless Communication Facility (Telecommunications Tower) – Tillman Infrastructure, LLC is conditionally approved subject to the performance and observation of the conditions and stipulations set forth herein.,

II. The Special Use Permit conditionally granted in Section I. is hereby contingent upon the performance and observations of the following additional and supplementary regulations, stipulations, conditions, and restrictions, of which any violations shall constitute an additional basis for revocation:

1. The SUP is considered a Type 2 permit and shall be limited to a period of twenty (20) years.
2. No limit on hours of operation.
3. The Special Use Permit shall be subject to the written narrative and site plan provided on April 6, 2026 and April 13, 2026.
4. The applicant shall provide a certificate of general liability insurance in the amount of $1,000,000 and shall indicate Leavenworth County as the certificate holder prior to commencement of activities on the site.
5. The applicant shall provide confirmation of both the FCC and FAA approval of the telecommunications tower to the Planning & Zoning Department prior to a building permit being issued and construction commencing.
6. A copy of the executed lease agreement must be provided to the Planning & Zoning Department prior to a building permit being issued.
7. A building permit shall be obtained prior to commencement of construction.
8. A 24-hour emergency contact number shall be posted at the facility in the event of an emergency.
9. The applicant shall provide updated plans in compliance with all outstanding review comments made by County Staff prior to any acceptance being issued.
10. The applicant shall contact the Emergency Management Department and Fire District #2 with an

Emergency Plan. Confirmation of the final approved plan must be submitted to the Planning & Zoning Department prior to issuance of a building permit.

11. The proposed telecommunications tower shall maintain a required setback of the total tower height plus 20 feet to all property lines and right-of-way lines.
12. Applicant shall file and maintain a security bond, letter of credit or other such security acceptable to the County. Such security shall be in the amount equal to twenty (20) percent of the cost of construction to the tower as disclosed by the applicant. Such security shall be used to pay for removal of the tower if the owner fails to remove the tower as provided in #14. The security shall be returned to the applicant upon proper removal of the tower.
13. Any tower that is not operated for a continuous period of two (2) years shall be considered abandoned, and the owner of such tower shall remove same within ninety (90) days of receipt of notice from the governing authority notifying the owner of such abandonment. If such tower is not removed within said ninety (90) days, the governing authority may remove such tower at the owner's expense.
14. Pad sites and guy wire locations must be surrounded by a minimum of a six-foot tall fence that may use screening inserts or other material that block direct view of the site.
15. Vegetation must be removed from around the pad site and controlled on the leased area of the property.
16. No signage shall be allowed in the right-of-way. Sign permits shall be required for any on-site or off-site signage. The applicant shall provide an owner authorization form for any off-site signs. All signage shall comply with Article 25, Sign Regulations of the Leavenworth County Zoning and Subdivision Regulations.
17. No on-street parking shall be allowed and traffic shall not queue onto the public road network when entering the site.
18. Lighting generated from proposed use shall be limited to 0.00 foot-candles net gain, as measured at the property line.
19. Noise shall be limited to 65 dBs along property lines adjacent to Residentially Zoned Parcels.
20. All areas disturbed during construction shall be either sodded or seeded within a year of completion of construction.
21. That the conditional Special Use Permit granted herein is subject to revocation upon the breaching of the conditions set forth herein, or any substantial change in the use of the subject property. The Tillman Infrastructure LLC, and its assigns or successors in interest, hereby consent to, and authorize, entry onto the subject property by employees or agents of the county for the purpose of inspecting the subject property for compliance with the conditions set forth herein.
22. This SUP is subject to revocation upon the violation or, or failure to comply with, any condition stated herein.
23. Applicant shall not cause or allow any public nuisance to exist on the subject property
24. This SUP shall comply with all local, state, and federal rules and regulations that may be applicable.

Located in Section 34, Township 11 South, Range 21, in Leavenworth County, Kansas, more commonly known as 15076 214th Street.

Adopted this 3rd day of June, 2026
Board of County Commission
Leavenworth, County, Kansas

_____
Mike Stieben, Chairman

ATTEST:

_____
Fran Keppler, Leavenworth County Clerk

_____
Jeff Culbertson, Member

_____
Vanessa Reid, Member

_____
Willie Dove, Member

_____
Mike Smith, Member

Leavenworth County
Request for Board Action
Resolution 2026-07
Special Use Permit Kaw Valley Companies LLC

Date: June 3, 2026
To: Board of County Commissioners
From: Planning & Zoning Staff

Department Head Review: John Jacobson, Reviewed

Additional Reviews as needed:

Budget Review ☐ Administrator Review ☒ Legal Review ☒

Recommendation of Planning Commission:

> *Chairman, I find that the request for a Special Use Permit outlined in Case DEV-25-021 does NOT comply with Golden Factors (LIST THE GOLDEN FACTORS) and move that the proposed Special Use Permit as outlined in Case DEV-25-021 be denied based on the recommendation and findings of the Planning Commission on the Golden factors and as substantiated by the facts, testimony and evidence presented at the public hearing.*

Analysis: The applicant is requesting a Special Use Permit to operate a Sand Excavation and Stockpiling business on the property located at 16201 & 00000 Lenape Road. The property is located at the northeast and southeast corners of 166th Street and Lenape Road in unincorporated Leavenworth County. The property is approximately 435 acres in total. The property is currently zoned I-3, Heavy Industrial. The site will be used for dredging sand material within a sedimentation basin; the dredged sand material will be sorted and loaded onto commercial trucks for transport to the company's other facilities or to project sites.

A full analysis can be found in the attached staff report.

Planning Commission Recommendation: On November 12, 2025, the Planning Commission, after conducting a public hearing, recommended denial of the Special Use Permit. On March 25, 2026, the Board of County Commissioners considered the recommendation of the Planning Commission and remanded the case back to the Planning Commission with direction to conduct a second public hearing based on additional information offered by the applicant for consideration. On May 13, 2026, the Planning Commission, after conducting a second public hearing, voted 5-3 to recommend denial of Case DEV-25-021 on the grounds that the application did not meet the following Golden Factors: character of the neighborhood (Factor 1), and relative gain to economic development, health, safety and welfare (Factor 6). The Commission's findings were as follows:

- Factor 1: The proposed application does not match the character of the neighborhood, specifically because there are complications as there are abutting residential and industrial zones.

- Factor 6: The proposed application has a detrimental effect to the public health, safety and welfare because there will a reduction in property values of adjacent properties that adversely effects the general prosperity, a reduction in the health and safety due to some factors of transportation, and the proposed use will have an adverse effect to the general welfare.

Alternatives:

1. Approve Case DEV-25-021 (Resolution 2026-07), Special Use Permit for Sand Excavation and Stockpiling for Kaw Valley Companies, LLC, by overriding the Planning Commission's recommendation with a majority vote[i] with Findings of Fact, and with or without conditions; or

   Motion: *Chairman, I find that the request for a Special Use Permit* outlined in Case DEV-25-021 *complies with the Golden Factors, including factors 1 and 6 and I move to adopt Resolution 2026-07 and conditionally approve the Special Use Permit as outlined in Case No DEV-25-021 based on the facts set forth in the staff report and as amended by the Commission.*

2. Deny Case DEV-25-021, Special Use Permit for Sand Excavation and Stockpiling for Kaw Valley Companies, LLC, with Findings of Fact and thereby approve the Planning Commission's recommendation of denial with a majority vote; or

   Motion: *Chairman, I find that the request for a Special Use Permit outlined in Case DEV-25-021 does NOT comply with Golden Factors (LIST THE GOLDEN FACTORS) and move that the proposed Special Use Permit as outlined in Case DEV-25-021 be denied based on the recommendation and findings of the Planning Commission on the Golden factors and as substantiated by the facts, testimony and evidence presented at the public hearing.*

3. Revise or Modify the Planning Commission Recommendation to Case DEV-25-021 (Resolution 2026-07), Special Use Permit for Sand Excavation and Stockpiling for Kaw Valley Companies, LLC, with Findings of Fact with a majority vote; or

   Motion: *Chairman, I find that the Special Use Permit outlined in Case DEV-25-021 complies with the Golden Factors, including Factors 1 and 6,, and I move to adopt Resolution 2026-07 and conditionally approve the Special Use Permit as outlined in Case DEV-25-021 based on the findings as set forth in the staff report and information presented at the public hearing subject to the following additional conditions*

   *1.*_____*;*

   *2.*_____*; and*

   *3.*_____.

Budgetary Impact:

☒ Not Applicable
☐ Budgeted item with available funds
☐ Non-Budgeted item with available funds through prioritization
☐ Non-Budgeted item with additional funds requested

Total Amount Requested:
$0.00

Additional Attachments: Staff Report, Planning Commission Minutes

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[i] Under K.S.A. 12-757(g) an ordinance or resolution adopting a zoning amendment for surface mining operations regardless of protest petition or failure to recommend by the planning commission shall only require a majority vote of all members of the governing body. Here, that means that this action will only require 3 members of the Board of County Commissioners to adopt a Resolution approving the Special Use Permit.

LEAVENWORTH COUNTY
PLANNING COMMISSION
STAFF REPORT

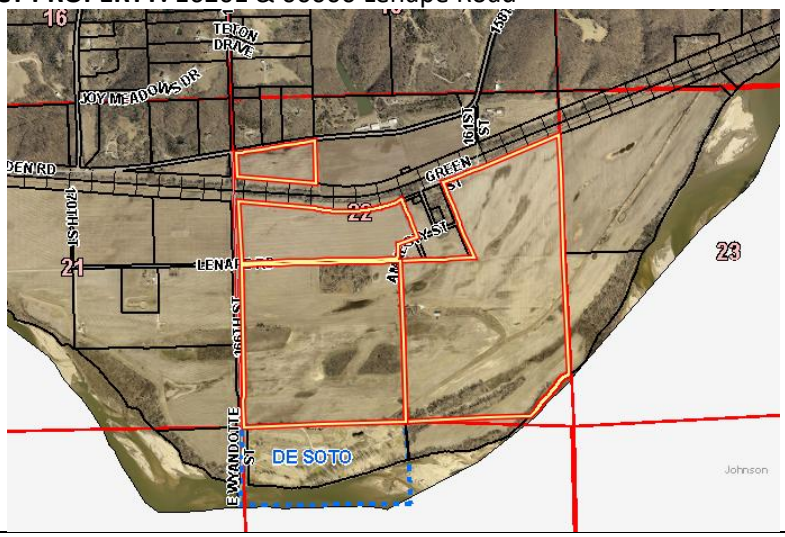
CASE NO: DEV-25-021 Kaw Valley Sand Excavation & Stockpiling — May 13, 2026

REQUEST: ***Public Hearing Required***

☐ Zoning Amendment ☒ Special Use Permit

☐ Temporary Special Use Permit

SUBJECT PROPERTY: 16201 & 00000 Lenape Road



LEGAL DESCRIPTION:
Tracts of land over a portion of the Northwest, Northeast, Southwest and Southeast Section 22, Township 12 South, Range 22 East, of Leavenworth County, Kansas

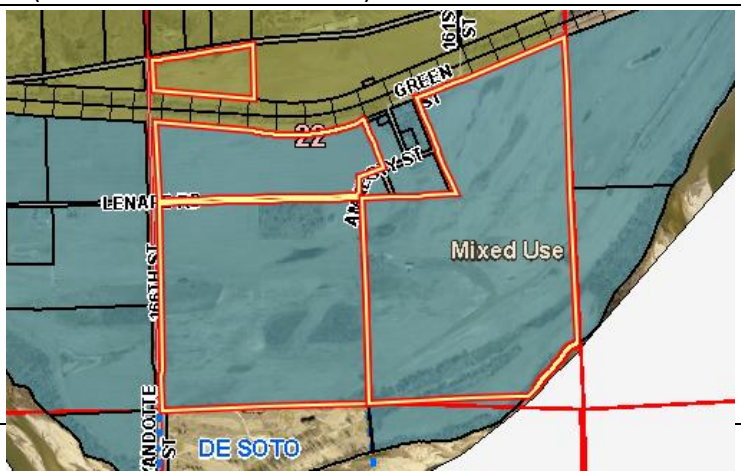
STAFF RECOMMENDATION: Approval with Conditions

ACTION OPTIONS:

1. Recommend approval of Case No. DEV-25-021, Special Use Permit for Kaw Valley Companies for a Sand Excavation & Stockpiling Operation, to the Board of County Commission, with or without conditions; or
2. Recommend denial of Case No. DEV-25-021, Special Use Permit for Kaw Valley Companies for a Sand Excavation & Stockpiling Operation, to the Board of County Commission for the following reasons; or
3. Continue the hearing to another date, time, and place.

PROJECT SUMMARY:
Request for Special Use Permit to operate a Sand Excavation & Stockpiling Operation for Kaw Valley Companies on the properties located at 16201 & 00000 Lenape Road (PID 235-22-0-00-00-004.00).

Future Land Use Map:



STAFF REPRESENTATIVE:
Amy Allison
Deputy Director

APPLICANT/APPLICANT AGENT:
Kaw Valley Companies, Inc.
5600 Kansas Avenue
Kansas City KS 66106

PROPERTY OWNER:
Kaw Valley Companies &
Carolyn E Spring Trust
2806 Campus Lane
Albert Lea, MN 56007

CONCURRENT APPLICATIONS:
N/A

LAND USE

ZONING: I-3 Heavy Industrial

FUTURE LAND USE DESIGNATION: Mixed Use

SUBDIVISION: N/A & Town of Lenape Plat

FLOODPLAIN: Floodway & Zone AE

PROPERTY INFORMATION

PARCEL SIZE: 435 ACRES

PARCEL ID NO:
235-22-0-00-00-004.00 & -014.00

BUILDINGS:
Accessory Agricultural Structure

ACCESS/STREET:
Lenape Road, Local, Gravel ±22'
Green Street, Local, Gravel ±12;
166th Street, Arterial, Paved ±26''

UTILITIES

SEWER: SEPTIC

FIRE: Fire District 2

WATER: N/A

ELECTRIC: EVERGY

NOTICE & REVIEW:

STAFF REVIEW: 4/10/2026

NEWSPAPER NOTIFICATION:
3/18/2026

NOTICE TO SURROUNDING PROPERTY OWNERS:3/21/2026

FACTORS TO BE CONSIDERED:		
The following factors are to be considered by the Planning Commission and the Board of County Commissioners when approving or disapproving this Special Use Permit request:	**Met**	**Not Met**
1. Character of the Neighborhood: *Density:* Within the immediate vicinity of the proposed development, the area is mostly undeveloped, with five homes being located south of the railroad tracks. North of the railroad tracks, the neighborhood is more developed with most developed tracks being located north of Golden Road and exceed 5 acres in size. *Nearby City Limits: The City of De Soto does abut the development along its southern border. The City of Linwood is located over 3 miles to the west.* *Initial Growth Management Area: This parcel is located within 660 ft of the City of De Soto and therefore within their Initial Urban Growth Area. However, it appears that no sanitary sewer or water from the City is located on the north side of the Kansas River which will limit their potential growth to the north.*	✓	
2. Zoning and uses of nearby property: *Adjacent Uses: Most of the adjacent parcels are residential and agricultural in nature. There are five residences within 1,000 feet of the development area. The City of Olathe also operates a golf course to the south of the property.* *Adjacent Zoning: All adjacent properties are zoned I-3 Heavy Industrial.*	✓	✓
3. Suitability of the Property for the uses to which is has been restricted: *The property is* currently used for agricultural purposes. *The property is suitable for agricultural uses; however, residential uses are not generally recommended as the property is located within the regulatory floodway. The proposed use is permitted within the I-3 zoning district with a Special Use Permit. All proposed structures are temporary in nature and would be constructed in compliance with all applicable floodplain regulations.*	✓	
4. Extent to which removal of the restrictions will detrimentally affect nearby property: *The use is likely to impact neighboring parcels, with an increase in noise and traffic being the primary concern. However, considering this area is designated for industrial use, the impacts are within normal parameters of most industrial type uses.* *Noise: The proposed development will utilize equipment and machinery that will generate noise. The applicant has prepared a noise study, to which they indicate that noise levels will be between 62.2 and 73.5 dBA at different locations adjoining the proposed development. The study indicated that the location with the most consistent noise levels (#3) will have an average dBA of 70.1. In comparison, a typical industrial operation will have noise thresholds of 80 dBA. The applicant has indicated that they will take the following measures to mitigate noise:* • *Electric equipment will be used* • *Production schedule will be set to reduce impacts by coordinating sound sources on-site during daylight hours.* • *Processing equipment will be used during morning hours* • *Equipment will be turned off when not in use*	✓	

• *Equipment will be maintained and lubricated to minimize noise* • *Landscaping will be used to minimize noise to adjacent properties.* *Traffic: Traffic generated from the proposed use would increase the general traffic counts for this area. The applicant has indicated that development would have up to 10 passenger trips and up to 120 commercial vehicles trips (240 one-way trips) per day. The average daily trip count for commercial vehicles is estimated to be 50 trips (100 one-way trips). The applicant has indicated that off-site hauling (commercial trips) are proposed to be between the hours of 7:00 am and 3:00 pm. The proposed primary haul route would utilize 161st Street to Golden Road, west on Golden Road to 189th Street and then on to K-32 until the highway crosses into Wyandotte County. The alternate route would use 161st St to 158th Street, east on Loring Road until they cross into Wyandotte County. Both routes have been studied to determine the suitability of the existing roadways for the proposed traffic. Based on the studies provided by the applicant, upgrades will need to be made to the existing road network for either route. De Soto has indicated that they will not approve of commercial traffic going south on 166th Street and crossing into De Soto. Staff recommend placing a restriction to reflect that request.*	✓		
Lighting: The applicant will utilize security and overhead lighting on site. A light study was provided showing the location and type of lighting proposed. Lighting will be directed towards the ground and it is not proposed to increase the net-footcandles on adjoining property. Staff recommend placing a condition that the lighting shall be measured as 0.00 foot-candles net increase as measured at the property line.	✓		
Outdoor Storage: The applicant is proposing to stockpile dredged sand on the site before pick-up. Stockpiled sand will generate dust issues; however, the applicant has indicated that they will maintain the stockpile in manner that will reduce dust and erosion. The applicant will use a water truck to spray the stockpile which is proposed to create a protective crust on the pile that will reduce dust generation and erosion. Excavation activities will also create dust and erosion on site. The applicant has proposed utilizing mulch or other stabilization measures within 14 days of soil disturbance and to plant native vegetation on areas that will not become part of the dredging pond, but will still be disturbed. Additionally, silt fencing will also be used around temporary topsoil stockpiling sites. Last, the applicant has indicated that all equipment and machinery will be maintained and cleaned as to reduce and waste or sediment from being tracked out on the public roads. Inspections of containment berms and erosion control features will occur at least once every 14 days and after a major rainfall event.	✓		
Parking: The applicant has provided off-street parking for both commercial and pedestrian vehicles on-site. 16 parking stalls have been provided, and the internal drive will be utilized for the stacking of commercial vehicles for pickup. Staff recommend placing a condition that no stacking shall occur on a public roadway, including before operation hours.	✓		

Visitors/Employees: The applicant indicated five full-time employees will be on-site for the sand dredging and operation management. They will utilize 19 truck drivers for pick-up of stockpiled materials. Additional staff may be on-site for periodic maintenance. Staff recommend limiting visitors to the site to those outlined in the narrative. Staff recommend placing a condition that no on-site sales or second-party pick-up shall be permitted. *Waste/Pollution: The applicant indicated that the operation will be a zero-point discharge facility where all sediments generated will be trapped within a sedimentation basin, preventing pollution into the Kansas River. Excavation will be limited to the boundaries proposed in the application, which will result in a sedimentation basin that will fill with ground water to create a lake. The applicant will not be using hazardous chemicals on site, nor will their use create odors or fumes. They will utilize electric equipment to minimize the creation of odors and fumes, as well as minimizing diesel fuel and oil. All lubricants are proposed to be non-toxic and biodegradable. The proposed operation has raised concerns about ground water contamination; however, the applicant will need to obtain a permit and comply with all conditions set by the Kansas Department of Health and Environment who is the entity responsible for ground water safety.*	✓ ✓	
5. Length of time the property has been vacant as zoned: ☒*Vacant: To our knowledge, the properties have either been used for agriculture purposes or at one time a residence. The parcel is no longer used for residential purposes.* ☐ *Not Vacant:*	✓	
6. Relative gain to economic development, public health, safety and welfare: *The proposed application would allow for an industrial operation to expand into Leavenworth County. Due to the nature of the type of business, there are concerns about potential detriments to the public health, safety and welfare of the public. However, those concerns can be mitigated by the proposed operation plan provided by the applicant and conditions placed on the Special Use Permit. Furthermore, this type of business is not only regulated at the local level, it is also regulated by the State and Federal government to which they must maintain compliance in order to be in good standing with the County*	✓	✓
7. Conformance to the Comprehensive Plan: *Future Land Use Map: Mixed Use* *The Comprehensive Plan has indicated that Mixed Use is suitable for land use categories that include development for retail, service, office and industrial uses. The plan also recommends supporting new industrial growth that balances the desire for economic development and a heightened tax base with Leavenworth County's small town feel and rural heritage. The proposed use is not located within a targeted area for growth; however, the site does have resources that are limited to this area.*	✓	

STAFF COMMENTS:

May 13, 2026 Update:

On March 25, 2026, the Board of County Commissioners considered the recommendation from the Planning Commission for this application. The applicant suggested the possibility of substantial changes to their application, and the Board of County Commissioners remanded this application back to the Planning Commission for another public hearing to consider the newly proposed haul route, retail sales from the site as

well as other proposed changes. The Board of County Commissioners further directed the Planning Commission to evaluate the modified application under all applicable criteria, including the Golden Factors and to develop an updated record and recommendation for consideration by the Commission.

The applicant provided an email, dated March 25, 2026, stating no changes are proposed for the application that is on file. However, they did offer two alternatives if the Planning Commission or County Commissioners wished to consider them. Since they did not formally amend their application, staff did not review the proposed alternatives. Staff have resubmitted the application from the November 12, 2026, meeting and recommends that the Planning Commission conduct a new public hearing to review the application and develop an updated record and recommendation per the remand.

Original Comments:

The applicant is requesting a Special Use Permit to operate a Sand Excavation and Stockpiling business on the property located at 16201 & 00000 Lenape Road. Both properties are currently being used for agricultural purposes. The site will be utilized for the dredging of sand material within a sedimentation basin which will be filled with ground water for a continued dredging operation. The site will have two stockpiles that will be used for the pick-up of mined material, as well as a high-capacity electric water pump, an industrial aggregate washer, a separator/consolidator, rotating conveyor belts, a laboratory/scale house and a control room. Other equipment will be used on-site for the purpose of moving sand.

The operation will be self-contained on the property. The operation will consist of the excavation of material resulting in a pit that will be filled with water through a high-capacity water pump and eventually groundwater. A dredge line will be installed within the pit to vacuum material into a slurry pipeline that feeds into the industrial aggregate washer. The washer will then separate and remove the sediment from the sand material. The sand is then pumped through a second slurry pipeline to the separator/consolidator. The separator/consolidator will then grade the sand into course and fine materials. Once graded the sand will then be conveyed on a conveyor belt to two stockpiles. Loaders will then load the sand from the stockpiles into the commercial trucks which will then be transported to the applicant's Edwardsville location for processing. Prior to leaving the site, all trucks will be weighed to confirm compliance with weight requirements. The proposed plans indicate that an excavation pit will be located on the north side of Lenape Road. The applicant has indicated that a subterranean slurry pipe will be placed under the Lenape Roadway to connect it to the main excavation pit and would then follow the process outlined above. Said pipe will need County right-of-way approval. Additionally, all sediment separated from the sand will be redistributed back into the excavation pit or utilized for dust or erosion control.

The applicant has requested that five full-time employees work on-site for the ongoing management of the excavation pit, machinery and required testing. Additionally, up to 19 truck drivers will be used to transport the sand to the applicant's Edwardsville location. They have proposed to limit excavation work from Monday through Friday, 7:00 am to 3:00 pm. Hauling operation would also be limited to Monday through Friday, 7:00 am to 3:00 pm. They have requested that dredging and stockpiling operations be allowed to operate without restrictions. However, staff recommend that all operations be limited to Monday through Saturday, 6:30 am to 6:30 pm as this is located adjacent to residential properties.

As discussed previously, this operation proposes a substantial increase in truck traffic for this area. The proposed traffic is consistent with traffic of similar industrial uses. However, the roads that are proposed within the primary and alternate routes are not currently suitable for this level of truck traffic. Staff recommend that a development agreement between Kaw Valley and Leavenworth County be developed that incorporates, among other things, provisions of the County's Roadway Improvement Agreement in order to ensure that the roads are evaluated, improved to a standard that will support the proposed truck traffic generated by the Special Use Permit, and maintained in accordance with County Policy.

The applicant has provided a narrative for its reclamation plans, which indicates that the excavation pit will be converted into a recreational lake that will serve the property owners. Staff recommend that once a KDHE permit has been finalized, a copy of the permit including the reclamation plan and state-required bond shall be provided to the County. Additionally, the applicant has indicated that a security fence will be utilized for the safety of the public. Said fence shall be located outside of the required front yard setbacks and will be erected and maintained in accordance with their provided application. Any utility services located within the vicinity shall not be interrupted by the proposed operation, and all temporary, private sanitation systems must be permitted and in compliance with the adopted Sanitary Code. All trash receptacles shall be maintained and fenced in by an enclosure from adjacent roadways and properties. Any signage on the property must be installed in compliance with Article 25 of the Zoning & Subdivision Regulations. An emergency plan shall be prepared by applicant and subject to the review and approval by the Emergency Management Department and Fire District #2.

Concerns raised by adjoining jurisdictions include De Soto who would like to prohibit commercial truck traffic from going south on 166th Street. Staff recommend placing conditions that exclude truck traffic on 166th Street, and the applicant has included routes that comply by excluding truck traffic on 166th Street. Additionally, the City of Olathe had concerns about the adjoining golf course they operate. The previous request was to require an 80-foot buffer along the southern property line that will be maintained with a row of deciduous trees to reduce noise. As well as placing all machinery and equipment to the north. The applicant has designed their site plan to comply with all of these requests.

The proposed use is classified as a Type 4, industrial operation that frequently generates hazardous or intense nuisance factors. Staff's recommendation is that if approved, the permit would be valid for three years based on the potential impact on surrounding property and increased traffic in the area. The applicant is requesting the permit be approved for 25 years.

STAFF RECOMMENDED CONDITIONS:

The staff recommends approval of Case No.DEV-25-021, Special Use Permit for Kaw Valley Sand Excavation and Stockpiling, with the following conditions:

1. The SUP shall be limited to a period of 3 years with annual staff evaluations.
2. The applicants shall enter into and fully execute a Development Agreement incorporating provisions of the County's Roadway Improvement Agreement to ensure that the roads are evaluated, improved to a standard that will accommodate the proposed use and maintained. for all necessary improvements to accommodate the proposed use.
3. The applicants shall develop the property in compliance with the site plan submitted on September 30, 2025, except they shall erect an 8ft perimeter fence.
4. An emergency plan shall be prepared and submitted to Fire District #2 and the Emergency Management Department for approval prior to operations commencing.
5. All operations shall not take place within 105' from the center of any public roadway. All activities shall be a minimum of 40' from the property line. All activity along the southern parcel boundary shall be a minimum of 80' from the property line.
6. Machinery shall be well-maintained and lubricated to reduce noise.
7. There shall be no truck traffic associated with the development traveling south on 166th Street into De Soto.
8. Jake braking shall be prohibited.
9. Trucks shall use only the designated haul route as approved with this Special Use Permit.
10. All trucks exiting the site shall be weighed and must meet legal load limits prior to exiting the site.

11. Trucks shall not enter the site prior to 7:00am and shall exit the site no later than 3:00pm, Monday-Friday.
12. Noise shall be limited to 65 dBs along property lines adjacent to Residentially Zoned Parcels.
13. Lighting generated from the development shall be limited 0.00 foot-candles net gain, as measured at the property line.
14. A permit for the private sanitation system shall be submitted to the County and must be maintained in compliance with the Leavenworth County Sanitary Code per the Email from Kyle Anderson dated March 28, 2025.
15. A right-of-way obstruction permit shall be required for any improvement within the County right-of-way.
16. Dredging operations shall be limited to the hours of 6:30am until 6:30pm Monday-Saturday.
17. The applicants shall file a Surface Mining Permit with the Kansas Department of Agriculture. This shall be submitted to Leavenworth County upon completion, including confirmation of the reclamation bond and a copy of the approved reclamation plan.
18. The applicants shall file a Surface Mining Permit with the State of Kansas. This shall be submitted to Leavenworth County upon completion, including confirmation of the reclamation bond and a copy of the approved reclamation plan.
19. The applicant shall update and maintain the Section 401 Water Quality Certification with the Kansas Department of Health and Environment and shall comply with all conditions set forth within the Certification.
20. All Notices of Intents and Stormwater Pollution Prevention Plans shall be obtained from the State of Kansas and a copy provided to the County.
21. The applicant shall obtain and comply with all State, Federal and local floodplain permits.
22. The SUP shall be limited to five (5) full-time employees not including truck operators.
23. No on-site retail sales shall be permitted from the site.
24. The applicant shall adhere to the following memorandums:
    a. Email – Kyle Anderson, Code Enforcement, dated March 28, 2025
    b. Memo – Chuck Magaha, Emergency Management, dated July 31, 2025
    c. Memo – Public Works, dated October 15, 2025
25. No signage is allowed in the right-of-way. No signage is requested with the SUP. All signage shall comply with Article 25, Sign Regulations of the Leavenworth County Zoning and Subdivision Regulations.
26. No on-street parking or stacking shall be allowed.
27. The applicant shall provide a certificate of general liability insurance in the amount of $1,000,000 and shall indicate Leavenworth County as the certificate holder prior to commencement of activities on the site.
28. This SUP shall be limited to the application submitted on September 30, 2025 and narrative submitted on October 16, 2025.
29. That no public nuisance be allowed or created upon the subject real property.
30. This SUP shall comply with all local, state, and federal rules and regulations that may be applicable.
31. That the conditional Special Use Permit granted herein is subject to revocation upon the breaching of the conditions set forth herein, or any substantial change in the use of the subject property. Kaw Valley Companies, Inc., and its assigns or successors in interest, hereby consent to, and authorize, entry onto the subject property by employees or agents of the County for the purpose of inspecting the subject property for compliance with the conditions set forth herein.

ATTACHMENTS:

A: Application & Narrative

B: Zoning Map

C: Memorandums

D: Resident Correspondence

Allison, Amy

From: Aaron G. March [redacted]
Sent: Wednesday, March 25, 2026 1:33 PM
To: Allison, Amy; Brown, Misty
Cc: Aaron G. March; Adam C. Carlson
Subject: KAW VALLEY REMAND TO PLANNING COMMISSION
Attachments: 2026.02.25_16477_Supplemental_Kaw Valley Route Study.pdf

Hi Amy, as we briefly discussed this morning, no changes are proposed to the Kaw Valley SUP application on file and pending for approval. We understand that there have been rumors or suggestions of changes which we are happy to entertain if requested to do so by the Planning Commission or the County Commission, specifically including:

1. A change to the haul route so that a left turn is made at Golden Road on to K-32 with a right turn on to 222nd street and thence on to I-70.
2. The introduction of retail sales into our operations in order to generate sales tax.

Anticipating that these requests might be forthcoming after the planning commission meeting, GBA has reviewed these possible conditions of approval and has issued the attached Supplemental Route Study which indicates that "no major operational impacts are anticipated from the imposition of these (conditions of approval) changes and that all other recommendations from the original Route Study are still valid."

[redacted]

It is our hope that this matter can be considered by the Planning commission at its next meeting on April 8th or if mailed notice is required, at its May 13th meeting.

I am happy to discuss this further if you so desire.

AARON G. MARCH
ROUSE FRETS WHITE GOSS
GENTILE RHODES, P.C.
[redacted]
801 W 47th Street, Suite 500
Kansas City MO 64112

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1. Introduction

This Supplemental Document provides analysis and discussion of potential changes from the original Route Study. First, a change in the Primary Route is proposed from the original Route Study, impacting Kaw Valley hauling operations. Second, the project site is now proposed to allow for retail sales, impacting turning movement at the Golden Road / 189th Street and K-32 intersection.

2. Primary Route Change for Kaw Valley Hauling Operations

In the original Route Study, vehicles for the Kaw Valley haul operation following the Primary Route would turn right onto K-32 at the Golden Road / 189th Street and K-32 intersection. They would then follow the marked K-32 Truck route through Bonner Springs to the processing facility. Vehicles for the Kaw Valley haul operation following potential new Primary Route would turn left at the Golden Road / 189th Street and K-32 intersection, then turn right from K-32 to 222nd Street. From 222nd Street, drivers would enter onto I-70 East, then onto I-435 South, and use the Woodend Road exit to access the processing facility. Drivers would use the same route, but in reverse, for return trips from the processing facility to the operation. The potential route is shown in **Figure 1**.

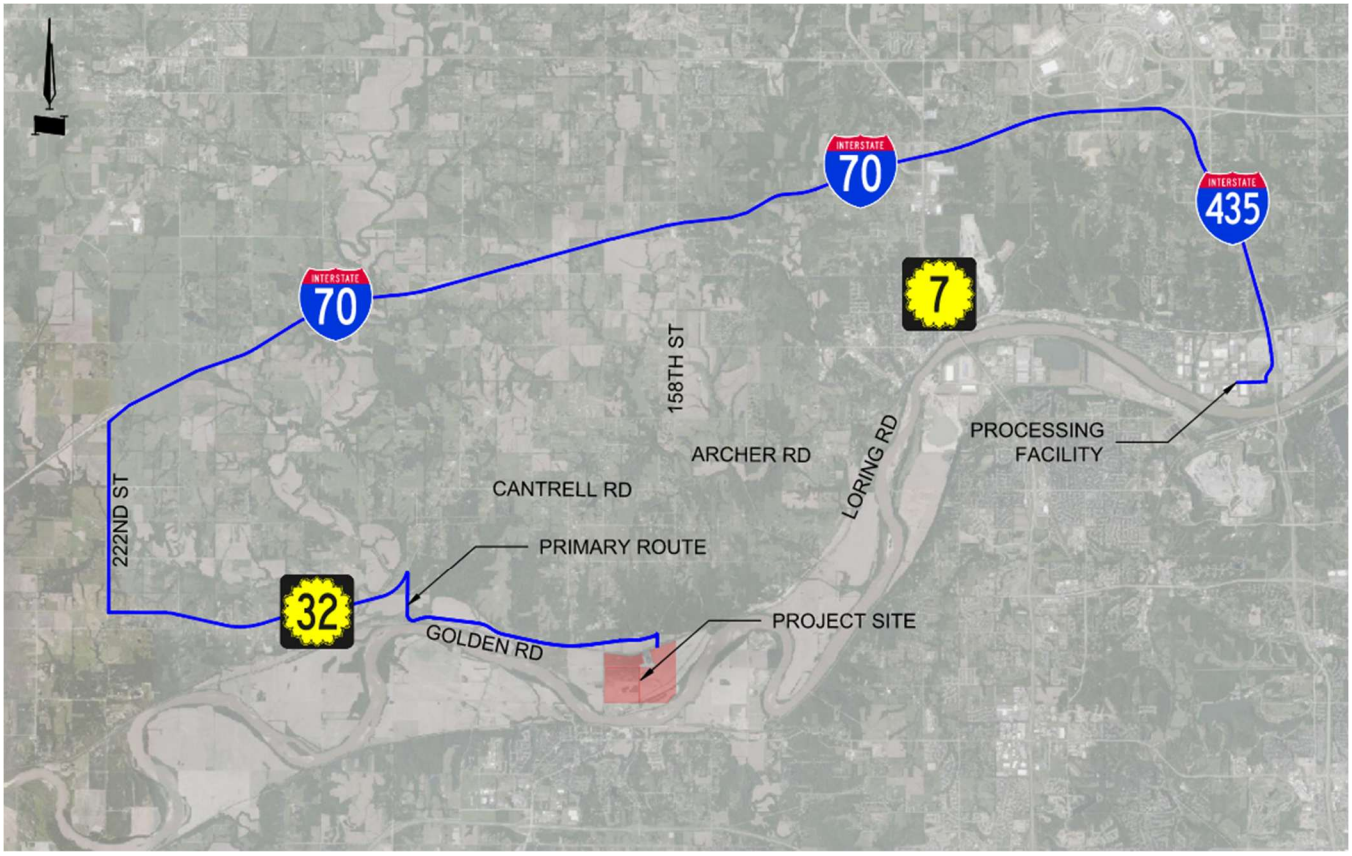


Figure 1. Proposed Kaw Valley Primary Route

3. Retail Sales

Another change from the initial route study is the proposed allowance of retail sales at the project site. As part of sales agreements, third-party buyers purchasing material from the site would be required to follow the Primary Route between K-32 and the Project Site. However, they could approach or exit from the east or west at K-32, impacting turning movements. It is expected that 70 of the 120 daily trips to the site would be from third-party buyers. The remaining 50 trips will be associated with the Kaw Valley hauling operation. Of these trips, it is estimated that approximately 75% of them will turn left at the Golden Road / 189th Street and K-32 intersection, generally to access I-70 from 222nd Street. The remaining 25% are expected to turn right at the Golden Road / 189th Street and K-32 intersection, and access areas to the east.

4. Geometric Impacts of Primary Route Change

In the original Route Study, analysis of the Primary Route ended at K-32, and thus geometric impacts as a result of the potential change are minimal. No additional geometric analysis was completed, aside from what is discussed within this section.

Truck turning envelopes were created and are shown in **Appendix A**. As shown, right-turn movements from K-32 to 189th Street would require pavement widening to allow for truck turning movements. These improvements are shown in **Appendix B**.

The original Primary Route also included turning movements at the Loring Lane / West Front Street & K-32 Truck Route (Santa Fe Road) intersection. As a result of turning movement envelopes at the intersection, pavement widening was recommended in the original Route Study. As the potential Primary Route would no longer use the intersection, these recommendations would be rescinded. If the revised Primary Route is finalized, no improvements at the Loring Lane / West Front Street & K-32 Truck Route (Santa Fe Road) intersection are recommended.

5. Operational Impacts of Primary Route Change

As the proposed changes in Primary Route and retail sales do not create major differences to overall turning movements along the route, no major impacts to operations are expected. Any volume of trips generated by the site are extremely small relative to volumes on K-32, and would not fulfill the criteria for turn lanes or additional intersection control. At the Loring Lane / West Front Street & K-32 Truck Route (Santa Fe Road) intersection, elimination of trips from vehicles following the Primary Route returned operations closer to existing conditions. Remaining trip increases at the intersection are expected to be employee arrivals and departures, and not truck traffic associated with operations.

6. Conclusion

As part of ongoing discussions with the County, two changes are proposed from the original Route Study. As shown in **Figure 1**, the new Primary Route for Kaw Valley hauling operations would turn left on K-32 at Golden Road / 189th Street, and use a combination of 222nd Street, I-70, and I-435 to reach the processing facility. Additionally, allowance of public sales at the Project Site would result in some right-turning movements at the K-32 at Golden Road / 189th Street intersection. The potential change has been examined and determined to impact the following elements of the original Route Study:

1. Intersection improvements at the Golden Road / 189th Street and K-32 would be recommended. Additional pavement widening would be recommended in the south portion of the intersection. These improvements are shown in **Appendix B**.
2. Intersection improvements at the Loring Lane / West Front Street & K-32 Truck Route (Santa Fe Road) are no longer recommended.

No major operational impacts are anticipated from the potential change, and all other recommendations from the original Route Study are still valid.

Respectfully submitted,

GEORGE BUTLER ASSOCIATES, INC.

7. Appendices

Appendix A – Truck Turning Envelopes (Page 5)

Appendix B – Proposed Intersection Improvements (Page 14)

APPENDIX A
TRUCK TURNING ENVELOPES



Legend:

Ultimate design tied to reconstruction

Interim design to address offtracking

25' 0' 25' 50'

SCALE : 1 INCH = 50 FEET

189th Street & Golden Road
Existing Truck Turning

GBA
9801 Renner Blvd., Ste. 300
Lenexa, KS 66219
913.492.0400
gbateam.com

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

PROJECT NUMBER
16477.00

DATE
10/31/2025

132

G:\16477\Civil 3D\Production Drawings\Exhibits\Civil\Traffic Study Exhibits\New Traffic Study Exhibits\Truck Turning Templates.dwg Layout: 33 Truck Turning - 189thKS32 S -- Friday, October 31, 2025, 11:10am -- Copyright 2025, George Butler Associates, Inc.



Legend:

Ultimate design tied to reconstruction

Interim design to address offtracking

25' 0' 25' 50'

SCALE : 1 INCH = 50 FEET

189th Street & Golden Road
Existing Truck Turning

GBA
9801 Renner Blvd., Ste. 300
Lenexa, KS 66219
913.492.0400
gbateam.com

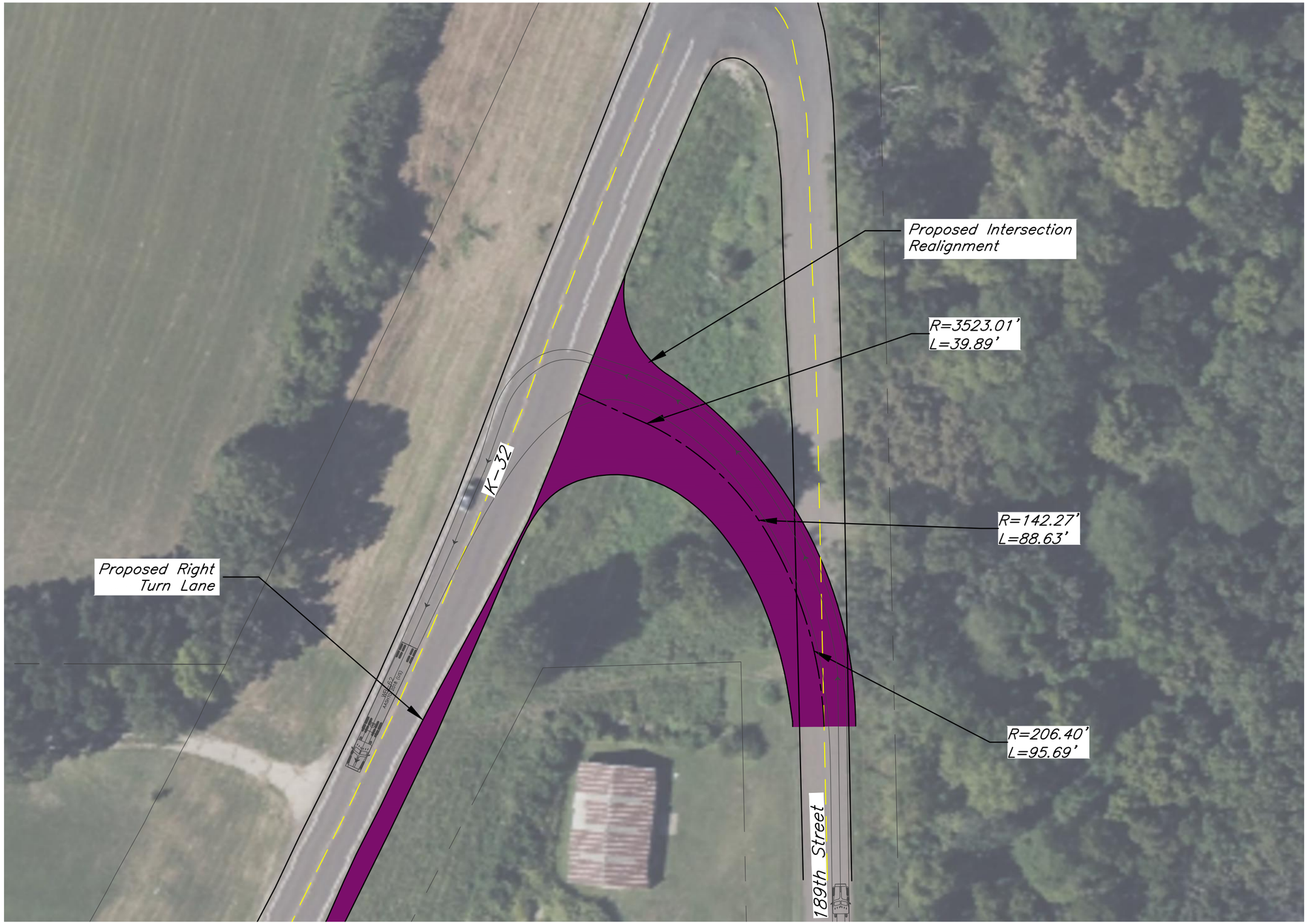
Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

PROJECT NUMBER
16477.00

DATE
10/31/2025

G:\16477\Civil 3D\Production Drawings\Exhibits\Civil\Traffic Study Exhibits\New Traffic Study Exhibits\Truck Turning Templates.dwg Layout: 33 Truck Turning - 189thK32 S -- Friday, October 31, 2025, 11:09am -- Copyright 2025, George Butler Associates, Inc.

C:\16477\Civil 3D\Production Drawings\Exhibits\Civil\Traffic Study Exhibits\New Traffic Study Exhibits\Truck Turning Templates.dwg Layout: 34 Truck Turning - Prop 189thK32 N -- Friday October 31, 2025, 11:13am -- Copyright 2025, George Butler Associates, Inc.



Legend:

- Ultimate design tied to reconstruction
- Interim design to address offtracking

25' 0' 25' 50'

SCALE : 1 INCH = 50 FEET

189th Street & K-32 Highway
Proposed Truck Turning

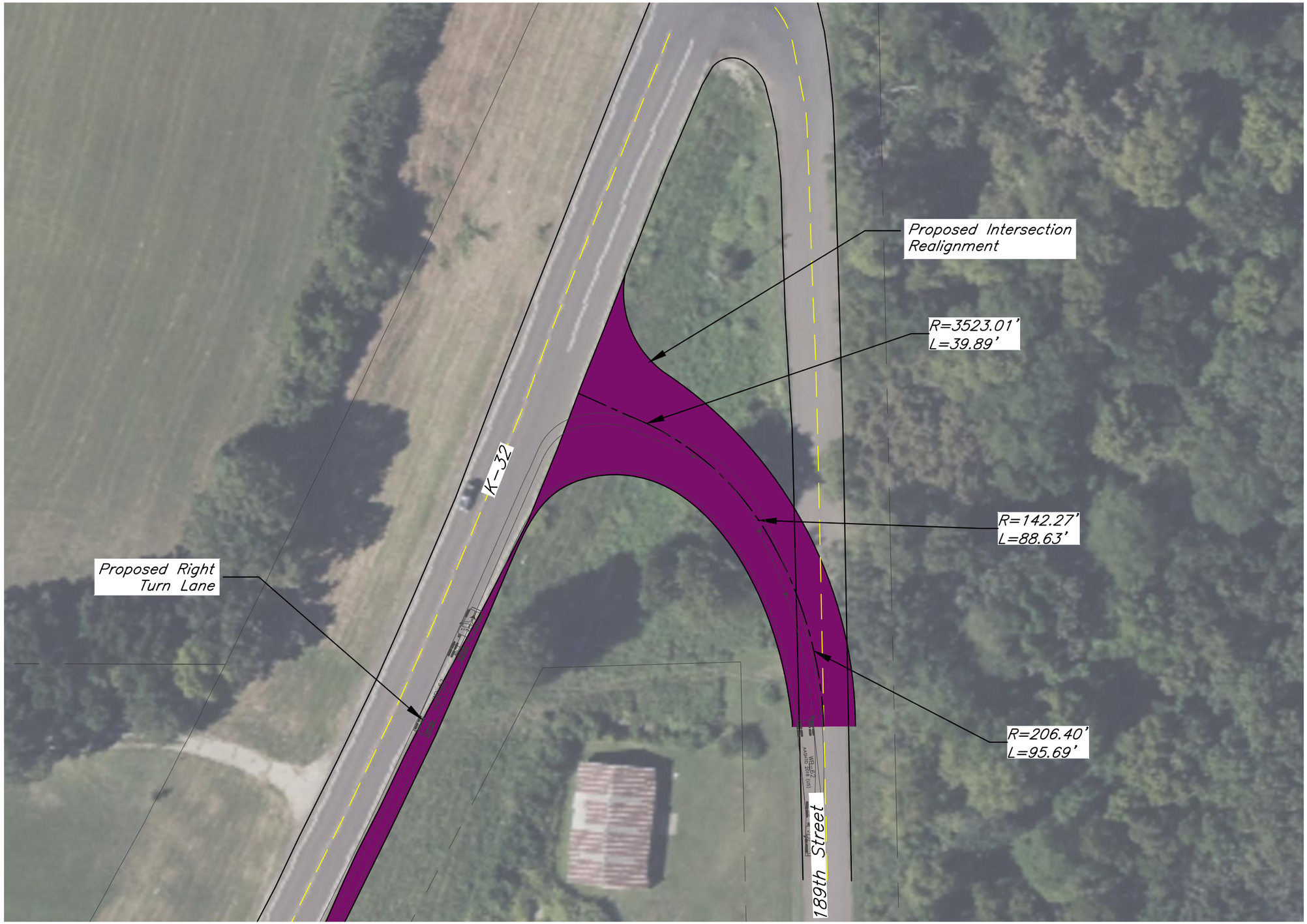
GBA
9801 Renner Blvd., Ste. 300
Lenexa, KS 66219
913.492.0400
gbateam.com

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

PROJECT NUMBER
16477.00

DATE
10/31/2025

G:\16477\Civil 3D\Production Drawings\Exhibits\Civil\Traffic Study Exhibits\New Traffic Study Exhibits\Truck Turning Templates.dwg Layout: 34 Truck Turning - Prop 189thK32 N --- Friday October 31, 2025, 11:12am --- Copyright 2025, George Butler Associates, Inc.



Legend:

- Ultimate design tied to reconstruction
- Interim design to address offtracking

25' 0' 25' 50'

SCALE : 1 INCH = 50 FEET

189th Street & K-32 Highway
Proposed Truck Turning

GBA
9801 Renner Blvd., Ste. 300
Lenexa, KS 66219
913.492.0400
gbateam.com

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

PROJECT NUMBER
16477.00

DATE
10/31/2025



Legend:

- Ultimate design tied to reconstruction
- Interim design to address offtracking

25' 0' 25' 50'

SCALE : 1 INCH = 50 FEET

189th Street & Golden Road
Existing Truck Turning

GBA
9801 Renner Blvd., Ste. 300
Lenexa, KS 66219
913.492.0400
gbateam.com

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

PROJECT NUMBER
16477.00

DATE
9/25/2025

136

G:\16477\Civil 3D\Production Drawings\Exhibits\Civil\Traffic Study Exhibits\Truck Turning Templates.dwg Layout: 32 Truck Turning - 189thK32 N -- Thursday September 25, 2025, 3:43pm -- Copyright 2025, George Butler Associates, Inc.



Legend:

- Ultimate design tied to reconstruction
- Interim design to address offtracking

25' 0' 25' 50'

SCALE : 1 INCH = 50 FEET

189th Street & Golden Road
Existing Truck Turning

GBA
9801 Renner Blvd., Ste. 300
Lenexa, KS 66219
913.492.0400
gbateam.com

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

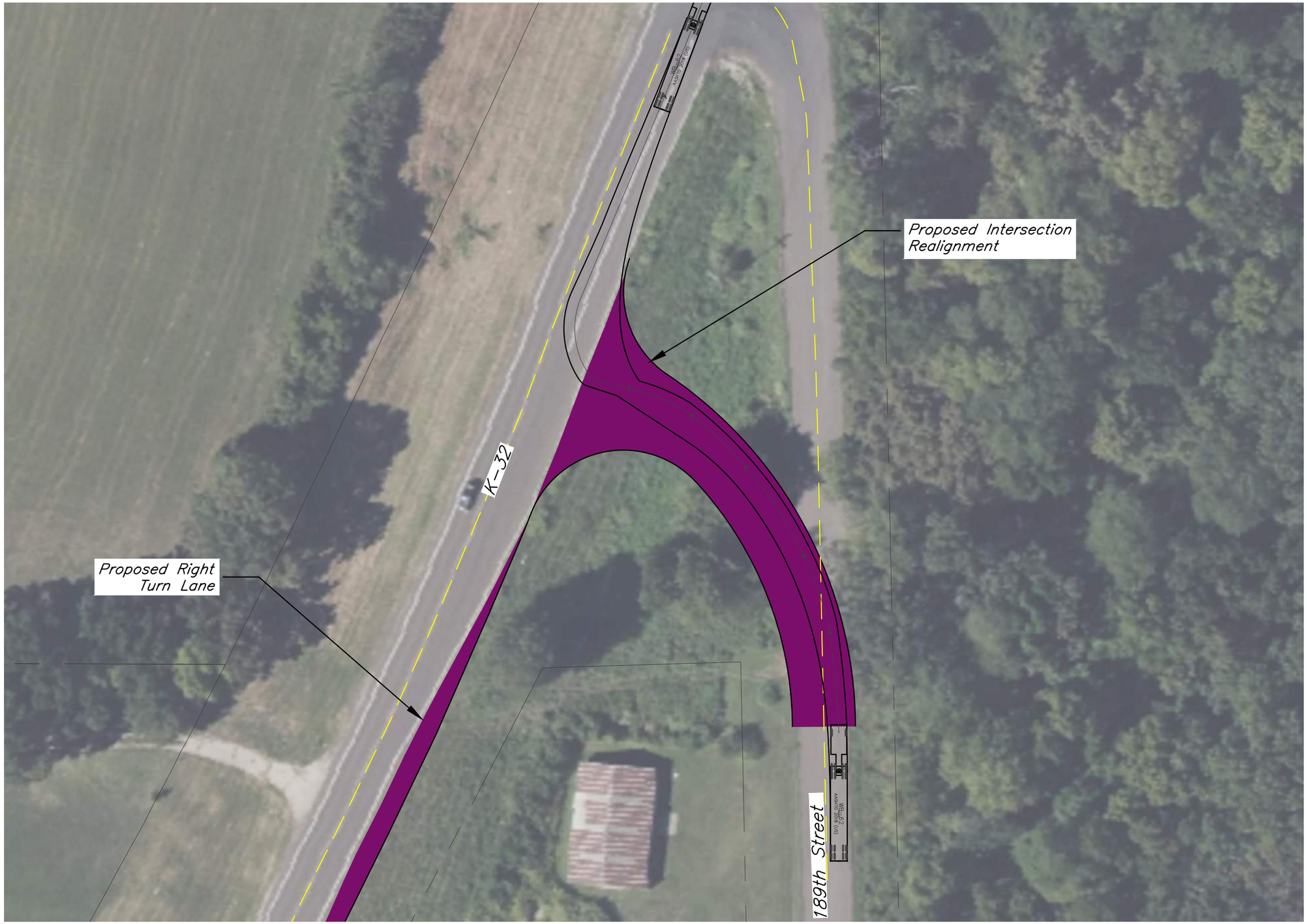
PROJECT NUMBER
16477.00

DATE
9/25/2025

137

G:\16477\Civil 3D\Production Drawings\Exhibits\Civil\Traffic Study Exhibits\Truck Turning Templates.dwg Layout: 33 Truck Turning - 189thK32 S -- Thursday September 25, 2025, 3:43pm -- Copyright 2025, George Butler Associates, Inc.

G:\16477\Civil 3D\Production Drawings\Exhibits\Civil\Traffic Study Exhibits\Truck Turning Templates.dwg Layout: 34 Truck Turning - Prop 189thK32 N --- Thursday September 25, 2025, 3:43pm --- Copyright 2025, George Butler Associates, Inc.



Legend:

- Ultimate design tied to reconstruction
- Interim design to address offtracking

25' 0' 25' 50'

SCALE : 1 INCH = 50 FEET

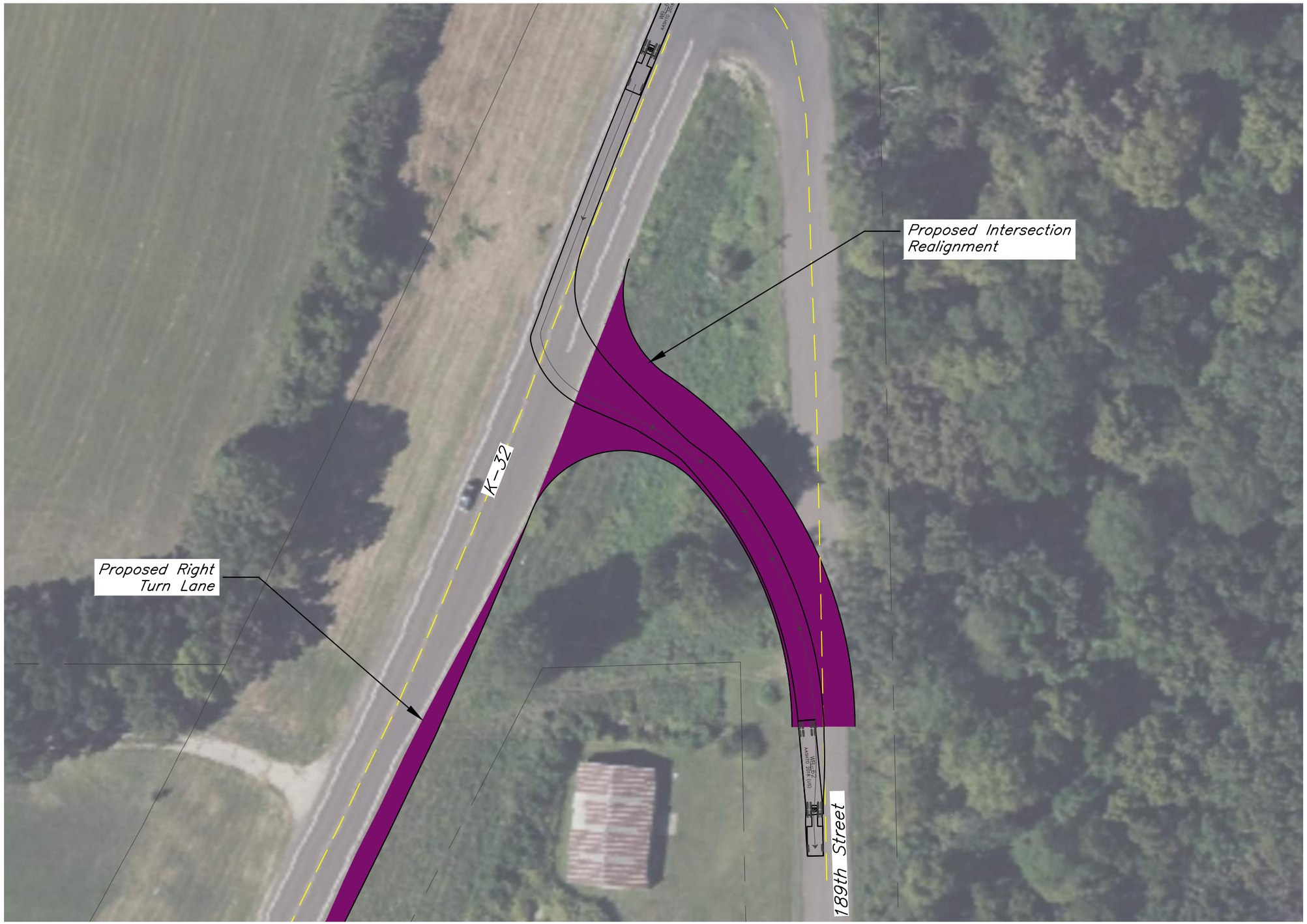
189th Street & K-32 Highway
Proposed Truck Turning

GBA
9801 Renner Blvd., Ste. 300
Lenexa, KS 66219
913.492.0400
gbateam.com

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

PROJECT NUMBER
16477.00

DATE
9/25/2025



Legend:

- Ultimate design tied to reconstruction
- Interim design to address offtracking

25' 0' 25' 50'

SCALE : 1 INCH = 50 FEET

189th Street & K-32 Highway
Proposed Truck Turning

GBA
9801 Renner Blvd., Ste. 300
Lenexa, KS 66219
913.492.0400
gbateam.com

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

PROJECT NUMBER
16477.00

DATE
9/25/2025

139

G:\16477\Civil 3D\Production Drawings\Exhibits\Civil\Traffic Study Exhibits\Truck Turning Templates.dwg Layout: 35 Truck Turning - Prop 189thK32 S -- Thursday September 25, 2025, 3:43pm -- Copyright 2025, George Butler Associates, Inc.

APPENDIX B
PROPOSED INTERSECTION IMPROVEMENTS



100' 0' 100' 200'

SCALE : 1 INCH = 200 FEET

189th Street & K-32 Highway
Intersection Improvements

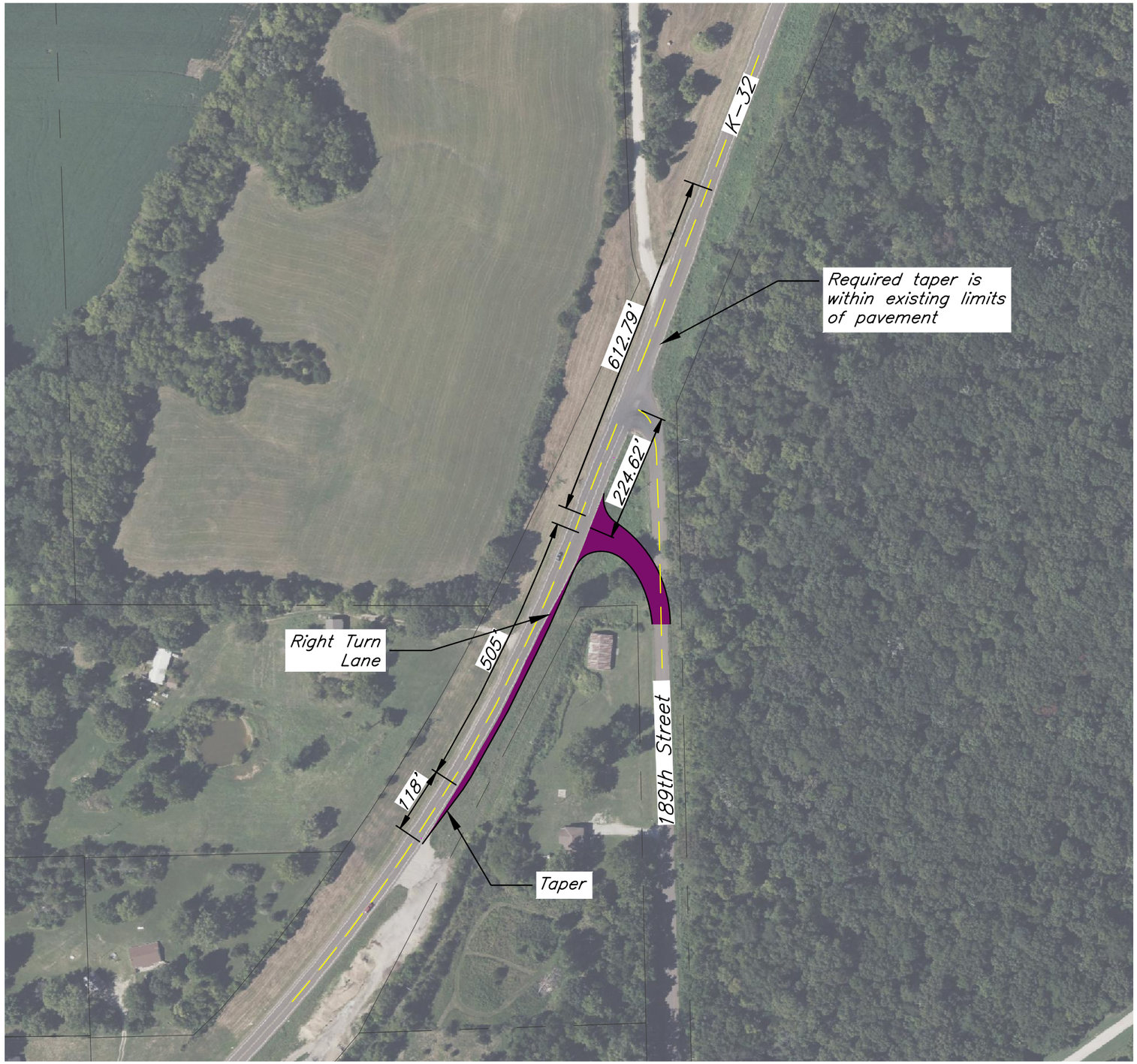
GBA
9801 Renner Blvd., Ste. 300
Lenexa, KS 66219
913.492.0400
gbateam.com

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

PROJECT NUMBER
16477.00

DATE
10/31/2025

C:\16477\Civil 3D\Production Drawings\Exhibits\Civil\Traffic Study Exhibits\New Traffic Study Exhibits\Intersection Improvements Exhibit.dwg Layout: 44 Intersection Improvements Exhibit - 189thK32 -- Friday October 31, 2025, 1:07pm -- Copyright 2025, George Butler Associates



100' 0' 100' 200'
SCALE : 1 INCH = 200 FEET

189th Street & K-32 Highway
Intersection Improvements

GBA
9801 Renner Blvd., Ste. 300
Lenexa, KS 66219
913.492.0400
gbateam.com

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

PROJECT NUMBER
16477.00

DATE
10/31/2025

G:\16477\Civil 3D\Production Drawings\Exhibits\Civil\Traffic Study Exhibits\New Traffic Study Exhibits\Intersection Improvements Exhibit.dwg Layout: 44 Intersection Improvements Exhibit - 189thK32 --- Friday October 31, 2025, 10:40am --- Copyright 2025, George Butler Associates, Inc.

SPECIAL USE PERMIT APPLICATION

Leavenworth County Planning Department
300 Walnut, St., Suite 212
County Courthouse
Leavenworth, Kansas 66048
913-684-0465

APPLICANT/AGENT INFORMATION

NAME Kaw Valley Companies, Inc.
ADDRESS [redacted]
CITY/ST/ZIP Kansas City, KS 66106
PHONE [redacted]
EMAIL [redacted]
CONTACT PERSON Evan Horowitz

OWNER INFORMATION (If different)*

NAME Carolyn E. Spring Trust
ADDRESS [redacted]
CITY/ST/ZIP Albert Lea, MN 56007
Two parcel project - see Ownership Map
PHONE
EMAIL
CONTACT PERSON Carolyn Knutson

PROPERTY INFORMATION*

PID: 2352200000004000 (Trust), 2352200000014000 (Kaw) Zoning District: I-3, Heavy Industrial
Address of property Southeast corner of 166th & Lenape Rd Parcel size 435 acre
Current use of the property Agricultural
Does the owner live on the property? ☐ Yes ☒ No
Proposed Special Use Sand excavation and stockpiling operation

TAX ASSESSEMENT STATEMENT

Upon the granting of a Special Use Permit by the Leavenworth County Board of County Commissioners, the assessable nature of the above referenced property and structures on the property may result in a change of the Appraised Class and Value and in the next year's Tax Assessment.

I, the applicant, have read and understand that there may be a change in the appraised value of my property due to the presence of a Special Use Permit for my property. (Check one) ☒ Yes ☐ No

I, the applicant, understand that if the project requires a review from the State Fire Marshall. I/we must provide the inspection report or planned review approval prior to submittal. (Check one) ☒ Yes ☐ No

I, the undersigned am the *(circle one) owner, duly authorized agent,* of the aforementioned property situated in the unincorporated portion of Leavenworth County, Kansas. By execution of my signature, I do hereby officially apply for a Special Use Permit and acknowledge the potential of a change in the Appraised Value of my property as indicated above. **I hereby agree to "cease and desist" the operation of the activity upon denial of the permit by the Board of County Commissioners.**

Signature Steven A. March. Date Feb 26, 2025

*See attached ownership map.

ATTACHMENT A

PROPOSED SPECIAL USE PERMIT INFORMATION

Name of Business Kaw Valley Companies, Inc.

Existing and Proposed Structures Small field shed existing; three proposed portable structures

Number of structures used for Special Use Permit Three portable structures

Will the use require parking? ☒ Yes ☐ No How many parking spaces are proposed/available? 16

Is the proposed use seasonal? ☐ Yes ☒ No

If yes, what months will the use be active? _____ (Month) through _____ (Month)

Reason for requesting a Special Use Permit: To utilize the site for a sand excavation and stockpiling

Estimated Traffic

In this section, you are determining the impact your proposed use will have on the county roadways. A vehicle visiting your site is to be considered two trips because the visitor/employee/user will use the roadways twice. If you are planning to expand the use that may generate additional traffic during the duration of the permit, provide the traffic generation for the full expansion.

How many total Passenger vehicle trips (both entering and exiting) will be generated by the Special Use Permit?

Daily 10 Weekly 50 Monthly 217

If applicable, how many total Commercial (delivery, heavy trucks, equipment, etc.) vehicle trips (both entering and exiting) will be generated by the Special Use Permit?

Daily 10-120 Weekly 50-600 Monthly 217-2600

If applicable, describe Seasonal trips not accounted for above: What type (Passenger and Commercial) vehicle trips, how many trips per vehicle type in the seasonal timeframe, and describe the seasonal time frame (months, weeks, or days) in a calendar year.

Passenger: Months _____ Weeks _____ Days _____

Commercial: Months _____ Weeks _____ Days _____

When are trips to the site expected to occur (i.e. throughout the day, limited certain hours, etc.)? If applicable, separate occurrences by vehicle type (Passenger, Commercial, Seasonal Passenger, and Seasonal Commercial):

Passenger trips to the site will be throughout the day based on operational needs, but will be limited generally to the operation's five employees. Commercial trips between 7:00 A.M. and 3:00 P.M.

What is the anticipated route(s) from the nearest State Highway to the Site? K-32 to 189th Street, then Golden Road to 161st and Railroad Road

Special Use Permit Renewal

Describe any change to operations since the SUP was last issued including traffic trips compared to this SUP:

Have you added any buildings since the SUP was last issued? ☐Yes ☐ No Any parking? ☐Yes ☐ No

ATTACHMENT B

KAW VALLEY COMPANIES' APPLICATION FOR SPECIAL USE PERMIT OWNERSHIP MAP



Carolyn E. Spring Trust's property (PID 2352200000004000)

Kaw Valley Companies' property (PID 2352200000014000)

OWNER AUTHORIZATION

I/WE Carolyn Knutson, Trustee, hereby referred to as the "Undersigned", being of lawful age, do hereby on this 15 day of May, 2025, make the following statements, to wit:

1. I/We the Undersigned, on the date first above written, am the lawful, owner(s) in fee simple absolute of the following described real property

   See Exhibit A attached hereto and incorporated herein by reference.

2. I/We the undersigned, have previously authorized and hereby authorize Aaron G. March, Esq. (Hereinafter referred to as "Applicant"), to act on my/our behalf for the purpose of making application with the Planning Office of Leavenworth County, Kansas, 00000 Lenape Rd, Linwood, KS (common address) the subject real property, or portion thereof, and which authorization includes, but is not limited to, all acts or things whatsoever necessarily required of Applicant in the application process.

3. I/We the Undersigned, hereby agree to protect, defend, indemnify and hold the Board of County Commissioners of Leavenworth County, Kansas, its officers employees and agents (hereinafter collectively referred to as the "County"), free and harmless from and against any and all claims, losses, penalties, damages, settlements, costs, charges, professional fees or other expenses or liabilities, whether false, fraudulent, meritless or meritorious, of every kind and character arising out of or relating to any and all claims, liens, demands, obligations, actions, proceedings, or causes of action of every kind and character (hereinafter "claims"), in connection with, relating to, or arising directly or indirectly out of this authorization and the actions taken by the Applicant and the County in reliance thereof. I, the Undersigned, hereby further agree to investigate, handle, respond to, provide defense for and defend any such claims at my sole expense and agree to bear all other costs at my sole expense and agree to bear all other costs and expenses related thereto, even if such claims are groundless, false or fraudulent.

4. It is understood that in the event the Undersigned is a corporation or partnership then the individual whose signature appears below for and on behalf of the corporation or partnership has in fact the authority to so bind the corporation or partnership to the terms and statements contained within this instrument.

IN WITNESS THEREOF, I, the Undersigned, have set my hand and seal below.

* Carolyn Knutson, Trustee
Owner

Owner

STATE OF ~~KANSAS~~ MINNESOTA
COUNTY OF ~~LEAVENWORTH~~ FREEBORN

The foregoing instrument was acknowledge before me on this 15 day of May, 2025,
by Carolyn Knutson
My Commission Expires: Jan. 31, 2030

Donald W. Savelkoul
Notary Public
Minnesota
My Commission Expires January 31, 2030

Notary Public

UNOFFICIAL COPY

All right, title and interest in a tract of real estate (farm) beginning at Northwest corner of Section Twenty-three (23) Township Twelve (12) South, Range Twenty-two (22) East thence South along westerly line of Section Twenty-three (23) to the northerly line of the right-of-way of the Union Pacific Railroad, three (300) Hundred feet, more or less, thence northeasterly along the northerly property line of said right-of-way nine (930) hundred thirty feet, more or less to a point on the northerly line of said Section Twenty-three (23), thence west on the north line of said Section Twenty-three (23), eight (875) Hundred Seventy-five feet, more or less to point of beginning. ALSO, all right, title and interest in a tract of real estate (farm) described as that part of north forty-five (45) acres of East half (½) of Northeast quarter (¼) of Section Twenty-two (22), Township Twelve (12), Range Twenty-two (22), lying north of the Union Pacific Railroad's right-of-way and Lots One (1) and Nine (9) in the Township of LeNape; ALSO, all right, title and interest in and to a tract of real property (farm) described as, that part of East half (½) of Northwest quarter (¼) of Section Twenty-two (22), Township Twelve (12), Range Twenty-two (22), which lies south of the railroad right-of-way; and, all of Blocks Twenty-three (23) and Thirty-two (32) in the Town of LeNape, being a sub-division of part of the West half (½) of the Northeast quarter (¼) of Section Twenty-two (22), Township Twelve (12), Range Twenty-two (22); and that part of the Southeast quarter (¼) of the Northeast quarter (¼) of Section Twenty-one (21), Township Twelve (12), Range Twenty-two (22), lying South of south line of the right-of-way of the Union Pacific Railroad Company, excepting public highways; and that part of the West half (½) of Northwest quarter (¼) of Section Twenty-two (22), lying south of County Highway No. 2, except the railroad right of way, all in Township Twelve (12) Range Twenty-two (22), and also excepting public highways, in Leavenworth County, Kansas: ALSO, all right, title and interest in tract of real estate (farm) described as, Southwest quarter (¼) of Section Twenty-two (22), Township Twelve (12), Range Twenty-two (22), ALL of the said within described real property being situated in County of Leavenworth, State of Kansas,

SUBJECT TO easements, reservations and restrictions of record and subject to the lien of general and special real estate taxes and assessments not delinquent on the date hereof.

EXHIBIT

A

Leavenworth County, Register of Deeds 2012r08518

OWNER AUTHORIZATION

I/WE Carolyn Knutson, Trustee, hereby referred to as the "Undersigned", being of lawful age, do hereby on this 9 day of April, 2025, make the following statements, to wit:

1. I/We the Undersigned, on the date first above written, am the lawful, owner(s) in fee simple absolute of the following described real property

   See Attachment "A" attached hereto and incorporated herein by reference.

2. I/We the undersigned, have previously authorized and hereby authorize Kaw Valley Companies, Inc. (Hereinafter referred to as "Applicant"), to act on my/our behalf for the purpose of making application with the Planning Office of Leavenworth County, Kansas, 00000 Lenape Rd, Linwood, KS (common address) the subject real property, or portion thereof, and which authorization includes, but is not limited to, all acts or things whatsoever necessarily required of Applicant in the application process.

3. I/We the Undersigned, hereby agree to protect, defend, indemnify and hold the Board of County Commissioners of Leavenworth County, Kansas, its officers employees and agents (hereinafter collectively referred to as the "County"), free and harmless from and against any and all claims, losses, penalties, damages, settlements, costs, charges, professional fees or other expenses or liabilities, whether false, fraudulent, meritless or meritorious, of every kind and character arising out of or relating to any and all claims, liens, demands, obligations, actions, proceedings, or causes of action of every kind and character (hereinafter "claims"), in connection with, relating to, or arising directly or indirectly out of this authorization and the actions taken by the Applicant and the County in reliance thereof. I, the Undersigned, hereby further agree to investigate, handle, respond to, provide defense for and defend any such claims at my sole expense and agree to bear all other costs at my sole expense and agree to bear all other costs and expenses related thereto, even if such claims are groundless, false or fraudulent.

4. It is understood that in the event the Undersigned is a corporation or partnership then the individual whose signature appears below for and on behalf of the corporation or partnership has in fact the authority to so bind the corporation or partnership to the terms and statements contained within this instrument.

IN WITNESS THEREOF, I, the Undersigned, have set my hand and seal below.

Carolyn Knutson, Trustee
Owner

Owner

STATE OF ~~KANSAS~~ MINNESOTA
COUNTY OF ~~LEAVENWORTH~~ FREEBORN

The foregoing instrument was acknowledged before me on this 9 day of April, 2025,
by Carolyn Knutson, Trustee of the Carolyn E. Spring Trust.

My Commission Expires:

Donald W. Savelkoul
Notary Public
Minnesota
My Commission Expires January 31, 2030

Notary Public

ATTACHMENT C

UNOFFICIAL COPY

All right, title and interest in a tract of real estate (farm) beginning at Northwest corner of Section Twenty-three (23) Township Twelve (12) South, Range Twenty-two (22) East thence South along westerly line of Section Twenty-three (23) to the northerly line of the right-of-way of the Union Pacific Railroad, three (300) Hundred feet, more or less, thence northeasterly along the northerly property line of said right-of-way nine (930) hundred thirty feet, more or less to a point on the northerly line of said Section Twenty-three (23), thence west on the north line of said Section Twenty-three (23), eight (875) Hundred Seventy-five feet, more or less to point of beginning. ALSO, all right, title and interest in a tract of real estate (farm) described as that part of north forty-five (45) acres of East half (½) of Northeast quarter (¼) of Section Twenty-two (22), Township Twelve (12), Range Twenty-two (22), lying north of the Union Pacific Railroad's right-of-way and Lots One (1) and Nine (9) in the Township of LeNape; ALSO, all right, title and interest in and to a tract of real property (farm) described as, that part of East half (½) of Northwest quarter (¼) of Section Twenty-two (22), Township Twelve (12), Range Twenty-two (22), which lies south of the railroad right-of-way; and, all of Blocks Twenty-three (23) and Thirty-two (32) in the Town of LeNape, being a sub-division of part of the West half (½) of the Northeast quarter (¼) of Section Twenty-two (22), Township Twelve (12), Range Twenty-two (22); and that part of the Southeast quarter (¼) of the Northeast quarter (¼) of Section Twenty-one (21), Township Twelve (12), Range Twenty-two (22), lying South of south line of the right-of-way of the Union Pacific Railroad Company, excepting public highways; and that part of the West half (½) of Northwest quarter (¼) of Section Twenty-two (22), lying south of County Highway No. 2, except the railroad right of way, all in Township Twelve (12) Range Twenty-two (22), and also excepting public highways, in Leavenworth County, Kansas: ALSO, all right, title and interest in tract of real estate (farm) described as, Southwest quarter (¼) of Section Twenty-two (22), Township Twelve (12), Range Twenty-two (22), ALL of the said within described real property being situated in County of Leavenworth, State of Kansas,

SUBJECT TO easements, reservations and restrictions of record and subject to the lien of general and special real estate taxes and assessments not delinquent on the date hereof.

EXHIBIT

A

Leavenworth County, Register of Deeds 2012r08518

UNOFFICIAL COPY

Entered in the transfer record in my office this
2 day of July 2020
Janet K. Kaufmann
County Clerk
by B. Jones

Doc #: 2020R05916
STACY R. DRISCOLL
REGISTER OF DEEDS
LEAVENWORTH COUNTY, KANSAS
RECORDED ON:
07/02/2020 04:27:56 PM
RECORDING FEE: 55.00
PAGES: 3

KANSAS GENERAL WARRANTY DEED

THIS KANSAS GENERAL WARRANTY DEED, is made this 29th day of June 2020 by and between Olander Family Limited Partnership, L.P., a Kansas limited partnership, as Grantor, and Kaw Valley Companies, Inc., a Kansas corporation, as Grantee, whose mailing address is 5600 Kansas Avenue, Kansas City, Kansas 66106.

WITNESSETH, that the Grantor, for and in consideration of the sum of Ten Dollars ($10.00) and other good and valuable consideration paid by the Grantee, the receipt and sufficiency of which is hereby acknowledged by the Grantor, does by these presents Grant, Bargain, Sell, Convey, Confirm, and Warrant unto the Grantee, the Real Estate and Property, situated in the County of Leavenworth and State of Kansas, being legally described as shown on Exhibit A attached hereto and incorporated herein by reference, subject to all easements, covenants, restrictions, reservations, conditions and rights appearing of record.

TO HAVE AND HOLD THE SAME, together with the improvements located thereon and together with all rights and appurtenances to the same belonging unto the Grantee, and to the successors and assigns of such Grantee forever.

The Grantor hereby covenants that the Grantor, and the heirs, executors, administrators, and assigns of the Grantor, shall and will warrant and defend the title to the Real Estate and Property unto the Grantee, and to the successors and assigns of Grantee forever, against the lawful claims of all persons, whomsoever, claiming same, excepting, however, the general taxes for the current calendar year and thereafter, and special taxes becoming a lien after the date of this deed.

[*Remainder of page intentionally left blank; signature page follows.*]

When Recorded Return To: LSV
First American Title Insurance Company
National Commercial Services
1201 Walnut, Suite 700
Kansas City, MO 64106
File No: NCS 982593

Leavenworth County, Register of Deeds 2020R05916

UNOFFICIAL COPY

GRANTOR:

OLANDER FAMILY LIMITED PARTNERSHIP, L.P.,
by its general partner, Olander Farms, Inc.,

By: Morgan T. Olander
Morgan T. Olander, President

DATE: 6/29/2020

STATE OF KANSAS }
}ss.
COUNTY OF JOHNSON }

BE IT REMEMBERED, that on this 29th day of June 2020, before me, the undersigned, a Notary Public in and for said County and State, came Morgan T. Olander, President of Olander Farms, Inc., general partner of the Olander Family Limited Partnership, L.P., who is personally known to me to be the same person who executed the foregoing instrument, and duly acknowledged execution of the same as his free act and deed for the purposes expressed therein.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year last above written.

Maribeth A Stack
Notary Public

My Commission Expires:
7/30/21

STATE OF KANSAS NOTARY PUBLIC
MARIBETH A. STACK
My Appointment Expires
July 30, 2021

[Remainder of page intentionally left blank; Exhibit A follows.]

Leavenworth County, Register of Deeds 2020R05916

UNOFFICIAL COPY

EXHIBIT A

LEGAL DESCRIPTION OF THE SUBJECT PROPERTY

That certain real property located in Leavenworth County, Kansas, and described as follows:

TRACT 1:

PARCEL 1:

ALL OF THE FOLLOWING DESCRIBED LAND LYING NORTH AND WEST OF THE KANSAS RIVER:

THE SOUTH 17.97 ACRES OF THE NORTH 45 ACRES OF THE EAST HALF OF THE NORTHEAST QUARTER LYING SOUTH OF THE SOUTH LINE OF THE U.P.R.R. RIGHT-OF-WAY; AND THE SOUTH 35 ACRES OF SAID EAST HALF OF THE NORTHEAST QUARTER AND THE SOUTHEAST (FRACTIONAL) QUARTER OF SECTION 22, TOWNSHIP 12 SOUTH, RANGE 22 EAST OF THE 6TH P.M., ALL IN THE TOWN OF LENAPE, LEAVENWORTH COUNTY, KANSAS.

PARCEL 2:

ALL OF THE FOLLOWING DESCRIBED LAND LYING NORTH AND WEST OF THE KANSAS RIVER:

THE NORTHWEST (FRACTIONAL) QUARTER SOUTHWEST (FRACTIONAL) QUARTER OF SECTION 23, IN TOWNSHIP 12 SOUTH, RANGE 22 EAST OF THE 6TH P.M., IN THE TOWN OF LENAPE, LEAVENWORTH COUNTY, KANSAS.

TRACT 2:

LOTS 2 AND 3 OF BLOCK 36, IN THE TOWN OF LENAPE, LEAVENWORTH COUNTY, KANSAS.

[Remainder of page intentionally left blank.]

Leavenworth County, Register of Deeds 2020R05916

UNOFFICIAL COPY

Doc #: 2020R05917
STACY R. DRISCOLL
REGISTER OF DEEDS
LEAVENWORTH COUNTY, KANSAS
RECORDED ON:
07/02/2020 04:27:58 PM
RECORDING FEE: 72.00
PAGES: 4

Entered in the transfer record in my office this
2 day of July 20 20
Janet Klasinski
County Clerk
by B. Lakes

KANSAS TRUSTEE'S DEED

THIS KANSAS TRUSTEE'S DEED, is made this 29th day of June 2020 by and between Morgan T. Olander, Trustee of the Martha Sue Olander Revocable Trust under agreement dated March 12, 2003, as Grantor, and Kaw Valley Companies, Inc., a Kansas corporation, as Grantee, whose mailing address is 5600 Kansas Avenue, Kansas City, Kansas 66106.

WITNESSETH, that the Grantor, for and in consideration of the sum of Ten Dollars ($10.00) and other good and valuable consideration paid by the Grantee, the receipt and sufficiency of which is hereby acknowledged by the Grantor, does by these presents Grant, Bargain, Sell, Convey, Confirm, and Warrant unto the Grantee, the Real Estate and Property, situated in the County of Leavenworth and State of Kansas, being legally described as shown on Exhibit A attached hereto and incorporated herein by reference, subject to all easements, covenants, restrictions, reservations, conditions and rights appearing of record.

TO HAVE AND HOLD THE SAME, together with the improvements located thereon and together with all rights and appurtenances to the same belonging unto the Grantee, and to the successors and assigns of such Grantee forever.

The Grantor hereby covenants that the Grantor, and the heirs, executors, administrators, and assigns of the Grantor, shall and will warrant and defend the title to the Real Estate and Property unto the Grantee, and to the successors and assigns of Grantee forever, against the lawful claims of all persons, whomsoever, claiming by, through or under Grantor, excepting, however, the general taxes for the current calendar year and thereafter, and special taxes becoming a lien after the date of this deed.

Grantor warrants to Grantee that Grantor is conveying the Real Estate and Property pursuant to the provisions of the Martha Sue Olander Revocable Trust under agreement dated March 12, 2003 (the "Trust"). Grantor further warrants to Grantee that said Trust is in full force and effect as of the date hereof and has not been amended, modified, or revoked, and that Grantor is the duly constituted trustee or successor trustee of the Trust. Grantor covenants to Grantee that this conveyance is made pursuant to the authority granted to Grantor by the Trust and the consideration received by Grantor is in full accordance with the provisions of the Trust.

When Recorded Return To: LSV
First American Title Insurance Company
National Commercial Services
1201 Walnut, Suite 700
Kansas City, MO 64106
File No: NCS 982593

Leavenworth County, Register of Deeds 2020R05917

UNOFFICIAL COPY

GRANTOR:

MARTHA SUE OLANDER REVOCABLE TRUST

Morgan T. Olander, Trustee

DATE: 6/24/2020

STATE OF KANSAS }
}ss.
COUNTY OF JOHNSON }

BE IT REMEMBERED, that on this 24th day of June 2020, before me, the undersigned, a Notary Public in and for said County and State, came Morgan T. Olander, Trustee of the Martha Sue Olander Revocable Trust described in the foregoing instrument who is personally known to me to be the same person who executed the foregoing instrument, and duly acknowledged execution of the same as his free act and deed for the purposes expressed therein pursuant to the authority granted by said Trust agreement.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year last above written.

Maribeth A. Stack
Notary Public

My Commission Expires:
7/30/21

MARIBETH A. STACK
My Appointment Expires
July 30, 2021

[Remainder of page intentionally left blank; Exhibit A follows.]

Leavenworth County, Register of Deeds 2020R05917

UNOFFICIAL COPY

EXHIBIT A

LEGAL DESCRIPTION OF THE SUBJECT PROPERTY

That certain real property located in Leavenworth County, Kansas, and described as follows:

ALL OF BLOCK NUMBERED TWENTY-SIX (26) AND TWENTY-NINE (29) AND ALL OF FRACTIONAL BLOCKS NUMBERED TWENTY-SEVEN (27) AND TWENTY-EIGHT (28) AND ALL OF LOT NUMBERED ONE (1), IN FRACTIONAL BLOCK NUMBERED THIRTY-SIX (36) IN THE ORIGINAL TOWN OF LENAPE, LEAVENWORTH COUNTY, KANSAS, ACCORDING TO THE MAP OR PLAT THEREOF ON RECORD IN THE OFFICE OF THE REGISTER OF DEEDS IN AND FOR SAID COUNTY OF LEAVENWORTH;

ALSO, ALL STREETS AND ALLEYS LYING WITHIN THE BOUNDARIES OF THE LOTS AND BLOCKS AFORESAID, WHICH WERE PURPORTED TO HAVE BEEN VACATED BY ORDER OF THE BOARD OF COUNTY COMMISSIONERS OF LEAVENWORTH COUNTY, KANSAS BY ITS ORDER DATED JANUARY 5, 1874, AND NONE OF WHICH IS NOW IN USE AS PUBLIC THOROUGHFARES THE ABOVE DESCRIBED REAL ESTATE IS MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHWEST CORNER OF LOT NUMBERED ONE (1), IN FRACTIONAL BLOCK NUMBERED THIRTY-SIX OF THE TOWN OF LENAPE; THENCE NORTHERLY ALONG THE WEST LINE OF SAID LOT AND CONTINUED NORTHERLY ON THE SAME COURSE ALONG THE WEST LINE OF BLOCKS TWENTY-NINE (29) AND TWENTY-SIX (26) TO THE NORTHWEST CORNER OF SAID BLOCK TWENTY-SIX (26); THENCE EASTERLY AND ALONG THE NORTH LINE OF SAID BLOCKS TWENTY-SIX (26) AND FRACTIONAL BLOCK NUMBERED TWENTY-SEVEN (27) TO THE NORTHEAST CORNER OF SAID FRACTIONAL BLOCK NUMBERED TWENTY-SEVEN (27); THENCE SOUTHERLY ALONG THE EASTERLY LINE OF FRACTIONAL BLOCKS NUMBERED TWENTY-SEVEN (27) AND TWENTY-EIGHT (28) AND THE EASTERLY LINE OF LOT NUMBERED ONE (1), IN FRACTIONAL BLOCK NUMBERED THIRTY-SIX (36) TO THE SOUTHEASTERLY CORNER OF SAID LOT NUMBERED ONE (1), IN SAID FRACTIONAL BLOCK NUMBERED THIRTY-SIX (36); THENCE WEST TO THE POINT, THE PLACE OF BEGINNING, IN LEAVENWORTH COUNTY, KANSAS.

THE ABOVE DESCRIBED TRACTS WITHIN TRACT 3 ARE MORE COMMONLY DESCRIBED AS: BEING ALL THAT PART OF BLOCKS TWENTY-SIX (26) AND TWENTY-NINE (29), AND FRACTIONAL BLOCKS TWENTY-SEVEN (27) AND TWENTY-EIGHT (28) AND OF LOT

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UNOFFICIAL COPY

NUMBERED ONE (1) IN FRACTIONAL BLOCK NUMBERED THIRTY-SIX (36) LYING EASTERLY OF THE EASTERLY LINE OF LYON STREET VACATED, IN THE TOWN OF LENAPE, INCLUDING ALL VACATED STREETS AND ALLEYS WITHIN THE DESCRIBED PROPERTY, REFERENCE BEING HEREBY MADE TO THE RECORDED MAP OR PLAT THEREOF IN THE OFFICE OF THE REGISTER OF DEEDS OF SAID COUNTY OF LEAVENWORTH, STATE OF KANSAS, AND ALSO TO SURVEY MADE BY R.E. BACON, SURVEYOR UNDER DATE OF SEPTEMBER 5, 1968 AND TO THE MINUTES OF THE BOARD OF COUNTY COMMISSIONERS OF LEAVENWORTH COUNTY, KANSAS ABOVE REFERRED TO.

[*Remainder of page intentionally left blank.*]

Leavenworth County, Register of Deeds 2020R05917

Leavenworth County, Register of Deeds 2020R05917

UNOFFICIAL COPY

Entered in the transfer record in my office this
14 day of Sept 20 12
County Clerk
by B. Jones

Doc #: 2012R08518
STACY R. DRISCOLL
REGISTER OF DEEDS
LEAVENWORTH COUNTY
RECORDED ON
09/14/2012 02:07PM
RECORDING FEE: $16.00

INDEBTEDNESS: 0
PAGES: 3

Secured Title of Kansas City
6201 College Blvd, Ste. 210
Overland Park, KS 66211

SKC0006878

CORRECTION QUIT CLAIM DEED

Carolyn E. Knutson, formerly known as Carolyn E. Spring and Larry Knutson, wife and husband

convey and quitclaim(s) to

Carolyn E. Knutson, Trustee of the Carolyn E. Spring Revocable Trust dated March 11, 2008

all the following REAL ESTATE in the County of LEAVENWORTH, and the State of Kansas, to-wit:

The land referred to in this Deed is described as follows:

See attached Exhibit "A"

for no consideration

Grantor, Carolyn E. Knutson, formerly known as Carolyn E. Spring, states this Deed is being recorded to correct the date of the Trust of the Grantee in the Quit-Claim Deed filed for record on March 13, 2008, under Document No. 2008R02554. The Trust date should have been March 11, 2008.

EXCEPT AND SUBJECT TO: Easements, restrictions and assessments of record, and all the taxes and assessments that may be levied, imposed or become payable hereafter.

No Real Estate Validation Questionnaire per KSA 1993 Supp. 79-1437e as amended (3)

UNOFFICIAL COPY

Dated this 12 day of September, 2012.

Carolyn E. Knutson, Trustee
Carolyn E. Knutson

Larry Knutson

STATE OF KANSAS

COUNTY OF WYANDOTTE

The foregoing instrument executed was acknowledged before me this 12th day of September, 2012, by Carolyn E. Knutson and Larry Knutson, wife and husband.

Notary Public

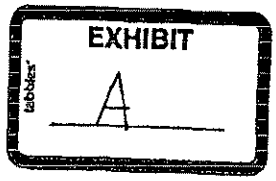
Notary Public-State of Kansas
LINDA C. MOORE
My Appt. Expires 7/16/16

My appointment expires:_____

UNOFFICIAL COPY

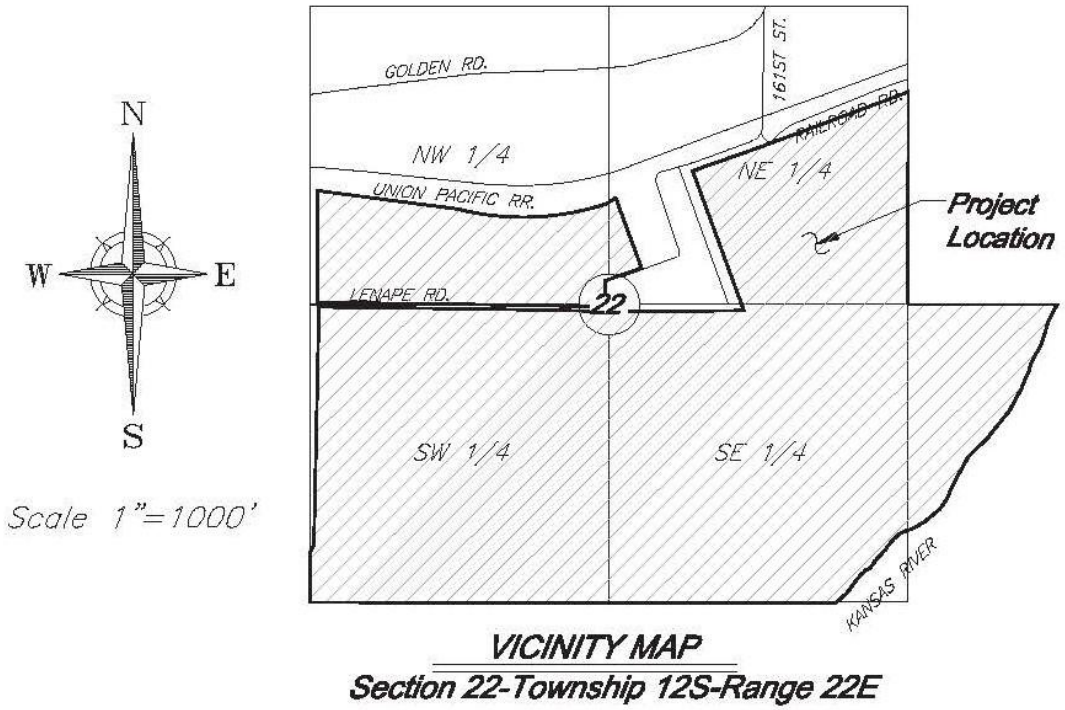
All right, title and interest in a tract of real estate (farm) beginning at Northwest corner of Section Twenty-three (23) Township Twelve (12) South, Range Twenty-two (22) East thence South along westerly line of Section Twenty-three (23) to the northerly line of the right-of-way of the Union Pacific Railroad, three (300) Hundred feet, more or less, thence northeasterly along the northerly property line of said right-of-way nine (930) hundred thirty feet, more or less to a point on the northerly line of said Section Twenty-three (23), thence west on the north line of said Section Twenty-three (23), eight (875) Hundred Seventy-five feet, more or less to point of beginning. ALSO, all right, title and interest in a tract of real estate (farm) described as that part of north forty-five (45) acres of East half (½) of Northeast quarter (¼) of Section Twenty-two (22), Township Twelve (12), Range Twenty-two (22), lying north of the Union Pacific Railroad's right-of-way and Lots One (1) and Nine (9) in the Township of LeNape; ALSO, all right, title and interest in and to a tract of real property (farm) described as, that part of East half (½) of Northwest quarter (¼) of Section Twenty-two (22), Township Twelve (12), Range Twenty-two (22), which lies south of the railroad right-of-way; and, all of Blocks Twenty-three (23) and Thirty-two (32) in the Town of LeNape, being a sub-division of part of the West half (½) of the Northeast quarter (¼) of Section Twenty-two (22), Township Twelve (12), Range Twenty-two (22); and that part of the Southeast quarter (¼) of the Northeast quarter (¼) of Section Twenty-one (21), Township Twelve (12), Range Twenty-two (22), lying South of south line of the right-of-way of the Union Pacific Railroad Company, excepting public highways; and that part of the West half (½) of Northwest quarter (¼) of Section Twenty-two (22), lying south of County Highway No. 2, except the railroad right of way, all in Township Twelve (12) Range Twenty-two (22), and also excepting public highways, in Leavenworth County, Kansas: ALSO, all right, title and interest in tract of real estate (farm) described as, Southwest quarter (¼) of Section Twenty-two (22), Township Twelve (12), Range Twenty-two (22), ALL of the said within described real property being situated in County of Leavenworth, State of Kansas,

SUBJECT TO easements, reservations and restrictions of record and subject to the lien of general and special real estate taxes and assessments not delinquent on the date hereof.



Leavenworth County, Register of Deeds 2012r08518

Kaw Valley Companies'
Narrative for Special Use Permit
Leavenworth County, Kansas
10/16/2025



VICINITY MAP
Section 22-Township 12S-Range 22E

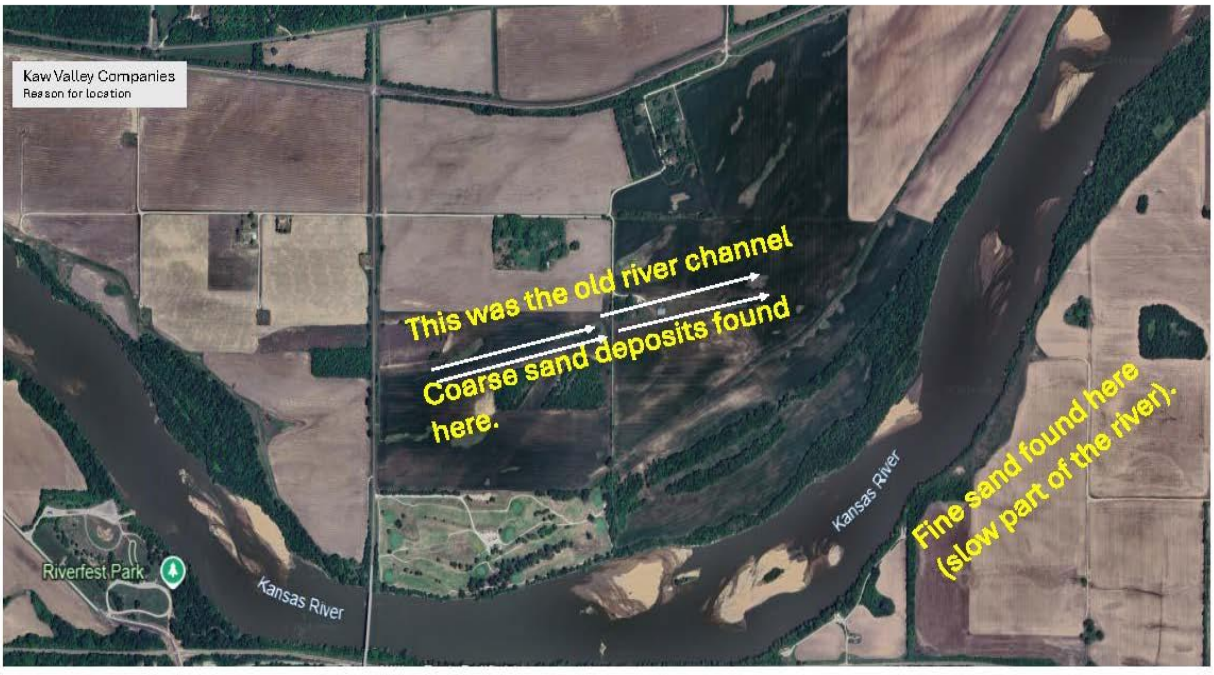
A. INTRODUCTION.

Kaw Valley Companies, Inc. ("Kaw Valley") requests approval of a Special Use Permit to utilize an approximately 435-acre site located at 166th and Lenape Road in rural Leavenworth County, Kansas (the "Property") for a sand excavation and stockpiling operation (the "Sand Operation"). The stockpiled material will be removed from the site and transported for processing at Kaw Valley's facility located at 9501 Woodend Road in Edwardsville, Kansas or to other facilities owned by third parties. The Property is currently zoned I-3, Heavy Industrial.

B. THE REASONS THAT MAKE THE SITE IN QUESTION APPROPRIATE FOR THE PROPOSED USE.

Kaw Valley is regionally recognized as a premier source for aggregate materials, including Kansas River sand. Industries such as glass and fiberglass manufacturing, water filtration fabrication and construction rely on Kaw Valley's product and its ability to source superior quality raw materials. The type of sand Kaw Valley seeks has a unique chemical make-up which is only found near or directly out of the Kansas River. The Kansas River's historical route at the Property from hundreds of years ago (Figure 1) left high-quality deposits of exceptionally coarse sand, sand with unmatched grain size, purity, and consistency making it ideal for a variety of industrial uses. The Property's unique geological characteristics have created a location with an unmatched natural resource.

Figure 1



Coring and lab testing have confirmed that shallow, high-quality sand and gravel deposits exist on the Property. The shallow location of the deposits requires less extensive excavation making the extraction of the sand more efficient, cost-effective and less impactful.

The Property is currently zoned "I-3" (Heavy Industrial) and Leavenworth County, Kansas' Zoning and Subdivision Regulations indicate that "[e]xtraction of raw materials such as rock, gravel, sand and clay; minerals and earths, quarrying, extracting, grinding, crushing and processing" may occur at the site after obtaining a Special Use Permit.

The Property is isolated from residential areas and is within reasonable transportation range of several industrial hubs. The Property is also strategically located near key transportation routes providing access to major highways, facilitating efficient delivery to end users. (In the future it is also possible that transport will occur by railway).

C. ANY REASONS THAT THE PROPOSED USE COULD CAUSE CONFLICT WITH OTHER PARCELS SURROUNDING THE SITE IN QUESTION AND THE STEPS TO BE TAKEN TO CAUSE THE USE TO BE COMPATIBLE WITH OTHER PARCELS NEAR THE SITE IN QUESTION.

1. **No Conflict with Surrounding Parcels**: The Property is located at the northeast and southeast corners of 166th Street and Lenape Road in rural Leavenworth County. The Property is isolated from major residential areas due to the predominant industrial zoning (Figure 2) and the existing buffers created by the Union Pacific Railroad to the north and the Kansas River to the south (Figures 3 & 4).

Figure 2

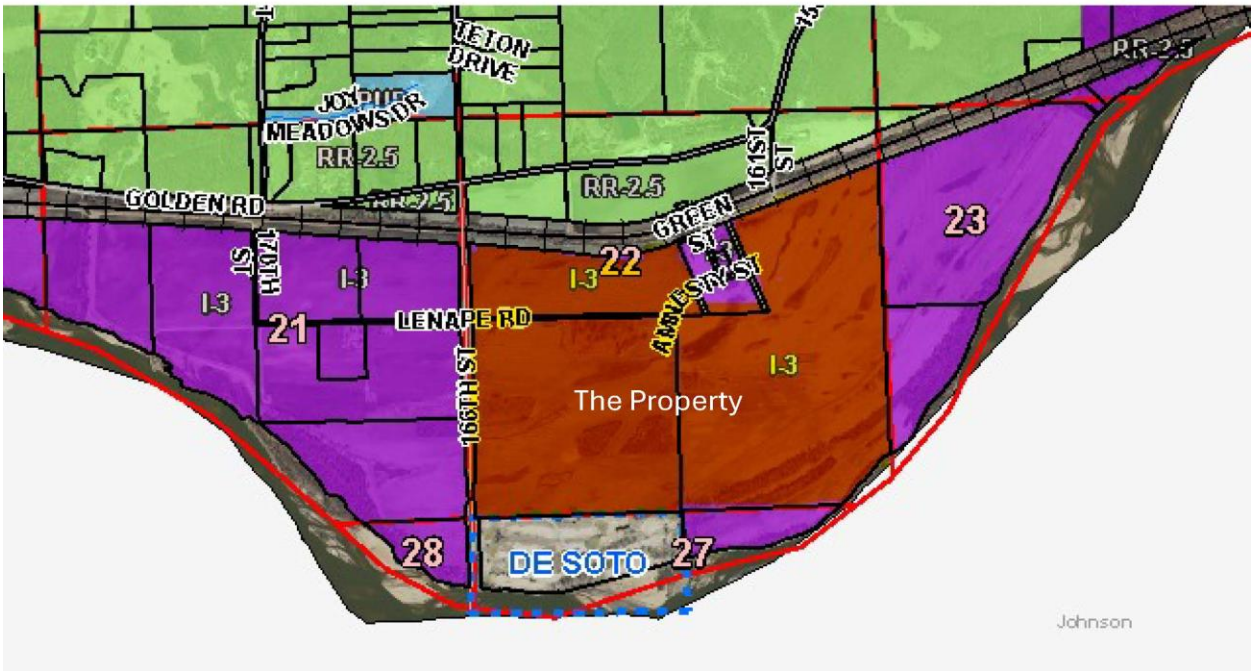


Figure 3



Figure 4



Immediately to the south of the Property is the existing Burning Tree Golf Club and the Kansas River. While there are a few residences in the vicinity of the Property (off Amnesty, De Soto, and Lyon Street), they are located on industrially zoned I-3 property. There is an existing rail line immediately north of the Property separating the southern industrial zoned areas from the northern residential zoned areas (see Figures 2 & 3). Farther to the north of Golden Road large parcel residential development exists. To the east and west of the Property the space between the railroad and Kansas River narrows, isolating the Property and its few neighboring parcels.

Considering the industrial zoning of the surrounding areas, the rural and isolated nature of the Property, existing and significant sources of noise (Figure 4), and the buffering to the north, south, east, and west provided by Golden Road, the railroad and the path of the Kansas River, the impact of the proposed Sand Operation on the Property on the surrounding area is minimized and the potential future impact is minimal for the same reasons.

2. **Noise Control**:

To identify the potential noise impact of the proposed Sand Operation on surrounding parcels, Kaw Valley engaged GBA to update the previous Noise Study based upon the new plan of operations in order to accurately determine the potential noise impact of the various machinery and equipment utilized in the Sand Operation and to determine what additional noise mitigation strategies might be appropriate.

In the original Noise Study, sound levels were measured at Kaw Valley's existing Morris facility located at 2400 S. 78th Street in Kansas City, Kansas, while a diesel-powered loader was actively loading semi-trailers with excavated material. Sound volume measurements were also taken at Holiday Sand & Gravel's sand dredging site at 43rd & Frisbee Road in Shawnee, Kansas, while electric dredges were in use on the Kansas River and also in the site's off-river dredging pond. Sound measurements were also taken at the electric pump / washer / and separator conveyor belt. Sound levels were measured using calibrated decibel meters along with sound meter applications available on smart phones.

Using that collected data, GBA prepared an updated and conservative study of potential noise which could be generated by the proposed Sand Operation to estimate the potential noise levels on:

a) the Burning Tree Golf Course (66.7 and 66.6 dBA);
b) the residential homes immediately adjacent to the Property (70.1, 63.9, and 73.5 dBA);
c) the residential homes along Golden Road (62.2 dBA); and
d) the residential property on 161st Street (66.1 dBA).

For the analysis the Sand Operation was assumed to be at peak volume, all equipment was assumed to be running simultaneously, the mobile equipment was assumed to be stationary at the closest point to each calculation location, and the terrain was assumed to be level with no barriers or reductions for noise dampening from trees or berms. These "worst-case" calculations of the GBA study are conservative and are still below the threshold of what is considered to be the typical sound level generated by industrial operations (80 dBA). In most instances the noise levels will be much lower for each location given that the mobile equipment will not always be at the closest point, it will not always be peak operations, there are existing noise buffers, and additional noise buffers will be installed.

For comparison purposes, an average suburban household during the day might generate a noise level ranging from 40-49 dB; a dishwasher might generate a noise level of 60 dB; and a vacuum cleaner might generate a noise level of 80 dB or more.

To help mitigate noise from the proposed Sand Operation, the following measures will be taken:

- The separator/consolidator, laboratory/scale house and control room will be installed east of 166th Street, just south of Amnesty Road, on the northern portion of the Property to keep space (approximately 2,400 feet - Figure 5) between the equipment and the Burning Tree Golf Club to the south.

Figure 5



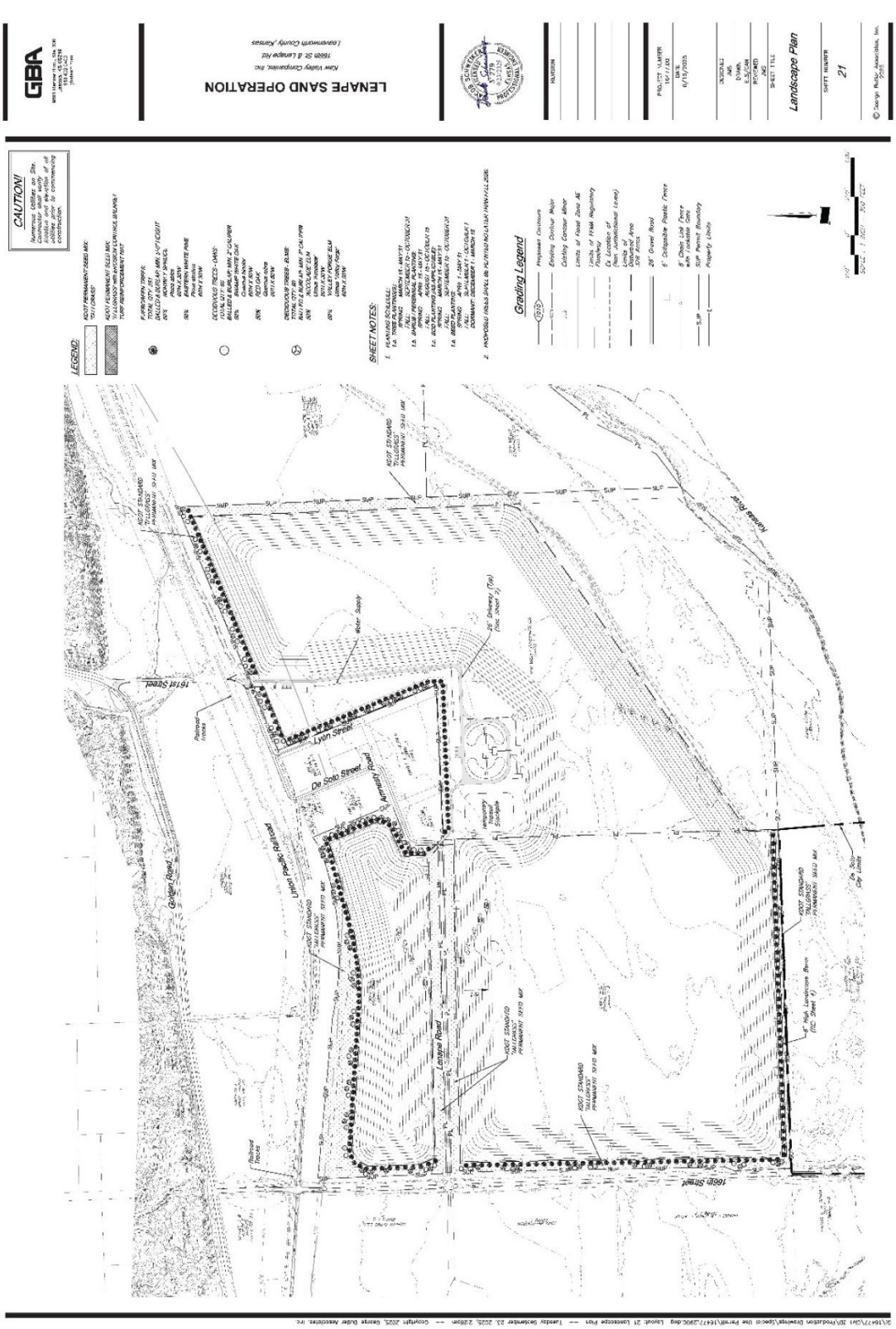
- Kaw Valley will use electrical power for the dredge line, industrial aggregate washer, and the separator/consolidator, instead of noisier diesel-powered units. Electrical units operate with much less noise and maintenance, will not need to be constantly supplied with gasoline or diesel fuel, and will not have the environmental spill containment requirements of their petroleum powered counterparts.

- All production area processing equipment will be turned off when not in use.

- Processing equipment will be kept well-maintained with regular lubrication to keep the workings as quiet as possible.

- Landscaping will be strategically installed on the Property to mitigate noise generated by the Sand Operation. The landscape plan (Figure 6) includes planting three hundred native species of deciduous and coniferous trees to ensure they root and prosper. The trees will be planted along the Property's southern and eastern boundaries and the Property's boundaries with the existing residences off Amnesty and De Soto Road. The southern boundary will additionally have a six-foot-high landscape berm to mitigate noise reaching Burning Tree Golf Club.

Figure 6


LENAPE SAND OPERATION
Landscape Plan
Grading Legend
SHEET NOTES:
LEGEND:
CAUTION!
Lyon Street
De Soto Street
Lenape Road
Garden Road
Union Pacific Railroad
16th Street
Kansas River

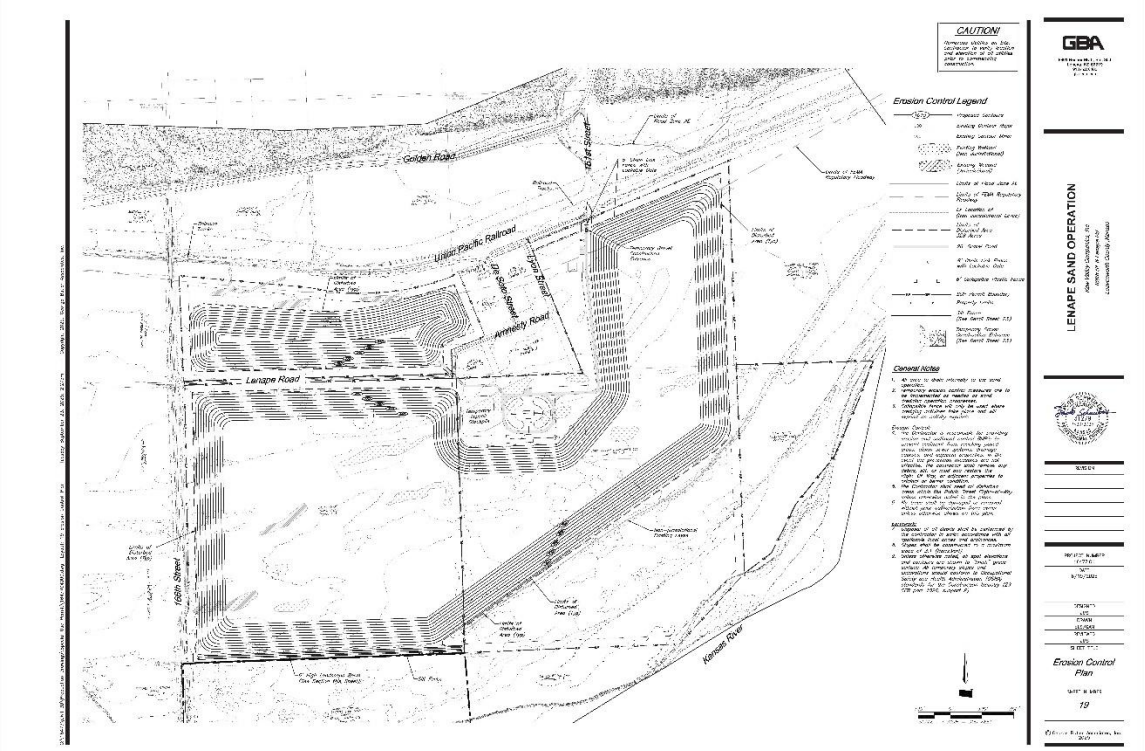
3. **Dust Control**: Newly dredged sand will be moist and have a relatively high-water content which will make it only minimally susceptible to wind erosion. If stockpiled sand is left in place over long periods, a water truck will be used to spray water onto stockpiles of sand, soil or aggregate to control windblown dust generation. The sprayed water reacts with the surface material to form a protective crust on the surface making it resistant to wind erosion. This type of protective crust occurs naturally during the winter when temperatures fall below freezing.

4. **Erosion Control and Good Housekeeping Practices**:

a. Erosion Control:

Extensive erosion and sediment controls will be utilized during the construction of and operational life of the Sand Operation. An updated Stormwater Pollution Prevention Plan was prepared for the Property and it covers temporary and permanent plans for sediment stabilization and also frequent inspections and oversight of those controls. Areas disturbed by excavation activity will be stabilized with mulch or equivalent stabilization measures within 14 days after soil disturbing activities have ceased and will not resume for more than 14 days. (This includes the topsoil stockpile area and any project areas that are being seeded). Disturbed ground not designated to become part of the permanent lake formed from the dredging pond upon completion of the Sand Operation will be planted with native vegetation. Silt fencing will be utilized around temporary topsoil stockpiles to stabilize the ground and prevent sediment from being washed back into the dredging pool. (Figure 7).

Figure 7



b. Good Housekeeping Practices:

Dry methods of cleaning equipment will be utilized to prevent waste and sediment from being "tracked out" onto the streets. This includes large-aggregate lined construction entrance driveways which act to shake and knock soil and mud off vehicles. Vehicles/equipment will be washed periodically off-site to remove these materials from the vehicles/equipment.

Silt fencing will be utilized around temporary topsoil stockpiles to stabilize the ground and prevent sediment from being washed back into the dredging pond.

Inspections of the containment berms and erosion control features, including the silt fencing and large-aggregate lined construction entrance driveways, will be performed at least once every 14 days and also after each ½" or greater rainfall event.

5. **Sediment Basin**: The proposed dredging ponds will also serve as large sediment basins for storing runoff from the surrounding fields. The southern dredging pond, south of Lenape Road, at full excavation will have a surface area of approximately 249 acres and a storage depth of approximately 50 feet. The northern dredging pond, north of Lenape Road, at full excavation will have a surface area of approximately 32 acres and a storage depth of approximately 50 feet. The existing grid-roads running along the section, and quarter-section lines are raised relative to the agricultural fields and act as berms to contain runoff, preventing runoff from crossing over onto the neighboring fields. The existing under-bedding is also an alluvial overbank area, which allows for the ready absorption of stormwater runoff into the underlying groundwater table and onto the Kansas River under-bed.

6. **Restoration of the Site**: Once the Sand Operation has concluded, the existing excavation pit will be filled with ground water to serve as a lake for the Property owners. The lake will provide private recreation for fishing and swimming and will serve as a refuge for local wildlife. (Figure 15, page 17)

D. THE HOURS OF OPERATION, TRAFFIC ROUTES AND EXPECTED VOLUMES, STAFFING LEVELS, METHODS OF OPERATION, AND OFF-STREET PARKING.

1. **Hours of Operation**: Dredging/stockpiling are the lifeblood of this operation and as with our other locations, are intended to operate without restrictions. The excavation work for removal of the overburdened only takes place every one to three years and will occur Monday through Friday, 7:00 a.m. to 3:00 p.m. These are the same hours proposed for the hauling operations, Monday through Friday, 7:00 a.m. to 3:00 p.m.

2. **Expected Traffic Volumes**: The Sand Operation will generate irregular traffic based upon a variety of factors such as demand, weather, and production. When operating, it is estimated that 10-120 round trips per day will be created. Across Kaw Valley Companies' historical traffic volumes, 120 round trips is at the very high end. The average expected number

of round trips will be 50 round trips per day, i.e. 50 trucks in to the site and 50 trucks out of the site. Nevertheless, for modeling purposes and to be overly conservative, the Route Study assumed 120 round trips, 120 in and 120 out, would be generated. The site will include a weight scale to ensure that outgoing trucks do not exceed allowable weight limits on the roadways.

3. **Traffic Routes**: All trucks leaving the Property will utilize the Primary Route. Only in the event that the Primary Route is shut down will the Alternate Route be utilized. (Figure 8).

Figure 8



1. All drivers will be directed on the Primary Route. The Primary Route (the dark blue line on Figure 8) is proposed to begin at 161st Street and Railroad Road, then traverse north, at which point vehicles will turn left onto Golden Road, traveling west. From this point, vehicles will continue on Golden Road, then follow the northward curve, at which point Golden Road becomes 189th Street. Vehicles heading to Kaw Valley's processing plant will turn right onto K-32 heading northeast. Vehicles will then follow the marked K-32 truck route, turning onto Scheidt Lane / Santa Fe Road. Next, vehicles will turn left from Scheidt Lane / Santa Fe Road onto West Front Street and follow K-32 until the industrial park in which the processing facility is located. Third party destinations will use the Primary Route to K-32 and proceed to their ultimate destination.

2. **THE ALTERNATE ROUTE WILL ONLY BE USED WHEN THRU TRAFFIC IS NOT PERMITTED ON THE PRIMARY ROUTE**. The Alternate Route (the light blue line on Figure 8) is also proposed to begin at 161st Street and Railroad Road, then traverse north, where vehicles will make a slight right turn onto 158th Street. Vehicles will then travel north to Loring Road, and make a right turn onto Loring Road and begin traveling in the eastbound direction. Next, vehicles will make a left turn from Loring Road onto Loring Road / Loring Lane, then continue on the same roadway, which is designated differently along the segment (Loring Road, Loring

Lane, West Front Street, and K-32) until turning into the industrial park if they are heading to Kaw Valley's processing plant. Third party destinations will use the Alternate Route to K-32 and proceed to their ultimate destinations.

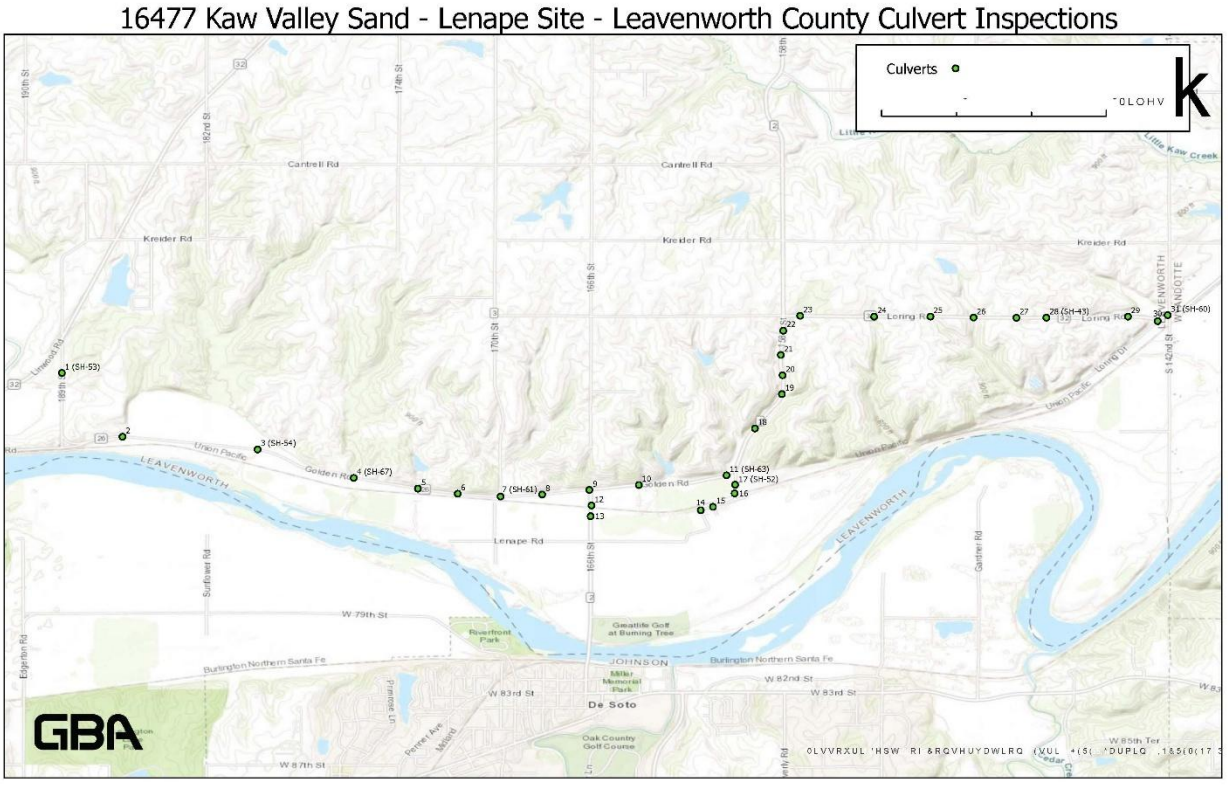
4. **Stormwater Drainage Study**:

In May 2025 GBA conducted a stormwater drainage study of the Property. GBA concludes that "[a]t no point before, during, or after excavation operations will stormwater runoff patterns be altered to cause additional discharge to neighboring properties." This is because the "dredging area…will serve as a large pond after dredging is complete" and "[d]ue to the addition of a pond to the site, stormwater runoff control structures are not anticipated to be required."

5. **Drainage Structures Study**:

In December 2024 and May of 2025, GBA inspected and evaluated the 31 culverts/drainage structures along the Primary Route to have accurate information about the structures that drivers will pass over as part of the Sand Operation (Figure 9). The inspection focused on the culvert/drainage structure itself, the channel into and out of the structure, and the scour.

Figure 9



A chart summarizing the Maintenance Recommendations for each of the 31 structures is set out in Figure 10 below.

Figure 10

Structure ID	Maintenance Recommendations
1 (SH-53)	Reconstruct headwalls with new guardrail.
2	Fill downstream scour hole with rip rap.
3 (SH-54)	Structure is scheduled for replacement. Construction to begin December 15, 2025. Structure to be completed in August 2026.
4 (SH-67)	Clean drift out of upstream channel.
5	None at this time.
6	Clear silt/debris from upstream and downstream end.
7 (SH-61)	Structure is scheduled for replacement. Construction to begin December 15, 2025. Structure to be completed in August 2026.
8	None at this time.
9	None at this time.
10	Put NE hazard marker up; Remove tree on north end of culvert; Repair scour hole downstream with rip rap and backfill undermining.
11 (SH-63)	None at this time.
12	Clear brush at ends of pipe.
13	Replace structure.
14	None at this time.
15	None at this time.
16	Replace structure.
17 (SH-52)	Monitor retaining wall movement at northwest corner.
18	None at this time.
19	Replace structure.
20	Replace structure.
21	None at this time.
22	Clear stones/debris/brush at ends of box. Stabilize upstream banks.
23	Replace structure – repair is not recommended.
24	Clear drift/debris in downstream channel; Monitor corrosion to bottom of pipe.
25	Replace guardrails; Clear debris at upstream end.
26	Replace guardrails; Fill downstream scour hole with rip rap; Clear drift/debris in downstream channel.
27	None at this time.
28 (SH-43)	Replace guardrails; Clear silt in downstream end of pipe.
29	None at this time.
30	Clear trees/brush around downstream end of pipe.
31 (SH-60)	Replace guardrails; Clear silt/debris in box and channel.

6. **Pavement Evaluation Report**:

On September 23, 2025, Terracon provided an updated Pavement Evaluation Report of the Primary and Alternate Routes, which is incorporated into the Route Study Report. The Study was conservative (inputting 120 roundtrips per day from the Sand Operation vs. the real anticipated 50 round trips per day) and calculated each route's ability to handle the current and additional loading for a twenty-year period.

Terracon's pavement recommendations are highlighted here:

Pavement Evaluation Report
Golden Road Pavement Evaluation | Leavenworth County, Kansas
September 23, 2025 | Terracon Project No. 02245065.rev2

Pavement Recommendations

Pavement Section Thicknesses

Pavement thickness depends upon many factors including but not limited to:

- applied wheel/axle loads and number of repetitions
- subgrade and pavement material characteristics
- climate conditions
- site and pavement drainage

Due to the variable thickness of the existing aggregate base in the sections observed, we have developed new minimum pavement section thicknesses to utilize a value of 2 inches of aggregate base at existing route 1 locations and 3 inches of aggregate base at existing route 2 locations. For 161st Street a thickness of 4 inches of aggregate base was used.

To meet the anticipated future loading of 13,600,000 ESALs, we recommend that route 1 asphalt section be thickened to **11.5 total inches**. For route 2, we recommend that the asphalt section be thickened to **11 total inches**. For 161st street segment, we recommend an asphalt section of **11 total inches** overlying the existing gravel roadway. Values for additional asphalt to meet existing traffic needs as well as the new truck traffic are provided in the table below.

Recommended Pavement Thicknesses				
		To Support Current Traffic		
Route	Existing Aggregate Base Used in Analysis (in)	Average Additional Asphalt Needed (in)	Maximum Additional Asphalt Needed (in)	Total Asphalt Needed (in)
Route 1	2	1.5	4.5	7
Route 2	3	0.5	4	7
161st Street	4	6.5	6.5	6.5
		To Support Current and Additional Traffic		
Route 1	2	6	9	11.5
Route 2	3	4.5	8	11
161st Street	4	11	11	11

7. **Staffing Levels**: There will be five regular (full-time) employees (with two or three per shift) for the sand dredging and processing operations, including an on-site manager. Various service and maintenance personnel will also visit the site on a periodic basis for equipment and machinery maintenance. In addition to the full time onsite and service and maintenance personnel described above, Kaw Valley currently employs 19 truck drivers. These drivers will be utilized to haul materials from this site as well as from other sites. Many of these 19 employees are residents of Leavenworth County.

8. **Method of Operations**:

a. **On Site Manager**: An on-site manager will oversee daily production, test aggregate materials in the on-site laboratory, monitor the truck weight scales to keep loads at legal limits, track and schedule regular maintenance for the equipment, trouble-shoot problems, and be responsible for safety and environmental requirements. Other employee positions will include a dredge line operator, a scale clerk, and a loader operator.

b. **On Site Equipment**: The on-site processing equipment utilized in the Sand Operation will include: the high-capacity electric water pump (Figure 11); an industrial aggregate washer; a separator/consolidator (Figure 12); and rotating conveyor belts to deposit processed sand and aggregate onto stockpiles.

Figure 11



Figure 12



c. **Structures**: The on-site portable structures utilized in the Sand Operation will include: a separator/consolidator; a laboratory/scale house; and a control room. Building mounted LED lights will be mounted on the scale house, radial stacker belts, and the sand separator/consolidator.

d. **Electrical Service**: Electrical service will be provided by Evergy. There are existing overhead power lines along the eastern side of 166th Street and the northern side of Lenape Road. Westar Energy has been contacted, and they have replied that they can serve the Property.

e. **Sanitary Sewers**: There are no sanitary sewers on the Property. Restroom facilities will be accommodated with a septic tank and leach field or Port-a-Potty stations. Drinking water will be provided. A holding tank will be used to store all septic waste. The holding tank will require floodplain permits and will be anchored to meet state guidelines. An engineer will design the system and it will have a minimum 5-day holding capacity, with not less than 2,000 gallons. A contract with a Leavenworth County Septic Hauler to regularly pump the holding tank will be provided to the County prior to use of the system. The portable toilet will not be located in the Floodway.

f. **Trash Enclosure**: A trash dumpster and enclosure will be located just north of the laboratory/scale house. Kaw Valley will arrange for trash hauling or handle waste collection services in-house.

g. **Signage**: There are no plans for on-site outdoor displays, advertising, or signage, other than directional signage and signage required and appropriate for safety.

h. **Emergencies**: In the event of emergency or safety issue, plans will be in place for evacuation and contact numbers identified for key personnel in charge of such issues.

i. **Fencing**: 6-foot-tall collapsible/movable fence will surround the open pit. The fencing will expand as the pit expands. An 8-foot-tall chain link fence with a lockable gate will be along the northeast frontage of the Property, with the gate located across the entrance to the Property off of 161st Street.

j. **General Operations**: The Sand Operation will be self-contained on the Property. The following describes the different tasks and operations that will be performed as part of the plant's daily routine:

i. During the early stages of operation, a high-capacity water pump will flood the dredging pool. After the excavation work has advanced, groundwater will fill the excavation pit like a pond (Figure 13).

Figure 13



ii. A dredge line will vacuum material into a slurry pipeline that feeds into the industrial aggregate washer.

iii. The industrial aggregate washer separates and removes the sediment from the sand material. The sand is then pumped through a second slurry pipeline to the separator/consolidator.

iv. Subject to securing a permit from Leavenworth County, material from the northern pond will be transferred to the separator/consolidator utilizing an underground slurry pipe which

will run under the Lenape Road. Public roadways will not be used to transport material from the northern pond to the separator/consolidator.

v. The separator/consolidator (approximately 30 feet high and 60 feet long) will grade the sand into coarse and fine materials. Two rotating conveyor belts will radiate out from the separator/consolidator and deposit the graded sand onto two half-donut shaped stockpiles. (Surplus sand may also be stockpiled near the main entrance).

vi. A loader will scoop sand material (Figure 14) and load it into trucks for weighing and transport to Kaw Valley's Edwardsville processing plant, or to other aggregate/concrete companies' locations using the Primary Route.

Figure 14



E. THE NUMBER OF PARKING SPACES AVAILABLE ON THE PROPERTY AND THE REASONING BEHIND THE NUMBER PROVIDED.

Off-Street Parking: With only two to three employees working on any given shift, an eight-space parking area off of 161st Street near the laboratory and scale house is proposed, with an additional eight parking stalls located near the separator/consolidator.

F. THE NUMBER OF MONTHS/YEARS FOR WHICH THE PERMIT IS REQUESTED AND WHETHER THE CHARACTER OF THE USE WOULD TEND TO BE SEASONAL OR VARY DURING THE DURATION OF THE PERMIT.

1. While the Property has potential raw material to support an operation of fifty or more years, Kaw Valley is requesting a special use permit for twenty-five years.

2. The plant will be open and operational year-round with variation in seasonal production. Because the company's primary customers are construction related, spring, summer and fall are typically the busiest periods with demand falling off during the colder winter months.

G. THE EXTENT TO WHICH THE USE COULD CAUSE POLLUTION.

The proposed Sand Operation will be a zero-point discharge operation with the dredge pond serving as a sedimentation basin to trap erosion and sediment to prevent them from flowing into the Kansas River. The surrounding terrain consists of flat agricultural fields and there are no major creeks or drainage-ways flowing through the Property. Excavation of sand will take place in a large open pit that will form into a lake. The lake will also act as a sediment basin to hold sediment and keep it from washing into the Kansas River. There will be no hazardous chemicals stored on site or used in the sand production process. Kaw Valley will use all electric production equipment to minimize the use of diesel fuel and oil. All lubricants for the site's equipment and machinery will be non-toxic and biodegradable.

As additional information:

1. Odors and fumes will not be produced.

2. There will be no outdoor displays.

3. Retails sales will not occur on the property.

4. Customers will not visit the site.

5. Food and alcohol will not be served.

H. ANY OTHER REASONABLE INFORMATION NECESSARY OR HELPFUL FOR THE IMPACT OF THE USE TO BE FULLY EVALUATED AND CONSIDERED.

Kaw Valley's company-wide operating vision focuses on business safety, efficiency, and the production of high-quality products with a strong emphasis on ensuring a positive community impact. We intend to bring this focus to the Lenape Sand Operation in Leavenworth County.

Kaw Valley is committed to sustainable practices, minimizing waste, and avoiding unnecessary environmental impact. There will be no activities involving hazardous materials or methods that could compromise safety or environmental quality. Kaw Valley will retain ownership and will be responsible for maintenance of the reclaimed private property.

1. **Reclamation Plan**. When the Sand Operation is complete, a comprehensive reclamation plan to restore the site as depicted in Figure 15 will be implemented. The existing excavation pit will be filled with ground water to serve as a lake for the Property owners. The lake will provide private recreation for fishing and swimming and will serve as a refuge for the local wildlife.

2. **Community Benefits**. Community wide, the proposed Sand Operation will create jobs and generate tax revenue for the County including sales tax, business licenses and permitting fees, road maintenance benefits and property taxes.

Figure 15

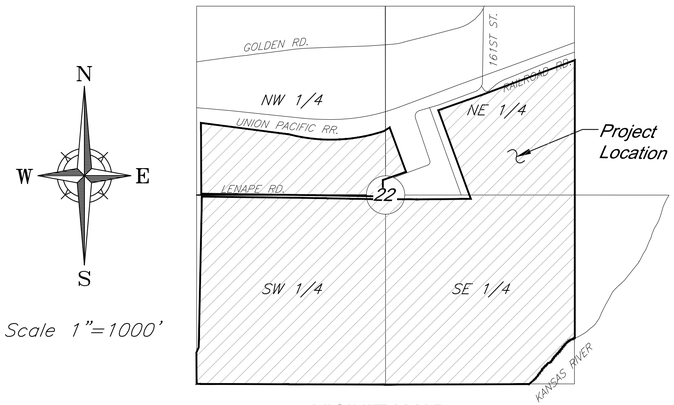

24
Great Lawn
Park Shelter(s)
Fishing Dock(s)
Community Trail
Kansas River
161st Street
Union Pacific Railroad
Lyon Street
DeSoto Street
Kennedy Road
Lenape Road
166th Street
Golden Road
GBA
Reclamation Plan - Lenape Sand Operation
November 2004

SPECIAL USE PERMIT SITE PLAN
FOR
LENAPE SAND OPERATION
Section 22-Township 12S-Range 22E
IN
LEAVENWORTH COUNTY, KANSAS

SUP PERMIT BOUNDARY DESCRIPTION:

A tract of land over a portion of the Northwest, Northeast, Southwest and Southeast Section 22, Township 12 South, Range 22 East, of Leavenworth County, Kansas, more particularly described as follows:

BEGINNING at the North westerly corner of this SUP PERMIT BOUNDARY thence S84°49'09"E a distance of 1245.06 feet, said point also being a point on a non-tangent curve; thence Easterly, along a curve to the left, having a radius of 2348.16 feet, a central angle of 32°43'54", a distance of 1341.45 feet, thence N55°26'49"E a distance of 94.09 feet, thence S22°28'51"E, a distance of 661.46 feet, thence S68°30'32"W, a distance of 343.39 feet, thence S02°38'11"E a distance of 268.68 feet, thence N87°29'03"E, a distance of 1226.92 feet, thence N22°20'46"W, a distance of 1318.47 feet, thence N67°34'56"E a distance of 2031.74 feet, thence S02°15'53"E a distance of 3885.72 feet, thence S42°36'55"W a distance of 906.97 feet, thence S87°45'55"W a distance of 4644.77 feet, thence N02°42'34"W a distance of 437.46 feet, thence N21°33'21"E a distance of 79.21 feet, thence N01°03'15"W a distance of 2148.27 feet, thence S88°25'46"E a distance of 10.29 feet, thence N02°26'46"W a distance of 990.90 feet, to the POINT OF BEGINNING.



Scale 1"=1000'

VICINITY MAP
Section 22-Township 12S-Range 22E

INDEX OF SHEETS

Sht. No.	Description
1	Cover Sheet
2	Typical Sections
3	Site Plan
4	Overall Grading Plan
5 - 18	Grading Plan
19	Erosion Control Plan
20	Lighting Plan
21	Landscape Plan
22	Truck Turning Circulation
23	Construction Details
24	Reclamation Plan

NOTE:

ALL CONSTRUCTION SHALL CONFORM TO LEAVENWORTH COUNTY TECHNICAL SPECIFICATIONS.

FLOODPLAIN:

The site lies within areas designated as Regulatory Floodway Areas in Zone AE, per FEMA FIRM 20103C0142G, dated July 16, 2015.

(See Exhibit 2 of the Storm Report)

BENCHMARK:

DESIGNATION:	WY 51
PID:	KE1714
CONTROL POINT:	LVCO-0151
NORTHING:	263019.26
EASTING:	2190504.82
ELEVATION:	787.7

LOCATION DESCRIPTION:
THE STATION IS A MONUMENT BOX IN THE CENTER OF 142ND STREET 36.58 M (120.0 FT) SOUTH OF THE CENTER LINE OF LORING DRIVE. THE STATION IS 33.85 M (111.1 FT) NORTH NORTHWEST OF A SPIKE AND WASHER IN THE WEST SIDE OF THE POWER POLE, 21.23 M (69.7 FT) NORTHEAST OF A SPIKE AND WASHER IN THE NORTH FACE OF A POWER POLE, 16.84 M (55.2 FT) NORTH NORTHEAST OF A SPIKE AND WASHER IN THE WEST FACE OF A 92 INCH ELM TREE, 13.76 M (45.1 FT) SOUTHWEST OF A NAIL AND WASHER IN THE WEST FACE OF THE POWER POLE, 7.06 M (23.2 FT) SOUTHEAST OF A NAIL AND WASHER IN THE TOP OF SOUTH END GUARD RAIL POST.

UTILITY CONTACTS

Electric Service: Evergy
Tel (888) 471-5275
www.evergy.com/

Communications: AT&T
www.att.com/local/kansas/de-soto

RG Fiber
www.rgfiber.com/

Spectrum
www.spectrum.com/internet-service/kansas/de-soto

Zoom Fiber
www.zoomfiber.com/

Gas: Atmos Energy
Tel (888) 286-6700
www.atmosenergy.com/

CAUTION!
Numerous Utilities on site. Contractor shall verify location and elevation of all utilities prior to commencing construction.

811 Know what's below. Call before you dig.
Kansas One Call 811 or 1-800-DIG-SAFE(800-344-7233)

JACOB SCHWEIKERT
LICENSED
51279
9/23/2025
KANSAS
PROFESSIONAL ENGINEER

PROJECT ENGINEER:

DATE:

PREPARED FOR:
KAW VALLEY COMPANIES, INC.
5600 KANSAS AVENUE
KANSAS CITY, KANSAS 66106
CONTACT: EVAN HOROWITZ

PREPARED BY:
GEORGE BUTLER ASSOCIATES, INC.
9801 RENNER BOULEVARD
LENEXA, KANSAS 66219-9745
[redacted]

OWNER:
KAW VALLEY COMPANIES LLC
5600 KANSAS AVE
KANSAS CITY, KS 66106
CAROLYN E. SPRING TRUST
425 CRESCENT CIRCLE
ALBERT LEA, MN 56007-1482

GBA
architects
engineers
9801 Renner Boulevard
Lenexa, Kansas 66219
[redacted]
www.gbateam.com

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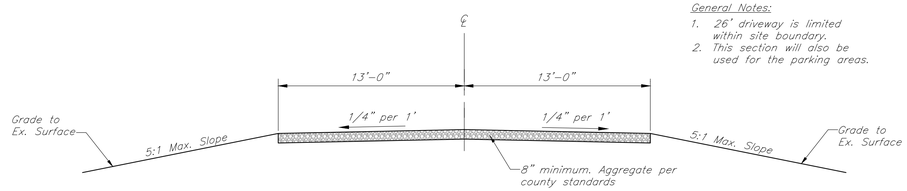
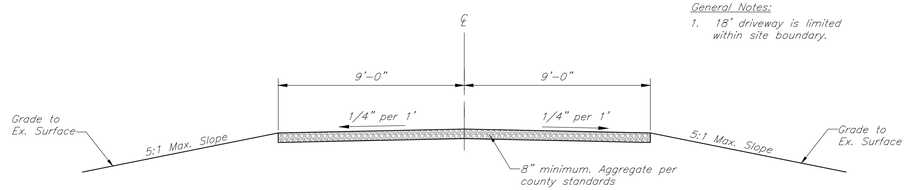


General Notes:
1. 26' driveway is limited within site boundary.
2. This section will also be used for the parking areas.

26' PRIVATE DRIVE - SECTION

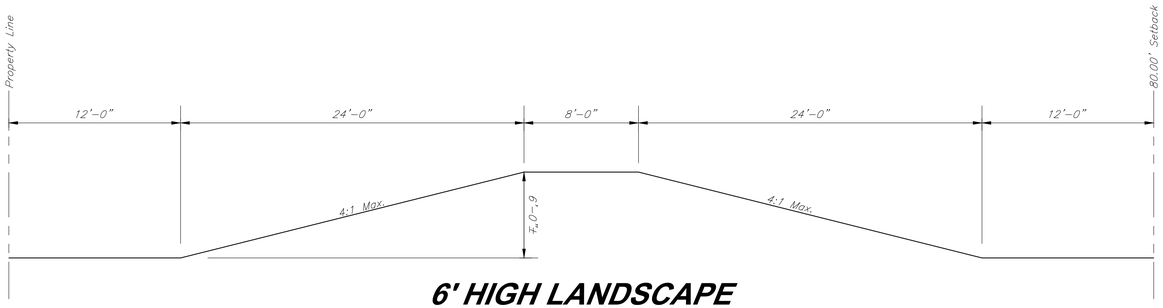
Scale: 1" = 5'



General Notes:
1. 18' driveway is limited within site boundary.

18' PRIVATE DRIVE - SECTION

Scale: 1" = 5'



6' HIGH LANDSCAPE BERM - SECTION

Scale: 1" = 5'

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GBA
9801 Renner Blvd., Ste. 300
Lenexa, KS 66219
913.492.0400
gbateam.com

LENAPE SAND OPERATION

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

JACOB SCHWEIKERT LICENSED 31279 9/23/2025 KANSAS PROFESSIONAL ENGINEER

REVISION

PROJECT NUMBER
16477.00

DATE
6/19/2025

DESIGNED
JMS

DRAWN
ELS/GAN

REVIEWED
JMS

SHEET TITLE

Typical Sections

SHEET NUMBER

2

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Proposed Use of Site

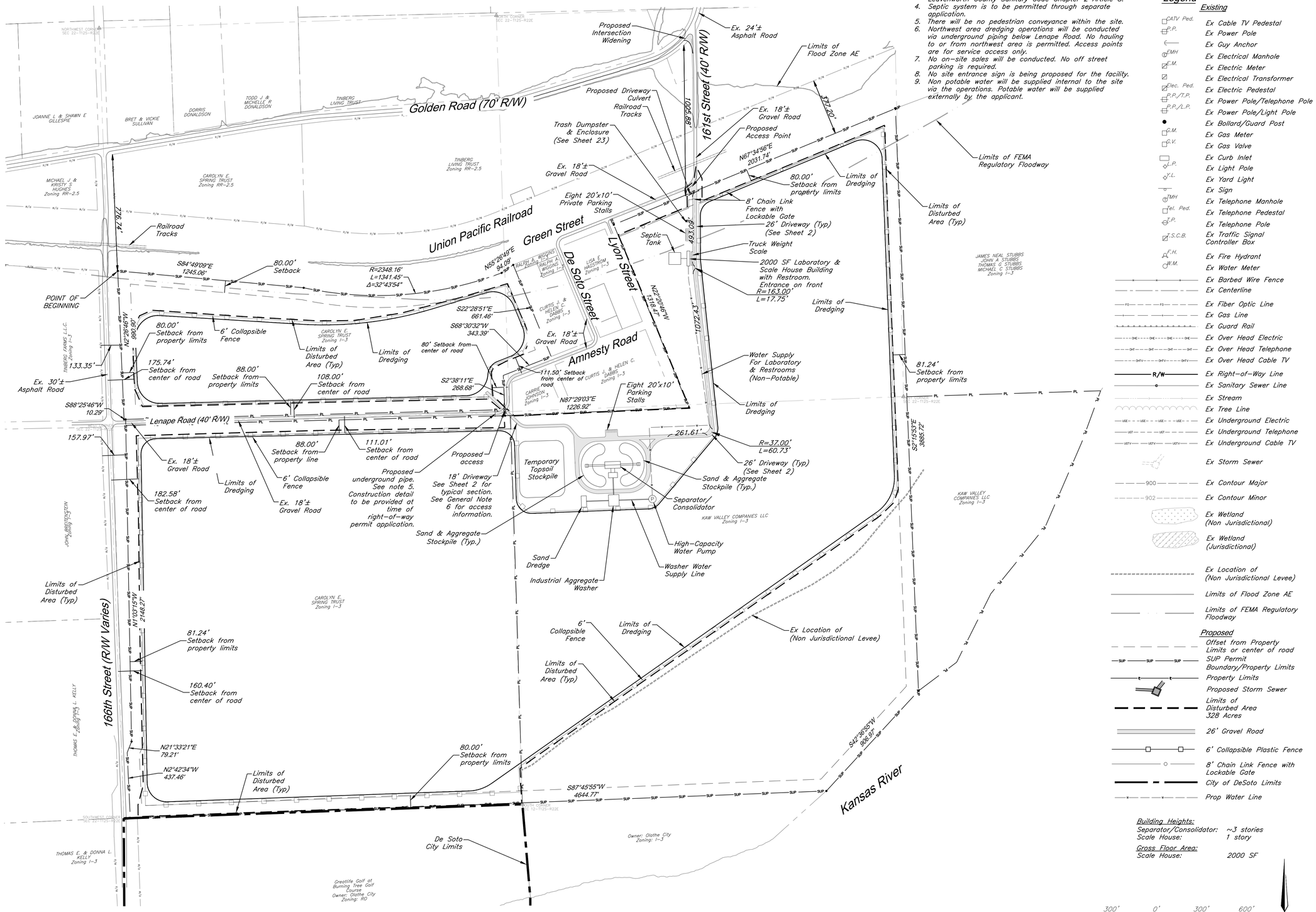
Kaw Valley Companies, Inc. ("Kaw Valley") requests approval of a Special Use Permit to utilize the approximately 435–acre site located at 166th and Lenape Road in rural Leavenworth County, Kansas (the "Property") for a sand excavation and stockpiling operation (the "Sand Operation")

General Notes

1. Collapsible fence will only be used where dredging activities take place and will expand as activity expands.
2. Septic tank system with minimum 5 day holding capacity and not less than 2,000 gallons will be designed by a licensed engineer. Septic tank requires Floodplain permits and will obtained for the septic tank prior to construction. The septic tank will be anchored to meet state guidelines. A contract with a Leavenworth County septic hauler to regularly pump the septic tank will be obtained and provided to Leavenworth County Planning & Zoning prior to use of the system.
3. Septic tank is to be designed in accordance with Leavenworth County Sanitary Code Chapter 2 Article 8.
4. Septic system is to be permitted through separate application.
5. There will be no pedestrian conveyance within the site.
6. Northwest area dredging operations will be conducted via underground piping below Lenape Road. No hauling to or from northwest area is permitted. Access points are for service access only.
7. No on–site sales will be conducted. No off street parking is required.
8. No site entrance sign is being proposed for the facility.
9. Non potable water will be supplied internal to the site via the operations. Potable water will be supplied externally by the applicant.

CAUTION!

Numerous Utilities on Site. Contractor shall verify location and elevation of all utilities prior to commencing construction.



Legend

Existing

- Ex Cable TV Pedestal
- Ex Power Pole
- Ex Guy Anchor
- Ex Electrical Manhole
- Ex Electric Meter
- Ex Electrical Transformer
- Ex Electric Pedestal
- Ex Power Pole/Telephone Pole
- Ex Power Pole/Light Pole
- Ex Bollard/Guard Post
- Ex Gas Meter
- Ex Gas Valve
- Ex Curb Inlet
- Ex Light Pole
- Ex Yard Light
- Ex Sign
- Ex Telephone Manhole
- Ex Telephone Pedestal
- Ex Telephone Pole
- Ex Traffic Signal Controller Box
- Ex Fire Hydrant
- Ex Water Meter
- Ex Barbed Wire Fence
- Ex Centerline
- Ex Fiber Optic Line
- Ex Gas Line
- Ex Guard Rail
- Ex Over Head Electric
- Ex Over Head Telephone
- Ex Over Head Cable TV
- Ex Right–of–Way Line
- Ex Sanitary Sewer Line
- Ex Stream
- Ex Tree Line
- Ex Underground Electric
- Ex Underground Telephone
- Ex Underground Cable TV
- Ex Storm Sewer
- Ex Contour Major
- Ex Contour Minor
- Ex Wetland (Non Jurisdictional)
- Ex Wetland (Jurisdictional)
- Ex Location of (Non Jurisdictional Levee)
- Limits of Flood Zone AE
- Limits of FEMA Regulatory Floodway

Proposed

- Offset from Property Limits or center of road
- SUP Permit Boundary/Property Limits
- Property Limits
- Proposed Storm Sewer
- Limits of Disturbed Area 328 Acres
- 26' Gravel Road
- 6' Collapsible Plastic Fence
- 8' Chain Link Fence with Lockable Gate
- City of DeSoto Limits
- Prop Water Line

Building Heights:
Separator/Consolidator: ~3 stories
Scale House: 1 story

Gross Floor Area:
Scale House: 2000 SF

300' 0' 300' 600'
SCALE : 1 INCH = 300 FEET

GBA
9801 Renner Blvd., Ste. 300
Lenexa, KS 66219
913.492.0400
gbateam.com

LENAPE SAND OPERATION

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

JACOB SCHWEIKERT LICENSED PROFESSIONAL ENGINEER 31279 9/23/2025 KANSAS

REVISION

PROJECT NUMBER 16477.00

DATE 6/19/2025

DESIGNED JMS

DRAWN ELS/GAN

REVIEWED JMS

SHEET TITLE

Site Plan

SHEET NUMBER 3

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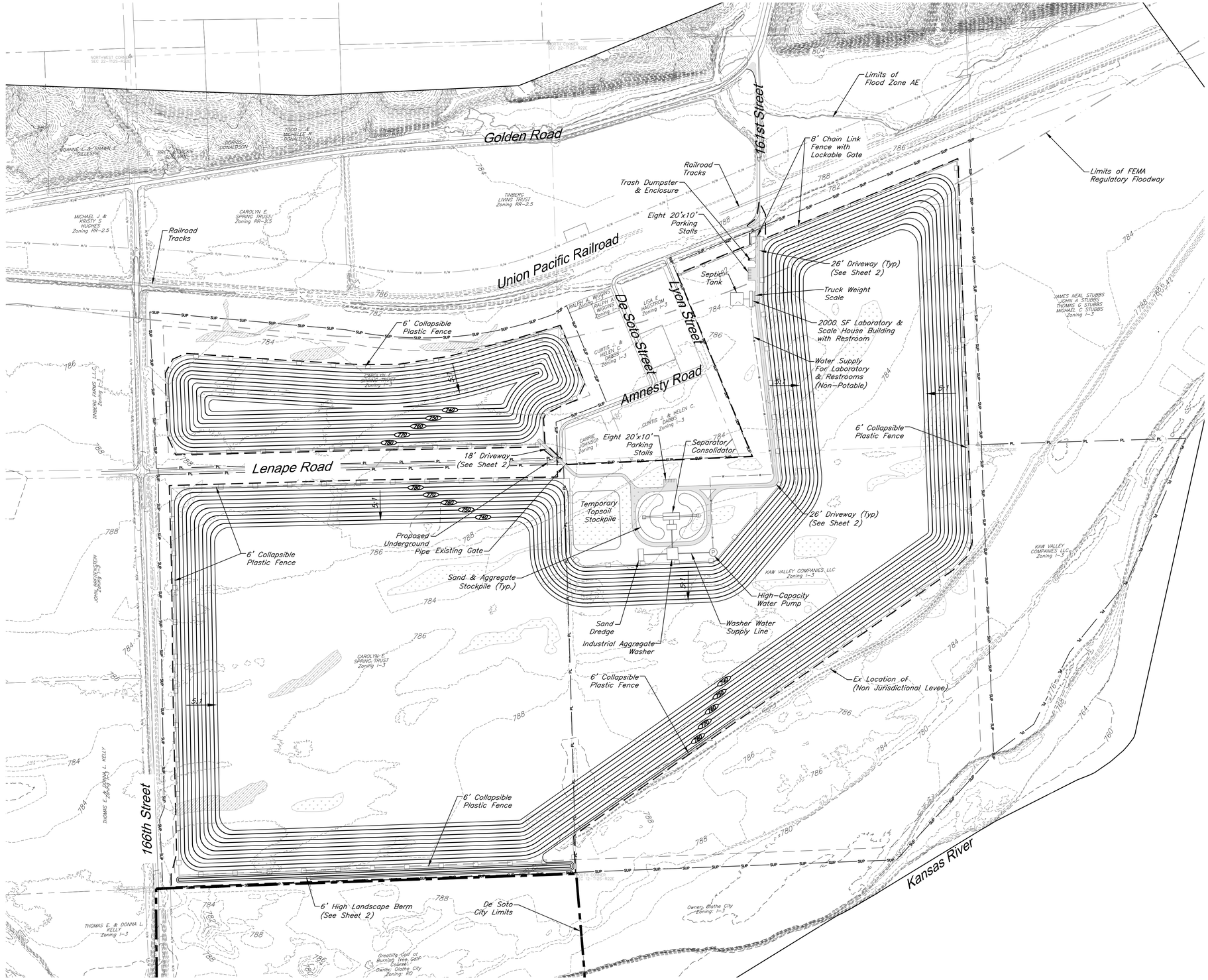
G:\16477\Civil 3D\Production Drawings\Special Use Permit\16477C00700.dwg Layout: 4 Overall Grading Plan -- Tuesday, September 23, 2025, 2:26pm -- Copyright 2025, George Butler Associates, Inc.



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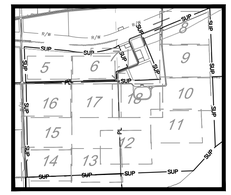

KEY MAP
Not to Scale

General Notes

1. Collapsible Plastic Fence will only be used where dredging activities take place and will expand as activity expands.
2. Septic tank system with minimum 5 day holding capacity and not less than 2,000 gallons will be designed by a licensed engineer. Septic tank requires Floodplain permits and will obtained for the septic tank prior to construction. The septic tank will be anchored to meet state guidelines. A contract with a Leavenworth County septic hauler to regularly pump the septic tank will be obtained and provided to Leavenworth County Planning & Zoning prior to use of the system.
3. Septic tank is to be designed in accordance with Leavenworth County Sanitary Code Chapter 2 Article 8.
4. Septic system is to be permitted through separate application.
5. There will be no pedestrian conveyance within the site.
6. No offsite areas drain to this site. No runoff from this site affects adjacent properties.

Grading Legend

- 1010 — Proposed Contours
- 900 — Existing Contour Major
- 902 — Existing Contour Minor
- Existing Wetland (Non Jurisdictional)
- Existing Wetland (Jurisdictional)
- Limits of Flood Zone AE
- Limits of FEMA Regulatory Floodway
- Ex Location of (Non Jurisdictional Levee)
- Limits of Disturbed Area 328 Acres
- 26' Gravel Road
- 6' Collapsible Plastic Fence
- 8' Chain Link Fence with Lockable Gate
- SUP SUP — SUP Permit Boundary
- Property Limits
- Drainage Flow Arrow
- City of DeSoto Limits

300' 0' 300' 600'
SCALE : 1 INCH = 300 FEET

GBA
9801 Renner Blvd., Ste. 300
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LENAPE SAND OPERATION

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

JACOB SCHWEIKERT LICENSED 31279 9/23/2025 KANSAS PROFESSIONAL ENGINEER

REVISION

PROJECT NUMBER
16477.00

DATE
6/19/2025

DESIGNED
JMS

DRAWN
ELS/GAN

REVIEWED
JMS

SHEET TITLE

Overall Grading Plan

SHEET NUMBER
4

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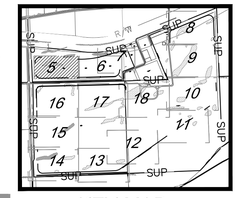
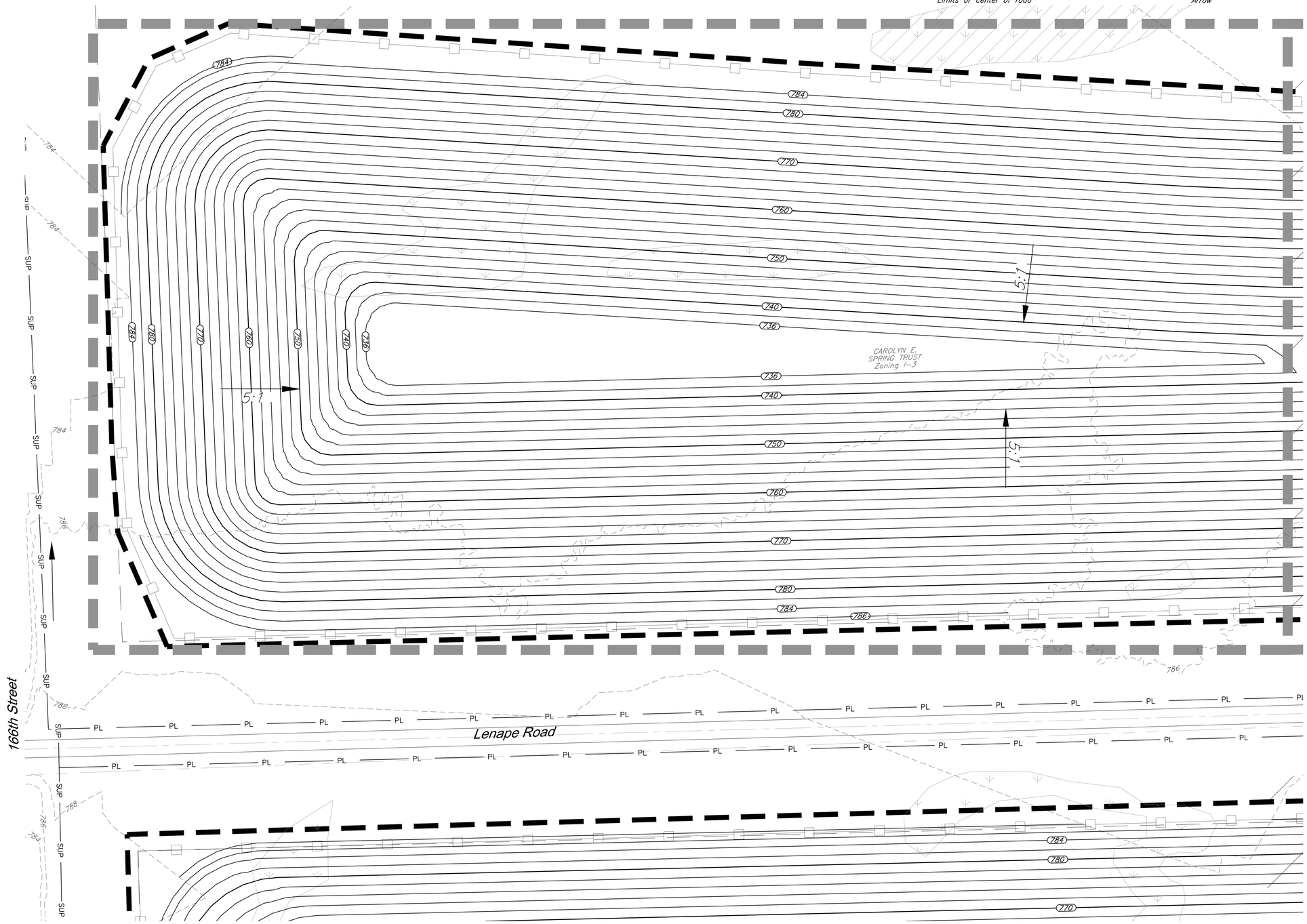
Grading Legend

- 1010 — Proposed Contours
- 900 — Existing Contour Major
- 902 — Existing Contour Minor
- Enlargement Line
- Existing Wetland (Non Jurisdictional)
- Existing Wetland (Jurisdictional)
- Ex Location of (Non Jurisdictional Levee)
- Limits of Flood Zone AE
- Limits of FEMA Regulatory Floodway
- Limits of Disturbed Area 328 Acres
- Offset from Property Limits or center of road
- 26' Gravel Road
- 6' Collapsible Plastic Fence
- 8' Chain Link Fence with Lockable Gate
- SUP — SUP Permit Boundary
- PL — Property Limits
- Drainage Flow Arrow



KEY MAP
Not to Scale



50' 0' 50' 100'
SCALE : 1 INCH = 50 FEET

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LENAPE SAND OPERATION

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

JACOB SCHWEIKERT
LICENSED
31279
9/23/2025
KANSAS
PROFESSIONAL ENGINEER

REVISION

PROJECT NUMBER
16477.00

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6/19/2025

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Grading Plan

SHEET NUMBER
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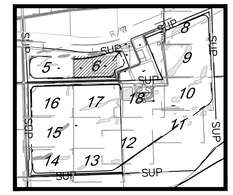

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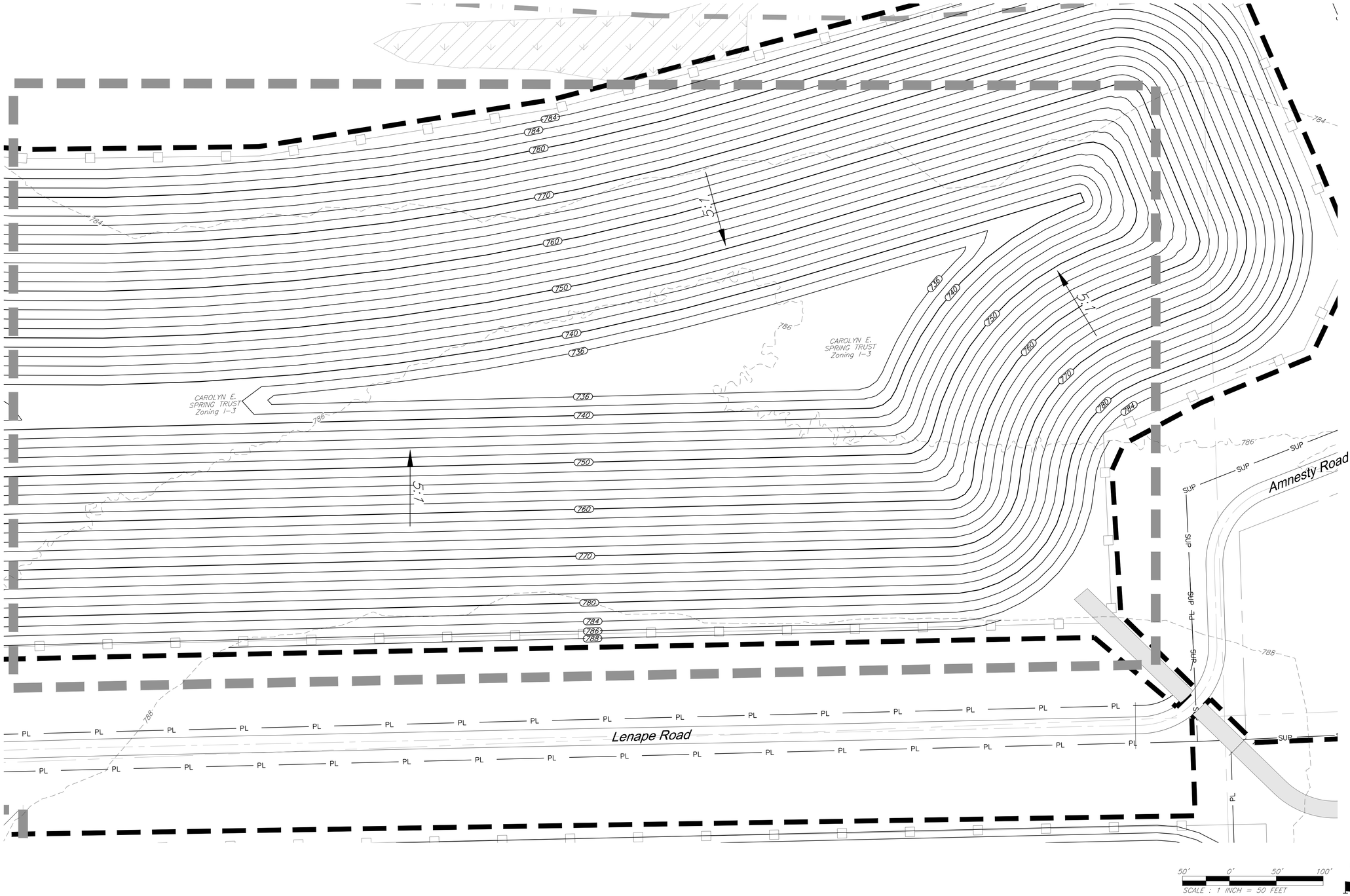

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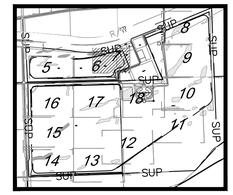
- SUP — SUP Permit Boundary
- Property Limits
- Drainage Flow Arrow



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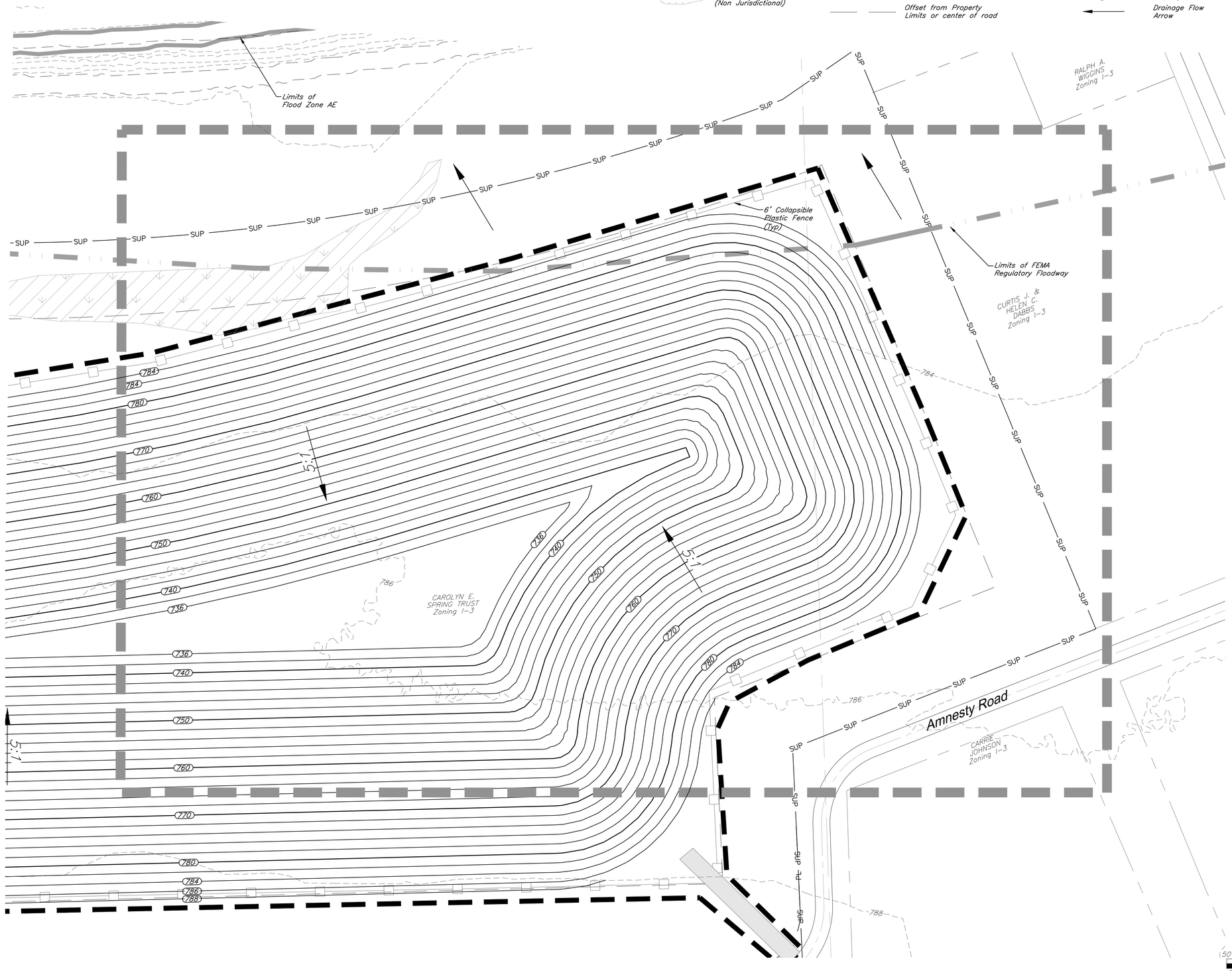

SCALE : 1 INCH = 50 FEET

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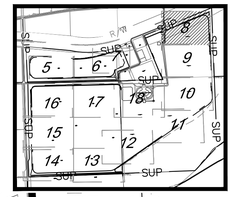

KEY MAP
Not to Scale

161st Street

Union Pacific Railroad

Proposed Driveway Culvert

8' Chain Link Fence with Lockable Gate

26' Driveway

KAW VALLEY COMPANIES LLC
Zoning I-3

Limits of FEMA Regulatory Floodway

5:1

SUP

788 786 784 782 780

50' 0' 50' 100'
SCALE : 1 INCH = 50 FEET

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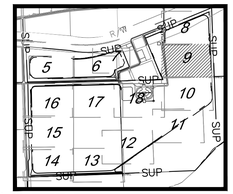

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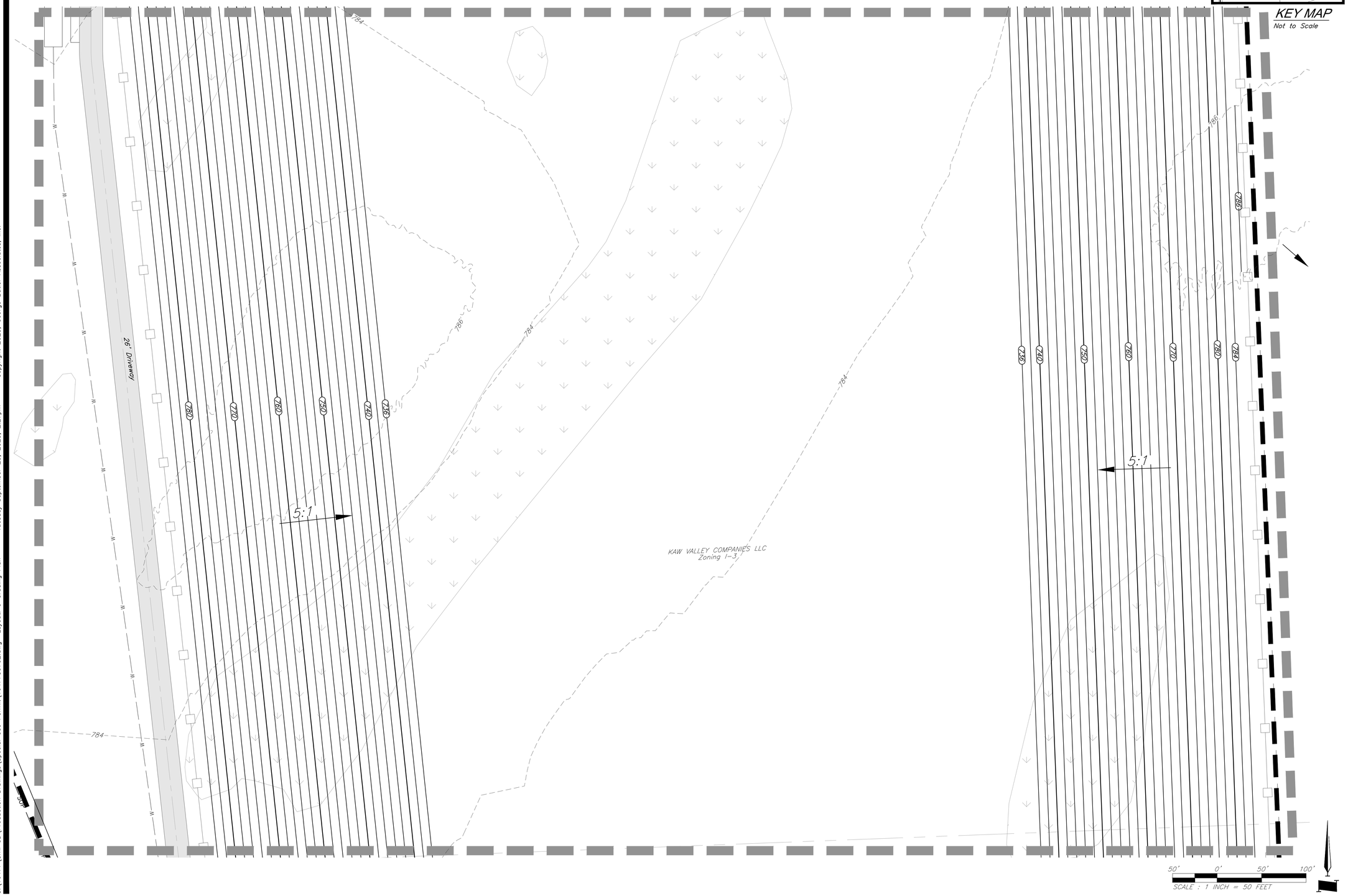

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Leavenworth County, Kansas

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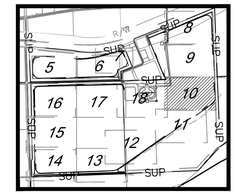

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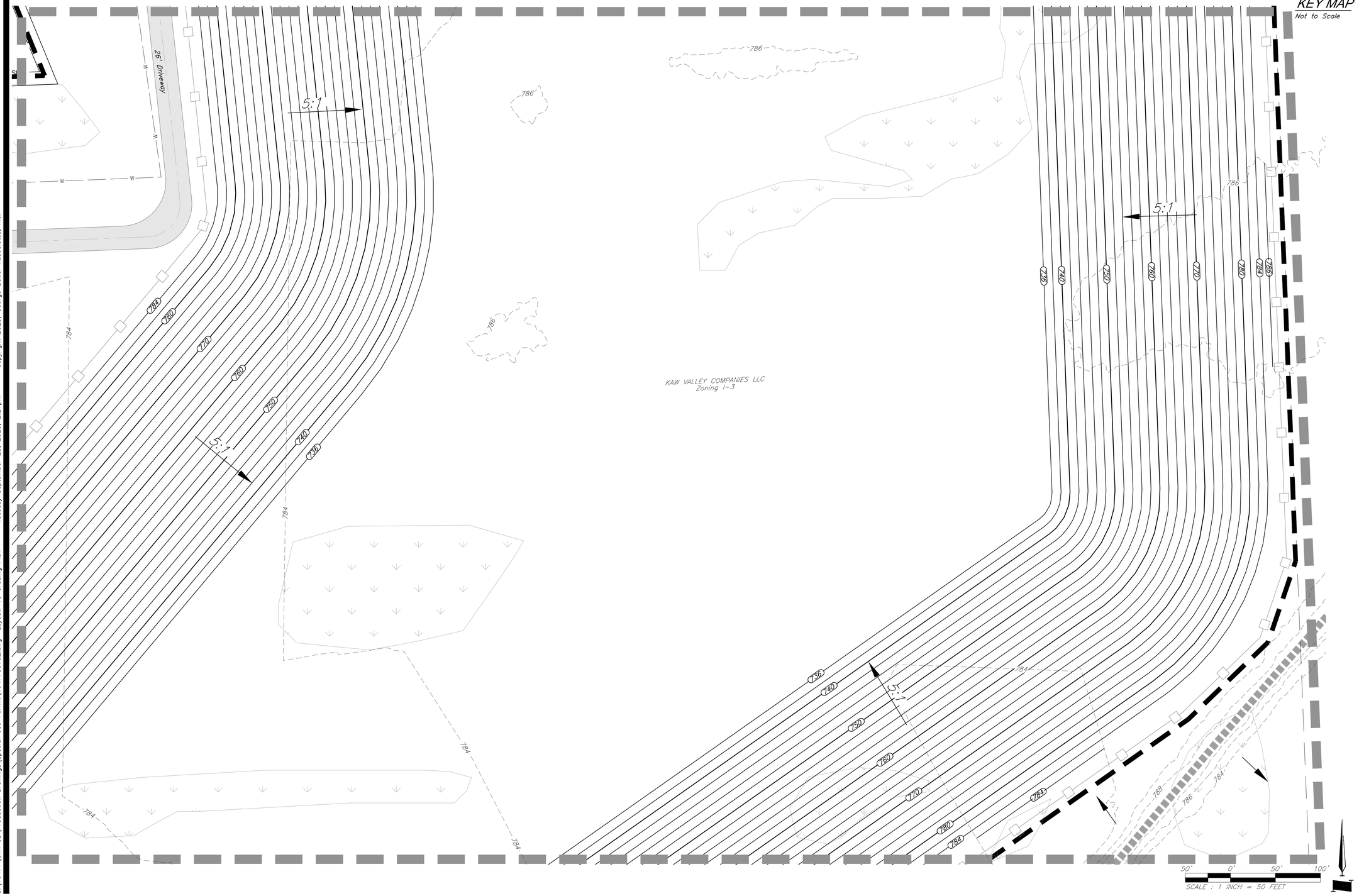

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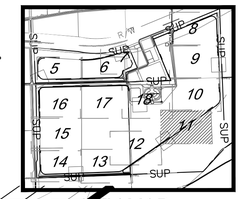
- SUP — SUP Permit Boundary
- ℄ — Property Limits
- Drainage Flow Arrow



KEY MAP
Not to Scale

KAW VALLEY COMPANIES LLC
Zoning I-3

5:1

5:1

50' 0' 50' 100'
SCALE : 1 INCH = 50 FEET

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SHEET NUMBER

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Grading Legend

- Proposed Contours (1010)
- Existing Contour Major (900)
- Existing Contour Minor (902)
- Enlargement Line
- Existing Wetland (Non Jurisdictional)
- Existing Wetland (Jurisdictional)
- Ex Location of (Non Jurisdictional Levee)
- Limits of Flood Zone AE
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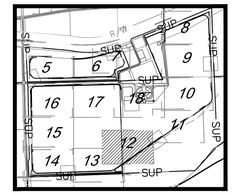
- 8' Chain Link Fence with Lockable Gate
- SUP Permit Boundary
- Property Limits
- Drainage Flow Arrow



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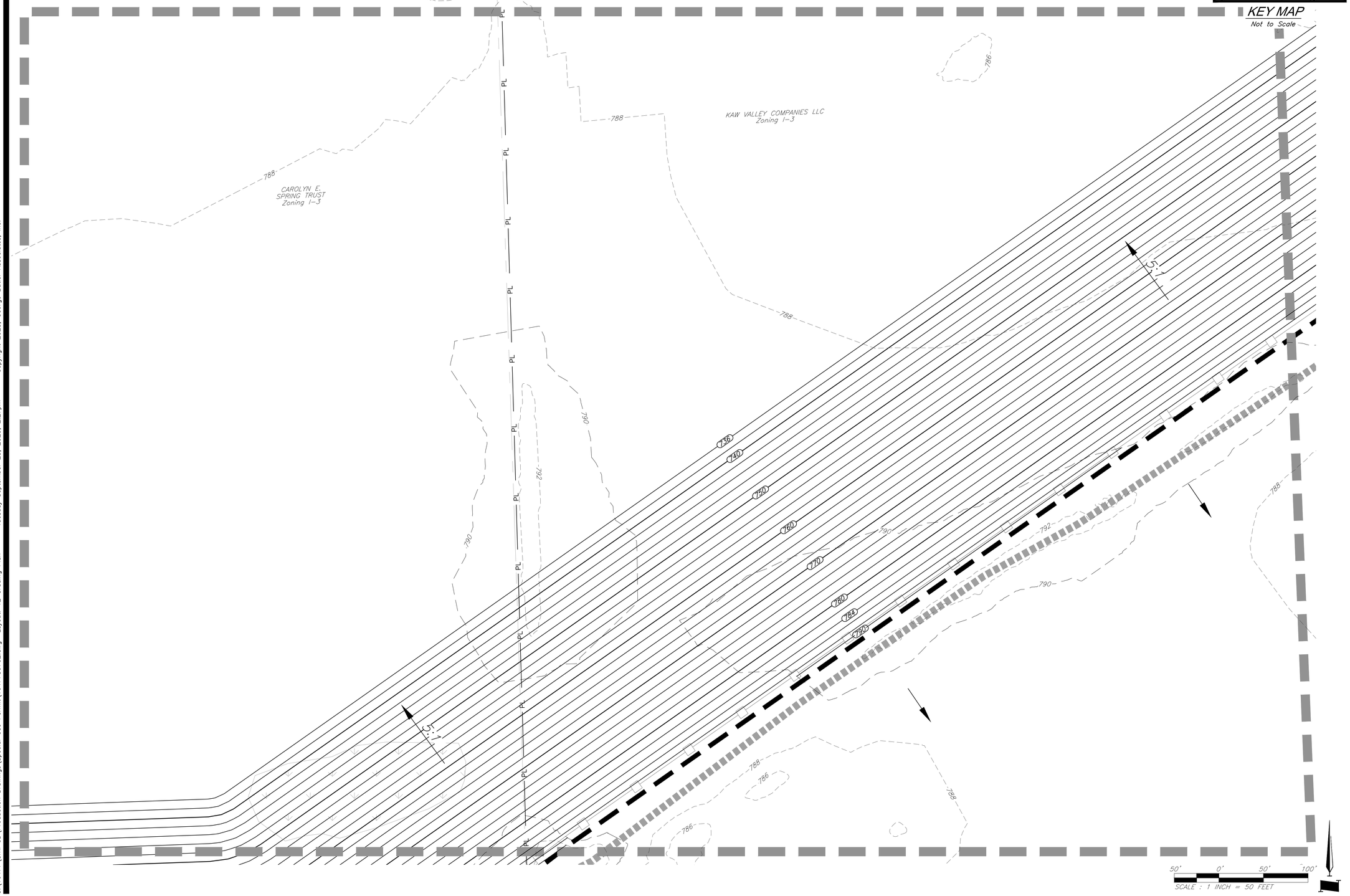

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- City of DeSoto Limits
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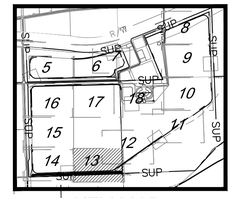
- 8' Chain Link Fence with Lockable Gate
- SUP — SUP Permit Boundary
- PL — Property Limits
- Drainage Flow Arrow



KEY MAP
Not to Scale

CAROLYN E. SPRING TRUST
Zoning I-3

6' High Landscape Berm

Greatlife Golf at Burning Tree Golf Course
Owner: Olathe City
Zoning: RO (DeSoto)

De Soto City Limits

SCALE : 1 INCH = 50 FEET

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Leavenworth County, Kansas

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- 8' Chain Link Fence with Lockable Gate
- SUP — SUP Permit Boundary
- P.L. — Property Limits
- Drainage Flow Arrow

KEY MAP
Not to Scale

166th Street

5·1

CAROLYN E. SPRING TRUST
Zoning I-3

6' High Landscape Berm

6' Collapsible Fence

6' High Landscape Berm

Greatlife Golf at Burning Tree Golf Course
Owner: Olathe City
Zoning: RO (DeSoto)

De Soto City Limits

SCALE : 1 INCH = 50 FEET

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- ℄ Property Limits
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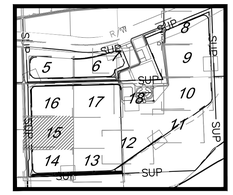

KEY MAP
Not to Scale

166th Street

SUP

786 784 782 780 778 776 774 772 770 768 766 764 762 760 758 756 754 752 750 748 746 744 742 740 738

5:1

CAROLYN E. SPRING TRUST
Zoning I-3

50' 0' 50' 100'
SCALE : 1 INCH = 50 FEET

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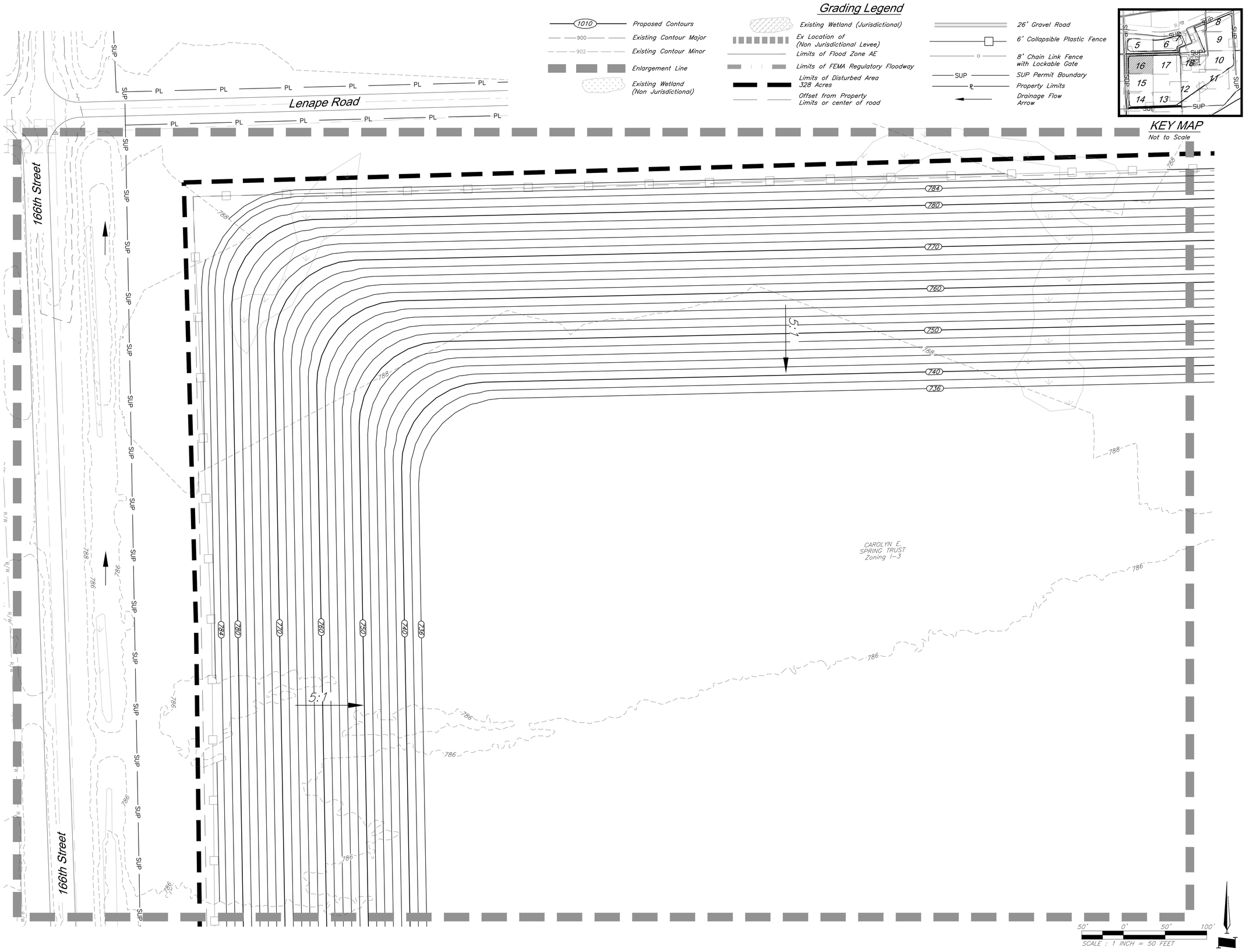

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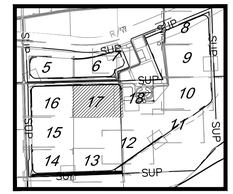
- Existing Wetland (Jurisdictional)
- Ex Location of (Non Jurisdictional Levee)
- Limits of Flood Zone AE
- Limits of FEMA Regulatory Floodway
- Limits of Disturbed Area 328 Acres
- Offset from Property Limits or center of road
- 26' Gravel Road
- 6' Collapsible Plastic Fence
- 8' Chain Link Fence with Lockable Gate
- SUP — SUP Permit Boundary
- PL — Property Limits
- Drainage Flow Arrow



KEY MAP
Not to Scale

Lenape Road

CAROLYN E. SPRING TRUST Zoning I-3

CAROLYN E. SPRING TRUST Zoning I-3

SCALE : 1 INCH = 50 FEET

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LENAPE SAND OPERATION

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

JACOB SCHWEIKERT LICENSED 31279 9/23/2025 KANSAS PROFESSIONAL ENGINEER

REVISION

PROJECT NUMBER
16477.00

DATE
6/19/2025

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JMS

DRAWN
ELS/GAN

REVIEWED
JMS

SHEET TITLE

Grading Plan

SHEET NUMBER
17

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Grading Legend

- 1010 — Proposed Contours
- 900 — Existing Contour Major
- 902 — Existing Contour Minor
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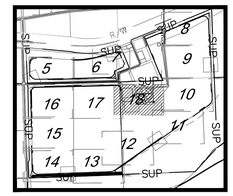
- Property Limits
- Drainage Flow Arrow



KEY MAP
Not to Scale

Lenape Road

CARRIE JOHNSON Zoning I-3

CURTIS J. & HELEN C. DABBS I-3

Service Access Road (Non Hauling)

6' Collapsible Fence

Eight 20'x10' Parking Stalls

26' Gravel Road

Temporary Topsoil Stockpile

Separator/ Consolidator

Sand & Aggregate Stockpile (Typ.)

Sand Dredge

Industrial Aggregate Washer

Washer Water Supply Line

High-Capacity Water Pump

CAROLYN E. SPRING TRUST Zoning I-3

KAW VALLEY COMPANIES LLC Zoning I-3

5:1

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18

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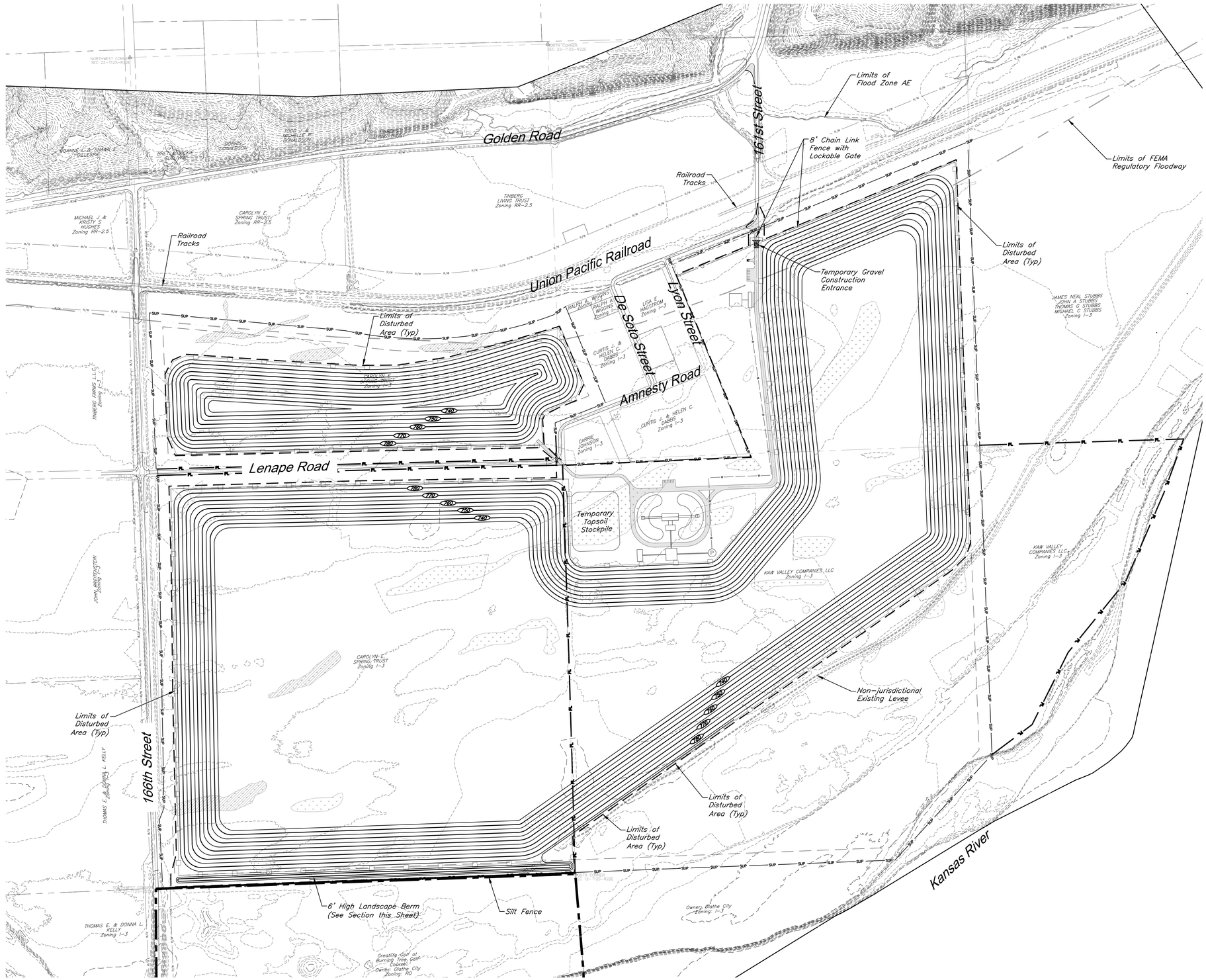
G:\16477\Civil 3D\Production Drawings\Special Use Permit\16477C4000.dwg Layout: 19 Erosion Control Plan -- Tuesday September 23, 2025, 2:27pm -- Copyright 2025, George Butler Associates, Inc.

CAUTION!

Numerous Utilities on Site. Contractor to verify location and elevation of all utilities prior to commencing construction.



Erosion Control Legend

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- 902 — Existing Contour Minor
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- Existing Wetland (Jurisdictional)
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- Limits of Disturbed Area 328 Acres
- 26' Gravel Road
- 8' Chain Link Fence with Lockable Gate
- 6' Collapsible Plastic Fence
- SUP — SUP Permit Boundary
- Property Limits
- Silt Fence (See Detail Sheet 23)
- Temporary Gravel Construction Entrance (See Detail Sheet 23)

General Notes

1. All area to drain internally to the sand operation.
2. Temporary erosion control measures are to be implemented as needed as sand dredging operation progresses.
3. Collapsible fence will only be used where dredging activities take place and will expand as activity expands.

Erosion Control:

4. The Contractor is responsible for providing erosion and sediment control BMP's to prevent sediment from reaching paved areas, storm sewer systems, drainage courses, and adjacent properties. In the event the prevention measures are not effective, the contractor shall remove any debris, silt, or mud and restore the Right-Of-Way, or adjacent properties to original or better condition.
5. The Contractor shall seed all disturbed areas within the Public Street Right-of-Way unless otherwise noted in the plans.
6. No trees shall be damaged or removed without prior authorization from owner unless otherwise shown on this plan.

Earthwork:

7. Disposal of all debris shall be performed by the contractor in strict accordance with all applicable local codes and ordinances.
8. Slopes shall be constructed to a maximum slope of 3:1 (Horiz:Vert).
9. Unless otherwise noted, all spot elevations and contours are shown to "finish" grade surface. All temporary slopes and excavations should conform to Occupational Safety and Health Administration (OSHA) standards for the Construction Industry (29 CFR part 1026, subpart P).

300' 0' 300' 600'

SCALE : 1 INCH = 300 FEET

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LENAPE SAND OPERATION

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

JACOB SCHWEIKERT LICENSED 31279 9/23/2025 KANSAS PROFESSIONAL ENGINEER

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Erosion Control Plan

SHEET NUMBER
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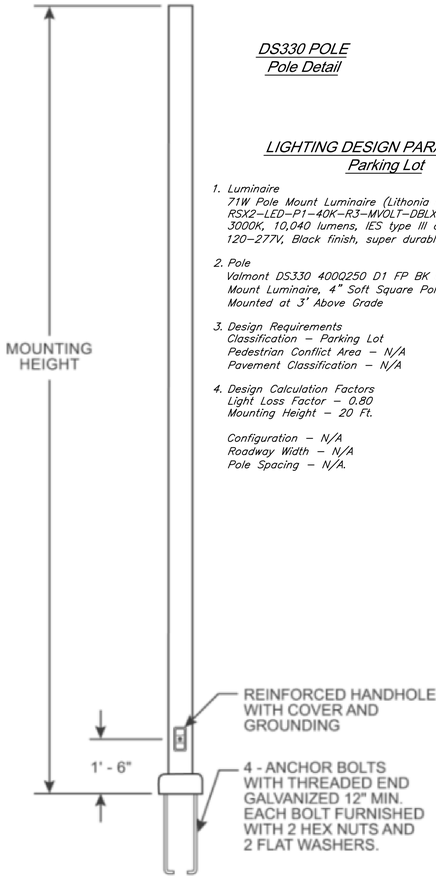
DS330 POLE
Pole Detail



LIGHTING DESIGN PARAMETERS
Parking Lot

1. Luminaire
   71W Pole Mount Luminaire (Lithonia Lighting, RSX2-LED-P1-40K-R3-MVOLT-DBLXD; Package 1, 3000K, 10,040 lumens, IES type III asymmetric, 120-277V, Black finish, super durable)
2. Pole
   Valmont DS330 400Q250 D1 FP BK FBC BK (25' Pole Mount Luminaire, 4" Sqft Square Pole, Black Color); Mounted at 3' Above Grade
3. Design Requirements
   Classification – Parking Lot
   Pedestrian Conflict Area – N/A
   Pavement Classification – N/A
4. Design Calculation Factors
   Light Loss Factor – 0.80
   Mounting Height – 20 Ft.

   Configuration – N/A
   Roadway Width – N/A
   Pole Spacing – N/A.

GENERAL NOTES

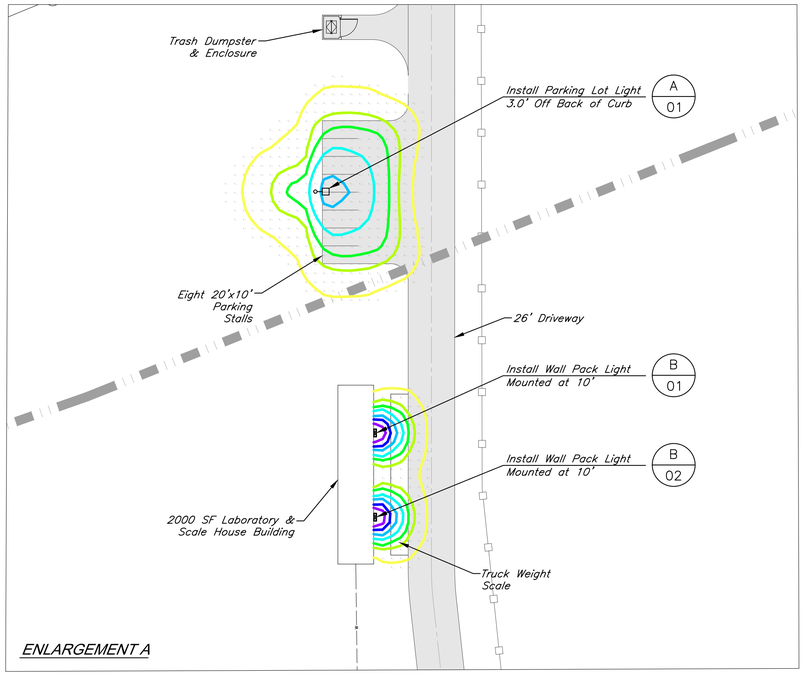
1. Site lighting and conduits for power other than primary/secondary conduits below grade shall be buried a minimum of 36" deep unless noted otherwise. Conduits above grade outdoors or exposed to potential damage shall be rigid metal conduit.
2. Lighting circuits will be fed from panelboard located in proposed building.

Lighting Table (North Parking Lot)	
Design Minimum Average Maintained Illuminance	0.5 Fc
Design Maximum Average Maintained Illuminance	4.7 Fc
Calculated Average Maintained Illuminance	1.98 Fc
Calculated Average/Min	3.96
Calculated Max/Min	9.40

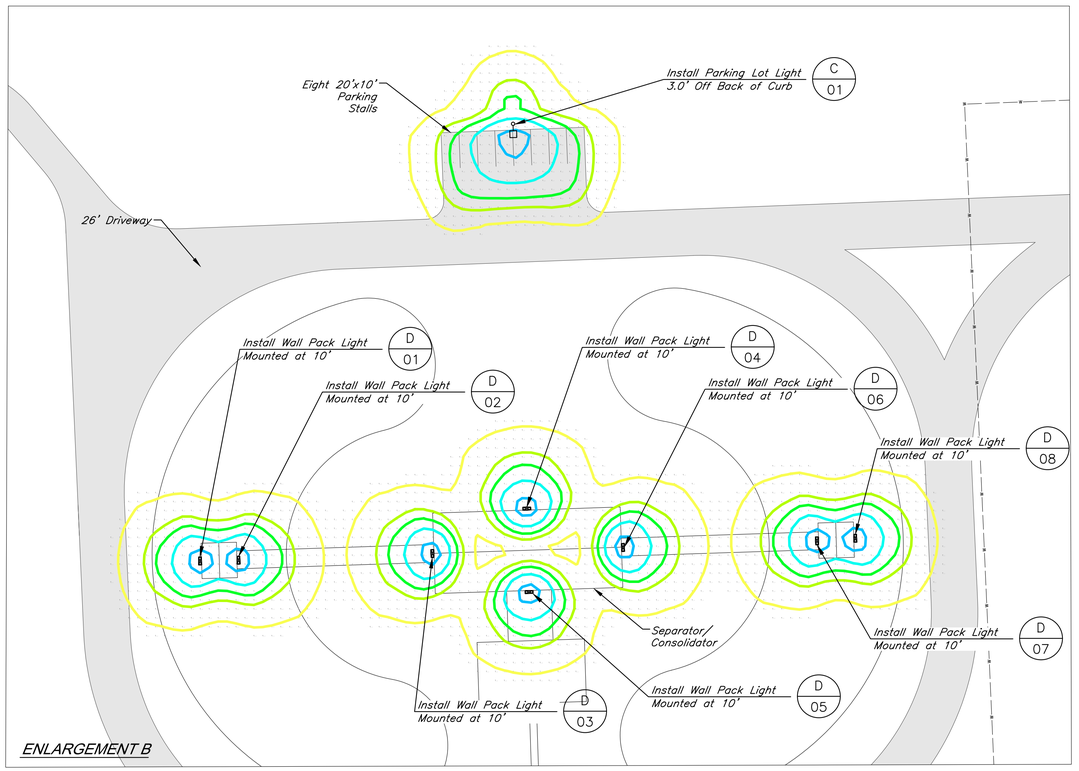
Lighting Table (South Parking Lot)	
Design Minimum Average Maintained Illuminance	0.5 Fc
Design Maximum Average Maintained Illuminance	4.7 Fc
Calculated Average Maintained Illuminance	1.94 Fc
Calculated Average/Min	3.88
Calculated Max/Min	9.40

LEGEND

- Single Parking Lot Light RSX2-LED-P1-40K-R3-MVOLT-DBLXD Mounted at 20'
- Wall Pack Light XTOR4B-W-BK-PC1
- A / 01 — Circuit Number / Luminaire Number



ENLARGEMENT A

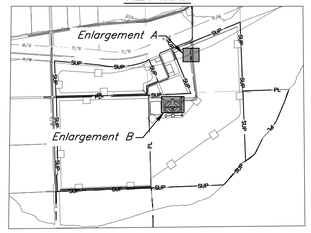


ENLARGEMENT B

CAUTION!

Numerous Utilities on Site. Contractor shall verify location and elevation of all utilities prior to commencing construction.

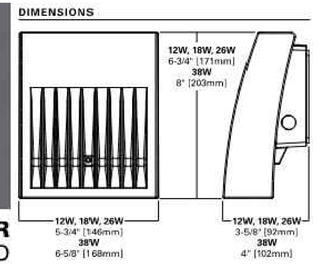
KEY MAP





XTOR
CROSSTOUR LED

DIMENSIONS



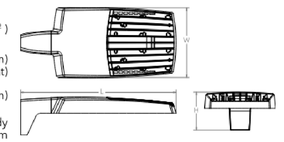


RSX2 LED
Area Luminaire

Buy American

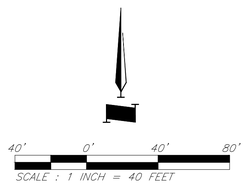
Specifications

EPA (ft^2@0°):	0.69 ft^2 (0.06 m^2)
Length:	29.3" (74.4 cm) (SPA mount)
Width:	13.4" (34.0 cm)
Height:	3.0" (7.6 cm) Main Body 7.2" (18.3 cm) Arm
Weight: (SPA mount)	30.0 lbs (13.6 kg)



ISOLINE LEGEND

- 0.1 foot-candles
- 0.5 foot-candles
- 1.0 foot-candles
- 2.0 foot-candles
- 4.0 foot-candles
- 7.0 foot-candles
- 11.0 foot-candles



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LENAPE SAND OPERATION
Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

JACOB SCHWEIKERT LICENSED 31279 9/23/2025 KANSAS PROFESSIONAL ENGINEER

REVISION

PROJECT NUMBER
16477.00

DATE
6/19/2025

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SHEET TITLE
Lighting Plan

SHEET NUMBER
20

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CAUTION!

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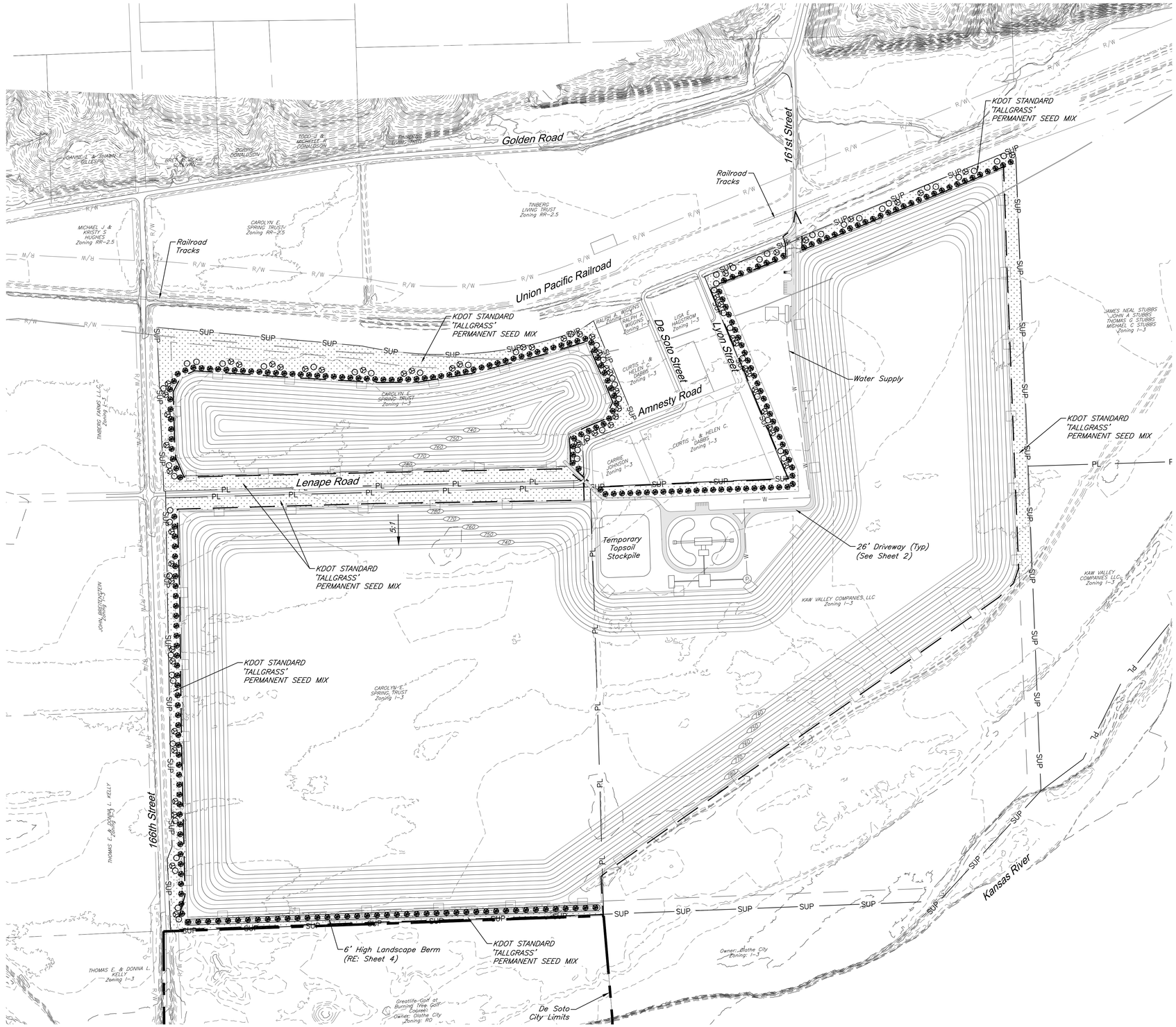

LEGEND:

- KDOT PERMANENT SEED MIX: 'TALLGRASS'
- KDOT PERMANENT SEED MIX: 'TALLGRASS' with EROSION CONTROL BALNKET TURF REINFORCEMENT MAT

EVERGREEN TREES:
TOTAL QTY: 251
BALLED & BURLAP; MIN. 5'-0" HEIGHT
50% NORWAY SPRUCE
Picea abies
60'H X 30'W
50% EASTERN WHITE PINE
Pinus strobus
60'H X 30'W

DECIDUOUS TREES - OAKS:
TOTAL QTY: 60
BALLED & BURLAP; MIN. 2" CALIPER
50% SWAMP WHITE OAK
Quercus bicolor
60'H X 50'W
50% RED OAK
Quercus rubra
60'H X 50'W

DECIDUOUS TREES - ELMS:
TOTAL QTY: 60
BALLED & BURLAP; MIN. 2" CALIPER
50% 'ACCOLADE' ELM
Ulmus 'Accolade'
50'H X 30'W
50% 'VALLEY FORGE' ELM
Ulmus 'Valley Forge'
60'H X 50'W

SHEET NOTES:

1. PLANTING SCHEDULE:
   - 1.a. TREE PLANTING(S):
     - SPRING: MARCH 15 - MAY 31
     - FALL: SEPTEMBER 15 - OCTOBER 31
   - 1.b. SHRUB / PERENNIAL PLANTING:
     - SPRING: APRIL 15 - MAY 31
     - FALL: AUGUST 15 - OCTOBER 15
   - 1.c. SOD PLANTING (AS APPLICABLE):
     - SPRING: MARCH 15 - MAY 31
     - FALL: SEPTEMBER 15 - OCTOBER 31
   - 1.a. SEED PLANTING:
     - SPRING: APRIL 1 - MAY 31
     - FALL: SEPTEMBER 1 - OCTOBER 1
     - DORMANT: DECEMBER 1 - MARCH 15
2. PROPOSED TREES SHALL BE PLANTED NO LATER THAN FALL 2026.

Grading Legend

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- 26' Gravel Road
- 6' Collapsible Plastic Fence
- 8' Chain Link Fence with Lockable Gate
- SUP — SUP Permit Boundary
- ℄ — Property Limits

300' 0' 300' 600'
SCALE : 1 INCH = 300 FEET

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LENAPE SAND OPERATION

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SHEET TITLE

Landscape Plan

SHEET NUMBER
21

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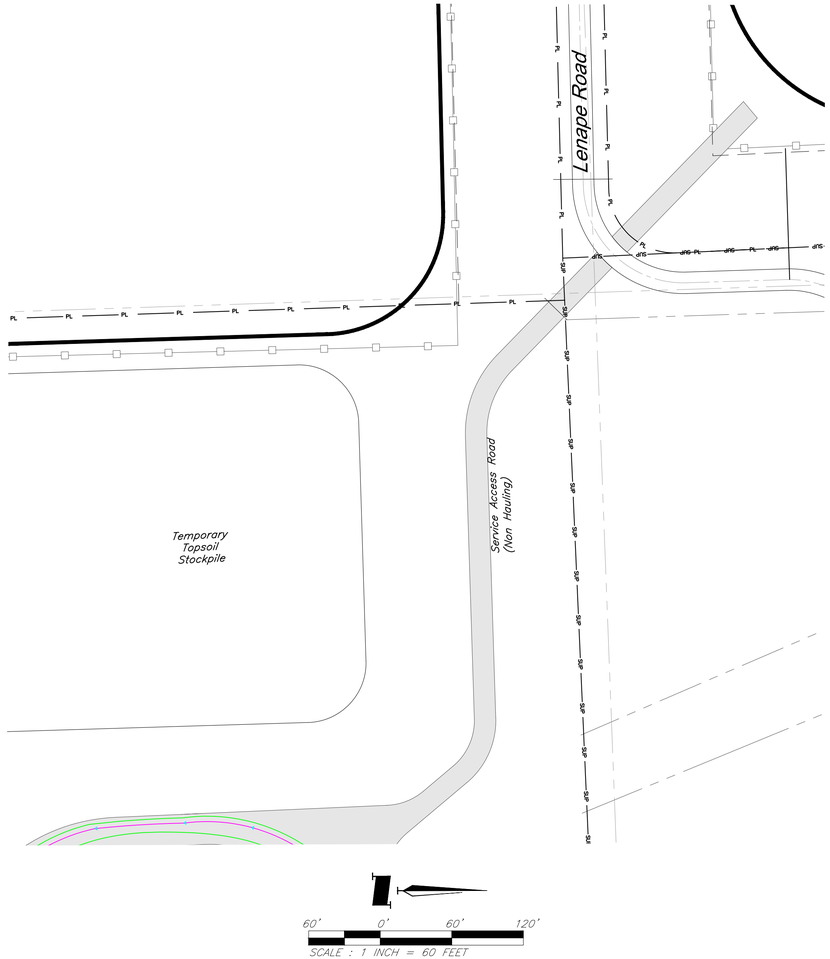
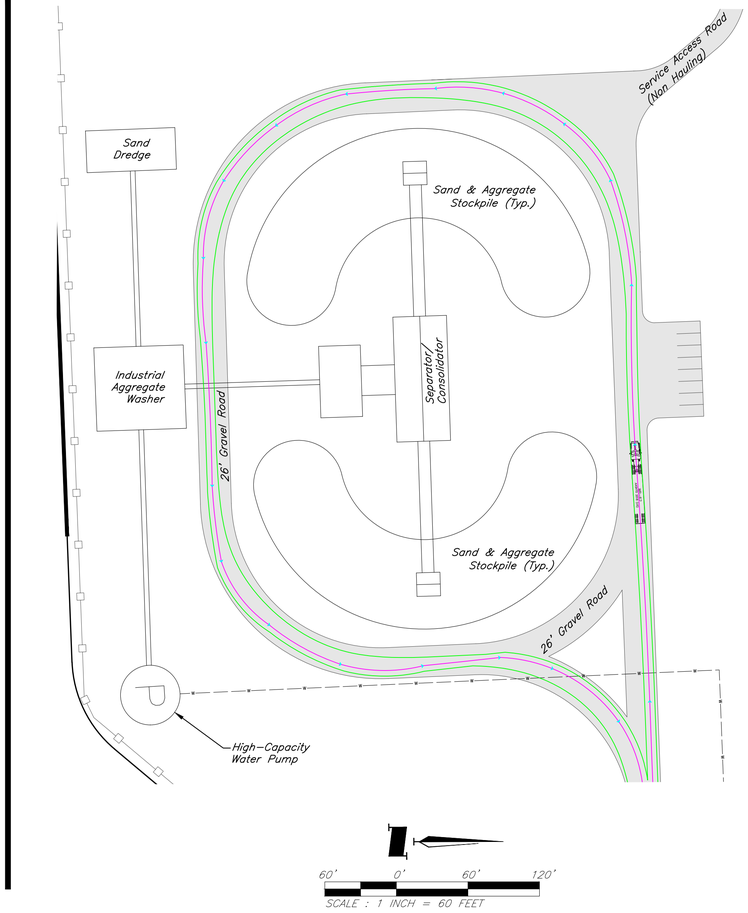
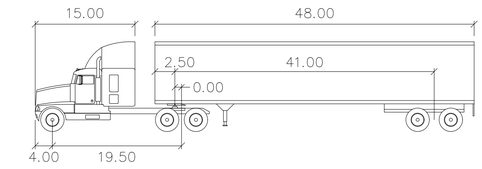






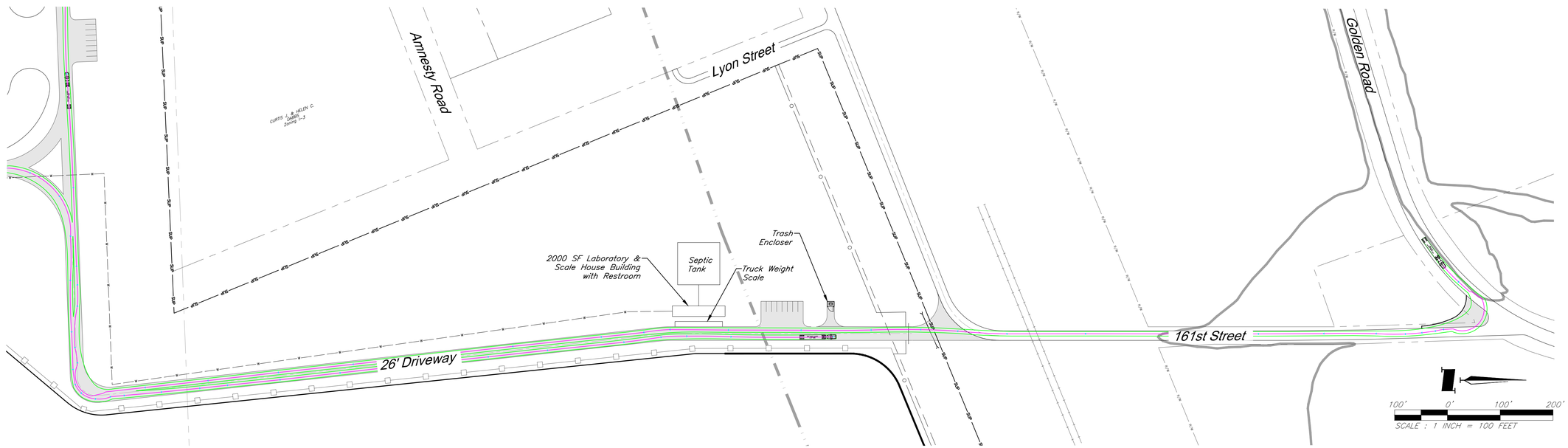
WB-62

feet

Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 28.4
Tractor Track	: 8.00	Articulating Angle	: 70.0
Trailer Track	: 8.50		

Legend

- Vehicle Centerline
- Vehicle Turning Envelope
- Proposed Roadway



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Truck Turning Circulation

SHEET NUMBER

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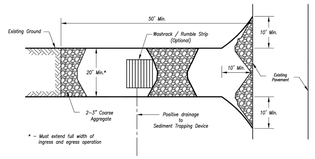
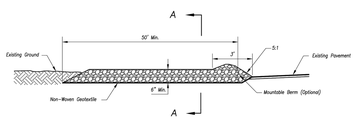
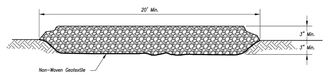


Plan View
Not to Scale



Side Elevation
Not to Scale



Section A-A
Not to Scale

Avoid locating on steep slopes, at curves on public roads, or downhill of disturbed area.

Remove all vegetation and other unsuitable material from the foundation area, grade, and crown for positive drainage.

If slope towards the public road exceeds 2%, construct a 6- to 8-inch high ridge with 3H:1V side slopes across the foundation approximately 15 feet from the edge of the public road to divert runoff from it.

Install pipe under the entrance if needed to maintain drainage ditches along public roads.

Place stone to dimensions and grade as shown on plans. Leave surface sloped for drainage.

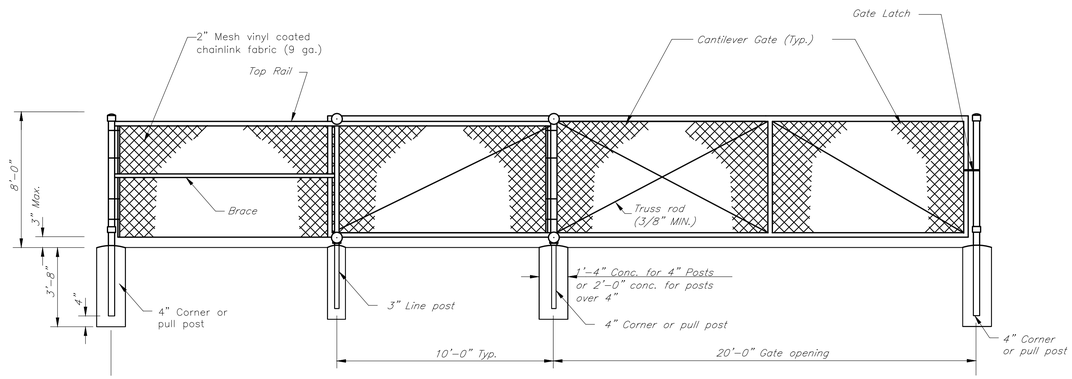
Divert all surface runoff and drainage from the entrance to a sediment control device.

If conditions warrant, place geotextile fabric on the graded foundation to improve stability.

Maintenance:

Reshape entrance as needed to maintain function and integrity of installation. Top dress with clean aggregate as needed.

CONSTRUCTION ENTRANCE
Not to Scale



8' GALVANIZED CHAIN LINK FENCE W/ LOCAKING GATE
Not to Scale

Partial Box Culvert Plan
Not to Scale

Erosion Control Blankets and TRMs shall be laid in the direction of the slope. In order for blanket to be in contact with the soil, lay blanket loosely, avoiding stretching.

ANCHOR SLOTS: The top of the blanket should be "knotted in" at the top of the slope. Additional rows of anchors 6 inches apart. The slots should be 6 inches wide x 6 inches deep with the blanket anchored in the bottom of the slot, then backfilled, tamped and seeded.

LONGITUDINAL SEAM: The edges of the blanket should overlap each other a minimum of 6 inches, with anchors catching the edges of both blankets.

SPLICE SEAM: When splices are necessary, overlap and a minimum of 8 inches in direction of water flow. Stagger splice seams.

TERMINAL FOLD: The bottom edge of the blanket shall be turned under a minimum of 4 inches, then anchored in place with anchors 9 inches apart.

TYPICAL ANCHORS: Anchor design shall be as recommended by the manufacturer.

STAPLE PATTERN: Staple pattern and spacing shall be as required by the manufacturer.

Maintenance:

Torn or degraded product shall be repaired or replaced, unless such degradation is within the functional longevity specified by the manufacturer. Edges or seams which are loose or frayed shall be secured.

EROSION CONTROL BLANKET
TURF REINFORCEMANT MAT
Not to Scale

(*) POSTS
- MIN. LENGTH 4'
- HARDWOOD 1 ½" x 1 ½"
- NO.2 SOUTHERN PINE 2 ¼" x 2 ¼"
- STEEL 1.33 LB/FT

(**) - Geotextile Fabric shall meet the requirements of AASHTO M288

In order to contain water, the ends of the silt fence must be turned uphill (Figure A).

Long perimeter runs of silt fence must be limited to 100'. Runs should be broken up into several smaller segments to minimize water concentrations (Figure A).

Long slopes should be broken up with intermediate rows of silt fence to slow runoff velocities.

Attach fabric to upstream side of post.

Install posts a minimum of 2' into the ground.

Trenching will only be allowed for small or difficult installation, where slicing machine cannot be reasonably used.

Maintenance:

Remove and dispose of sediment deposits when the deposit approaches ½ the height of silt fence. Repair as necessary to maintain function and structure.

JOINING FENCE SECTIONS
Not to Scale

SILT FENCE
Not to Scale

TRASH DUMPSTER
Not to Scale

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SHEET TITLE
Construction Details

SHEET NUMBER
23

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Reclamation Plan - Lenape Sand Operation

November 2024

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U.S. ARMY CORPS OF ENGINEERS, KANSAS CITY DISTRICT
601 E. 12TH STREET, 635 FEDERAL BUILDING
KANSAS CITY, MO 64106-2824

June 24, 2024

Regulatory Branch
(NWK-2018-01458)

Mr. Todd Trotter
GBA
9801 Renner Boulevard
Lenexa, KS 66219

Dear Mr. Trotter:

This letter is in response to your request of May 10, 2024, submitted on behalf of Kaw Valley Companies for a Jurisdictional Determination for an approximate 222-acre project site. The site is located within Section 22, Township 12 south, Range 22 east, Leavenworth County Kansas. Your request was assigned to Regulatory File No. NWK- 2018-01458. A preliminary jurisdictional determination of waters of the U.S. within this site was issued in 2018 and an individual permit was issued to Kaw Valley for sand mining within the project site boundary in 2019. Please reference this file number on any correspondence to us or to other interested parties concerning this matter.

This letter contains an approved jurisdictional determination for your project site. This jurisdictional determination is valid for a 5-year period from the date of this letter unless new information warrants revision of the determination before the expiration date. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed you will find a Notification of Administrative Appeal Options and Process and Request for Appeal (NAO-RFA) form. If you request to appeal this determination, you must submit a completed NAO-RFA form to the Northwestern Division Office at the following address:

Division Engineer
U.S. Army Corps of Engineers, Northwestern Division
ATTN: Melinda M. Larsen, Regulatory Appeals Review Officer
1201 NE Lloyd Blvd., Suite 400
Portland, OR 97232
Telephone: 503-808-3888

In order for an NAO-RFA to be accepted by the Corps, the Corps must determine that it is completed, that it meets the criteria for appeal under 33 CFR Part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAO-RFA. Should you decide to submit an NAO-RFA form, it must be received at the above address by August 23, 2024. It is not necessary to submit an NAO-RFA form to the Division Office if you do not object to the determination in this letter.

In the event that you disagree with an approved jurisdictional determination, and you have **new information** not considered in the original determination, you may request reconsideration of that determination by the Corps District prior to initiating an appeal. To request this reconsideration based upon new information, you must submit the completed NAO-RFA form and the new information to the District Office so that it is received within 60 days of the date of the NAO-RFA. Send approved jurisdictional determination reconsideration requests to:

District Commander
U.S. Army Engineer District, Kansas City
ATTN: David R. Hibbs, Chief, Regulatory Branch
601 East 12th Street, Suite 402
Kansas City, MO 64106-2824
Telephone: 816-389-3990

The Corps of Engineers has jurisdiction over all waters of the United States. Discharges of dredged or fill material in waters of the United States, including wetlands, require prior authorization from the Corps under Section 404 of the Clean Water Act (33 USC 1344).

The delineation included herein has been conducted to identify the location and extent of the aquatic resources for purposes of the Clean Water Act for the particular site identified in this request. This delineation may not be valid for the Wetland Conservation Provisions of the Food Security Act of 1985, as amended. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should discuss the applicability of an NRCS Certified Wetland Determination with the local USDA service center, prior to starting work.

We are interested in your thoughts and opinions concerning your experience with the Kansas City District, Corps of Engineers Regulatory Program. Please feel free to complete our Customer Service Survey form on our website at: https://regulatory.ops.usace.army.mil/customer-service-survey/. You may also call and request a paper copy of the survey which you may complete and return to us by mail.

If you have any questions concerning this matter, please feel free to write or contact me at 816-389-3703 or by email at brian.t.donahue@usace.army.mil. Please reference Regulatory File No. NWK-2018-01458 in all comments and/or inquiries relating to this project. This letter is only being provided to you electronically at: ttrotter@gba.com.

Sincerely,

Brian Donahue

Brian Donahue
Project Manager

Enclosures

cc (electronically w/o enclosures):

Environmental Protection Agency,
Watershed and Grants Branch
U.S. Fish and Wildlife Service, Manhattan, Kansas
Kansas Department of Wildlife and Parks
Kansas Department of Health and Environment
Kansas Department of Agriculture

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, KANSAS CITY DISTRICT
601 E. 12TH STREET, 635 FEDERAL BUILDING
KANSAS CITY, MO 64106-2824

CENWK-ODR

24 June 2024

MEMORANDUM FOR RECORD

SUBJECT: US Army Corps of Engineers (Corps) Pre-2015 Regulatory Regime Approved Jurisdictional Determination in Light of *Sackett v. EPA*, 143 S. Ct. 1322 (2023),[1] NWK-2018-01458, MFR 1 of 1.

BACKGROUND. An Approved Jurisdictional Determination (AJD) is a Corps document stating the presence or absence of waters of the United States on a parcel or a written statement and map identifying the limits of waters of the United States on a parcel. AJDs are clearly designated appealable actions and will include a basis of JD with the document.[2] AJDs are case-specific and are typically made in response to a request. AJDs are valid for a period of five years unless new information warrants revision of the determination before the expiration date or a District Engineer has identified, after public notice and comment, that specific geographic areas with rapidly changing environmental conditions merit re-verification on a more frequent basis.[3] For the purposes of this AJD, we have relied on section 10 of the Rivers and Harbors Act of 1899 (RHA),[4] the Clean Water Act (CWA) implementing regulations published by the Department of the Army in 1986 and amended in 1993 (references 2.a. and 2.b. respectively), the 2008 *Rapanos-Carabell* guidance (reference 2.c.), and other applicable guidance, relevant case law and longstanding practice, (collectively the pre-2015 regulatory regime), and the *Sackett* decision (reference 2.d.) in evaluating jurisdiction.

This Memorandum for Record (MFR) constitutes the basis of jurisdiction for a Corps AJD as defined in 33 CFR §331.2. The features addressed in this AJD were evaluated consistent with the definition of "waters of the United States" found in the pre-2015 regulatory regime and consistent with the Supreme Court's decision in *Sackett*. This AJD did not rely on the 2023 "Revised Definition of 'Waters of the United States,'" as amended on 8 September 2023 (Amended 2023 Rule) because, as of the date of this decision, the Amended 2023 Rule is not applicable within the State of Kansas due to litigation.

1. SUMMARY OF CONCLUSIONS.

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[1] While the Supreme Court's decision in *Sackett* had no effect on some categories of waters covered under the CWA, and no effect on any waters covered under RHA, all categories are included in this Memorandum for Record for efficiency.
[2] 33 CFR 331.2.
[3] Regulatory Guidance Letter 05-02.
[4] USACE has authority under both Section 9 and Section 10 of the Rivers and Harbors Act of 1899 but for convenience, in this MFR, jurisdiction under RHA will be referred to as Section 10.

a. Provide a list of each individual feature within the review area and the jurisdictional status of each one (i.e., identify whether each feature is/is not a water of the United States and/or a navigable water of the United States).

i. Wetland 1, 0.17 acres, non-jurisdictional, Section 404
ii. Wetland 2, 0.12 acres, non-jurisdictional, Section 404
iii. Wetland 3, 0.29 acres, non-jurisdictional, Section 404
iv. Wetland 4, 0.44 acres, non-jurisdictional, Section 404
v. Wetland 6, 0.53 acres, non-jurisdictional, Section 404
vi. Wetland 8, 1.11 acres, non-jurisdictional, Section 404
vii. Wetland 9, 1.91 acres, non-jurisdictional, Section 404
viii. Wetland 10, 0.57 acres, non-jurisdictional, Section 404
ix. Wetland 11, 0.22 acres, non-jurisdictional, Section 404
x. Wetland 12, 0.04 acres, non-jurisdictional, Section 404
xi. Wetland 13, 0.20 acres, non-jurisdictional, Section 404
xii. Wetland 14, 0.49 acres, non-jurisdictional, Section 404

xiii. Wetland 5, 1.22 acres, jurisdictional, Section 404
xiv. Wetland 7, 0.71 acres, jurisdictional, Section 404
xv. Wetland 15, 0.45 acres, jurisdictional, Section 404
xvi. Wetland 16, 0.56 acres, jurisdictional, Section 404
xvii. Wetland 17, 0.57 acres, jurisdictional, Section 404

2. REFERENCES.

a. Final Rule for Regulatory Programs of the Corps of Engineers, 51 FR 41206 (November 13, 1986).

b. Clean Water Act Regulatory Programs, 58 FR 45008 (August 25, 1993).

c. U.S. EPA & U.S. Army Corps of Engineers, Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in *Rapanos v. United States* & *Carabell v. United States* (December 2, 2008).

d. *Sackett v. EPA*, 598 U.S. _, 143 S. Ct. 1322 (2023).

e. Coordination memo for the Pre-2015 regulatory regime (27 September 2023).

3. REVIEW AREA. The approximate 223 -acre project site is located within Section 22, Township 12 south, Range 22 east, Leavenworth County Kansas. USGS QUAD: DeSoto, Kansas. Center Coordinates: Latitude 38.98997, and Longitude -94.95948.

4. NEAREST TRADITIONAL NAVIGABLE WATER (TNW), INTERSTATE WATER, OR THE TERRITORIAL SEAS TO WHICH THE AQUATIC RESOURCE IS CONNECTED. The project site is located within the historic floodplain of the Kansas River. The Kansas River has been determined to be a TNW from river mile 0.0 to mile 170.4 (confluence with the Missouri River upstream to its confluence with the Republican and Smoky Hill Rivers in the vicinity of Junction City, in Geary County, Kansas).

5. FLOWPATH FROM THE SUBJECT AQUATIC RESOURCES TO A TNW, INTERSTATE WATER, OR THE TERRITORIAL SEAS.

   Wetlands 5 and 7 located within the SW project area, both contain a shallow ditch that has persisted in the landscape since 2016 and provides drainage from each wetland to a roadside ditch on the east side of project site, (166th Street). Flows within this ditch drain west via a culvert under 166th and then flow to the south along the west side of 166th Street approximately 0.30 miles to the Kansas River,(TNW).

   Wetlands 15, 16, and 17, located within the northern portion of the project area, all contain shallow ditches that drain them to the north and east into a ditch along the south side of a railroad embankment. Water within this ditch flows from the NE boundary of the project site to the east approximately 1.20 miles before entering a small tributary,(RPW), that then flows approximately 400 linear feet south into the Kansas River.

6. SECTION 10 JURISDICTIONAL WATERS[5]: Describe aquatic resources or other features within the review area determined to be jurisdictional in accordance with Section 10 of the Rivers and Harbors Act of 1899. Include the size of each aquatic resource or other feature within the review area and how it was determined to be jurisdictional in accordance with Section 10.[6] N/A

[5] 33 CFR 329.9(a) A waterbody which was navigable in its natural or improved state, or which was susceptible of reasonable improvement (as discussed in § 329.8(b) of this part) retains its character as "navigable in law" even though it is not presently used for commerce, or is presently incapable of such use because of changed conditions or the presence of obstructions.

[6] This MFR is not to be used to make a report of findings to support a determination that the water is a navigable water of the United States. The district must follow the procedures outlined in 33 CFR part 329.14 to make a determination that water is a navigable water of the United States subject to Section 10 of the RHA.

7. SECTION 404 JURISDICTIONAL WATERS: Describe the aquatic resources within the review area that were found to meet the definition of waters of the United States in accordance with the pre-2015 regulatory regime and consistent with the Supreme Court's decision in *Sackett*. List each aquatic resource separately, by name, consistent with the naming convention used in section 1, above. Include a rationale for each aquatic resource, supporting that the aquatic resource meets the relevant category of "waters of the United States" in the pre-2015 regulatory regime. The rationale should also include a written description of, or reference to a map in the administrative record that shows, the lateral limits of jurisdiction for each aquatic resource, including how that limit was determined, and incorporate relevant references used. Include the size of each aquatic resource in acres or linear feet and attach and reference related figures as needed.

   a. TNWs (a)(1): N/A
   b. Interstate Waters (a)(2): N/A
   c. Other Waters (a)(3): N/A
   d. Impoundments (a)(4): N/A
   e. Tributaries (a)(5): N/A
   f. The territorial seas (a)(6): N/A
   g. Adjacent wetlands (a)(7):

      Wetland 5: This 1.22 acre wetland is located within a shallow swale within an agricultural crop field that has a slightly lower elevation than the surrounding landscape. The swale drains from east to west and there is a shallow ditch that connects it to the roadside ditch alongside the east side of 166th Street. The swale is evident on the wetland aerial map and lidar elevation map of the project site included with this MFR. Flows within this ditch drain west via a culvert under 166th and then flow to the south along the west side of 166th Street approximately 0.30 miles to the Kansas River, providing a continuous surface connection from this wetland to the Kansas River. The wetland was further described in the Delineation Report by Terra Technologies dated 9 October 2018.

      Wetland 7: This 0.71 acre wetland is located within a shallow swale within an agricultural crop field that has a slightly lower elevation than the surrounding landscape. The swale drains from east to west and there is a shallow ditch that connects it to the roadside ditch alongside the east side of 166th Street. The swale is evident on the wetland aerial map and lidar elevation map of the project site included with this MFR. Flows within this ditch drain west via a culvert under 166th and then flow to the south along the west side of 166th Street approximately 0.30 miles to the Kansas River, providing a continuous surface connection from this wetland to the Kansas River. The wetland was further

described in the Delineation Report by Terra Technologies dated 9 October 2018.

Wetland 15: This 0.45-acre wetland is located within a shallow swale within an agricultural crop field that has a slightly lower elevation than the surrounding landscape. This swale is evident on the wetland aerial map and lidar elevation map of the project site included with this MFR. The wetland swale drains from west to east through an excavated ditch connecting it through and along the north edge of wetland 16. The swale continues from the area of wetland 16 to the north and east and off the project site where it enters a ditch along the south side of a railroad embankment. Water within this ditch flows from the NE boundary of the project site to the east approximately 1.20 miles before entering an unnamed tributary, (RPW), that then flows approximately 400 linear feet south into the Kansas River. The swale and ditch provide a continuous surface connection from this wetland to the Kansas River.

Wetland 16: This 0.56-acre wetland is located within a shallow swale within an agricultural crop field that has a slightly lower elevation than the surrounding landscape. This swale is evident on the wetland aerial map and lidar elevation map of the project site included with this MFR. The swale drains to the north and east off the project site and into a ditch along the south side of a railroad embankment. Water within this ditch flows from the NE boundary of the project site to the east approximately 1.20 miles before entering an unnamed tributary, (RPW), that then flows approximately 400 linear feet south into the Kansas River. The swale and ditch provide a continuous surface connection from this wetland to the Kansas River.

Wetland 17: This 0.57-acre wetland is located within a shallow swale within an agricultural crop field that has a slightly lower elevation than the surrounding landscape. This swale is evident on the wetland aerial map and lidar elevation map of the project site included with this MFR. The swale drains to the north off the project site and into a ditch along the south side of a railroad embankment. Water within this ditch flows eastward along the northern boundary of the project site to the east approximately 1.20 miles where it enters an unnamed tributary, (RPW), that then flows approximately 400 linear feet south into the Kansas River. The swale and ditch provide a continuous surface connection from this wetland to the Kansas River.

These five wetlands are jurisdictional waters of the U.S. because they were each determined to be adjacent wetlands having a continuous surface connection to a relatively permanent water (RPW) that connects to a downstream traditional navigable water (TNW). The surface connections are evidenced by aerial

photography, lidar imagery, and the previously completed 2018 wetland delineation report for the site.

8. NON-JURISDICTIONAL AQUATIC RESOURCES AND FEATURES

a. Describe aquatic resources and other features within the review area identified as "generally non-jurisdictional" in the preamble to the 1986 regulations (referred to as "preamble waters").[7] Include size of the aquatic resource or feature within the review area and describe how it was determined to be non-jurisdictional under the CWA as a preamble water. N/A

b. Describe aquatic resources and features within the review area identified as "generally not jurisdictional" in the *Rapanos* guidance. Include size of the aquatic resource or feature within the review area and describe how it was determined to be non-jurisdictional under the CWA based on the criteria listed in the guidance. N/A

c. Describe aquatic resources and features identified within the review area as waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA. Include the size of the waste treatment system within the review area and describe how it was determined to be a waste treatment system. N/A

d. Describe aquatic resources and features within the review area determined to be prior converted cropland in accordance with the 1993 regulations (reference 2.b.). Include the size of the aquatic resource or feature within the review area and describe how it was determined to be prior converted cropland. N/A

e. Describe aquatic resources (i.e. lakes and ponds) within the review area, which do not have a nexus to interstate or foreign commerce, and prior to the January 2001 Supreme Court decision in "*SWANCC*," would have been jurisdictional based solely on the "Migratory Bird Rule." Include the size of the aquatic resource or feature, and how it was determined to be an "isolated water" in accordance with *SWANCC*. N/A

f. Describe aquatic resources and features within the review area that were determined to be non-jurisdictional because they do not meet one or more categories of waters of the United States under the pre-2015 regulatory regime consistent with the Supreme Court's decision in *Sackett* (e.g., tributaries that are

[7] 51 FR 41217, November 13, 1986.

non-relatively permanent waters; non-tidal wetlands that do not have a continuous surface connection to a jurisdictional water).

Wetland 1, 0.17 acres, non-jurisdictional, Section 404
Wetland 2, 0.12 acres, non-jurisdictional, Section 404
Wetland 3, 0.29 acres, non-jurisdictional, Section 404
Wetland 4, 0.44 acres, non-jurisdictional, Section 404
Wetland 6, 0.53 acres, non-jurisdictional, Section 404
Wetland 8, 1.11 acres, non-jurisdictional, Section 404
Wetland 9, 1.91 acres, non-jurisdictional, Section 404
Wetland 10, 0.57 acres, non-jurisdictional, Section 404
Wetland 11, 0.22 acres, non-jurisdictional, Section 404
Wetland 12, 0.04 acres, non-jurisdictional, Section 404
Wetland 13, 0.20 acres, non-jurisdictional, Section 404
Wetland 14, 0.49 acres, non-jurisdictional, Section 404

These twelve wetlands are not paragraph (a)(7) adjacent wetlands. Based on the resources consulted, it has been determined that these wetlands do not physically abut another water of the U.S. (i.e., a TNW, interstate water, jurisdictional impoundment, jurisdictional tributary, or the territorial seas). Additionally, the wetlands do not have a continuous surface connection to another water of the U.S. and are not connected to another water of the U.S. by a discrete feature like a non-jurisdictional ditch, swale, pipe, or culvert. A review of aerial imagery and Kansas Elevation Hillshade (LiDAR Shaded Relief) indicates that the wetlands listed above are depressions on the landscape. LiDAR does not indicate the presence of any discrete surface connections between these wetlands and a tributary system, including the Kansas River. These wetlands are closed depressions in a crop field. Drainage from the wetlands to downstream waters is diffuse and not discrete. Only upland sheet flow could connect these wetlands to any downslope ditches, culverts or other conveyances. Therefore, it has been determined that these wetlands are not adjacent to another water of the U.S. and as such are not jurisdictional.

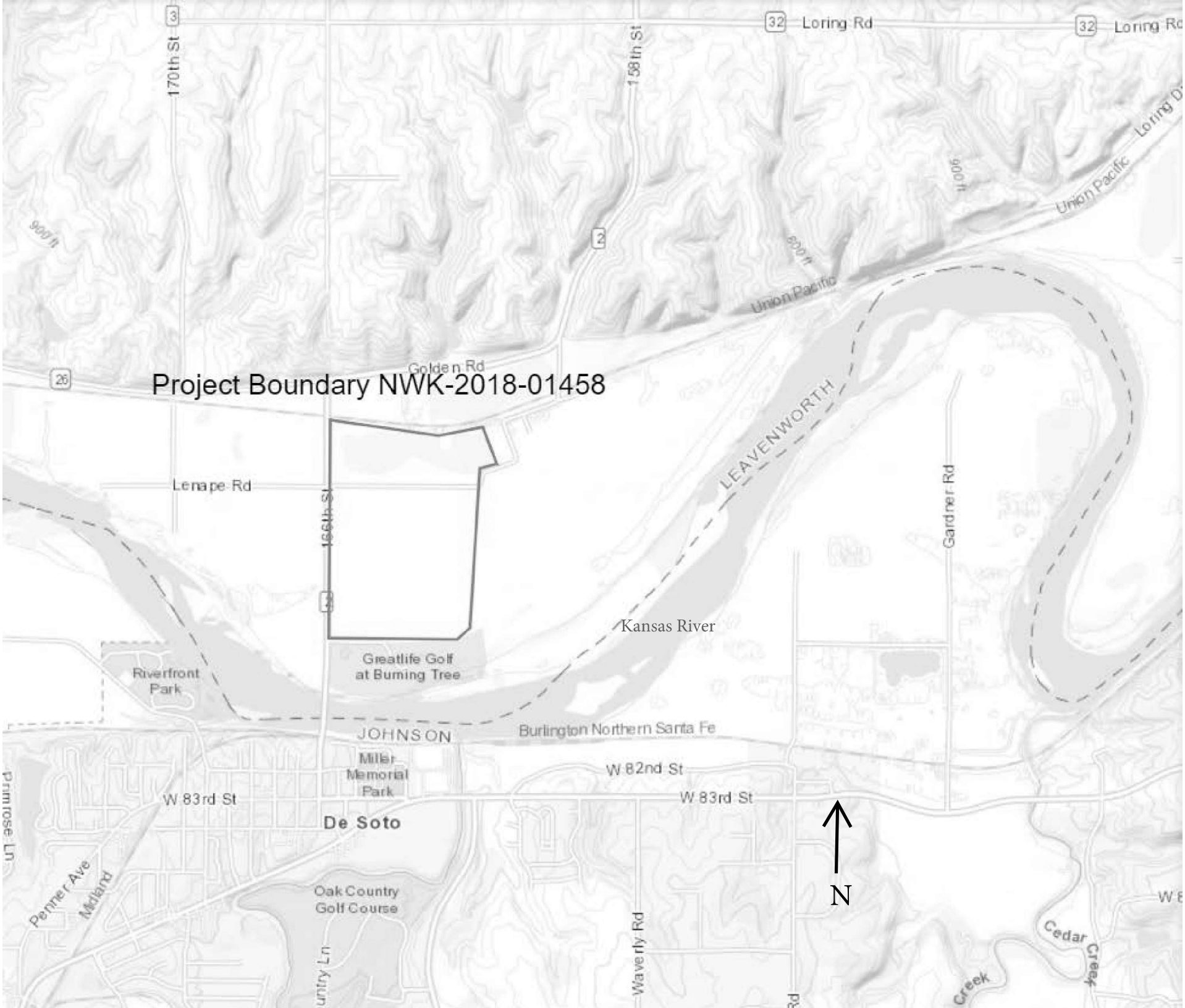
9. DATA SOURCES. List sources of data/information used in making determination. Include titles and dates of sources used and ensure that information referenced is available in the administrative record.

   a. Previous PJD determination for this site, dated 24 Oct 2018.
   b. Delineation Report, Terra Technologies, dated 9 Oct 2018.
   c. National Wetland Inventory, (NWI), DeSoto, KS Quad.
   d. Kansas Elevation 3DEP Digital Elevation Model, (DEM), 2024.
   e. Kansas Regulatory Viewer, Maxar aerial imagery.

f. Digital Globe aerial imagery dated 22 Apr 2024.

10. OTHER SUPPORTING INFORMATION. N/A

11. NOTE: The structure and format of this MFR were developed in coordination with the EPA and Department of the Army. The MFR's structure and format may be subject to future modification or may be rescinded as needed to implement additional guidance from the agencies; however, the approved jurisdictional determination described herein is a final agency action.


Project Boundary NWK-2018-01458
Loring Rd
170th St
158th St
Union Pacific
Golden Rd
Lenape Rd
166th St
LEAVENWORTH
Gardner Rd
Kansas River
Greatlife Golf
at Burning Tree
Riverfront
Park
JOHNSON
Burlington Northern Santa Fe
Miller
Memorial
Park
W 82nd St
W 83rd St
De Soto
Primrose Ln
Penner Ave
Midland
Oak Country
Golf Course
Waverly Rd
Cedar Creek
N



NWK-2018-01458

0 0.13 0.25 0.5
mi

Map Center: 94.959107°W 38.990273°N

Map Created by: PM NAME

Date: 5/23/2024

Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
Projection: Mercator Auxiliary Sphere


Imagery
wetland 7
flow
NWK-2018-01458
AJD
Wetlands 5 and 7
wetland 5
flow
N
USGS National Map 3D Elevation Program (3DEP). April 15, 2024. | MARC/local jurisdictions, Maxar, M


RR tracks
Ditch flow
W-17
W-15
W-16
NWK-2018-01458
AJD map
wetlands 15, 16 and 17
N

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Kaw Valley Companies	File Number: NWK-2018-01458	Date: June 24, 2024
Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL WITHOUT PREJUDICE	C
	PERMIT DENIAL WITH PREJUDICE	D
XX	APPROVED JURISDICTIONAL DETERMINATION	E
	PRELIMINARY JURISDICTIONAL DETERMINATION	F

SECTION I

The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at https://www.usace.army.mil/Missions/Civil-Works/Regulatory-Program-and-Permits/appeals/ or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C. PERMIT DENIAL WITHOUT PREJUDICE: Not appealable

You received a permit denial without prejudice because a required Federal, state, and/or local authorization and/or certification has been denied for activities which also require a Department of the Army permit before final action has been taken on the Army permit application. The permit denial without prejudice is not appealable. There is no prejudice to the right of the applicant to reinstate processing of the Army permit application if subsequent approval is received from the appropriate Federal, state, and/or local agency on a previously denied authorization and/or certification.

D: PERMIT DENIAL WITH PREJUDICE: You may appeal the permit denial

You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information for reconsideration

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice means that you accept the approved JD in its entirety and waive all rights to appeal the approved JD.

- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

- RECONSIDERATION: You may request that the district engineer reconsider the approved JD by submitting new information or data to the district engineer within 60 days of the date of this notice. The district will determine whether the information submitted qualifies as new information or data that justifies reconsideration of the approved JD. A reconsideration request does not initiate the appeal process. You may submit a request for appeal to the division engineer to preserve your appeal rights while the district is determining whether the submitted information qualifies for a reconsideration.

F: PRELIMINARY JURISDICTIONAL DETERMINATION: Not appealable

You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also, you may provide new information for further consideration by the Corps to reevaluate the JD.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision you may contact:	If you have questions regarding the appeal process, or to submit your request for appeal, you may contact:
DISTRICT ENGINEER **U.S. Army Corps of Engineers, Kansas City District** **ATTN: David R. Hibbs** **Chief, Regulatory Branch** **601 E. 12th Street, Room 402** **Kansas City, MO 64106-2824** **Telephone: 816-389-3990** **Email: David.R.Hibbs@usace.army.mil**	DIVISION ENGINEER **U.S. Army Corps of Engineers, Northwestern Division** **ATTN: Melinda M. Larsen, Regulatory Appeals Review Officer** **1201 NE Lloyd Blvd., Suite 400** **Portland, OR 97232** **Telephone: 503-808-3888** **Email: Melinda.M.Larsen@usace.army.mil**

SECTION II – REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. Use additional pages as necessary. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15-day notice of any site investigation and will have the opportunity to participate in all site investigations.

_____ Signature of appellant or agent.	Date:
Email address of appellant and/or agent:	Telephone number:

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, KANSAS CITY DISTRICT
601 E. 12TH STREET, 635 FEDERAL BUILDING
KANSAS CITY, MO 64106-2824

June 24, 2024

Regulatory Branch
(NWK-2020-00968)

Mr. Todd Trotter
GBA
9801 Renner Boulevard
Lenexa, KS 66219

Dear Mr. Trotter:

This letter is in response to your request of May 10, 2024, submitted on behalf of Kaw Valley Companies for a Jurisdictional Determination for an approximate 218-acre project site. The site is located within Section 22, Township 12 south, Range 22 east, Leavenworth County Kansas. This request was assigned to Regulatory File No. NWK- 2020-00968, previously created for a determination of jurisdictional waters on the site on December 8, 2020, using the navigable waters protection rule in effect at that time. Please reference this file number on any correspondence to us or to other interested parties concerning this matter.

This letter contains an approved jurisdictional determination for your project site. This jurisdictional determination is valid for a 5-year period from the date of this letter unless new information warrants revision of the determination before the expiration date. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed you will find a Notification of Administrative Appeal Options and Process and Request for Appeal (NAO-RFA) form. If you request to appeal this determination, you must submit a completed NAO-RFA form to the Northwestern Division Office at the following address:

Division Engineer
U.S. Army Corps of Engineers, Northwestern Division
ATTN: Melinda M. Larsen, Regulatory Appeals Review Officer
1201 NE Lloyd Blvd., Suite 400
Portland, OR 97232
Telephone: 503-808-3888

In order for an NAO-RFA to be accepted by the Corps, the Corps must determine that it is completed, that it meets the criteria for appeal under 33 CFR Part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAO-RFA. Should you decide to submit an NAO-RFA form, it must be received at the above address by August 23, 2024. It is not necessary to submit an NAO-RFA form to the Division Office if you do not object to the determination in this letter.

In the event that you disagree with an approved jurisdictional determination, and you have **new information** not considered in the original determination, you may request reconsideration of that determination by the Corps District prior to initiating an appeal. To request this reconsideration based upon new information, you must submit the completed NAO-RFA form and the new information to the District Office so that it is received within 60 days of the date of the NAO-RFA. Send approved jurisdictional determination reconsideration requests to:

District Commander
U.S. Army Engineer District, Kansas City
ATTN: David R. Hibbs, Chief, Regulatory Branch
601 East 12th Street, Suite 402
Kansas City, MO 64106-2824
Telephone: 816-389-3990

The Corps of Engineers has jurisdiction over all waters of the United States. Discharges of dredged or fill material in waters of the United States, including wetlands, require prior authorization from the Corps under Section 404 of the Clean Water Act (33 USC 1344).

The delineation included herein has been conducted to identify the location and extent of the aquatic resources for purposes of the Clean Water Act for the particular site identified in this request. This delineation may not be valid for the Wetland Conservation Provisions of the Food Security Act of 1985, as amended. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should discuss the applicability of an NRCS Certified Wetland Determination with the local USDA service center, prior to starting work.

We are interested in your thoughts and opinions concerning your experience with the Kansas City District, Corps of Engineers Regulatory Program. Please feel free to complete our Customer Service Survey form on our website at: https://regulatory.ops.usace.army.mil/customer-service-survey/. You may also call and request a paper copy of the survey which you may complete and return to us by mail.

If you have any questions concerning this matter, please feel free to write or contact me at 816-389-3703 or by email at brian.t.donahue@usace.army.mil. Please reference Regulatory File No. NWK-2020-00968 in all comments and/or inquiries relating to this project. This letter is only being provided to you electronically at: ttrotter@gba.com.

Sincerely,

Brian Donahue

Brian Donahue
Project Manager

Enclosures

cc (electronically w/o enclosures):

Environmental Protection Agency,
Watershed and Grants Branch
U.S. Fish and Wildlife Service, Manhattan, Kansas
Kansas Department of Wildlife and Parks
Kansas Department of Health and Environment
Kansas Department of Agriculture

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, KANSAS CITY DISTRICT
601 E. 12TH STREET, 635 FEDERAL BUILDING
KANSAS CITY, MO 64106-2824

CENWK-ODR

24 June 2024

MEMORANDUM FOR RECORD

SUBJECT: US Army Corps of Engineers (Corps) Pre-2015 Regulatory Regime Approved Jurisdictional Determination in Light of *Sackett v. EPA*, 143 S. Ct. 1322 (2023),[1] NWK-2020-00968, (MFR # 1 of 1).

BACKGROUND. An Approved Jurisdictional Determination (AJD) is a Corps document stating the presence or absence of waters of the United States on a parcel or a written statement and map identifying the limits of waters of the United States on a parcel. AJDs are clearly designated appealable actions and will include a basis of JD with the document.[2] AJDs are case-specific and are typically made in response to a request. AJDs are valid for a period of five years unless new information warrants revision of the determination before the expiration date or a District Engineer has identified, after public notice and comment, that specific geographic areas with rapidly changing environmental conditions merit re-verification on a more frequent basis.[3] For the purposes of this AJD, we have relied on section 10 of the Rivers and Harbors Act of 1899 (RHA),[4] the Clean Water Act (CWA) implementing regulations published by the Department of the Army in 1986 and amended in 1993 (references 2.a. and 2.b. respectively), the 2008 *Rapanos-Carabell* guidance (reference 2.c.), and other applicable guidance, relevant case law and longstanding practice, (collectively the pre-2015 regulatory regime), and the *Sackett* decision (reference 2.d.) in evaluating jurisdiction.

This Memorandum for Record (MFR) constitutes the basis of jurisdiction for a Corps AJD as defined in 33 CFR §331.2. The features addressed in this AJD were evaluated consistent with the definition of "waters of the United States" found in the pre-2015 regulatory regime and consistent with the Supreme Court's decision in *Sackett*. This AJD did not rely on the 2023 "Revised Definition of 'Waters of the United States,'" as amended on 8 September 2023 (Amended 2023 Rule) because, as of the date of this decision, the Amended 2023 Rule is not applicable within the State of Kansas due to litigation.

1. SUMMARY OF CONCLUSIONS.

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[1] While the Supreme Court's decision in *Sackett* had no effect on some categories of waters covered under the CWA, and no effect on any waters covered under RHA, all categories are included in this Memorandum for Record for efficiency.
[2] 33 CFR 331.2.
[3] Regulatory Guidance Letter 05-02.
[4] USACE has authority under both Section 9 and Section 10 of the Rivers and Harbors Act of 1899 but for convenience, in this MFR, jurisdiction under RHA will be referred to as Section 10.

a. Provide a list of each individual feature within the review area and the jurisdictional status of each one (i.e., identify whether each feature is/is not a water of the United States and/or a navigable water of the United States).

i. Wetland 2, 0.25 acres, non-jurisdictional, Section 404
ii. Wetland 3, 0.20 acres, non-jurisdictional, Section 404
iii. Wetland 4, 0.40 acres, non-jurisdictional, Section 404
iv. Wetland 5, 0.30 acres, non-jurisdictional, Section 404
v. Wetland 6, 0.01 acres, non-jurisdictional, Section 404
vi. Wetland 7, 0.13 acres, non-jurisdictional, Section 404
vii. Wetland 8, 0.07 acres, non-jurisdictional, Section 404
viii. Wetland 9, 0.03 acres, non-jurisdictional, Section 404
ix. Wetland 10, 0.42 acres, non-jurisdictional, Section 404
x. Wetland 11, 0.67 acres, non-jurisdictional, Section 404
xi. Wetland 12, 0.53 acres, non-jurisdictional, Section 404
xii. Wetland 13, 3.61 acres, non-jurisdictional, Section 404
xiii. Wetland 14, 0.26 acres, non-jurisdictional, Section 404
xiv. Wetland 15, 1.44 acres, non-jurisdictional, Section 404
xv. Wetland 16, 3.06 acres, non-jurisdictional, Section 404
xvi. Wetland 17, 0.07 acres, non-jurisdictional, Section 404
xvii Wetland 18, 0.28 acres, non-jurisdictional, Section 404
xviii. Wetland 19, 0.05 acres, non-jurisdictional, Section 404
xix. Wetland 20, 0.08 acres, non-jurisdictional, Section 404
xx. Wetland 21, 0.90 acres, non-jurisdictional, Section 404
xxi. Wetland 22, 0.25 acres, non-jurisdictional, Section 404

xxii. Wetland 1, 0.12 acres, jurisdictional, Section 404

2. REFERENCES.

a. Final Rule for Regulatory Programs of the Corps of Engineers, 51 FR 41206 (November 13, 1986).

b. Clean Water Act Regulatory Programs, 58 FR 45008 (August 25, 1993).

c. U.S. EPA & U.S. Army Corps of Engineers, Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in *Rapanos v. United States & Carabell v. United States* (December 2, 2008)

d. *Sackett v. EPA*, 598 U.S. _, 143 S. Ct. 1322 (2023)

e. Coordination memo for the Pre-2015 regulatory regime (27 September 2023).

3. REVIEW AREA The approximate 217-acre review area is located within Section 22, Township 12 south, Range 22 east, Leavenworth County Kansas. USGS QUAD: DeSoto, Kansas. Center Coordinates: Latitude 38.99180, and Longitude -94.94888.

4. NEAREST TRADITIONAL NAVIGABLE WATER (TNW), INTERSTATE WATER, OR THE TERRITORIAL SEAS TO WHICH THE AQUATIC RESOURCE IS CONNECTED. The review area is located within the historic floodplain of the Kansas River. The Kansas River has been determined to be a TNW from river mile 0.0 to mile 170.4 (confluence with the Missouri River upstream to its confluence with the Republican and Smoky Hill Rivers in the vicinity of Junction City, in Geary County, Kansas.

5. FLOWPATH FROM THE SUBJECT AQUATIC RESOURCES TO A TNW, INTERSTATE WATER, OR THE TERRITORIAL SEAS. Wetland 1, in the SW project area, is located within the bottom of a shallow ditch/swale that provides drainage directly from an upper floodplain bench to the adjacent Kansas River.

6. SECTION 10 JURISDICTIONAL WATERS[5]: Describe aquatic resources or other features within the review area determined to be jurisdictional in accordance with Section 10 of the Rivers and Harbors Act of 1899. Include the size of each aquatic resource or other feature within the review area and how it was determined to be jurisdictional in accordance with Section 10.[6] N/A, there are no Section 10 waters within the review area.

7. SECTION 404 JURISDICTIONAL WATERS: Describe the aquatic resources within the review area that were found to meet the definition of waters of the United States in accordance with the pre-2015 regulatory regime and consistent with the Supreme Court's decision in *Sackett*. List each aquatic resource separately, by name, consistent with the naming convention used in section 1, above. Include a rationale for each aquatic resource, supporting that the aquatic resource meets the relevant category of "waters of the United States" in the pre-2015 regulatory regime. The

[5] 33 CFR 329.9(a) A waterbody which was navigable in its natural or improved state, or which was susceptible of reasonable improvement (as discussed in § 329.8(b) of this part) retains its character as "navigable in law" even though it is not presently used for commerce, or is presently incapable of such use because of changed conditions or the presence of obstructions.

[6] This MFR is not to be used to make a report of findings to support a determination that the water is a navigable water of the United States. The district must follow the procedures outlined in 33 CFR part 329.14 to make a determination that water is a navigable water of the United States subject to Section 10 of the RHA.

rationale should also include a written description of, or reference to a map in the administrative record that shows, the lateral limits of jurisdiction for each aquatic resource, including how that limit was determined, and incorporate relevant references used. Include the size of each aquatic resource in acres or linear feet and attach and reference related figures as needed.

a. TNWs (a)(1): N/A

b. Interstate Waters (a)(2): N/A

c. Other Waters (a)(3): N/A

d. Impoundments (a)(4): N/A

e. Tributaries (a)(5): N/A

f. The territorial seas (a)(6): N/A

g. Adjacent wetlands (a)(7):

Wetland 1: This 0.12-acre wetland is located within a shallow swale on a floodplain bench that has a slightly lower elevation than the surrounding landscape. The swale is evident on the lidar elevation map of the review area included with this MFR. The swale provides a continuous surface connection from this wetland to the Kansas River (TNW). As such wetland 1 is considered an adjacent wetland and is jurisdictional.

8. NON-JURISDICTIONAL AQUATIC RESOURCES AND FEATURES

a. Describe aquatic resources and other features within the review area identified as "generally non-jurisdictional" in the preamble to the 1986 regulations (referred to as "preamble waters").[7] Include size of the aquatic resource or feature within the review area and describe how it was determined to be non-jurisdictional under the CWA as a preamble water. N/A

b. Describe aquatic resources and features within the review area identified as "generally not jurisdictional" in the *Rapanos* guidance. Include size of the aquatic resource or feature within the review area and describe how it was determined to be non-jurisdictional under the CWA based on the criteria listed in the guidance. N/A

[7] 51 FR 41217, November 13, 1986.

c. Describe aquatic resources and features identified within the review area as waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA. Include the size of the waste treatment system within the review area and describe how it was determined to be a waste treatment system. N/A

d. Describe aquatic resources and features within the review area determined to be prior converted cropland in accordance with the 1993 regulations (reference 2.b.). Include the size of the aquatic resource or feature within the review area and describe how it was determined to be prior converted cropland. N/A

e. Describe aquatic resources (i.e. lakes and ponds) within the review area, which do not have a nexus to interstate or foreign commerce, and prior to the January 2001 Supreme Court decision in "*SWANCC*," would have been jurisdictional based solely on the "Migratory Bird Rule." Include the size of the aquatic resource or feature, and how it was determined to be an "isolated water" in accordance with *SWANCC*. N/A

f. Describe aquatic resources and features within the review area that were determined to be non-jurisdictional because they do not meet one or more categories of waters of the United States under the pre-2015 regulatory regime consistent with the Supreme Court's decision in *Sackett* (e.g., tributaries that are non-relatively permanent waters; non-tidal wetlands that do not have a continuous surface connection to a jurisdictional water).

Wetland 2, 0.25 acres, non-jurisdictional, Section 404
Wetland 3, 0.20 acres, non-jurisdictional, Section 404
Wetland 4, 0.40 acres, non-jurisdictional, Section 404
Wetland 5, 0.30 acres, non-jurisdictional, Section 404
Wetland 6, 0.01 acres, non-jurisdictional, Section 404
Wetland 7, 0.13 acres, non-jurisdictional, Section 404
Wetland 8, 0.07 acres, non-jurisdictional, Section 404
Wetland 9, 0.03 acres, non-jurisdictional, Section 404
Wetland 10, 0.42 acres, non-jurisdictional, Section 404
Wetland 11, 0.67 acres, non-jurisdictional, Section 404
Wetland 12, 0.53 acres, non-jurisdictional, Section 404
Wetland 13, 3.61 acres, non-jurisdictional, Section 404
Wetland 14, 0.26 acres, non-jurisdictional, Section 404
Wetland 15, 1.44 acres, non-jurisdictional, Section 404
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Wetland 17, 0.07 acres, non-jurisdictional, Section 404

Wetland 18, 0.28 acres, non-jurisdictional, Section 404
Wetland 19, 0.05 acres, non-jurisdictional, Section 404
Wetland 20, 0.08 acres, non-jurisdictional, Section 404
Wetland 21, 0.90 acres, non-jurisdictional, Section 404
Wetland 22, 0.25 acres, non-jurisdictional, Section 404

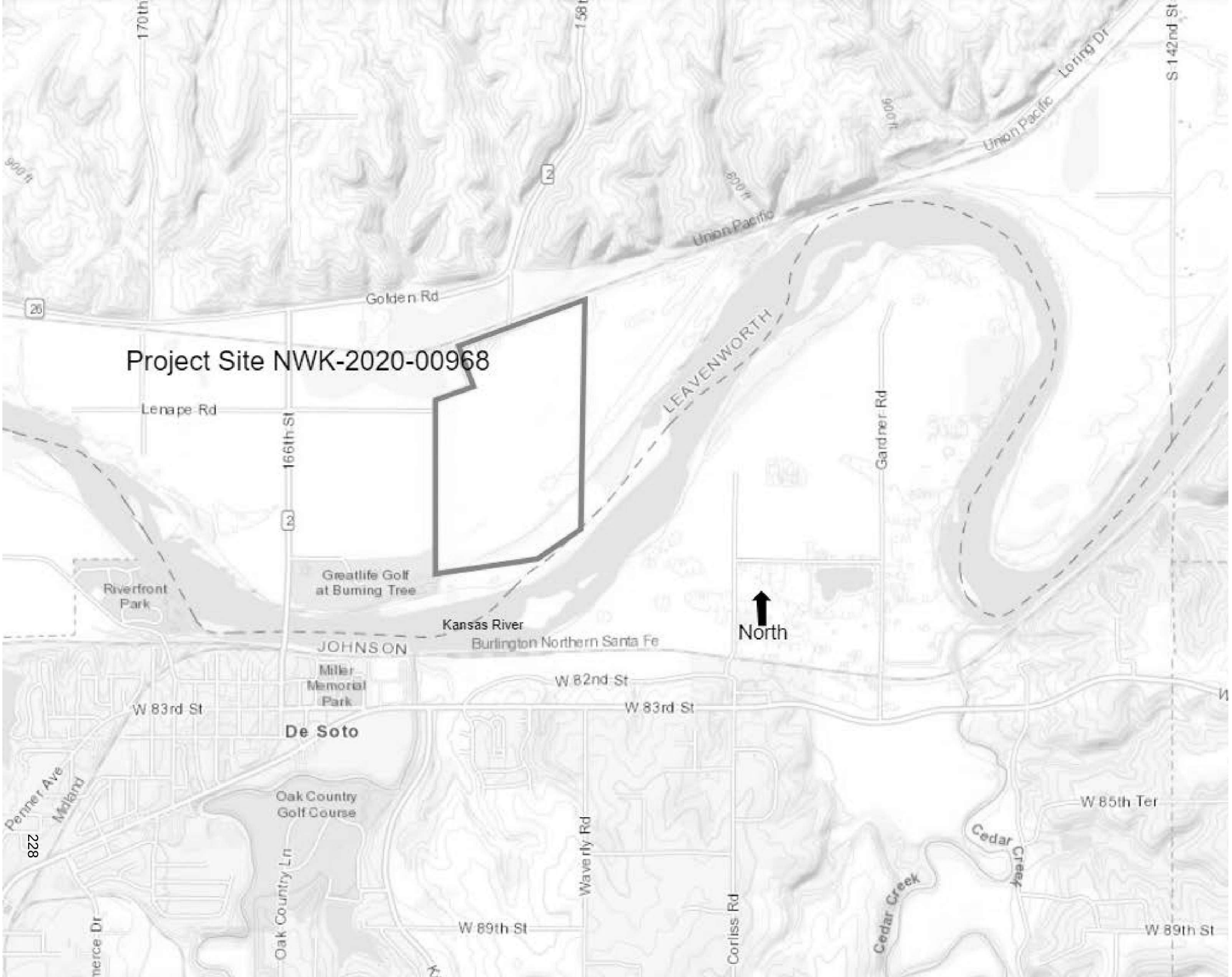
These twenty-one wetlands are not paragraph (a)(7) adjacent wetlands. Based on the resources consulted, it has been determined that these wetlands do not physically abut another water of the U.S. (i.e., a TNW, interstate water, jurisdictional impoundment, jurisdictional tributary, or the territorial seas). Additionally, the wetlands do not have a continuous surface connection to another water of the U.S. and are not connected to another water of the U.S. by a discrete feature like a non-jurisdictional ditch, swale, pipe, or culvert. A review of aerial imagery and Kansas Elevation Hillshade (LiDAR Shaded Relief) indicates that the wetlands listed above are depressions on the landscape. LiDAR does not indicate the presence of any discrete surface connection between these wetlands and a tributary system, including the Kansas River. These wetlands are closed depressions in a crop field. Drainage from the wetlands to downstream waters is diffuse and not discrete. Only upland sheet flow could connect these wetlands to any downslope ditches, culverts or other conveyances. Therefore, it has been determined that these wetlands are not adjacent to another water of the U.S. and as such are not jurisdictional.

9. DATA SOURCES. List sources of data/information used in making determination. Include titles and dates of sources used and ensure that information referenced is available in the administrative record.

   a. Previous AJD determination for this site, dated 3 December 2020.
   b. Delineation Report, Terra Technologies, dated October 2020.
   c. National Wetland Inventory, (NWI), DeSoto, KS Quad.
   d. Kansas Elevation 3DEP Digital Elevation Model, (DEM), 2024.
   e. Kansas Regulatory Viewer, Maxar aerial imagery.

10. OTHER SUPPORTING INFORMATION. N/A

11. NOTE: The structure and format of this MFR were developed in coordination with the EPA and Department of the Army. The MFR's structure and format may be subject to future modification or may be rescinded as needed to implement additional guidance from the agencies; however, the approved jurisdictional determination described herein is a final agency action.


Project Site NWK-2020-00968
Golden Rd
Lenape Rd
166th St
170th
158th
Union Pacific
Loring Dr
S 142nd St
LEAVENWORTH
Gardner Rd
Greatlife Golf
at Burning Tree
Riverfront
Park
Kansas River
Burlington Northern Santa Fe
JOHNSON
Miller
Memorial
Park
W 82nd St
W 83rd St
De Soto
Oak Country
Golf Course
Oak Country Ln
Waverly Rd
Corliss Rd
Cedar Creek
W 85th Ter
W 89th St
Pennet Ave
Midland
North
228


NWK-2020-00968
Project site
waters
Wetland #21
0.90 Acre
Wetland #22
0.25 Acre
Wetland #20
0.08 Acre
Wetland #19
0.05 Acre
Wetland #18
0.28 Acre
Wetland #17
0.07 Acre
Wetland #16
3.06 Acre
Wetland #14
0.26 Acre
Wetland #12
0.53 Acre
Wetland #15
1.44 Acre
Wetland #13
3.61 Acre
Wetland #7
0.13 Acre
Wetland #6
0.01 Acre
Wetland #11
0.67 Acre
Wetland #5
0.30 Acre
Wetland #10
0.42 Acre
Wetland #9
0.03 Acre
Wetland #4
0.40 Acre
Wetland #3
0.20 Acre
Wetland #8
0.07 Acre
Kansas River
Wetland #2
0.25 Acre
Wetland #1
0.12 Acre
N

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Kaw Valley Companies	File Number: NWK-2020-00968	Date: June 24, 2024
Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL WITHOUT PREJUDICE	C
	PERMIT DENIAL WITH PREJUDICE	D
XX	APPROVED JURISDICTIONAL DETERMINATION	E
	PRELIMINARY JURISDICTIONAL DETERMINATION	F

SECTION I

The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at https://www.usace.army.mil/Missions/Civil-Works/Regulatory-Program-and-Permits/appeals/ or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C. PERMIT DENIAL WITHOUT PREJUDICE: Not appealable

You received a permit denial without prejudice because a required Federal, state, and/or local authorization and/or certification has been denied for activities which also require a Department of the Army permit before final action has been taken on the Army permit application. The permit denial without prejudice is not appealable. There is no prejudice to the right of the applicant to reinstate processing of the Army permit application if subsequent approval is received from the appropriate Federal, state, and/or local agency on a previously denied authorization and/or certification.

D: PERMIT DENIAL WITH PREJUDICE: You may appeal the permit denial

You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information for reconsideration

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice means that you accept the approved JD in its entirety and waive all rights to appeal the approved JD.

- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

- RECONSIDERATION: You may request that the district engineer reconsider the approved JD by submitting new information or data to the district engineer within 60 days of the date of this notice. The district will determine whether the information submitted qualifies as new information or data that justifies reconsideration of the approved JD. A reconsideration request does not initiate the appeal process. You may submit a request for appeal to the division engineer to preserve your appeal rights while the district is determining whether the submitted information qualifies for a reconsideration.

F: PRELIMINARY JURISDICTIONAL DETERMINATION: Not appealable

You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also, you may provide new information for further consideration by the Corps to reevaluate the JD.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision you may contact: DISTRICT ENGINEER **U.S. Army Corps of Engineers, Kansas City District** **ATTN: David R. Hibbs** **Chief, Regulatory Branch** **601 E. 12th Street, Room 402** **Kansas City, MO 64106-2824** **Telephone: 816-389-3990** **Email: David.R.Hibbs@usace.army.mil**	If you have questions regarding the appeal process, or to submit your request for appeal, you may contact: DIVISION ENGINEER **U.S. Army Corps of Engineers, Northwestern Division** **ATTN: Melinda M. Larsen, Regulatory Appeals Review Officer** **1201 NE Lloyd Blvd., Suite 400** **Portland, OR 97232** **Telephone: 503-808-3888** **Email: Melinda.M.Larsen@usace.army.mil**

SECTION II – REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. Use additional pages as necessary. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15-day notice of any site investigation and will have the opportunity to participate in all site investigations.

_____ Signature of appellant or agent.	Date:
Email address of appellant and/or agent:	Telephone number:

1320 Research Park Drive
Manhattan, KS 66502
785-564-6700
www. agriculture.ks.gov

Kansas
Department of Agriculture

900 SW Jackson, Room 456
Topeka, KS 66612
785-296-3556

Mike Beam, Secretary

Laura Kelly, Governor

March 5, 2025

KAW VALLEY COMPANIES INC.
EVAN HOROWITZ
5600 KANSAS AVENUE
KANSAS CITY, KS 66106

CAROLYN E SPRING TRUST
2806 CAMPUS LN
ALBERT LEA, MN 56007

CAROLYN E SPRING TRUST
CAROLYN KNUTSON
425 CRESCENT DRIVE
ALBERT LEA, MN 56007

Re: Proj. No.: Lenape Sand Operation-166th Street & Lenape Road
Construction Of A Sand Mining Operation
Kansas River
Leavenworth County
WSN: LLV-0151, Notice No.: 2025011

To whom it may concern:

Consideration has been given to your application for a permit and approval of plans relating to the placement of fill for the construction of a sand mining operation, 6' tall safety berm, and approximately 20' tall temporary storage stockpile in the floodway of the Kansas River at a location in Section 22, Township 12 South, Range 22 East, Leavenworth County, Kansas.

In accordance with the provisions of K.S.A. 24-126, the Chief Engineer has approved the plans and issued the enclosed approval of application, authorizing construction of the proposed project. Please note the approval conditions on the reverse side of the approval document. Condition No. 9 requires the owner to notify this office within 30 days after the project is completed. A Notice and Proof of Completion form is enclosed for this purpose. Other special conditions have been added to limit the removal of timber and vegetation, to require the use of clean material for riprap, to prohibit the introduction of toxic or deleterious materials into the watercourse, and to require the project meet the floodplain management requirements of the community.

The one set of plans submitted to this office has been endorsed with the Chief Engineer's approval and will be retained in our files. Should you desire any copies of the plans with the Chief Engineer's approval shown thereon, please submit the required number.

Comments about this proposed project were received from several agencies during the environmental review process. Copies of the letters with recommendations from the environmental review agencies are enclosed for your information.

The work has been authorized to be completed on or before July 1, 2028. Approval for construction of this project will expire on that date unless the time is subsequently specifically extended by the Chief Engineer. Any desired extension of time should be requested in writing approximately 30 days prior to the expiration date.

Sincerely,

Terry Medley

Terry Medley, P.E.
Water Structures Program Manager
(785) 564-6657

Enclosure
pc: Jay Healy- GBA
John Jacobson- Leavenworth County FPA

THE STATE OF KANSAS

KANSAS DEPARTMENT OF AGRICULTURE
Mike Beam, Secretary of Agriculture

DIVISION OF WATER RESOURCES
Earl D. Lewis Jr., Chief Engineer

APPROVAL OF APPLICATION

NO. LLV-0151

K.S.A. *24-126*

The Chief Engineer of the Division of Water Resources, Kansas Department of Agriculture, by virtue of the powers and duties imposed by K.S.A. 24-126, hereby issues this approval to Kaw Valley Companies Inc. and Carolyn E Spring Trust, giving his consent to the placement of fill for the construction of a sand mining operation, 6' tall safety berm, and approximately 20' tall temporary storage stockpile in the floodway of the Kansas River at a location in Section 22, Township 12 South, Range 22 East, Leavenworth County, Kansas.

All work authorized by this approval shall be performed in accordance with the maps, plans, profiles and specifications filed with the application and approved by the Chief Engineer, and in accordance with plans for any changes or modifications subsequently approved by the Chief Engineer subject to the provisions of the aforementioned statute, its regulations and the attached approval conditions.

Witness my hand this 5th day of March, 2025.

DIVISION OF WATER RESOURCES
EARL D. LEWIS, JR., P.E.
CHIEF ENGINEER
KANSAS DEPT OF AGRICULTURE

Earl D. Lewis Jr., P.E.
Chief Engineer
Division of Water Resources
Kansas Department of Agriculture

State of Kansas)
)SS
County of Riley)

The foregoing instrument was acknowledged before me this 5th day of March, 2025, by Earl D. Lewis Jr., Chief Engineer, Division of Water Resources, Kansas Department of Agriculture.

STATE OF KANSAS NOTARY PUBLIC
DEIDRE ROMINE
My Appointment Expires
March 18, 2026

Deidre Romine
Notary Public

RECORD THIS INSTRUMENT IN THE OFFICE OF THE REGISTER OF DEEDS OF THE COUNTY WHEREIN THE WORK IS LOCATED

DWR 3-200.0 (Rev. 11/92)

APPROVAL CONDITIONS

1. This approval grants no water rights nor other property rights, nor does it authorize any injury to private property, invasion of private rights nor impairment of senior water rights, nor does it exempt the applicant from obtaining consent from appropriate federal, state or local government.
2. The work shall at all times be subject to supervision and inspection by representatives of the Division of Water Resources.
3. No changes in the work, maps, plans, profiles and specifications as approved shall be made except with the written consent of the Chief Engineer.
4. Any work authorized by this approval will be maintained in a condition satisfactory to the Chief Engineer and substantially in accordance with the approved plans.
5. The clearing of trees, brush, drift and other debris, in order to maintain the work substantially in accordance with the approved plans is hereby authorized, except that the removal of plantings made specifically for habitat or environmental mitigation is not authorized by this approval.
6. Any excess material deposited in the stream channel incidental to the construction and maintenance of the project authorized by this approval shall be removed and the channel restored to a condition satisfactory to the Chief Engineer and substantially in accordance with the approved plans.
7. All areas disturbed by construction or other exposed soil areas shall be seeded and maintained with a mixture of grass or other vegetation appropriate to the soils, climate and project in order to minimize erosion and protect the project integrity.
8. If the work is not completed on or before the 1st day of July, 2028, this approval, if not specifically extended, shall cease and be null and void. If, upon the expiration or revocation of the approval, the work has not been completed, the applicant shall, at his own expense and to such extent and in such time and manner as the Chief Engineer may require, remove all or any portion of the uncompleted work and restore the watercourse to a satisfactory condition. No claim shall be made against the State of Kansas on account of any such removal or alteration.
9. Within thirty (30) days after the completion of the work authorized in this approval, the applicant shall file with the Division a statement that the work has been performed in accordance with this approval and the approved maps, plans, profiles and specifications.
10. The Chief Engineer reserves the right to require such changes in the maps, plans, profiles and specifications as may be considered necessary. The Chief Engineer further reserves the right to modify, suspend or revoke this approval at any time, should the applicant fail to comply with any of the conditions of this approval or regulations of the Division without sufficient cause or should such action be deemed necessary in the interest of public safety and welfare.
11. That the clearing of timber and vegetation is restricted to the absolute minimum required to accomplish the work and not interfere with the beneficial use of project.
12. Only graded rock, quarry-run rock and/or clean concrete rubble shall be used in the work as approved. If concrete rubble is used, all large slabs should be broken up and all exposed reinforcement rods, trash, and other extraneous materials shall be removed prior to placement. No asphalt material shall be placed as fill material.
13. No deleterious or toxic materials shall be introduced into the watercourse or reservoir by runoff, leaching or disposal during or in connection with the work authorized by this permit.
14. The project must meet the floodplain management requirements of the community.

STATE OF KANSAS
DIVISION OF WATER RESOURCES
DEPARTMENT OF AGRICULTURE

In the matter of: Water Structure No. LLV-0151
Kaw Valley Companies Inc.
Carolyn E Spring Trust
Construction Of A Sand Mining Operation
Kansas River
Leavenworth County
Proj. No.: Lenape Sand Operation-166th Street & Lenape Road

NOTICE AND PROOF OF COMPLETION
K.S.A. *24-126*

To: CHIEF ENGINEER
DIVISION OF WATER RESOURCES
KANSAS DEPARTMENT OF AGRICULTURE
1320 RESEARCH PARK DR
MANHATTAN KS 66502

I, the undersigned, being the holder of an approval to construct pursuant to K.S.A. 24-126 for the placement of fill for the construction of a sand mining operation, 6' tall safety berm, and approximately 20' tall temporary storage stockpile in the floodway of the Kansas River at a location in Section 22, Township 12 South, Range 22 East, Leavenworth County, Kansas, hereby certify that the works, identified above, have been completed as of _____. I further certify that these works have been completed in accordance with such permit, the approved plans, approved specifications, and the terms, conditions and limitations incorporated therein.

I understand that an end-of-construction inspection will be conducted by your office at some future date.

Dated this _____ day of _____ 20_____.

Signature: _____

Name: _____
(Please Print)

Address: _____

_____

Telephone No: _____

Ryan, Meaghan [KDA]

From: Kathy Haynes [KCC]
Sent: Friday, January 17, 2025 12:48 PM
To: Ryan, Meaghan [KDA]
Subject: RE: ECA 2025011

A review of Conservation Division files failed to indicate any environmental concerns within the acreage described within this application.

In the event unexpected circumstances are encountered during construction, such as the discovery of abandoned oil, gas or exploratory holes or lead lines, the applicant should contact KCC district office at (620) 902-6450, so appropriate regulatory response can be made.

If you have any questions or concerns, please call me at (316) 337-6243.

Kathy Haynes
Department of Environmental Protection and Remediation
Conservation Division
Kansas Corporation Commission
266 N. Main Ste 220 | Wichita, KS | 67202-1513
Phone (316) 337-6243 | Fax (316) 337-6211 |
Email: Kathy.Haynes@ks.gov
http://kcc.ks.gov/

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From: Ryan, Meaghan [KDA] <Meaghan.Ryan@ks.gov>
Sent: Friday, January 17, 2025 12:17 PM
To: Klein, Andrew <ajklein@ksu.edu>; Biological survey <biosurvey@ku.edu>; Kathy Haynes [KCC] <Kathy.Haynes@ks.gov>; KDA DOC Office Assistant <KDA.DOC@ks.gov>; Environmental Services, KDWPT [KDWPT] <KDWPT.ess@ks.gov>; KSHS_Historic Preservation <KSHS.SHPO@ks.gov>; Scott Satterthwaite [KDHE] <Scott.Satterthwaite@ks.gov>
Cc: evanh@kvco.net; jhealy@gbateam.com; regulatory.kansascity@usace.army.mil; jjacobson@leavenworthcounty.gov
Subject: ECA 2025011

The Water Projects Environmental Coordination Act, K.S.A. 82a-325 to 327, requires this agency to provide seven other agencies in the state government an opportunity to review and comment on your application for a period of not less than 30 days. The environmental coordination process has been initiated, but a thorough review of your project may not yet have been performed. You will be informed of any changes that may be necessary to comply with our rules and regulations and any concerns or comments we receive from the

environmental coordination agencies. This letter does not provide any permission to begin the construction of your project.

Construction can begin only after written approval has been obtained from the Chief Engineer of this agency.

If you have any questions or comments please contact this office by writing or calling (785) 370-2535.

https://www.agriculture.ks.gov/divisions-programs/division-of-water-resources/water-structures/environmental-coordination-act/notice-index-page

Notice No.: 2025011 **Date of Notice:** 1/17/2025
WS No.: LLV-0151 **Expiration Date:** 2/16/2025
Project No.: Lenape Sand Operation-166th Street & Lenape Road

Along the Kansas River at a location in the Section 22, Township 12 South, Range 22 East, Leavenworth County, Kansas.

Thank you,

Meaghan Ryan
Engineering Associate
Division of Water Resources
Kansas Department of Agriculture
Meaghan.Ryan@KS.gov
(785) 370-2535

Ryan, Meaghan [KDA]

From: Kramer, Diedre [KDWP]
Sent: Thursday, February 13, 2025 1:31 PM
To: Ryan, Meaghan [KDA]
Subject: KDWP Review ERT20250197 (ECA2025011; Track 20181159-6) Lenape Sand Mining Operations Construction, LV Co.

Evan Horowitz,

We have reviewed the information submitted for Kaw Valley Companies Inc. for the construction of Lenape Sand Mining Operation along the floodplain of the Kansas River near De Soto in Leavenworth County, Kansas (S22-T12S-R22E). The project was reviewed for potential impacts to critical wildlife habitats, current state-listed threatened or endangered species and species in need of conservation, as well as Kansas Department of Wildlife and Parks managed areas for which this agency has administrative authority.

The Kansas River adjacent to the proposed work area is Designated Critical Habitat for multiple state-listed wildlife species including the Least Tern (*Sterna antillarum*), Piping Plover (*Charadrius melodus*), Plains Minnow (*Hybognathus placitus*), Silver Chub (*Macrhybopsis storeriana*), Shoal Chub (*Macrhybopsis hyostoma*), Sturgeon Chub (*Macrhybopsis gelida*), and Flathead Chub (*Platygobio gracilis*). As such, impacts to the river, riverbanks, and riparian vegetation should be avoided. Strict adherence to erosion control and stormwater pollution prevention plans should be maintained by the contractor through final site grading and vegetation establishment to avoid degrading water quality adjacent to the site. Finally, we recommend that all site revegetation be completed with grass and forbs native to the area.

Exposed sand bars and sparsely vegetated shorelines along the Kansas River represent nesting habitat for Least Terns and Piping Plovers. Due to the construction limits surrounding the project not extending into the Kansas River, we have determined this project is unlikely to impact nesting Least Terns or Piping Plovers. To minimize potential impacts to nests or nesting individuals, we recommend the project avoids construction during the species nesting dates of May 1 through September 1. Additionally, we recommend potential nesting habitat near the project area should be assessed for the presence of these species prior to construction. If they are present or the project construction limits change, that information should be submitted to our office for further review.

We advocate for off-channel gravel and sand extraction mines—as is proposed in the submitted plans. However, we also advocate for non-development of floodplain areas to avoid impacts to the hydrologic interactions between a stream and it's surrounding lands. Development within the floodplain can reduce a stream's ability to dissipate flood waters. The likely increases in flood water level can result in destruction of the intended project, cause changes to the stream's channel geometry, and increase bank erosion. We offer the following general suggestions and recommendations to help minimize potential negative impacts to wildlife and habitat.

- **KDWP recommends borrow/waste sites, materials stockpiles, staging, and laydown areas be sited in previously disturbed habitats (e.g., cropland, non-native pasture).**

- **Develop or update contingency plans to avoid/minimize environmental impacts from inundation of the project area during flood events.**

- **Avoid fuel spills or other contaminant releases. Have operational contingency plans (such as a Spill Prevention, Control, and Countermeasure plan), which comply with all applicable guidance from Kansas Department of Health and Environment in place to respond to leaks and spills. For more information about SPCC plans, see: https://www.epa.gov/sites/production/files/documents/spccbluebroch.pdf.**

- **Implement a closed loop water supply system using point source and non-point source waters for process water. Where possible, recycle process water for other necessary uses (dust suppression, truck wash, etc.).**

- **To the extent possible, site reclamation should grade land to resemble natural contours and substrate configuration. Use native warm season grass, forb, and shrub species to revegetate reclamation areas. Abide by all applicable KDHE mine reclamation guidance. KDWP advocates for reclamation plans which incorporate the techniques of the Forestry Reclamation Approach or holistic reclamation approach, as appropriate.**

- **Avoid operation and storage of heavy equipment in riparian areas.**

- **Setbacks for project boundaries should be a minimum of 150 ft from the riparian buffer. Any mature native timber (trees greater than 50 ft tall or 24 inches in diameter) and/or groups of more than 10 trees between 12 & 24 inches diameter which are removed from the floodplain by operation of the site should be reestablished as part of the site reclamation process.**

- **Abide by all applicable surface mine/quarry guidance, policies, statutes, and regulations given by the Kansas Department of Health and Environment. Provide a surety bond for post closure site reclamation.**

- **Use a phased approach to opening new mine/quarry phases, and restore previously mined/quarried areas prior to opening a new phase.**

- **Incorporate principles of low impact development (LID), such as permeable asphalt pavement, porous concrete, swales, bioretention, or raingardens. More info on LID: https://www.epa.gov/nps/urban-runoff-low-impact-development.**

- **Implement and maintain standard erosion control Best Management Practices during all aspects of construction by installing sediment barriers (wattles, filter logs, rock check ditches, mulching, or any combination of these) across the entire construction area to prevent sediment and spoil from entering aquatic systems. Barriers should be maintained at high functioning capacity until construction is completed and vegetation is established. For more information on erosion BMPs go to: https://www.kdhe.ks.gov/757/Construction-Stormwater-Program.**

- **Avoid impacts to streams and rivers, adjacent riparian zones, wetlands and springs as well as native prairie and woodland areas. KDWP recommends bridges be used to span streams crossed by roads.**

- **Restore disturbed soils with native grasses, forbs, shrubs, and/or trees as appropriate for the ecological site. KDWP Ecological Services Division staff can provide technical assistance for site restoration.**

Results of our review indicate there will be no significant impacts to critical wildlife habitats; therefore, no special mitigation measures are recommended. The project will not impact any public recreational areas, nor could we document any potential impacts to currently-listed threatened or endangered species or species in need of conservation. No Department of Wildlife and Parks permits or special authorizations will be needed if construction is started within one year, and no design changes are made in the project plans. Permits may be required from other agencies. We encourage consultation with all applicable regulatory authorities including, but not limited to, Kansas Department of Health and Environment, Kansas Department of Agriculture – Division of Water Resources, and the U.S. Army Corps of Engineers.

Since the Departments' recreational land obligations and the State's species listings periodically change, if construction has not started within one year of this date, or if design changes are made in the project plans, the project sponsor must contact this office to verify continued applicability of this assessment report. For our purposes, we consider construction started when advertisements for bids are distributed.

Please consider this email our official review for this project. Thank you for the opportunity to provide these comments and recommendations. Please let me know if you have any questions or concerns about the preceding information.

Please submit all future projects through the Kansas Ecological Review Tool (ERT) that can be accessed at ert.ksoutdoors.com to streamline the review process for all parties. If you have any questions or need assistance with the ERT please contact us at kdwpt.ess@ks.gov.

Thank you.

Diedre H. Kramer

Diedre Kramer | *Ecologist*
Kansas Department of Wildlife and Parks
512 SE 25th Ave. | Pratt, KS 67124
T: (620) 672-0792 | ksoutdoors.com
C: (620) 388-6061 | chickadeecheckoff.com

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Instagram - @kswildlifediversity

Kansas Forest Service Policy for Environmental Coordination Act Permits

Under the Water Projects Environmental Coordination Act, the Kansas Forest Service (KFS) is responsible for reviewing permit applications from the Kansas Department of Agriculture, Division of Water Resources to determine if projects adversely affect critical forest resources.

Due to the large volume of permits we are unable to review them all. For this reason we request the Division of Water Resources to share this document with all people applying for ECA

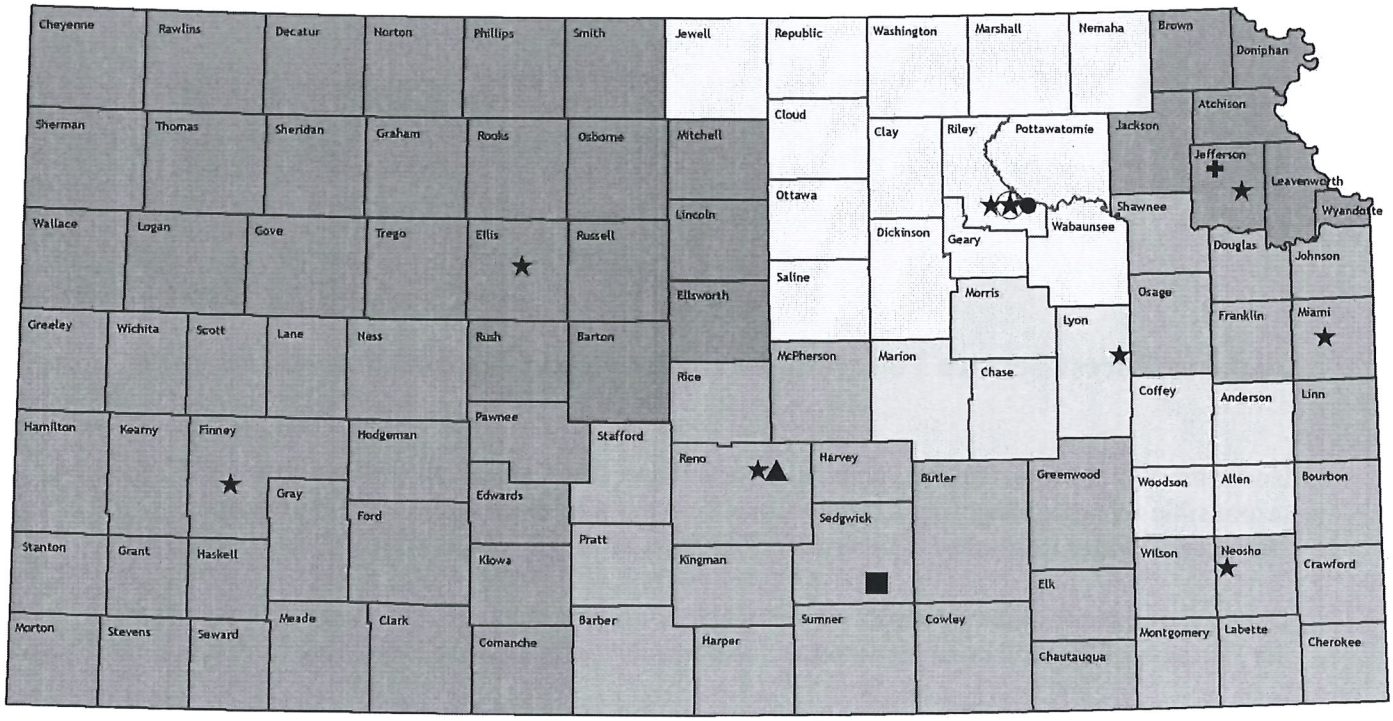
There is 2.2 million acres of forestland in Kansas and a significant percent is riparian forest that borders streams and rivers providing important water quality, soil conservation, wildlife habitat, recreational and wood product benefits to the people of Kansas.

Each year we lose a million acres of forestland to development in the United States (Ralph Alig, USDA FS Pacific NW Research Station). This generally occurs in small patches which often seem insignificant, but collectively degrades our quality of life.

If your project contributes to the conversion of forestland to another land use that exceeds an acre in size, the Kansas Forest Service requests that you consider mitigating the damage by planting at least 435 native trees per acre on a site of similar ecological value.

Kansas Forest Service foresters are available to assist with preparing tree planting plans at no charge and can also advise on financial incentives programs to help cover project expenses. Foresters contact information may be found on the back of this sheet. You are also invited to check out the KFS web site (www.kansasforests.org) for additional information.

Kansas Forest Service - State and District Offices



STATE OFFICE PERSONNEL:
Kansas Forest Service
2610 Claflin Road
Manhattan, KS 66502
785-532-3300; Fax: 785-532-3305
Larry Biles - State Forester
Bob Atchison - Rural Forestry Coordinator
Jarran Tindle - Water Quality Forester
Darci Paull - GIS Specialist
Mark Haller - Conservation Specialist
Ryan Armbrust - Forest Health/Conservation Forester
Aaron Yoder - Agricultural Technician
Jason Hartman - Fire Protection Specialist
Ross Hauck - Fire Management Coordinator
Eric Ward - Excess Property Manager
Jennifer Williams - Communications Coordinator
Annie Cummings - Conservation Program Associate
Kylie Rethman - Administrative Specialist
Aimee Hawkes - Accountant
Bob Duncan - Equipment Mechanic Specialist
Terry Fleming - Equipment Mechanic

▲ STATEWIDE
Fire Training Specialist
Rodney Redinger
3211 East 4th
Hutchinson, KS 67501
620-728-4464
rodney2@ksu.edu

✚ STATEWIDE
Marketing and Utilization Forester
David Bruton
7760 174th Street
Valley Falls, KS 66088
785-945-6147
dbruton@ksu.edu

● STATEWIDE
Watershed Forester
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Manhattan, KS 66502
785-564-6673
ajklein@ksu.edu

★ Rural District Forester
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Oskaloosa, KS 66066
785-410-0399
rrastok@ksu.edu

★ Rural District Forester
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785-477-6412
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★ Rural District Forester
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hfreerksen@ksu.edu

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★ Rural District Forester
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★ Rural District Forester
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★ Rural and Community District Forester
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3012 Broadway Avenue
Hays, KS 67601
785-624-3138
jseirer@ksu.edu

★ Rural and Community District Forester
John Klempa
2106 East Spruce Street
Garden City, KS 67846
620-275-0211, ext 111
jdklempa@ksu.edu

Community District Forester
Kim Bomberger
2610 Claflin Road
Manhattan, KS 66502
785-532-3315
kbomberg@ksu.edu

■ Community District Forester
Community Forestry Coordinator
Tim McDonnell
1901 E. 95th Street South
Haysville, KS 67060
316-788-0492, ext 202
tmcdonne@ksu.edu

KANSAS FOREST SERVICE
KANSAS STATE UNIVERSITY

Updated: 9/1/2017

6425 SW 6th Avenue
Topeka, KS 66615

Kansas

phone: 785-272-8681
fax: 785-272-8682
cultural_resources@kshs.org

Kansas Historical Society

[redacted]
Jennie Chinn, Executive Director

MEMORANDUM

To: ECA Permit Applicant

From: Kansas State Historical Society
Bob Hoard, State Archeologist

Re: Historic and Prehistoric Cultural Resources

Because of time and budget constraints, the Kansas State Historical Society has elected to waive review of permit applications under the Water Projects Environmental Coordination Act (KSA-82a-325 *et seq.*). However, digging, grading, and other types of construction activities may reveal the presence of buried historic and/or prehistoric archeological sites or artifacts within your project area. If archeological materials are encountered during construction, please contact me at 785-272-8681 ext. 269 or by email at rhoard@kshs.org and do not further disturb the site. If the materials appear to be significant, we may ask for the opportunity to document or salvage the.

In the event human burials or remains are encountered, the Kansas Unmarked Burial Sites Preservation Act (KSA 75-2741 through 75-2754) requires the finder to immediately report these discoveries to the local law enforcement agency. If the remains are not the result of criminal activity, their fate will be determined by the Unmarked Burial Sites Preservation Board. Encountering an unmarked burial does not necessarily stop a project. Discussion with the Board may lead to modification of the project, and in some cases the burial is removed and the project allowed to proceed. Human burials and associated artifacts must not be further disturbed after their discovery, until law enforcement officials or the Unmarked Burial Sites Preservation Board has determined the appropriate action. The Unmarked Burial Sites Preservation Act provides substantial penalties for intentionally disturbing human burials and grave goods, whether located on public or private property. If you find a bone that you suspect may be human, leave it where it is and get expert help to identify it. The county coroner, a medical doctor, or an archeologist can help.

What to Look For

Archeological sites from the historic and prehistoric periods may be buried. Prehistoric sites can be recognized by the presence of discolored earth, bones, stone tools (arrow heads, knives, scrapers), stone flakes (thin, sharp edged pieces of stone produced when making chipped stone tools), burned stones, and pieces of coarse, unglazed pottery. Stone flakes are the most commonly found artifact.

Historic period sites can be recognized by the presence of stone, brick, or concrete foundation walls, or concentrations of these materials. Many of the items used in historic times are similar to those used today. Bottles, cups, tin cans, buckets, hand tools, glass fragments, and other items can be easily recognized. If you are unsure of the significance of what you have found, contact my office.

Thank you for assisting in preserving the archeological heritage of Kansas.

****

These actions do not constitute compliance with Section 106 of the National Historic Preservation Act. If this project receives federal funding, licensing, permitting or assistance you must contact the State Historic Preservation Office (785-272-8681 ext. 240) prior to construction for a review of the undertaking under federal law.

FLOOD PLAIN DEVELOPMENT PERMIT APPLICATION

Leavenworth County Planning and Zoning Department
300 Walnut St., Suite 212
County Courthouse
Leavenworth, Kansas 66048
www.leavenworthcounty.gov
(913) 684-0465

Case No. _____ Date _____

Applicant GBA
Address 9801 Renner Blvd
City, Lenexa
State, Zip
Phone [redacted]
Email [redacted]

Owner Kaw Valley Companies Inc
Address 5600 Kansas Ave
City Kansas City
State, Zip
Phone [redacted]
Email [redacted]

Development Address 166th Street and Lenape Road

PID Section 22, Township 12S, Range 22E

A. Flood Plain and Floodway Information and Sources: ***(To be completed by Surveyor)***

FIRM Panel Number 20103C0425G
Map Date July 16, 2015
Flood Hazard Zone(s) AE
Floodway Area along Kansas River
(Circle One) Creek, River, Stream.

Nearest Reference Mark(s) and Elevations(s): Cross Section C - Elevation 791

Estimated Base Flood Elevation (BFE) at the site Min. 790.5
Max. 791

Source(s) of BFE data if not available on FIRM Map FIRM panel

Flood Hazard Boundary Map, Floodway Map, Flood Plain Information report, Etc. (indicate Title, No., Date, Etc.)_____

_____

Elevation of proposed development: Range from 807-735 ft. Existing grade is 790 ft.

B. Would the proposed development on this property be located in an Area of Special Flood Hazard? Yes: X No: _____

If YES, a Flood Plain Development Permit is required and the development must comply with the following:

Flood Plain Development Permits for new or substantially improved residential structure(s) in designated Area of Special Flood Hazard but not in a Floodway Area are conditioned on the structure(s) being elevated so the lowest floor (including basement floor) would be at least two (2) feet above the Base Flood Elevation. Flood Plain Development Permits for new or substantially improved non-residential structure(s) in designated Areas of Special Flood Hazard are conditioned on the structure(s) either being elevated so the lowest floor (including basement floor) would be at least two (2) feet above the Base Flood Elevation or, for non-residential structure(s) only, the structure(s) being flood proofed to an elevation at least two (2) feet above the Base Flood Elevation. The Permits also are conditioned on the provision of additional information and certifications as indicated in Sections E. and F. of this form. Development within Areas of Special Flood Hazard where Base Flood Elevations and Floodways have not been determined shall not be approved if the development would result in a 1-foot or greater rise in the Base Flood Elevation.

C. Would the proposed development on this property be located in a Floodway Area? Yes: X No: _____

If YES, a Flood Plain Development Permit is required and the development must comply with the following:

Permits for proposed development in any Floodway Area within any Area of Special Flood Hazard are not issued without certification that the development would not result in any increase in the Base Flood Elevation, and the Permits are subject to the provision of additional information and certifications as indicated in Sections E. and F. of this form.

D. Description of Proposed Work (Check ALL items that apply. Attach plans, descriptions, blueprints, etc., as available. Provide at least a written description and sketch plan drawings(s) showing existing and proposed conditions.)

BUILDING/STRUCTURE
___New
___Addition/Alteration*
___Residential
___Non-residential
___Moving structure
___Removal/Demolition

NON-BUILDING
___Road, street or bridge work
___Watercourse alteration
___Drainage alteration
___Grading
___Filling
_X_Material Removal/Excavation
___Subdivision of land (If more than 5 acres or 50 lots, see Section E, 1, c below)

Other (Describe)_____

* Does the proposed work involve an addition, alteration, reconstruction, or remodeling of an existing structure? Yes:_____ No:__X__

If YES, the market value of the existing structure is $_____
If YES, the estimated cost for the proposed work is $_____
Comments or further explanation/description of work _____

(Continue on reverse side or attach additional page(s) if needed)

E. Additional Information and Certifications required before a Flood Plain Development Permit is approved and to be provided by qualified, registered, professional engineer(s) or architect(s) licensed in the State of Kansas and whose services the applicant shall obtain.

1. If the proposed development would be located in any Area of Special Flood Hazard, the following must be provided:

   a. The Mean Sea Level (MSL) elevation proposed for the lowest floor (including basement floor) of each proposed structure, or
   b. The Mean Sea Level (MSL) elevation to which each proposed non-residential structure would be flood proofed, and certification that the proposed development would withstand the hydrostatic and hydrodynamic loading conditions of expected flood events, and
   c. Determination and certification of the Base Flood Elevation (BFE), including calculations, a map (to scale) showing the Base Flood boundaries, and a grading plan with maximum topographic contour intervals of five (5) feet for any development or subdivision greater than fifty (50) lots or five (5) acres, and

d. Determination and certification that the development would not raise the Base Flood Elevation (BFE) one foot or more.

2. If the proposed development would be located in a Floodway Area, a determination and certification that the development would not result in any increase whatsoever of the Base Flood Elevation (BFE).

F. After Construction Elevation Certifications (To be provided by the applicant before issuance of a Zoning Permit and after completion of construction in accordance with an approved Flood Plain Development Permit.)

1. For development located in a flood hazard area, the following certifications by a qualified, licensed, professional engineer, architect or land surveyor must be provided:
   a. The certified as-built Mean Sea Level (MSL) elevation of the lowest floor (including basement floor) of each residential structure.
   b. The certified as-built Mean Sea Level (MSL) flood proofed elevation of each non-residential structure, or the certified as-built Mean Sea Level (MSL) elevation of the lowest floor (including basement floor) of each nonresidential structure.

G. Summary of Elevation Certifications: (Attach Certification(s)

1. The certified as-built Mean Sea Level elevation of the lowest floor (including basement floor) of each residential structure is _____ feet.

   a. The certified as-built Mean Sea Level (MLS) flood proofed elevation of each non-residential structure is ____ feet, or the certified as-built lowest floor Mean Sea Level elevation (including basement floor) of each non-residential structure is ____ feet.

H. Action -- Approval, Conditional Approval or Denial

Approved _____, The proposed development would comply with the applicable flood plain regulations and standards if constructed as indicated on the plans and/or descriptions considered for this permit. The permit is approved conditioned on the builder/property owner providing certifications by qualified, licensed, professional engineer(s), architect(s) or land surveyor(s) of the "as-built" Mean Sea Level elevation of the lowest floor(s) (including basement) of any new or substantially improved structure covered by this permit as indicated above. The permit is/is not subject to special conditions stipulated as noted with the endorsement below.

Denied _____, The proposed development would not comply with the applicable flood plain regulations and standards if constructed as indicated on the plans and/or description considered for this permit. The permit is denied. (Additional explanation is/is not attached)

I. Other Permits Required? The applicant shall contact the other agencies and obtain and provide confirmation of whether a permit is required from the following agencies:

Corps of Engineers Permit:_____ Kansas City Office (816) 983-3533
State Permit:__X__ Division of Water Resources (785) 296-5440
Other:_____ e.g. Building Permit, Grading Permit, Hauling Permit, etc.

J. Additional Information:

Engineer, Architect, Land Surveyor and Contractor information (as applicable)
(Note: This information may be provided as soon as it becomes available during processing of the permit application or approval of the permit may be conditioned on the builder/property owner providing such information as soon as it becomes available.)

Engineer GBA
Address 9801 Renner
City Lenexa
State, Zip KS, 66219
Phone [redacted]
Email [redacted]

Architect _____
Address _____
City _____
State, Zip _____
Phone _____
Email _____

Contractor _____
Address _____
City _____
State, Zip _____
Phone _____
Email _____

Surveyor _____
Address _____
City _____
State, Zip _____
Phone _____
Email _____

(Continue on reverse side or attach an additional page if needed)

K. Acknowledgements

I have submitted this application for a Flood Plain Development Permit and attest that the statements and representations in this application are true and accurate to the best of my knowledge.

Builder/Property Owner Jacob Schweikert Date 9/29/2025

L. Endorsement

This application has been reviewed with respect to the information provided for this application, reference materials, maps and reports available for the administration of the Flood Plain Regulations, and the Flood Plain Regulations for Leavenworth County, Kansas, and appropriate action has been taken as indicated in Section H on this application.

Authorizing Official (Name and Title) _____
Certified Floodplain Manager: Yes___No___
Signature _____
Date _____

Approval of this permit is/is not subject to_____stipulated special conditions as stated on the following attached page.

9801 Renner Boulevard
Lenexa, KS 66219

Leavenworth County Planning and Zoning Department

300 Walnut St., Suite 212

County Courthouse

Leavenworth, Kansas 66048

On behalf of Kaw Valley Companies, GBA is submitting the following floodplain development permit application for a sand mining operation proposed to be developed in Leavenworth County, KS near 166th and Lanape Rd, north of the Kansas River. The existing site is primary undeveloped and drains into the Kansas River. The project site will include areas in the FEMA Zone AE Floodway, effective FIRM map 20103C0425G revised July 16, 2015.

The proposed site improvements include a dredging pond, sand dryer and processors, sand stockpiles, gravel road, and amenities to be used in the sand mining operations. The pit created by operations will serve as a large pond after dredging is complete. Due to the addition of a pond to the site, stormwater runoff control structures are not anticipated to be required.

There will be no rise in the BFE at the proposed project area due to no net fills being placed within the floodway, eliminating the need for hydraulic analysis. There are no permanent fills associated with the project higher than 1', but a temporary soil stockpile area south of Lenape Rd could have heights up to 20' before the material is hauled off-site. The grading plan attached confirms no net fills within the floodway, providing a no-rise in BFE.

The following documents are included with this submittal:

- Completed Leavenworth County Floodplain Development Permit
- Annotated FEMA FIRM panel effective 7/16/2015
- Full set of engineering site plans for the project
- Cross section of proposed grading showing no net fills within the floodway
- Floodplain Fills DWR Permit

If you have any questions or concerns, please contact our office below.

Sincerely,

Jacob Schweikert

Jacob Schweikert, PE

GEORGE BUTLER ASSOCIATES, INC.

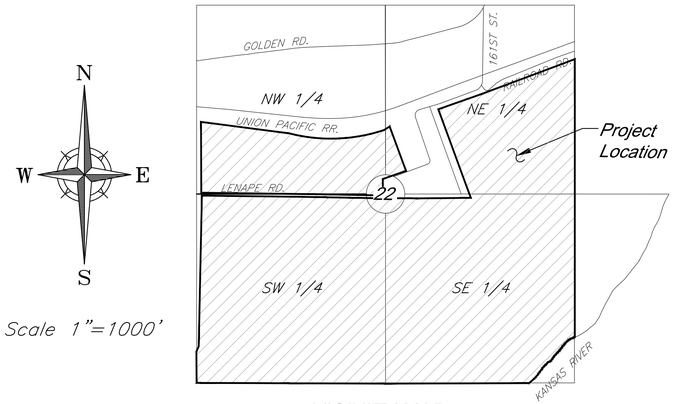
SPECIAL USE PERMIT SITE PLAN
FOR
LENAPE SAND OPERATION
Section 22-Township 12S-Range 22E
IN
LEAVENWORTH COUNTY, KANSAS

G:\16427\Civil 3D\Production Drawings\Special Use Permit\16427C0100.dwg Layout: 1 Cover Sheet -- Tuesday September 23, 2025, 2:26pm -- Copyright 2025, George Butler Associates, Inc.

SUP PERMIT BOUNDARY DESCRIPTION:

A tract of land over a portion of the Northwest, Northeast, Southwest and Southeast Section 22, Township 12 South, Range 22 East, of Leavenworth County, Kansas, more particularly described as follows:

BEGINNING at the North westerly corner of this SUP PERMIT BOUNDARY thence S84°49'09"E a distance of 1245.06 feet, said point also being a point on a non-tangent curve; thence Easterly, along a curve to the left, having a radius of 2348.16 feet, a central angle of 32°43'54", a distance of 1341.45 feet, thence N55°26'49"E a distance of 94.09 feet, thence S22°28'51"E, a distance of 661.46 feet, thence S68°30'32"W, a distance of 343.39 feet, thence S02°38'11"E a distance of 268.68 feet, thence N87°29'03"E, a distance of 1226.92 feet, thence N22°20'46"W, a distance of 1318.47 feet, thence N67°34'56"E a distance of 2031.74 feet, thence S02°15'53"E a distance of 3885.72 feet, thence S42°36'55"W a distance of 906.97 feet, thence S87°45'55"W a distance of 4644.77 feet, thence N02°42'34"W a distance of 437.46 feet, thence N21°33'21"E a distance of 79.21 feet, thence N01°03'15"W a distance of 2148.27 feet, thence S88°25'46"E a distance of 10.29 feet, thence N02°26'46"W a distance of 990.90 feet, to the POINT OF BEGINNING.



Scale 1"=1000'

VICINITY MAP
Section 22-Township 12S-Range 22E

INDEX OF SHEETS

Sht. No.	Description
1	Cover Sheet
2	Typical Sections
3	Site Plan
4	Overall Grading Plan
5 - 18	Grading Plan
19	Erosion Control Plan
20	Lighting Plan
21	Landscape Plan
22	Truck Turning Circulation
23	Construction Details
24	Reclamation Plan

NOTE:

ALL CONSTRUCTION SHALL CONFORM TO LEAVENWORTH COUNTY TECHNICAL SPECIFICATIONS.

FLOODPLAIN:

The site lies within areas designated as Regulatory Floodway Areas in Zone AE, per FEMA FIRM 20103C0142G, dated July 16, 2015.

(See Exhibit 2 of the Storm Report)

BENCHMARK:

DESIGNATION:	WY 51
PID:	KE1714
CONTROL POINT:	LVCO-0151
NORTHING:	263019.26
EASTING:	2190504.82
ELEVATION:	787.7

LOCATION DESCRIPTION:
THE STATION IS A MONUMENT BOX IN THE CENTER OF 142ND STREET 36.58 M (120.0 FT) SOUTH OF THE CENTER LINE OF LORING DRIVE. THE STATION IS 33.85 M (111.1 FT) NORTH NORTHWEST OF A SPIKE AND WASHER IN THE WEST SIDE OF THE POWER POLE, 21.23 M (69.7 FT) NORTHEAST OF A SPIKE AND WASHER IN THE NORTH FACE OF A POWER POLE, 16.84 M (55.2 FT) NORTH NORTHEAST OF A SPIKE AND WASHER IN THE WEST FACE OF A 92 INCH ELM TREE, 13.76 M (45.1 FT) SOUTHWEST OF A NAIL AND WASHER IN THE WEST FACE OF THE POWER POLE, 7.06 M (23.2 FT) SOUTHEAST OF A NAIL AND WASHER IN THE TOP OF SOUTH END GUARD RAIL POST.

UTILITY CONTACTS

Electric Service: Evergy
Tel (888) 471-5275
www.evergy.com/

Communications: AT&T
www.att.com/local/kansas/de-soto

RG Fiber
www.rgfiber.com/

Spectrum
www.spectrum.com/internet-service/kansas/de-soto

Zoom Fiber
www.zoomfiber.com/

Gas: Atmos Energy
Tel (888) 286-6700
www.atmosenergy.com/

CAUTION!
Numerous Utilities on site. Contractor shall verify location and elevation of all utilities prior to commencing construction.

811 Know what's below. Call before you dig.
Kansas One Call 811 or 1-800-DIG-SAFE(800-344-7233)

JACOB SCHWEIKERT LICENSED 31279 9/23/2025 KANSAS PROFESSIONAL ENGINEER

PROJECT ENGINEER: DATE:

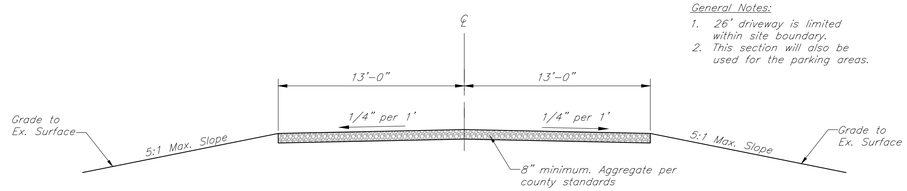
PREPARED FOR:
KAW VALLEY COMPANIES, INC.
5600 KANSAS AVENUE
KANSAS CITY, KANSAS 66106
CONTACT: EVAN HOROWITZ

PREPARED BY:
GEORGE BUTLER ASSOCIATES, INC.
9801 RENNER BOULEVARD
LENEXA, KANSAS 66219-9745
[redacted]

OWNER:
KAW VALLEY COMPANIES LLC
5600 KANSAS AVE
KANSAS CITY, KS 66106

CAROLYN E. SPRING TRUST
425 CRESCENT CIRCLE
ALBERT LEA, MN 56007-1482

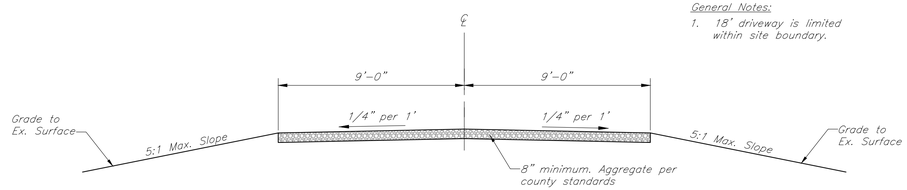
GBA architects engineers
9801 Renner Boulevard
[redacted]



General Notes:
1. 26' driveway is limited within site boundary.
2. This section will also be used for the parking areas.

26' PRIVATE DRIVE - SECTION

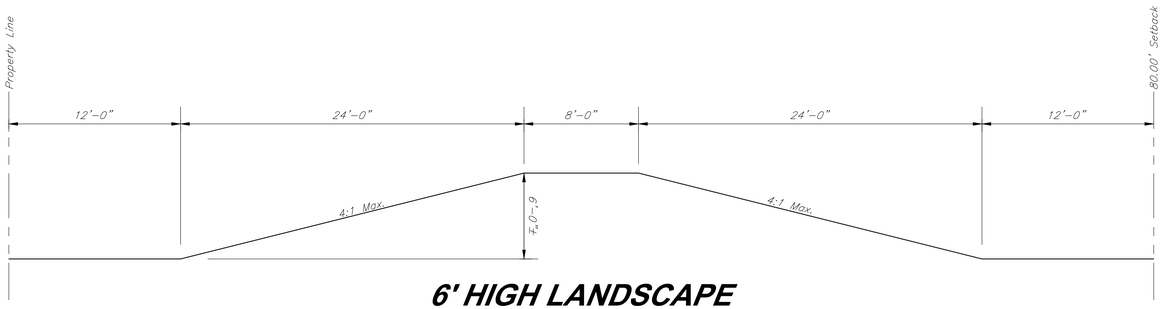
Scale: 1" = 5'



General Notes:
1. 18' driveway is limited within site boundary.

18' PRIVATE DRIVE - SECTION

Scale: 1" = 5'



6' HIGH LANDSCAPE BERM - SECTION

Scale: 1" = 5'

GBA
9801 Renner Blvd., Ste. 300
Lenexa, KS 66219
913.492.0400
gbateam.com

LENAPE SAND OPERATION

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

JACOB SCHWEIKERT LICENSED 31279 9/23/2025 KANSAS PROFESSIONAL ENGINEER

REVISION

PROJECT NUMBER
16477.00

DATE
6/19/2025

DESIGNED
JMS

DRAWN
ELS/GAN

REVIEWED
JMS

SHEET TITLE

Typical Sections

SHEET NUMBER

2

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Proposed Use of Site

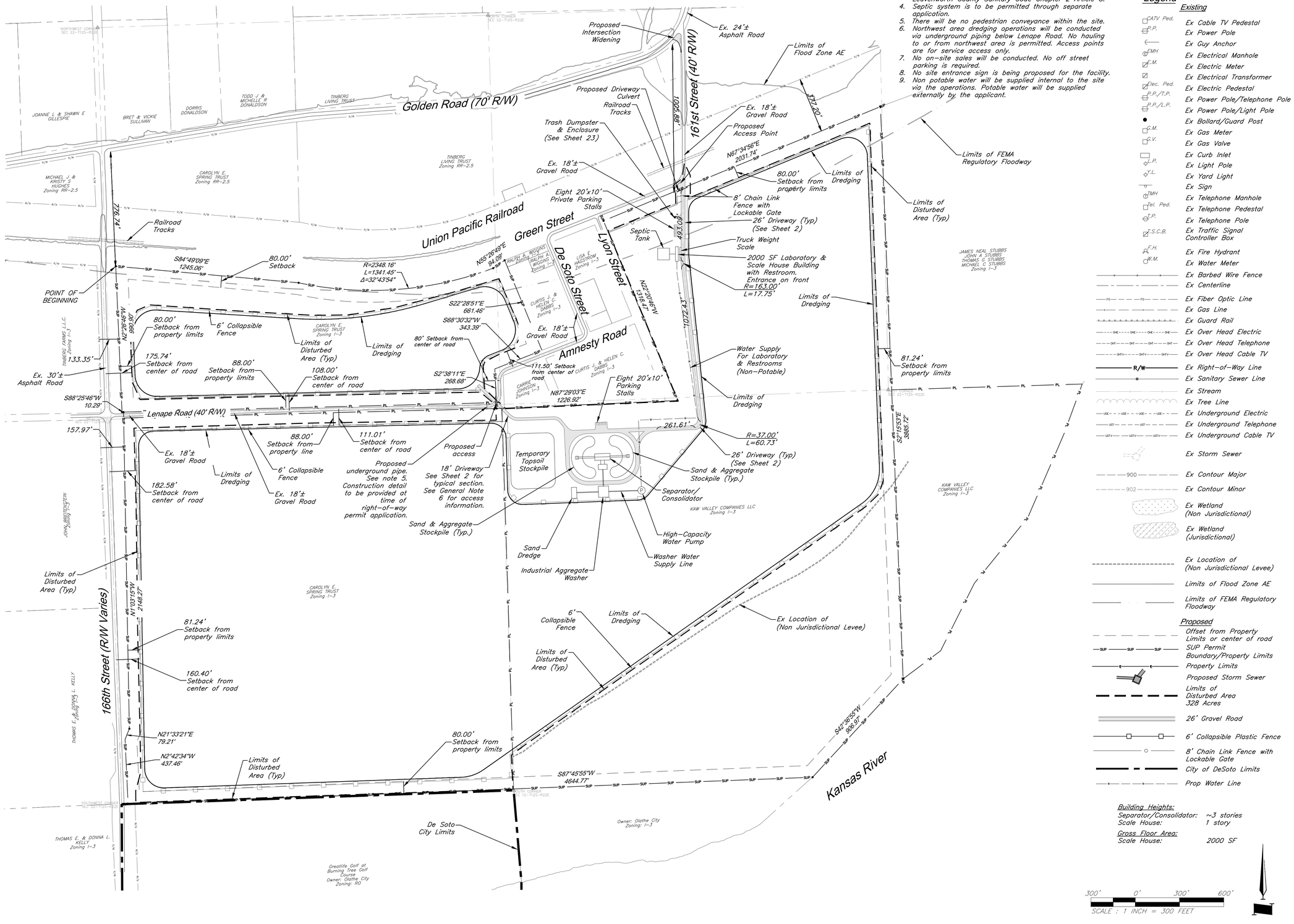
Kaw Valley Companies, Inc. ("Kaw Valley") requests approval of a Special Use Permit to utilize the approximately 435–acre site located at 166th and Lenape Road in rural Leavenworth County, Kansas (the "Property") for a sand excavation and stockpiling operation (the "Sand Operation")

General Notes

1. Collapsible fence will only be used where dredging activities take place and will expand as activity expands.
2. Septic tank system with minimum 5 day holding capacity and not less than 2,000 gallons will be designed by a licensed engineer. Septic tank requires Floodplain permits and will obtained for the septic tank prior to construction. The septic tank will be anchored to meet state guidelines. A contract with a Leavenworth County septic hauler to regularly pump the septic tank will be obtained and provided to Leavenworth County Planning & Zoning prior to use of the system.
3. Septic tank is to be designed in accordance with Leavenworth County Sanitary Code Chapter 2 Article 8.
4. Septic system is to be permitted through separate application.
5. There will be no pedestrian conveyance within the site.
6. Northwest area dredging operations will be conducted via underground piping below Lenape Road. No hauling to or from northwest area is permitted. Access points are for service access only.
7. No on–site sales will be conducted. No off street parking is required.
8. No site entrance sign is being proposed for the facility.
9. Non potable water will be supplied internal to the site via the operations. Potable water will be supplied externally by the applicant.

CAUTION!

Numerous Utilities on Site. Contractor shall verify location and elevation of all utilities prior to commencing construction.



Legend

Existing

Proposed

Building Heights:
Separator/Consolidator: ~3 stories
Scale House: 1 story

Gross Floor Area:
Scale House: 2000 SF

300' 0' 300' 600'
SCALE : 1 INCH = 300 FEET

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LENAPE SAND OPERATION

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

JACOB SCHWEIKERT LICENSED PROFESSIONAL ENGINEER 31279 9/23/2025 KANSAS

REVISION

PROJECT NUMBER 16477.00

DATE 6/19/2025

DESIGNED JMS

DRAWN ELS/GAN

REVIEWED JMS

SHEET TITLE

Site Plan

SHEET NUMBER 3

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G:\16477\Civil 3D\Production Drawings\Special Use Permit\1647700200.dwg Layout: 3 Site Plan -- Tuesday, September 23, 2025, 2:26pm -- © Copyright 2025, George Butler Associates, Inc.

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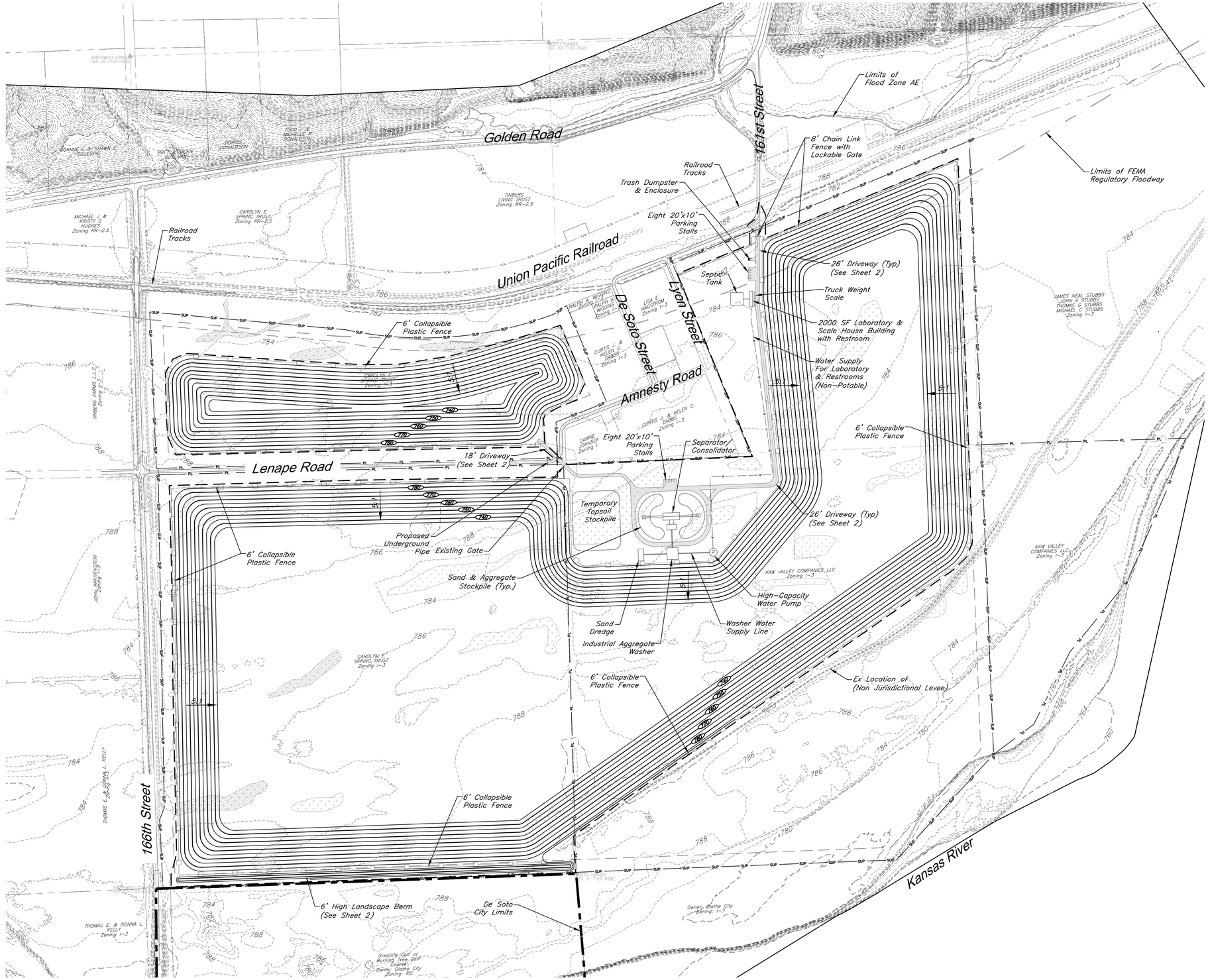
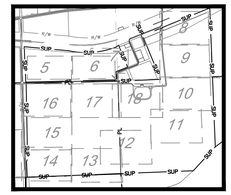


CAUTION!

Numerous Utilities on Site. Contractor shall verify location and elevation of all utilities prior to commencing construction.



KEY MAP

Not to Scale

General Notes

1. Collapsible Plastic Fence will only be used where dredging activities take place and will expand as activity expands.
2. Septic tank system with minimum 5 day holding capacity and not less than 2,000 gallons will be designed by a licensed engineer. Septic tank requires Floodplain permits and will obtained for the septic tank prior to construction. The septic tank will be anchored to meet state guidelines. A contract with a Leavenworth County septic hauler to regularly pump the septic tank will be obtained and provided to Leavenworth County Planning & Zoning prior to use of the system.
3. Septic tank is to be designed in accordance with Leavenworth County Sanitary Code Chapter 2 Article 8.
4. Septic system is to be permitted through separate application.
5. There will be no pedestrian conveyance within the site.
6. No offsite areas drain to this site. No runoff from this site affects adjacent properties.

Grading Legend

- 1010 — Proposed Contours
- 900 — Existing Contour Major
- 902 — Existing Contour Minor
- Existing Wetland (Non Jurisdictional)
- Existing Wetland (Jurisdictional)
- Limits of Flood Zone AE
- Limits of FEMA Regulatory Floodway
- Ex Location of (Non Jurisdictional Levee)
- Limits of Disturbed Area 328 Acres
- 26' Gravel Road
- 6' Collapsible Plastic Fence
- 8' Chain Link Fence with Lockable Gate
- SUP — SUP Permit Boundary
- Property Limits
- Drainage Flow Arrow
- City of DeSoto Limits

300' 0' 300' 600'

SCALE : 1 INCH = 300 FEET

GBA
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Lenexa, KS 66219
913.492.0400
gbateam.com

LENAPE SAND OPERATION

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

JACOB SCHWEIKERT
LICENSED
31279
9/23/2025
KANSAS
PROFESSIONAL ENGINEER

REVISION

PROJECT NUMBER
16477.00

DATE
6/19/2025

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JMS

DRAWN
ELS/GAN

REVIEWED
JMS

SHEET TITLE

Overall Grading Plan

SHEET NUMBER
4

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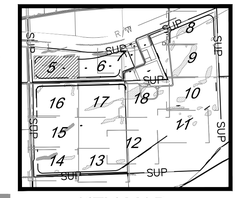

KEY MAP
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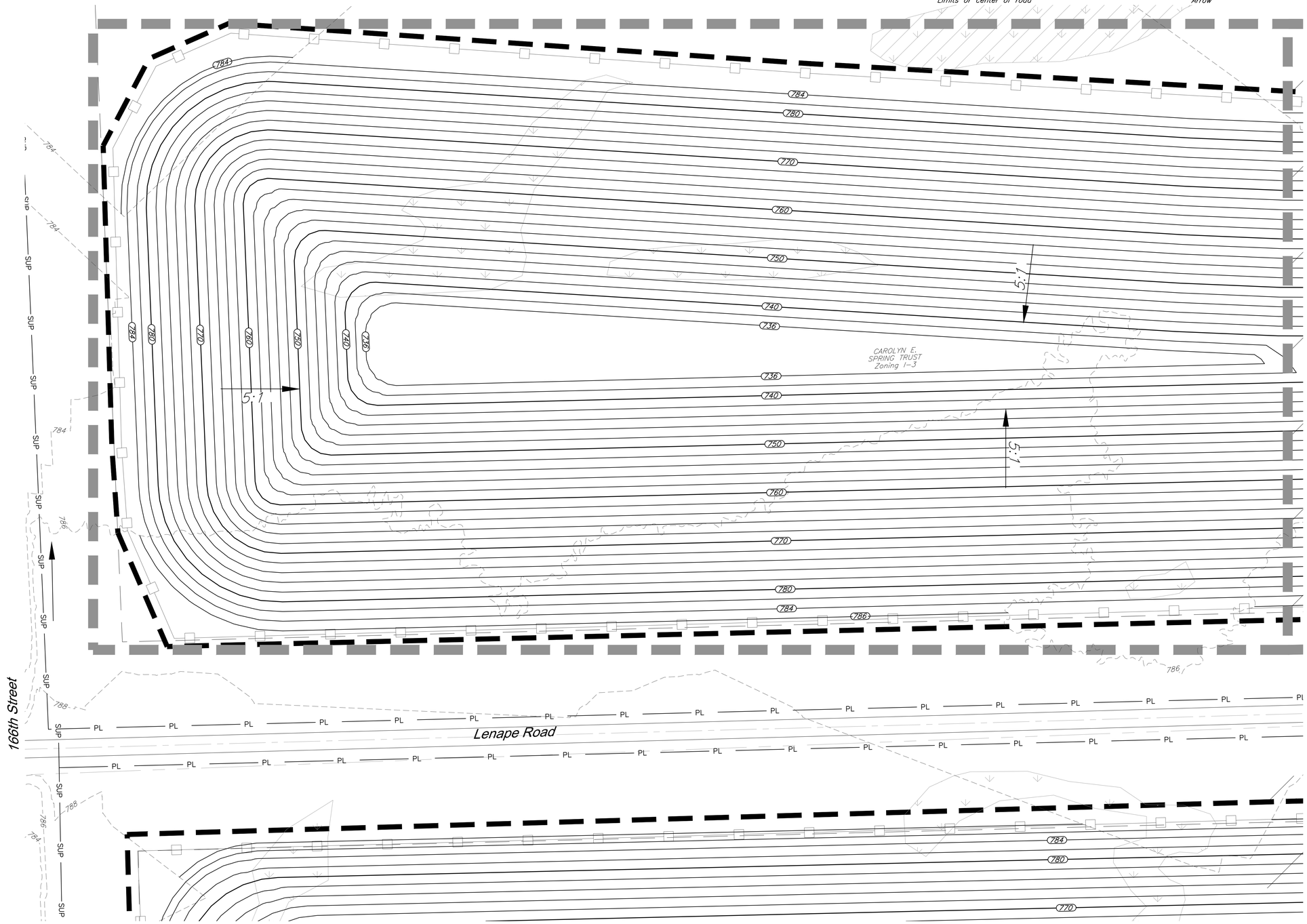

50' 0' 50' 100'
SCALE : 1 INCH = 50 FEET

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LENAPE SAND OPERATION

Kaw Valley Companies, Inc.
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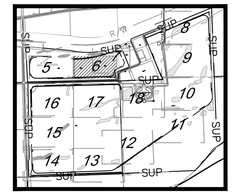

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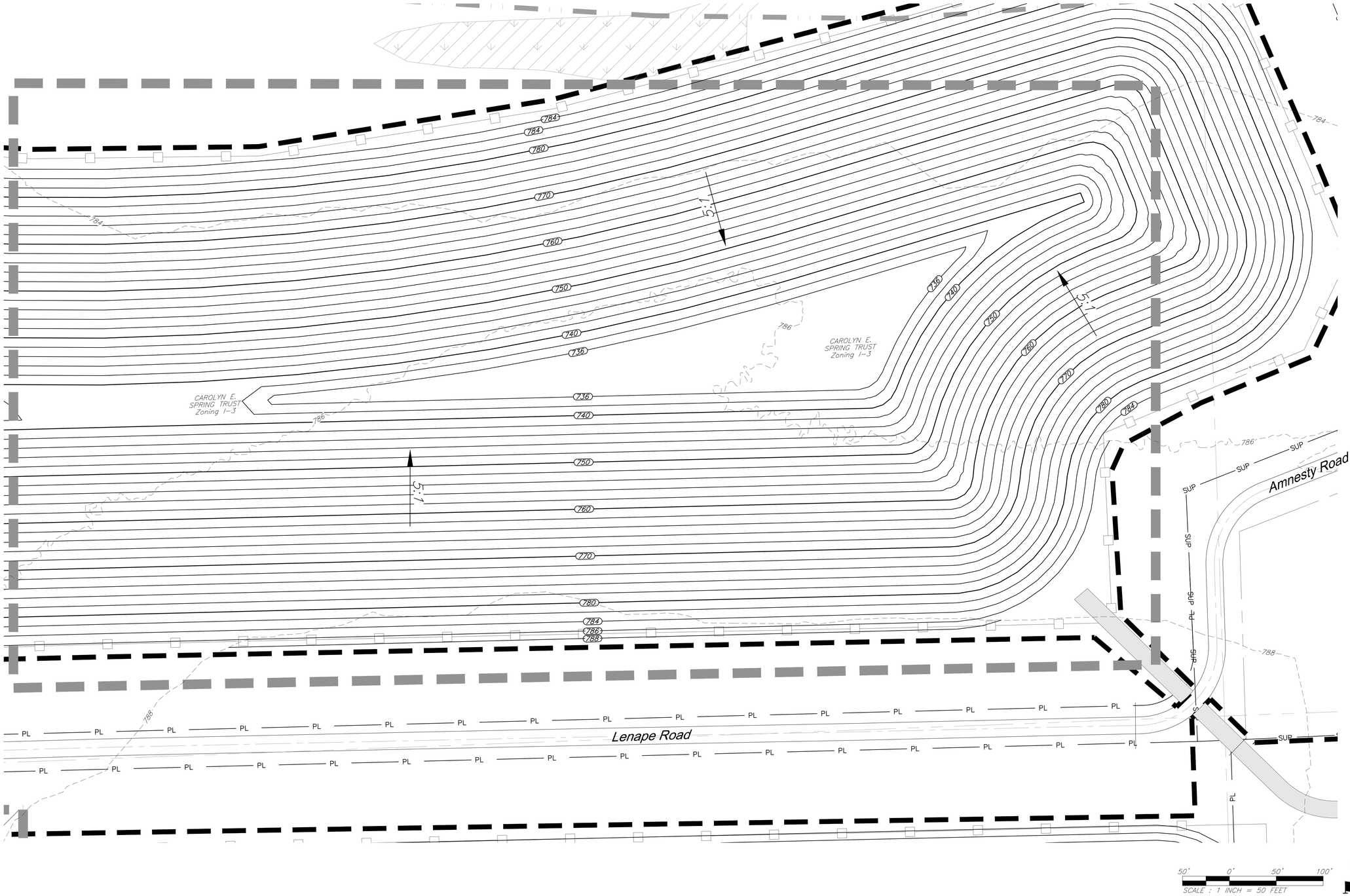

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LENAPE SAND OPERATION

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

JACOB SCHWEIKERT LICENSED 31279 9/23/2025 KANSAS PROFESSIONAL ENGINEER

REVISION

PROJECT NUMBER
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6/19/2025

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SHEET NUMBER

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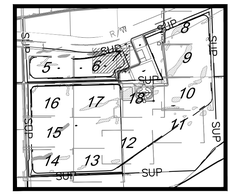

KEY MAP
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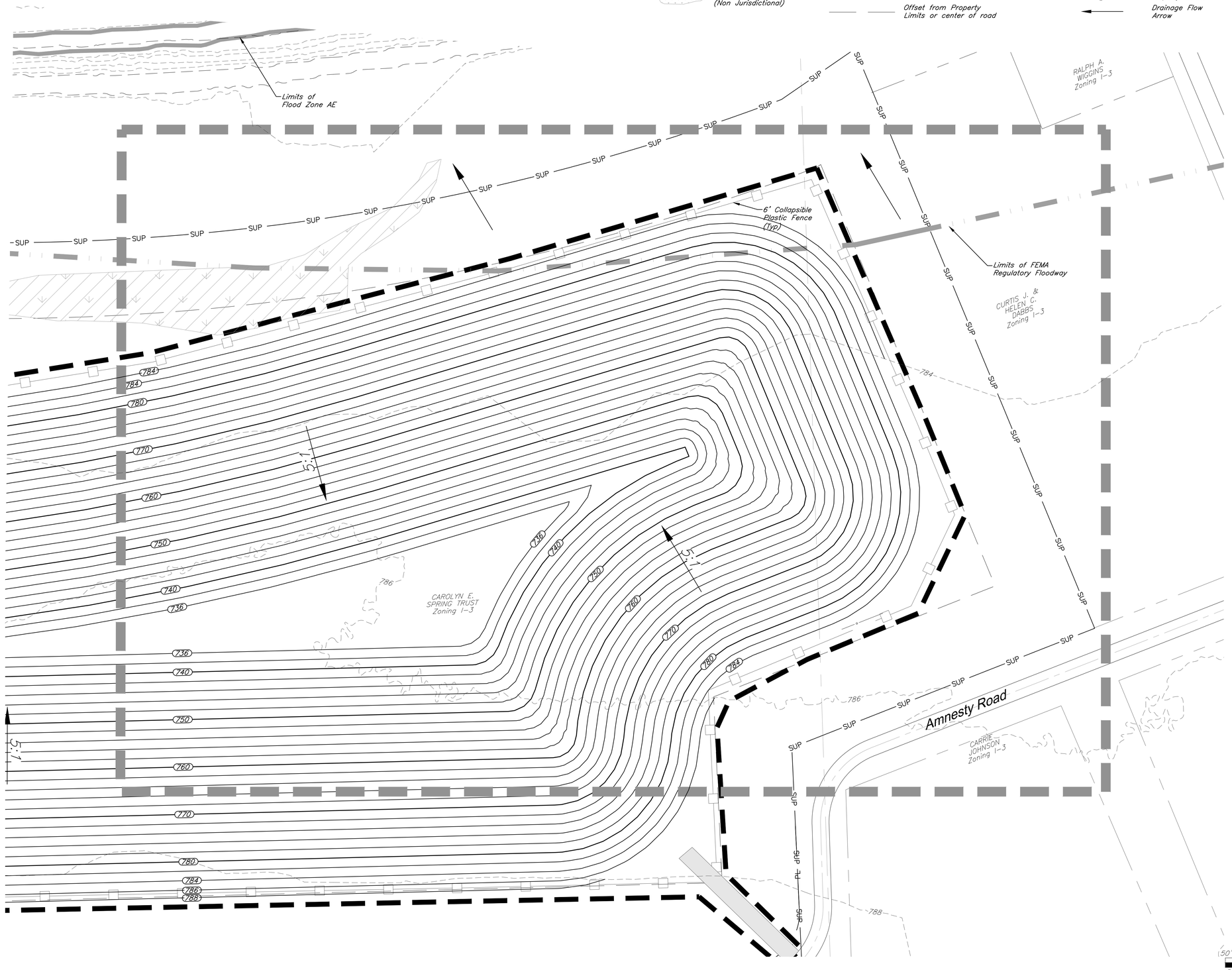

GBA
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Lenexa, KS 66219
913.492.0400
gbateam.com

LENAPE SAND OPERATION

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

JACOB SCHWEIKERT LICENSED 31279 9/23/2025 KANSAS PROFESSIONAL ENGINEER

REVISION

PROJECT NUMBER
16477.00

DATE
6/19/2025

DESIGNED
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ELS/GAN

REVIEWED
JMS

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Grading Plan

SHEET NUMBER
7

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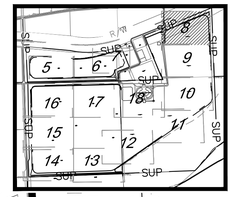

KEY MAP
Not to Scale

161st Street

Union Pacific Railroad

Proposed Driveway Culvert

8' Chain Link Fence with Lockable Gate

26' Driveway

5:1

Limits of FEMA Regulatory Floodway

KAW VALLEY COMPANIES LLC
Zoning I-3

788 786 784 782 780 770 760 750 740 730

50' 0' 50' 100'
SCALE : 1 INCH = 50 FEET

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LENAPE SAND OPERATION

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

JACOB SCHWEIKERT
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JMS

SHEET TITLE
Grading Plan

SHEET NUMBER
8

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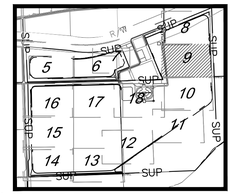
- Offset from Property Limits or center of road
- 26' Gravel Road
- 6' Collapsible Plastic Fence
- 8' Chain Link Fence with Lockable Gate
- SUP — SUP Permit Boundary
- Property Limits
- Drainage Flow Arrow



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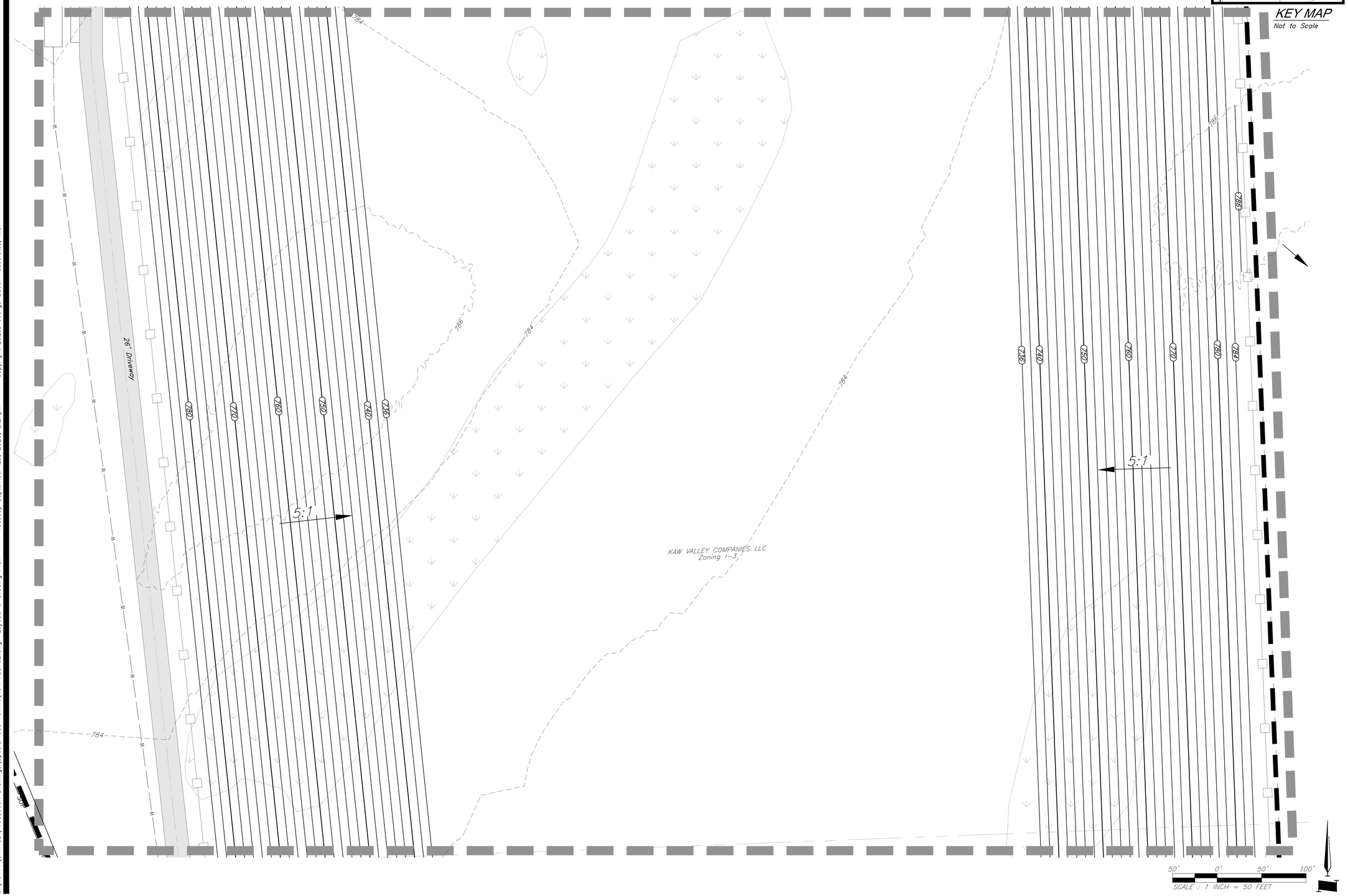

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166th St. & Lenape Rd.
Leavenworth County, Kansas

JACOB SCHWEIKERT
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31279
9/23/2025
KANSAS
PROFESSIONAL ENGINEER

REVISION

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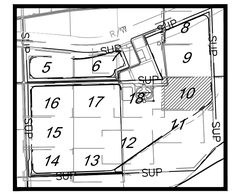
- Drainage Flow Arrow



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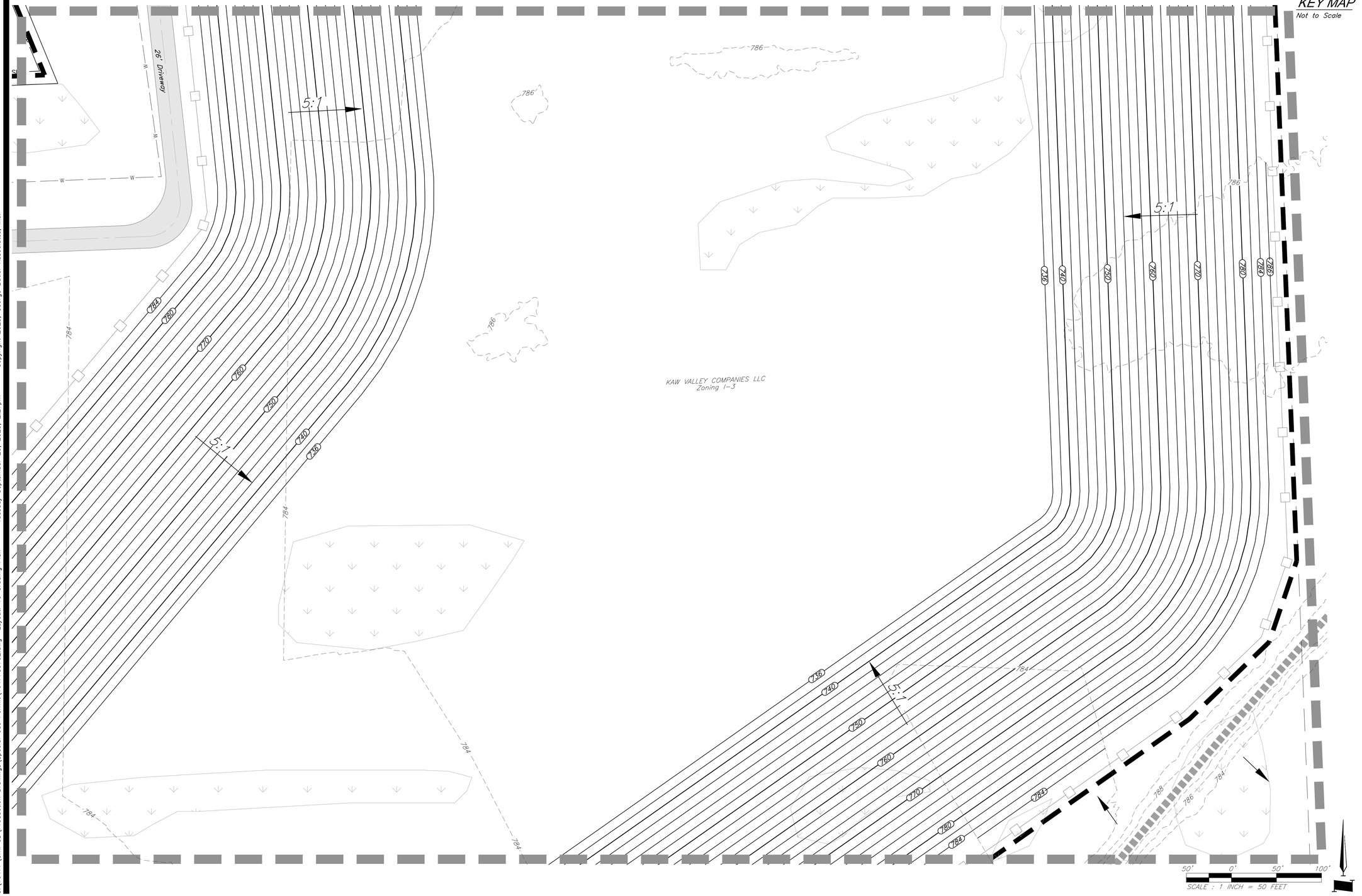

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- SUP — SUP Permit Boundary
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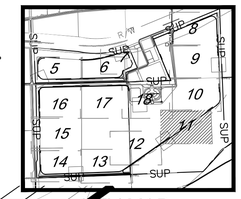
- Drainage Flow Arrow



KEY MAP
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KAW VALLEY COMPANIES LLC
Zoning I-3

5:1

5:1

50' 0' 50' 100'
SCALE : 1 INCH = 50 FEET

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Grading Legend

- Proposed Contours (1010)
- Existing Contour Major (900)
- Existing Contour Minor (902)
- Enlargement Line
- Existing Wetland (Non Jurisdictional)
- Existing Wetland (Jurisdictional)
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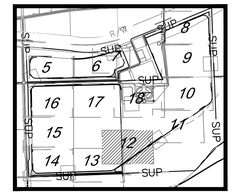

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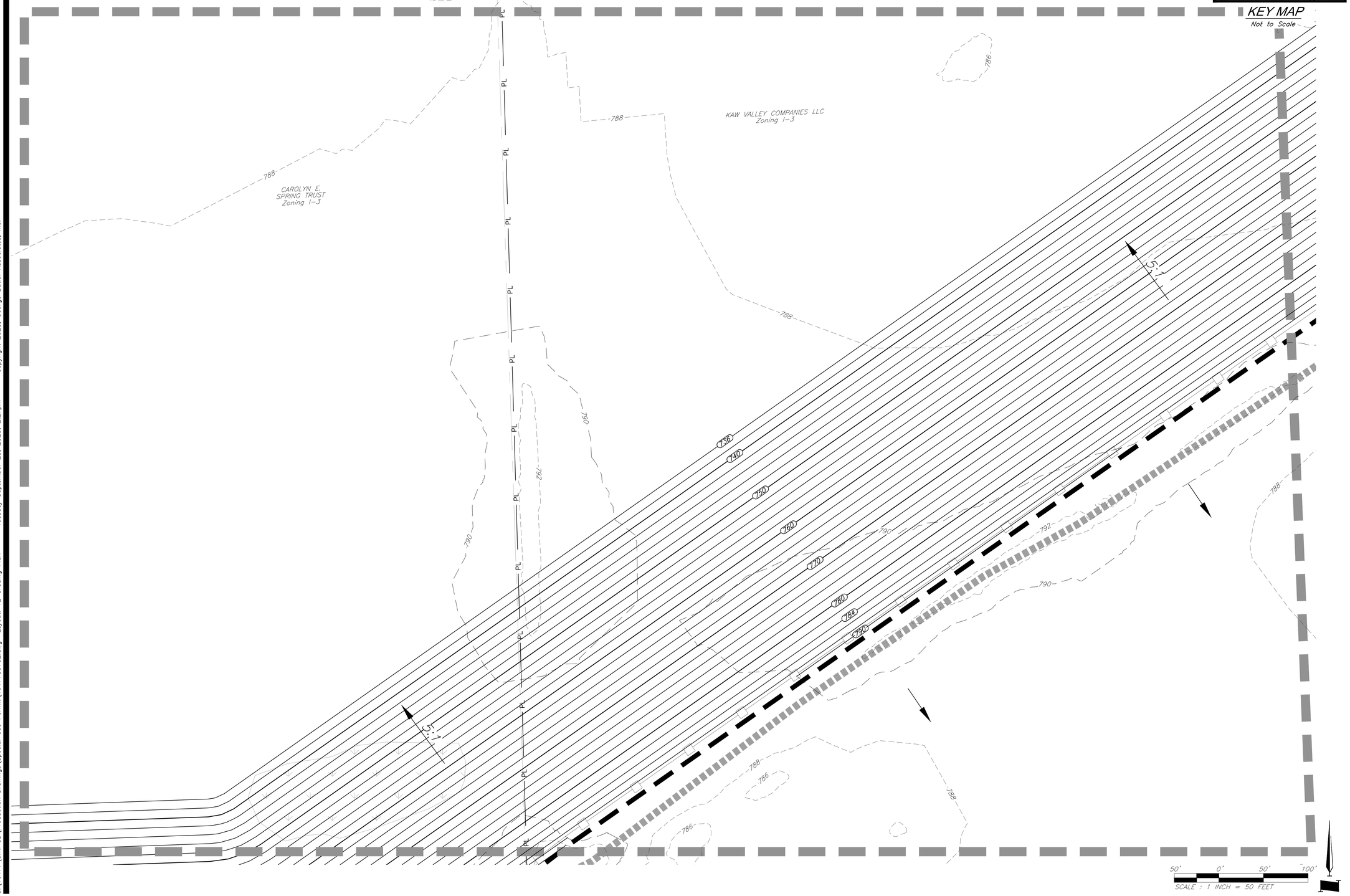

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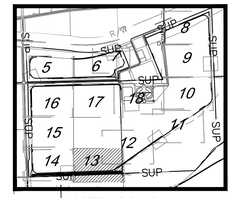
- City of DeSoto Limits
- 26' Gravel Road
- 6' Collapsible Plastic Fence
- 8' Chain Link Fence with Lockable Gate
- SUP — SUP Permit Boundary
- PL — Property Limits
- Drainage Flow Arrow



KEY MAP
Not to Scale

CAROLYN E. SPRING TRUST
Zoning I-3

6' High Landscape Berm

Greatlife Golf at Burning Tree Golf Course
Owner: Olathe City
Zoning: RO (DeSoto)

De Soto City Limits

SCALE : 1 INCH = 50 FEET

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Leavenworth County, Kansas

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- 8' Chain Link Fence with Lockable Gate
- SUP — SUP Permit Boundary
- P.L. — Property Limits
- Drainage Flow Arrow

KEY MAP
Not to Scale

166th Street

5·1

CAROLYN E. SPRING TRUST
Zoning I-3

6' High Landscape Berm

6' Collapsible Fence

6' High Landscape Berm

Greatlife Golf at Burning Tree Golf Course
Owner: Olathe City
Zoning: RO (DeSoto)

De Soto City Limits

SCALE : 1 INCH = 50 FEET

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LENAPE SAND OPERATION

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166th St. & Lenape Rd.
Leavenworth County, Kansas

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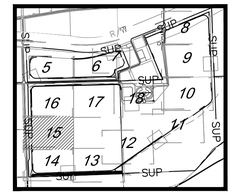

KEY MAP
Not to Scale

166th Street

SUP

786 784 782 780 778 776 774 772 770 768 766 764 762 760 758 756 754 752 750 748 746 744 742 740 738

5:1

CAROLYN E. SPRING TRUST
Zoning I-3

50' 0' 50' 100'
SCALE : 1 INCH = 50 FEET

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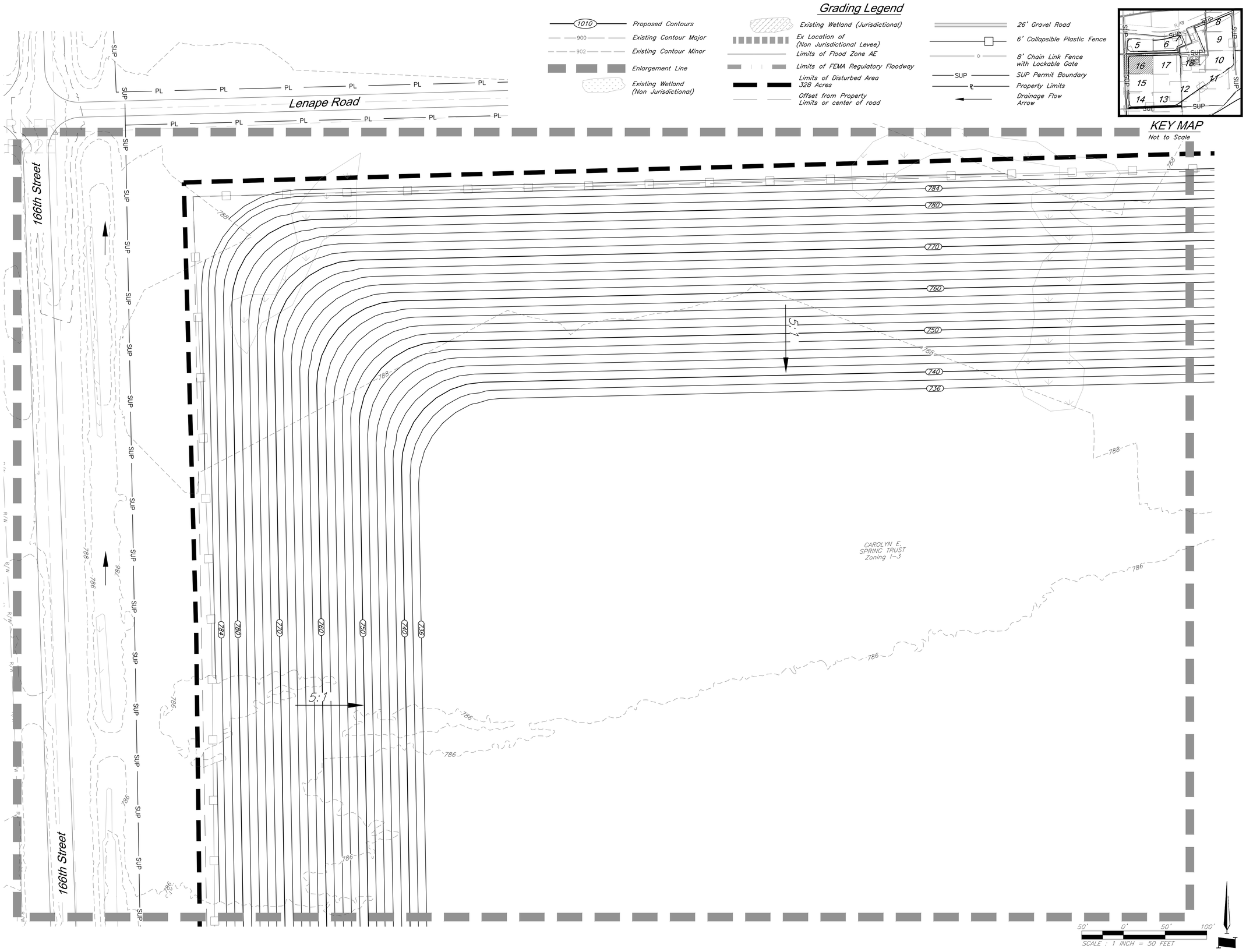

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- PL — Property Limits
- Drainage Flow Arrow

Lenape Road

CAROLYN E. SPRING TRUST Zoning I-3

CAROLYN E. SPRING TRUST Zoning I-3

KEY MAP
Not to Scale

SCALE : 1 INCH = 50 FEET

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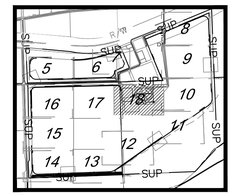

KEY MAP
Not to Scale

Lenape Road

CARRIE JOHNSON Zoning I-3

CURTIS J. & HELEN C. DABBS I-3

Service Access Road (Non Hauling)

6' Collapsible Fence

Eight 20'x10' Parking Stalls

26' Gravel Road

Temporary Topsoil Stockpile

Separator/ Consolidator

Sand & Aggregate Stockpile (Typ.)

Sand Dredge

Industrial Aggregate Washer

Washer Water Supply Line

High-Capacity Water Pump

5:1

CAROLYN E. SPRING TRUST Zoning I-3

KAW VALLEY COMPANIES LLC Zoning I-3

SCALE : 1 INCH = 50 FEET

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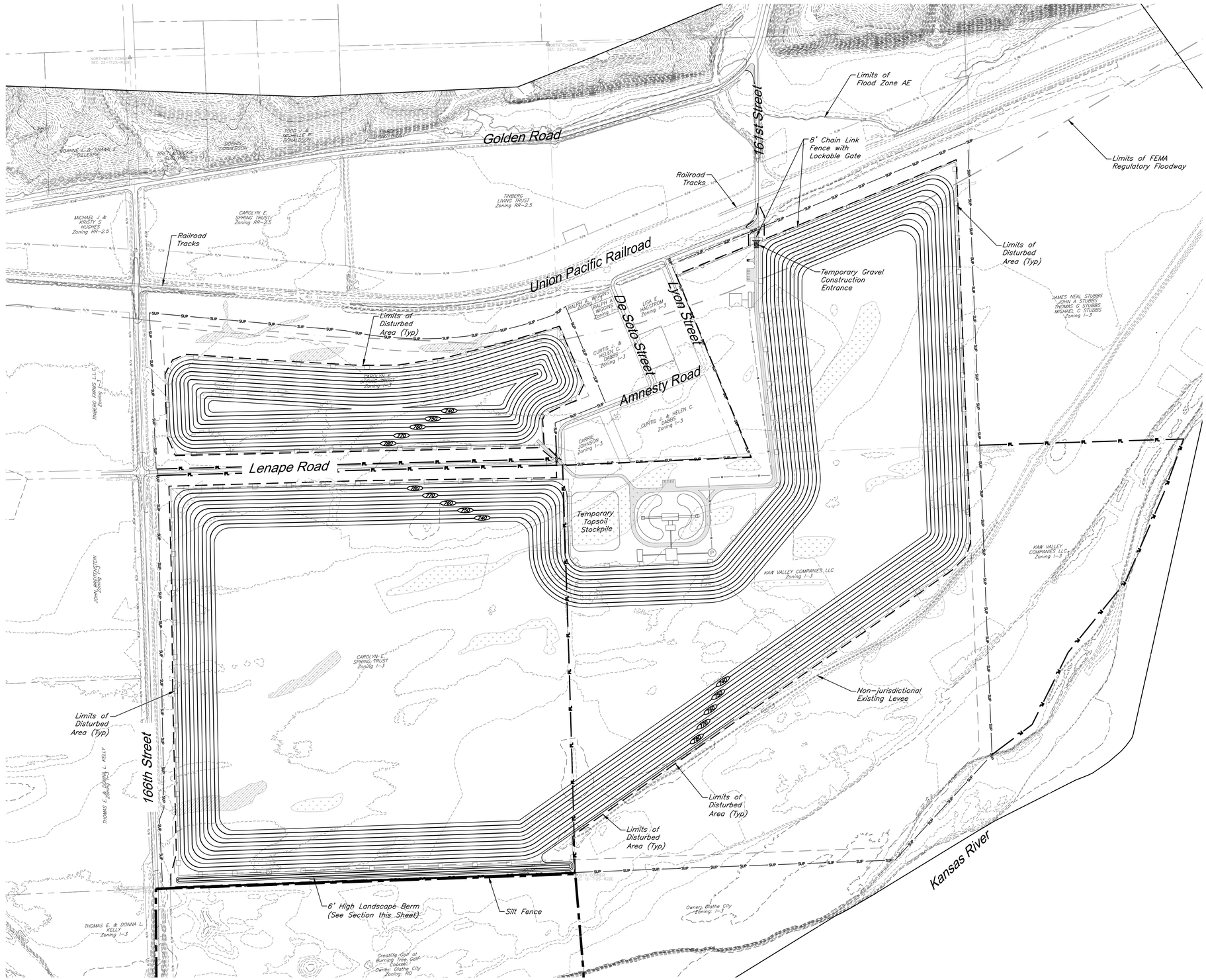
G:\16477\Civil 3D\Production Drawings\Special Use Permit\16477C4000.dwg Layout: 19 Erosion Control Plan -- Tuesday September 23, 2025, 2:27pm -- Copyright 2025, George Butler Associates, Inc.

CAUTION!

Numerous Utilities on Site. Contractor to verify location and elevation of all utilities prior to commencing construction.



Erosion Control Legend

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- 902 — Existing Contour Minor
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- Limits of Disturbed Area 328 Acres
- 26' Gravel Road
- 8' Chain Link Fence with Lockable Gate
- 6' Collapsible Plastic Fence
- SUP — SUP Permit Boundary
- Property Limits
- Silt Fence (See Detail Sheet 23)
- Temporary Gravel Construction Entrance (See Detail Sheet 23)

General Notes

1. All area to drain internally to the sand operation.
2. Temporary erosion control measures are to be implemented as needed as sand dredging operation progresses.
3. Collapsible fence will only be used where dredging activities take place and will expand as activity expands.

Erosion Control:

4. The Contractor is responsible for providing erosion and sediment control BMP's to prevent sediment from reaching paved areas, storm sewer systems, drainage courses, and adjacent properties. In the event the prevention measures are not effective, the contractor shall remove any debris, silt, or mud and restore the Right-Of-Way, or adjacent properties to original or better condition.
5. The Contractor shall seed all disturbed areas within the Public Street Right-of-Way unless otherwise noted in the plans.
6. No trees shall be damaged or removed without prior authorization from owner unless otherwise shown on this plan.

Earthwork:

7. Disposal of all debris shall be performed by the contractor in strict accordance with all applicable local codes and ordinances.
8. Slopes shall be constructed to a maximum slope of 3:1 (Horiz:Vert).
9. Unless otherwise noted, all spot elevations and contours are shown to "finish" grade surface. All temporary slopes and excavations should conform to Occupational Safety and Health Administration (OSHA) standards for the Construction Industry (29 CFR part 1026, subpart P).

300' 0' 300' 600'

SCALE : 1 INCH = 300 FEET

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LENAPE SAND OPERATION

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Leavenworth County, Kansas

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Erosion Control Plan

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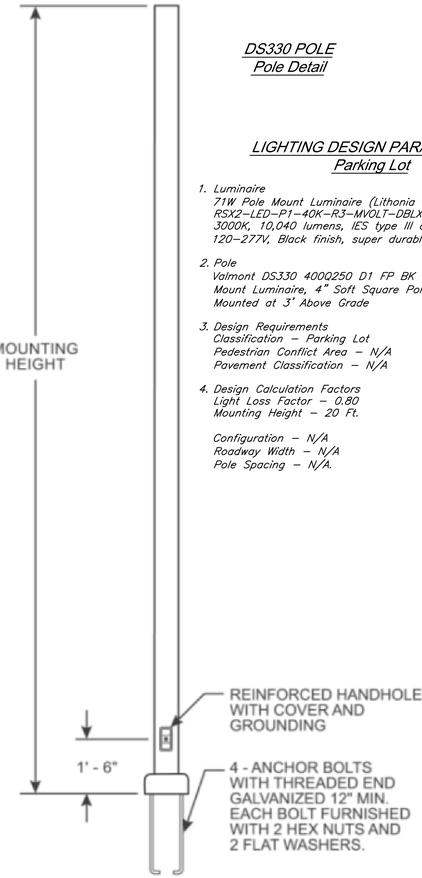
DS330 POLE
Pole Detail



LIGHTING DESIGN PARAMETERS
Parking Lot

1. Luminaire
   71W Pole Mount Luminaire (Lithonia Lighting, RSX2-LED-P1-40K-R3-MVOLT-DBLXD; Package 1, 3000K, 10,040 lumens, IES type III asymmetric, 120-277V, Black finish, super durable)
2. Pole
   Valmont DS330 400Q250 D1 FP BK FBC BK (25' Pole Mount Luminaire, 4" Sqft Square Pole, Black Color); Mounted at 3' Above Grade
3. Design Requirements
   Classification – Parking Lot
   Pedestrian Conflict Area – N/A
   Pavement Classification – N/A
4. Design Calculation Factors
   Light Loss Factor – 0.80
   Mounting Height – 20 Ft.

   Configuration – N/A
   Roadway Width – N/A
   Pole Spacing – N/A.

GENERAL NOTES

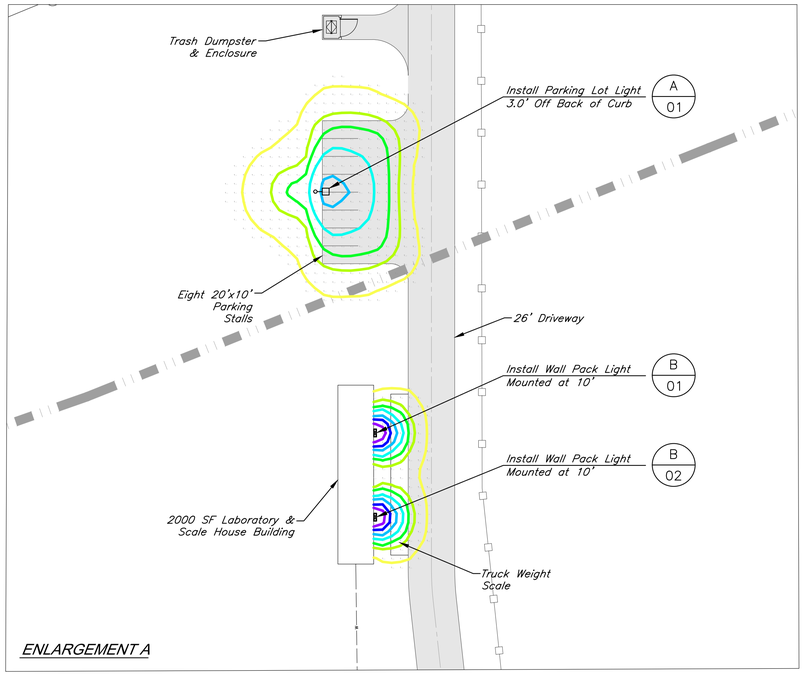
1. Site lighting and conduits for power other than primary/secondary conduits below grade shall be buried a minimum of 36" deep unless noted otherwise. Conduits above grade outdoors or exposed to potential damage shall be rigid metal conduit.
2. Lighting circuits will be fed from panelboard located in proposed building.

Lighting Table (North Parking Lot)	
Design Minimum Average Maintained Illuminance	0.5 Fc
Design Maximum Average Maintained Illuminance	4.7 Fc
Calculated Average Maintained Illuminance	1.98 Fc
Calculated Average/Min	3.96
Calculated Max/Min	9.40

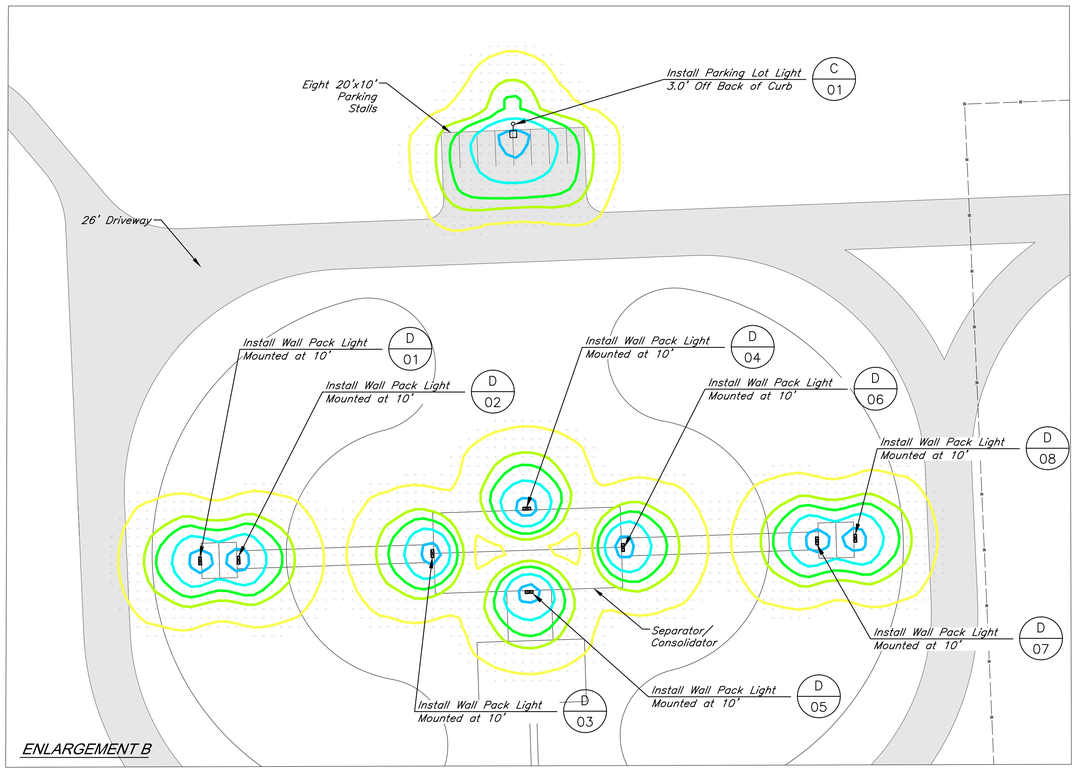
Lighting Table (South Parking Lot)	
Design Minimum Average Maintained Illuminance	0.5 Fc
Design Maximum Average Maintained Illuminance	4.7 Fc
Calculated Average Maintained Illuminance	1.94 Fc
Calculated Average/Min	3.88
Calculated Max/Min	9.40

LEGEND

- Single Parking Lot Light RSX2-LED-P1-40K-R3-MVOLT-DBLXD Mounted at 20'
- Wall Pack Light XTOR4B-W-BK-PC1
- A / 01 — Circuit Number / Luminaire Number



ENLARGEMENT A

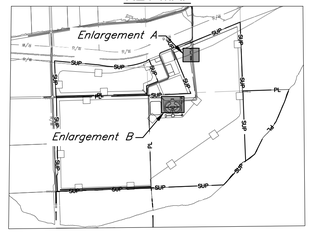


ENLARGEMENT B

CAUTION!

Numerous Utilities on Site. Contractor shall verify location and elevation of all utilities prior to commencing construction.

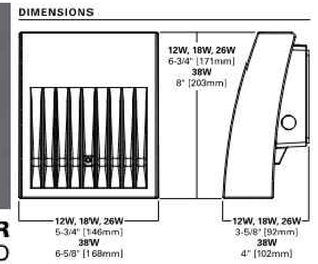
KEY MAP





XTOR
CROSSTOUR LED

DIMENSIONS



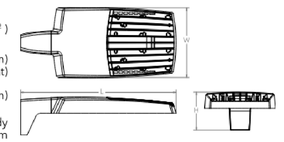


RSX2 LED
Area Luminaire

Buy American

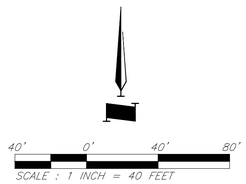
Specifications

EPA (ft²@0°):	0.69 ft² (0.06 m²)
Length:	29.3" (74.4 cm) (SPA mount)
Width:	13.4" (34.0 cm)
Height:	3.0" (7.6 cm) Main Body 7.2" (18.3 cm) Arm
Weight: (SPA mount)	30.0 lbs (13.6 kg)



ISOLINE LEGEND

- 0.1 foot-candles
- 0.5 foot-candles
- 1.0 foot-candles
- 2.0 foot-candles
- 4.0 foot-candles
- 7.0 foot-candles
- 11.0 foot-candles



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LENAPE SAND OPERATION
Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

JACOB SCHWEIKERT LICENSED 31279 9/23/2025 KANSAS PROFESSIONAL ENGINEER

REVISION

PROJECT NUMBER
16477.00

DATE
6/19/2025

DESIGNED
JMS

DRAWN
ELS/GAN

REVIEWED
JMS

SHEET TITLE
Lighting Plan

SHEET NUMBER
20

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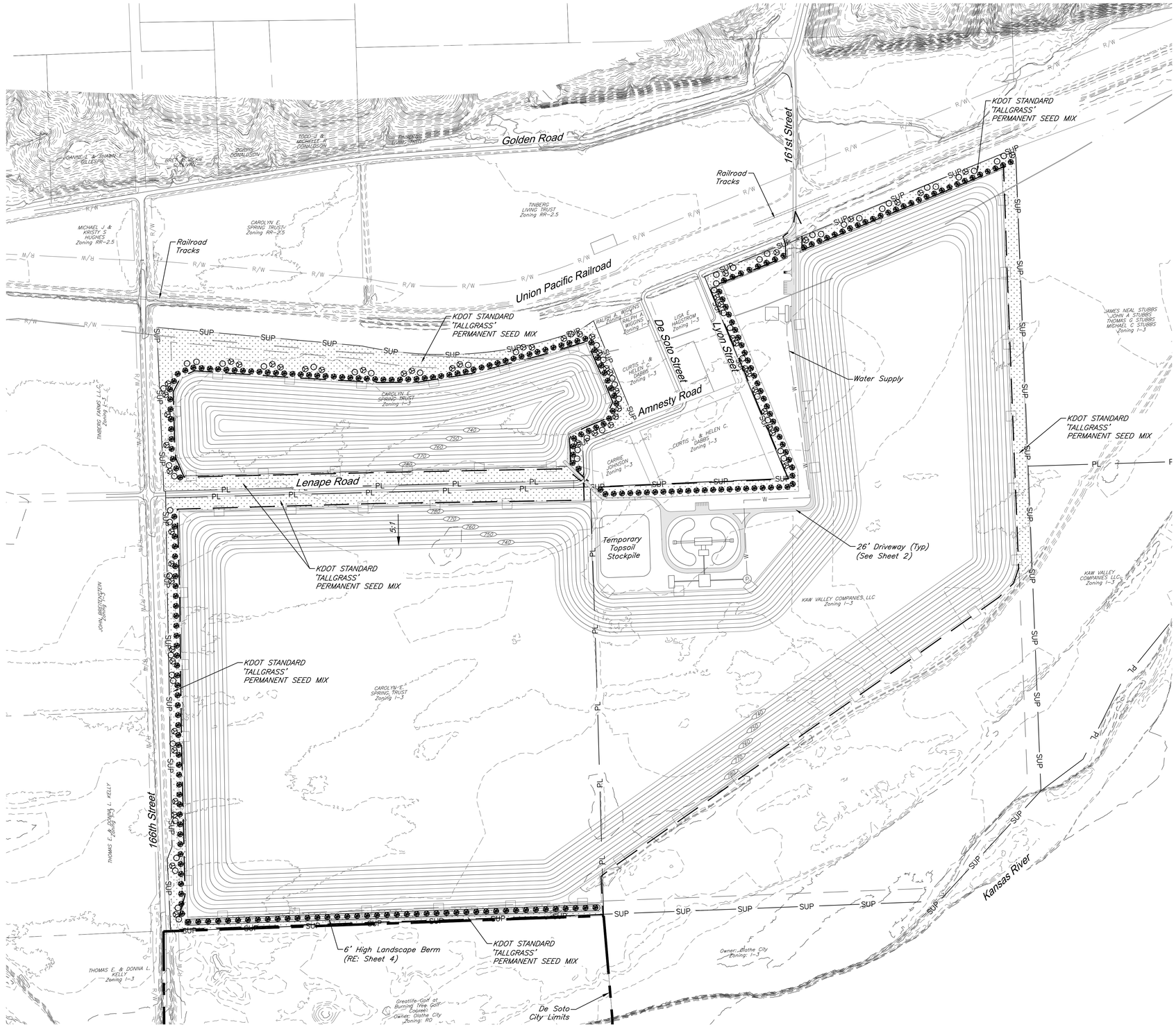

CAUTION!

Numerous Utilities on Site. Contractor shall verify location and elevation of all utilities prior to commencing construction.

LEGEND:

- KDOT PERMANENT SEED MIX: 'TALLGRASS'
- KDOT PERMANENT SEED MIX: 'TALLGRASS' with EROSION CONTROL BALNKET TURF REINFORCEMENT MAT
- EVERGREEN TREES:
  TOTAL QTY: 251
  BALLED & BURLAP; MIN. 5'-0" HEIGHT
  50% NORWAY SPRUCE — Picea abies — 60'H X 30'W
  50% EASTERN WHITE PINE — Pinus strobus — 60'H X 30'W
- DECIDUOUS TREES - OAKS:
  TOTAL QTY: 60
  BALLED & BURLAP; MIN. 2" CALIPER
  50% SWAMP WHITE OAK — Quercus bicolor — 60'H X 50'W
  50% RED OAK — Quercus rubra — 60'H X 50'W
- DECIDUOUS TREES - ELMS:
  TOTAL QTY: 60
  BALLED & BURLAP; MIN. 2" CALIPER
  50% 'ACCOLADE' ELM — Ulmus 'Accolade' — 50'H X 30'W
  50% 'VALLEY FORGE' ELM — Ulmus 'Valley Forge' — 60'H X 50'W

SHEET NOTES:

1. PLANTING SCHEDULE:
   1.a. TREE PLANTING(S):
   SPRING: MARCH 15 - MAY 31
   FALL: SEPTEMBER 15 - OCTOBER 31
   1.b. SHRUB / PERENNIAL PLANTING:
   SPRING: APRIL 15 - MAY 31
   FALL: AUGUST 15 - OCTOBER 15
   1.c. SOD PLANTING (AS APPLICABLE):
   SPRING: MARCH 15 - MAY 31
   FALL: SEPTEMBER 15 - OCTOBER 31
   1.a. SEED PLANTING:
   SPRING: APRIL 1 - MAY 31
   FALL: SEPTEMBER 1 - OCTOBER 1
   DORMANT: DECEMBER 1 - MARCH 15
2. PROPOSED TREES SHALL BE PLANTED NO LATER THAN FALL 2026.

Grading Legend

- 1010 — Proposed Contours
- 900 — Existing Contour Major
- 902 — Existing Contour Minor
- Limits of Flood Zone AE
- Limits of FEMA Regulatory Floodway
- Ex Location of (Non Jurisdictional Levee)
- Limits of Disturbed Area 328 Acres
- 26' Gravel Road
- 6' Collapsible Plastic Fence
- 8' Chain Link Fence with Lockable Gate
- SUP — SUP Permit Boundary
- ℄ — Property Limits

300' 0' 300' 600'
SCALE : 1 INCH = 300 FEET

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LENAPE SAND OPERATION

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

JACOB SCHWEIKERT LICENSED PROFESSIONAL ENGINEER 31279 9/23/2025 KANSAS

REVISION

PROJECT NUMBER 16477.00

DATE 6/19/2025

DESIGNED JMS
DRAWN ELS/GAN
REVIEWED JMS

SHEET TITLE

Landscape Plan

SHEET NUMBER 21

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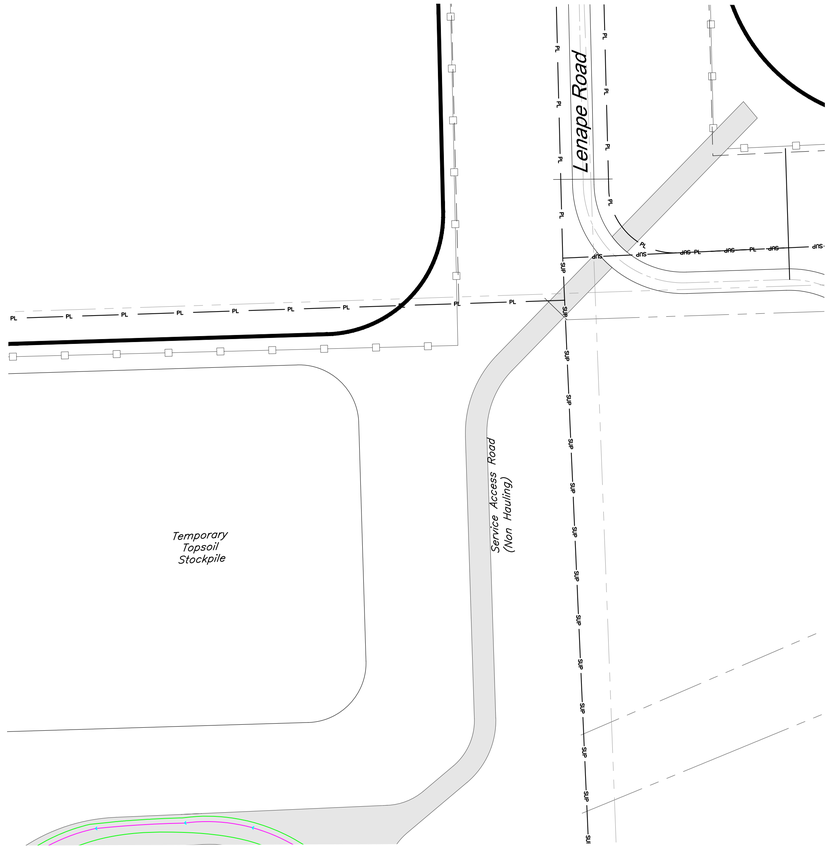
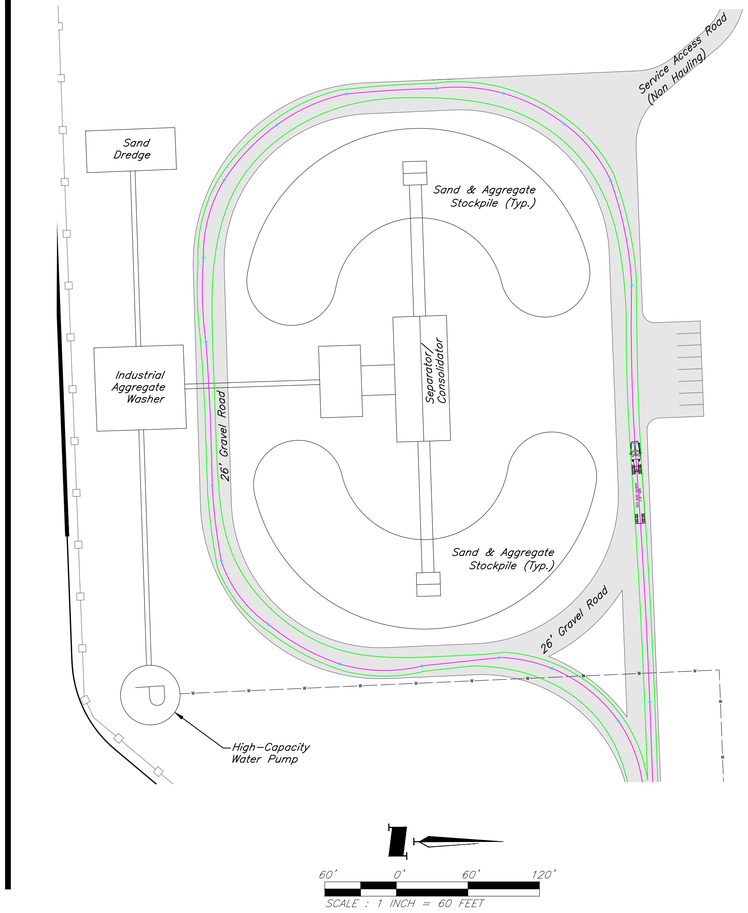
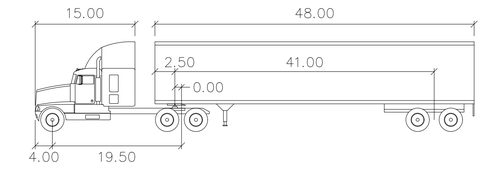






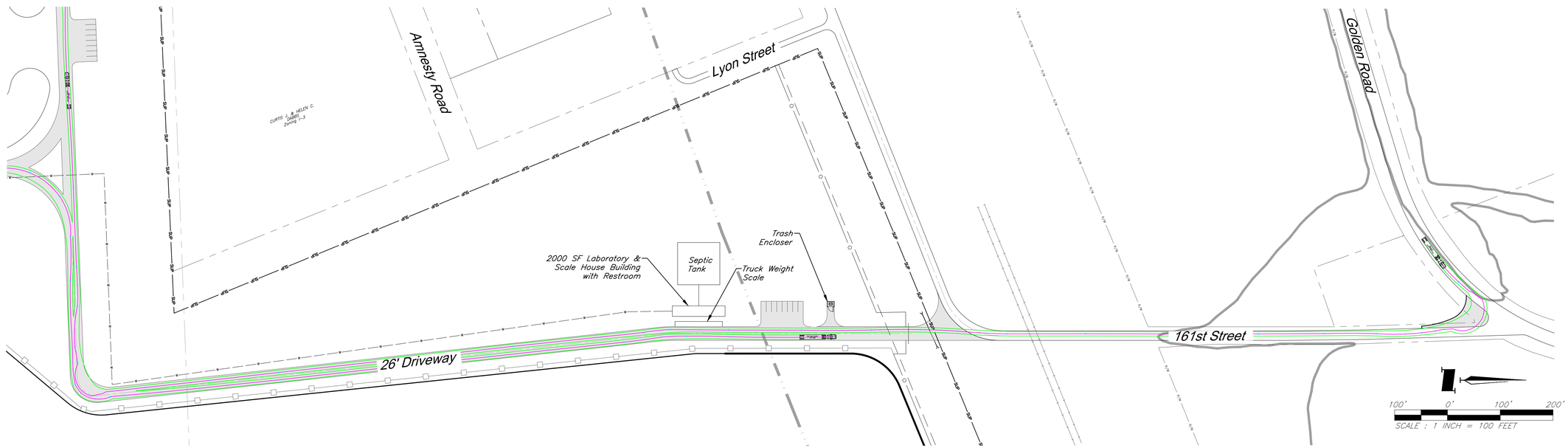
WB-62

feet

Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 28.4
Tractor Track	: 8.00	Articulating Angle	: 70.0
Trailer Track	: 8.50		

Legend

- Vehicle Centerline
- Vehicle Turning Envelope
- Proposed Roadway



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LENAPE SAND OPERATION

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

JACOB SCHWEIKERT LICENSED 31279 9/23/2025 KANSAS PROFESSIONAL ENGINEER

REVISION

PROJECT NUMBER
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DATE
6/19/2025

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ELS/GAN

REVIEWED
JMS

SHEET TITLE

Truck Turning Circulation

SHEET NUMBER

22

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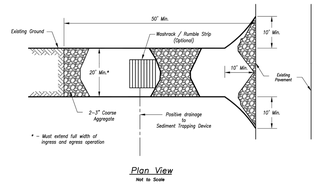
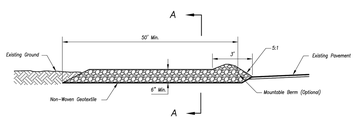
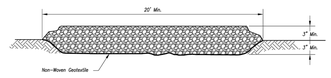


Plan View
Not to Scale



Side Elevation
Not to Scale



Section A-A
Not to Scale

Avoid locating on steep slopes, at curves on public roads, or downhill of disturbed area.

Remove all vegetation and other unsuitable material from the foundation area, grade, and crown for positive drainage.

If slope towards the public road exceeds 2%, construct a 6- to 8-inch high ridge with 3H:1V side slopes across the foundation approximately 15 feet from the edge of the public road to divert runoff from it.

Install pipe under the entrance if needed to maintain drainage ditches along public roads.

Place stone to dimensions and grade as shown on plans. Leave surface sloped for drainage.

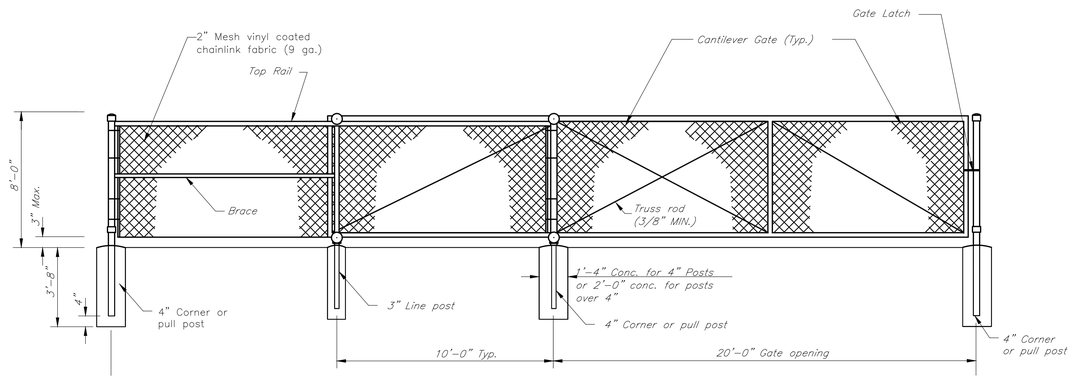
Divert all surface runoff and drainage from the entrance to a sediment control device.

If conditions warrant, place geotextile fabric on the graded foundation to improve stability.

Maintenance:

Reshape entrance as needed to maintain function and integrity of installation. Top dress with clean aggregate as needed.

CONSTRUCTION ENTRANCE
Not to Scale



8' GALVANIZED CHAIN LINK FENCE W/ LOCAKING GATE
Not to Scale

Partial Box Culvert Plan
Not to Scale

Erosion Control Blankets and TRMs shall be laid in the direction of the slope. In order for blanket to be in contact with the soil, lay blanket loosely, avoiding stretching.

ANCHOR SLOTS: The top of the blanket should be "knotted in" at the top of the slope. Additional rows of anchors 6 inches apart. The slots should be 6 inches wide x 6 inches deep with the blanket anchored in the bottom of the slot, then backfilled, tamped and seeded.

LONGITUDINAL SEAM: The edges of the blanket should overlap each other a minimum of 6 inches, with anchors catching the edges of both blankets.

SPLICE SEAM: When splices are necessary, overlap end a minimum of 6 inches in direction of water flow. Stagger splice seams.

TERMINAL FOLD: The bottom edge of the blanket shall be turned under a minimum of 4 inches, then anchored in place with anchors 9 inches apart.

TYPICAL ANCHORS: Anchor design shall be as recommended by the manufacturer.

STAPLE PATTERN: Staple pattern and spacing shall be as required by the manufacturer.

Maintenance:

Torn or degraded product shall be repaired or replaced, unless such degradation is within the functional longevity specified by the manufacturer. Edges or seams which are loose or frayed shall be secured.

EROSION CONTROL BLANKET
TURF REINFORCEMANT MAT
Not to Scale

(*) POSTS
- MIN. LENGTH 4'
- HARDWOOD 1 ½" x 1 ½"
- NO.2 SOUTHERN PINE 2 ¼" x 2 ¼"
- STEEL 1.33 LB/FT

(**) - Geotextile Fabric shall meet the requirements of AASHTO M288

In order to contain water, the ends of the silt fence must be turned uphill (Figure A).

Long perimeter runs of silt fence must be limited to 100'. Runs should be broken up into several smaller segments to minimize water concentrations (Figure A).

Long slopes should be broken up with intermediate rows of silt fence to slow runoff velocities.

Attach fabric to upstream side of post.

Install posts a minimum of 2' into the ground.

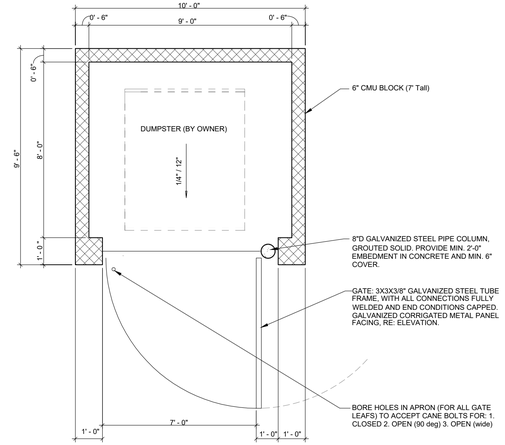
Trenching will only be allowed for small or difficult installation, where slicing machine cannot be reasonably used.

Maintenance:

Remove and dispose of sediment deposits when the deposit approaches ½ the height of silt fence. Repair as necessary to maintain function and structure.

JOINING FENCE SECTIONS
Not to Scale

SILT FENCE
Not to Scale



TRASH DUMPSTER
Not to Scale

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LENAPE SAND OPERATION
Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

JACOB SCHWEIKERT LICENSED 31279 9/23/2025 KANSAS PROFESSIONAL ENGINEER

REVISION

PROJECT NUMBER
16477.00

DATE
6/19/2025

DESIGNED
JMS

DRAWN
ELS/GAN

REVIEWED
JMS

SHEET TITLE
Construction Details

SHEET NUMBER
23

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Reclamation Plan - Lenape Sand Operation

November 2024

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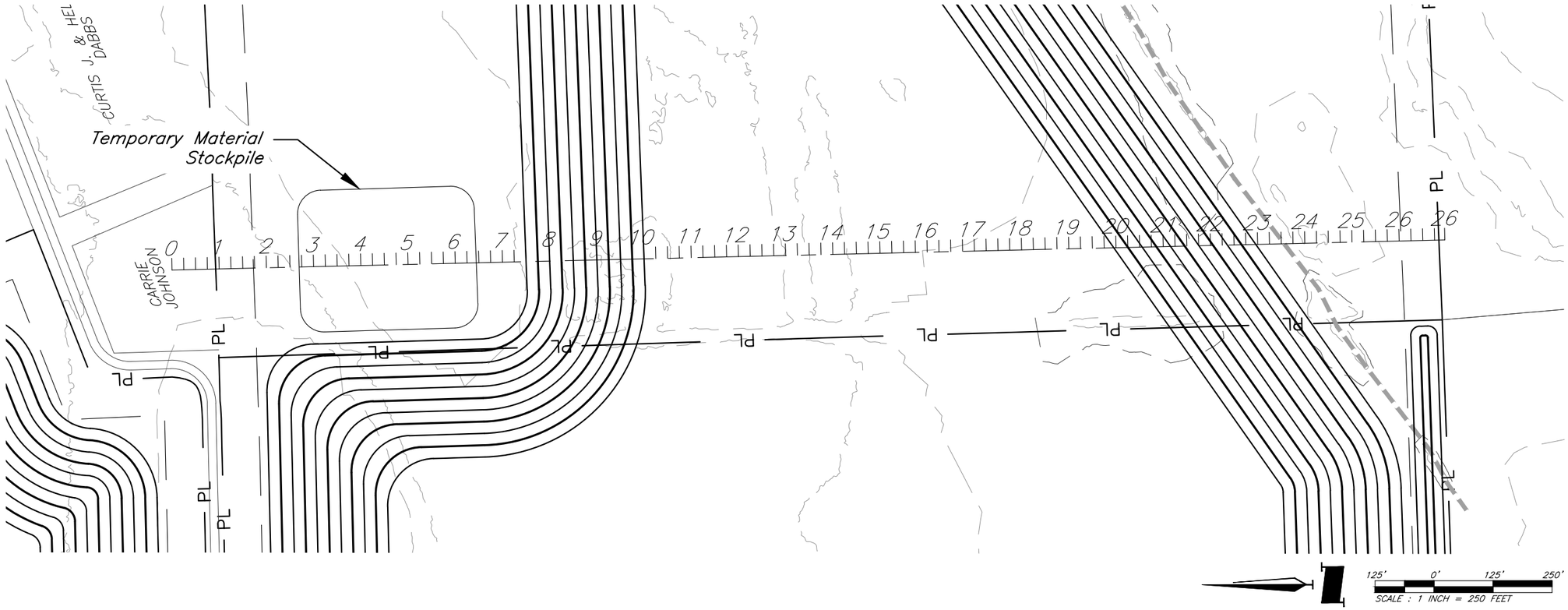

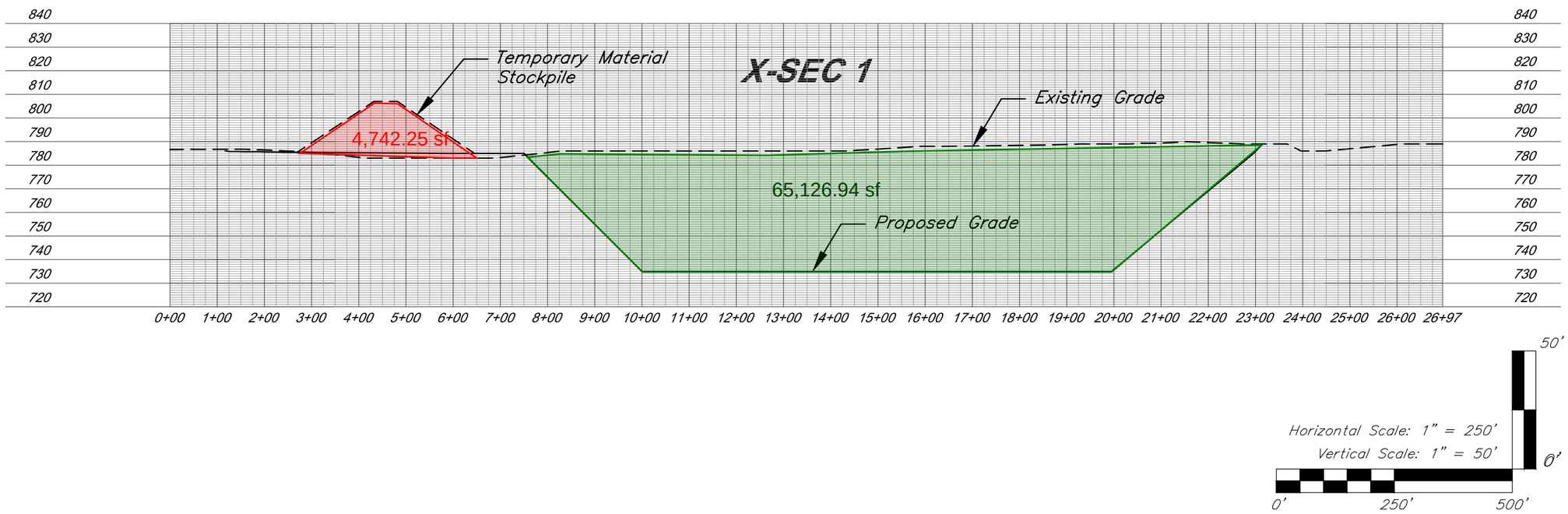

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LENAPE SAND OPERATION

166th St. & Lenape Rd.
Leavenworth County, Kansas
Floodplain Cross Section

PROJECT NUMBER
16477.00

DATE
12/16/2024

Floodplain Cross Section

276

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NOTES TO USERS

o is for use in administering the National Flood Insurance Program. It does essarily identify all areas subject to flooding, particularly from local sources of small size. The **community map repository** should be d for possible updated or additional flood hazard information.

n more detailed information in areas where **Base Flood Elevations** and/or **floodways** have been determined, users are encouraged to consult d Profiles and Floodway Data and/or Summary of Stillwater Elevations ontained within the Flood Insurance Study (FIS) report that accompanies M. Users should be aware that BFEs shown on the FIRM represent whole-foot elevations. These BFEs are intended for flood insurance rating s only and should not be used as the sole source of flood elevation on. Accordingly, flood elevation data presented in the FIS report should be n conjunction with the FIRM for purposes of construction and/or floodplain ment.

ies of the **floodways** were computed at cross sections and interpolated cross sections. The floodways were based on hydraulic considerations ard to requirements of the National Flood Insurance Program. Floodway nd other pertinent floodway data are provided in the Flood Insurance port for this jurisdiction.

areas not in Special Flood Hazard Areas may be protected by **flood structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood e Study report for information on flood control structures for this on.

jection used in the preparation of this map was NAD 1983 State Plane North, zone 1501. The **Horizontal datum** was NAD 83, GRS80 spheroid. ces in datum, spheroid, projection or UTM zones used in the production of or adjacent jurisdictions may result in slight positional differences in map across jurisdiction boundaries. These differences do not affect the of this FIRM.

vations on this map are referenced to the North American Vertical Datum These flood elevations must be compared to structure and ground s referenced to the same **vertical datum**. For information regarding on between the National Geodetic Vertical Datum of 1929 and the North n Vertical Datum of 1988, visit the National Geodetic Survey website at w.ngs.noaa.gov/ or contact the National Geodetic Survey at the following

ormation Services
I/NGS12
Geodetic Survey
, #9202
st-West Highway
ring, Maryland 20910-3282
3-3242

n current elevation, description, and/or location information for **bench** hown on this map, please contact the Information Services Branch of the Geodetic Survey at **(301) 713-3242**, or visit its website at w.ngs.noaa.gov/.

ap information shown on this FIRM was provided in digital format by orth County GIS Department. This information was photogrammetrically d at a scale of 1:1,200 from aerial photography dated 2012.

n updated topographic information, this map reflects more detailed and e **stream channel configurations and floodplain delineations** than own on the previous FIRM for this jurisdiction. As a result, the Flood and Floodway Data tables may reflect stream channel distances that differ at is shown on the map. Also, the road to floodplain relationships for d streams may differ from what is shown on previous maps.

ofile baselines' represent the hydraulic modeling baselines that match the ofiles in the FIS report. As a result of improved topographic data, the baseline", in some cases, may deviate significantly from the channel e or appear outside the SFHA.

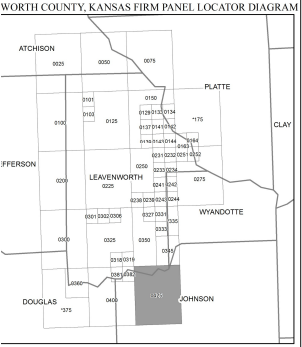
te limits shown on this map are based on the best data available at the ublication. Because changes due to annexations or de-annexations may urred after this map was published, map users should contact appropriate ity officials to verify current corporate limit locations.

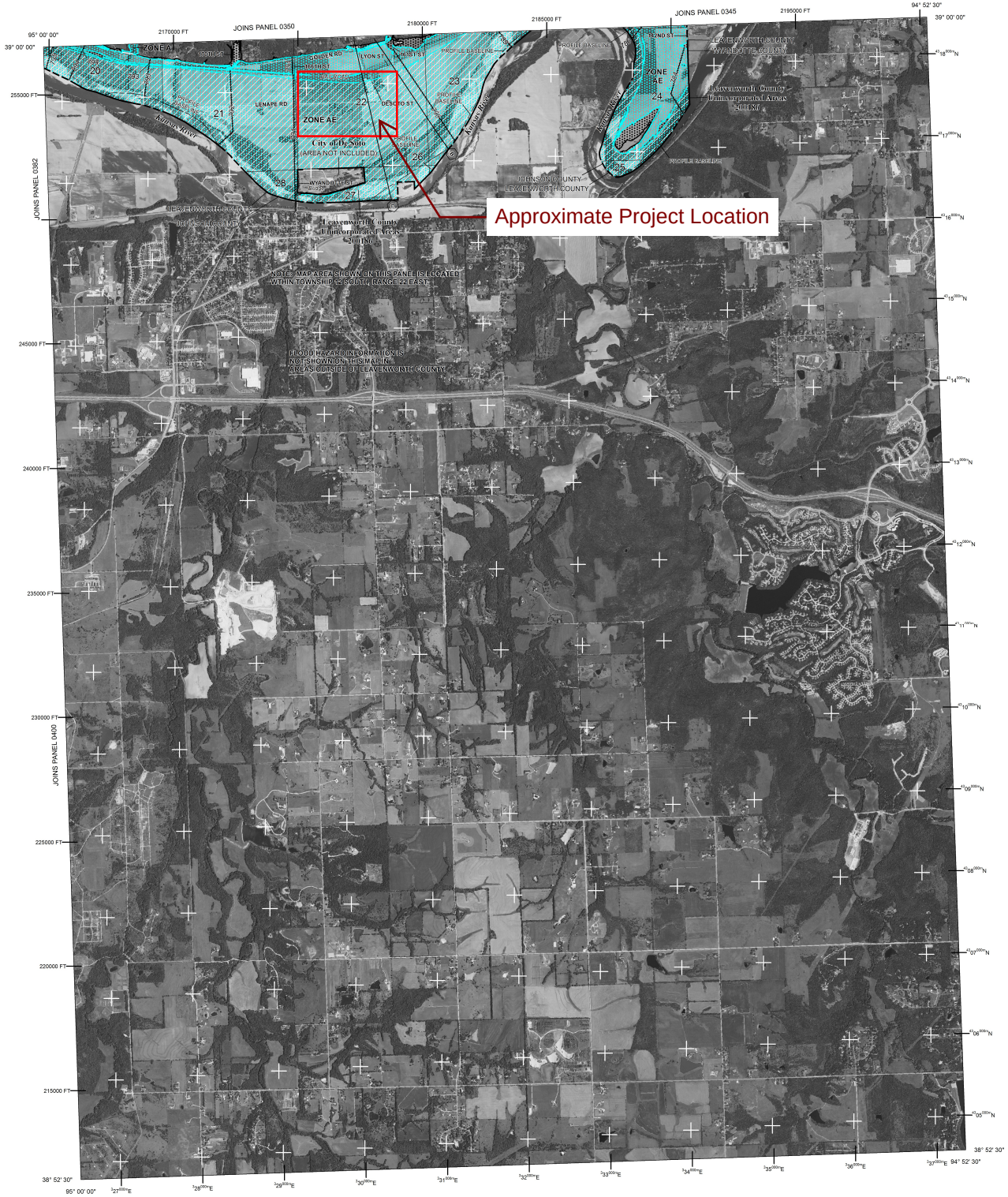
efer to the separately printed **Map Index** for an overview map of the howing the layout of map panels; community map repository addresses; sting of Communities table containing National Flood Insurance Program r each community as well as a listing of the panels on which each ity is located.

the **FEMA Map Service Center** (MSC) via the FEMA Map Information ge (FMIX) at 1-877-336-2627 for information on available products ed with this FIRM. Available products may include previously issued f Map Change, a Flood Insurance Study Report, and/or digital versions of o. The MSC may also be reached by Fax at 1-800-358-9620 and its at http://msc.fema.gov/.

ve **questions about this map** or questions concerning the National Flood e Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or FEMA website at http://www.fema.gov/business/nfip/.

WORTH COUNTY, KANSAS FIRM PANEL LOCATOR DIAGRAM





LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUN BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the has a 1% chance of being equaled or exceeded in any given year. The Special Flo Area is the area subject to flooding by the 1% annual chance flood. Areas of Spe Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevati water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); avera determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Special Flood Hazard Area formerly protected from the 1% annual chanc a flood control system that was subsequently decertified. Zone AR indi the former flood control system is being restored to provide protection 1% annual chance or greater flood.

ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that mus free of encroachment so that the 1% annual chance flood can be carried without s increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood wit depths of less than 1 foot or with drainage areas less than 1 square areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAS)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Area

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- Boundary dividing Special Flood Hazard Areas of different E Elevations, flood depths, or flood velocities.
- CBRS and OPA boundary
- International, State, or County boundary
- Corporate, Extraterritorial Jurisdiction, or Urban Growth bou
- Area Not Included boundary
- Military Reservation, Native American Lands boundary
- 513 Base Flood Elevation line and value; elevation in feet*
- (EL. 987) Base Flood Elevation value where uniform within zone; eleva

* Referenced to the North American Vertical Datum of 1988

- A—A Cross section line
- 23—23 Transect line
- 87°07'45", 32°22'30" Geographic coordinates referenced to the North American 1983 (NAD 83)
- 4276 0000mE 1000-meter Universal Transverse Mercator grid values, zone
- 600000 FT 5000-foot grid ticks: Kansas State Plane coordinate syst 1501), Lambert Conformal Conic projection
- DX5510 × Bench mark (see explanation in Notes to Users section of panel)
- M1.5 River Mile
- Culvert, Flume, Penstock, or Aqueduct
- Road or Railroad Bridge

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
AUGUST 18, 2009

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
July 16, 2015 - to reflect updated topographic information

For community map revision history prior to countywide mapping, refer to the Comm History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance ag the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
600 0 600 1200 METER

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0425G

FIRM
FLOOD INSURANCE RATE M

LEAVENWORTH CO
KANSAS
AND INCORPORATED AR

PANEL 425 OF 425
(SEE LOCATOR DIAGRAM OR MA FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL
LEAVENWORTH COUNTY	200186	0425

Notice to User: The **Map Number** shown below sh when placing map orders; the **Community Number** should be used on insurance applications for the subject

MAP NU
20103C

MAP RE
JULY 16

Federal Emergency Management

APPENDIX N
NOISE STUDY



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09/23/2025
KANSAS
PROFESSIONAL ENGINEER

GBA

LENAPE SAND OPERATION NOISE STUDY

LEAVENWORTH COUNTY, KANSAS

GBA PROJECT NO. 16477

9801 Renner Boulevard
Lenexa, KS 66219-9745

SEPTEMBER 2025

279

Project Background

This study was prepared to analyze the potential noise impacts of the sand operation in unincorporated Leavenworth County. This study is an update to the previously completed noise study by Cook, Flatt & Strobel (CFS) Engineers due to proposed changes in the sand operation and site layout.

The updated proposed site is located near 166th Street and Lenape Road in unincorporated Leavenworth County, as shown in Figure 1: Project Site Location. The site is approximately 435 acres, spread across three parcels, as shown in Figure 2.

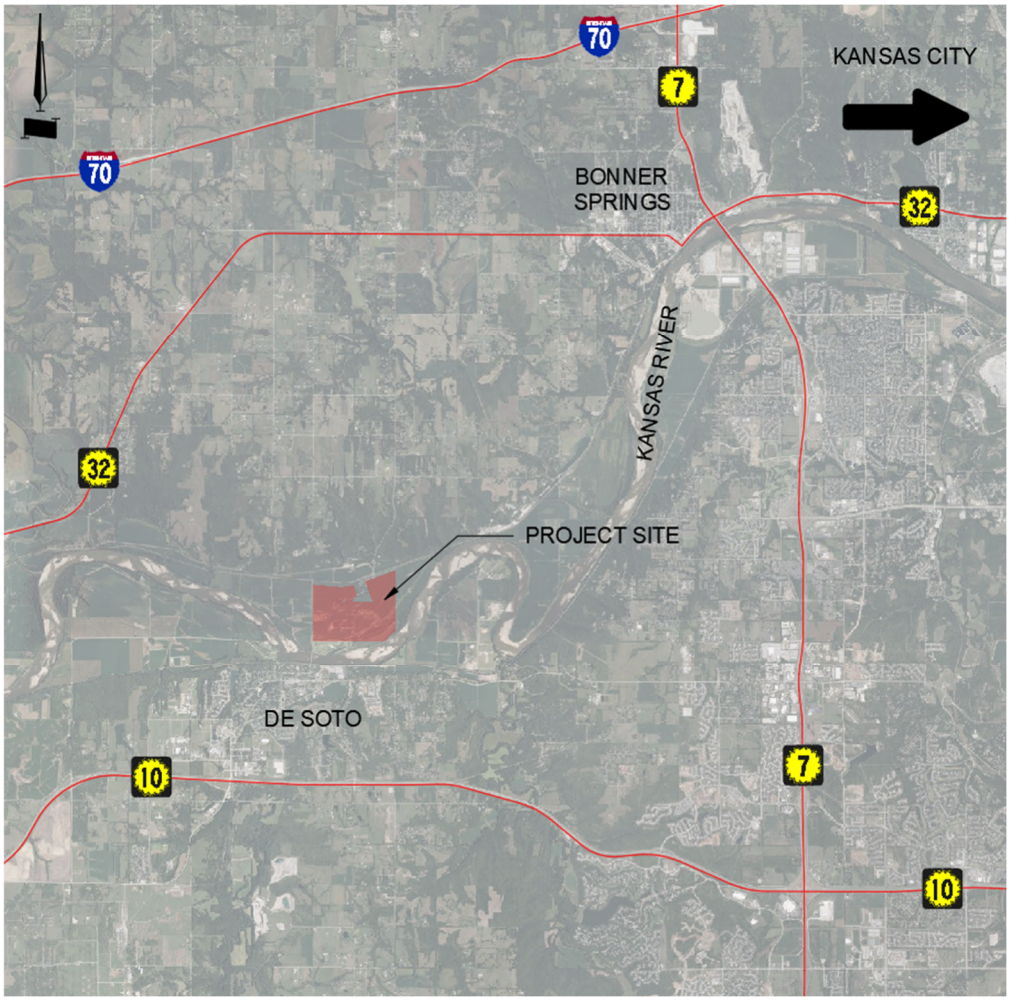

Figure 1: Project Site Location

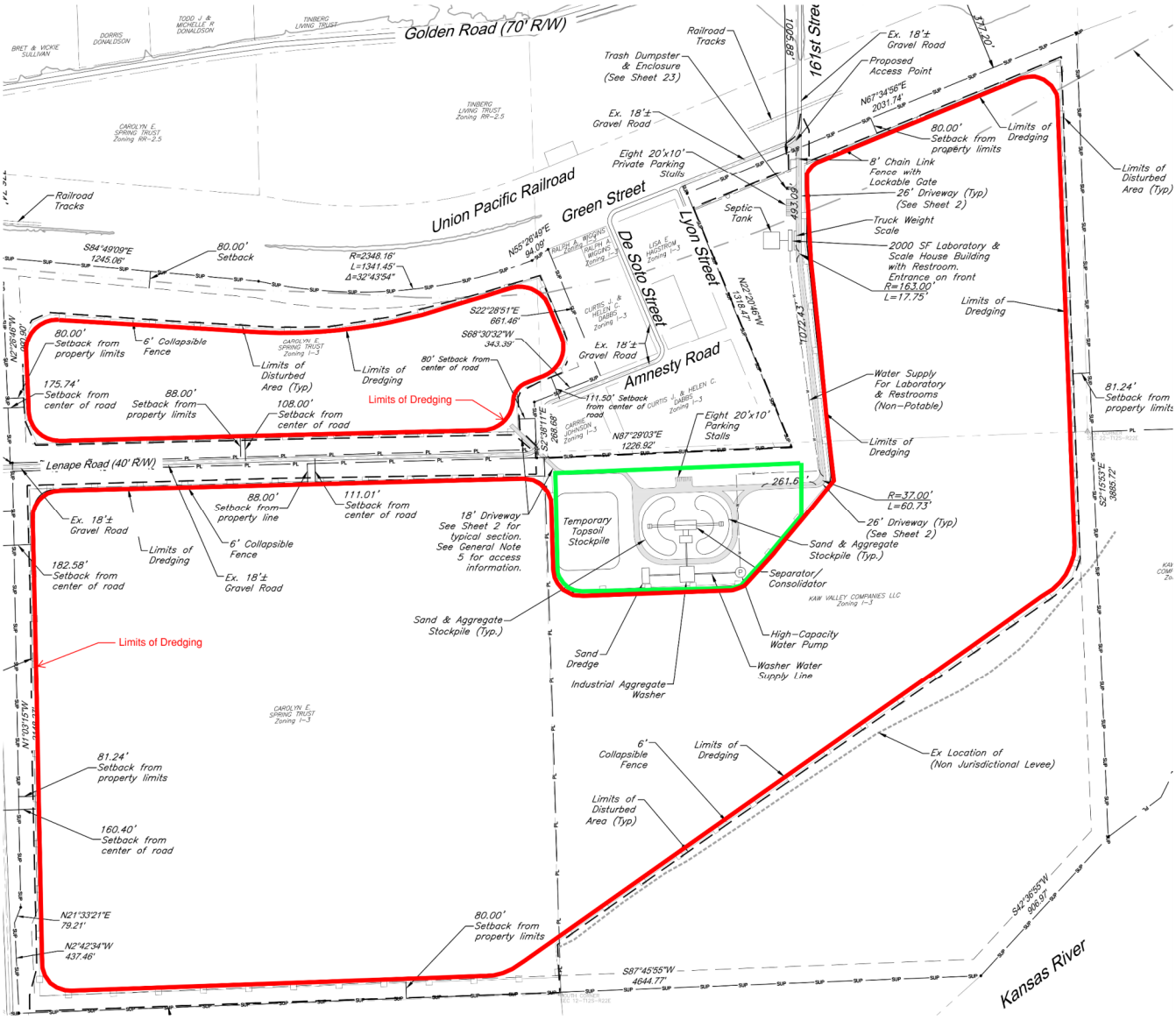

Figure 2: Proposed Site Plan

Site Characteristics and Production Process

With a new size of the proposed site, the resulting calculations of estimated sound pressure value was determined at seven key locations. Each of the locations chosen are at the boundary of the property and were chosen to evaluate results in proximity to the production area, electric dredging barge, and booster barge.

Noise Generation Calculations

The distances from each calculation point to the various sound sources were estimated and those distances were used to determine the individual sound pressure values for each sound source using Equation 1. Those values were then used to calculate the estimated composite sound pressure values for each of the calculation locations using Equation 2. All of the locations where total values were calculated are shown in Figure 3, and each individual location is shown in Figure 5 through Figure 11**.** The decibel readings shown in Table 1 below were taken from the previously completed sound study and were used to calculate the estimated sound pressure values. Additionally 95 dBA at 50 ft (+/-) was used based on the sound of a diesel barge, which was referenced from the previous report's conclusions, to represent a booster barge that would most likely be necessary for the equipment scenarios shown.

Equation 1: Inverse Square Law

$$L_2 = L_1 - 20 * \log\left(\frac{R_2}{R_1}\right)$$

Equation 2: Total Sound Pressure Level for Multiple Sources

$$L_{Combined} = 10 * \log(10^{L_1/10} + 10^{L_2/10} + \cdots + 10^{L_n/10})$$

Table 1: Field Measurements of Sound Sources at Morris and 43rd & Frisbee Sand Quarries (from CFS Study)

Sound Source	Decibel Reading	Reading Distance
Electric Dredging Barge	62 dBA	50 ft +/- from banks of Kansas River
Front-End Wheeled Loader	80 dBA	50 ft +/-
Semi-Truck & Trailer	72 dBA	30 ft +/-
Washer/Pump/Conveyor	72 dBA	25 ft +/-

The analysis of potential sound generated by the mobile and stationary equipment on the proposed Lenape Sand Operation was made to estimate the potential sound levels on the surrounding properties: the Burning Tree Golf Course, the residential homes immediately adjacent to the operation site, the residential homes along Golden Road, and the residential property on 161st Street. The terrain surrounding the proposed operation site was assumed to be level with no barriers or reductions for noise dampening from trees or berms. There are plans for sound mitigation as stated in the previous sound study.

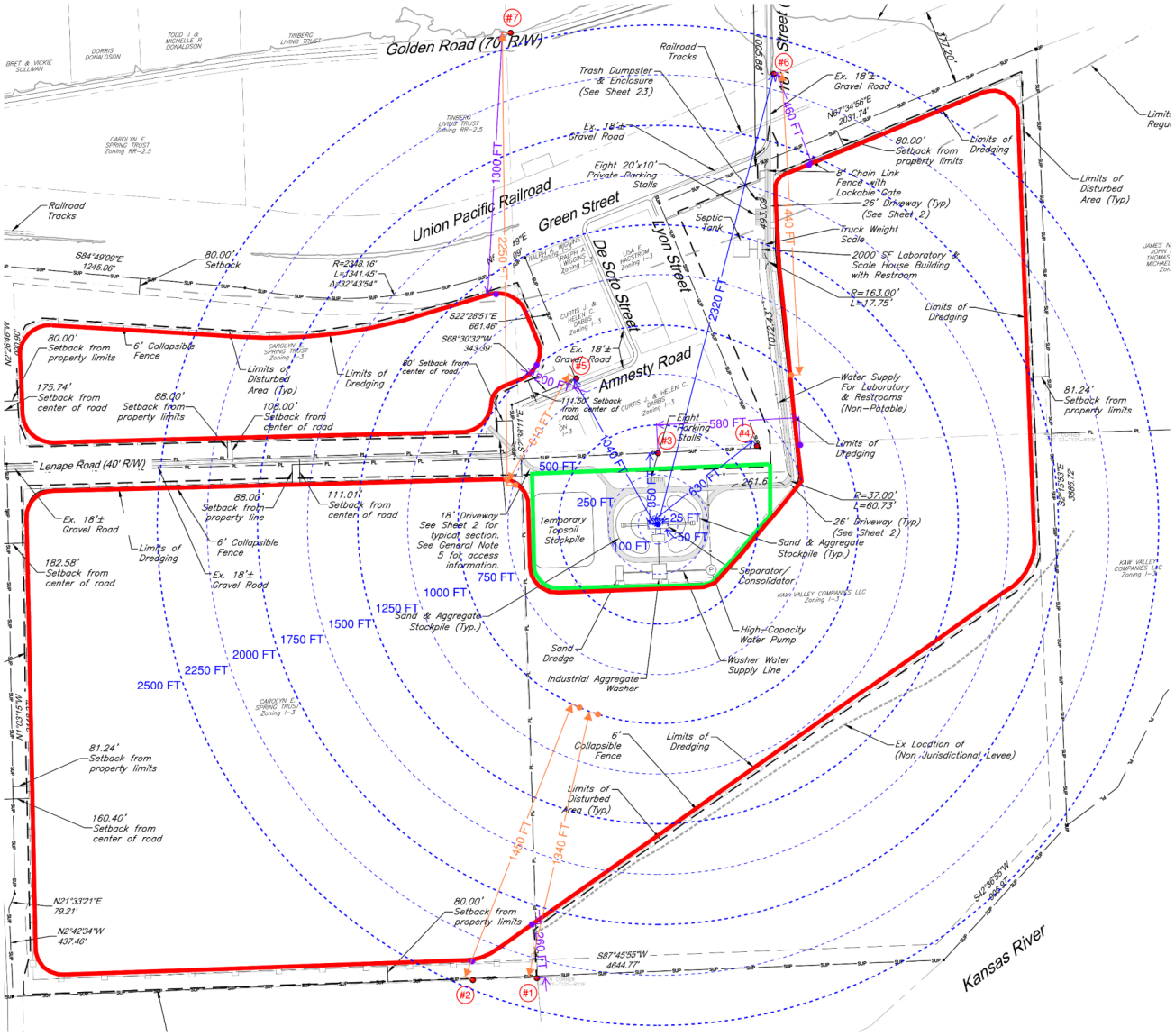

Figure 3: Sound Source Locations and Locations of Calculated Composite Sound Pressure Values

- Washer/Pump/Conveyor Location
- Distance from Washer/Pump/Conveyor (FT)
- Electric Dredging Barge Locations for Calculations
- Booster Barge Locations for Calculations
- # Noise Level Calculation Points

Figure 4: Legend

The noise generated by the production area of the operation where the washer/pump/conveyor would process sand is assumed to be 72 dBA at approximately 25 ft from the center of the production area,

or 140 dBA at the source. The loading of two semi-trucks by the wheel loader is assumed to occur approximately 200 ft from the center of the washer/pump/conveyor center along the shortest distance between the calculation point and the center of the production area to conservatively calculate the highest composite sound pressure possible. The electric dredging barge was assumed to be at the edge of the dredging area, closest to the calculation point, and the distance to the property boundary estimated, at a minimum of 80 ft. The composite sound pressure values calculated for the seven calculation points are shown in Table 2. The booster barge is the loudest single point source based on the assumption that a diesel booster will be used, however a booster should not be required within the first five years of production, and within this time a quieter, or more far-reaching option is likely to be more economical.

Table 2: Calculated Sound Pressure Values

Calculation Location	Estimated Sound Pressure Value
#1 – Burning Tree Golf Course	66.7 dBA
#2 – Burning Tree Golf Course	66.6 dBA
#3 – Adjacent Properties	70.1 dBA
#4 – Adjacent Properties	63.9 dBA
#5 – Adjacent Properties	73.5 dBA
#6 – 161st Street Property	66.1 dBA
#7 – Golden Road Properties	62.2 dBA

Location #5 was determined to be the highest estimated composite sound pressure of 73.5 dBA due to the proximity of the production area to the property boundary, as well as the proximity of the electric dredging barge and booster barge. The sound levels would be similar, though slightly lower for all of the remaining residential properties directly adjacent to the operation's proposed property.

The estimated sound level for location #3 is the second highest value at 70.1 dBA. This value is due to the immediate vicinity of the production area and will be the most consistent estimated sound level throughout the life of the operation.

All other estimated sound level values are relatively consistent between 62 dBA and 67 dBA. Locations #1, #2, #5, #6, and #7 include a booster pump in the calculations for the estimated values.

Noise Mitigation Measures

The following measures will be used to mitigate the noise from the site operations. Also, noise levels should be reduced for most of the surrounding properties as excavation progresses and the dredging pits get deeper, with the exception of the properties immediately adjacent to the production area.

- To help mitigate the sound levels for those properties adjacent to the static production area, the equipment used will be electric and the production schedule will be set to reduce impacts to the most effected properties by coordinating the concurrence of sound sources during daylight hours.
- Work activity will be scheduled to build-up material stockpiles later in the afternoons so that processing equipment will not be used during the early morning hours
- All equipment will be turned off when not in use.
- Equipment will be kept well-maintained and lubricated to minimize operating noise.
- Native species of deciduous and coniferous trees will be planted along the site's southern border with Burning Tree Golf Club to provide a visual and noise buffer from the mining operations.

Conclusions and Recommendations

The noise levels estimated in this study are assumed to be the peak volumes with no mitigation measures factored into the values, with all equipment running simultaneously, and represent static placements of the mobile operation equipment such as the electric dredging barge. In general, the sound levels will be comparable to an isolated industrial zone (approximately 65 dBA) for all surrounding properties. The highest of the estimated noise levels are still below the threshold of industrial operations (80 dBA).

The estimated sand operation's noise generation calculations used actual sound measurements of similar equipment in operation at similar dredging sites. The sound levels were estimated based on level-ground transmission without any deductions figured into the calculations. Based on the estimated noise levels that would be generated by the plant within the near future, the worst-case noise levels projected onto the surrounding properties would be within the noise control areas for industrial areas during daytime hours.

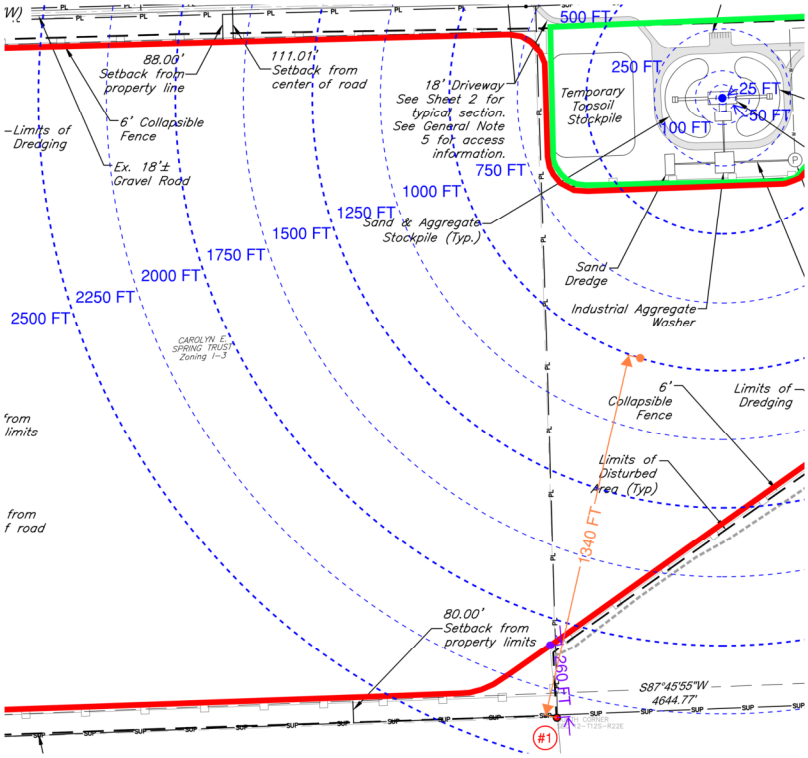

Figure 5: Distances Between Sound Source and Calculation Location #1

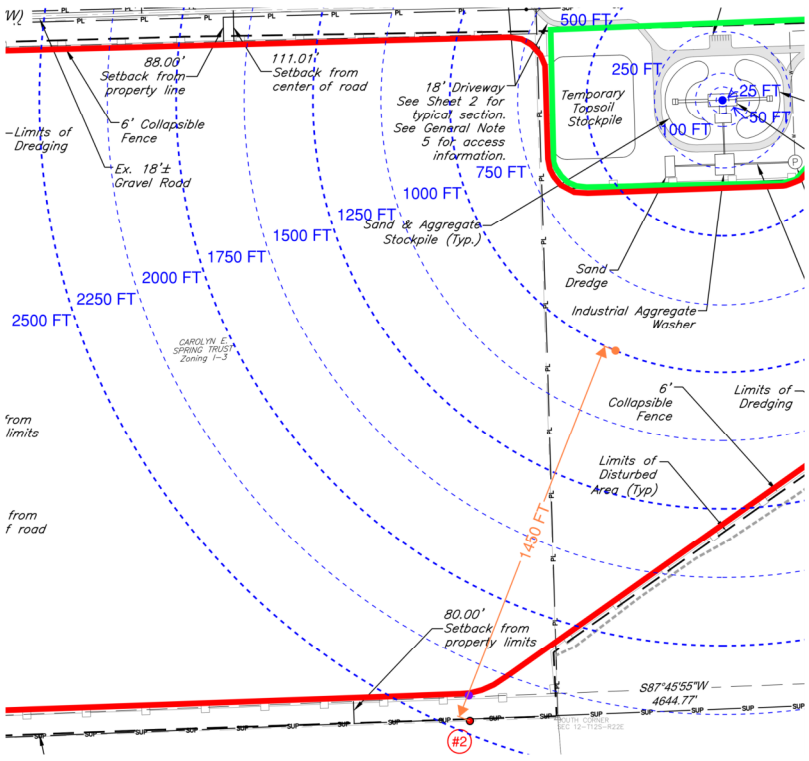

Figure 6: Distances Between Sound Sources and Calculation Location #2

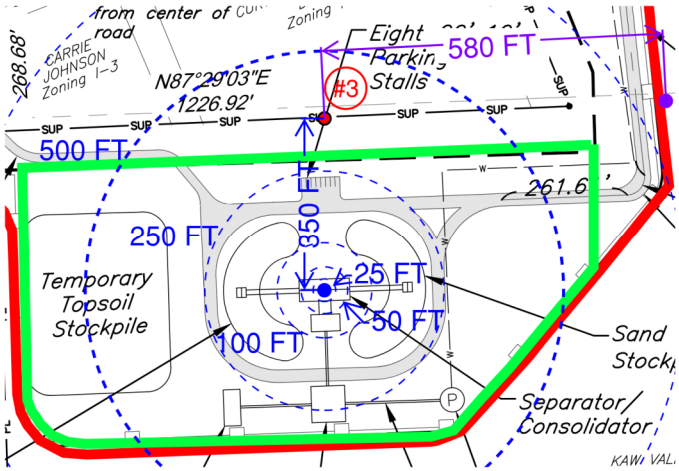

Figure 7: Distances Between Sound Source and Calculation Location #3

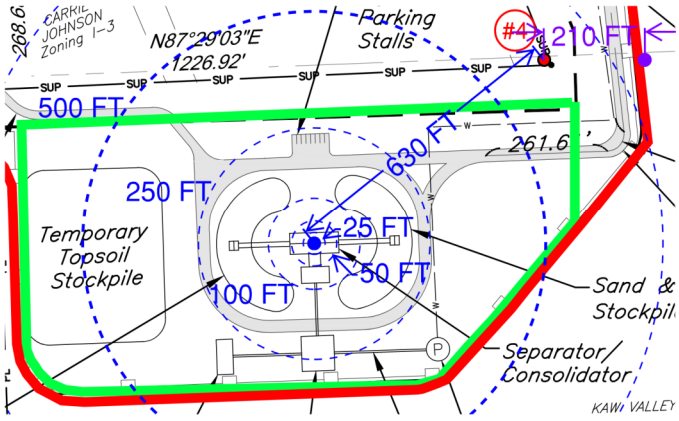

Figure 8: Distances Between Sound Source and Calculation Location #5

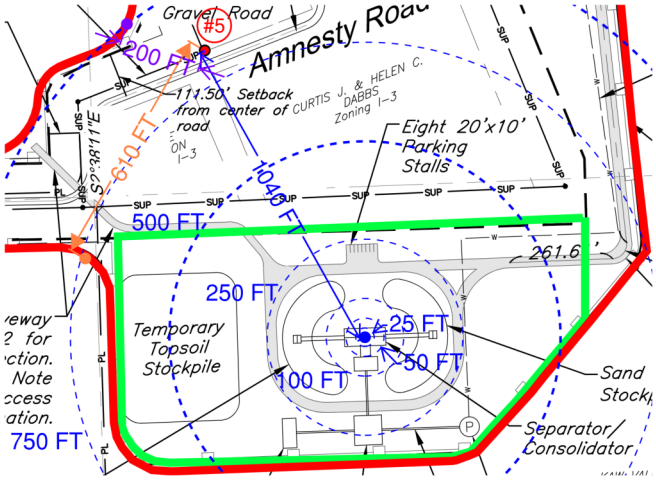

Figure 9: Distances Between Sound Source and Calculation Location #5

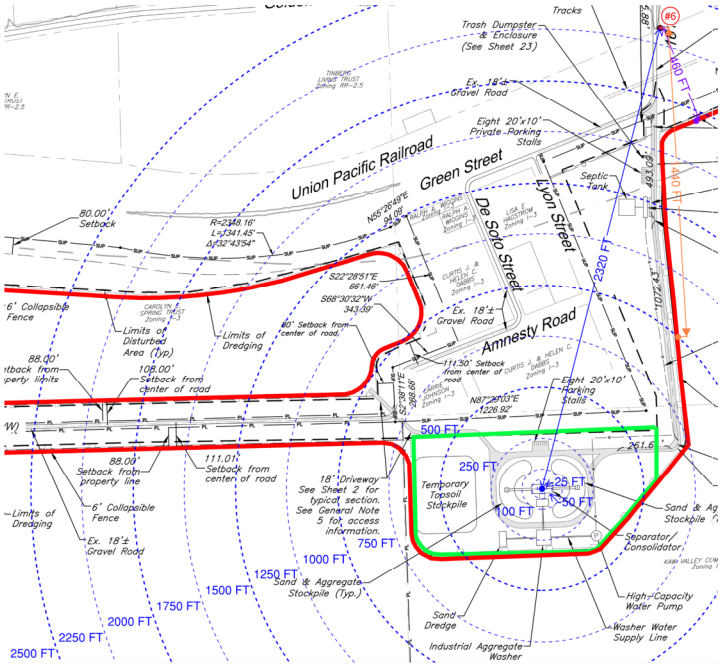

Figure 10: Distances Between Sound Source and Calculation Location #6

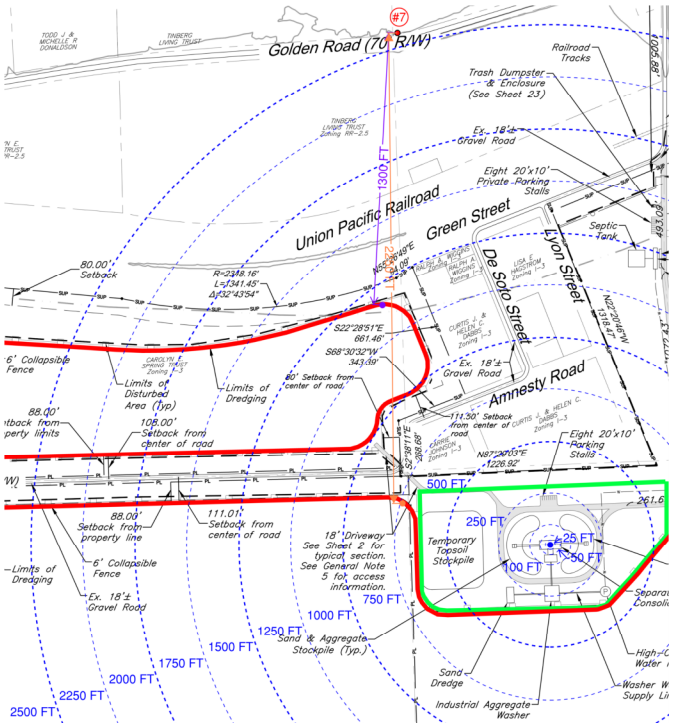

Figure 11: Distances Between Sound Source and Calculation Location #7



LENAPE SAND OPERATION SWPPP

LEAVENWORTH COUNTY, KANSAS

GBA PROJECT NO. 16477

9801 Renner Boulevard
Lenexa, KS 66219-9745
913.492.0400 | www.gbateam.com

February 2025

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Appendix G – Completed Inspection Forms

STORMWATER POLLUTION PREVENTION PLAN
For building & grading projects disturbing 1 or more acres

I. GENERAL PROJECT INFORMATION

Project Name & Description:

Lenape Sand Operation
166th St. & Lenape Rd.
Sherman, Leavenworth County, Kansas
Section 22, Township 12S, Range 22E
(**Figures 1 & 2**)

Owner's Representative's Name and Address:

Evan Horowitz, Chief Financial Officer
Kaw Valley Companies, Inc.
5600 Kansas Avenue
Kansas City, KS. 66106
(913) 634-8816 – Main

Consultant's Name and Address:

George Butler Associates, Inc
9801 Renner Blvd.
Lenexa, Kansas 66219
(913) 492-0400 - Main
(913) 577-8346 - Fax

II. PROJECT PLANNING & DESIGN

A. SITE CHARACTERISTICS

1. **Site Area**: The total acreage of the site is approximately 435 acres with approximately 328 acres to be disturbed. The purpose of the project is for sand excavation and stockpiling operation to use for controlled fill, backfill, concrete aggregate material, etc. According to the NRCS Web Soil Survey (**Figure 3**), soil types listed as occurring on the project site includes Eudora-Bismarckgrove fine sandy loams (7035), Kimo silty clay loam (7055), Stonehouse sand (7088), Stonehouse-Eudora fine sandy loams (7089), Eudora-Bismarckgrove silt loams (7106), and Bismarckgrove-Kimo complex (7107).

2. **Soil Erodibility**: According to the United States Department of Agriculture, Natural Resource Conservation Service, Soil Survey of Johnson County, the erosion properties of the soils located on the project site are as follows:

   Eudora-Bismarckgrove – **Moderate**
   Kimo silty clay loam – **Moderate**
   Stonehouse sand – **Moderate**
   Stonehouse-Eudora fine sandy loams – **Moderate**
   Eudora-Bismarckgrove silt loams – **Moderate**
   Bismarckgrove-Kimo complex – **Moderate**

   Slight – Little or no erosion is likely.
   Moderate – Some erosion is likely and erosion control measures are needed.
   Severe – Significant erosion is expected and erosion control measures are needed.

3. **Name of Receiving Waters**: The project site has one outfall location, which drains to the Kansas River.

   Outfall Number 01 - Kansas River

4. **Section 404/401 Permitting:** According to the signed KDHE Notice of Intent, the project qualifies for a Corps of Engineers Nationwide Permit (NWP) 12 and a Pre-Construction Notification is not required for the project. According to the signed KDHE Notice of Intent, the project does not impact the line or grade of a stream and does not include dredge or fill of a potential jurisdictional water body or wetland.

B. TYPE OF SOIL DISTURBING ACTIVITIES PROPOSED

☒ Clearing and grubbing of existing vegetation

☒ Stripping of topsoil within the limits of construction

☒ Stockpiling and re-spreading topsoil

☒ Utility trench excavation and backfill

☐ Preparing subgrade for streets and sidewalks

☐ Backfilling curbs and sidewalks

☐ Disposal areas for excess excavated material

☐ Borrow areas for fill material

☐ Other (specify) _____

The limits of land disturbance are shown on the sediment and erosion control plan.

C. EROSION AND SEDIMENT CONTROLS

The layout of erosion control best management practices (BMPs) shown on the engineering plans is intended to control erosion and minimize, if not eliminate, the transport of sediment from the disturbed areas. The Contractor shall be responsible for the evaluation of existing surface drainage patterns and for making adjustments to the BMP locations to best control erosion and minimize, if not eliminate, the transport of sediment from the disturbed areas. **NOTE: The project construction documents shall supersede any BMP design requirements shown in this SWPPP.** The following are the minimum measures required to control erosion and sediment runoff for the project:

1. **Stabilization Practices –** Stabilization practices are very effective at preventing erosion by shielding the soil surface from the impact of rain, slowing the velocity of runoff, holding soils in place, and increasing infiltration of runoff and allowing the soil to absorb more rainfall.

    a. **Temporary Seeding Stabilization –** During acceptable growing periods (see Table 1 below); temporary seeding of annual vegetation with a straw mulch cover shall be used as a temporary cover until permanent vegetation is established. If there is a possibility that a vegetative cover will be required to control erosion for more than 1 year, then consider the addition of a perennial/permanent grass species as part of a seeding mixture.

Table 1 – Temporary Seeding Dates

Species	Seeding Date Optimum and Acceptable											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Oats												
Cereals: Rye / Wheat												
Annual Ryegrass												

Optimum Seeding Times
Acceptable Seeding Times

Species	Minimum Application Rates (pure live seed lbs. per acre)	Straw Mulch (tons per acre)
Oats	80	1.5 (w/ seed) - 2.25 (stand alone)
Cereals: Rye / Wheat	90/120	1.5 (w/ seed) - 2.25 (stand alone)
Annual Ryegrass	75	1.5 (w/ seed) - 2.25 (stand alone)

Source: Protecting Water Quality – A field guide to erosion, sediment and stormwater best management practices for developing sites in Missouri and Kansas. Revised January 2011.

Seedbed Preparation – For broadcast seeding or drilling, loosen soil to depth of 3 inches. For no till drilling, loosen soil if it is compacted. Loosen compacted, hard or crusted soil surfaces with a disk, ripper, chisel, harrow or other tillage equipment. Avoid preparing the seedbed under excessively wet conditions. For establishment and long-term growth, apply a complete fertilizer at rates recommended by soil tests or as specified in plans and specifications. If soil pH is less than 6.0, apply lime according to soil tests. Incorporate necessary lime and fertilizer to a depth of 3 to 6 inches of soil.

Installation – For the best results use certified seed. Apply seed uniformly using a cyclone seeder, drop-type spreader, drill, cultipacker seeder or hydroseeder. When using a drill seeder, plant rye or other grains about 1 inch deep and plant grasses no more than ½ inch. A vegetative straw mulch cover shall be applied over the seed mixture to help germinate and establish plant cover, control weeds, and protect seed mixture against temperature extremes. Follow straw mulch preparation and application procedures described in **Section C.1.b**.

b. **Temporary Mulch Stabilization –** During non-growing periods, or when construction activity has ceased and will not resume for 14 days, a straw mulch cover shall be applied immediately to protect against erosion until temporary or permanent vegetation is established.

Site Preparation – Divert runoff water from areas above the site that will be mulched. Remove stumps, roots and other debris from the construction area. Grade area as needed to permit the use of equipment for seeding, mulching and maintenance. Shape area so that it is relatively uniform and smooth.

Application – Spread straw mulch uniformly over the area with a power blower, hydroseeder, or by hand. No more than 25% of the ground surface should be visible after spreading. Apply straw mulch at a minimum rate of 1.5 tons per acre as a seed cover or 2.25 tons per acre as a stand-alone cover. The straw should be dry, unchopped, unweathered; free of weed seeds and rot. In areas of steep slopes or high winds, or in critical areas such as swales, mulching may need to be secured to the ground with a binder, netting, or tacking.

c. **Permanent Seeding Stabilization –** All disturbed areas shall be permanently seeded with a cool season grass mixture as specified by the Owner or Owner's Representative. Table 2 below should be used as a guide for appropriate seeding dates:

Table 2 – Permanent Seeding Dates

Species	Seeding Date Optimum and Acceptable											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Turf Fescue												
Tall Fescue												
Kentucky Bluegrass												
Perennial Ryegrass												
Buffalograss[1]												
Wheat/Rye[2]												
Oats[2,3]												

Optimum Seeding Times
Acceptable Seeding Times

[1] Can also be sprigged.

[2] Check with your local Noxious Weed Department before planting.

[3] Nurse crop only.

Source: Protecting Water Quality – A field guide to erosion, sediment and stormwater best management practices for developing sites in Missouri and Kansas. Revised January 2011.

Seedbed Preparation – For broadcast seeding or drilling, loosen soil to depth of 3 inches. For no till drilling, loosen soil if it is compacted. Loosen compacted, hard or crusted soil surfaces with a disk, ripper, chisel, harrow or other tillage equipment. Avoid preparing the seedbed under excessively wet conditions. For establishment and long-term growth, apply a complete fertilizer at rates recommended by soil tests or as specified in plans and specifications. If soil pH is less than 6.0, apply lime according to soil tests. Incorporate necessary lime and fertilizer to a depth of 3 to 6 inches of soil.

Installation – For the best results use certified seed. Apply seed uniformly using a cyclone seeder, drop-type spreader, drill, cultipacker seeder or hydroseeder. When using a drill seeder, plant rye or other grains about 1 inch deep and plant grasses no more than ½ inch. A vegetative straw mulch cover shall be applied over the seed mixture to help germinate and establish plant cover, control weeds, and protect seed mixture against temperature extremes. Follow straw mulch preparation and application procedures described in **Section C.1.b**.

d. **Permanent BMPs –** The project construction documents may contain permanent post-construction BMPs to control various pollutants for the life of the post-constructed site. The BMPs contained in this SWPPP are for temporary erosion control only and do not govern the construction or maintenance of any permanent BMPs. The Contractor shall be responsible for proper installation and maintenance of post-construction BMPs.

e. **Permanent Sodding Stabilization –** Any areas designated for sodding shall be sodded with a cool season grass mixture as specified by the Contract Documents and Specifications.

Site Preparation – Apply amendments according to soil test recommendations or as specified in plans and specifications. Incorporate amendments to a depth of 4 to 6 inches with a disk or chisel plow. Rake or harrow to achieve a smooth, final grade on which to lay the sod. The surface should be loose, and free of plants, trash, and other debris.

Laying Sod – Sod should not be laid on soil surfaces that are frozen. During high temperatures, moisten the soil immediately prior to laying sod. This cools the soil and reduces root burning and dieback. The first row of sod should be in a straight line with subsequent rows placed parallel to and butting tightly against each other. Stagger joints to create a brick-like pattern. Staggered joints promote more uniform growth and strength. Ensure that sod is not stretched or overlapped and that all joints are butted tight to prevent spaces which would cause drying of the roots. On slopes 3:1 or steeper, or wherever erosion may be a problem, lay sod with staggered joints and secure by stapling or pegging. Immediately after laying the sod, roll or tamp it to provide firm contact between roots and soil, then irrigate the sod deeply so that the underside of the sod pad and the soil 4 inches below the sod is thoroughly wet.

2. **Structural Practices** (See **Appendix B** for Engineering Plans and Details)

a. **Temporary Road Access –** Temporary Road Accesses have been designed on the plans. Only designated entrances shall be used for construction access to and from the site. The Contractor is responsible for keeping mud cleaned from adjoining streets as necessary.

Minimum Requirements:

Aggregate Size: 3- to 6-inch course aggregate.

Pad Design: Thickness of 8” minimum, Width of 20’ minimum or full width of roadway, and a total length of 50 feet minimum.

Geotextile Fabric: An underliner of woven geotextile (fabric) may be used under wet conditions to provide stability.

b. **Gravel Construction Entrance –** Gravel Construction Entrances have been designed on the plans. Only designated entrances shall be used for construction access to and from the site. The Contractor is responsible for keeping mud cleaned from adjoining streets as necessary.

   Minimum Requirements:
   - Aggregate Size: 2- to 3-inch course aggregate
   - Pad Design: Thickness of 6" minimum, Width of 12' minimum or full width of roadway, and a total length of 50 feet minimum.
   - Geotextile Fabric: An underliner of woven geotextile (fabric) may be used under wet conditions to provide stability.

c. **Stockpiles -** The toe of stockpiles shall be placed a minimum of 10 feet from silt fencing. If stockpiles are to remain for more than 14 days, they shall be temporarily stabilized with vegetative mulch and temporary seeding.

3. Non-Storm Water Management

Non-Storm water discharges at construction sites include the following:

- Waterline flushing – from the pressure testing of waterlines
- Irrigation water
- Building and pavement wash down
- Foundation and footing drain – from subsurface drainage systems
- Dewatering – removal of groundwater when excavating
- Dust control
- Vehicle rinse water

If these non-storm water discharges are allowed by the permit, then the discharge should be directed to a sediment filtering/trapping device. If the non-stormwater discharges are not allowed by the permit, then the discharges should be eliminated, apply for a separate permit, or connect the discharge to the sanitary sewer following approval of the local municipality.

III. CONSTRUCTION PHASE

A. GENERAL CONTRACTOR'S NAME

Mr. or Ms._____
Company Name _____
Street Address _____
City, State, Zip _____
Phone # ( ) ____-_____ Fax # ( ) ____-_____
Mobile # ( ) ____-_____ Pager # ( ) ____-_____

Name of Erosion and Pollution Control Officer: _____
Phone # ( ) ____-_____ Fax # ( ) ____-_____
Mobile # ( ) ____- _____ Pager # ( ) ____-_____

B. SUBCONTRACTORS

(check those that apply)

☐	Grading	☐	Storm Sewers	☐	Paving
☐	Concrete flatwork	☐	Seeding & Mulching	☐	Gas
☐	Blasting	☐	Sanitary Sewers	☐	Curb & Gutter
☐	Sediment Controls	☐	Water	☐	Electric
☐	Concrete Drainage Structures				
☐	Other: _____				

List all additional subcontractors whose scope of work includes land disturbance activities.

_____

_____

C. UTILITY CONTRACTORS

List of utility companies which will be doing work on the site with their own contractors and any other contractors who may have land disturbance activities on the site.

Telephone	
Gas	
Electric	

Cable TV	
Water	
Other	

D. MATERIALS INVENTORY

List below all materials which will be stored outside on the site during construction:

____ Pipe, fittings and joint compounds for underground utility piping

____ Gravel and stone bedding material

____ Concrete forming materials

____ Other (specify)_____

_____

_____

Note: Fuels, oils, and other petroleum products; forming oils and compounds; fertilizers; pesticides; or any other hazardous or toxic compounds shall not be stored outside on the site unless specifically approved in this plan.

E. SEQUENCE OF CONSTRUCTION ACTIVITIES

1. Prior to clearing, topsoil separations, and construction of improvements, install BMPs according to the attached engineering plans and details as soon as construction phasing permits.

2. As construction of improvements advances, maintain all erosion and sediment control measures until the site is stabilized such that a 70 percent density or more of the permanent vegetation is well established for all areas. Remove accumulated sediment and debris from the BMPs as required. Redistribute sediment onsite within the control of the BMP's.

3. When construction of improvements ceases, redistribute the topsoil and begin final restoration of the disturbed areas as shown on the engineering plans and details or as directed by the Owner or Representative.

4. Continually update the SWPPP with project changes as necessary. Perform routine site inspections as detailed in Section III.H and maintain all inspection records and logs.

5. Remove temporary stabilization and structural BMPs when the site is stabilized such

that a 70 percent density or more of permanent vegetation is well established for all areas.

Timing of Controls/Measures

As detailed in the sequence of construction activities, installation of BMPs along areas which are not to be disturbed shall **precede** the start of any grading. Once construction activities have permanently ceased, the site shall be permanently seeded, sodded, and/or mulched. After the disturbed site is stabilized such that a 70 percent density or more of the perennial/permanent vegetation is well established, the accumulated sediment will be removed from erosion control features and the features removed and the location of the control features seeded and mulched. Excess sediment shall be disposed of on-site in relatively non-erodible areas. Appropriate control measures will be completed with each additional phase utilizing erosion and sediment control measure used in the initial site construction activities.

F. GENERAL SEDIMENT CONTROL PRACTICES

The Contractor shall implement the following general sediment and erosion control practices in addition to specific measures required in the **Section II.C** - Erosion and Sediment Controls.

- Prior to initiation of land disturbance activities, the Contractor shall sign the General Contractor's Certification located in **Section X,** complete and sign the Contractor's Certification Form in **Appendix C,** and complete **Section III.A-D**. The Stormwater Pollution Prevention Plan shall be maintained on-site along with a copy of the State and City (if applicable) issued Water Pollution Control General/Operating Permit for the project.
- The Contractor shall install and maintain the erosion control measures shown on the engineering plans and details, and as described in the construction specifications and the Stormwater Pollution Prevention Plan. If the Owner and/or Engineer determine that the installation or the maintenance is inadequate, the Contractor must immediately correct at his or her expense. If it is determined that additional erosion control measures are needed, the Contractor will be directed to install and maintain those measures.
- The Contractor shall provide for the control of surface erosion and sediment runoff during all phases of construction and until the Owner accepts the work as complete. The sediment control measures shown are intended to be a general guide as to the measures that will most likely be required during construction. The Contractor shall be responsible for the evaluation of existing surface drainage patterns and for making adjustments to the erosion controls measures to best control erosion and minimize, if not eliminate, the transport of sediment from disturbed areas. The Contractor shall provide erosion and sediment controls such as, and not limited to, temporary and permanent seeding, mulching, hydromulch, sodding, tackifiers, filter berms, sediment fence, straw wattle, rolled erosion control products, temporary sediment traps, temporary sediment basins, ditch checks, storm drain inlet protection, geotextiles, or other means to prevent sediment from reaching the public

right-of-way, streams, or adjacent properties. In the event the prevention measures are not effective, the Contractor shall remove any debris sediment and restore the damaged areas to original or better condition.

- All erosion and sediment control BMPs shall be removed when soil disturbing activities at the site have been completed and a uniform permanent vegetative cover with a density of 70 percent or the equivalent permanent stabilization measures have been employed.
- Temporary surfacing shall be utilized wherever necessary by the Contractor to permit vehicular or pedestrian traffic without the transport of any sediment onto adjacent surfaces.

G. MAINTENANCE / INSPECTION PROCEDURES

The Contractor shall inspect erosion and sediment controls on a regular schedule and within 24 hours of the end of a precipitation event which results in precipitation of 0.5 inches or greater. The frequency of regular inspections should be proportional to the amount of construction activity but at a minimum of once every 14 days. Controls shall be inspected for proper installation, operation and maintenance. Controls must be in good operating condition until the area they protect has been completely stabilized and the construction activities are complete. The Contractor shall maintain a log of each inspection. See **Section V.B** for further inspection information.

The following maintenance and inspection practices are required to maintain sediment and erosion controls:

- Mulched areas shall be inspected for erosion and damage during regularly scheduled inspections and after rainstorms. Promptly repair damaged areas and restore to original condition. Continue inspections until vegetation is well established.
- Check temporary seedlings within 2 to 4 weeks of planting to see if stands are of adequate thickness (more than 30% of the ground surface covered). Stands should be uniform and dense for best results. Fertilize, reseed, and mulch bare and sparse areas immediately to prevent erosion. Temporary grass can be mowed when height is greater than 12 inches; however, to prevent damage to temporary grasses, do not mow shorter than 4 inches. Replant temporary or permanent vegetation within 12 months as annual/temporary grasses die off and no longer provide erosion control. Note: Watering of temporary seeded areas may be necessary at the discretion of the Owner during periods of dry weather.
- Check permanent grass seedlings within 4 to 6 weeks after planting. Look for uniform density with at least 30% of the ground surface covered. Inspect seedlings for erosion or die out for at least a year. To repair bare and sparse areas, fill gullies, re-fertilize, reseed and mulch. Consider mowing after permanent grass has reached a height of 6 to 8 inches. Mow grasses at least 3 inches in height and minimize compaction during the mowing process. Note: Watering of permanent seeded areas may be necessary at the discretion of the Owner during periods of dry weather.
- Keep sod moist until it is fully rooted. Mow sod to a height of 2 to 3 inches after sod

is well-rooted, in 2 to 3 weeks. Do not remove more than 1/3 of the leaf blade in any mowing.

- Silt fencing shall be inspected during regularly scheduled inspections and after rainstorms for proper anchorage and leakage underneath. Should the fabric of the sediment fence collapse, tear, decompose, or become ineffective, replace or repair it promptly. Built-up sediment will be removed from silt barriers when it has reached one-half of the height of the barrier. Sediment removal will include removal and disposal in a location where it will not erode into construction areas or watercourses.
- Inspect rock check dams during regularly scheduled inspections and after rainstorms. Check rock check dams for adequate performance, rock placement, washouts, or excess sediment loading. If any issues are noted, the rock check dams shall be maintained as soon as possible.

The following maintenance and inspection practices are optional and may be required to be performed by the Contractor to maintain sediment and erosion controls:

- Inspect temporary road access during regularly scheduled inspections and after rainstorms. Check temporary road access for adequate performance, adequate rock depth, or excess sediment loading. If any issues are noted, the temporary road access shall be maintained as soon as possible.
- Inspect temporary stream crossings during regularly scheduled inspections and after rainstorms. Check temporary stream crossings for adequate performance, rock placement, washouts, or excess debris accumulation. If any issues are noted, the rock check dams shall be maintained as soon as possible.
- Straw wattle ditch checks shall be inspected during regularly scheduled inspections and after rainstorms for proper anchorage and leakage around the edges or underneath. Should the wattle become misplaced, tear, decompose, or become ineffective, replace or repair it promptly. Built-up sediment will be removed from silt barriers when it has reached three quarters of the height of the barrier. Sediment removal will include removal and disposal in a location where it will not erode into construction areas or watercourses.
- Inspect gravel filter bags during regularly scheduled inspections and after rainstorms. Check gravel filter bags for adequate performance and any other displacement of the bags. If any issues are noted, the gravel filter bags shall be repaired as soon as possible.
- Straw wattles shall be inspected during regularly scheduled inspections and after rainstorms for proper anchorage and leakage underneath. Should the wattles tear, decompose, or become ineffective, replace or repair it promptly. Built-up sediment will be removed from silt barriers when it has reached one-half of the height of the barrier. Sediment removal will include removal and disposal in a location where it will not erode into construction areas or watercourses.
- Compost berms shall be inspected during regularly scheduled inspections and after rainstorms for washouts and leakage underneath. Should the berms decompose or become ineffective, replace or repair it promptly. Built-up sediment will be removed from compost berms when it has reached one-half of the height of the barrier.

Sediment removal will include removal and disposal in a location where it will not erode into construction areas or watercourses.

- Inspect gravel construction entrance during regularly scheduled inspections and after rainstorms. Check entrance for adequate performance, adequate rock depth, or excess sediment loading. If any issues are noted, the entrance shall be maintained as soon as possible.
- Inspect erosion control blankets during regularly scheduled inspections and after rainstorms. Check adequate performance, undermining, unraveling, or any displacement of the blankets. If any issues are noted, the blankets shall be repaired or replaced as soon as possible.

IV. SPILL PREVENTION / MATERIAL MANAGEMENT PRACTICES

Best Management Practices (BMPs) shall be utilized as required to prevent contamination of storm water runoff. Such BMPs shall include solid and hazardous waste management for the following:

A. PETROLEUM PRODUCTS

All vehicles kept on the site will be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers which are clearly labeled. Any asphalt substances used on-site will be applied according to the manufacturer's recommendations. BMPs shall be used through the installation of containment berms and use of drip pans for petroleum product and liquid storage and containers.

B. FUELING & SERVICING

No fueling, servicing, maintenance, or repair of equipment or machinery may be done within 50 feet of a stream, water quality management area, stream, or sinkhole. Fueling storage will have soil berms around the tank for spill controls, if needed.

C. CONCRETE TRUCKS

Concrete washout should be done at the concrete contractor's own plant facilities whenever possible. If on-site concrete washout is necessary, a pit or other method of containment shall be designated as far away as possible from storm drains or existing watercourses. Discharge of concrete wash and rinse waters is prohibited, including from ready mix concrete trucks.

D. DISPOSAL OF OIL

No fuels, oils, lubricants, solvent, or other hazardous materials can be disposed of on the site. All hazardous material must be properly disposed of in accordance with State law. For guidance, contact 1-785-296-1667 in Kansas.

E. TRASH/SOLID WASTE

The General Contractor is responsible for disposal of all solid waste from the site in accordance with State law. Dumpsters or other collection facilities must be provided as needed. Solid waste may not be buried on the site. The dumpsters or trash containers shall be used for proper disposal of solid waste such as scrap building material, product/material shipping waste, food containers, and cups.

F. SANITARY WASTE

The General Contractor is responsible for providing sanitary facilities on the site. Sanitary waste may be disposed only in locations having a State permit.

G. OTHER DISCHARGES

Water for pressure testing sanitary sewers, flushing water lines, etc. may be discharged only in approved areas.

H. AIR EMISSIONS

1. **Burning:** Any burning on the site requires approval from the local and State governments. Burning must comply with the State regulations under 28-19 and any local requirement.

2. **Dust Control:** The Contractor is required by State law to control fugitive dust blown from the site. Dust can be minimized by stabilizing areas with mulch and watering.

I. OTHER GOOD HOUSEKEEPING PRACTICES

In addition to the foregoing, the following good housekeeping practices will be followed during the construction of the project:

- An effort will be made to store only enough products to do the job.
- All materials stored on-site will be stored in a neat, orderly manner in their appropriate containers and, if possible, under a roof or other enclosure.
- Products will be kept in their original containers with the original manufacturer's label.
- Whenever possible, all of a product will be used up before disposing of the container.
- Manufacturer's recommendations for proper use and disposal will be followed.
- The site superintendent shall inspect daily to ensure proper use, storage, and disposal of materials.
- Fertilizers will be applied only in the minimum amounts recommended by the manufacturer.
- All paint containers will be tightly sealed and stored when not required for use. Excess paint will not be dumped into the storm sewer system but will be properly disposed of according to manufacturer's instructions and State regulations.

J. HAZARDOUS PRODUCTS

- Products will be kept in original containers unless they are unable to be sealed and leak-proof. If product is transferred to a new container, it must be properly marked and labeled.
- Original labels and material safety data will be retained.
- If surplus product must be disposed of, disposal must be done in accordance with State law. For local disposal information, contact your solid waste district, your local emergency planning committee (LEPC) or in Kansas call 1-785-296-1667.
- Containers shall be provided for proper disposal of waste paints, solvents, and cleaning compounds.

K. SPILL CONTROLS

The Erosion and Pollution Control Officer will be the spill prevention and cleanup coordinator. In addition to the good housekeeping practices and material management practices listed in the previous sections of this plan, the following practices will be followed for spill prevention and clean-up:

- Manufacturer's recommended methods for spill cleanup will be clearly posted and site personnel will be made aware of the procedures and the location of the information and cleanup supplies.
- Material and equipment necessary for spill cleanup will be kept in the material storage area on-site. Equipment and materials will include, but not be limited to, brooms, dust pans, mops, rags, gloves, goggles, kitty litter, sand, sawdust, and plastic and metal trash containers specifically for this purpose.
- All spills will be cleaned up immediately after discovery.
- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.
- Spills of toxic or hazardous material will be reported immediately to the *Local Emergency Planning Committee (LEPC)*, regardless of the size of the spill. The permittee or his authorized representative is required to notify the KDHE Environmental Emergency Response in accordance with 40CFR117 and 40CFR302 as soon as they have knowledge of the discharge of any hazardous substance or petroleum product in excess of the reportable quantity. In Kansas, contact the KDHE 24-hour spill hotline at 1-785-296-1679.
- See **Appendix D** – Construction Site Pollutant Reference for more information on common construction site pollutants.

L. SAMPLING REQUIREMENTS

There are no sampling requirements required as a part of this plan. The local, state, or federal agencies may require sampling and reporting as a result of illegal discharges, compliance issues, complaint investigations, or other such evidence of on-site or off-site contamination from activities at the site. If such an action is needed the local, state, or federal agency will specify in writing any additional sampling requirements.

V. IMPLEMENTATION / UPDATING THE SWPPP

A. AMENDING THE SWPPP

The permittee shall amend and update the SWPPP as appropriate during the term of the land disturbance activity. The permittee shall amend the SWPPP, at a minimum, whenever the:

a. Design, operation, or maintenance of BMPs is changed.

b. Design of the construction project is changed that could significantly affect the quality of the storm water discharges.

c. Permittee's inspections indicate deficiencies in the SWPPP or any BMP.

d. KDHE notifies the permittee of deficiencies in the SWPPP.

e. SWPPP is determined to be ineffective in significantly minimizing or controlling erosion and sedimentation (e.g., there is visual evidence, such as excessive site erosion or excessive sediment deposits in streams or lakes).

f. KDHE determines violations of Water Quality Standards may occur or have occurred.

B. SITE INSPECTIONS

The permittee shall ensure the land disturbance site is inspected on a regular schedule and within 24-hours of the end of a precipitation event of 0.5 inches or greater. The frequency of regular inspections should be proportional to the amount of construction activity. The frequency of inspections should increase as the construction activities increase. Regularly scheduled inspections shall be at a minimum of once every 14 days. For disturbed areas that have not been finally stabilized, all installed BMPs and other pollution control measures shall be inspected for proper installation, operation and maintenance. Locations where storm water leaves the site shall be inspected for evidence of erosion or sediment deposition. Any deficiencies shall be noted in a report of the inspection and corrected within seven calendar days of the inspection. The permittee shall promptly notify the site contractors responsible for operation and maintenance of BMPs of deficiencies.

See **Appendix E** for the Site Inspection Form to be used when conducting site inspections. A log of each inspection shall be kept (See **Appendix F)**. The Site Inspection Form is to include the following minimum information: inspector's name, date of inspection, observation relative to the effectiveness of the BMPs, actions taken or necessary to correct deficiencies, and listing of areas where land disturbance operations have permanently or temporarily stopped. The inspection report shall be signed by the permittee or by the person performing the inspection if duly authorized to do so.

Completed Site Inspection Forms shall be kept with this SWPPP. See **Appendix G** for a pocket to hold completed Site Inspection Forms.

C. PROPER OPERATION AND MAINTENANCE

The permittee shall, at all times, maintain all pollution control measures and systems in good order to achieve compliance with the terms of this general permit. The need to halt or reduce the permitted activity in order to maintain compliance with general permit conditions shall not be a defense to the permittee in an enforcement action.

D. NOTIFICATION TO ALL CONTRACTORS

The permittee shall notify each contractor or entity (including utility crews and city employees or their agents) who will perform work at the site of the existence of the SWPPP and what action or precautions shall be taken while on site to minimize the potential for erosion or pollution and the potential for damaging any BMP. If additional land is disturbed or any BMP damaged, then the permittee shall cause to have the disturbance or damage repaired.

VI. RECORDS OF INSPECTION

A. If construction ceases prior to final stabilization occurring, the permittee shall retain copies of the general permit, the SWPPP and all amendments for the site names in the General Permit, results of any monitoring and analysis, and all site inspection records required by the general permit. The permittee shall retain these permit records at a site which is readily available from the permitted site until final stabilization of a site is achieved. The local office of the permittee, their contractor or consultant, is considered to be readily available from the project site if it is located in the same county as the project site. The permit records shall be accessible during normal business hours. After final stabilization, the permit records may be maintained at the location of the permittee's main office. The permit records shall be retained for a period of at least three years from the Notice of Termination.

B. The permittee shall provide a copy of the SWPPP to KDHE, USEPA, or any local agency or government representative if they request a copy in the performance of their official duties.

The permittee shall provide those who are responsible for installation, operation, or maintenance of any BMP a copy of the SWPPP.

The permittee, their representative, and/or the contractor(s) responsible for installation, operation, and maintenance of the BMPs shall have a current copy of the SWPPP with them when on the project site.

VII. TRANSFER OF OWNERSHIP

A. Individual Lot or Lots: Federal and State storm water regulations require a storm water permit and erosion control for one acre or more disturbed as part of a common plan or sale. That language means the individual lots (commercial, industrial, or residential) when sold to an entity for construction (unless sold to an individual for purposes of building their own private residence) are also subject to storm water regulations because they are part of the common sale.

VIII. TERMINATION

The permit shall be terminated when the project is stabilized. The project is considered to be stabilized when perennial vegetation, pavement, buildings, or structures using permanent materials cover all areas that have been disturbed. With respect to areas that have been vegetated, permanent vegetative cover shall be at least 70% of fully established plant density over 100% of the disturbed area. See **Appendix A** for Notice of Termination form (last page of the General Permit) to be submitted to KDHE.

A. DUTY TO COMPLY

The permittee shall comply with all conditions of the general permit. Noncompliance may result in enforcement action, termination of this authorization, or denial of the permittee's request for renewal.

B. MAILING ADDRESS

The permittee shall send all written correspondence and forms which are to be submitted to KDHE to the address listed in the cover letter that accompanies the permit.

IX. ACTION ITEMS

Below is a list of action items required by the SWPPP to help the Permittee stay in compliance:

1. Permittee and Contractor - Read and understand the KDHE Stormwater Runoff from Construction Activities General Permit in **Appendix A**.
2. Permittee and Contractor - Sign **Section X**.
3. Contractor - Fill out the General Contractor's information in **Section III:A-D**.
4. Contractor - Complete the Contractor's Certification Form in **Appendix C**.
5. Contractor - Per **Section V:B**, inspect the site at a minimum of once per 14 days and within 24 hours of the end of a precipitation event of 0.5" or greater. Use the Site Inspection Form in **Appendix E** to record the findings.
6. Contractor - A record log of all Site Inspections shall be kept on the Site Inspection Log in **Appendix F**.
7. Contractor - All completed Site Inspection Forms shall be kept with this SWPPP. A pocket has been provided in **Appendix G** – Completed Site Inspection Forms.

8. Contractor - Amend the SWPPP drawings with pertinent project site specific information as construction progresses (i.e. BMP location changes, project site changes, additional BMPs, stabilized areas, etc.)
9. When all project areas achieve final stabilization to the satisfaction of the General Permit and this SWPPP, fill out and submit the Notice of Termination in **Appendix A** (last page of the General Permit).

X. SIGNATURES

OWNER'S CERTIFICATION

I hereby certify that I am the owner of the property described in this SWPPP, or his legally authorized agent, and that I assume full responsibility for the performance of the operation stated in this plan.

OWNER_____

By:_____Title:_____

Date:_____

GENERAL CONTRACTOR'S CERTIFICATION

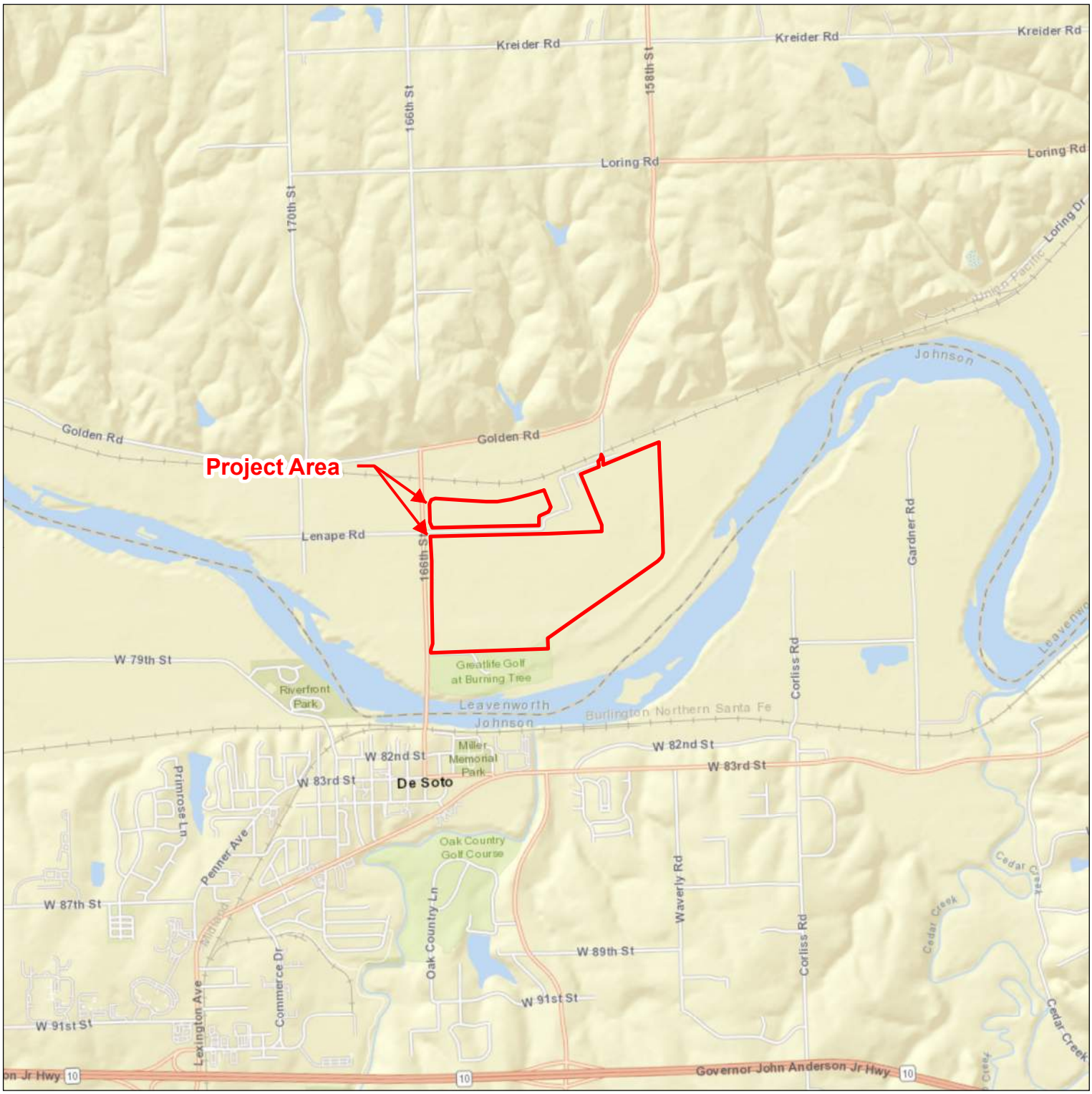
I hereby certify that I understand the requirements stated in this plan, that I am responsible for completing the requirements set forth in this SWPPP and shown on the Sediment & Erosion Control Plan, and that I am responsible for the performance of the subcontractors listed in the plan.

GENERAL CONTRACTOR_____

By:_____Title:_____

Date:_____

FIGURES



Source: ESRI World Street Map - http://services.arcgisonline.com

Project Location: Section 22, Township 12S, Range 22E

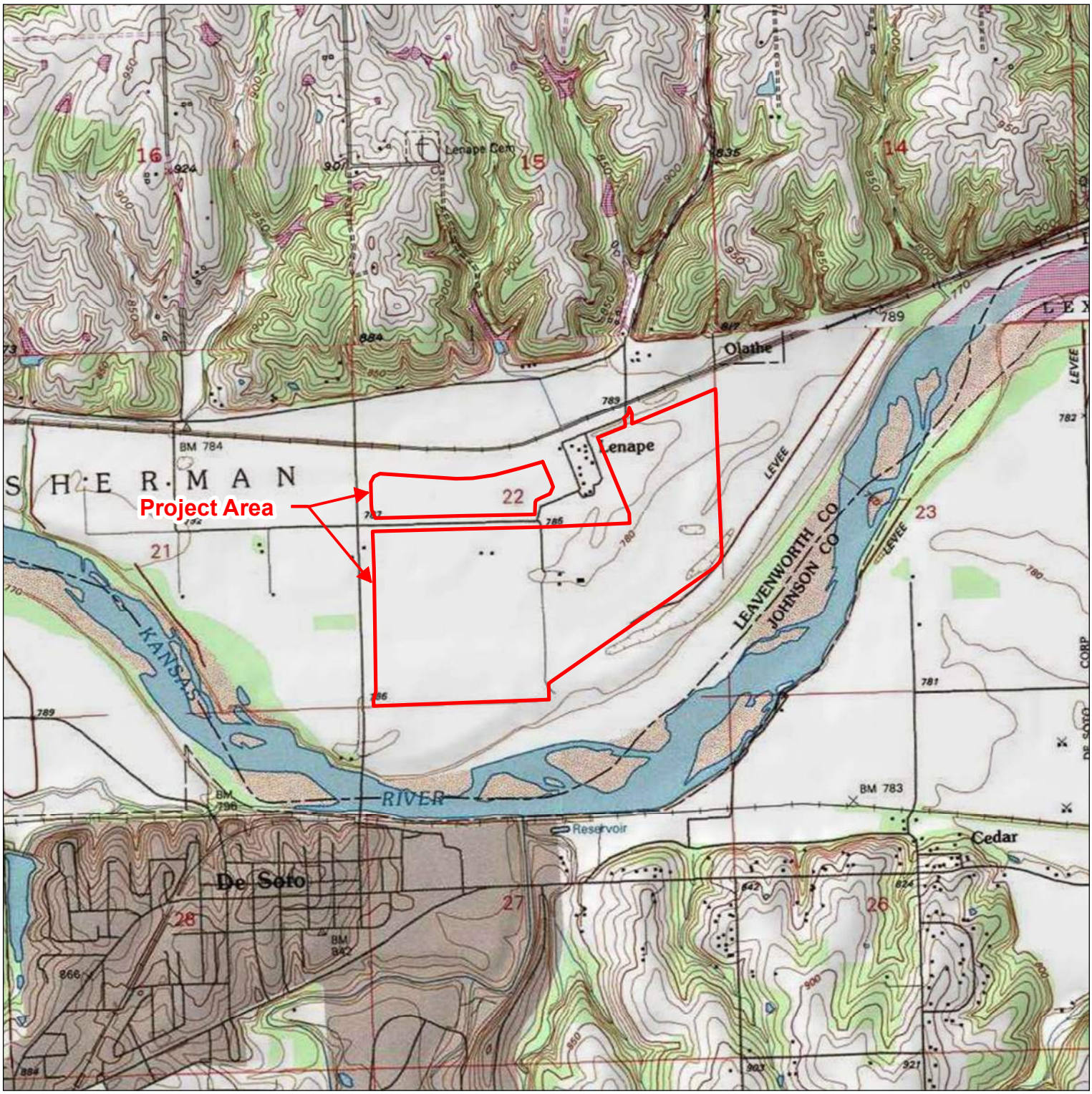
Legend

Project Area

N

1 inch = 3,000 feet

GBA	PROJECT NUMBER 16477.00 DATE 11/11/2024	LOCATION MAP Lenape Sand Operation 166th Street and Lenape Road Leavenworth County, Kansas	FIGURE 1 312



Source: ESRI USA Topo Maps - http://services.arcgisonline.com
USGS 7.5 Minute Quadrangle - De Soto, KS 1991

Project Location: Section 22, Township 12S, Range 22E

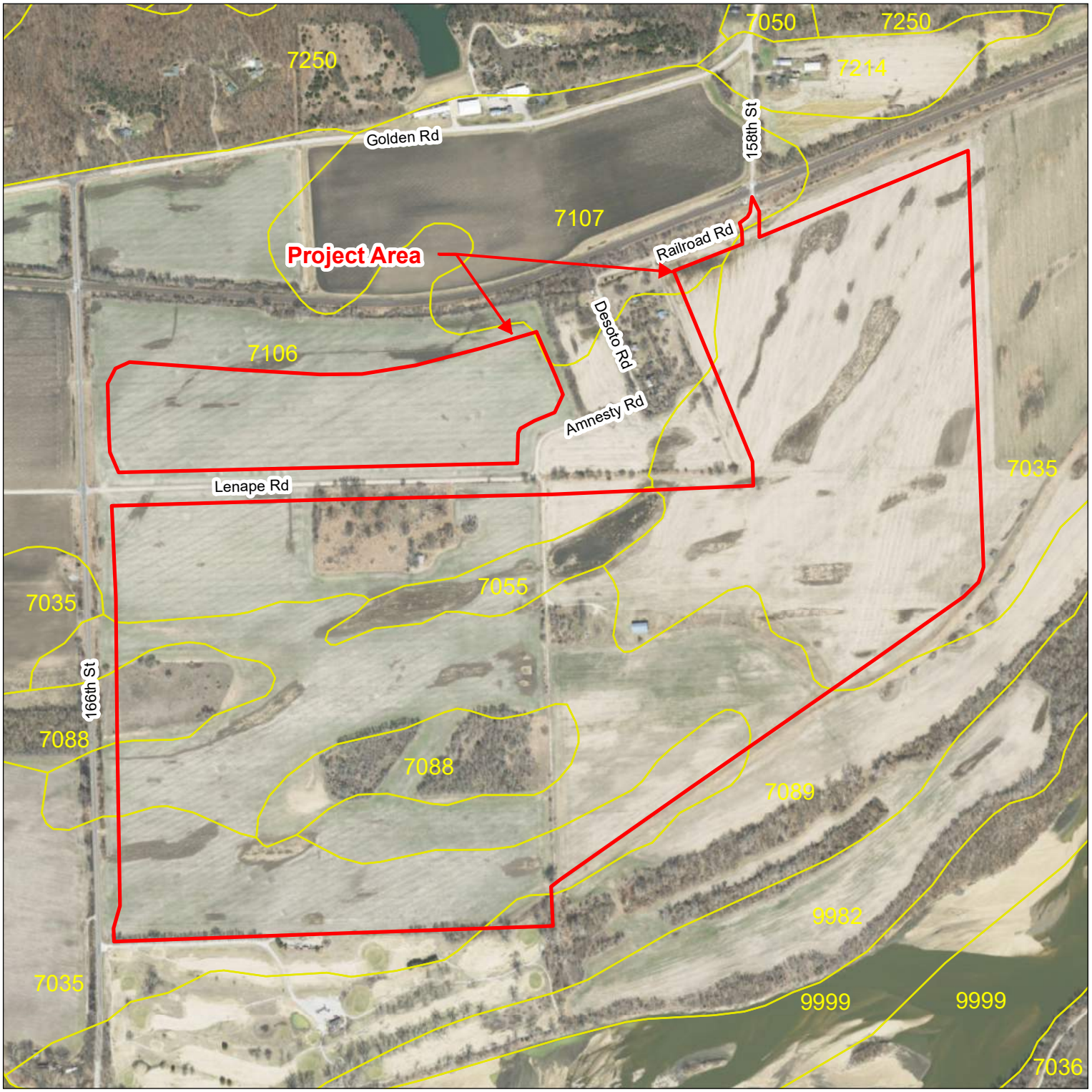
Legend

Project Area

N

1 inch = 2,000 feet

GBA	PROJECT NUMBER 16477.00 DATE 11/11/2024	TOPOGRAPHIC MAP Lenape Sand Operation 166th Street and Lenape Road Leavenworth County, Kansas	FIGURE 2



Legend

Project Area

Soil Boundaries

7035 - Eudora-Bismarckgrove fine sandy loams, overwash, occasionally flooded, Hydric rating 1
7055 - Kimo silty clay loam, occasionally flooded, Hydric rating 5
7088 - Stonehouse sand, occasionally flooded, Hydric rating 1
7089 - Stonehouse-Eudora fine sandy loams, overwash, occasionally flooded, Hydric rating 1
7106 - Eudora-Bismarckgrove silt loams, rarely flooded, Hydric rating 1
7107 - Bismarckgrove-Kimo complex, rarely flooded, Hydric rating 1

Source: ESRI World Imagery - http://services.arcgisonline.com
SSURGO Soil Outlines - http://websoilsurvey.sc.egov.usda.gov/

Project Location: Section 22, Township 12S, Range 22E

N

1 inch = 800 feet

GBA

PROJECT NUMBER
16477.00

DATE
11/11/2024

SOIL MAP

Lenape Sand Operation
166th Street and Lenape Road
Leavenworth County, Kansas

FIGURE
3

APPENDIX A
Kansas NPDES General Permit

Kansas Water Pollution Control General Permit and Authorization to Discharge

STORMWATER RUNOFF FROM CONSTRUCTION ACTIVITIES

Under the National Pollutant Discharge Elimination System

Pursuant to the Provisions of Kansas Statutes Annotated 65-164 and 65-165; the Federal Water Pollution Control Act as amended (33 U.S.C. 1251 et seq.; the "Clean Water Act"); and the Kansas Surface Water Quality Standards (K.A.R. 28-16-28 et seq.); this NPDES general permit provides the requirements and conditions under which the permittee is authorized to discharge stormwater runoff from construction activities.

Coverage is provided and construction Stormwater discharge is authorized when the Kansas Department of Health and Environment (KDHE) issues an Authorization to discharge stormwater runoff from construction activities until the Authorization is revoked/terminated. A signed and dated copy of the Authorization or notification that the Authorization has been issued and is available to access or download will be provided to the permittee.

Upon Authorization, the Permittee is allowed to discharge stormwater runoff from construction activities described in the Notice of Intent for Stormwater Runoff from Construction Activities and supporting documents in accordance with the requirements and conditions of this NPDES General Permit and the Stormwater Pollution Prevention Plan developed for the identified construction activities.

This NPDES general permit is effective August 1, 2022 through July 31, 2027.

(signed by Secretary Janet Stanek)
Secretary, Kansas Department of Health and Environment

July 29, 2022
Date

AUTHORIZED ACTIVITY DESCRIPTION:

Construction Activities

Construction activities consist of any activity (e.g. clearing, grubbing, excavating, and grading) which disturbs a cumulative total of one (1.0) or more acres or when the site is a part of a larger common plan of development or sale which will disturb a cumulative total of one or more acres.

Owners or operators of construction activities which disturb less than one acre (<1.0 acre), and which are not part of larger common plan of development or sale, must have authorization to discharge stormwater runoff from construction activities under this NPDES general permit when KDHE notifies the owner or operator that the water quality impact from discharge of stormwater runoff from construction activity warrants consideration because the proposed construction activities constitute a significant pollution potential.

Permit coverage is not required for routine maintenance (see endnote 7, page 21), for certain demolition and linear projects and for certain project support activities as specified in Part 1.1 of this permit.

Upon issuance of this NPDES General Permit, owners or operators who intend to engage in construction activities as indicated above shall obtain authorization to discharge stormwater runoff under this NPDES general permit prior to commencing construction activities at the project site. To obtain authorization to discharge stormwater runoff, the owner or operator of a construction site needs to submit a Notice of Intent (NOI) for the discharge of stormwater runoff from construction activities at least 60 days prior to removing vegetation or disturbing soil at the site to avoid any unplanned delays in the start of construction. The NOI form is a request for coverage under the requirements and conditions of this NPDES general permit. To obtain authorization, the NOI form and supporting documents shall be submitted in accordance with Part 4 of this NPDES general NPDES permit. Upon acceptance of the NOI and supporting documents, KDHE will indicate the authorization for coverage under the NPDES general permit on the NOI form, assign permit numbers, and indicate the KDHE issuance of the Authorization with the Department Secretary's signature. The owner or operator is then authorized to discharge stormwater runoff from construction activities under the provisions of this NPDES general permit and may commence construction activities at the site described in the NOI and supporting documents in accordance with the terms and conditions expressed in this NPDES general permit and in conformance with the stormwater pollution prevention plan developed for the site.

Owners or operators who received authorization to discharge under the previous Stormwater Runoff from Construction Activities General Permit S-MCST-1703-1, may continue to operate under those permit provisions, conditions, requirements, limits, site specific authorized Best Management Practices (BMPs), and site specific authorized Stormwater Pollution Prevention Plan (SWP2 Plan) until 18 months after permit issuance as provided for in Part 6.1 of this permit.

Rather than submitting an NOI, owners or operators who intend to engage in construction activity that will disturb between one (1) and five (5) acres may request a rainfall erosivity waiver. To receive a waiver, the owner or operator of a construction site shall submit a rainfall erosivity waiver application form prior to removing vegetation or disturbing soil at the site. KDHE recommends the rainfall erosivity waiver application form and supporting documentation be submitted at least 60 days prior to the start of construction activities. Prior to initiation of construction activities at the site the owner or operator must receive a copy of the authorized rainfall erosivity waiver or notification that authorization has been issued and the authorized form is available to access or download from KDHE. To be authorized, the small construction activity must have a low predicted rainfall potential that corresponds to a rainfall erosivity factor of less than 5 as calculated by the Revised Universal Soil Loss Equation [RUSLE]. The rainfall erosivity waiver application form is available on the Kansas Stormwater Website (see endnote 1, page 21). Copies can also be obtained by writing or e-mailing KDHE at the addresses in Part 10.2.

Any owner or operator who is subject to NPDES permit requirements for stormwater runoff from construction activities and who discharges stormwater runoff from construction activities prior to receiving authorization from KDHE is in violation of both State and Federal laws.

PREFACE

The purpose of this NPDES general permit is to implement the Federal Water Pollution Control statutes and regulations; permit discharges of stormwater runoff from construction sites subject to National Pollutant Discharge Elimination System (NPDES) permit requirements; and to protect waters of the State from sediment and other contaminants.

The issuance of an authorization to discharge under this NPDES general permit allows a project owner or operator, after implementation of the project site stormwater pollution prevention plan, to commence construction site soil disturbing activities that can produce or potentially produce a discharge of contaminated stormwater runoff to surface waters of the State of Kansas. In the absence of information demonstrating otherwise, KDHE expects that compliance with provisions and conditions in this permit will result in the discharge of stormwater being controlled as necessary to meet applicable Kansas surface water quality standards.

This NPDES general permit does not authorize the placement of fill materials in a flood plain, the obstruction of stream flow, directing stormwater runoff across private property, increasing stormwater runoff flow, changing the channel of a defined drainage course, etc. This NPDES general permit is intended to address only the quality of the stormwater runoff and to minimize off-site migration of sediments or other pollutants.

KDHE administers a number of regulatory programs that may preclude the initiation of construction activities until such time as a specific permit is issued or authorization is granted. This NPDES general permit authorization solely addresses NPDES stormwater discharge requirements for construction activities. It is the obligation of the permittee to ensure compliance with all other KDHE, State, Federal and local statutory and regulatory requirements.

Owners or operators seeking coverage under this NPDES general permit which have the potential to impact threatened or endangered species or historical sites can obtain information regarding regulatory requirements or special conditions which may be applicable to the activities covered by this permit from the Kansas Department of Wildlife and Parks (KDW&P) or the Kansas Historical Society (KSHS) respectively (See NOI instructions for contact information).

Other appropriate agencies should be contacted to determine the need for additional permits, authorizations, or requirements, if any. In particular the applicant should contact the local municipal separate storm sewer system (MS4) agency (see endnote 2, page 21). Other agencies the applicant should contact include the United States Army Corps of Engineers; Kansas Department of Agriculture, Division of Water Resources; and any other local governments or agencies that are not listed herein that may have jurisdiction.

Authorization to Discharge under this NPDES general permit does not constitute approval of the project under the provisions of the Kansas Water Projects Environmental Coordination Act and does not relieve the permittee of the responsibility to comply with the requirements of other Agencies prior to commencement of construction activities.

Part 1. WHO MUST OBTAIN AUTHORIZATION TO DISCHARGE

Owners or operators of construction activities which may disturb one (1.0) or more acres of soil or are part of a larger common plan of development or sale which may disturb a cumulative total of one (1.0) or more acres of soil must obtain authorization to discharge stormwater runoff from construction activities.

Owners or operators of construction activities which disturb less than one acre (<1.0 acre) of soil, and are not part of larger common plan of development or sale, must have authorization to discharge stormwater runoff from construction activities under this NPDES general permit when KDHE believes the water quality impact warrants consideration or KDHE determines the construction activities constitute a significant pollution potential (i.e., sites that will disturb contaminated soils, contaminated groundwater, or sites adjacent to sensitive waters).

Soil disturbing activities where contaminated soils or contaminated groundwater may be present on the site are reviewed by KDHE on a case-by-case basis and may require coverage under this NPDES general permit or an individual permit even if less than one acre (< 1.0 acre) of soil is disturbed. For sites where contaminated soil or groundwater is present, contact KDHE Bureau of Water - Industrial Programs Unit at (785) 296-5549 for a determination on the need for coverage under this NPDES general permit.

Platted subdivision projects must obtain coverage for all areas of the subdivision site. Subdivision projects that have roads and/or utilities constructed under separate contract (e.g., city assessment district) may need to have two concurrent discharge authorization requests (NOIs) for coverage under the NPDES general permit submitted. The owner (developer) of the subdivision project must maintain coverage for the individual lot construction sites. Owners that have control over the construction activities

of the entire subdivision site, including roads and utilities, need only submit one discharge authorization request (NOI) for coverage under the NPDES general permit.

Soil disturbing activities in response to a public emergency (e.g., tornado, earth quake, flood, ice storm, rail or highway incidents) where the related work requires immediate soil disturbance to avoid imminent endangerment to the public health or the environment is allowed without formal submittal and authorization by KDHE if the owner or operator implements soil erosion and sediment control as soon as possible after the emergency conditions have been resolved and a Notice of Intent application form for coverage under this permit is submitted within 30 days after the start of emergency soil disturbing activities showing the areas disturbed and the soil and erosion controls provided.

1.1 Activities that Do Not Require Permit Coverage – Construction activities do not include the following types of projects:

a. routine maintenance that disturbs less than 5 acres (see endnote 7, page 21);

b. structural demolition activities, including filling of basements, removal of debris and removal and replacement of pavement (even when exposing erodible soils or subsoils), which do not involve soil excavation, grading, clearing, grubbing or other soil disturbing construction activities;

c. the linear opening of soil in a single line of two (2) feet or less in width utilizing soil plow trenching equipment that immediately closes the opening as part of the plow equipment's normal operation by filling the opening with removed soil or by the closure of the sidewalls to their original configuration after passage of the plow; however, areas disturbed by soil plow operations that open a width of more than one (1) foot must immediately be seeded with an appropriate variety of vegetative cover or stabilized with mulch or a similarly effective soil stabilizing BMP after passage of the plow equipment.

Soil disturbing activities associated with construction support activities, such as concrete batch plants, asphalt plants, soil disposal sites and borrow sites at or immediately adjacent to the supported project site are considered part of the common plan of development for the project and will need coverage under this permit through separate authorization if the support activity is not included in the supported project's stormwater pollution prevention plan. Asphalt and concrete batch plants might also need to obtain a separate water pollution control permit for wastewater generated by these facilities.

Support activities such as concrete batch plants, asphalt plants and areas of offsite soil borrow and soil disposal/fill activities may be treated as stand-alone construction projects which are not considered part of the supported project's common plan of development if runoff from the support activity site is not anticipated to significantly impact the same surface waters and stream segments that receive runoff from the supported project site.

Part 2. WHAT THIS PERMIT COVERS

Coverage under this NPDES general permit authorizes the discharge of stormwater runoff from construction activities for sites where the discharge point is located in Kansas and for discharges and construction activities that are conducted in accordance with the provisions and requirements of this permit and in accordance with the site specific stormwater pollution prevention plan from the date of Authorization until the site conditions meet the closure requirements specified in Part 9 of this permit and a Notice of Termination (NOT) is received by KDHE or the permit is revoked/terminated or placed on inactive status for cause by KDHE.

Proposed new or existing unpermitted construction stormwater dischargers, in regard to antidegradation, are eligible for authorization under this general permit to discharge to a Tier 1, 2, or 2½ Water only if the discharge will not lower the water quality of the applicable water. In the absence of information demonstrating otherwise, KDHE expects that development, installation, operation, appropriate maintenance of site specific BMPs and the SWP2 Plan as well as compliance with the provisions, conditions, requirements, and limits of this general permit will result in discharges that will not lower the water quality of the receiving surface water.

Proposed new or existing unpermitted construction stormwater dischargers that will discharge directly into Tier 3 waters (Outstanding National Resource Waters) are, in regard to antidegradation, considered temporary discharges and eligible for authorization under this general permit to discharge stormwater from construction activities but only if the discharge will not lower the water quality of the receiving water, all enhanced (significantly better and more reliable) levels of controls and best management practices are evaluated and implemented to minimize off-site migration of sediments or other pollutants. In the absence of information demonstrating otherwise, KDHE expects that development, installation, operation, appropriate maintenance of enhanced site specific BMPs and the SWP2 Plan as well as compliance with the provisions, conditions, requirements, and limits of this general permit will result in discharges that will not lower the water quality of the receiving surface water and provide the highest protection reasonably available.

This NPDES general permit also authorizes the following non-stormwater discharges from construction sites during the life of the project:

1. Flushing water hydrants and potable water lines provided appropriate sediment and erosion controls are implemented,

2. Water used for rinsing streets or structures that does not contain cleansers, detergents, solvents or additives;

3. Irrigation to establish vegetation;

4. Discharges of uncontaminated non-turbid groundwater provided that appropriate sediment and erosion controls are implemented;

5. Discharges from emergency fire-fighting activities;

6. Water used to control dust;

7. Uncontaminated air conditioning or compressor condensate;

8. Foundation or footing drains where flows are not contaminated with process materials such as solvents or contaminated groundwater;

9. Uncontaminated construction dewatering wastewaters that have been treated by an appropriate control such as bag filters or equivalent technology. Wastewaters that have been treated by an appropriate control but still contain trace amounts of sediment are not considered contaminated; and

10. Discharges of stormwater listed above, or authorized non-stormwater commingled with a discharge authorized by a different NPDES permit and/or a discharge that does not require NPDES permit authorization.

Part 3. WHAT THIS PERMIT OR THE RAINFALL EROSIVITY WAIVER DOES NOT COVER

This NPDES general permit does <u>not</u> authorize or address:

1. A discharge of stormwater runoff from construction activities which violates the provisions of this NPDES general permit;
2. Construction activities on sites within Kansas which are located on Indian Country lands, (see endnote 3, page 21);

3. Construction activities which may discharge stormwater runoff one-half stream mile or less from a Critical Water Quality Management Area; an Exceptional State Water; a Special Aquatic Life Use Water; or to an Outstanding National Resource Water unless KDHE specifically grants coverage by this NPDES general permit (see endnote 4, page 21).

4. Construction activities that result in the discharge of stormwater runoff which violates the Kansas Surface Water Quality Standards;

5. Construction activities that result in the discharge of stormwater runoff which violates the applicable requirements of a Municipal Separate Storm Sewer program or local stormwater pollution prevention program;

6. Construction activities that may adversely affect threatened or endangered species as listed in K.A.R. 115-15-1 et seq. unless the KDW&P has been specifically consulted with;

7. Construction activities that may affect any identified archeological sites or historic sites listed or eligible for listing on the National Register of Historic Places unless the KSHS has been specifically consulted with;

8. Projects that are exempt under the Oil & Gas Exemption (see definition). However, if coverage under the NPDES general permit is requested, an Authorization will be issued, and permit requirements will be enforced. However, dewatering discharges (e.g., well point or groundwater dewatering wells) and trench dewatering from groundwater infiltration are not exempt activities under the Oil and Gas Exemption and require KDHE approval, permitting, or authorization under the NPDES general permit. KDHE will review discharges based on management by appropriate controls, discharge quality and quantity, and proposed location of the discharge to determine the need for approval or permitting requirements on a case-by-case basis. Acceptable discharges of uncontaminated groundwater dewatering shall meet Kansas Surface Water Quality Standards, control sediment by employing bag filters or equivalent technology, and prevent down gradient scouring and soil erosion.

9. Agricultural construction activities are generally exempt unless construction of a drainage structure will drain an area that exceeds the definition of a stream as defined by the Kansas Department of Agriculture under K.A.R. 5-45-1(t), or the construction is for a livestock pen or feature related to concentrated animal feeding operations or a structure such as a garage, barn, shed, stall, storage building, residence or office;

10. The discharge of stormwater from sites where construction activities will result in the disturbance of one or more acres or are a part of a common plan of development or sale which may disturb a cumulative total of one or more acres where a discharge is directed to an "impaired water" where the impairment is for total suspended solids, nitrogen, or phosphorous or a waterbody for which KDHE has developed, and EPA has approved, a Total Maximum Daily Load (TMDL) for total suspended solids, nitrogen, or phosphorous. Authorization of coverage under this general permit for such sites may be granted only if the stormwater discharge will not cause or contribute to a violation of surface water quality standards and the permittee implements, operates, and maintains appropriate BMPs, erosion and sediment control measures, and complies with all provisions of this NPDES general permit. In the absence of information demonstrating otherwise, KDHE expects that compliance with the provisions, conditions, and limits in this general permit will result in stormwater discharges being controlled, as necessary, to meet applicable water quality standards and satisfy current provisions in Kansas developed and EPA approved TMDLs directed at total suspended solids and indirectly address releases associated with nitrogen and phosphorus. KDHE may impose additional water- quality based limitations on a site-specific basis or require coverage under an NPDES individual permit if information in the NOI and associated materials, required reports, site inspections conducted by KDHE or EPA, or from other sources indicate that stormwater discharges from the site are not controlled as necessary to meet applicable water quality standards or the provisions of a specific TMDL for the waterbody receiving the discharge.

11. Discharges of water mixed with non-stormwater discharges, unless they are listed as allowable non-stormwater discharges in Part 2 above or are determined by KDHE as not requiring authorization;

12. Discharges of fill or dredged materials regulated by part 401 or 404 of the Clean Water Act unless permits under 401 or 404 so stipulate;

13. Stormwater discharges associated with construction activities that are authorized under an individual permit or a different NPDES general permit, unless coverage under this permit is authorized by KDHE Bureau of Water;

14. Stormwater and/or allowable non-stormwater discharges associated with construction activities that are discharged to a combined sewer system; and

15. The modification of stormwater drainage (the routing of flows or the change in quantity of flow) onto or across private property.

This NPDES general permit does not relieve the permit holder of the obligation to obtain other approvals, permits, licenses, or documents of sanction that may be required by other federal, state, or local government agencies.

This NPDES general permit also does not authorize any other discharge of sewage, pollutants or wastewater to waters of the State including for example:

a. Hazardous substances or oil from an on-site spill or improper handling and disposal practices;

b. Wash and/or rinse waters from concrete mixing equipment including ready mix concrete trucks;

c. Wastewater generated from wet air pollution control equipment including asphalt plants, or the containment of asphalt plant scrubber water in lined ponds;

d. Contaminated groundwater (see definitions);

e. Wastewater from washout and clean out of stucco, paint, form release oils, curing compounds and other construction materials;

f. Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance;

g. Soaps or solvents used in vehicle or equipment washing; or

h. Discharges from dewatering activities, including discharges from dewatering of trenches and excavations, unless managed by appropriate controls.

KDHE reserves the right to deny coverage under this NPDES general permit to applicants for stormwater runoff from construction or earth disturbing activities at sites which have contaminated soils which will be disturbed by the construction activity or have contaminated groundwater which could be discharged by the construction activity.

3.1 Individual Permits Required Due to Denial or Non-Compliance –
If the NOI for coverage under this NPDES general permit is denied by KDHE, then the applicant is not eligible for coverage under this NPDES general permit and shall apply for an individual NPDES permit.

The permittee shall apply for an individual NPDES permit at least 180 days prior to commencing construction

activities. Construction activities as defined in this permit shall not commence until the individual NPDES permit is issued.

Part 4. HOW TO APPLY

The owner or operator of a construction site needing to discharge stormwater runoff from construction activities shall submit a complete request for coverage under this NPDES general permit to obtain authorization under this NPDES general permit from KDHE prior to removing vegetation or disturbing soil at the site. The person requesting coverage under this general permit shall submit an NOI via the Kansas Environmental Information System (KEIMS); or shall submit an NOI as a paper or electronic document in a format acceptable to the Department along with a completed request for a temporary waiver of the NPDES Electronic Reporting Rule requirements, or a copy of an approved permanent waiver request form and verification of the continuing need for the permanent waiver of the electronic reporting requirements, in accordance with Part 10.10 of this permit.

A complete request for Authorization to discharge stormwater runoff from construction activities under this NPDES general permit must be submitted or the request will not be processed. A complete request for Authorization includes:

- An NOI form (construction stormwater) with all information provided and an original authorized signature; or completion and submittal of an equivalent form by the owner or operator or their duly authorized representative;

- A payment for the first year of the annual permit fee. Checks are to be made payable to "KDHE". Per K.A.R. 28-16-56 et seq., as amended, the current annual permit fee for this NPDES general permit is $60;

- An area map delineating the boundary of the construction site and the general topographic features of the area, including elevation contours, at least one mile beyond the construction site boundary and indicating the location of all streams and other surface water bodies within one mile of the site boundary that receive runoff from the construction site;

- A summary of the sequence of major soil disturbing activities including installation of the corresponding stormwater management and pollution control features;

- A detailed site plan covering the entire scope of the project construction activities showing the existing contours, proposed contours, erosion and sediment control features, and locations where stormwater runoff leaves the construction site;

- Design calculations for any proposed sedimentation basin, if applicable;

- Copies of letters, e-mails, website requests or similar documentation of coordination with appropriate local, state or federal agencies; and

- For sites where contaminated soil or groundwater is known or reasonably believed present and contaminated soil could be disturbed and/or contaminated groundwater could be discharged, provide the potential locations and concentrations of the contaminants reasonably anticipated to be present. Provide a narrative summary of best management practices proposed to eliminate or minimize discharge of the contaminants in stormwater runoff, dewatering flows and other discharges that leave the site. See Appendix 1 for definitions of contaminated soil and contaminated groundwater.

KDHE recommends the NOI and supporting documentation be submitted at least 60 days prior to the start of construction activities to avoid unplanned delays in the start of construction. Submittal of a Notice of Intent (NOI) to discharge Stormwater Runoff from Construction Activities and all supporting documentation indicated above, even 60 days after submittal, does not provide automatic coverage under the NPDES general permit. Coverage under this NPDES general permit begins when KDHE authorizes the discharge of stormwater runoff from construction activities identified in the NOI and supporting documentation.

An NOI form can be downloaded from the KDHE Stormwater Website (see endnote 1, page 21) or obtained from KDHE at the address given in Part 10.2 of this NPDES general permit.

If the construction activities will be conducted within the boundaries of a Municipal Separate Storm Sewer System (MS4), the permittee shall submit a copy of the KDHE Authorization and all supporting documentation to the operator of the local MS4 and obtain any permits or approvals that may be required under the local Stormwater Management Program. A list of NPDES permitted MS4 operators which are required to develop a Stormwater Management Program is available on the KDHE Stormwater Website (endnote 2, page 21) or upon written request to KDHE Bureau of Water - Municipal

Programs Unit.

Upon KDHE's Authorization to discharge stormwater runoff from construction activities for the site indicated on the NOI and supporting documents, the owner or operator and, if appropriate, the company, corporation, partnership, or government entity they represent becomes the permittee under this NPDES general permit.

Part 5. STARTING CONSTRUCTION ACTIVITY

The owner or operator who has applied for coverage under this NPDES general permit shall not initiate construction activities and discharge or have the potential to discharge stormwater runoff from construction activities described in the NOI until receiving Authorization from KDHE for the discharge.

When the owner or operator receives KDHE's Authorization to discharge stormwater from construction activities, the owner or operator may commence construction activities at the site described in the NOI and supporting documentation under the provisions of this NPDES general permit and in accordance with the construction site stormwater pollution prevention plan (SWP2 Plan).

A copy of the KDHE Authorized NOI and the project specific SWP2 Plan including the erosion and sediment control plan for the specific project shall be readily available at the construction site, with a paper or electronic copy of the plan being available at the site within 1 hour of request.

Part 6. CONTINUING COVERAGE - ANNUAL PERMIT FEE AND RENEWAL REQUIREMENTS

The permit holder shall pay an annual permit fee as specified in K.A.R. 28-16-56 et seq. as amended as long as stormwater discharges from the facility continue to meet the definition of stormwater discharges from construction activities. Checks are to be made payable to "KDHE".

An annual invoice for the annual fee will be sent to the designated billing contact listed in the NOI. Payment of the annual permit fee is required to maintain continued coverage under this NPDES general permit until such time as a request for a transfer of ownership is received and accepted by KDHE or until the site is stabilized or otherwise meets the requirements of Part 9 of this permit and a Notice of Termination (NOT) is received by KDHE or the permit is revoked/terminated.

KDHE reserves the right to revoke/terminate coverage under this NPDES general permit to applicants for stormwater runoff from construction or soil disturbing activities where annual payment for continuing coverage has not been received or reasonable application of best management practices or pollution controls have not been implemented or maintained following notification by KDHE staff.

Authorization under this general permit will be placed on inactive status by KDHE without further notice for any of the following reasons:

a) Failure to pay the annual permit fee after the mailing or electronic transmittal of the annual invoice and with no payment received for 3 months after the date of the invoice;

b) Failure to provide KDHE with a valid current mailing address or electronic contact information which results in an invoice or other KDHE correspondence being returned by the post office without a forwarding address or rejected by email or other communication service.

Projects that have been inactivated will no longer have permit coverage under this general permit.

Projects for which a Notice of Intent has been submitted but not Authorized and for which a response to a KDHE request for additional documentation has not been received within one year of NOI submittal will be administratively closed.

Owners or operators of projects that have been placed on Inactive Status, administratively closed or denied Authorization and who want to obtain coverage under this general permit must submit a complete new request for Authorization in accordance with Part 4 of this permit.

6.1 Continuing Coverage Authorization under Previous Permit –
The permittee is not required to submit a new NOI for continuing coverage under the successor NPDES general permit unless modifications, changes or discoveries are made which may affect coverage under the successor NPDES general permit or the information in the current NOI is inaccurate, needs to be updated, or KDHE requests the submission of a new NOI.

Owners or operators of constructions activities that received KDHE authorization for coverage under the previous Kansas Water Pollution Control and National Pollutant Discharge Elimination System General Permit (General Permit No. S-MCST-1703-1) prior to the effective date of this permit may continue to operate under those permit provisions, conditions, requirements, limits, site specific authorized Best Management Practices (BMPs), and site specific authorized Stormwater Pollution

Prevention Plan (SWP2 Plan) for a period of 18 months after issuance of this permit. If by 18 months after the effective date of this permit all construction activities authorized by General Permit No. S-MCST-1703-1 have not been completed, the construction site stabilized, a Notice of Termination (NOT) completed and submitted in conformance with the permit requirements and the Notice of Termination received by KDHE, then prior to the end of this 18-month period the permittee shall modify or amend the current SWP2 Plan in conformance with all permit provisions, conditions, requirements, and limits as established in this permit. The permittee shall also implement the modified or amended SWP2 Plan prior to the end of this 18-month period and shall install, modify and continue maintaining all BMPs as specified in the modified or amended SWP2 Plan. The intent of this 18- month transition period is to enable permittees that received authorization for construction activities under the previous general permit (S-MCST-1703-1) time to either complete construction activities and terminate permit coverage or retain the services of a licensed professional engineer, geologist, architect, landscape architect, or a Certified Professional in Erosion and Sediment Control (per Part 7.1 of this permit) to modify the SWP2 Plan and implement revised BMPs in conformance with all provisions, conditions, requirements, and limits of this permit, which includes EPA's Construction and Development Effluent Guideline Standards (40 CFR 450) in effect at the time this permit was issued.

6.2 Request for an Individual NPDES Permit –
On and after the effective date of this NPDES general permit, the permit holder must comply with the terms and conditions of this permit and continue paying the annual permit fee; or request an individual NPDES permit within 90 days after the publication of this permit. The facility will continue coverage under the previous NPDES general stormwater permit (General Permit No. S-MCST-1703-1) and comply with the provisions of the previous NPDES general permit until the individual NPDES permit is issued. If coverage under an individual permit is denied the owner or operator may continue to operate under General Permit S-MCST-1703-1 for 18 months after denial of the application for an individual permit and shall modify or amend the SWP2 Plan, implement the modified or amended SWP2 Plan and install appropriate BMPs in conformance with this permit within 18 months after said denial.

6.3 Continuing Coverage Authorization after Permit Expiration –
This NPDES general permit will expire five (5) years from issuance. Should KDHE fail to issue a new NPDES general permit with an effective date on or before the expiration date of this permit, the conditions of this NPDES general permit continue in force until the effective date of a new NPDES general permit.

If the permittee wishes to continue construction activities regulated by this NPDES general permit after the expiration date of this permit, the permittee must continue to pay the annual fee; and continue to comply with the terms and conditions of this NPDES general permit until the effective date of the successor NPDES general permit.

A permittee who has a valid authorization to discharge stormwater runoff from construction activities under the conditions of this NPDES general permit will continue to be covered until the effective date of the new NPDES general permit and shall comply with the conditions of this NPDES general permit until the effective date of the successor NPDES general permit. Upon the effective date of the successor NPDES general permit, the permittee shall continue to comply with the terms and conditions of the successor NPDES general permit or obtain coverage for construction stormwater discharges under alternative provisions of this permit.

Part 7. STORMWATER POLLUTION PREVENTION PLAN REQUIREMENTS AND GUIDELINES

Before initiating construction activities, the permittee shall develop a Stormwater Pollution Prevention Plan (SWP2 Plan) which is specific to the construction activities which are to be employed at the site authorized by this NPDES general permit to discharge stormwater runoff. The permittee shall fully implement the provisions of the SWP2 Plan required under this part as an enforceable condition of this NPDES general permit throughout the term of the construction project.

The purpose of the SWP2 Plan is to ensure the design, implementation, management, and maintenance of "Best Management Practices" (BMPs) in order to eliminate or minimize erosion, sediment; and other pollutants in stormwater runoff from construction activities; comply with the Kansas Surface Water Quality Standards; and ensure compliance with the terms and conditions of this NPDES general permit.

The SWP2 plan itself does not contain effluent limits but the SWP2 plan must include the specific control measures that will be used to meet the limits contained in the permit (i.e. the technology-based BMP limits).

The permittee shall select, install, utilize, operate, and maintain effective BMPs in accordance with best professional judgment, generally accepted and scientifically defensible guidance, and the concepts and methods described in Environmental Protection Agency (EPA) document number EPA 832-R-92-005, entitled *Stormwater Management for Construction Activities - Developing Pollution Prevention Plans and Best*

Management Practices, published in September, 1992 and EPA document number EPA 833-R-06-004 entitled *Developing your Stormwater Pollution Prevention Plan, A Guide for Construction Sites* published in May, 2007 (see endnote 5, page 21). The permittee is not limited to the BMPs provided in the EPA guidance manuals. Other pollution or erosion controls must utilize practices with similar effectiveness, and the permittee should develop BMPs with the goal of site-specific effectiveness in mind.

7.1 General SWP2 Plan Requirements -
Stormwater Pollution Prevention (SWP2) Plans shall be developed and prepared under the supervision of a licensed Kansas professional engineer, geologist, architect, or landscape architect or a Certified Professional in Erosion and Sediment Control (see endnote 6, page 21). Please note: It is unlawful for a person to perform any assignment involving a specific technical profession unless licensed or specifically exempted by the Kansas Board of Technical Professions and is qualified by education and expertise in that profession to perform such work.

Stormwater runoff from disturbed areas which leave the site shall pass through an appropriate sediment control, such as a sedimentation basin, sediment trap, silt fence, buffer area or similar control measure prior to leaving the construction site. An appropriate sediment control, such as a ditch check or turbidity curtain, may also be provided below disturbed stream channel sections where typical channel flow during construction might cause a non-negligible discharge of sediment. The permittee shall ensure the BMPs and/or pollution controls are properly installed and maintained at the locations and relative timeframes specified in the SWP2 Plan. Margin or border BMPs, such as a buffer area or vegetation strips, to control stormwater runoff where it leaves the site boundary, shall be installed or marked for preservation before general site clearing is started.

7.2 Contents of SWP2 Plan

7.2.1 Site Description –
The permittee's SWP2 Plan shall include all of the information provided in the NOI. The SWP2 Plan shall expand upon the NOI information in order to make the SWP2 Plan a working document which contractors and site construction workers can use to guide the installation and maintenance of BMPs and pollution controls.

7.2.2 Description of Best Management Practices –
The permittee's SWP2 Plan shall include a description of the BMPs and/or pollution controls they will use at the site. The SWP2 Plan shall provide the following general information for each BMP and/or pollution control which will be used one or more times at the site:

- a physical description of the BMP and/or pollution control;
- the site and physical conditions which must be met for effective use of the BMP and/or pollution control;
- the BMP and/or pollution control installation/ construction procedures, including typical drawings; and
- operation and maintenance procedures for the BMP and/or pollution control.

The SWP2 Plan shall provide the following information for each specific instance where a BMP and/or pollution control is to be installed:

- where, in relation to other site features, the BMP and/or pollution control is to be located;
- when, in relation to each phase of construction, the BMP and/or pollution control will be installed; and
- what site conditions must be met before removal of the BMP and/or pollution control, if it is not permanent.

7.2.3 Detailed SWP2 Plan Requirements -
The SWP2 Plan must provide BMPs and/or pollution controls that, at a minimum, are designed, installed, and maintained to:

(1) Control stormwater volume and velocity within the site to minimize soil erosion in order to minimize pollutant discharges.

(2) Control stormwater discharges, including both peak flow rates and total stormwater volume, to minimize channel and streambank erosion and scour in the immediate vicinity of discharge points;

(3) Minimize the amount of soil exposed during construction activity;

(4) Minimize the disturbance of steep slopes [slopes of forty (40) percent (2.5:1 horizontal to vertical ratio) or steeper, see definitions];

(5) Minimize sediment discharges from the site. The design, installation and maintenance of erosion and sediment controls must address factors such as the amount, frequency, intensity and duration of precipitation, the nature of resulting stormwater runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site;

(6) Provide and maintain natural buffers around waters of the United States, direct stormwater to vegetated areas and maximize stormwater infiltration to reduce pollutant discharges, unless infeasible;

(7) Minimize soil compaction. Minimizing soil compaction is not required where the intended function of a specific area of the site dictates that it be compacted;

(8) Unless infeasible, preserve topsoil. Preserving topsoil is not required where the intended function of a specific area of the site dictates that the topsoil be disturbed or removed;

(9) Minimize discharges from stream crossings, including open-cut trenched crossings, by immediately stabilizing the areas from top of bank to waters edge to the extent feasible and providing appropriate controls to minimize any stream scour. Appropriate sediment controls shall also be provided down gradient from bore pit stockpiles;

(10) Control discharges from sediment or soil stockpiles;

(11) Minimize the generation of dust through the application of water or other dust suppression techniques;

(12) Minimize off-site tracking of soils by utilizing wheel washing facilities or an appropriately designed construction entrance and exit. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge. Off-site track out shall be cleaned up at the end of each work day. Sites with contaminated soils must provide wheel washing and tanks for holding of the spent wash water, if feasible, or other equivalent practices if the vehicles can track the contaminated soil from the site;

(13) Provide structures to divert significant flows of stormwater from off-site drainage, if feasible;

(14) Reduce erosion of concentrated flows of stormwater in channelized drainage through the use of velocity dissipation devices, (e.g., check dams, riprap, and wattles), installation of channel liners (e.g., riprap, geotextiles, and erosion control blankets), or the combined use of both methods of erosion control; and

(15) Provide storm drain inlet protection (such as rock bags) for inlets down gradient of disturbed project areas that are not fully stabilized or where construction activity will soon be started.

7.2.4 Steep Slope Stabilization Requirements -
When construction activities on steep slopes [slopes of forty (40) percent (2.5:1 horizontal to vertical ratio) or steeper, see definitions] cannot be avoided, the SWPP Plan must require the contractor to immediately initiate placement of appropriate erosion control BMPs in any exposed steep slope areas where construction activities have permanently or temporarily ceased, and will not resume for a period exceeding 7 calendar days. For vegetative cover areas, in addition to seeding, watering, mulching, and any other required activities related to the planting and establishment of vegetation, other appropriate erosion control practices such as geotextiles or erosion control mats shall be utilized. Diversion of concentrated or channelized stormwater flows around steep slopes or slope drains shall be utilized where feasible.

7.2.5 Temporary and Permanent Non-Structural BMPs
Examples of non-structural BMPs which the permittee should consider specifying in the SWP2 Plan include: temporary seeding, permanent seeding, mulching, geotextiles, sod stabilization, protection of existing vegetation for use as buffer strips (especially along drainage courses), protection of trees, preserving existing stream channels as overflow areas when channel shortening is allowed, soil stabilizing emulsions and tackifiers, mulch tackifiers, preservation of mature vegetation, stabilized site entrances/exits, wheel brushing or washing, clean-up of soils on roadways, dust control and other appropriate BMPs.

The permittee's SWP2 Plan shall require existing vegetation to be preserved where practical, and the time period for soil areas to be without vegetative cover is to be minimized to the extent practical.

Clearing and grubbing within 50 feet of a defined drainage course shall be avoided, if feasible.

Where changes to defined drainage courses are to occur as part of the project, clearing and grubbing within 50 feet of the defined drainage course shall be delayed until all materials and equipment necessary to complete the drainage change are on site.

Changes to defined drainage courses shall be completed as quickly as possible once the work has been initiated. The area impacted by the construction of the drainage course change is to be re-vegetated or stabilized to minimize the length of time the area is exposed.

Stabilization of disturbed areas must, at a minimum, be initiated immediately whenever any clearing, grading, excavating, or other soil disturbing activities have permanently ceased on any portion of the site, or temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days. The disturbed areas shall be protected from erosion by stabilizing the area with mulch or other similarly effective

soil stabilizing BMPs. Activities required to stabilize disturbed areas with mulch or other similarly effective soil stabilizing BMPs must be completed within 14 days after soil disturbing activities cease.

Stabilization of disturbed areas is not required if the intended function of a specific area of the site necessitates that it remains disturbed. Such areas include stockpiles of soil materials (such as structural soils and clays, but not stockpiles of topsoil) that are intended for a use that prohibits introduction of vegetation, mulch or other foreign materials into the soil, areas reserved for landscaping, including areas prepared for final sod application, that prohibits the introduction of vegetation, mulch or other foreign materials prior to placement of final landscaping features, dirt tracks, courts and other amenities designed or otherwise intended to remain unstabilized, and disturbed floors and banks below the anticipated pool elevation of ponds and basins. Appropriate sediment control measures shall be provided below all such areas where the intended function necessitates that the area remain disturbed.

Disturbed areas that exhibit ice, frozen soil conditions, or have a consistent snow cover extending across 70 percent or more of the area are considered to be temporarily stabilized until thawing occurs across the affected area. Stabilization of such iced, frozen or snow-covered areas must be completed within 14 days following the first subsequent inspection required under Part 7.2.10 of this permit that finds the affected area thawed and no longer stabilized due to ice, frozen soil conditions or snow cover.

7.2.6 Temporary and Permanent Structural BMPs - Examples of structural BMPs which the permittee should consider specifying in the SWP2 Plan include: diverting flows from undisturbed areas away from disturbed areas and providing silt (filter fabric or straw bale) fences, filter log or wattle rows, earthen diversion dikes, drainage swales, sediment traps, rock check dams, subsurface drains (to gather or transport water for surface discharge elsewhere), pipe slope drains (to carry concentrated flow down a slope face), level spreaders (to distribute concentrated flow into sheet flow), storm drain inlet protection and outlet protection, reinforced soil retaining systems, gabions, temporary or permanent sediment basins, and other appropriate BMPs.

7.2.7 Sedimentation Basins -
The permittee's SWP2 Plan shall require a sedimentation basin, where feasible, for each drainage area with 10 or more acres disturbed at one time.

The sediment basin needs to be designed and maintained to provide at least 3,600 cubic feet of storage per acre drained. Where use of a sediment basin of this size is impractical, the SWP2 Plan shall evaluate and specify other similarly effective BMPs to be employed to minimize erosion and control sediment. Where large areas of undisturbed or stabilized areas can drain into the sediment basin or in certain areas of Western Kansas, alternative design detention volumes can be used. See the definition of Sediment Basin Design Criteria for additional clarification and alternatives for sizing and volume requirements.

Outlet structures must be designed and constructed to withdraw water from the surface, unless infeasible. If infeasible, the reason it is infeasible shall be provided as a part of the NOI and SWPP Plan submittal to KDHE.

The permittee's SWP2 Plan shall require that the sediment basin be cleaned to ensure adequate detention is available. No more than 20 percent of the required sediment basin capacity shall be taken up with sediment. The basin shall be maintained until less than 10 acres of area needing final stabilization within the drainage basin remains. If a sedimentation basin is removed, other appropriate and effective BMP's and/or pollution controls shall be provided, as needed.

The 3,600 cubic feet of storage area per acre drained criteria does not apply to flows from areas where such flows are diverted around both the disturbed area and the sediment basin.

The permittee's SWP2 Plan shall require both temporary and permanent sedimentation basins to have a stabilized emergency spillway to minimize the potential for erosion of the emergency spillway or sediment basin embankment.

7.2.8 Permanent Stormwater Controls -
If applicable, the permittee's SWP2 Plan shall include a description of the measures that will be installed during construction to control pollutants in stormwater runoff that will occur after construction activities have been completed. These would include drainage channels or systems; outlet control devices, detention basins, oil water separators, catch basins, etc. This NPDES general permit does not require the permittee or his contractors to operate or maintain these measures beyond the date of the Notice of Termination unless otherwise notified by KDHE.

7.2.9 Additional Site Management BMPs -
The permittee's SWP2 Plan shall address other BMPs, as required by site activities, to minimize or eliminate contamination of stormwater runoff. At a minimum, such measures must be designed, installed, implemented and maintained to:

(1) Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters must be free of detergents, soaps, or solvents and must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge;

(2) Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials present on the site to precipitation and to stormwater except where the exposure to precipitation and to stormwater will not result in a discharge of pollutants, or where exposure of a specific material or product poses little risk of stormwater contamination (such as final products and materials intended for outdoor use);

(3) Minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures;

(4) Require the contractor to provide solid and hazardous waste management including: providing trash containers and regular site clean-up for proper disposal of solid waste such as scrap building material, product/material shipping waste, food containers, and cups; and providing containers and proper disposal for waste paints, solvents, and cleaning compounds;

(5) Require portable toilets for proper disposal of sanitary sewage;

(6) Require storing construction materials away from drainage courses and low areas;

(7) Require containment berms and drip pans at fuel and liquid storage tanks and containers excluding containment of uncontaminated water;

(8) Provide procedures to eliminate or minimize the potential to discharge environmental contaminants from contaminated soil or groundwater; and

(9) Provide procedures and practices to eliminate the potential to discharge wash and/or rinse waters from concrete mixing equipment including ready mix concrete trucks.

7.2.10 Site Inspections by Permittee –
The permittee shall ensure the entire construction site including but not limited to disturbed areas, BMPs, waste and construction storage areas, drainage areas, locations where stormwater can flow from the construction site, and temporarily stabilized areas is inspected at least once within every 7-day inspection monitoring period, or is inspected at least once within every 8 to 14-day inspection monitoring period and by the end of the next standard weekday following a rain event which results in a rainfall total of 0.5 inches or greater. The next standard weekday is the next day Monday through Friday following the observed rain event, not including Saturday and Sunday and excluding days that have been established for the observance of a Federal Holiday and also the day after Thanksgiving.

Rainfall totals used to establish when a construction site inspection is required shall be determined from local weather station reports of daily rainfall totals such as the 1200 GMT end-of-day totals available through the National Weather Service and their cooperative observers or from regularly scheduled on-site rain gauge monitoring performed and recorded each work day by project personnel. For sites where inspections are scheduled once every 8 to 14 days, a rain event site inspection is required whenever a rainfall total of 0.5 inches or greater is observed based a single monitoring event; or based on the cumulative total of two consecutive monitoring events when the rainfall total of the first monitoring event is less than 0.5 inches.

The permittee shall, upon initiation of construction activities, determine an initial routine inspection monitoring period based on the start date of construction activities and a routine monitoring frequency of either 14 days or a different monitoring frequency established in the SWP2 Plan that does not exceed 14 days. Subsequent routine inspection monitoring periods shall be established based on the chosen routine monitoring frequency and the initial inspection monitoring period determined at the start of construction, without regard to the dates of routine or rain event inspections that are conducted. At a minimum, a single routine or rain event site inspection shall be conducted within each routine inspection monitoring period.

For disturbed areas that have not been finally stabilized all installed BMPs and other pollution control measures shall be inspected for proper installation, operation and maintenance. Locations where stormwater runoff leaves the site shall be inspected for evidence of erosion or sediment deposition. Once a portion of the project area meets the final stabilization criteria specified in Part 9 of this permit, then no further inspection of that final stabilized portion is required provided that the area is identified in the SWP2 Plan as having obtained final stabilization; however, the permittee shall remain responsible to correct any conditions within such areas that are identified as contributing to the discharge of sediment or other pollutants from the project site.

A report of each regularly scheduled inspection and required rain event inspection shall be prepared. The inspection report is to include the following minimum information: inspector's name, date of inspection, observations relative to the effectiveness of the BMPs, actions taken or necessary to correct deficiencies, listing of areas where construction operations have permanently or temporarily stopped, and observations of stormwater discharge locations with respect to the effectiveness of the upgradient BMPs. The inspection report shall be completed by the end of the next standard weekday following the inspection and shall be signed by the person performing the inspection.

Any deficiencies in the operation or maintenance, effectiveness, adequacy or coverage extent of all installed BMPs, temporary stabilization measures and other pollution control measures identified during the inspection shall be noted in the inspection report and corrected within seven calendar days of the inspection unless infeasible. The permittee shall promptly notify the site contractors responsible for operation and maintenance of BMPs of deficiencies. When correction of any noted deficiency within seven calendar days is infeasible, the inspection report shall document the reason why such correction is infeasible and provide a specific timeframe for completing all needed maintenance and repairs of installed control measures and installation or modification of all control measures and management practices identified as missing, ineffective or inadequate as soon as feasible.

If weather or site conditions render access to any portion of the site to be unsafe or infeasible for inspection activities, the inspection report shall document the reason why access is unsafe or infeasible. Weather and site conditions shall then be monitored and recorded each standard weekday until access for inspection activities is determined to be safe and feasible. Inspection of the affected area shall then be performed by the end of the next standard weekday after determining that access is safe and feasible.

Disturbed project areas that are temporarily stabilized due to ice, frozen soil conditions or consistent snow cover extending across 70 percent or more of the area shall be noted on the inspection report. For such areas, the observation of disturbed soils, sediment and erosion control BMPs, drainage areas and locations where stormwater can flow from the construction site is not required during site inspections while one or more of the listed conditions are present. The thawing of these areas shall be noted during the first subsequent inspection when iced, frozen or snow-covered conditions are no longer present.

For inactive project sites where soil disturbing construction activities have permanently ceased and final stabilization activities have been completed and documented as such in the SWP2 Plan but vegetative density does not meet the final stabilization criteria specified in Part 9 of this permit, inspections in response to rain events are not required; however, at a minimum, a single routine inspection shall still be conducted at the inactive project site within each established routine inspection monitoring period.

The permittee shall maintain the site inspection reports on-site or at the records storage location identified in the NOI. The permittee shall provide a copy of the site inspection reports to KDHE or EPA upon request.

7.3 Modifications and Amendments to SWP2 Plan –
The permittee shall modify or amend the SWP2 Plan as appropriate during the term of the construction activity until the site is stabilized. The permittee, an authorized representative, and/or the contractor(s) responsible for installation, operation, and maintenance of the BMPs shall keep a current copy of the SWP2 Plan on the project site.

7.3.1 Modification of Control Measures and Management Practices –
Modifications to the SWP2 Plan shall be made to better control the site erosion and sediment discharges based on field conditions or site phasing that was not considered during SWP2 Plan development. The permittee shall indicate the changes on the erosion and sediment control plan sheets, maintain a log showing dates of all SWP2 Plan modifications, a brief description of the SWP2 Plan modifications, and the name and title of the person authorizing the modification. Changes to the SWP2 Plan that are not an amendment (see below) are considered modifications and do not need to be submitted to KDHE. Modification of site erosion and sediment controls based on field conditions or site phasing do not require preparation or approval by a professional; however, modifications that involve the relocation or reconfiguration of any sedimentation basin or corresponding outlet structure required under Part 7.2.7 of this permit shall be prepared under the supervision of a licensed or certified professional as specified in Part 7.1 of this permit.

7.3.2 Amendment of the SWP2 Plan –
The SWP2 Plan shall be amended:

- when a change in the project scope increases the amount of soil disturbed by more than 1.0 acre;
- when stormwater will discharge into a surface water not originally receiving stormwater from the permitted site construction activities; and

- when determined as significant by KDHE upon notification of any discovery of contaminated soil or groundwater, potential historic or archeological sites, or threatened or endangered species during the construction that was not identified and addressed in the SWP2 Plan.

For projects requiring an amendment the permittee shall provide an explanation of the changes referencing the originally issued State and Federal permit numbers, a modified erosion and sediment control plan, and a new NOI form indicating the new acreage anticipated to be disturbed. Soil disturbing activities shall not occur on the added or discovered areas until Authorization from KDHE is provided. Amendments shall be prepared under the supervision of a Licensed Kansas professional engineer, geologist, architect, or landscape architect or a Certified Professional in Erosion and Sediment Control (CPESC) and need to be submitted at least 60 days prior to implementing the proposed changes at the site. Authorization for the revised project will be indicated in similar fashion as the initially authorized NOI and a copy of the newly authorized NOI or notification that the authorization has been issued and is available to access or download will be provided to the permittee.

The permittee shall modify or amend the SWP2 Plan, at a minimum, whenever:

- there is a change in design, operation, or maintenance of BMPs, pollution controls, or pollution prevention measures;
- there is a change in the design or scope of the construction project which could significantly affect the quality of the stormwater runoff or the use of designated BMPs or pollution controls;
- the construction site inspections indicate deficiencies in the SWP2 Plan or any BMP;
- KDHE or EPA notifies the permittee of deficiencies in the SWP2 Plan, BMP's, and/or pollution controls;
- the SWP2 Plan is determined to be ineffective in significantly minimizing or controlling erosion and sedimentation (e.g. there is evidence, such as excessive site erosion, excessive sediment leaving the site, or excessive sediment deposits in drainage channels, streams, or lakes);
- KDHE determines violations of Surface Water Quality Standards may occur or have occurred; or
- KDHE determines the activities at the site constitute a significant pollution potential which the current SWP2 Plan does not adequately address.

The permittee shall provide a copy of the most current SWP2 Plan to KDHE or EPA upon request.

7.4 Contractor Notification -
The permittee shall notify each contractor or entity (including utility crews, and city employees or their agents) that will perform work at the site of the existence of the SWP2 Plan and what action or precautions shall be taken while on-site to minimize the potential for erosion and the potential for damaging any BMP or pollution control. However, the permittee is ultimately responsible for ensuring compliance with this permit.

The permittee shall provide contractors who are responsible for installation, operation, or maintenance of any BMP a copy of or access to the SWP2 Plan.

Part 8. TRANSFER OF OWNERSHIP

8.1 Transfer of Entire Permitted Area -
Coverage under and the requirements of this NPDES general permit are transferable but transfer is not automatic and must be accepted by KDHE. The permit may be transferred only to a party that meets the definition of "Owner", "Owner or operator", or "owner/operator" for the entire authorized project scope. The current permittee and the new permittee shall complete a Notice of Transfer of Owner/Operator (NOTO) form as a paper or electronic document in a format acceptable to the Department and bearing original signatures, and submit to KDHE. If the original permittee is unavailable or unwilling to sign the NOTO (normally due to bankruptcy) the NOTO shall be filled out as much as possible by the new owner and submitted to the Department with an explanation of the situation.

Transfers shall be requested at least two weeks in advance of transfer of ownership or operational control to ensure KDHE has accepted the transfer and/or provisions that needed to be addressed by the two parties covering continued responsibility by the original permittee until such time as KDHE formally accepts the permit transfer.

8.2 Partial Permitted Area Transfer of One (1.0) or More Acres -
If ownership or operational control of a contiguous area, one (1.0) or more acres in size, within the overall project or subdivision area is sold or otherwise transferred by the permittee to a new owner, then a new complete request for Authorization for the area being sold or otherwise transferred shall be submitted in accordance with Part 4 of this NPDES general permit. This procedure is required for all projects including residential, commercial and industrial subdivisions. Lots for construction of residential homes of greater than one (1.0) acre can utilize

procedures under this section or under Part 8.3. Previous clearances issued for the original permitted project area (e.g., Kansas Historical Society, Kansas Department of Wildlife and Parks, United States Army Corps of Engineers) may be referenced.

8.3 Partial Permitted Area Transfer of Less than One (1.0) Acre or a Residential Home Lot -
Both the permittee and the new owner or operator including a contractor, who obtains ownership of a lot or contiguous portion of an overall permitted area that is less than one (1.0) acre in size shall jointly complete an Individual Lot Certification (ILC) form for each lot, lots or portions sold or otherwise transferred, or shall incorporate requirements into the contract for sale that are equivalent to those specified on the ILC form. The ILC or equivalent statements in the contract for sale do not constitute a transfer of the Authorization to discharge. The agreement is between the new owner or operator of the lot or portion and the permittee to implement the SWP2 Plan and the conditions of the general NPDES permit cooperatively, however, the original permittee maintains responsibility for discharges from the project site.

The permittee shall maintain the ILC form or a copy of the contract for sale covering the same requirements either on-site or at the Records Address location identified on the NOI. The permittee shall provide ILC forms or copies of contracts for sale to KDHE, EPA, or any other government agency upon request.

Part 9. PROJECT COMPLETION

The permittee shall notify KDHE of the project completion by submitting a Notice of Termination (NOT). The permittee shall sign the NOT and submit it to KDHE as a paper or electronic document in a format acceptable to the Department.

When the soil disturbing activities are complete and final stabilization of all disturbed areas has been achieved, the permittee can terminate coverage under this NPDES general permit by submitting the NOT. The project is considered to be stabilized when perennial vegetation, pavement, buildings, or structures using man-made materials cover all areas which have been disturbed. Vegetation must have a density of at least 70 percent of the density of undisturbed areas at or near the site.

For projects disturbing agricultural land, disturbed areas that are restored to their preconstruction agricultural use are not subject to the above stabilization criteria. Areas that are not being returned to preconstruction agricultural use, must meet the conditions for final stabilization in this Part.

For subdivision development projects, termination of coverage may be requested after three years, provided the entire subdivision is stabilized and the rate of home construction disturbs less than one (1.0) acre per year (approximately 5 lots) or less than one (1.0) acre of land remains to be developed (approximately 5 lots).

The permittee may also terminate coverage under this NPDES general permit prior to completion of the project construction activities provided that duplicate authorization for coverage under this general permit or KDHE authorized successor permits has been issued and is in effect for all remaining construction activities including all areas disturbed by previous construction activities that have not obtained final stabilization or otherwise met the completion requirements of this part.

Part 10. GENERAL REQUIREMENTS OF THIS PERMIT

10.1 Records -
The permittee shall maintain all records required by this NPDES general permit for a period of three (3) years following the date on the NOT. All records shall be kept on-site or in a readily available location identified in the NOI until final stabilization has been completed. Electronic versions of the required records are acceptable but must show or otherwise document all relevant signatures and be readily available for copying and contractor access as per Part 7.4 and agency review as per Part 10.4 of this general permit. After final stabilization has been completed, records may be maintained at the permittee's main office.

Records shall be readily available during normal business hours.

Records which shall be maintained by the permittee include, but are not limited to:

- the NOI indicating the Authorization by KDHE to discharge stormwater runoff from the construction activities and supporting documentation used to apply for authorization under this NPDES general permit;
- the SWP2 Plan for the construction site named in the Authorization to discharge stormwater runoff, and any amendments to the SWP2 Plan;
- all site inspection records;
- any clearance letters, from KDW&P, KSHS, COE, or any other agency providing clearance;
- Individual Lot Certification (ILC) forms or portions of the contract for land sale with equivalent wording; and
- a copy of the Notice of Termination submitted to

KDHE.

Except for data determined to be confidential *under 33 USC Section 1318*, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Department. Effluent data shall not be considered confidential. Knowingly making any false statement on any such report or tampering with equipment to falsify data may result in the imposition of criminal penalties as provided for in 33 USC Section 1319 and KSA 65-170c.

10.2 Contact Address -
All notifications, forms, reports, or other correspondence which must be submitted to KDHE as required by this NPDES general permit shall be submitted via the Kansas Environmental Information System (KEIMS) or, upon KDHE acceptance of an electronic reporting waiver per Part 10.10 of this permit, may be sent to:

Kansas Department of Health and Environment
Bureau of Water, Industrial Programs Unit
1000 SW Jackson, Suite 420
Topeka, KS 66612 – 1367

Applicants can download copies of all forms, references, or the NPDES general permit from the following KDHE Stormwater Websites:

www.kdhe.ks.gov/757/Construction-Stormwater-Program

www.kdhe.ks.gov/DocumentCenter

Copies may also be requested by e-mailing KDHE at:

kdhe.stormwater@ks.gov

10.3 Duty to Comply -
The permittee shall comply with all conditions of this NPDES general permit. Any noncompliance with this NPDES general permit constitutes a violation of the CWA, K.S.A. 65-164 and 65-165, and/or K.A.R. 28-16-28 et seq. Noncompliance may result in enforcement action; revocation/termination of this authorization; or amendment of this authorization.

It shall not be a defense for a permittee in an enforcement action to contend that it would have been necessary to halt or reduce the permitted activity to maintain compliance with the conditions of the NPDES general permit.

After implementation of the stormwater pollution prevention plan, if stormwater discharges adversely affect water quality, or cause violations of any other provision of this NPDES general permit, the permittee shall modify and implement the stormwater pollution prevention plan to address the non-compliance.

Failure to comply with the requirements of the NPDES general permit may subject the permittee to enforcement actions including revocation/termination of the authorization to discharge under this NPDES general permit, a requirement to discontinue the permitted activity, fines and/or possible imprisonment.

Projects which have received authorization under this Permit that are placed on Inactive Status will no longer have permit coverage under this Permit. KDHE will place previously permitted facilities on Inactive Status for failure to pay the annual permit fee without further notice if payment is not received within 3 months of the date of the invoice (see Part 6).

10.4 Duty to Provide Information and Site Access –
The permittee shall furnish to KDHE; the EPA; or any local agency having jurisdiction for any aspect of the project, any information which is requested to determine compliance with this NPDES general permit.

When the permittee becomes aware that they failed to submit any relevant facts or submitted incorrect information to KDHE, they shall promptly submit such facts or information to KDHE at the address given in Part 10.2.

The permittee shall allow the Director or an authorized representative of KDHE, the EPA, or, local agency having jurisdiction over the project, upon the presentation of proper credentials and other documents as may be required by law, to:

- enter upon the site where a regulated construction project or activity is located or conducted or where records must be kept under the conditions of this NPDES general permit;
- obtain samples of any discharge to waters of the State;
- have access to and copy at reasonable times, any records which must be kept under the conditions of this NPDES general permit; and
- inspect the construction site and any facilities or equipment (including monitoring equipment, stormwater controls, and BMPs).

10.5 Signatory Requirements -
The Notice of Intent (NOI), the Notice of Termination (NOT), and the Notice of Transfer of Owner/Operator (NOTO) shall be signed by the owner, operator, or

designee. All forms, reports, or other correspondence which must be submitted to KDHE as required by this NPDES general permit shall be signed by the permittee or a duly authorized representative.

10.6 Chemical and Sewage Spills -
In case of a spill emergency call:

U.S. EPA National Response Center:
(24 hours a day) (800) 424-8802

Kansas Division of Emergency Management:
(KDEM)
(24 hours a day) (785) 291-3333
Website: www.ksready.gov

KDHE Spill Report Hotline:
(24 hours a day) (785) 296-1679

10.7 Hazardous Substance and Oil Spill Reporting -
The permittee or authorized representative is required to notify the U.S. EPA National Response Center (800-424-8802) in accordance with the requirements of 40 CFR 117 and 40 CFR 302 as soon as the discharge of any hazardous substance or oil in excess of the reportable quantity has been discovered. A reportable quantity of oil is the quantity which causes a "film or sheen upon or discoloration of the surface of the water or adjoining shorelines or causes a sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines." Reportable quantities for hazardous substances are listed in the cited CFRs.

The permittee is also required to notify the Local Emergency Planning Agency and the Kansas Division of Emergency Management (KDEM) at the phone numbers and/or website listed above in permit paragraph 10.6.

Nothing in this permit shall be construed to preclude the initiation of any legal action or relieve the permittee from any responsibilities, liabilities or penalties to which the permittee is or may be subject to under 33 USC Section 1321 or KSA 65-164 et seq.

10.8 Sewage, Wastes, Materials, and Substances Spill Reporting -
Any discharge or escape of sewage, substances, materials, or wastes, as set forth in K.S.A. 65-171d, which are, or threaten to contaminate or alter any of the properties of the waters of the State or pollute soil in a detrimental, harmful, or injurious manner or create a nuisance, shall immediately be reported to the Kansas Department of Health and Environment at (785) 296-1679. The report shall be made by the permittee, or the owner of the spilled materials, or their respective authorized representative.

In the case of discharges under conditions other than those allowed in a valid NPDES permit, the report shall be made by the permittee or an authorized representative. The report shall be made by telephone to KDHE at 785- 296-1679 in accordance with K.A.R. 28-48-1 et seq.

Nothing in this NPDES general permit shall be construed to preclude KDHE's institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under the CWA (33 U.S.C. Section 1321); the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA); K.S.A. 65-161 et seq.; or under state or federal statutes or regulations governing oil or hazardous substances or wastes.

10.9 Requiring a Different NPDES Permit -
The Director may require the permittee to apply for and obtain an individual permit or different general permit if:

- the permittee is not in compliance with the conditions of this NPDES general permit;
- the discharge no longer qualifies for this NPDES general permit due to changed site conditions or regulations; or
- information becomes available which indicates water quality standards have been or may be violated.

The permittee will be notified in writing of the need to apply for an individual permit or a different NPDES general permit. When an individual permit or different general permit is issued to the authorized permittee, this NPDES general permit is automatically revoked/terminated upon the effective date of the individual or different general permit, whichever the case may be.

10.10 Electronic Data Monitoring Report -
EPA has promulgated a final rule requiring regulated entities to report discharge monitoring report (DMR) data electronically by December 21, 2016. Refer to Parts 11.5 and 11.10 of this Permit for such required reporting. Also, K.A.R. 28-16- 63 requires permittees to report NPDES data in a form required by KDHE. KDHE has developed the Internet based Kansas Environmental Information System (KEIMS) to assist permittees in complying with the EPA electronic reporting rule and K.A.R. 28-16-63. Unless a waiver has been approved by KDHE, permittees are required to submit reports electronically.

KDHE accepts the following types of electronic reporting waivers;

A. Temporary Waivers – A temporary waiver is good for five years and must clearly state the need or reason for the waiver and be signed by an authorized representative. Temporary Waivers are approved only for the following reasons:

- The permittee's Internet connection is not fast enough to upload documents to comply with NPDES Electronic Reporting Rule.
- The permittee does not have a computer for routine business functions to comply with the NPDES Electronic Reporting Rule.
- The permittee does not have an Internet connection; or
- "Other" which is determined on a case by case basis.

B. Permanent Waivers – Permanent waivers will be issued and approved for permittees that own or operate NPDES permitted facilities and do not utilize modern technologies due to religious beliefs. The permittee must verify that the permanent waiver is still required when submitting an NOI.

C. Episodic Waiver- Episodic waivers cannot last more than 60 days. Episodic waivers are issued immediately by KDHE staff without the need for waiver submission by the permittee. These waivers are strictly for permittees in emergency situation. Emergencies would consist of large-scale power outages greater than 96 hours, floods, tornados, other natural disasters or catastrophic circumstances beyond the control of the facilities. KDHE must receive the hardcopy (paper) submissions when an episodic waiver is in effect.

Part 11. STANDARD CONDITIONS

In addition to the conditions specified in this NPDES general permit, the permittee shall comply with the following Standard Conditions.

11.1 Proper Operation and Maintenance -
The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the requirements of this NPDES general permit, Kansas law, and Federal law. Proper operation and maintenance also include adequate laboratory controls, if applicable, and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the requirements of this permit. Pollution control systems, erosion control measures or best management practices which require maintenance shall be maintained, repaired or replaced in a timely manner to avoid discharging stormwater runoff laden with pollutants or sediment which adversely impacts water quality.

The permittee shall take all necessary steps to minimize or prevent any adverse impact to human health or the environment resulting from noncompliance with any requirements specified in this permit, including any monitoring as necessary to determine the nature and impact of the stormwater discharge. When necessary to maintain compliance with the permit requirements, the permittee shall halt or reduce those activities under its control.

When necessary to achieve compliance with the terms and conditions of this NPDES general permit, the permittee shall install, operate and maintain backup systems or auxiliary facilities to supplement the erosion control measures and best management practices proposed in the NOI.

11.2 Severability -
The provisions of this NPDES general permit are severable. If any provision of this NPDES general permit or any circumstance is held invalid, the application of such provision to other circumstances and the remainder of the NPDES general permit shall not be affected thereby.

11.3 Permit Modifications and Terminations -
As provided by KAR 28-16-62, after notice and opportunity for a hearing, this permit may be modified, suspended or revoked or terminated in whole or in part during its term for cause as provided, but not limited to those set forth in KAR 28-16-62 and KAR 28-16-28b through g.

The permittee shall furnish to the Director, within a reasonable amount of time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish upon request, copies of all records required to be kept by this permit. The filing of a request by the permittee for a permit modification or revocation and reissuance, or a notification of termination, planned changes or anticipated noncompliance does not stay any permit condition.

11.4 Change in Discharge -
All discharges authorized herein shall be consistent with the requirements and conditions of this NPDES general permit.

The SWP2 Plan shall be amended or modified to reflect significant changes to the project and/or the stormwater discharges in accordance with the applicable requirements of Part 7.3 of this NPDES general permit.

11.5 Discovery During Construction -
In the event contaminated soil, groundwater contamination, or contamination from hazardous substances are discovered at the site during construction activities, the permittee shall report the discovery to KDHE verbally within 24 hours to (785) 296-5549, and within 5 business days shall report the discovery via the Kansas Environmental Information System (KEIMS) or, upon KDHE acceptance of an electronic reporting waiver per Part 10.10 of this permit, may report the discovery in writing at the stated address in Part 10.2 of this permit. Until site evaluations have been completed and instruction has been provided by KDHE, construction activities in the contaminated area shall cease and additional provisions shall be provided to immediately mitigate discharges from the contaminated area.

Any discovery during construction activities of threatened or endangered species on the site or in the downstream receiving waters, or of a historical or archeological site, that were not previously identified or addressed in the SWP2 Plan needs to be reported to the KDW&P or KSHS and KDHE - Bureau of Water. Reporting to the KDHE – Bureau of Water shall be via the Kansas Environmental Information System (KEIMS) or, upon KDHE acceptance of an electronic reporting waiver per Part 10.10 of this permit, may be submitted in writing at the stated address in Part 10.2 of this permit. Until site evaluations have been completed and instruction has been provided by the appropriate agencies, construction activities in the affected area shall cease.

If soil contamination, hazardous substances, threatened or endangered species, or historical or archeological sites are discovered during construction activities, the SWP2 Plan shall be modified or amended to reflect this new information in accordance with the requirements and conditions of Part 7.3 of this NPDES general permit.

11.6 Removed Substances –
Solids, sludge, sediment, filter backwash, or other pollutants removed in the course of treatment or control of stormwater runoff shall be properly managed, utilized, and/or disposed of in accordance with applicable statutes and regulations to prevent pollution of surface water, groundwater, or soil.

11.7 Civil, Criminal, and Administrative Liability -
Kansas law provides for civil and criminal punishment including fines and imprisonment for violations of this NPDES general permit. The permittee shall comply with all requirements of this NPDES general permit. Except as authorized in paragraph 11.10 below, nothing in this permit shall be construed to relieve the permittee from administrative, civil or criminal penalties for noncompliance as provided for in KSA 65-161 et seq., and 33 USC Section 1319.

11.8 Property Rights –
The issuance of this NPDES general permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property, nor any invasion of personal rights, nor any infringement or violation of Federal, State or local laws or regulations. This NPDES general permit in no way reduces or eliminates the permittee's responsibilities to landowners whose property may be traversed by stormwater runoff from the project site either before, during, or after construction of the planned project. It is the permittee's responsibility to obtain any necessary approvals from any affected property owner.

11.9 Duty to Mitigate –
The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this NPDES general permit which has a reasonable likelihood of adversely affecting human health or the environment.

11.10 Bypass –
Any diversion or bypass of facilities necessary to maintain compliance with this NPDES general permit is prohibited except where necessary to prevent loss of human life, personal injury, or severe property damage, and where no feasible alternative to the bypass exists.

Any bypass which occurs during construction activities which may affect a threatened or endangered species, or a historical or archeological site, on site or in the receiving water body, shall be reported to KDHE verbally within 24 hours to (785) 296-5549, and within 5 business days shall be reported via the Kansas Environmental Information System (KEIMS) or, upon KDHE acceptance of an electronic reporting waiver per Part 10.10 of this permit, may be reported in writing at the stated address in Part 10.2 of this permit.

If a bypass occurs during construction activities, the SWP2 Plan shall be modified or amended to prevent future occurrences in accordance with the requirements and conditions of this NPDES general permit.

ENDNOTES

1. The NPDES general permit, application forms, guidance material, the rainfall erosivity waiver application, and reference material is available on the KDHE Stormwater Website at www.kdhe.ks.gov/757/Construction-Stormwater-Program. The website also provides links to EPA guidance documents and the instructions for the rainfall erosivity calculation, Fact Sheet 3.1 - Storm Water Phase II Final Rule Construction Rainfall Erosivity Waiver

Material available on the KDHE Stormwater Website includes the NPDES general Permit, Notice of Intent, Notice of Termination, Notice of Transfer of Owner/Operator, Individual Lot Certification, and the Definitions and Acronyms in Adobe Acrobat Reader format (pdf).

Reference material available on the KDHE Stormwater Website includes the Fact Sheet, Rainfall Erosivity Waiver Application, a list of Exceptional State Waters, Special Aquatic Life Use Waters and Outstanding National Resource Waters, and a link to the current Kansas Surface Water Register and maps.

2. The owner or operator must determine whether discharging stormwater runoff from construction activities on the site is subject to any local applicable requirements. To determine the local requirements applicable to each construction project, the owner or operator must contact the local Municipal Separate Storm Sewer System (MS4) operator. A list of MS4 operators who have or may be required to have a local stormwater pollution prevention program is available on the KDHE Stormwater Website at www.kdhe.ks.gov/1051/Municipal-Stormwater-Program This list is provided and maintained for information only and will not necessarily include all MS4 operators with a local program.

3. If the applicant is uncertain if the project is located on Indian Country land, please contact the Bureau of Indian Affairs Southern Plains Regional Office - Natural Resources Department at (405) 247-6673 and the EPA Region VII Tribal Program at (913) 551-7164 or (913) 551-7374. EPA is the permitting authority on Indian Country land. To request authorization to discharge stormwater runoff from construction activities conducted on Indian Country land the applicant must contact EPA.

4. To determine if your project is located near one of these areas find the stream segment(s) or lake(s) which receive(s) the stormwater runoff on the Kansas Surface Water Register Maps, then check the designated uses of the stream segment(s) or lake(s) in the Kansas Surface Water Register. Applicants can download a copy of the Surface Water Register from the KDHE Stormwater Website at www.kdhe.ks.gov/757/Construction-Stormwater-Program. At the time of this general NPDES permit issuance there were no Critical Water Quality Management Areas established. The stormwater website includes the most current list should an area be established.

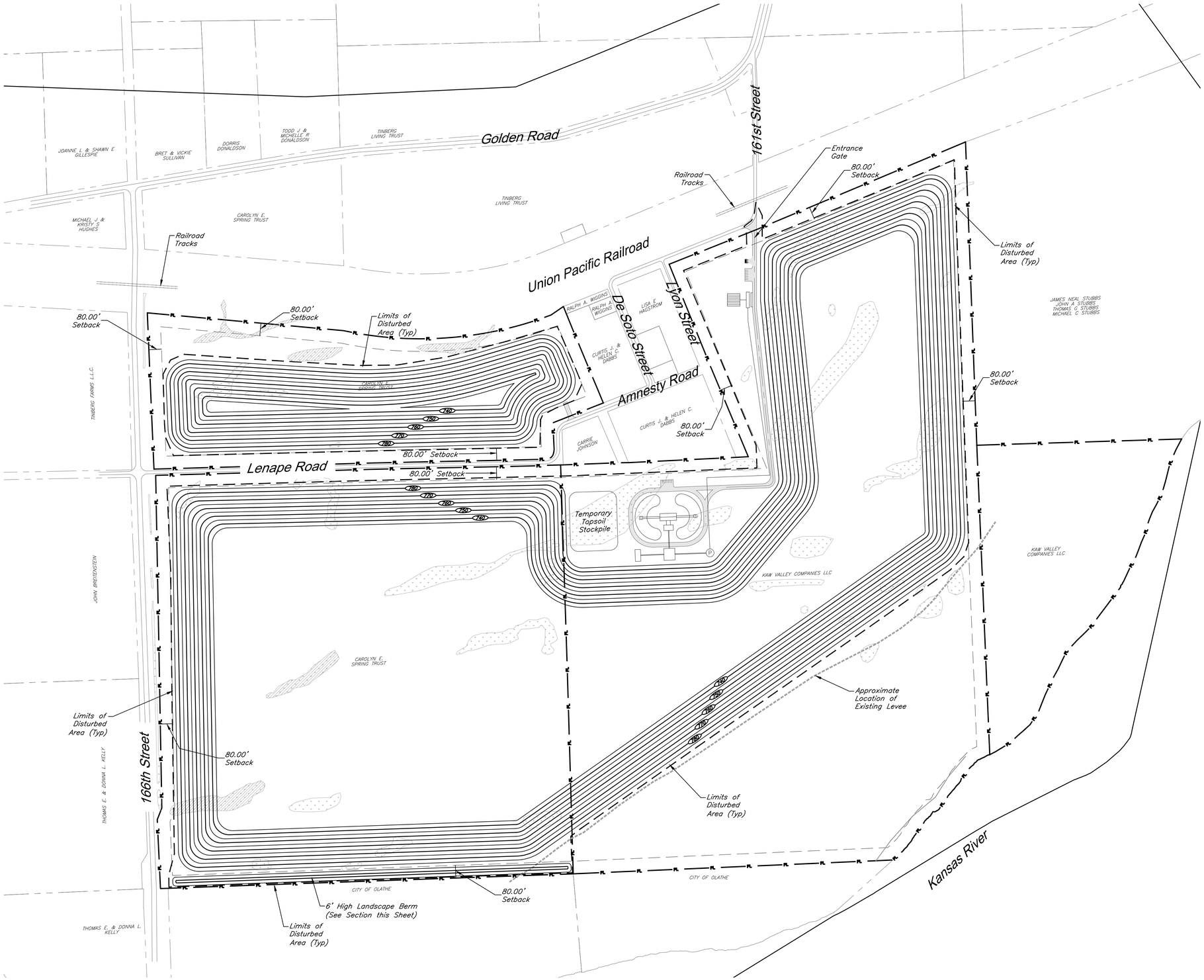
5. The referenced guidance documents are available on-line at: http://nepis.epa.gov/. Links to the referenced guidance are also available at the KDHE website: www.kdhe.ks.gov/757/Construction-Stormwater-Program.

6. Certification as a professional in erosion and sediment control is available through CPESC, Inc. CPESC information can be obtained through the internet at www.cpesc.org, or by calling (828) 655-1600. For other additional educational opportunities and information, contact the International Erosion Control Association at www.ieca.org or by calling (800) 455-4322.

7. Routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the facility that disturbs less than 5 acres is not considered to be construction activity, and therefore is not subject to construction stormwater permitting requirements.

APPENDIX B
ENGINEERING PLANS AND DETAILS

G:\16477\Civil 3D\Production Drawings\Special Use Permit\16477C4000.dwg Layout: 4 Erosion Control Plan – Phase 1 –– Friday October 11, 2024, 1:32pm –– Copyright 2024, George Butler Associates, Inc.



CAUTION!

Numerous Utilities on Site. Contractor to verify location and elevation of all utilities prior to commencing construction.

Erosion Control Legend

- 1010 — Proposed Contours
- 900 — Existing Contour Major
- 902 — Existing Contour Minor
- Existing Wetland (Non Jurisdictional)
- Existing Wetland (Jurisdictional)
- Existing Levee
- Limits of Disturbed Area 328 Acres
- 26' Gravel Road

Note: All area to drain internal to the sand operation.

300' 0' 300' 600'

SCALE : 1 INCH = 300 FEET

GBA
9801 Renner Blvd., Ste. 300
Lenexa, KS 66219
913.492.0400
gbateam.com

LENAPE SAND OPERATION

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

REVISION

PROJECT NUMBER
16477.00

DATE
10/11/2024

DRAFT SUP

DESIGNED

DRAWN

REVIEWED

SHEET TITLE

Erosion Control Plan - Phase 1

SHEET NUMBER

4

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APPENDIX C
CONTRACTOR'S CERTIFICATION FORM

CONTRACTOR'S CERTIFICATION FORM

For Discharge of Stormwater Runoff from Construction Activities
In accordance with the Kansas Water Pollution Control General Permit
Under the National Pollutant Discharge Elimination System

This form is to be completed by each Contractor responsible for installation, operation, or maintenance of any construction stormwater best management practices (BMPs) necessary to complete the requirements of the Stormwater Pollution Prevention Plan. This completed form must be included in, or kept with, the Stormwater Pollution Prevention Plan for the site identified below.

I certify under penalty of law that I understand the terms and conditions of the Kansas Water Pollution Control general permit that authorizes the stormwater discharges associated with construction activity from the construction site identified below, and the Stormwater Pollution Prevention Plan prepared for the project.

Name of Project: _____

City:_____ County:_____State: KS

Kansas Water Pollution Control General Permit No. S-MCST-0701-1

Kansas Permit No. _____ Federal Permit No. _____

Contractor Information

Company Name: _____

Company Address: _____

_____

Company Phone Number: _____

Project Responsibilities: _____

_____

_____

_____

_____

Contractor's Signature: _____ Date: _____

Name (typed or printed): _____

APPENDIX D
CONSTRUCTION SITE POLLUTANT REFERENCE

CONSTRUCTION SITE POLLUTANT REFERENCE (See attached fact sheet for more water quality protection practices)

Water Quality Standard Criteria	Substances/Actions Likely to Result in the Violation	Water Quality Protection Practices
pH below 6.5 pH above 8.5	Acids, Caustics	Prevent or respond to equipment leaks or spills. Report spill. Keep spill equipment (absorbents, socks, etc.) on site. Push up berm, etc. Locate and store substances an adequate distance from water resource. Implement vandalism prevention/reduction practices.
Visible oil and grease	Fuel, mechanical maintenance fluids, solvents, oil based paints.	Prevent or respond to equipment leaks or spills. Report spill. Keep spill equipment (absorbents, socks, etc.) on site. Push up berm, etc. Locate and store substances an adequate distance from water resource. Implement vandalism prevention/reduction practices.
Floating debris, solid material	Artificial items, such as food containers, plastic paper or anything else which may trigger a complaint.	Good housekeeping, a portable waste container. Proper disposal of construction waste, rubbish, equipment parts, tires, etc.
Dissolved oxygen below 5.0, Biochemical oxygen demand 3.0 mg/l (BOD)	Oxygen depletion from removal of natural aeration sources or overloading organic matter.	Minimize stream geometry changes, removal of riffle and rocky areas. Design stream channel geometry for artificial sources of oxygenation.
Pesticides	Substances which are used to control or eradicate living organisms (plant, animals, fungus)	Follow local regulations, label instructions, and investigate mechanical / biological alternatives.
Suspended solids (sources)	Accelerated sedimentation, siltation, and erosion formed land disturbance, stream and bank alteration. **If using heavy equipment, see practices for hazardous, visible oil, etc. as well as pH criteria.**	**Sediment/siltation:** silt barriers/fences, sediment ponds, retention and detention dams, protect or restore wetland/riparian areas, establish buffer strip, stabilize streambank. **Erosion:** compaction, surface roughening, erosion control mats, mulch systems, vegetative plantings, Use mulch or hydro-seeding.
Nutrients	Natural or commercial sources of nitrogen and phosphorus.	Follow label instructions, apply according to vegetation needs and rates. Use mulching techniques.
Toxics / Hazardous	Any contaminant which affects the health of a living, non-microbial organism. May include infections pathogens, radioactive isotopes, etc.	Prevent or respond to equipment leaks or spills. Report spill. Keep spill equipment (absorbents, socks, etc.) on site. Push up berm, etc. Locate and store substances an adequate distance from water resource. Implement vandalism prevention/reduction practices.

APPENDIX E
SITE INSPECTION FORM

Company Name: Company Address; Telephone Number; and Fax:

Site Inspection Form

Project No.:	Inspection Date:
Project Name:	Owner (Permittee):
Project Location:	Civil Engineer:
Superintendent:	NPDES Permit No.:

A Site Inspection was conducted on the project identified above. The following observations were noted during this inspection：

☐ Weekly Inspection ☐ Storm Event Inspection (>0.5 inches of rain) Rainfall (inches):_____

Storm Water Pollution Prevention Plan: ☐ Part of Grading Plans ☐ Separate Document	
SWPPP in Project Office: ☐ Yes ☐ No	Operator Inspection Form and Log ☐ Yes ☐ No
Copy of Permit & Conditions in Office: ☐ Yes ☐ No	Site Area (In Acres):
Name of receiving Waters or Streams:	
Grading Contractor: ☐ Subcontractor ☐ Contracted Direct to Owner	

No.	I. List of Erosion & Sediment Control BMP's	Acceptable Condition			Action Taken
1.		☐ Yes	☐ No	☐ N/A	
2.		☐ Yes	☐ No	☐ N/A	
3.		☐ Yes	☐ No	☐ N/A	
4.		☐ Yes	☐ No	☐ N/A	
5.		☐ Yes	☐ No	☐ N/A	
6.		☐ Yes	☐ No	☐ N/A	
7.		☐ Yes	☐ No	☐ N/A	
8.		☐ Yes	☐ No	☐ N/A	
9.		☐ Yes	☐ No	☐ N/A	
10.		☐ Yes	☐ No	☐ N/A	
11.		☐ Yes	☐ No	☐ N/A	
12.		☐ Yes	☐ No	☐ N/A	
13.		☐ Yes	☐ No	☐ N/A	
14.		☐ Yes	☐ No	☐ N/A	
15.		☐ Yes	☐ No	☐ N/A	

No.	II. General Condition Questions/Checklist	Acceptable Condition			Comments
1.	Are BMP's Completed per the SWPPP?	☐ Yes	☐ No	☐ N/A	
2.	Are BMP's routinely maintained?	☐ Yes	☐ No	☐ N/A	
3.	Are good site housekeeping practices observed?	☐ Yes	☐ No	☐ N/A	
4.	Is sediment form erosion being retained on site?	☐ Yes	☐ No	☐ N/A	
5.	Solid waste prohibited from being buried on site?	☐ Yes	☐ No	☐ N/A	
6.	Hazardous waste and paint removed from site?	☐ Yes	☐ No	☐ N/A	
7.	Has any disturbed site area been inactive >14 days?	☐ Yes	☐ No	☐ N/A	

Inspector's Signature (Required) _____

See continuation Page: ☐ Yes ☐ No, END OF REPORT Carbon Copy to: _____

Company Name: Company Address; Telephone Number; and Fax:

Site Inspection Form Continuation Sheet

The items described below are part of the Storm Water Pollution Prevention Plan (SWPPP) Site Inspection for Project Number _____, Project titled _____ as follows:

No	**III. Additional Comments** (if applicable, note the item number of the topic above to which your comments apply).

APPENDIX F
SITE INSPECTION LOG

Company Name: Company Address; Telephone Number; and Fax:

SITE INSPECTION LOG

Project No.:	**Page ____ of ____**	
Project Name:	**Owner (Permittee):**	
Project Location:	**Civil Engineer:**	
Superintendent:	**NPDES Permit No.:**	
Storm Water Pollution Plan:	**☐ Part of Grading Plans**	**☐ Separate Document**
Site Area (In Acres):	**Name of Receiving Waters or Streams:**	
Grading Contractor:	**☐ Subcontractor**	**☐ Contracted Direct to Owner**

Item No.	Inspection Date	Inspection Conducted By	Inspection Type Weekly (W) or Storm Event (S)		BMP Condition Good (G), Fair (F) or Poor (P)			BMP Maintenance Required? Y/N		Date Maintenance Performed
1.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
2.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
3.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
4.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
5.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
6.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
7.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
8.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
9.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
10.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
11.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
12.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
13.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
14.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
15.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
16.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
17.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
18.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
18.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
19.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
20.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
21.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
22.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
23.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
24.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
25.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
26.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
27.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
28.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
29.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
30.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	

Item No.	Inspection Date	Inspection Conducted By	Inspection Type Weekly (W) or Storm Event (S)		BMP Condition Good (G), Fair (F) or Poor (P)			BMP Maintenance Required? Y/N		Date Maintenance Performed
31.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
32.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
33.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
34.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
35.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
36.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
37.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
38.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
39.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
40.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
41.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
42.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
43.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
44.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
45.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
46.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
47.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
48.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
49.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
50.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
51.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
52.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
53.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
54.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	
55.			☐ W	☐ S	☐ G	☐ F	☐ P	☐ Y	☐ N	

Reference Item	Comments

APPENDIX G
COMPLETED INSPECTION FORMS

APPENDIX M
DRAINAGE REPORT



GBA

LENAPE SAND OPERATION DRAINAGE STRUCTURES

LEAVENWORTH COUNTY, KANSAS

GBA PROJECT NO. 16477

9801 Renner Boulevard
Lenexa, KS 66219-9745
913.492.0400 | www.gbateam.com

September 26, 2025

Kaw Valley Sand & Gravel
Lenape Sand Operation
166th & Lenape Road
Southern Leavenworth County, Kansas
GBA Project No. 16477

Drainage Structures Study
September 26, 2025

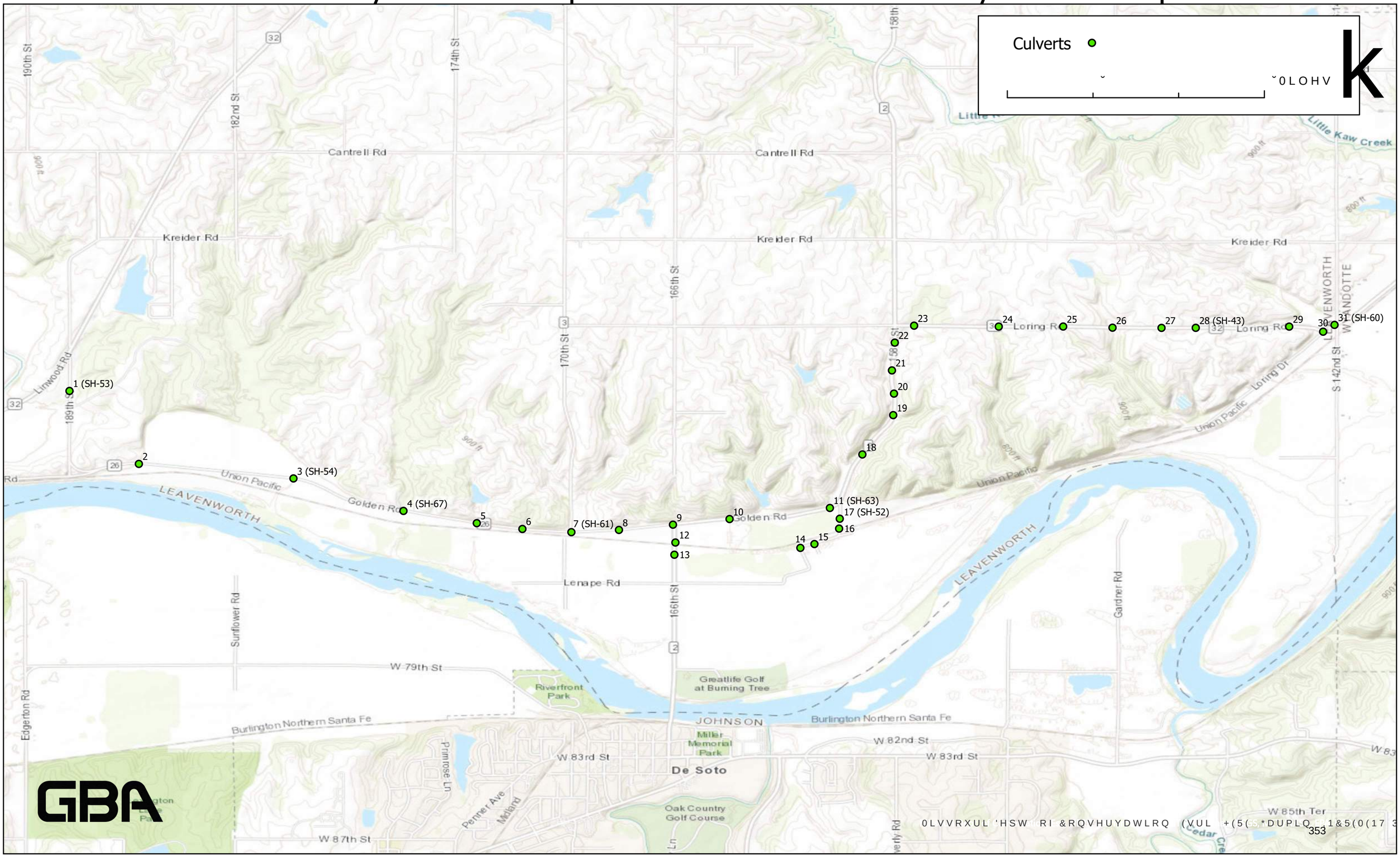
Disclaimer:
This report is an evaluation from a visual assessment perspective only. Structural analysis, hydrologic and hydraulic analysis, geometric and safety upgrades, including lane width and shoulder improvements, are outside the scope of the drainage structures study.

Prepared for:
Kaw Valley Companies, Inc.
5600 Kansas Avenue
Kansas City, Kansas 66106
(913) 281-9950

Prepared by:
George Butler Associates, Inc
9801 Renner Boulevard
Lenexa, Kansas 66219
(913) 492-0400



16477 Kaw Valley Sand - Lenape Site - Leavenworth County Culvert Inspections



Identification

Owner: Leavenworth County
Year Built: Unknown
Route Carried: 189th St
Location: 0.2 S of K-32
Structure Type: Corrugated Metal Arch
Structure Type Additional Feature:

Culvert ID: 1 (SH-53)
Longitude: -95.01563911
Latitude: 39.00905862

Span Configuration: 11.25'x6.58'
Feature Intersected: Stream
No. of Lanes: 2
Posting: None
Length: 30'
Roadway Width: 23'

Schedule

Inspection Date: December 17, 2024
Inspection Frequency: N/A
Inspector(s): RAM, CFL

Temperature: 45°F
Weather: Partly Cloudy

Condition

Culvert: Corrugated metal arch with concrete floor. Metal arch is in good condition with minor corrosion along seams and along bottom. Concrete headwalls in poor condition with large amount of deterioration and spalling with exposed rebar, worse on west end.

Condition Rating: 7

Channel: Poor alignment upstream with main channel entering culvert at 45° from the NE. Separate smaller roadway drainage channel coming from the SE meeting at the culvert. Good vegetation on banks. Up to 6" of scour on upstream end. Minor silt in cell.

Condition Rating: 6

Scour: Up to 6" of scour on upstream end.

Condition Rating: 7

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Bridge Railing Transitions: N

Approach Guardrail: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: NW,NE,SW,SE

Maintenance Recommendations

Reconstruct headwalls with new guardrail.



Approach - Looking North



Approach - Looking South



Upstream - Looking Northeast



Downstream - Looking West



Elevation - Looking East



Elevation - Looking West



Scour at Upstream End - Looking West



Typical Headwall Condition - Looking East



Typical View Through Arch - Looking East

Identification

Owner: Leavenworth County
Culvert ID: 2
Span Configuration: 3’x1.83’
Year Built: Unknown
Longitude: -95.00978663
Feature Intersected: Drainage ditch
Route Carried: Golden Rd
Latitude: 39.00290432
No. of Lanes: 2
Location: 0.3 E of 189th St
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 39'
Structure Type Additional Feature:
Roadway Width: 23’

Schedule

Inspection Date: December 17, 2024
Temperature: 50°F
Inspection Frequency: N/A
Weather: Cloudy
Inspector(s): RAM,CFL

Condition

Culvert: Corrugated metal pipe in fair condition with minor corrosion typical along bottom. Areas of heavy corrosion with minor to moderate section loss along bottom and along seams. A few areas with minor deflection in top and bottom of pipe.

Condition Rating: 6

Channel: Small drainage channel with generally good alignment and a few small trees in channel. 8’ diameter x 2.5’ deep scour hole downstream with 1.5’ of undermining. Moderate bank erosion around downstream end of pipe.

Condition Rating: 6

Scour: 8’ diameter x 2.5’ deep scour hole downstream with 1.5’ of undermining.

Condition Rating: 6

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: SW

Maintenance Recommendations

Fill downstream scour hole with rip rap.



Approach - Looking West



Approach - Looking East



Upstream - Looking North



Downstream - Looking South



Elevation - Looking South



Typical View Through Pipe - Looking South



Elevation - Looking South

Identification

Owner: Leavenworth County
Culvert ID: 3 (SH-54)
Span Configuration: 29.75’
Year Built: Unknown
Longitude: -94.9967456
Feature Intersected: Stream
Route Carried: Golden Rd
Latitude: 39.00167888
No. of Lanes: 2
Location: 1.0 E of 189th St
Posting: None
Structure Type: Steel Beam, Simple Span
Length: 24.5’
Structure Type Additional Feature:
Roadway Width: 23’

Schedule

Inspection Date: December 17, 2024
Temperature: 50°F
Inspection Frequency: N/A
Weather: Cloudy
Inspector(s): RAM,CFL

Condition

Culvert: Bottom of deck has heavy corrosion on north half and south edge. Steel beams have areas of heavy section loss in north 5 beams and south 3 beams. Steel pile caps and piles have areas of heavy section loss. Horizontal pile braces have 100% section loss. Corrugated steel backwalls have areas of moderate section loss. East backwall is bulging near groundline.

Condition Rating: 4

Channel: Rocky bottom channel with steep banks with exposed tree roots. Channel favors east abutment with ~3' of scour along abutment. Large drift caught in channel.

Condition Rating: 6

Scour: Channel favors east abutment with ~3' of scour along abutment.

Condition Rating: 6

Miscellaneous: Load rating performed on structure in 2019. NBI#: 000000000520160

Overall Condition Rating: Poor

Roadside Hardware

Bridge Railing: 0
Approach Guardrail: 0
Bridge Railing Transitions: 0
Approach Guardrail Ends: 0

Railing/Guardrail Notes: North side guardrail posts are broken off for entirety of span. Guardrail is unsupported for ~40’.

Hazard Markers: NW,NE,SW,SE

Maintenance Recommendations

Structure is scheduled for replacement. Construction to begin December 15, 2025. Structure to be completed in August 2026.



Approach Roadway - Looking East



Approach Roadway - Looking West



Upstream Channel - Looking North



Downstream Channel - Looking South



Approach Roadway Settlement at SE Corner - Looking East



North Guardrail Condition - Looking Northwest



Elevation - Looking South



Elevation - Looking North



East Abutment - Looking East



West Abutment - Looking West



Typical Superstructure - Looking West



Typical Superstructure and Substructure Condition - Looking North

Identification

Owner: Leavenworth County
Culvert ID: 4 (SH-67)
Span Configuration: 12'x7.75'
Year Built: Unknown
Longitude: -94.98746424
Feature Intersected: Stream
Route Carried: Golden Rd
Latitude: 38.99893823
No. of Lanes: 2
Location: 0.8 W of 170th St
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 66.75'
Structure Type Additional Feature:
Roadway Width: 23'

Schedule

Inspection Date: December 17, 2024
Temperature: 50°F
Inspection Frequency: N/A
Weather: Cloudy
Inspector(s): RAM,CFL

Condition

Culvert: Minor to moderate corrosion typical along bottom and seams. A few areas with minor to moderate section loss. One area of heaving bottom near north end.

Condition Rating: 6

Channel: Good alignment. Large trees with exposed roots line banks. Large amount of drift caught in channel upstream. 6" of scour with 6" undermining at south end.

Condition Rating: 6

Scour: 6" of scour with 6" undermining at south end.

Condition Rating: 7

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

Clean drift out of upstream channel.



Approach - Looking West



Approach - Looking East



Upstream - Looking North



Downstream - Looking South



Elevation - Looking South



Elevation - Looking North



Typical View Through Pipe - Looking North



ID Sign - Looking North

Identification

Owner: Leavenworth County
Culvert ID: 5
Span Configuration: 5'x6'
Year Built: Unknown
Longitude: -94.98128073
Feature Intersected: Drainage ditch
Route Carried: Golden Rd
Latitude: 38.99790552
No. of Lanes: 2
Location: 0.4 W of 170th St
Posting: None
Structure Type: Reinforced Concrete Box
Length: 28.5'
Structure Type Additional Feature:
Roadway Width: 23'

Schedule

Inspection Date: December 17, 2024
Temperature: 50°F
Inspection Frequency: N/A
Weather: Cloudy
Inspector(s): RAM,CFL

Condition

Culvert: RCB in generally good condition. Area of poor consolidation in top slab at north end. Several shallow spalls with exposed rebar in top slab due to shallow cover. Large spall with exposed rebar at west end of south head wall/barrier.

Condition Rating: 7

Channel: Upstream is 3-16" corrugated metal pipes coming from the W, N, & E. Moderate amount of debris around each pipe. Downstream is shallow banks with several small to large trees. 9" of scour at the end of downstream apron.

Condition Rating: 7

Scour: 9" of scour at the end of downstream apron.

Condition Rating: 7

Miscellaneous:

Overall Condition Rating: Good

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: NE, SW

Maintenance Recommendations

None at this time.



Approach - Looking West



Approach - Looking East



Upstream - Looking North



Downstream - Looking South



Elevation - Looking Southwest



Elevation - Looking Northeast



Scour at Downstream End - Looking North



Typical View Through Cell - Looking South



Poor Consolidation in Top Slab at North End - Looking Southwest



Shallow Spalls w/ Exposed Rebar in Top Slab - Looking South

Identification

Owner: Leavenworth County
Year Built: Unknown
Route Carried: Golden Rd
Location: 0.2 W of 170th St
Structure Type: Corrugated Metal Pipe
Structure Type Additional Feature:

Culvert ID: 6
Longitude: -94.97743333
Latitude: 38.99741546

Span Configuration: 3’
Feature Intersected: Stream
No. of Lanes: 2
Posting: None
Length: 39.5’
Roadway Width: 23’

Schedule

Inspection Date: December 17, 2024
Inspection Frequency: N/A
Inspector(s): RAM, CFL

Temperature: 50°F
Weather: Cloudy

Condition

Culvert: Corrugated metal pipe in good condition. Moderate impact damage at north end.

Condition Rating: 7

Channel: Good alignment. Upstream is narrow winding channel with small to moderate trees along banks. Downstream T’s into roadway drainage ditch 15’ downstream of pipe. 1’ of silt/debris accumulation at upstream end of pipe, 6” at downstream end.

Condition Rating: 6

Scour: Minimal scour at downstream end.

Condition Rating: 8

Miscellaneous: Bank above downstream end of pipe has erosion that is enchroaching on roadway.

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Bridge Railing Transitions: N

Approach Guardrail: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

Clear silt/debris from upstream and downstream end.



Approach - Looking East



Approach - Looking West



Upstream - Looking North



Downstream - Looking South



Elevation - Looking South



Typical View Through Pipe - Looking South



Impact Damage at North End - Looking South



Elevation - Looking Northwest

Identification

Owner: Leavenworth County
Culvert ID: 7 (SH-61)
Span Configuration: 3-7'x4' (45° skew)
Year Built: Unknown
Longitude: -94.97330054
Feature Intersected: Stream
Route Carried: Golden Rd
Latitude: 38.99714699
No. of Lanes: 2
Location: E of 170th St
Posting: 11 Tons
Structure Type: Reinforced Concrete Box
Length: 42'
Structure Type Additional Feature:
Roadway Width: 23'

Schedule

Inspection Date: December 17, 2024
Temperature: 50°F
Inspection Frequency: N/A
Weather: Cloudy
Inspector(s): RAM, CFL

Condition

Culvert: Hairline transverse cracks typical in top slab and walls. Both headwalls and ends of center walls have heavy deterioration/spalling with exposed rebar with section loss. Deterioration in top slab extends up to 1' into cell. NE wing wall has large spall with exposed rebar at joint with box allowing roadway fill material to fall through.

Condition Rating: 5

Channel: Upstream channel is flat and grassy then becomes more defined with thick vegetation ~50' upstream. Downstream has moderate bank scarring and moderate to large trees. Flow is primarily through east cell. Up to 1' of silt accumulation in west and center cells, 15% of total area blocked. Minor drift in channel.

Condition Rating: 5

Scour: 9" of scour on upstream end of east cell.

Condition Rating: 7

Miscellaneous: NBI#: 000000000520180

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: 0
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: NW,NE,SW,SE

Maintenance Recommendations

Structure is scheduled for replacement. Construction to begin December 15, 2025. Structure to be completed in August 2026.



Approach - Looking East



Approach - Looking West



Upstream - Looking Northeast



Downstream - Looking Southwest



Elevation - Looking Northeast



Typical Headwall Condition - Looking Northwest



Typical View Through Cell - Looking Northeast



Elevation - Looking Southwest



Typical Top Slab Condition at Ends - Looking West

Identification

Owner: Leavenworth County
Culvert ID: 8
Span Configuration: 3.5'x2'
Year Built: Unknown
Longitude: -94.96928809
Feature Intersected: Drainage ditch
Route Carried: Golden Rd
Latitude: 38.99733484
No. of Lanes: 2
Location: 0.2 E of 170th St
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 41.5'
Structure Type Additional Feature:
Roadway Width: 23'

Schedule

Inspection Date: December 17, 2024
Temperature: 50°F
Inspection Frequency: N/A
Weather: Cloudy
Inspector(s): RAM, CFL

Condition

Culvert: Top of corrugated metal pipe in good condition. Bottom of pipe not visible due to 4" of standing water. Near waterline is moderate corrosion with some minor section loss. Moderate impact damage to north end of pipe. Minor impact damage to south end.

Condition Rating: 6

Channel: Upstream is roadway drainage ditch. Downstream in shallow and flat grassy channel with large trees. Minor debris caught downstream.

Condition Rating: 7

Scour: No scour.

Condition Rating: 8

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

None at this time.



Approach - Looking East



Approach - Looking West



Upstream - Looking North



Downstream - Looking South



Elevation - Looking North



Typical View Through Pipe - Looking North



Elevation - Looking South

Identification

Owner: Leavenworth County
Culvert ID: 9
Span Configuration: 3.5’
Year Built: Unknown
Longitude: -94.96473068
Feature Intersected: Drainage ditch
Route Carried: Golden Rd
Latitude: 38.997777
No. of Lanes: 2
Location: W of 166th St
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 54.5’
Structure Type Additional Feature:
Roadway Width: 35’

Schedule

Inspection Date: December 18, 2024
Temperature: 36°F
Inspection Frequency: N/A
Weather: Cloudy
Inspector(s): RAM,CFL

Condition

Culvert: Corrugated metal pipe in generally good condition with a few areas of moderate corrosion along seams and minor deflection throughout. Upstream end has large impact damage with top of pipe bent down 1’.

Condition Rating: 6

Channel: Upstream and downstream is grassy roadway drainage channel.

Condition Rating: 8

Scour: No scour.

Condition Rating: 8

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

None at this time.



Approach - Looking West



Approach - Looking East



Upstream - Looking North



Downstream - Looking South



Elevation - Looking North



Elevation - Looking South



Typical View Through Pipe - Looking North

Identification

Owner: Leavenworth County
Culvert ID: 10
Span Configuration: 4'x5'
Year Built: Unknown
Longitude: -94.95995868
Feature Intersected: Drainage ditch
Route Carried: Golden Rd
Latitude: 38.99825315
No. of Lanes: 2
Location: 0.3 E of 166th St
Posting: None
Structure Type: Reinforced Concrete Box
Length: 27'
Structure Type Additional Feature:
Roadway Width: 23'

Schedule

Inspection Date: December 18, 2024
Temperature: 36°F
Inspection Frequency: N/A
Weather: Cloudy
Inspector(s): RAM, CFL

Condition

Culvert: Culvert in good condition.

Condition Rating: 7

Channel: Upstream and downstream is grassy drainage ditch. 5' deep x 15' diameter scour hole downstream. Up to 5' back x full width undermining under downstream apron. 3" diameter tree growing on upstream end of culvert.

Condition Rating: 5

Scour: 5' deep x 15' diameter scour hole downstream. Up to 5' back x full width undermining under downstream apron.

Condition Rating: 5

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: SW. NE marker is knocked down.

Maintenance Recommendations

Put NE hazard marker up. Remove tree on north end of culvert. Repair scour hole downstream with rip rap and backfill undermining.



Approach - Looking East



Approach - Looking West



Upstream - Looking North



Downstream - Looking South



Elevation - Looking Northwest



Typical View Through Cell - Looking North



Elevation - Looking South



Undermining at South End - Looking Northeast



Undermining at South End - Looking East

Identification

Owner: Leavenworth County
Culvert ID: 11 (SH-63)
Span Configuration: 18.25'x5.75'
Year Built: Unknown
Longitude: -94.95149325
Feature Intersected: Stream
Route Carried: Golden Rd
Latitude: 38.99918836
No. of Lanes: 2
Location: 0.1 W of 161st St
Posting: None
Structure Type: Corrugated Metal Arch
Length: 59'
Structure Type Additional Feature:
Roadway Width: 23'

Schedule

Inspection Date: December 18, 2024
Temperature: 38°F
Inspection Frequency: N/A
Weather: Cloudy
Inspector(s): RAM,CFL

Condition

Culvert: Corrugated metal arch in good condition.

Condition Rating: 8

Channel: Upstream is flat and grassy then becomes more defined channel ~50' upstream with large trees lining banks. Downstream has large trees along east bank and well graded west bank. Rip rap in place around all wings and at downstream end.

Condition Rating: 8

Scour: Insignificant scour.

Condition Rating: 8

Miscellaneous:

Overall Condition Rating: Good

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

None at this time.



Approach - Looking East



Approach - Looking West



Upstream - Looking North



Downstream - Looking South



Elevation - Looking North



Elevation - Looking South



Typical View Through Pipe - Looking South

Identification

Owner: Leavenworth County
Culvert ID: 12
Span Configuration: 4.5’
Year Built: Unknown
Longitude: -94.96461037
Feature Intersected: Drainage ditch
Route Carried: 166th St
Latitude: 38.99627358
No. of Lanes: 2
Location: 0.1 S of Golden Rd
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 84’
Structure Type Additional Feature:
Roadway Width: 24’

Schedule

Inspection Date: May 2, 2025
Temperature: 60°F
Inspection Frequency: N/A
Weather: Cloudy
Inspector(s): RAM,CFL

Condition

Culvert: Top of corrugated metal pipe in good condition. Bottom of pipe has minor to moderate surface corrosion throughout with a few areas of heavy corrosion with moderate section loss.

Condition Rating: 6

Channel: Pipe is at intersection of roadway drainage ditch coming from the north and railroad drainage ditch coming from the west. Channel is grassy with north banks lined with trees and south banks being a rock/grass lined railroad embankment. Moderate brush slightly blocking ends of pipe. Up to 6” of standing water in east half of pipe.

Condition Rating: 6

Scour: No scour.

Condition Rating: 8

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

Clear brush at ends of pipe.



Approach - Looking South



Approach - Looking North



Upstream - Looking West



Downstream - Looking East



Typical View Through Pipe - Looking East



Typical Bottom of Pipe Condition



Elevation - Looking West



Elevation - Looking East

Identification

Owner: Leavenworth County
Culvert ID: 13
Span Configuration: 3.5'x2'
Year Built: Unknown
Longitude: -94.96461104
Feature Intersected: Drainage ditch
Route Carried: 166th St
Latitude: 38.9952427
No. of Lanes: 2
Location: 0.2 S of Golden Rd
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 66’
Structure Type Additional Feature:
Roadway Width: 24.5’

Schedule

Inspection Date: May 2, 2025
Temperature: 60°F
Inspection Frequency: N/A
Weather: Cloudy
Inspector(s): RAM,CFL

Condition

Culvert: Top of corrugated metal pipe is in good condition. Bottom of pipe has severe corrosion/section loss. Bottom completely rusted out for majority of length, up to 2’ wide at east end. West end of pipe has large impact damage with top bent down ~1’.

Condition Rating: 3

Channel: Upstream and downstream end of pipe Ts into field drainage ditch on both sides. Upstream is grassy, downstream has thick brush throughout. 1’ of scour at downstream end with ~3’ of undermining.

Condition Rating: 6

Scour: 1’ of scour at downsteam end of pipe with ~3’ of undermining.

Condition Rating: 6

Miscellaneous:

Overall Condition Rating: Poor

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

Replace structure.



Elevation - Looking East



View Through Pipe - Looking East



Upstream - Looking West



Approach - Looking South



Approach - Looking North



Elevation - Looking West



View Through Pipe - Looking West



Downstream - Looking East

Identification

Owner: Leavenworth County
Culvert ID: 14
Span Configuration: 4’x4’
Year Built: Unknown
Longitude: -94.95398352
Feature Intersected: Stream
Route Carried: De Soto St
Latitude: 38.9958212
No. of Lanes: 2
Location: At corner of Desoto St/Amnesty Rd
Posting: None
Structure Type: Reinforced Concrete Frame, no Floor
Length: 23’
Structure Type Additional Feature:
Roadway Width: 17.5'

Schedule

Inspection Date: May 2, 2025
Temperature: 60°F
Inspection Frequency: N/A
Weather: Partly cloudy
Inspector(s): RAM,CFL

Condition

Culvert: Concrete frame in generally good condition. A few areas with poor consolidation. A few minor spalls in headwalls and wingwalls.

Condition Rating: 7

Channel: Downstream is grassy drainage ditch with trees along banks, upstream is more defined channel with trees and thick brush throughout. Moderate drift/debris in channel. Small tree growing in center of channel at downstream headwall. Footings exposed with 9” of scour along entire length of culvert.

Condition Rating: 5

Scour: Footings exposed with 9” of scour along entire length of culvert. No undermining.

Condition Rating: 5

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: NW, SE

Maintenance Recommendations

None at this time.



Approach - Looking South



Approach - Looking North



Elevation - Looking West



Typical View Through Culvert - Looking West



Typical Wall Condition



Typical Bottom of Top Slab Condition



Elevation - Looking East



Upstream - Looking East



Downstream - Looking West

Identification

Owner: Leavenworth County
Culvert ID: 15
Span Configuration: 4’
Year Built: Unknown
Longitude: -94.95279739
Feature Intersected: Drainage ditch
Route Carried: Lyon St
Latitude: 38.99614497
No. of Lanes: 1
Location: S of Amnesty Rd
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 23’
Structure Type Additional Feature:
Roadway Width: 13’

Schedule

Inspection Date: May 2, 2025
Temperature: 60°F
Inspection Frequency: N/A
Weather: Partly cloudy
Inspector(s): RAM,CFL

Condition

Culvert: Corrugated metal pipe in good condition.

Condition Rating: 8

Channel: Good alignment. Grassy channel with stable banks lined with trees. Asphalt poured around both ends of pipe. Up to 1’ of asphalt/silt buildup at ends of pipe, ~15% cross section blocked.

Condition Rating: 7

Scour: No scour.

Condition Rating: 8

Miscellaneous:

Overall Condition Rating: Good

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: NW, SE

Maintenance Recommendations

None at this time.



Approach - Looking South



Approach - Looking North



Upstream - Looking West



Downstream - Looking East



Elevation - Looking East



Typical View Through Pipe - Looking East



Elevation - Looking West

Identification

Owner: Leavenworth County
Culvert ID: 16
Span Configuration: 2’
Year Built: Unknown
Longitude: -94.95071633
Feature Intersected: Drainage ditch
Route Carried: 161st St
Latitude: 38.99744694
No. of Lanes: 2
Location: N Side of Railroad Tracks
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 51’
Structure Type Additional Feature:
Roadway Width: 21’

Schedule

Inspection Date: May 2, 2025
Temperature: 60°F
Inspection Frequency: N/A
Weather: Cloudy
Inspector(s): RAM,CFL

Condition

Culvert: Majority of corrugated steel pipe is buried. Visible portions have minor surface corrosion.

Condition Rating: 7

Channel: South banks are grassy railroad embankments. Upstream north bank is also grassy, downstream north bank has trees and thick brush throughout. Pipe is mostly buried with up to 21” silt build up, ~90% cross section blocked.

Condition Rating: 4

Scour: No scour.

Condition Rating: 8

Miscellaneous:

Overall Condition Rating: Poor

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

Replace structure.



Approach - Looking North



Approach - Looking South



Upstream - Looking West



Downstream - Looking East



Elevation - Looking East



Typical View Through Pipe



Elevation - Looking West

Identification

Owner: Leavenworth County
Year Built: Unknown
Route Carried: 161st St
Location: 0.1 S of Golden Rd
Structure Type: Corrugated Metal Arch
Structure Type Additional Feature:

Culvert ID: 17 (SH-52)
Longitude: -94.95066094
Latitude: 38.99828057

Span Configuration: 13’x8’
Feature Intersected: Stream
No. of Lanes: 2
Posting: None
Length: 58’
Roadway Width: 18.5'

Schedule

Inspection Date: May 2, 2025
Inspection Frequency: N/A
Inspector(s): RAM,CFL

Temperature: 60°F
Weather: Cloudy

Condition

Culvert: Corrugated metal arch in generally good condition. West 20’ appears to be a newer section. ~4” of misalignment and/or defelction at joint with steel plates added to hold backfill. A couple large punctures in top of arch with steel plates added near east end.

Condition Rating: 7

Channel: Upstream has good alignment. Channel turns south and flows parallel to road immediately downstream of pipe. Upstream has shallow grassy north bank, and steeper grassy south bank, both appear stable. Stone retaining wall at northwest corner of arch is undermined up to 2’ and appears to be moving. Downstream banks have large stones and thick trees/brush. ~3’ of standing water inside arch with ~1’ of silt.

Condition Rating: 6

Scour: Stone retaining wall at northwest corner of arch is undermined up to 2’ and appears to be moving.

Condition Rating: 5

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Bridge Railing Transitions: N

Approach Guardrail: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

Monitor retaining wall movement at northwest corner.



Approach - Looking South



Approach - Looking North



ID Sign - Looking East


Upstream - Looking Northwest



Downstream - Looking South



Elevation - Looking Southwest



Elevation - Looking East



Undermining of Northwest Retaining Wall - Looking East



Typical View Through Arch



Punctures in Top of Arch Near East End - Looking West

Identification

Owner: Leavenworth County
Culvert ID: 18
Span Configuration: 5'x3'
Year Built: Unknown
Longitude: -94.94875307
Feature Intersected: Drainage ditch
Route Carried: 158th St
Latitude: 39.00369999
No. of Lanes: 2
Location: 0.3 N of Golden Rd
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 48'
Structure Type Additional Feature:
Roadway Width: 22.5'

Schedule

Inspection Date: May 2, 2025
Temperature: 60°F
Inspection Frequency: N/A
Weather: Partly cloudy
Inspector(s): RAM,CFL

Condition

Culvert: Top of corrugated metal pipe in good condition. Bottom of pipe has surface corrosion with a few areas of minor section loss. Bottom has moderate heaving near center of pipe. Ends of pipe have moderate impact damage with top bent down up to ~9".

Condition Rating: 6

Channel: Upstream and downstream T into roadway drainage ditches. Thick trees/brush along outside banks. Moderate drift/debris in downstream channel.

Condition Rating: 6

Scour: No scour.

Condition Rating: 8

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

None at this time.



Approach - Looking South



Typical View Through Pipe - Looking West



Elevation - Looking Southwest



Upstream - Looking East



Downstream - Looking West



Elevation - Looking East



Approach - Looking North

Identification

Owner: Leavenworth County
Culvert ID: 19
Span Configuration: 3.5'x2'
Year Built: Unknown
Longitude: -94.94615155
Feature Intersected: Stream
Route Carried: 158th St
Latitude: 39.00701927
No. of Lanes: 2
Location: 0.5 S of Loring Rd
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 48'
Structure Type Additional Feature:
Roadway Width: 23'

Schedule

Inspection Date: May 2, 2025
Temperature: 60°F
Inspection Frequency: N/A
Weather: Partly Cloudy
Inspector(s): RAM,CFL

Condition

Culvert: Bottom of pipe has moderate surface corrosion. ~2-3" dent in top of pipe 5' from west end. Impact damage to west end with top bent down ~9".

Condition Rating: 6

Channel: Upstream channel meanders from the east, downstream channel curves south and flows parallel to roadway. Thick trees/brush throughout. Up to 6" of silt/debris in pipe with moderate drift/debris in channel throughout.

Condition Rating: 6

Scour: No scour.

Condition Rating: 8

Miscellaneous: West edge of roadway is eroding above end of pipe.

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

Replace structure.



Approach - Looking South



Approach - Looking North



Elevation - Looking East



Typical View Through Pipe - Looking East



Downstream - Looking West



Elevation - Looking West



Upstream - Looking East



West Edge of Roadway Condition - Looking South

Identification

Owner: Leavenworth County
Culvert ID: 20
Span Configuration: 2’
Year Built: Unknown
Longitude: -94.94608688
Feature Intersected: Stream
Route Carried: 158th St
Latitude: 39.00883359
No. of Lanes: 2
Location: 0.4 S of Loring Rd
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 70’
Structure Type Additional Feature:
Roadway Width: 22.5’

Schedule

Inspection Date: May 5, 2025
Temperature: 68°F
Inspection Frequency: N/A
Weather: Sunny
Inspector(s): RAM

Condition

Culvert: Top of corrugated metal pipe in generally good condition. Bottom has heavy corrosion with moderate section loss typical. 5’ section of pipe at east end has completely rusted out bottom, up to 1’ wide.

Condition Rating: 4

Channel: Small meandering rocky bottom channel. Trees and thick brush up and downstream. Moderate drift/debris in channel. 1-2’ deep scour hole at downstream end.

Condition Rating: 6

Scour: 1-2’ deep scour hole at downstream end.

Condition Rating: 7

Miscellaneous:

Overall Condition Rating: Poor

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

Replace structure.



Approach - Looking South



Approach - Looking North



Downstream - Looking West



Elevation - Looking East



View Through Pipe - Looking East



Elevation - Looking West



Upstream - Looking Northeast



View Through Pipe - Looking West

Identification

Owner: Leavenworth County
Culvert ID: 21
Span Configuration: 2.5’
Year Built: Unknown
Longitude: -94.94625776
Feature Intersected: Drainage ditch
Route Carried: 158th St
Latitude: 39.01079109
No. of Lanes: 2
Location: 0.3 S of Loring Rd
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 44.5’
Structure Type Additional Feature:
Roadway Width: 23’

Schedule

Inspection Date: May 5, 2025
Temperature: 72°F
Inspection Frequency: N/A
Weather: Sunny
Inspector(s): RAM

Condition

Culvert: Moderate surface corrosion along bottom of pipe at waterline. A few areas of minor section loss. Rest of pipe in generally good condition with a couple small dents.

Condition Rating: 7

Channel: Upstream channel is roadway drainage ditch coming from the north. Downstream flows to the southwest. Grassy slopes with small trees throughout. Minor drift/debris upstream. ~2-3’ deep x ~8’ wide scour hole at downstream end with 3’ of undermining.

Condition Rating: 6

Scour: ~2-3’ deep x ~8’ wide scour hole at downstream end with 3’ of undermining.

Condition Rating: 6

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

None at this time.



Approach - Looking North



Approach - Looking South



Upstream - Looking Northeast



Downstream - Looking Southwest



Elevation - Looking Northwest



View Through Pipe - Looking East



Elevation - Looking Northeast

Identification

Owner: Leavenworth County
Culvert ID: 22
Span Configuration: 4'x4'
Year Built: Unknown
Longitude: -94.94601972
Feature Intersected: Stream
Route Carried: 156th St
Latitude: 39.01313476
No. of Lanes: 2
Location: 0.1 S of Loring Rd
Posting: None
Structure Type: Reinforced Concrete Box
Length: 70'
Structure Type Additional Feature:
Roadway Width: 22.5'

Schedule

Inspection Date: May 5, 2025
Temperature: 72°F
Inspection Frequency: N/A
Weather: Sunny
Inspector(s): RAM

Condition

Culvert: Concrete box in generally good condition. Moderate leakage through west joint. Minor abrasion in bottom slab. Large spall with exposed rebar at end of southwest wing.

Condition Rating: 7

Channel: Upstream has steep banks lined with stones, trees, and thick brush. South bank is unstable with large pile of stones falling into end of box. Downstream has thick brush throughout that is partially blocking end of box. Fence immediately downstream of box collecting drift/debris.

Condition Rating: 5

Scour: Minimal scour downstream.

Condition Rating: 8

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

Clear stones/debris/brush at ends of box. Stabilize upstream banks.



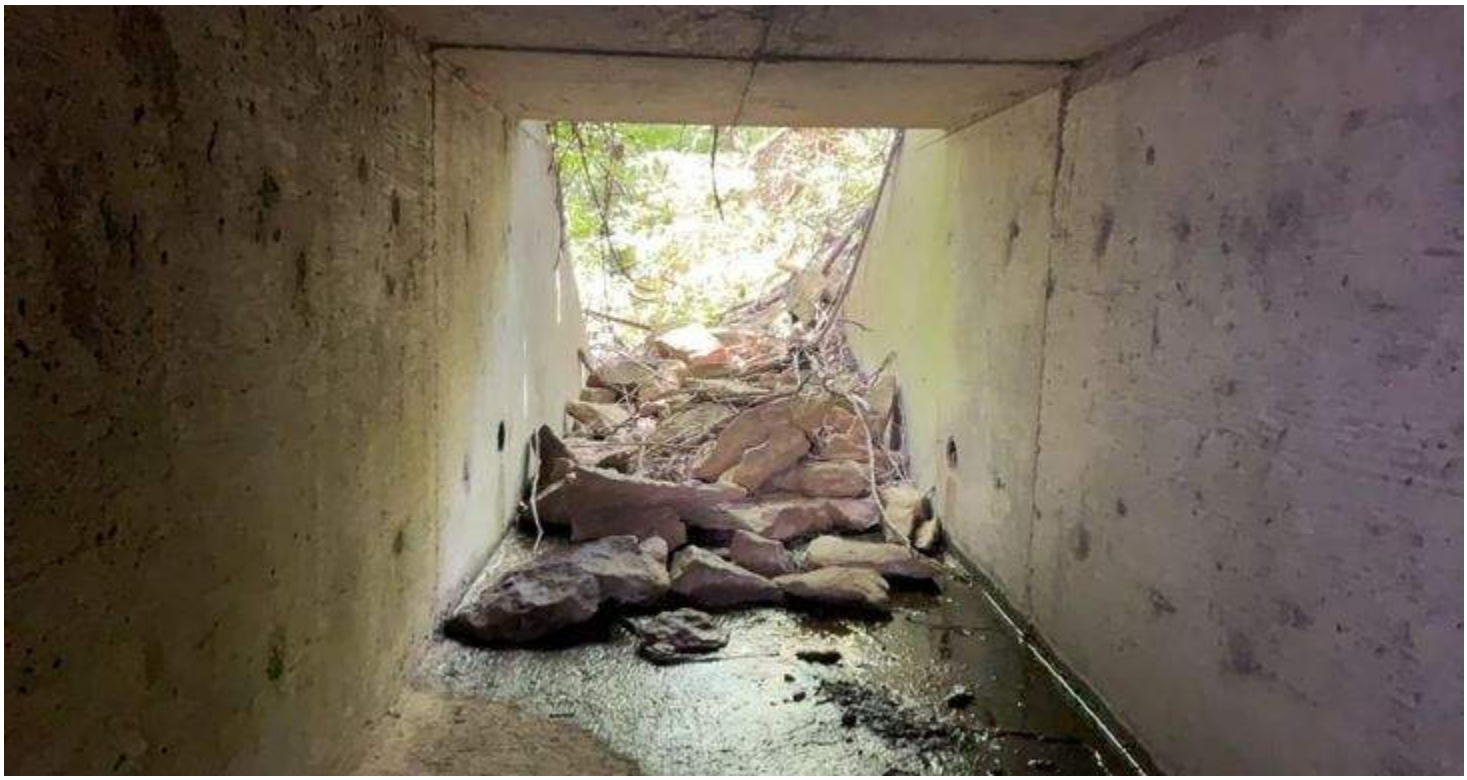
Elevation - Looking West



Upstream - Looking East



Typical View Through Cell - Looking West



Stones Falling Into East End of Box - Looking East



West Joint Leakage - Looking Northwest



Downstream - Looking West



Elevation - Looking East



Spall with Exposed Rebar on Southwest Wing - Looking Southeast



Approach - Looking North



Approach - Looking South

Identification

Owner: Leavenworth County
Culvert ID: 23
Span Configuration: 4’
Year Built: Unknown
Longitude: -94.94438817
Feature Intersected: Stream
Route Carried: Loring Rd
Latitude: 39.01456559
No. of Lanes: 2
Location: 0.1 E of 158th St
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 107’
Structure Type Additional Feature:
Roadway Width: 24’

Schedule

Inspection Date: May 5, 2025
Temperature: 75°F
Inspection Frequency: N/A
Weather: Sunny
Inspector(s): RAM

Condition

Culvert: Top of corrugated metal pipe in generally good condition. Bottom is heavily corroded with north 20’ rusted out up to 1’ wide. Two 4” diameter punctures in side/bottom of pipe ~10’ from north end.

Condition Rating: 4

Channel: Upstream has cluster of several small trees around and in front of end of pipe. 4’ from the downstream end of pipe the channel impacts a 3.5’ diameter tree then flows southwest. Shallow banks with trees and thick brush throughout. South end of pipe has 2’ of silt build up, 50% of cross section blocked.

Condition Rating: 5

Scour: No scour.

Condition Rating: 8

Miscellaneous:

Overall Condition Rating: Poor

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

Replace structure.



Approach - Looking East



Approach - Looking West



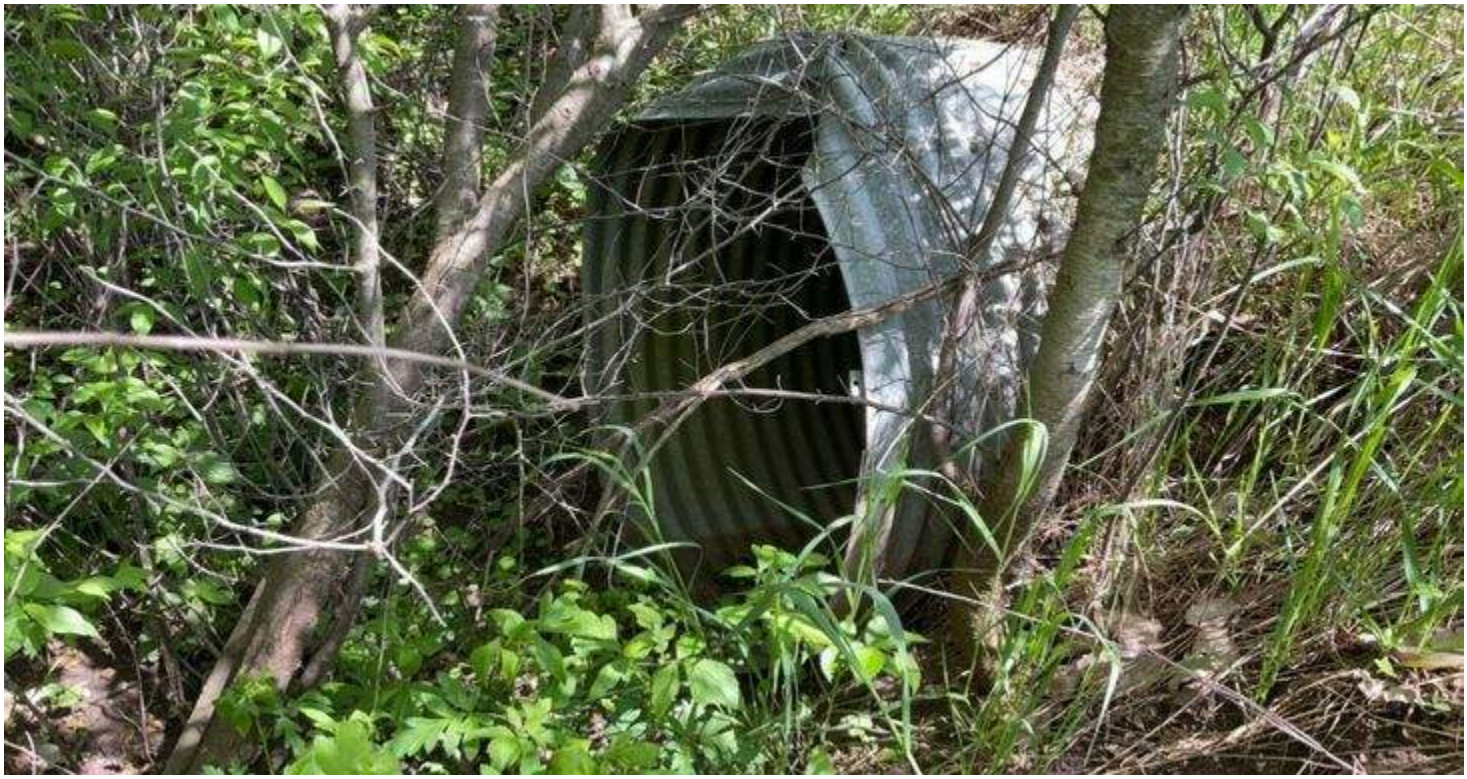
Upstream - Looking Southwest



Elevation - Looking Northeast



View Through Pipe - Looking North



Elevation - Looking Southeast



Upstream - Looking North



Bottom of Pipe Condition at North End - Looking South



Punctures in Pipe Near North End - Looking South

Identification

Owner: Leavenworth County
Culvert ID: 24
Span Configuration: 5’
Year Built: Unknown
Longitude: -94.93725019
Feature Intersected: Stream
Route Carried: Loring Rd
Latitude: 39.01448654
No. of Lanes: 2
Location: 0.3 E of 156th St
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 90’
Structure Type Additional Feature: North end encased in sloped concrete headwall.
Roadway Width: 24’

Schedule

Inspection Date: May 5, 2025
Temperature: 75°F
Inspection Frequency: N/A
Weather: Sunny
Inspector(s): RAM

Condition

Culvert: North end of pipe is encased in a sloped concrete headwall with ~13’ long section that drops ~30°. Top of corrugated metal pipe in generally good condition. Bottom is is heavily corroded with moderate section loss throughout with a few areas with corrosion holes. Pipe has approximately 2" of deflection throughout.

Condition Rating: 5

Channel: Upstream is grassy roadway drainage ditches coming from the east and west and small stream coming from the north. The stream from the north goes through 8” pipe that drops directly into end of pipe. Downstream has trees and thick brush throughout. Large amount of drift/debris caught in downstream channel.

Condition Rating: 6

Scour: Insignificant scour.

Condition Rating: 8

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

Clear drift/debris in downstream channel. Monitor corrosion to bottom of pipe.



Approach - Looking West



Approach - Looking East



Upstream - Looking North



Elevation - Looking South



View Through Pipe - Looking South



Downstream - Looking South



Elevation - Looking North



View Through Pipe - Looking North



Bottom of Pipe Condition - Looking South

Identification

Owner: Leavenworth County
Year Built: Unknown
Route Carried: Loring Rd
Location: 0.6 E of 156th St
Structure Type: Corrugated Metal Pipe
Structure Type Additional Feature:

Culvert ID: 25
Longitude: -94.93181312
Latitude: 39.01449141

Span Configuration: 3’
Feature Intersected: Stream
No. of Lanes: 2
Posting: None
Length: 141’
Roadway Width: 25’

Schedule

Inspection Date: May 7, 2025
Inspection Frequency: N/A
Inspector(s): RAM

Temperature: 60°F
Weather: Cloudy

Condition

Culvert: Top of corrugated metal pipe in generally good condition. Minor surface corrosion typical throughout bottom along flow line. Moderate leakage in walls along seams. These locations have heavier corrosion with some minor section loss.

Condition Rating: 6

Channel: Small stream with shallow banks. Downstream has rocky bottom and good alignment. Poor alignment upstream with channel curving right before entering pipe. The pipe is angled to the northwest and stream enters from the northeast. This is causing some minor erosion at the upstream end of pipe along east edge. A few large pieces of debris caught at upstream end blocking flow. Trees and thick brush throughout.

Condition Rating: 6

Scour: Minor erosion at upstream end of pipe.

Condition Rating: 7

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Bridge Railing Transitions: N

Approach Guardrail: 0
Approach Guardrail Ends: 0

Railing/Guardrail Notes: Moderate to heavy decay at bottom of many guardrail posts.

Hazard Markers: None

Maintenance Recommendations

Clear debris at upstream end. Replace guardrails.



Elevation - Looking South



Upstream - Looking North



Typical View Through Pipe



Typical Pipe Condition at Seams



Downstream - Looking South



Elevation - Looking North



Approach - Looking East



Approach - Looking West



Typical Guardrail Post Condition

Identification

Owner: Leavenworth County
Culvert ID: 26
Span Configuration: 4’
Year Built: Unknown
Longitude: -94.92765214
Feature Intersected: Stream
Route Carried: Loring Rd
Latitude: 39.01439531
No. of Lanes: 2
Location: 0.8 E of 156th St
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 155’
Structure Type Additional Feature:
Roadway Width: 25’

Schedule

Inspection Date: May 7, 2025
Temperature: 62°F
Inspection Frequency: N/A
Weather: Cloudy
Inspector(s): RAM

Condition

Culvert: Top of corrugated metal pipe in generally good condition. Bottom has moderate surface corrosion along flow line. Moderate leakage at seams throughout. These locations have heavier corrosion with some minor section loss. Approximately 2” of deflection in pipe under roadway.

Condition Rating: 6

Channel: Rocky bottom channel. Approximately 30’ west and 12’ north of the pipe the upstream channel coming from the north makes a right angle curve to flow along a large gravel path for 30’ and then make another right angle curve to enter pipe. Minor erosion around west side of upstream end of pipe. 3’ deep x 10’ diameter scour hole at downstream end with minimal undermining. Large amount of drift/debris caught in downstream channel. Trees and thick brush throughout.

Condition Rating: 6

Scour: Minor erosion around west side of upstream end of pipe. 3’ deep x 10’ diameter scour hole at downstream end with minnimal undermining.

Condition Rating: 6

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: 0
Bridge Railing Transitions: N
Approach Guardrail Ends: 0

Railing/Guardrail Notes: Moderate to heavy decay at bottom of many guardrail posts.

Hazard Markers: None

Maintenance Recommendations

Replace guardrails. Fill downstream scour hole with rip rap. Clear drift/debris in downstream channel.



Approach - Looking East



Typical Guardrail Post Condition



Approach - Looking West



Upstream - Looking North



Elevation - Looking South



Typical View Through Pipe



Typical Condition of Pipe at Seams



Downstream - Looking South



Elevation - Looking East

Identification

Owner: Leavenworth County
Culvert ID: 27
Span Configuration: 3’
Year Built: Unknown
Longitude: -94.92351782
Feature Intersected: Drainage ditch
Route Carried: Loring Rd
Latitude: 39.01437857
No. of Lanes: 2
Location: 0.8 W of 142nd St
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 84’
Structure Type Additional Feature:
Roadway Width: 24’

Schedule

Inspection Date: May 7, 2025
Temperature: 62°F
Inspection Frequency: N/A
Weather: Cloudy
Inspector(s): RAM

Condition

Culvert: Top of corrugated metal pipe in generally good condition. Bottom has corrosion with some minor to moderate section loss. North half of pipe has steeper slope with south half being more level. South half appears to have approximately 1-2” of deflection under roadway.

Condition Rating: 6

Channel: Upstream is grassy pasture drainage with trees and thick brush around end of pipe. Minor drift caught at upstream end. Downstream flows directly into east edge of 3.5’ diameter tree. It is then a flat grassy pasture that drains into a pond ~200’ downstream. ~1’ of scour along base of tree. 6” of standing water in downstream half of pipe.

Condition Rating: 5

Scour: ~1’ of scour along base off tree at downstream end.

Condition Rating: 7

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

None at this time.



Approach - Looking East



Approach - Looking West



Downstream - Looking South



Elevation - Looking West



Upstream - Looking North



Elevation - Looking East



View Through Pipe - Looking South



Typical Bottom of Pipe Condition



View Through Pipe - Looking North

Identification

Owner: Leavenworth County
Culvert ID: 28 (SH-43)
Span Configuration: 3’
Year Built: Unknown
Longitude: -94.92063018
Feature Intersected: Drainage ditch
Route Carried: Loring Rd
Latitude: 39.01438176
No. of Lanes: 2
Location: 0.6 W of 142nd St
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 102’
Structure Type Additional Feature: Concrete drop inlet at south end
Roadway Width: 24’

Schedule

Inspection Date: May 7, 2025
Temperature: 65°F
Inspection Frequency: N/A
Weather: Cloudy
Inspector(s): RAM

Condition

Culvert: South end of pipe is 2.5’x4’x11’ deep concrete drop inlet. Inlet in generally good condition with some areas of poor consolidation. Top of corrugated metal pipe in generally good condition. Bottom has moderate surface corrosion throughout. Moderate leakage at seams throughout. These locations have heavier corrosion with some minor section loss. Pipe appears to have approximately 1-2” of deflection under roadway.

Condition Rating: 6

Channel: Upstream is grassy roadway drainage ditch coming from the east and west that flow into drop inlet. There is also a 1.5’ diameter pipe coming from the south pond overflow at the bottom of the inlet. Downstream flows into pasture with slight ponding and then drains to the east with trees and brush throughout. Downstream end of pipe is silted in up to 1.5’ deep, 50% of cross section blocked.

Condition Rating: 5

Scour: Insignificant scour.

Condition Rating: 8

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: 0
Bridge Railing Transitions: N
Approach Guardrail Ends: 0

Railing/Guardrail Notes: Moderate to heavy decay at bottom of many guardrail posts.

Hazard Markers: None

Maintenance Recommendations

Clear silt in downstream end of pipe. Replace guardrails.



Approach - Looking East



Approach - Looking West



Typical Guardrail Post Condition



ID Sign - Looking North



Upstream - Looking West



Elevation - Looking North



View Through Drop Inlet - Looking North



View Through Pipe - Looking North



View Through Upstream Pond Overflow Pipe - Looking South



Elevation - Looking Southwest



Downstream - Looking East



View Through Pipe - Looking South

Identification

Owner: Leavenworth County
Culvert ID: 29
Span Configuration: 3.5’
Year Built: Unknown
Longitude: -94.91275695
Feature Intersected: Stream
Route Carried: Loring Rd
Latitude: 39.0144941
No. of Lanes: 2
Location: 0.2 W of 142nd St
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 69’
Structure Type Additional Feature:
Roadway Width: 24’

Schedule

Inspection Date: May 8, 2025
Temperature: 70°F
Inspection Frequency: N/A
Weather: Sunny
Inspector(s): RAM

Condition

Culvert: Top of corrugated metal pipe in generally good condition. North half has minor surface corrosion on bottom. South half has heavy corrosion with heavy section loss to bottom, ~1’ wide. Minor impact damage to north end.

Condition Rating: 6

Channel: Upstream is combination of roadway drainage ditch coming from east and west as well as a stream coming from the south ~100’ west of pipe. Rocky bottom channel with very tall and steep south bank. Minor drift/debris caught upstream. Downstream T’s into roadway drainage ditch/stream flowing east. Channel has concrete lined bottom for ~10’ then rocky bottom. ~6” of silt buildup in north end of pipe and on concrete channel. North bank is concrete lined. Trees and thick brush throughout upstream and downstream.

Condition Rating: 7

Scour: Insignificant scour.

Condition Rating: 8

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

None at this time.



Approach - Looking West



Approach - Looking East



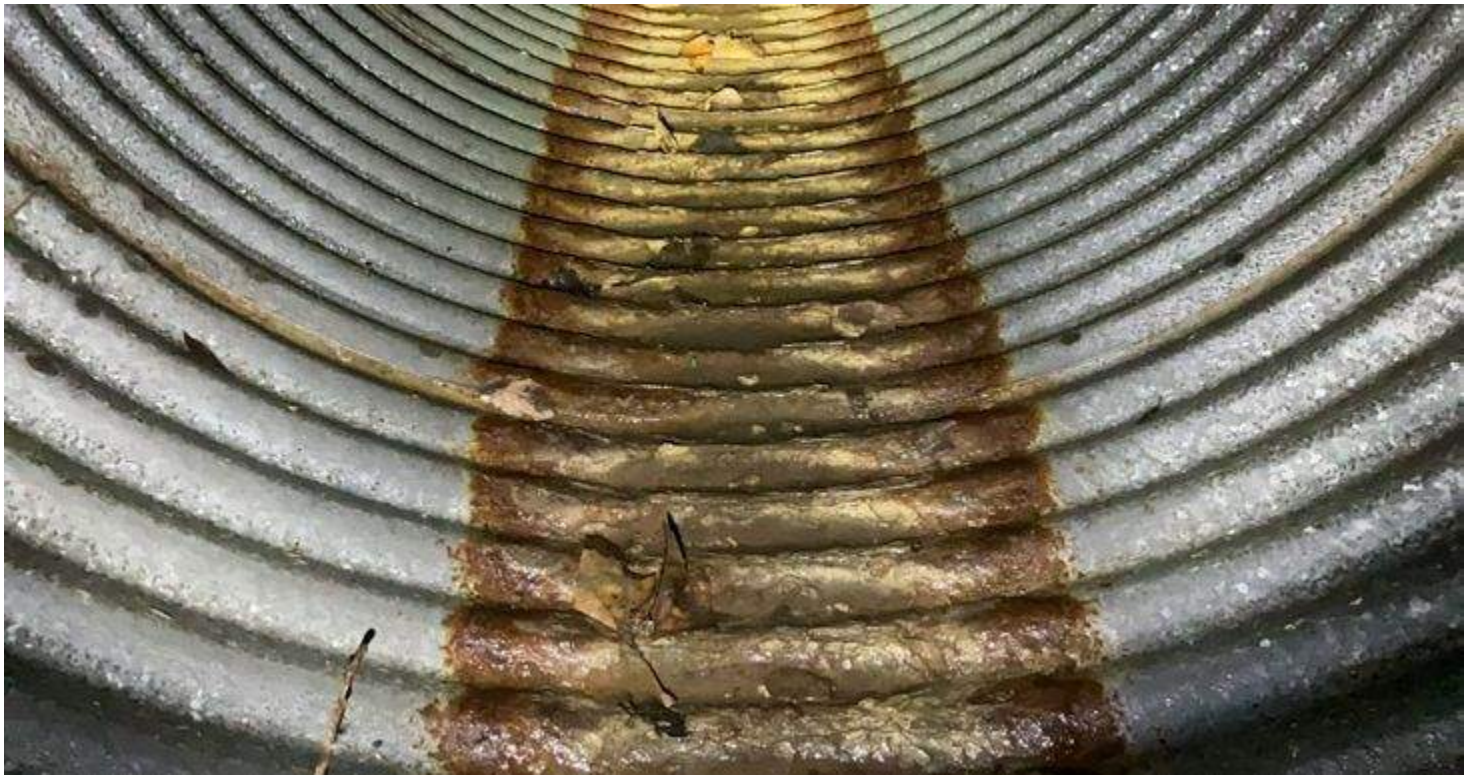
Downstream - Looking East



Elevation - Looking South



Typical View Through Pipe



Bottom of Pipe Condition in South Half - Looking North



Elevation - Looking Northeast



Upstream - Looking West

Identification

Owner: Leavenworth County
Culvert ID: 30
Span Configuration: 2’
Year Built: Unknown
Longitude: -94.90988449
Feature Intersected: Drainage ditch
Route Carried: Loring Dr
Latitude: 39.0140564
No. of Lanes: 2
Location: N of Loring Rd
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 61’
Structure Type Additional Feature: Flared metal end sections at both ends
Roadway Width: 24'

Schedule

Inspection Date: May 8, 2025
Temperature: 70°F
Inspection Frequency: N/A
Weather: Sunny
Inspector(s): RAM

Condition

Culvert: Corrugated metal pipe in generally good condition. Unable to to see bottom due to 3-6” of silt/water. Visible portions along flowline have minor surface corrosion.

Condition Rating: 7

Channel: Upstream is grassy roadway drainage ditches coming from the northwest and northeast. Small erosion channel coming from the roadway along south edge of upstream end of pipe. Downstream has trees and thick brush throughout with several small trees directly in front of end of pipe. Moderate drift/debris caught downstream.

Condition Rating: 6

Scour: Insignificant scour.

Condition Rating: 8

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

Clear trees/brush around donwstream end of pipe.



Approach - Looking Southwest



Approach - Looking Northeast



Elevation - Looking Southeast



Upstream - Looking Northwest



Upstream - Looking Northeast



View Through Pipe - Looking Southeast



Downstream - Looking East



Elevation - Looking Northwest



View Through Pipe - Looking Northwest

Identification

Owner: Leavenworth County
Year Built: 1975
Route Carried: Loring Dr
Location: W of 142nd St
Structure Type: Reinforced Concrete Box
Structure Type Additional Feature:

Culvert ID: 31 (SH-60)
Longitude: -94.9089244
Latitude: 39.01463095

Span Configuration: 3-8'x4' (30° Rotation)
Feature Intersected: Stream
No. of Lanes: 2
Posting: None
Length: 91'
Roadway Width: 24'

Schedule

Inspection Date: May 8, 2025
Inspection Frequency: N/A
Inspector(s): RAM

Temperature: 70°F
Weather: Sunny

Condition

Culvert: Hairline vertical cracks typical in walls. Hairline transverse cracks with efflorescence typical in bottom of top slab. Large spalls along upstream headwall and end of interior walls. One spall in headwall has exposed rebar. Minor spalls in downstream headwall. Large spall along top of southeast wingwall.

Condition Rating: 7

Channel: Upstream channel has large silt bar in front of west two cells. Channel flows along northeast wing and primarily through the east cell. Large amount of drift/debris caught at upstream and downstream ends. Trees and thick brush throughout. Up to 2' of silt accumulation in all cells, 50% cross section blocked.

Condition Rating: 5

Scour: No scour.

Condition Rating: 8

Miscellaneous: NBI#: 000000000520190

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Bridge Railing Transitions: N

Approach Guardrail: 0
Approach Guardrail Ends: 0

Railing/Guardrail Notes: North guardrail has completely failed (see photo).

Hazard Markers: NE,SW,SE

Maintenance Recommendations

Replace guardrails. Clear silt/debris in box and channel.



Approach - Looking Northeast



Approach - Looking Southwest



North Guardrail Condition - Looking Southwest



ID Sign - Looking South



Upstream - Looking North



Elevation - Looking Southwest



Typical Upstream End of Wall Condition



Typical View Through Cell



Typical Wall Condition



Typical Bottom of Top Slab Condition



Downstream - Looking South



Elevation - Looking North



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GBA

LENAPE SAND OPERATION ROUTE STUDY

LEAVENWORTH COUNTY, KANSAS

GBA PROJECT NO. 16477

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SEPTEMBER 2025

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1. Executive Summary

Study Overview

This Route Study is intended to evaluate the impacts of Lenape Sand Operation (identified as "the Project") use of the roadway corridor as a haul route for their operations, with particular emphasis on the impacts of the design vehicle (WB-62, semitruck) on various design components of the roadway including: traffic, safety, geometrics, typical section, drainage, structures, and surfacing of the roadway.

The route is comprised of two sections, a Primary Route, and Alternate Route: In general, the route limits are as follows:

- Primary Route: K-32 east to 161st Street
- Alternate Route: 161st Street east to Sante Fe Intersection

The purpose of the report is to summarize existing conditions, while defining known areas of concerns and providing proposed recommendations and/or identifying what roadway features will be further evaluated and addressed as part of the preliminary design phase.

Key Findings and Recommendations

Horizontal Curvature and Superelevation Rate

None of the existing horizontal curves would meet design criteria per AASHTO "A Policy on the Geometric Design of Highways and Streets", 7th Edition, henceforth referred to as the AASHTO *Green Book*. In general, the high side of the curve is nearly flat, while the low side often has sufficient super to meet current criteria. A corrective overlay or reconstruction would be required to improve high side super to meet current criteria; in addition, some curves would need a corrective action to the low side as well, to either improve superelevation to meet current criteria, or a reduction in superelevation to meet excessive superelevation. See **Appendix F** for summary of results. Selection of paving action and revising the existing radius and/or superelevation will be further evaluated and selected during the preliminary design phase to meet current design criteria.

Vertical Curvature

While many vertical curves meet the posted speed limit, a portion of the existing vertical curves either do not meet Stopping Sight Distance (SSD) or K value minimums as recommended in the *Green Book*.

Intersection Sight Distance (ISD)

Existing ISD either meets current design criteria or would meet criteria with brush removal within the existing right of way. Locations for brush removal include Golden Road/158th Street, Golden Road/161st Street, Loring Road and Loring Lane, and 158th and Loring Lane.

Intersection Turn lanes

Based on current and future traffic, an addition of a northbound right-turn taper at the 158th Street & Loring Road intersection.

Swept Path/Off-Tracking

As noted in **Appendix J**, off-tracking was evaluated using Auto-turn software for a WB-62 design vehicle. In most cases, the design vehicle would be able to complete a maneuver without encroaching on the opposing lane. Where off-tracking would cause encroachment, widening of the return radii at the intersection is proposed to eliminate encroachment, as demonstrated in the turning radii diagrams for 158th and Loring Road.

Drainage Structure Improvements

In general, many culverts could use maintenance to repair existing guardrail, culvert ends, and/or wingwalls. Many structures could benefit from cleanout, and preventative scour treatments, typically aggregate installation within current right of way.

Pavement Condition and Recommended Surfacing Actions

Surfacing actions have been identified based on current surfacing needs in **Appendix L**, as well as surfacing actions that would be necessary due to the increased truck traffic impact resulting from the Project.

Signing and Pavement Marking Recommendations

Pavement Marking changes will be needed as a result of both widening and surfacing actions that will be selected for the corridor. Signing Recommendations have been identified and are shown in **Appendix K**.

Noise Impacts

Mitigation measures have been identified from site operations, and are summarized in **Appendix N.** In general, the sound levels will be comparable to an isolated industrial zone (approximately 65 dBA) for all surrounding properties. The highest of the estimated noise levels are still below the threshold of acceptable industrial operations (80 dBA).

Key Findings to be Addressed During the Preliminary Design Phase

Horizontal Roadway Curvature and Superelevation

Further evaluate and select improvement options during the preliminary design phase to meet current design criteria. This would include evaluation of lane keeping by the design vehicle.

Vertical Roadway Curvature

Further evaluate and select improvement options during the preliminary design phase to meet current design criteria.

Typical Section

Determine appropriate surfacing actions for station ranges along the corridor, which would then allow for development of the various typical sections to address the addition of shoulders, improvement of existing clear zones, and potential regrading of side slopes.

Other

Reassess recommended roadway signage from this report for any alterations resulting from the selection of design improvements for horizontal and vertical curves.

Select structure improvements for existing structures during the preliminary design phase to address structure condition, scour issues, and roadside safety needs.

Other items to evaluate and recommend during the preliminary design phase: hydrology and hydraulics, environmental assessments, existing right of way limits, utilities along the corridor and impacts resulting from proposed improvements.

Impact of Additional Trucks Resulting From the Project

While there are many features of the roadway that do not meet current design criteria, identified in this report are those specifically relating to the additional truck traffic that would need improvement. They include:

Potential roadway widening for off-tracking at tight radii curves and intersections with turning movements and insufficient roadway width. While maintain lane position is difficult for all vehicles, trucks will be more affected due to their wider swept path. The impacts from off-tracking on horizontal curves would be addressed during the design phase as the selection of the proposed improvement will change what amount of widening may be necessary, if flattening of the curve radius is not selected.

Existing drainage structures that may not have sufficient structural capacity due to their maintenance condition. Drainage structure analysis for structural capacity would occur during the design phase, as replacements that are discussed and selected during that phase of the project would negate the need for those structures to be assessed.

Elevation differences resulting from the proposed surfacing actions due to additional truck traffic, increasing the pavement elevation above the existing ground. Mitigation for these edge drop-offs will be necessary and treatments will be evaluated and selected during the preliminary design phase.

2. Introduction

Project Background

This study was prepared to analyze the potential traffic impacts of the proposed sand operation in unincorporated Leavenworth County. This study includes an analysis of existing conditions, trip distribution and generation, and geometric analysis of both a Primary and Alternate haul route for operation vehicles.

The proposed site is located near 166th Street and Lenape Road in unincorporated Leavenworth County. The site is approximately 435 acres, spread across three parcels. A site plan may be seen in **Exhibit A**, and **Figure 1** shows the location of the site.

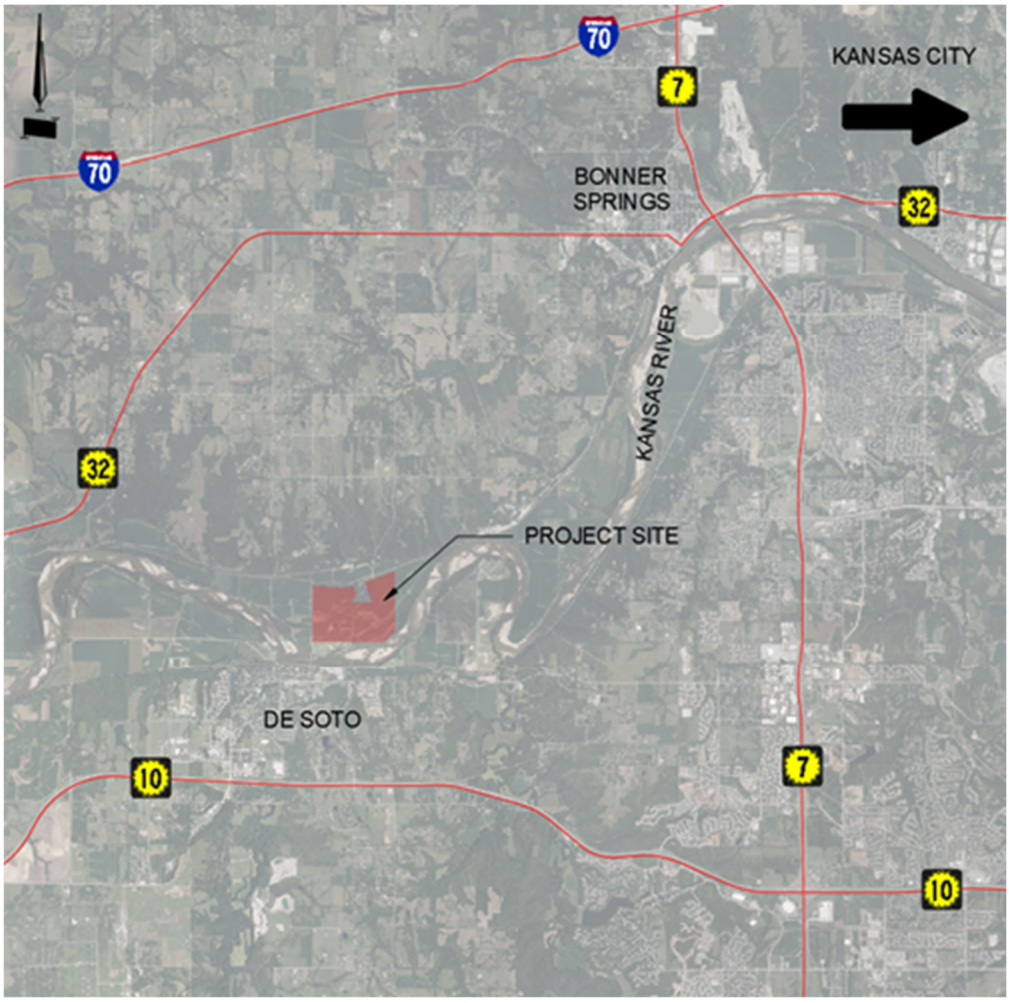


Figure 1. Project Site Area

Site operations would include surface mining to operation and stockpile sand from underlying deposits on the parcels. Excavated and stockpiled sand would then be transported to the Kaw Valley Companies processing facility at 9501 Woodend Road in Edwardsville, Kansas. Off-site hauling activities are proposed only between the hours of

7:00 A.M. and 3:00 P.M. The primary purpose of this study is to analyze the safety, operational, and geometric needs along the two identified transport routes to accommodate sand operation traffic and vehicles.

Study Scope

- Geometric Review of the existing roadway, including typical section and assessment of design criteria
- Turning movements, capacity needs and swept path/off-tracking evaluation
- Sight Distance Evaluation, Stopping and Intersection
- Drainage assessment, including ponding water and roadway overtopping.
- Traffic Safety – evaluation of crash history
- Traffic Volumes – existing and future volumes expected based on Kaw Valley haul route designation
- Existing Pavement Assessment and potential proposed actions
- Visual Drainage Structure Assessment – scour, existing roadside safety features and condition
- Noise Study

3. Study Area Description

As stated previously, the primary purpose of this study is to analyze existing conditions, as well as the impact of the proposed operation on, both the Primary and Alternate haul routes. To accomplish this, both the Primary and Alternate Routes must first be defined, as will be done in this section. Both routes begin at the proposed operation, and end at the processing facility at 9501 Woodend Road in Edwardsville, Kansas. Both inbound and outbound trips to the operation will be evaluated, as operation vehicles would transport excavated material from the operation to the processing facility, then return to the operation for more material.

Analysis of both the Primary and Alternate Routes will occur independently. It is anticipated that the operation will use the Primary Route exclusively. To accomplish this, Kaw Valley will provide printed directions to all drivers, who will be instructed to use the Primary Route. However, drivers may use the Alternate Route in the event of road closures, hazards, or other unforeseen circumstances. Although the instances of the Alternative Route being used are rare, a review of the Alternative Route was necessary to meet the objectives of identifying potential operational, safety, and geometric improvements.

Primary Route

The Primary Route is proposed to begin at 161st Street and Railroad Road, then traverse north, at which point vehicles will turn left onto Golden Road, traveling west. From this point, vehicles will continue on Golden Road, then follow the northward curve, at which point Golden Road becomes 189th Street. Then, vehicles will turn right onto K-32 heading northeast. Vehicles will then follow the marked K-32 truck route, turning onto Scheidt Lane / Santa Fe Road. Next, vehicles will turn left from Scheidt Lane / Santa Fe Road onto West Front Street, and follow K-32 until the industrial park in which the processing facility is located. A map showing the Primary Route may be seen in **Figure 2**.

Importantly, this study did not include analysis of K-32, including the truck route. This means that analysis of the Primary Route ended at the Golden Road / 189th Street and K-32 intersection, which was analyzed as part of this study.

Alternate Route

The Alternate Route is also proposed to begin at 161st Street and Railroad Road, then traverse north, where vehicles will make a slight right-turn onto 158th Street. Vehicles will then travel north to Loring Road, and make a right-turn onto Loring Road and begin traveling in the eastbound direction. Next, vehicles will make a left-turn from Loring Road onto Loring Lane, then continue on the same roadway, which is designated differently along the segment (Loring Lane, West Front Street, and K-32) until turning into the industrial park in which the processing facility is located. A map showing the Alternate Route may be seen in **Figure 2.**

A map of the Primary and Alternate Route, as well as key intersections along the routes may be seen in **Figure 2**.



Figure 2. Study Intersection Locations and Identification of Primary and Alternate Routes

All drivers will be directed on the Primary Route. The Primary Route (the dark blue line on **Figure 2**) is proposed to begin at 161st Street and Railroad Road, then traverse north, at which point vehicles will turn left onto Golden Road, travelling west. From this point, vehicles will continue on Golden Road, then follow the northward curve, at which point Golden Road becomes 189th Street. Vehicles heading to Kaw Valley's processing plant will turn right onto K-32 heading northeast. Vehicles will then follow the marked K-32 truck route, turning onto Scheidt Lane / Santa Fe Road. Next, vehicles will turn left from Scheidt Lane / Santa Fe Road onto West Front Street, and follow K-32 until the industrial park in which the processing facility is located. Third party destinations will use the Primary Route to K-32 and proceed to their ultimate destination.

As part of this study, six intersections were analyzed for operational, safety, and geometric needs under both existing and proposed conditions. The chosen intersections are at key locations along both the Primary and Alternate Routes, and they are as follows:

1. Golden Road / 158th Street & 161st Street – (Both Primary and Alternate Routes)
2. Golden Road & 166th Street – (Primary Route)
3. K-32 (Linwood Road) & 189th Street / Golden Road – (Primary Route)
4. 158th Street & Loring Road – (Alternate Route)
5. Loring Lane & 142nd Street – (Alternate Route)
6. Loring Lane / West Front Street & K-32 Truck Route (Santa Fe Road) – (Alternate Route)

Existing Roadway Classifications

Roadways within the Primary and Alternate Routes are given different functional classifications by both the Kansas Department of Transportation (KDOT) County Roadway Functional Classification Maps and Leavenworth County Functional Classification Maps. As portions of the Alternate Route are outside of Leavenworth County, the functional classifications designated by both KDOT and Leavenworth County are outlined in **Tables 1 and 2**.

Table 1. KDOT Roadway Functional Classifications

Roadway Name	Classification
K-32	Minor Arterial
Golden Road	Major Collector
Loring Road	Major Collector
158th Street	Major Collector
161st Street	Local Road
189th Street / Golden Road	Major Collector

Table 2. Leavenworth County Roadway Functional Classifications

Roadway Name	Classification
K-32	State Maintained Road
Golden Road (West of 166th St)	Collector
Golden Road (East of 166th St)	Arterial
Loring Road (158th to County Line)	Collector
158th Street	Arterial
161st Street	Local
189th Street / Golden Road	Collector

Additionally, the Mid-America Regional Council (MARC) Functional Classification maps describe all roads on the Primary and Alternate Route as collectors. Furthermore, narrative in the *Green Book* support the designation of roads on the Primary and Alternative Route as collectors.

Existing Roadway Jurisdictions

Roadways within the primary and alternate are subject to the jurisdiction of different entities. All segments of the Primary and Alternate Routes within Leavenworth County are under the jurisdiction of Leavenworth County. This does not include portions of the Primary Route using K-32, which is a KDOT roadway. Similarly, the Leavenworth County line is designated by 142nd Street, with areas to east being part of Wyandotte County. Parts of the Alternate Route along Loring Road in Wyandotte County, stretching from the County line to K-32, are subject to the jurisdiction of Bonner Springs. A map displaying the jurisdictions of certain roadways and county lines is shown in **Figure 3**.

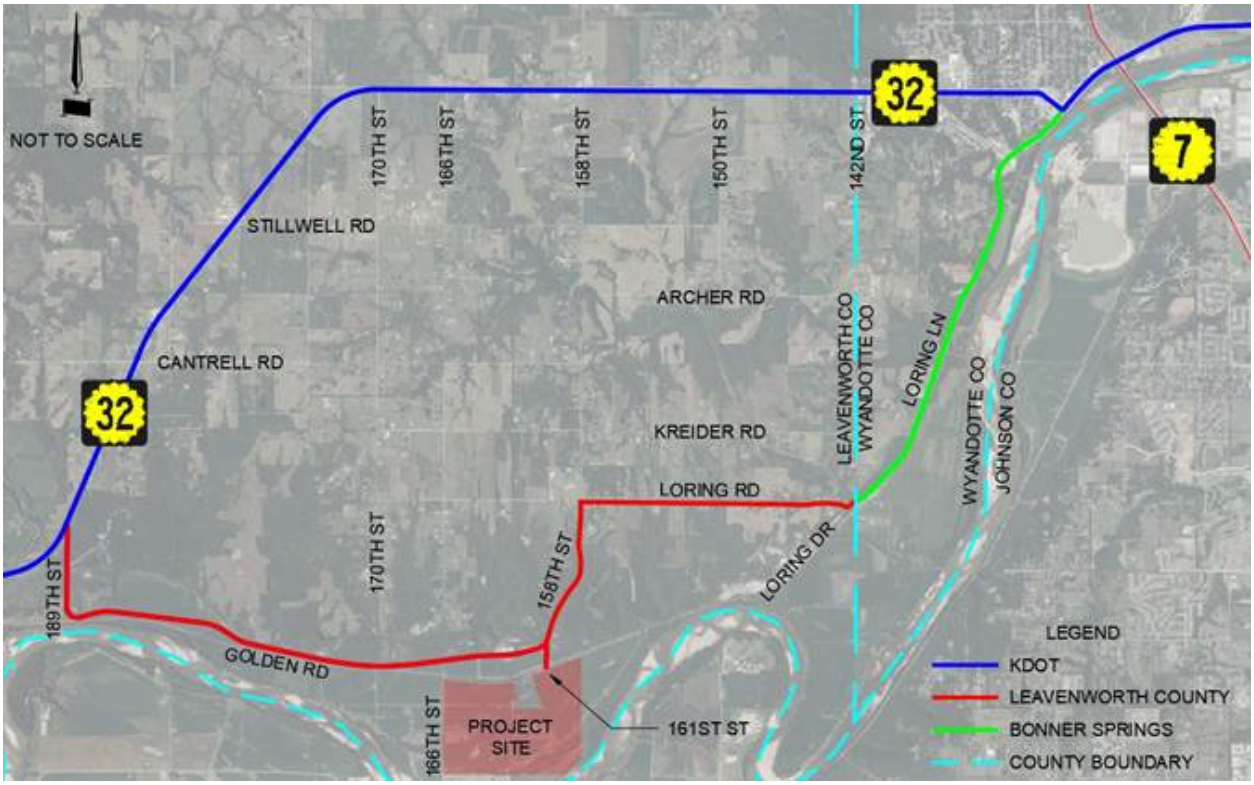


Figure 3. Roadway Jurisdiction Map

Existing Land Uses and Zoning

The site is currently zoned "I-3" by Leavenworth County. The I-3 zoning designation is for Heavy Industrial Districts, and based upon the Leavenworth County Zoning and Subdivision Regulations, a special use permit will be required to operate the proposed operation under the properties' current zoning.

4. Review of Relevant Plans and Studies

One previous engineering report was reviewed as part of this study. This was the Safe Streets for All (SS4A), also identified as the *Vision Zero Action Plan*. Discussions of findings and recommendations can be found in Section Five "Traffic and Transportation Analysis" of this report.

Separately, the Leavenworth County Comprehensive Plan was reviewed. This document provided recommendations regarding bicycle and pedestrian future planning. See Section Five "Traffic and Transportation Analysis" of this report for discussion of findings and recommendations.

5. Infrastructure Inventory

Existing Intersection Geometric Analysis

Existing intersection sight distance was field verified for the six study intersections, and at the intersection of Loring Road and Loring Lane. In addition to stopping sight distance evaluation, intersection sight distance was checked by comparing field observations of sight lengths against calculated ISD from Chapter 9 of the *Green Book*, Case B1 left-turn from the minor roadway. Existing intersection sight distance either meets current criteria or would meet with brush removal within the existing right of way. Additionally, anticipated operation truck turning movements were developed using AutoTURN software with the County GIS survey and basemap. Based on information given by the developer, a WB-62 design vehicle was used to create turning movements.

Golden Road / 158th Street & 161st Street

The Golden Road / 158th Street & 161st Street intersection forms a "T", with Golden Road / 158th Street serving as the major roadway. 161st Street serves as the minor roadway and is stop-controlled.

Intersection sight distance at the Golden Road / 158th Street & 161st Street intersection was reviewed to meet the minimum requirements as outlined in the *Green Book*. Based on calculations for tractor-trailer trucks, a minimum of 846 ft. of sight distance is required in both directions at the intersection for stop-controlled vehicles on northbound 161st Street. Based on visibility at the Golden Road / 158th Street & 161st Street intersection, the required distance is exceeded looking to the north, but is not met looking to the west. Sight distance to the west was measured in the field to be approximately 400 ft. This issue could be remedied by trimming vegetation on the north side of Golden Road, which obstructs the view of motorists looking to the west. This vegetation is the only visual obstruction, and it is estimated that the required sight distance would be exceeded in the event that the vegetation was removed. Based on GIS data, this vegetation lies within the right of way, and access to private property would not be necessary. Full sight distance calculations and photos may be seen in **Appendix D.**

At the intersection, sand operation trucks utilizing the Primary Route headed to and from the processing facility will make a northbound left-turn and eastbound right-turn. Sand operation trucks utilizing the Alternate Route to travel to and from the processing facility will make a northbound right-turn and southbound left-turn. Additional pavement is required to the south of the intersection to accommodate turning movements from eastbound Golden Road to southbound 161st Street. Full truck turning envelopes may be seen in **Appendix E.**

Golden Road & 166th Street

The Golden Road & 166th Street intersection forms a "T", with Golden Road serving as the major roadway. 166th Street serves as the minor roadway and is stop-controlled.

Intersection sight distance at the Golden Road & 166th Street intersection was reviewed to meet the minimum requirements as outlined in the *Green Book*. Based on calculations for tractor-trailer trucks, a minimum of 846 ft. of sight distance is required in both directions at the intersection for stop-controlled vehicles on northbound 166th Street. Based on visibility at the Golden Road & 166th Street intersection, the required distance is exceeded. Full sight distance calculations and photos may be seen in **Appendix D**.

At the intersection, sand operation trucks utilizing the Primary Route headed to and from the processing facility will travel eastbound and westbound through the intersection. The Alternate Route does not utilize the intersection. Trucks along the Primary Route will travel straight through the intersection, and thus truck turning envelopes were not created at the intersection.

K-32 (Linwood Road) & 189th Street / Golden Road

The K-32 (Linwood Road) & 189th Street / Golden Road intersection forms a "T", with K-32 (Linwood Road) serving as the major roadway. 189th Street / Golden Road serves as the minor roadway and is stop-controlled. Approximately 200 ft. to the northeast of the study intersection, another intersection with 189th Street exists, but was not analyzed as part of this study, as no movements at the intersection are expected due to operation traffic.

Intersection sight distance at the K-32 (Linwood Road) & 189th Street / Golden Road intersection was reviewed to meet the minimum requirements as outlined in the *Green Book*. Based on calculations for tractor-trailer trucks, a minimum of 1,099 of sight distance is required in both directions at the intersection for stop-controlled vehicles on northbound 189th Street / Golden Road. Based on visibility at the K-32 (Linwood Road) & 189th Street / Golden Road intersection, the required distance is exceeded. Full sight distance calculations and photos may be seen in **Appendix D**.

While the sight distance is met, it is worth noting that 189th Street / Golden Road aligns with K-32 (Linwood Road) at a skew, which is undesirable for vehicles turning onto K-32. It is preferable that the skew angle is closer to a perpendicular angle so that drivers along 189th Street / Golden Road have an improved view for traffic along K-32 (Linwood Road). Improving the skew depends on public right of way for improvements and the pavement needed to accommodate the turning envelope of trucks. Additionally, 189th Street / Golden Road meets K-32 at a significant upslope for vehicles approaching the intersection. Pavement gouging was observed in the field, and is likely due to vehicles with low-clearances making contact with the roadway surface as they negotiate curvature and differing slopes on turning movements between K-32 (Linwood Road) and 189th Street / Golden Road.

If Leavenworth County desires to move forward with adjusting the skew, the length of the northeast bound right-turn lane along K-32 (Linwood Road) will be impacted. The right-turn lane should be adjusted to meet current design criteria outlined within the KDOT *Access Management Policy*, as will be outlined later within this study. For vehicles making a northbound right-turn onto K-32 (Linwood Road), a 375 ft. acceleration taper is currently provided. The right-turn acceleration taper length should be adjusted to meet the KDOT *Access Management Policy*, Section 4.5.4.D. A 600 ft. acceleration taper is required for a speed of 65 mph. While an acceleration taper exists for northbound right-turns and should be brought up to current design criteria, the addition of an acceleration lane is not required to meet current design criteria established by KDOT. KDOT considers acceleration lanes depending on traffic conditions. An acceleration lane is not required because daily traffic on K-32 (Linwood Road) is less than the 3,000 vehicles per day (vpd) threshold, and there are less than 45 large trucks turning right from the access to the highway within the peak hour.

At the intersection, sand operation trucks utilizing the Primary Route headed to and from the facility will make a northbound right-turn and southwest bound left-turn. The Alternate Route does not utilize the intersection. Truck turning envelopes are shown for existing conditions and for proposed geometry to address the skew angle. Additional pavement is not required to accommodate truck turning movements for either existing or proposed geometries at the intersection. Full truck turning envelopes for the intersection may be seen in **Appendix E.**

158th Street & Loring Road

158th Street and Loring Road forms a two-way stop-controlled intersection, with 158th Street serving as the major roadway. Loring serves as the stop-controlled minor roadway.

Intersection sight distance at the 158th Street & Loring Road intersection was reviewed to meet the minimum requirements as outlined in the *Green Book*. Based on calculations for tractor-trailer trucks, a minimum of 846 ft. of sight distance is required in both directions at the intersection for stop-controlled vehicles on eastbound and westbound Loring Road. Based on visibility and measurements at the 158th Street & Loring Road intersection, the required distance is exceeded. Grades at the intersection were checked based on County GIS data, but no adjustments to sight triangles were necessary, as grades were not identified to be in excess of 3%.

It is worth noting that 158th Street has vertical curvature that crests north of the intersection, but field measurements confirmed that the minimum sight distance for both eastbound and westbound turning vehicles was met. Although sight distances are met, it was noted during field observations that overgrowth adjacent to the roadways could be removed to improve sight distances for eastbound vehicles looking south. Based on GIS data, this vegetation lies within the right of way, and access to private property would not be necessary. Full sight distance calculations and photos may be seen in **Appendix D**.

At the intersection, sand operation trucks utilizing the Alternate Route headed to and from the facility will make a northbound right-turn and westbound left-turn. The Primary Route does not utilize the intersection. No additional pavement is required to accommodate truck turning movements at the intersection. Full turning envelopes for the intersection may be seen in **Appendix E.**

Loring Road & Loring Lane

Loring Road & Loring Lane is a minor-road stop-controlled intersection, with the north-south portion of Loring Lane serving as the major roadway. Eastbound Loring Road serves as the stop-controlled minor roadway.

Sight distance at the Loring Road & Loring Lane intersection was reviewed to meet the minimum requirements as outlined in the *Green Book*. Based on calculations for tractor-trailer trucks, a minimum of 761 ft. of sight distance is required to the north, and a minimum of 592 ft. is required to the south for stop-controlled vehicles on eastbound Loring Road. For both right-turns and left-turns, sight distance requirements were met. Full sight distance calculations and photos may be seen in **Appendix D**.

At the intersection, sand operation trucks utilizing the Alternate Route headed to and from the facility will complete eastbound left-turn and southbound right-turn movements. Additional pavement is not required to accommodate truck turning movements for either existing or proposed geometries at the intersection. Full turning envelopes for the intersection may be seen in **Appendix E**. The Primary Route does not utilize the intersection.

Loring Lane & 142nd Street

Loring Lane and 142nd Street forms a two-way stop-controlled intersection, with Loring Lane serving as the major roadway. 142nd Street serves as the stop-controlled minor roadway.

Intersection sight distance at the Loring Lane & 142nd Street was reviewed to meet the minimum requirements as outlined in the *Green Book*. Based on calculations for tractor-trailer trucks, a minimum of 761 ft. of sight distance

is required in both directions at the intersection for stop-controlled vehicles on northbound and southbound 142nd Street. For both northbound right-turns and southbound left-turns looking to the west, sight distance requirements were not met. This was due to vegetation on the south side of Loring Road, which obstructs the view of approaching vehicles. Trimming the vegetation to maintain the required clear zone is expected to improve site distance conditions. Based on GIS data, this vegetation lies within the right of way, and access to private property would not be necessary. In addition to vegetational issues, the skew angle and roadway curvature at the intersection presents challenges for vehicles making turning movements onto Loring Lane. Full sight distance calculations and photos may be seen in **Appendix D**.

At the intersection, sand operation trucks utilizing the Alternate Route headed to and from the facility will travel northeast bound and southwest bound through the intersection. As these are the through movements at the intersection, no additional pavement will be required to accommodate truck turning movements. The Primary Route does not utilize the intersection.

Loring Lane / West Front Street & K-32 Truck Route (Santa Fe Road)

The Loring Lane / West Front Street & K-32 Truck Route (Santa Fe Road) intersection forms a "T", with Loring Lane / West Front Street serving as the major roadway. K-32 Truck Route (Santa Fe Road) serves as the minor roadway and is stop-controlled. While there is a railway crossing approximately 135 ft. north of the intersection, it was not analyzed as part of this study.

Intersection sight distance at the Loring Lane / West Front Street & K-32 Truck Route (Santa Fe Road) intersection was reviewed to meet the minimum requirements as outlined in the *Green Book*. Based on calculations for tractor-trailer trucks, a minimum of 592 ft. of sight distance is required in both directions at the intersection for stop-controlled vehicles on eastbound K-32 Truck Route (Santa Fe Road). Based on visibility/measurements at the Loring Lane / West Front Street & K-32 Truck Route (Santa Fe Road) intersection, the required distance is exceeded. Full sight distance calculations and photos may be seen in **Appendix D**.

At the intersection, sand operation trucks utilizing the Primary Route headed to and from the facility will make an eastbound left-turn and southwest bound right-turn. Sand operation trucks utilizing the Alternate Route headed to and from the facility will travel northeast bound and southwest bound through the intersection. Based on existing intersection geometry, trucks turning right must use portions of the inside southwest bound and eastbound lanes to successfully complete turning movements onto K-32 Truck Route (Santa Fe Road) westbound. As the movement is part of the designated truck route, addition of sand operation trucks along the Primary Route are not expected to worsen these existing conditions. Evaluation of geometric improvements to the intersection to properly accommodate truck turning movements should be evaluated by KDOT in a separate project. Truck turning envelopes for the intersection may be seen in **Appendix E.**

Existing Route Geometric Analysis

Geometric evaluation along the Primary and Alternate routes was based on a cross section developed using AASHTO Green Book, AASHTO Roadside Design Guide, and KDOT criteria.

All roadways along the Primary and Alternate Route have posted speeds of 50 mph, with two exceptions. First, Loring Lane from the Loring Lane / West Front Street & K-32 Truck Route (Santa Fe Road) intersection to the Loring Road & Loring Lane intersection has a posted speed of 45 mph. Second, 161st Street from the proposed operation

site to the Golden Road / 158th Street & 161st Street intersection is subject to Kansas Statute 8-1558, which states that a maximum speed of 55 mph is allowed on rural roadways without a posted speed limit. Given the railway crossing and narrow nature of the roadway, it is anticipated that actual travel speeds on 161st Street are much lower than the allowable maximum speed limit.

Horizontal and Vertical Geometry

The existing Primary and Alternate Route geometries have been evaluated based on aerial imagery and available GIS data. Existing geometry and assessment against current design criteria is shown in **Appendix F**. As previously stated, all roads on the Primary and Alternate Routes are best described as collectors. Design criteria presented in **Table 3** have been created based on applicable guidance from the Green Book for "Collectors in Rural Areas", and the Roadside Design Guide.

Table 3. Applicable Street Design Criteria

Roadway Type	Collector
Design Speed	50
Stopping Sight Distance	425 ft.
Minimum Grade	0.5%
Maximum Grade	7.0%
Maximum Grade Near Intersection	3.0%
Minimum Radius of Horizontal Curve	Based on Superelevation
Minimum Width of Traveled Way	22 ft.
Minimum Width of Shoulder	6 ft.
Maximum Rate of Superelevation	8.0%
Rate of Vertical Curvature – Crest Curve	84
Rate of Vertical Curvature – Sag Curve	96

The presented minimum pavement width for the cross section is based on the *Golden Road Pavement Evaluation* report, found in **Appendix L**. Importantly, neither document specifically outlines the material to be used on the shoulder. Therefore, shoulders along the route may be paved, gravel, composite, or turf according to applicable manuals. A shoulder exists if a side slope outside of the travel lane is present with a similar slope compared to the travel lanes. If there is a steep drop off past the edge of the travel lane, then a shoulder is not present. A typical cross section of the minimum requirements for the traveled way and shoulders is shown in **Figure 4.** Beyond the shoulders, roadside design elements such as foreslopes, backslopes, and roadside ditches have a variety of compliant applicable treatments. At a minimum, all slopes within the clear zone will be flatter than 4:1. As the grades, drainage needs, and materials along the routes vary, there is no one typical cross section that is applicable beyond the roadway shoulders. Applicable criteria for such roadside design elements are presented in **Table 4**.

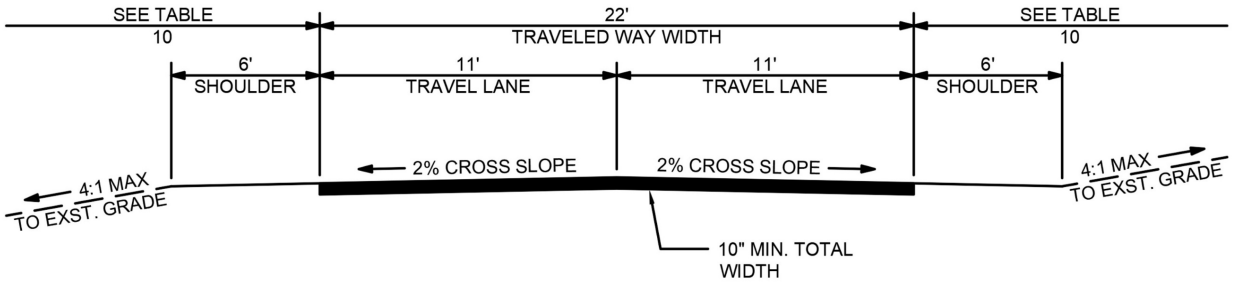


Figure 4. Proposed Cross Section

Table 4. Cross Section Requirements Beyond Traveled Way

	Foreslopes		Backslopes		
	1V:6H or Flatter	1V:5H to 1V:4H	1V:3H	1V:5H to 1V:4H	1V:6H or Flatter
Suggested Clear Zone Distances from Edge of Through Traveled Lane (ft.)	16 – 18	20 – 26	12 – 14	14 – 16	16 – 18

	Minimum Channel Width	Cross Section Design
Cross Section for Channels with Abrupt Slope Changes	V-Ditch	See Roadside Design Guide Figure 3-6
Cross Section for Channels with Abrupt Slope Changes	4 ft.	See Roadside Design Guide Figure 3-7

With regard to vertical curves and the impact of trucks versus automobiles, vertical curves are designed based on speed taking into account the height of eye to meet stopping sight distance requirements, therefore accounting for both automobiles and trucks. The same is true for horizontal curves, in combination with superelevation, that the design vehicle will not alter the selection of an appropriate radius and superelevation based on design speed. Modifications to both horizontal and vertical curves would be developed as part of preliminary design in coordination with the county.

In addition, it was identified that there is an inability for trucks to maintain their lane position on horizontal curves with 11 ft. lanes and tight radii as they exist today. Based on field observations, no vehicle is able to consistently maintain their lane position due to these very tight radius horizontal curves. To address this concern, a swept path analysis will be performed during design when assessing existing horizontal curves to determine off-tracking impacts and whether flattening of the curve radius or lane widening (beyond the proposed shoulder) is the better solution. Note: swept path analysis was performed at key intersections; those results and recommendations for widening can be found in **Appendix E**.

Assessing horizontal curves also includes evaluating existing cross slope data to evaluate superelevation; a summary of those findings can be found in **Table 5**. In addition, a superelevation assessment was performed when examining advisory speeds along the corridor; that information is included in a later part of this report. While ball-bank readings can provide some insight into advisory speeds that could be used for existing curves, to meet current design criteria, best practice is to evaluate the existing cross slope against recommended superelevation based on speed and radii. A summary of those findings indicates that in general, the high side of the super does not meet current criteria for any horizontal curve, therefore none of the existing horizontal curves meet current criteria. A variety of treatments can be used to improve horizontal curvature: a) reconstruct the curve with a flatter radius, b) increase the superelevation up to 8% based on the existing radius to meet 50 mph design speed, c) a corrective mill and/or overlay, to improve superelevation where superelevation at or below 8% would meet current criteria for the existing radius, d) a combination of any of the 3 listed prior.

To review horizontal curvature along the routes, average and maximum cross slopes for inside and outside lanes of each horizontal curve were measured in the field. A summary of collected data and comparisons to applicable criteria is shown in **Table 5**.

Table 5. Review of Horizontal Curvature

Route	Approximate Station Segment (From Appendix F)	Radius (ft.)	Inside		Outside		Meets Criteria?
			Avg. (%)	Max (%)	Avg. (%)	Max (%)	
Primary	Sta. 32+00 to Sta. 40+00	400	10.7	11.9	6.1	6.3	No
Primary	Sta. 46+00 to Sta. 53+00	1,800	3.6	3.7	1.2	1.5	No
Primary	Sta. 87+00 to Sta. 95+00	2,000	4.0	4.4	0.8	0.9	No
Primary	Sta. 100+00 to Sta. 107+00	1,500	7.0	9.5	4.0	4.4	No
Primary	Sta. 132+00 to Sta. 138+00	2,500	2.3	3.0	0.4	0.6	No
Primary	Sta. 153+00 to Sta. 163+00	7,500	1.8	1.9	0.7	1.2	No
Primary	Sta. 168+00 to Sta. 172+00	2,500	2.1	3.5	1.5	1.8	No
Primary	Sta. 194+00 to Sta. 200+00	3,000	4.3	4.8	1.5	1.6	No
Primary	Sta. 208+00 to Sta. 212+00	800	2.6	3.4	1.4	2.6	No
Primary	Sta. 220+00 to Sta. 225+00	500	4.5	5.1	1.1	2.2	No
Alternate	Sta. 9+00 to Sta. 11+00	1,000	2.5	2.9	2.6	3.1	No
Alternate	Sta. 21+00 to Sta. 23+00	1,500	3.7	4.5	1.4	2.2	No
Alternate	Sta. 25+00 to Sta. 29+00	900	2.2	3.2	0.9	1.4	No
Alternate	Sta. 34+00 to Sta. 37+00	1,000	8.4	9.9	5.1	5.8	No
Alternate	Sta. 38+00 to Sta. 41+00	1,000	8.0	8.6	0.2	0.5	No
Alternate	Sta. 48+00 to Sta. 50+00	200	4.9	5.0	2.7	1.1	No
Alternate	Sta. 141+00 to Sta. 144+00	1,500	3.6	4.4	1.1	1.7	No
Alternate	Sta. 148+00 to Sta. 151+00	1,500	1.8	3.0	2.5	3.0	No
Alternate	Sta. 151+00 to Sta. 152+00	2,500	3.8	4.5	0.7	0.9	No
Alternate	Sta. 157+00 to Sta. 159+00	400	4.3	5.8	3.0	3.8	No
Alternate	Sta. 160+00 to Sta. 165+00	1,500	1.0	1.1	0.9	1.0	No
Alternate	Sta. 168+00 to Sta. 171+00	2,000	1.6	1.8	0.5	0.7	No
Alternate	Sta. 187+00 to Sta. 193+00	2,500	2.7	2.7	1.5	1.7	No
Alternate	Sta. 253+00 to Sta. 259+00	1,500	2.0	2.4	1.8	2.1	No
Alternate	Sta. 262+00 to Sta. 266+00	1,500	1.0	1.5	0.5	0.6	No
Alternate	Sta. 288+00 to Sta. 295+00	1,500	0.8	1.0	0.9	1.2	No
Alternate	Sta. 303+00 to Sta. 313+00	1,200	1.9	2.2	1.5	1.7	No

The 2018 *Green Book*, 7th Edition, provides an applicable current design criteria for evaluating vertical curvature for roadways. Vertical curvature for the Primary and Alternate Routes was reviewed based on applicable K values and stopping sight distances (SSD). Based on applicable criteria, several vertical curves do not meet design current design criteria, as shown in **Table 6**.

Table 6. Review of Vertical Curvature

Route	Station Segment (From Appendix F)	Comments
Primary	Sta. 0+32 to Sta. 3+82	Meets Criteria for 50 mph
Primary	Sta. 19+13 to Sta. 24+13	Meets Criteria for 50 mph
Primary	Sta. 29+43 to Sta. 35+43	Meets Criteria for 45 mph
Primary	Sta. 38+53 to Sta. 41+03	Meets SSD, Meets K Value for 30 mph
Primary	Sta. 42+62 to Sta. 44+12	Meets Criteria for 50 mph
Primary	Sta. 45+48 to Sta. 46+98	Meets SSD, Meets K Value for 40 mph
Primary	Sta. 50+71 to Sta. 52+21	Meets Criteria for 50 mph
Primary	Sta. 66+84 to Sta. 72+84	Meets Criteria for 50 mph
Primary	Sta. 75+00 to Sta. 82+50	Meets Criteria for 50 mph
Primary	Sta. 109+11 to Sta. 110+45	Meets Criteria for 50 mph
Primary	Sta. 110+76 to Sta. 111+96	Meets SSD, Does Not Meet K Value for 50 mph
Primary	Sta. 112+95 to Sta. 114+22	Meets SSD, Meets K Value for 45 mph
Primary	Sta. 114+49 to Sta. 115+89	Meets Criteria for 30 mph
Primary	Sta. 116+60 to Sta. 122+60	Meets Criteria for 50 mph
Primary	Sta. 129+17 to Sta. 134+17	Meets Criteria for 50 mph
Primary	Sta. 137+73 to Sta. 144+73	Meets Criteria for 50 mph
Primary	Sta. 153+50 to Sta. 159+50	Meets Criteria for 50 mph
Primary	Sta. 160+47 to Sta. 164+47	Meets Criteria for 50 mph
Primary	Sta. 198+86 to Sta. 203+86	Meets Criteria for 50 mph
Primary	Sta. 208+56 to Sta. 211+76	Meets Criteria for 50 mph
Primary	Sta. 212+87 to Sta. 218+63	Meets Criteria for 50 mph
Primary	Sta. 219+16 to Sta. 224+76	Meets Criteria for 50 mph
Alternate	Sta. 0+45 to Sta. 3+45	Meets Criteria for 50 mph
Alternate	Sta. 5+52 to Sta. 10+02	Meets Criteria for 50 mph
Alternate	Sta. 12+36 to Sta. 15+36	Meets Criteria for 50 mph
Alternate	Sta. 16+82 to Sta. 22+82	Meets Criteria for 50 mph
Alternate	Sta. 28+61 to Sta. 33+86	Meets Criteria for 50 mph
Alternate	Sta. 34+39 to Sta. 41+39	Meets Criteria for 50 mph
Alternate	Sta. 46+02 to Sta. 49+02	Meets Criteria for 50 mph
Alternate	Sta. 49+87 to Sta. 51+87	Meets SSD, K Value for 35 mph
Alternate	Sta. 57+80 to Sta. 59+30	Meets Criteria for 20 mph
Alternate	Sta. 61+51 to Sta. 64+01	Meets Criteria for 25 mph
Alternate	Sta. 67+83 to Sta. 75+33	Meets SSD, Meets K Value for 45 mph

Table 6 (continued). Review of Vertical Curvature

Route	Station Segment (From Appendix F)	Reasoning
Alternate	Sta. 80+02 to Sta. 87+52	Meets SSD, Meets K Value for 40 mph
Alternate	Sta. 88+86 to Sta. 96+36	Meets SSD, Meets K Value for 45 mph
Alternate	Sta. 97+24 to Sta. 99+24	Meets SSD for 40, Meets K Value for 35 mph
Alternate	Sta. 103+01 to Sta. 106+51	Meets Criteria for 40 mph
Alternate	Sta. 108+56 to Sta. 114+56	Meets Criteria for 35 mph
Alternate	Sta. 117+72 to Sta. 126+22	Meets Criteria for 45 mph
Alternate	Sta. 126+73 to Sta. 131+23	Meets Criteria for 45 mph
Alternate	Sta. 134+68 to Sta. 139+18	Meets Criteria for 45 mph
Alternate	Sta. 145+66 to Sta. 148+66	Meets Criteria for 50 mph
Alternate	Sta. 149+78 to Sta. 152+78	Meets SSD for 40, Meets K Value for 35 mph
Alternate	Sta. 154+67 to Sta. 159+67	Meets Criteria for 50 mph
Alternate	Sta. 161+26 to Sta. 162+76	Meets Criteria for 20 mph
Alternate	Sta. 163+19 to Sta. 164+69	Meets Criteria for 50 mph
Alternate	Sta. 175+62 to Sta. 180+62	Meets Criteria for 50 mph
Alternate	Sta. 196+90 to Sta. 199+90	Meets Criteria for 50 mph
Alternate	Sta. 199+96 to Sta. 202+96	Meets Criteria for 50 mph
Alternate	Sta. 210+92 to Sta. 216+92	Meets Criteria for 50 mph
Alternate	Sta. 227+83 to Sta. 232+83	Meets Criteria for 50 mph
Alternate	Sta. 234+96 to Sta. 237+96	Meets Criteria for 50 mph
Alternate	Sta. 251+73 to Sta. 256+73	Meets Criteria for 50 mph
Alternate	Sta. 260+48 to Sta. 269+73	Meets Criteria for 50 mph
Alternate	Sta. 270+24 to Sta. 274+24	Meets Criteria for 50 mph
Alternate	Sta. 285+72 to Sta. 290+72	Meets Criteria for 50 mph
Alternate	Sta. 306+15 to Sta. 308+65	SSD Meets 35 mph
Alternate	Sta. 316+16 to Sta. 318+66	SSD Meets 45 mph
Alternate	Sta. 320+72 to Sta. 322+22	SSD Meets 30 mph
Alternate	Sta. 325+56 to Sta. 327+06	Meets Criteria for 50 mph
Alternate	Sta. 328+35 to Sta. 331+85	Meets Criteria for 50 mph
Alternate	Sta. 332+98 to Sta. 334+48	Meets Criteria for 50 mph
Alternate	Sta. 334+83 to Sta. 338+83	Meets Criteria for 50 mph
Alternate	Sta. 341+92 to Sta. 342+92	SSD Meets 25 mph

Grades along the routes were also analyzed. All vertical grades were below the 7.0% maximum along the Primary and Alternate Routes. Within 200 ft. of key intersections, it is recommended to have slopes of less than 3.0%. Several locations were identified as exceeding such grades, as shown in **Table 7**.

Table 7. Review of Roadway Grades

Route	Station Segment (From Appendix F)	Comments
Primary	Sta. 0+00 to Sta. 2+00	Maximum Grade Exceeded; 3.73% > 3.00%
Alternate	Sta. 56+80 to Sta. 58+80	Maximum Grade Exceeded; 5.79% > 3.00%
Alternate	Sta. 160+00 to Sta. 162+00	Maximum Grade Exceeded; 4.43% > 3.00%

Roadway Typical Section

Based on data obtained from Leavenworth County's GIS site, cross sections were reviewed at approximately 500 ft. increments and key locations along the proposed Primary and Alternate Routes. Cross sections were then compared to the proposed cross sections based on applicable design criteria. Detailed cross sections are located in **Appendix F**.

The existing roadway geometry of both the Primary and Alternate Routes do not match the proposed typical section based on applicable design criteria. The Primary Route and Alternate Route are striped with 11 ft. wide lanes, which is a typical width for streets, and meets the presented typical section. However, for much of the roadway, the Primary Route and Alternate Route have a shoulder of 0 ft., which does not match the proposed typical section shoulder width of 6 ft.

As shown in **Appendix F**, the Primary Route and Alternate Route do not have end conditions beyond the shoulder or ditches that match the adopted typical section for a majority of the corridor.

Depending on what pavement recommendation is selected in coordination with the county, there are a variety of combinations of typical sections that may be used to modify the existing roadway to meet current criteria. One size will not fit all based on varying existing conditions along the Primary and Alternate Routes (e.g. a fill versus cut section and existing right of way widths will drive typical section choices that may not be one consistent typical section). This route study is intended to identify existing conditions, and through the development of preliminary design plans and coordination with county officials, a preferred typical section will be selected for one or more station ranges along the Primary and Alternate Routes.

Surfacing Improvements

See **Appendix L** for recommendations of potential surfacing actions. A variety of paving actions will be considered given that the existing pavement thickness is not uniform. Typical design practice is to show proposed treatments in the preliminary design plans, providing station ranges with a proposed paving action that will be used to meet a minimum thickness. This is needed to not only address a minimum thickness across the roadway, but may also require increased thickness where existing superelevation correction is needed to meet current geometric design criteria.

As a result of the surfacing actions, an increase in existing pavement elevations will require mitigation for edge drop offs. Various methodologies can be used to address edge drop offs; the change in elevation of the drop off and existing typical section often dictates the proposed solution. Since the existing pavement thickness varies along the Primary and Alternate Routes, various treatments may be required to balance impacts to right of way, maintaining ditch capacity, accommodating existing drainage structures, avoidance of utilities, etc. Several solutions include: the addition of shoulder with flattened sideslopes, pavement edge wedge to tie pavement to existing ground where foreslopes are flatter, the use of FHWA recommended safety edge slope, the use of roadside safety appurtenances such as guardrail, etc. A combination of these features can be chosen to address varying existing roadway typical sections in coordination with the paving action, which would be selected as part of the decision making process with the county during preliminary design.

Clear Zone

In addition to identified areas of concern when compared to the representative cross sections, several items along the defined routes were identified as having less than desirable conditions. First, multiple areas had vegetation of various densities within the clear zone. Where reasonable, this vegetation should be cleared to provide some space adjacent to the roadway free of visual obstruction. This area not only provides space in which to regain control of a vehicle in the event of a roadway departure, but may increase sight distances and safety along the Primary and Alternate Routes.

Guardrail, Type 4 end sections at crossroad pipes, flattening of side slopes, and potentially other appropriate safety treatments, are recommended if the clear zone conditions cannot be met with an existing traversable and recoverable slope. Regardless of vehicle type or proposed shoulder width, the clear zone requirement will be the same. Regardless of crash history, improvements to the roadway should address providing a clear zone that meets current design criteria.

Another clear zone area of concern was identified at the location shown in **Figure 5**. During field observations, it was noted that a large amount of standing water was present on the east side of the roadway between the intersections, despite no recent rain events. This ponding area may impact the pavement structure over time, as there were no physical barriers between the ponding area and the pavement structure itself.

Because the clear zone can be met using a variety of means and methods, and depending on the proposed surfacing actions that could be used along the corridor depending on the existing pavement section, a current design criteria typical section along the entire route is not appropriate when considering these factors and existing right of way limitations. A more balanced approach, considering all tools in the roadside design toolbox, should be considered when the selection of typical section is made. Roadside safety treatments to meet clear zone requirements would be identified and selected in concert with typical section development during the preliminary design phase.



Figure 5. Clear Zone Ponding Location

Along the Primary Route, existing conditions were reviewed for potential addition of guardrail based on key locations with a steep embankment. Considering the daily traffic volume of the Primary Route, guardrail along an embankment is considered when the fill section embankment is over a height of 31 ft and the slope is 3H:1V (or steeper), or a height of 17 ft at 2.5H:1V (or steeper), or a height of 11 ft at 2H:1V (or steeper), or a height of 7 ft at 1.5H:1V (or steeper). Based on a cursory review of the roadside fill section embankment for the Primary Route, the application of guardrail could be considered for the eastbound direction to the segments of Sta 31+00 to Sta 37+00, Sta 133+00 to Sta 147+00, Sta 207+00 to Sta 209+00, and Sta 218+00 to Sta 221+00 and for the northbound direction to the segment of Sta 9+00 to Sta 12+00. This would be a total guardrail length of 2,800 ft.

Utilities

Existing and proposed utilities were not evaluated as part of this Route Study report. Identification will occur during preliminary design phase as part of the survey effort, and impacts from proposed improvements to the roadway will be identified and/or mitigated as part of preliminary design.

Right of Way

In general, the existing right of way along the corridor is 80 feet wide and is illustrated on the cross sections provided in the **Appendix F**. Given this limited right of way, many improvements that could be proposed may require easements, right of way acquisition, or limiting the footprint of the roadside to keep grading and drainage features within existing right of way. As part of the design survey, exact right of way linework will be collected and added to the proposed plan sheets during the preliminary design phase. Recommendations based on that information will be used to balance and limit right of way needs where possible.

Advisory Speed Review

Advisory speed checks at significant curves were reviewed in the field using the "Ball-Bank Indicator Method" as described in Section 2C.08 of the 2009 Manual on Uniform Traffic Control Devices. The ball-bank method uses the following criteria to determine curve advisory speeds:

1. 16 degrees of ball-bank for speeds of 20 mph or less.
2. 14 degrees of ball-bank for speeds of 25 to 30 mph.
3. 12 degrees of ball-bank for speeds of 35 mph and higher.

According to the MUTCD, "the 16, 14, and 12 degrees of ball-bank criteria are comparable to the current AASHTO horizontal curve design guidance. Research has shown that drivers often exceed existing posted advisory curve speeds by 7 to 10 mph." In the test, ball-bank measurements are taken on the inside lane of a given curve until the readings exceed the maximum values outlined. The advisory speed is the highest speed at which the curve can be traversed without exceeding the maximum ball-bank criteria.

In total, two curves were analyzed along the Primary and Alternate Route. Each curve is summarized below, and shown in **Table 8**.

The Golden Road to 189th Street curve, located on the Primary Route, currently has a current advisory speed of 30 mph. Based on ball-bank measurement obtained in the field, the advisory speed is appropriate. Furthermore, it was observed that 30 mph was a comfortable speed to traverse the curve.

The Golden Road to 158th Street curve, located on both the Primary and Alternate Routes, currently has a current advisory speed of 35 mph. Based on ball-bank measurements obtained in the field, the ball-bank criteria indicates 30 mph is a comfortable driving speed for vehicles to transverse the curve. It is recommended that the advisory speed of the curve be lowered to 30 mph.

While advisory speeds are posted for a curve and reverse curve on 158th Street between Golden Road and Loring Road, the posted speeds were deemed to be comfortable on the curve and ball-bank measurements were not taken. It is recommended to remove the advisory plaques in both directions. The reverse curves on 158th between Golden Road and Loring Road did not register a reading on the ball-bank indicator, therefore a reduction in advisory speed was not necessary.

Table 8. Summary of Ball-Bank Readings

Curve	Traveled Speed	Ball-Bank Reading	Exceeds Criteria
Golden Road to 189th Street	30	7.1	No
	35	13.1	Yes
Golden Road to 158th Street	30	8.9	No
	35	14.3	Yes

Structures Assessment

This section is a summary of the drainage structures located within the study area. The report is an evaluation from a visual assessment perspective only. Structural analysis, hydrologic and hydraulic analysis, geometric and safety upgrades, including lane width and shoulder improvements, are outside the scope of the drainage structures evaluation.

The inspections were performed during the months of December, 2024 and May, 2025. All field inspection notes were documented on a current design criteria inspection form and digital photos were taken at each structure, which can be found in **Appendix M**. As a part of each inspection, condition ratings and maintenance recommendations were made by the inspectors.

In general, many structures could use maintenance to repair existing guardrail, culvert ends, headwalls, some concrete wall and top slab repair, and wingwalls. Many locations would benefit from culvert cleanout, vegetation removal, and preventive scour treatment, typically within the current right of way. Multiple structures were identified as replacement candidates, some of which are already scheduled for future construction.

Structural capacity was not evaluated and would be assessed during the design phase to determine if, and which, structures may need replacement or other modifications to meet current criteria.

Table 9. Summary of Drainage Structure Maintenance Recommendations

Structure ID	Maintenance Recommendations
1 (SH-53)	Reconstruct headwalls with new guardrail.
2	Fill downstream scour hole with rip rap.
3 (SH-54)	Structure is scheduled for replacement. Construction to begin December 15, 2025. Structure to be completed in August 2026.
4 (SH-67)	Clean drift out of upstream channel.
5	None at this time.
6	Clear silt/debris from upstream and downstream end.
7 (SH-61)	Structure is scheduled for replacement. Construction to begin December 15, 2025. Structure to be completed in August 2026.
8	None at this time.
9	None at this time.
10	Put NE hazard marker up; Remove tree on north end of culvert; Repair scour hole downstream with rip rap and backfill undermining.
11 (SH-63)	None at this time.
12	Clear brush at ends of pipe.
13	Replace structure.
14	None at this time.
15	None at this time.
16	Replace structure.
17 (SH-52)	Monitor retaining wall movement at northwest corner.
18	None at this time.
19	Replace structure.
20	Replace structure.
21	None at this time.
22	Clear stones/debris/brush at ends of box. Stabilize upstream banks.
23	Replace structure – repair is not recommended.
24	Clear drift/debris in downstream channel; Monitor corrosion to bottom of pipe.
25	Replace guardrails; Clear debris at upstream end.
26	Replace guardrails; Fill downstream scour hole with rip rap; Clear drift/debris in downstream channel.
27	None at this time.
28 (SH-43)	Replace guardrails; Clear silt in downstream end of pipe.
29	None at this time.
30	Clear trees/brush around downstream end of pipe.
31 (SH-60)	Replace guardrails; Clear silt/debris in box and channel.

Stormwater

Based on an initial assessment, there is no history of overtopping of the roadway, however a more in depth analysis will occur during the preliminary design phase.

A large portion of the existing roadway falls within a floodplain based on effective FEMA maps. Proposed improvements would need to be modeled within HEC RAS software to verify that a No Rise could be obtained and a CLOMR/LOMR would not be needed. It is not anticipated that a CLOMR/LOMR would be necessary, however a No Rise Certification and Floodplain Development Permit would be required and would be addressed during the preliminary design phase.

As noted in the Clear Zone section, ponding was observed as shown in **Figure 5**, and more evaluation will occur during the preliminary design phase to determine if, or how, any improvements may be needed.

Existing Pavement Marking and Signing

Pavement marking and signing along the Primary and Alternate haul routes was reviewed to check compliance with the MUTCD. The review was limited to examining the traffic control measures in place, and did not evaluate the condition or materials used, with the exception of clearly degraded or damaged items, which will be noted subsequently. Additionally, it was assumed that technical items, such as pavement marking widths, sign mounting heights, and sign retro reflectivity, were in compliance with the MUTCD, and thus such items were not reviewed as part of the pavement marking and signing analysis. Existing signage along the Primary and Alternate Routes is shown in **Appendix G**.

In addition to detailed reviews of existing signing on the Primary and Alternate Routes, it is recommended that the "Commercial Vehicles Excluded" and other signing prohibiting trucks from roadways on the routes be removed.

Primary Route Pavement Marking and Signing

Unless otherwise noted, signing along the Primary Route has been identified to be in compliance with the MUTCD, with the following exceptions:

At the K-32 (Linwood Road) & 189th Street / Golden Road, guide signage is placed around the intersection to direct motorist onto K-32 and Leavenworth County Highway 26. As K-32 is under the jurisdiction of KDOT, all K-32 signs will need to provided by KDOT. The following modifications are recommended:

For eastbound K-32, add an assembly including M1-6 (26) and M6-1R signs at the beginning of the turning radius onto southbound 189th Street / Golden Road.

For westbound K-32, add an assembly including M1-6 (26) and M6-1L signs at the beginning of the turning radius onto southbound 189th Street / Golden Road.

For northbound 189th Street / Golden Road, add an assembly including M1-5 (32) and M6-4 signs on the north side of K-32 at the intersection. Additionally, add an assembly including an M2-1 and M1-5 (32) a minimum of 600 ft. in advance of the intersection.

Through the curve from Golden Road to 189th Street / Golden Road, there are currently five W1-8R and W1-8L chevron assemblies to guide vehicles through the curve. Based upon the measured curve radii of 400 ft. and advisory speed of 30 mph, these signs should be spaced at 80 ft., according to Table 2C-6 of the MUTCD. The current spacing of the signs exceeds the outlined distance. It is recommended to replace or relocate existing signs to provide the 80 foot spacing throughout the curve to meet identified current design criteria.

Guide signage is used at the Golden Road & 170th Street intersection to direct motorists onto Leavenworth County Highway 3. The following modifications are recommended:

For eastbound Golden Road, add an assembly including M1-6 (3) and M6-1L signs at the beginning of the turning radius onto northbound 170th Street.

For westbound Golden Road, add an assembly including M1-6 (3) and M6-1R signs at the beginning of the turning radius onto northbound 170th Street. Additionally, the existing assembly consisting of M1-6 (3) and M5-1R signs should be relocated to a minimum distance of 400 ft. in advance of the Golden Road and 170th Street intersection.

For southbound 170th Street, Add an assembly with M4-6, M1-6 (3), M1-6 (26), and M6-4 on the south side of Golden road opposite the stopped location of vehicles. Additionally, an assembly including M2-1 and M1-6 (26) should be placed a minimum of 600 ft. in advance of the intersection.

At the Golden Road and 166th Street intersection, Leavenworth County 26 ends, and Leavenworth County 2 is designated on Golden Road to the east of the intersection, and 166th Street to the south of the intersection. The following modifications are recommended:

For eastbound Golden Road, add an assembly including M2-1 and M1-6 (2) signs a minimum of 600 ft. in advance of the intersection. Additionally, add an assembly including M1-6 (2), M6-6R, M4-6, M1-6 (26) signs at the intersection.

For westbound Golden Road, add an assembly including M2-1 and M1-6 (26) signs 600 ft. in advance of the intersection. Additionally, add an assembly including M1-6 (2), M6-1L, M1-6 (26), and M6-3 signs a minimum of 400 ft. in advance of the intersection. Finally, add an assembly including M1-6 (2), M5-1L, M1-6 (26), and M6-3 signs at the intersection.

For northbound 166th Street, add an assembly including M2-1 and M1-6 (26) signs 600 ft. in advance of the intersection. Additionally, add an assembly including M1-6 (2), M5-1L, M1-6 (26), and M5-1R signs a minimum of 400 ft. in advance of the intersection. Finally, add an assembly including M1-6 (2), M6-1L, M1-6 (26), and M6-1R signs at the intersection.

Appropriate signage should be added to denote the haul route.

Additionally, some signs were observed to have vegetation obstructing the signs themselves. The clear zones on either side of the Primary Route should be maintained to ensure all signs remain visible at all times.

While signage modifications are recommended to ensure compliance with the MUTCD, no such modifications are due to traffic added onto the Primary Route from the proposed operation. Proposed signage based on the outlined improvements may be seen in **Appendix K**.

Pavement marking along the route typically consists of a double solid yellow centerline and solid white edge lines on either side of the roadway. A variety of no passing zones are presented to accompany changes in horizontal and vertical alignments. Generally, no passing zones appear to be in compliance with the current design criteria set within the MUTCD, but sight distance checks were not performed to ensure such zones began and terminated at correct locations. Unless otherwise noted, pavement marking along the Primary Route has been identified to be in compliance with the MUTCD, with the following exceptions:

Dashed center line yellow pavement marking is continued on Golden Road through the Golden Road and 166th Street intersection, but no center line should be present through the intersection.

Dashed center line yellow pavement marking is continued on Golden Road through the Golden Road and 170th Street intersection, but no center line should be present through the intersection.

While pavement marking modifications are recommended to ensure compliance with the MUTCD, no such modifications are due to traffic added onto the Primary Route from the proposed operation.

Alternate Route Pavement Marking and Signing

Unless otherwise noted, signing along the Alternate Route has been identified to be in compliance with the MUTCD, with the following exceptions:

Through the curve from Golden Road to 158th Street, there are currently no chevron assemblies to guide vehicles through the curve. Given the differential between the posted advisory speed through the curve of 35 mph and the posted roadway speed of 50 mph, chevrons through the curve are required to be in compliance with the MUTCD. Based upon the measured curve radii of 500 ft. and advisory speed of 35 mph, these signs should be spaced at 120 ft. New signs should be placed along the curve, mounted at 4 ft., and spaced at 120 ft. throughout the curve. If the advisory speed is lowered to 30 mph, as recommended previously, these signs should be spaced at 80 ft. through the curve. As the Golden Road / 158th Street & 161st Street intersection, which serves as the primary entrance to the operation, is located within the curve itself, such distances may be difficult to fully achieve.

Guide signage is used at the Loring Road & 158th Street intersection to direct motorists onto Leavenworth County Highway 32. The following modifications are recommended:

For northbound 158th Street, add an assembly including M2-1 and M1-6 (32) signs 600 ft. in advance of the intersection. Additionally, add an assembly including M1-6 (2), M6-3, M1-6 (32), and M5-1R signs a minimum of 400 ft. in advance of the intersection. Finally, add an assembly including M1-6 (2), M6-3, M1-6 (32), and M6-1R signs at the intersection. An assembly including an M1-6 (2) sign should be placed between 25 and 200 ft. north of the intersection.

For southbound 158th Street, add an assembly including M2-1 and M1-6 (32) signs 600 ft. in advance of the intersection. Additionally, add an assembly including M1-6 (32), M5-1L, M1-6 (2), and M6-3 signs a minimum of 400 ft. in advance of the intersection. Finally, add an assembly including M1-6 (32), M6-1L, M1-6 (2), and M6-3 signs at the intersection. An assembly including an M1-6 (2) sign should be placed between 25 and 200 ft. south of the intersection.

For eastbound Loring Road add an assembly including M2-1, M1-6 (2), M2-1, and M1-6 (32) signs 600 ft. in advance of the intersection. Additionally, add an assembly including M4-6 (2), M6-4, M1-6 (32), and M6-3 signs a minimum of 400 ft. in advance of the intersection. Finally, add an assembly including M1-6 (2), M6-4, M1-6 (32), and M6-3 signs at the intersection. An assembly including an M1-6 (32) sign should be placed between 25 and 200 ft. east of the intersection.

For westbound Loring Road, add an assembly including M2-1 and M1-6 (2) signs 600 ft. in advance of the intersection. Additionally, add an assembly including M4-6 (2) and M6-4 signs a minimum of 400 ft. in advance of the intersection. Finally, add an assembly including M1-6 (2), M6-4, M4-6, M1-6 (32) signs at the intersection.

Guide signage is used at the Loring Road & Loring Lane intersection to direct motorists to Leavenworth County Highway 32. The following modifications are recommended:

For northbound Loring Lane add an assembly including M2-1 and M1-6 (32) signs 600 ft. in advance of the intersection. Additionally, add an assembly including M1-6 (32) and M5-1L signs a minimum of 400 ft. in advance of the intersection. Finally, add an assembly including M1-6 (32) and M6-1L signs at the intersection.

For southbound Loring Lane add an assembly including M2-1 and M1-6 (32) signs 600 ft. in advance of the intersection. Additionally, add an assembly including M1-6 (32) and M5-1R signs a minimum of 400 ft. in advance of the intersection. Finally, add an assembly including M1-6 (32) and M6-1R signs at the intersection.

For eastbound Loring Road add an assembly including M4-6 and M1-6 (32) signs at the intersection.

North of the Loring Lane & 142nd Street, a W1-2L sign is used to alert northbound motorists to a horizontal curve. However, this sign does not have an advisory speed plaque, and is not accompanied by a W1-2R sign for southbound Loring Road traffic. It is recommended that an advisory plaque be added if the speed differential exceeds 5 mph and accompanying assembly be added north of the curve, or the sign be removed.

South of the Loring Lane / West Front Street & K-32 Truck Route (Santa Fe Road) intersection, a W1-2R sign is used to alert southbound motorists to a horizontal curve. However, this sign does not have an advisory speed plaque, and is not accompanied by a W1-2L sign for northbound Loring Road traffic. It is recommended that an advisory plaque be added if the speed differential exceeds 5 mph and accompanying assembly be added north of the curve.

North of the Loring Lane & Archer Road intersection, a W1-2R sign is used to alert southbound motorists to a horizontal curve. However, this sign does not have an advisory speed plaque, and is not accompanied by a W1-2L sign for northbound Loring Road traffic. It is recommended that an advisory plaque be added and accompanying assembly be added north of the curve.

Guide signage is used at the Loring Lane / West Front Street & K-32 Truck Route (Santa Fe Road) intersection to direct trucks on the designated K-32 Truck Route. The following modifications are recommended:

For eastbound K-32 Truck Route (Santa Fe Road) add an assembly including M4-4, M1-4 (32) and M5-1L signs a minimum of 400 ft. in advance of the intersection. Additionally, add an assembly including M4-4, M1-6 (32) and M6-1L signs at the intersection. Remove the assembly including an M4-4, M1-6 (32) and M6-1L approximately 400 ft. in advance of the intersection.

For southbound Loring Road K-32 Truck Route (Santa Fe Road) add an assembly including M4-4, M1-4 (32) and M5-1R signs a minimum of 400 ft. in advance of the intersection. Additionally, add an assembly including M1-6 (32) and M6-1R signs at the intersection. Remove the assembly including an M4-4, M1-6 (32) and M5-1R approximately 75 ft. in advance of the intersection.

The no parking signs used on Loring Lane south of the Loring Lane / West Front Street & K-32 Truck Route (Santa Fe Road) are not included as part of the MUTCD, and use a mix of symbols, words, and other layouts. These signs should be replaced with consistent no parking signage as outlined in the MUTCD.

Appropriate signage should be added to denote the haul route.

Additionally, some signs were observed to have vegetation obstructing the signs themselves. The clear zones on either side of the Alternate Route should be maintained to ensure all signs remain visible at all times.

While signage modifications are recommended to ensure compliance with the MUTCD, no such modifications are due to traffic added onto the Alternate Route from the proposed operation. Proposed signage based on the outlined improvements may be seen in **Appendix K**.

Pavement marking along the route typically consists of a double solid yellow centerline and solid white edge lines on either side of the roadway. A variety of no passing zones are presented to accompany changes in horizontal and

vertical alignments. Generally, no passing zones appear to be in compliance with the current design criteria set within the MUTCD, but sight distance checks were not performed to ensure such zones began and terminated at correct locations. Unless otherwise noted, pavement marking along the Alternate Route has been identified to be in compliance with the MUTCD, with the following exceptions:

Dashed center line yellow pavement marking is continued on 158th Street through the 158th Street & Loring Road intersection, but no center line should be present through the intersection.

While pavement marking modifications are recommended to ensure compliance with the MUTCD, no such modifications are due to traffic added onto the Alternate Route from the proposed operation.

6. Traffic and Transportation Analysis

Existing Traffic Volumes

Existing 24-hour turning movement counts were conducted by Gewalt Hamilton Associates (GHA), Inc. at all six study intersections on Thursday, July 11, 2024. A tabulation of count locations and peak hours may be seen in **Table 10**.

Table 10. Collected Intersection Peak Hours

Intersection	Observed A.M. Peak Hour	Observed P.M. Peak Hour
Golden Road / 158th Street & 161st Street	6:30 – 7:30 A.M.	4:30 – 5:30 P.M.
Golden Road & 166th Street	6:30 – 7:30 A.M.	4:30 – 5:30 P.M.
K-32 (Linwood Road) & 189th Street / Golden Road	6:45 – 7:45 A.M.	4:30 – 5:30 P.M.
158th Street & Loring Road	6:00 – 7:00 A.M.	4:30 – 5:30 P.M.
Loring Lane & 142nd Street	7:30 – 8:30 A.M.	4:45 – 5:45 P.M.
Loring Lane / West Front Street & K-32 Truck Route (Santa Fe Road)	7:00 – 8:00 A.M.	4:45 – 5:45 P.M.

Peak hours based on existing turning movement counts differed at several intersections, but one A.M. and P.M. overall peak hour was identified and used for calculations and projections. The overall A.M. Peak Hour was identified to be from 6:30 - 7:30 A.M. and the P.M. Peak Hour was identified to be from 4:30 - 5:30 P.M. However, as stated previously, off-site hauling is only proposed between the hours of 7:00 A.M. and 3:00 P.M. Therefore, any analysis of the overall peak hours would show little or no changes in conditions due to the proposed sand operation. To provide meaningful analysis, operational peak hours were identified based on which hours would experience the largest traffic impacts due to increased traffic from the proposed sand operation. The Operational A.M. Peak Hour was determined to be from 7:15 - 8:15 A.M., and the Operational P.M. Peak Hour was determined to be from 2:00 – 3:00 P.M. Information for peak hours on the route are reflected in **Table 11**.

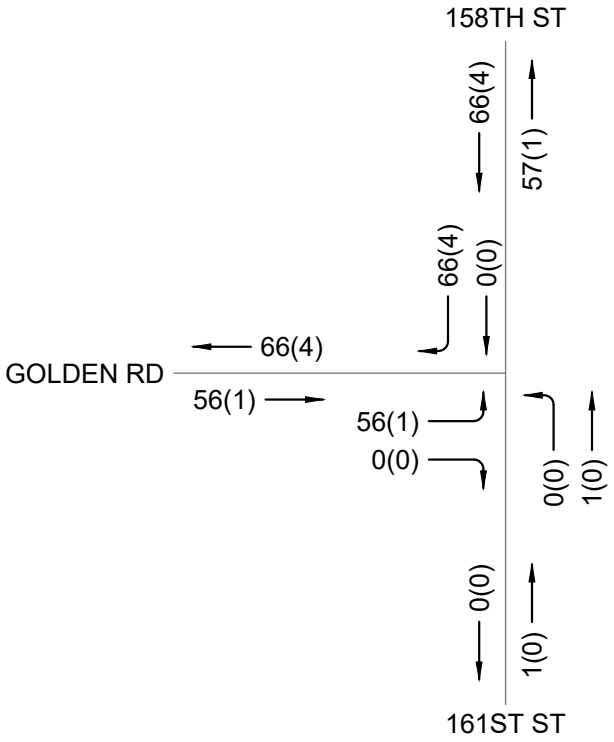
Table 11. Intersection Peak Hours

Condition	A.M. Peak Hour	P.M. Peak Hour
Observed Peak Hours	6:30 – 7:30	4:30 – 5:30
Operational Peak Hours	7:15 – 8:15	2:00 – 3:00

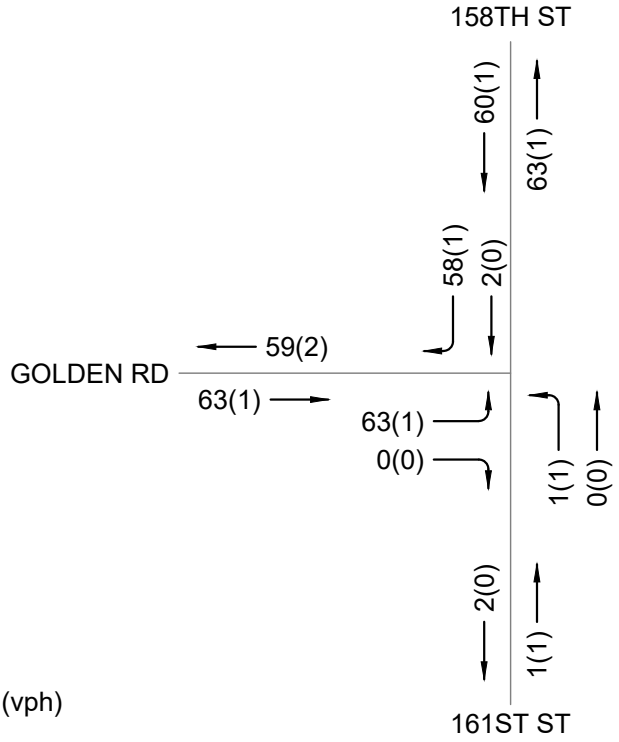
The Operational A.M. and P.M. Peak Hours will be used for analysis throughout this study. Existing peak hour counts conducted at each study intersection may be viewed in **Figures 6 – 11**. Detailed traffic count data provided by GHA may be seen in **Appendix A**.

Based on the conducted turning movement counts, trucks account for approximately 4.5% of existing traffic in the study area. However, there is variance from intersection to intersection, with truck volumes on K-32, including the designated truck route, being higher than truck volumes on Loring Road and Golden Road. Full truck volumes may be seen as part of the conducted turning movement count reports in **Appendix A**.

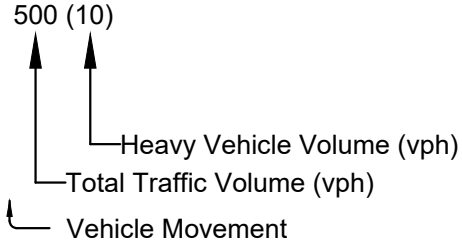
OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)



OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)



LEGEND

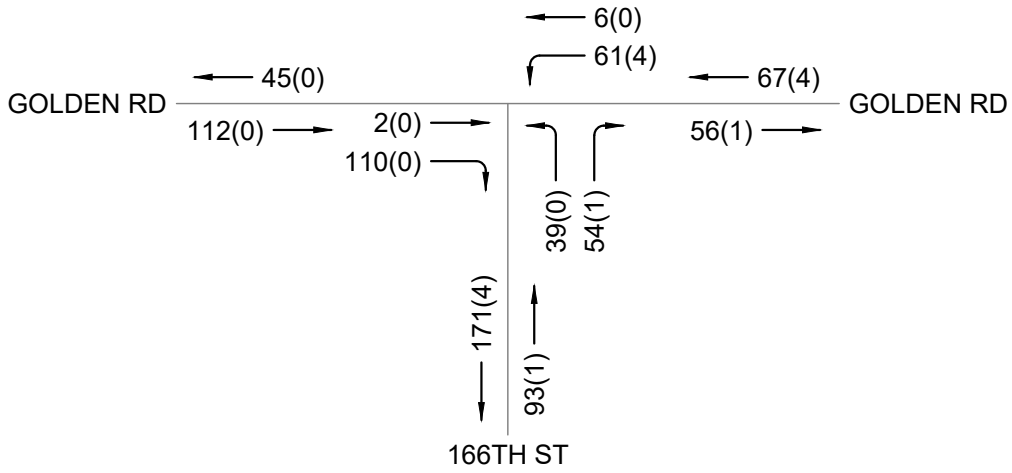




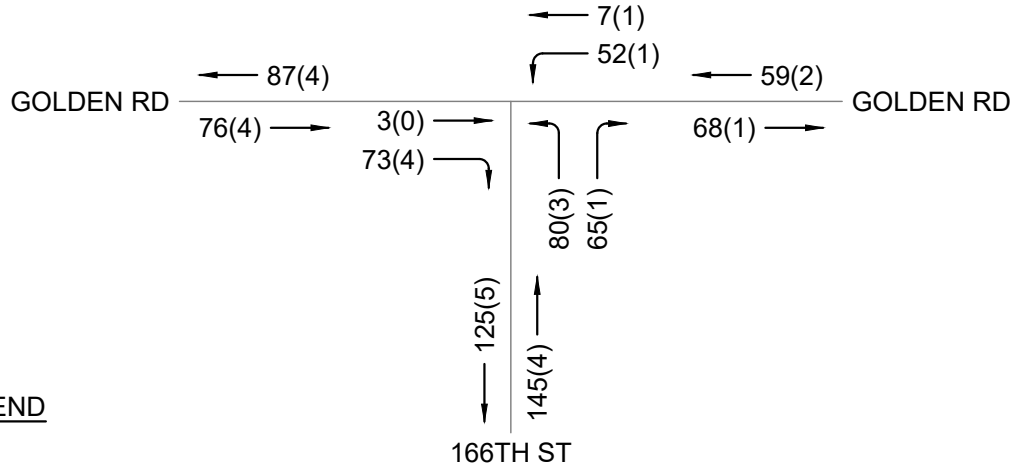
N.T.S.

GBA	PROJECT NUMBER 16477.00	TITLE	FIGURE NUMBER
	DATE 09/26/2025	GOLDEN RD & 158TH ST / 161ST ST EXISTING TRAFFIC VOLUMES	6

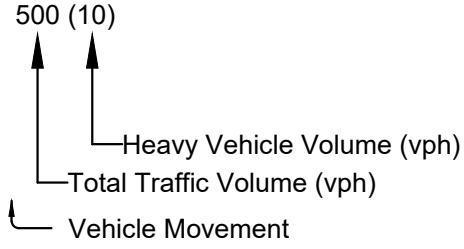
OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)



OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)



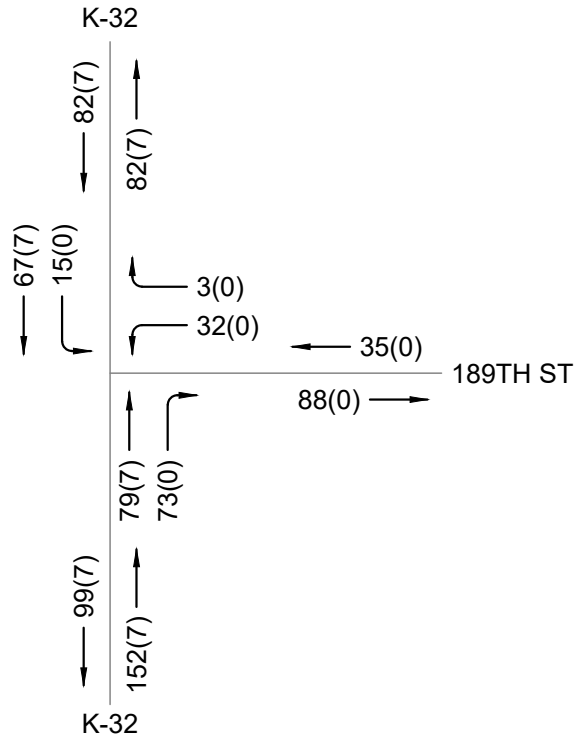
LEGEND



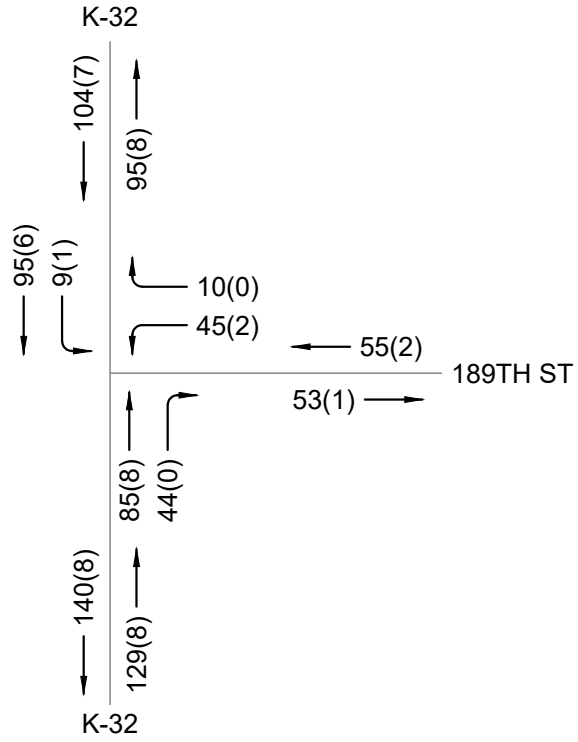


	PROJECT NUMBER	TITLE	FIGURE NUMBER
GBA	16477.00	GOLDEN RD & 166TH ST EXISTING TRAFFIC VOLUMES	7
	DATE 09/26/2025		570

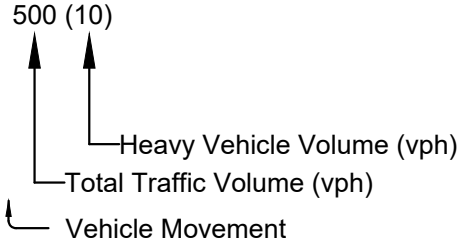
OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)



OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)



LEGEND

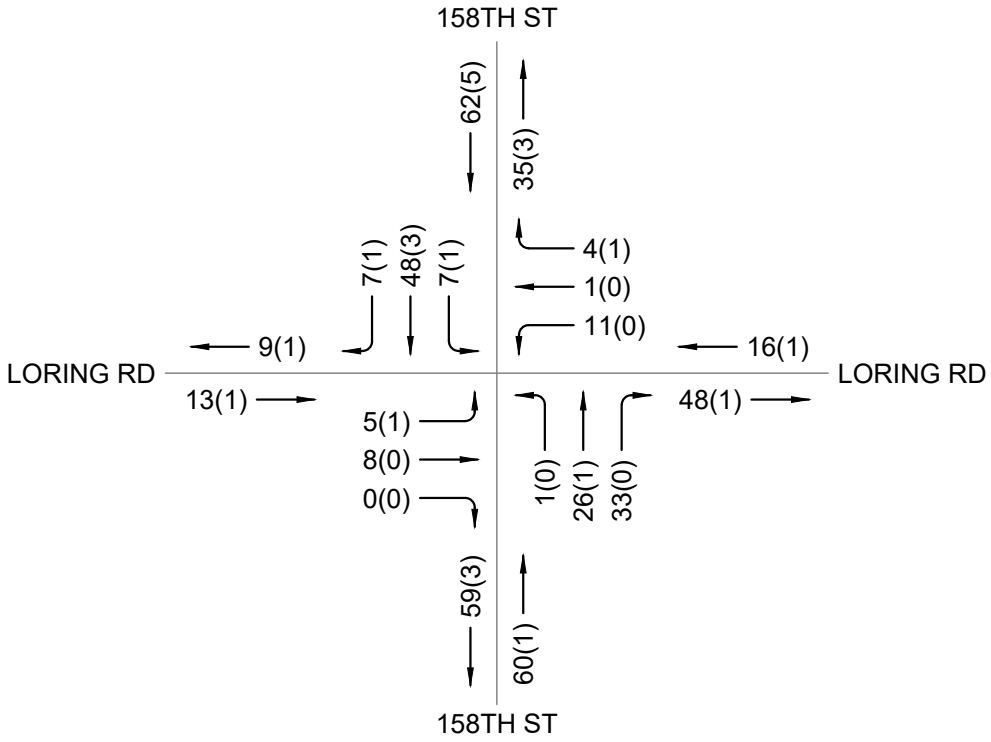


N

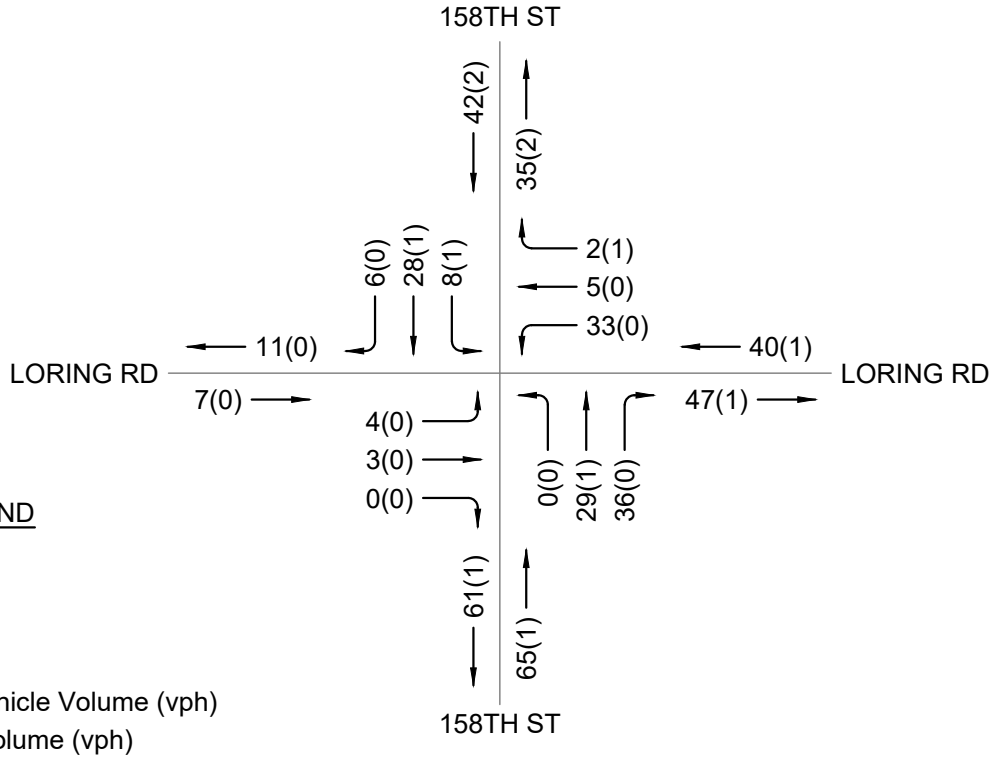
N.T.S.

GBA	PROJECT NUMBER 16477.00	TITLE	FIGURE NUMBER
	DATE 09/26/2025	K-32 (LINWOOD RD) & 189TH ST / GOLDEN RD EXISTING TRAFFIC VOLUMES	8

OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)



OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)



LEGEND

500 (10)

Heavy Vehicle Volume (vph)

Total Traffic Volume (vph)

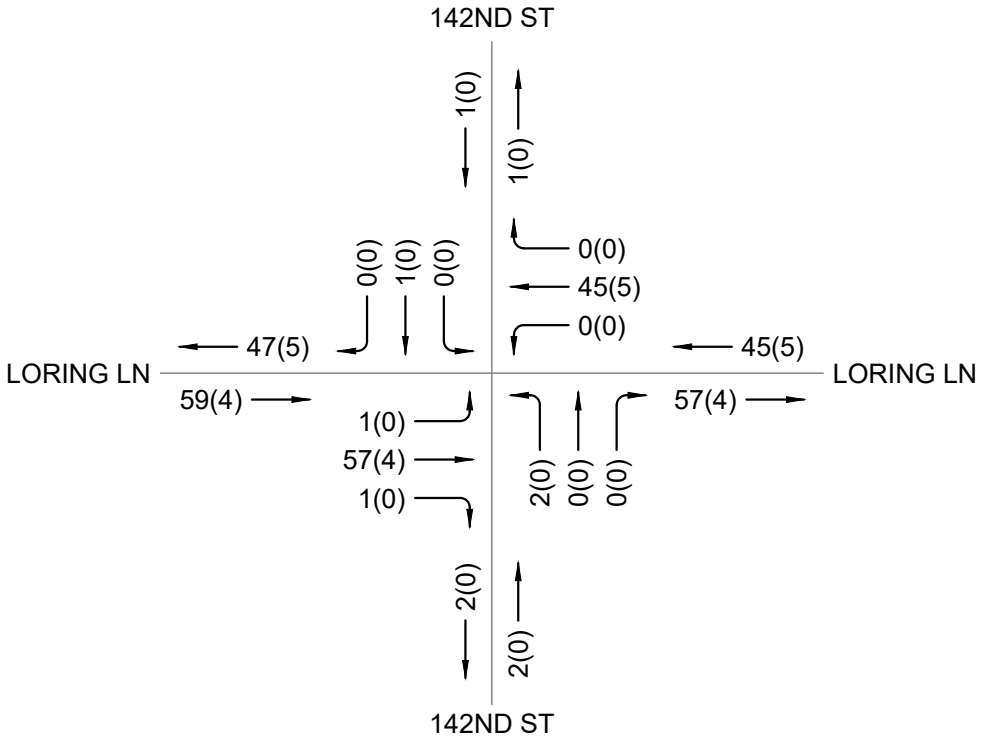
Vehicle Movement

N

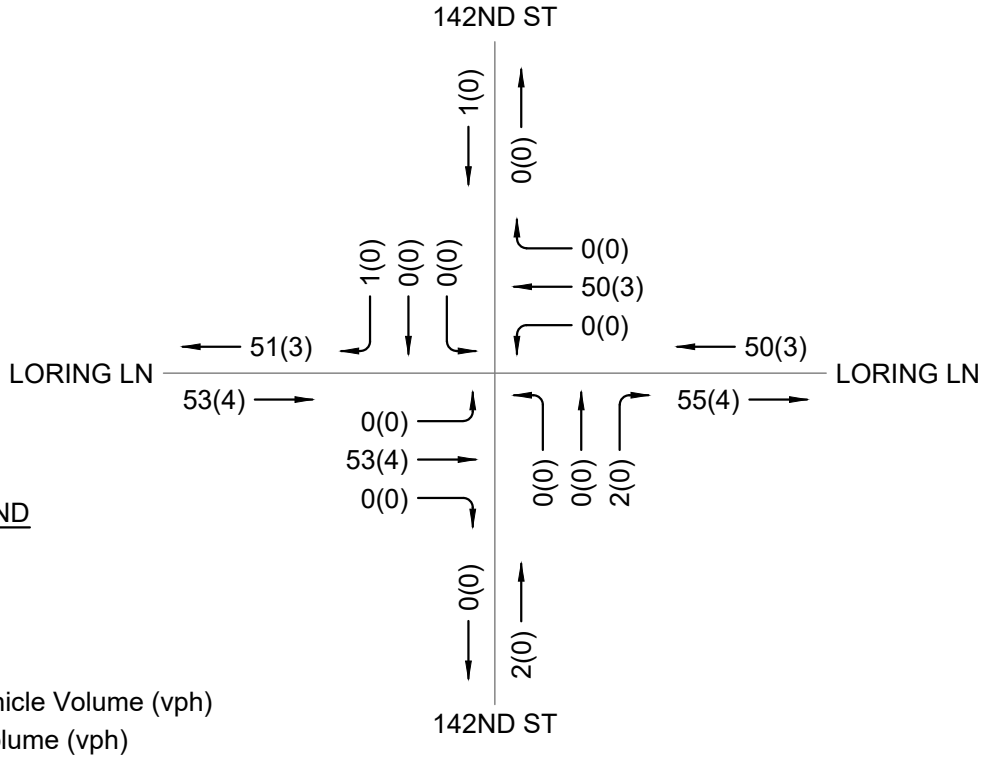
N.T.S.

GBA	PROJECT NUMBER 16477.00	TITLE	FIGURE NUMBER
	DATE 09/26/2025	158TH ST & LORING RD EXISTING TRAFFIC VOLUMES	9

OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)



OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)



LEGEND

500 (10)

Heavy Vehicle Volume (vph)

Total Traffic Volume (vph)

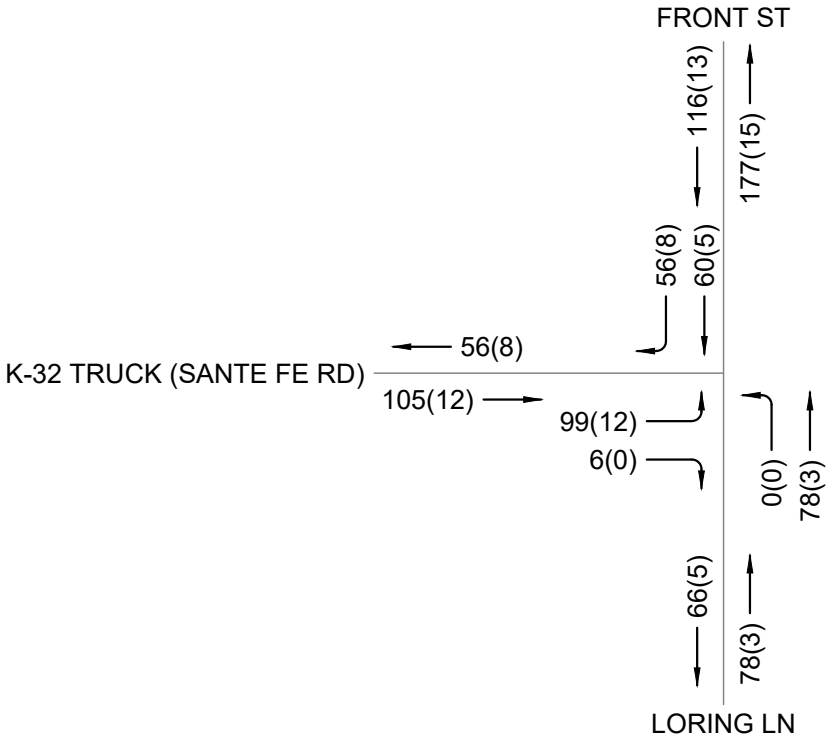
Vehicle Movement

N

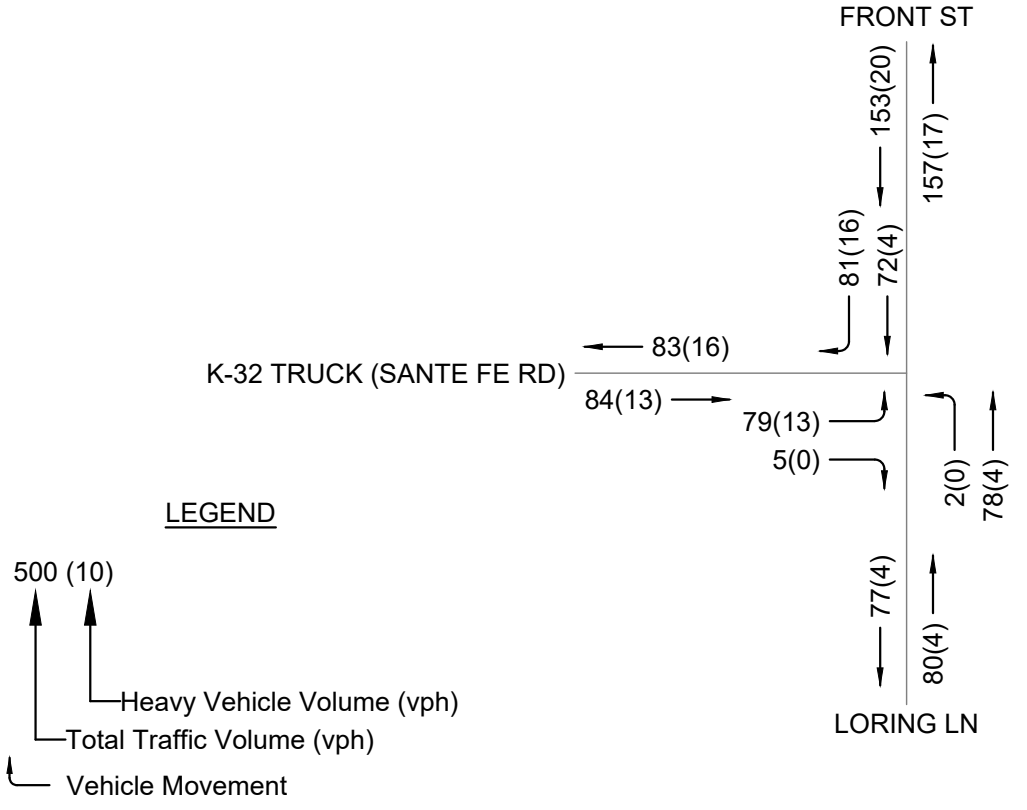
N.T.S.

GBA	PROJECT NUMBER 16477.00	TITLE	FIGURE NUMBER
	DATE 09/26/2025	LORING LN & 142ND ST EXISTING TRAFFIC VOLUMES	10

OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)



OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)



GBA	PROJECT NUMBER 16477.00 DATE 09/26/2025	TITLE LORING LN / W FRONT ST & K-32 TRUCK (SANTA FE RD) EXISTING TRAFFIC VOLUMES	FIGURE NUMBER 11

Existing Traffic Operations

Existing operational analysis was conducted using Trafficware Synchro (Version 12) analysis software. The main performance measures were Level of Service (LOS) and queuing, which were determined using Highway Capacity Manual (HCM) 7th Edition Methodology. Level of Service is a qualitative term used to describe the operating conditions of a given roadway movement, which is correlated to the delay for the given movement. An LOS of A, B, and C are all acceptable conditions. An LOS of D or E indicated that mitigation of traffic congestion may be warranted. An LOS of F is considered unacceptable congestion, and indicates that mitigation of traffic congestion is warranted. A full listing of LOS conditions for both signalized and unsignalized intersections may be seen in **Exhibit B**. The Synchro results of the LOS analysis for existing traffic counts for the A.M. and P.M. Operational Peak Hours are summarized in **Figures 12 - 17**. The completed analysis indicates that key movements at each intersection perform at LOS "B" or better during the A.M and P.M. Operational Peak Hours. Therefore, the existing traffic demand compared to the capacity of the existing roadway is within acceptable limits. A summary of intersection operations under existing volume conditions may be seen in **Table 12**. **Appendix B** includes detailed Synchro reports for each analyzed intersection.

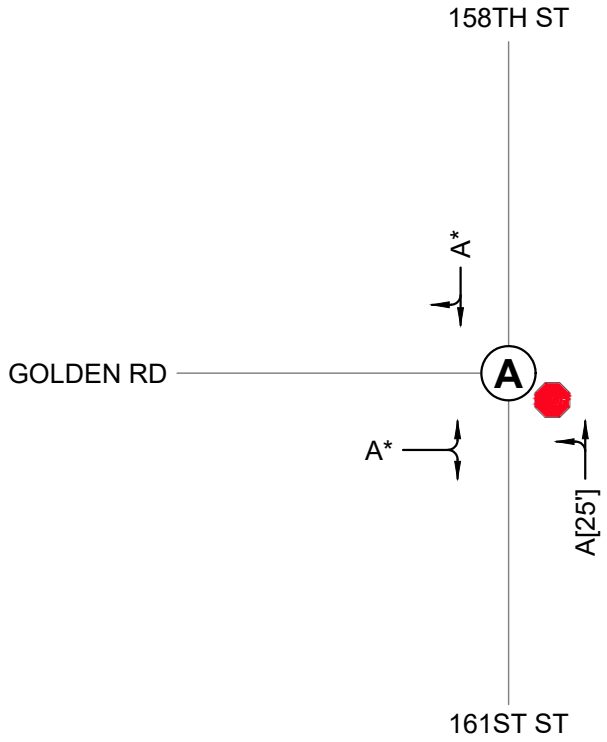
As there are no pedestrian facilities present at any of the study intersections, pedestrian operations were not considered as part of this study, and pedestrian counts were not included as part of turning movement counts collected by GHA.

Table 12. Summary of Existing Intersection Operations

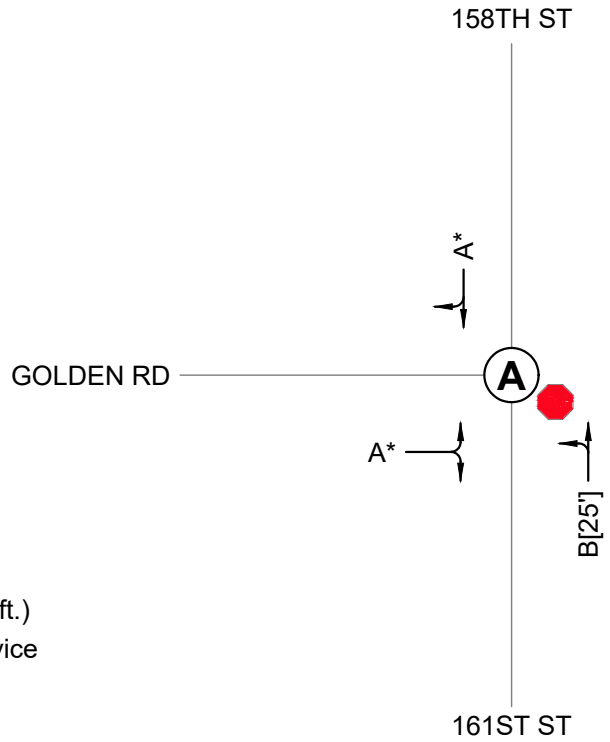
Route	Intersection	Movement	A.M. Peak Hour LOS (Delay (s))	P.M. Peak Hour LOS (Delay (s))
Primary and Alternate	Golden Road / 158th Street & 161st Street	WB	A (8.7)	B (10.6)
		SBL	A (0.0)	A (7.4)
Primary	Golden Road & 166th Street	NB	A (10.0)	B (10.5)
		WBL	A (7.7)	A (7.5)
Primary	K-32 (Linwood Road) & 189th Street / Golden Road	WB	A (9.9)	B (10.5)
		SBL	A (7.6)	A (7.7)
Alternate	158th Street & Loring Road	NBL	A (7.4)	A (0.0)
		EB	B (10.2)	A (9.5)
		WB	A (9.7)	A (9.8)
		SBL	A (7.5)	A (7.5)
Alternate	Loring Lane & 142nd Street	NB	A (9.7)	A (8.7)
		EBL	A (7.4)	A (0.0)
		WBL	A (0.0)	A (0.0)
		SB	A (10.1)	A (8.7)
Alternate	Loring Lane / West Front Street & K-32 Truck Route (Santa Fe Road)	NBL	A (0.0)	A (7.6)
		EB	B (10.4)	B (11.2)

Note: Movements not shown are free-flowing, and do not have an associated level of service.

OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)



OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)



LEGEND

A [100'] — 95th Percentile Queue (ft.) / Movement Level of Service

A* Capacity per Demand

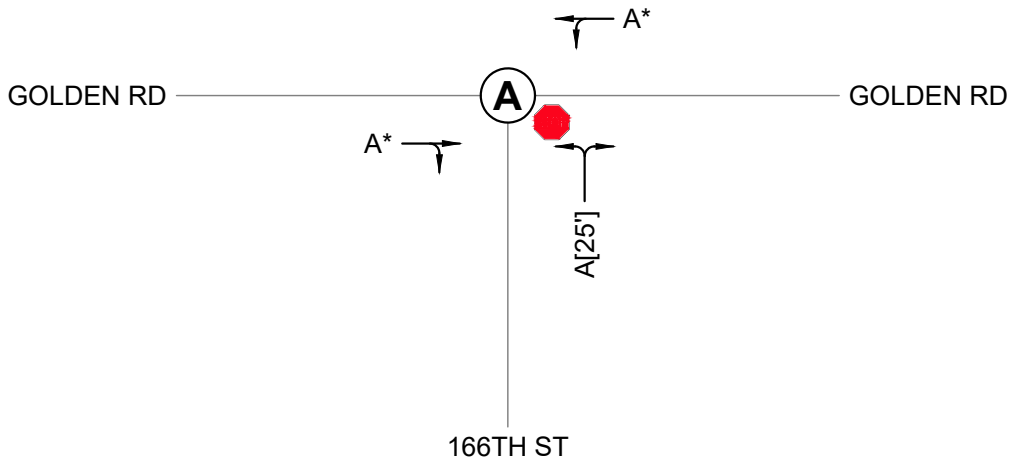
(A) Stop-Controlled Intersection Overall Level of Service

N

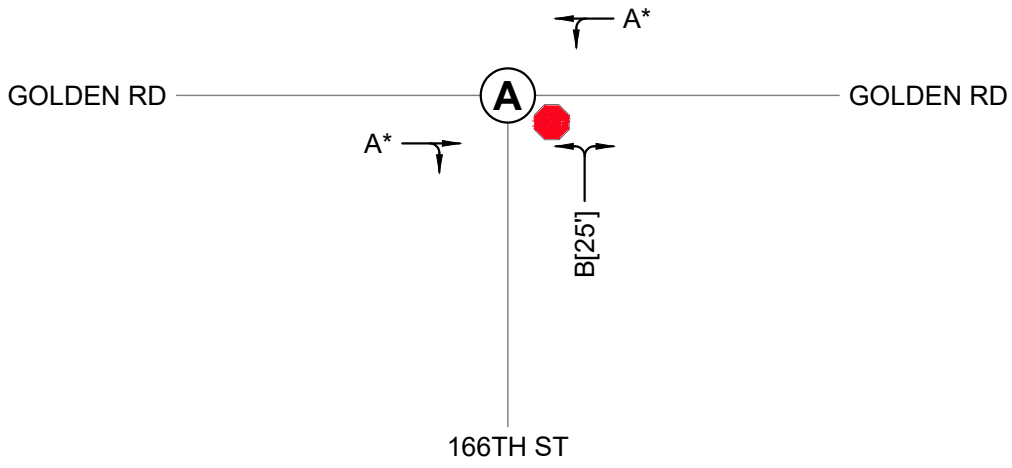
N.T.S.

	PROJECT NUMBER	TITLE	FIGURE NUMBER
GBA	16477.00	GOLDEN RD & 158TH ST / 161ST ST EXISTING INTERSECTION OPERATIONS	12
	DATE 09/26/2025		576

OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)



OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)



LEGEND

A [100'] — 95th Percentile Queue (ft.) / Movement Level of Service

A* Capacity per Demand

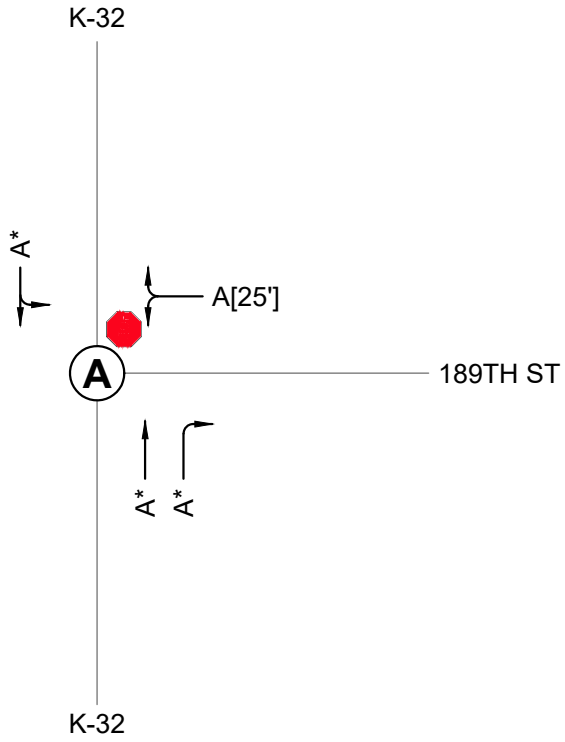
(A) Stop-Controlled Intersection Overall Level of Service

N

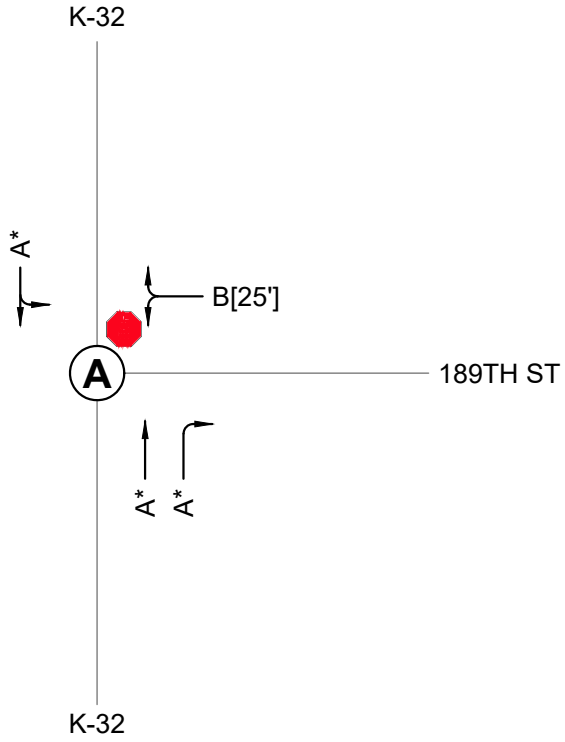
N.T.S.

GBA	PROJECT NUMBER 16477.00	TITLE	FIGURE NUMBER
	DATE 09/26/2025	GOLDEN RD & 166TH ST EXISTING INTERSECTION OPERATIONS	13

OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)



OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)



LEGEND

A [100']
- 95th Percentile Queue (ft.)
- Movement Level of Service

A* Capacity per Demand

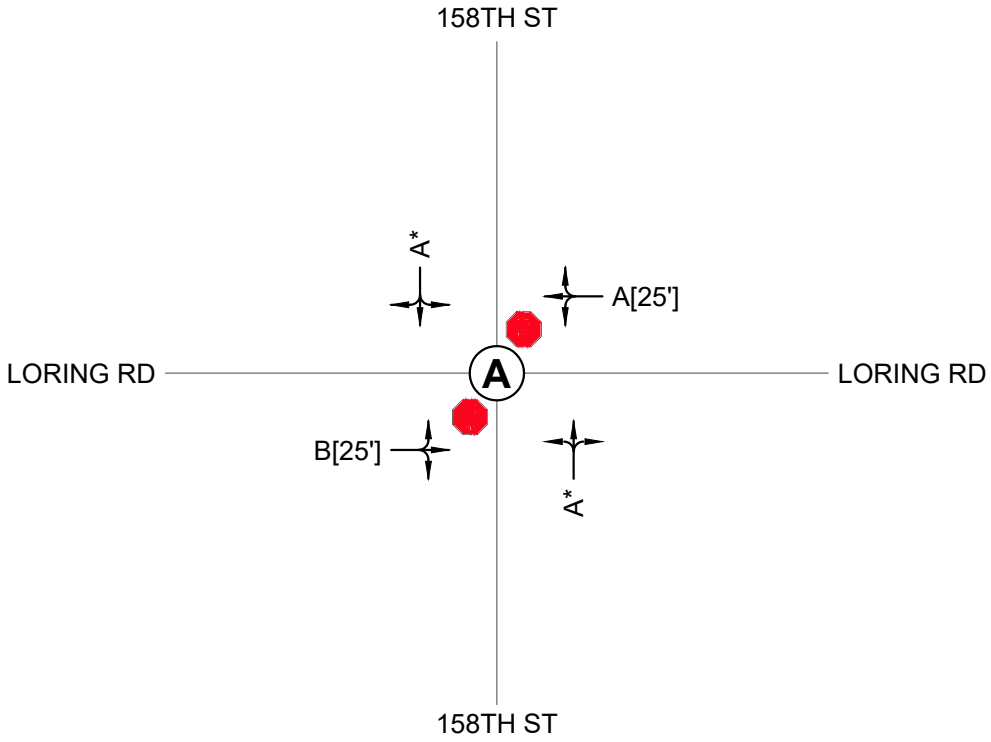
(A) Stop-Controlled Intersection Overall Level of Service

N

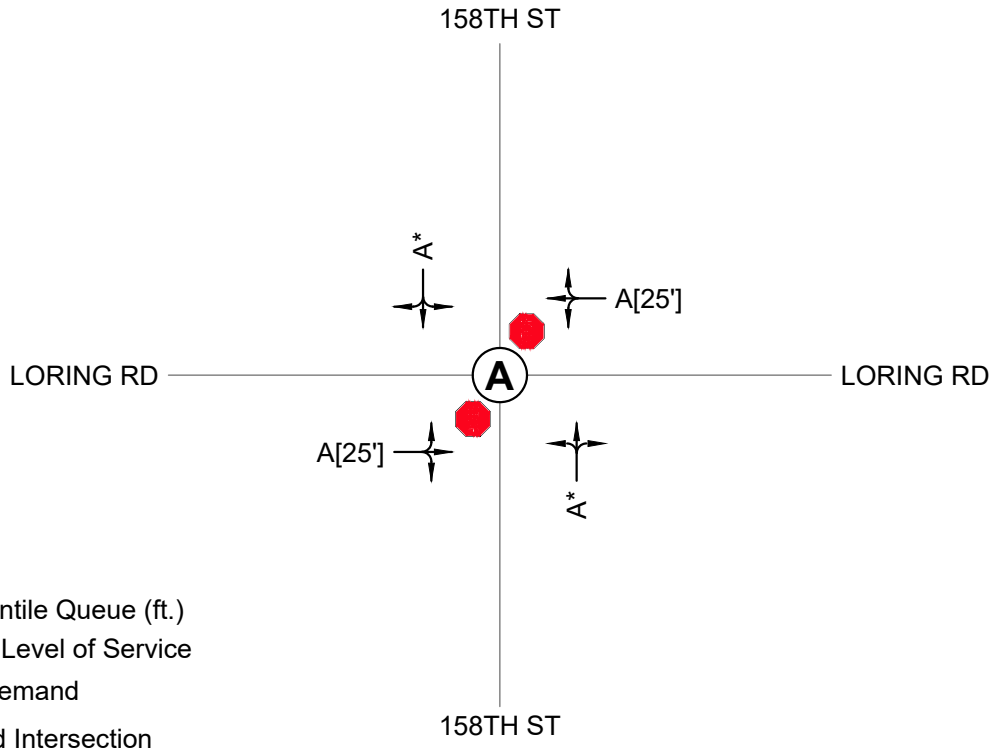
N.T.S.

	PROJECT NUMBER	TITLE	FIGURE NUMBER
GBA	16477.00	K-32 (LINWOOD RD) & 189TH ST / GOLDEN RD EXISTING INTERSECTION OPERATIONS	14
	DATE 09/26/2025		578

OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)



OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)



LEGEND

A [100'] — 95th Percentile Queue (ft.) / Movement Level of Service

A* Capacity per Demand

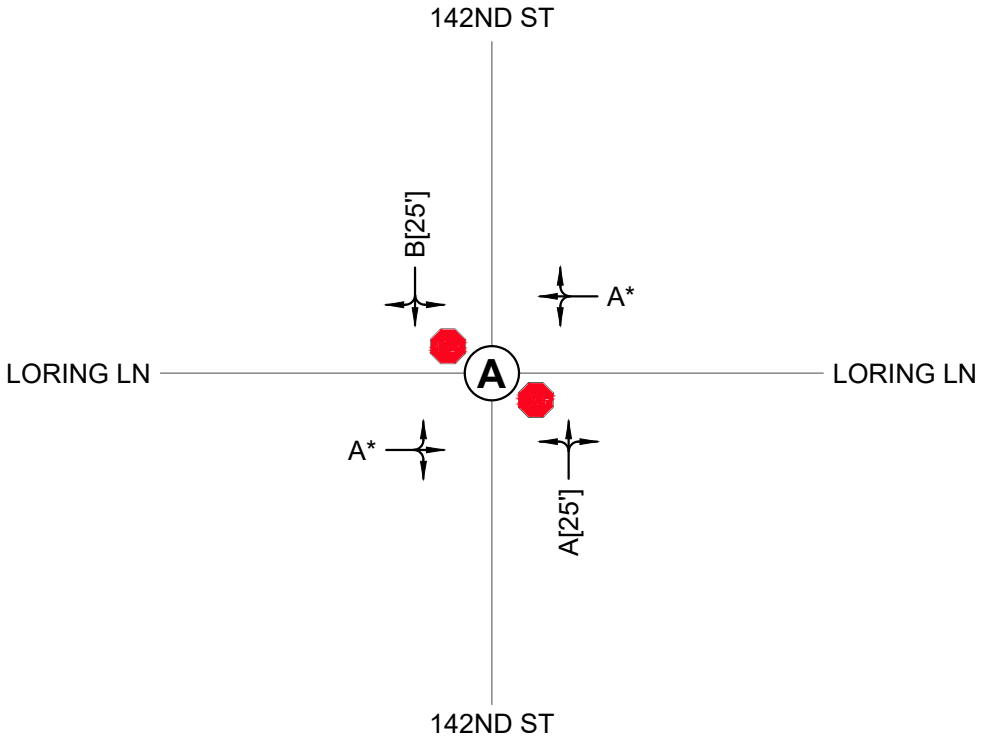
(A) Stop-Controlled Intersection Overall Level of Service

N

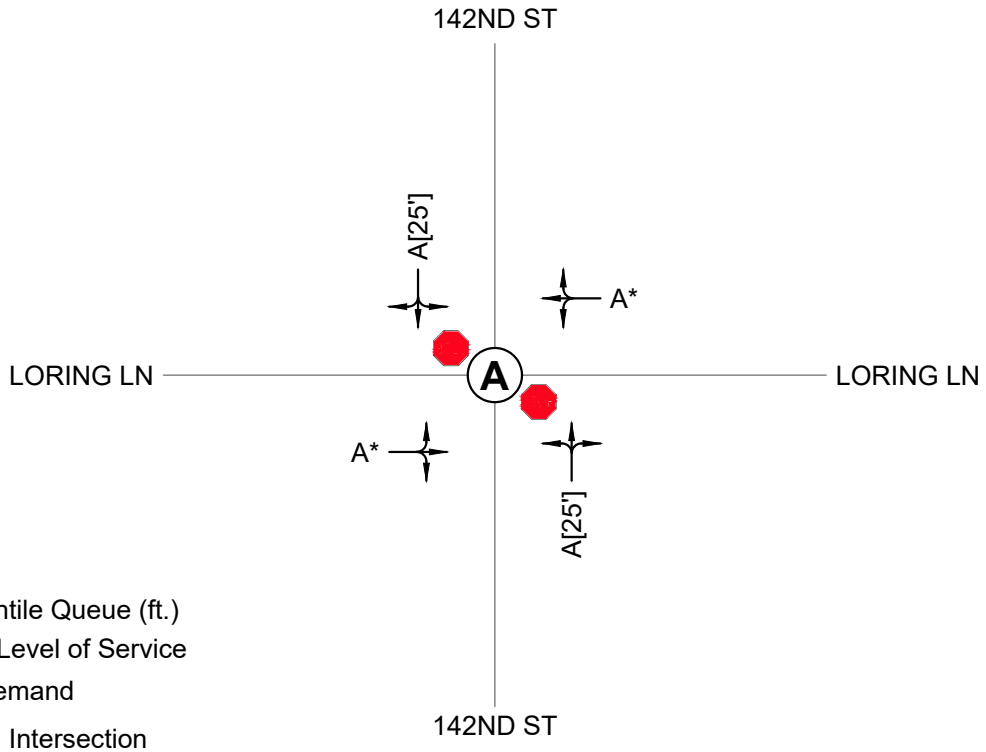
N.T.S.

GBA	PROJECT NUMBER 16477.00	TITLE	FIGURE NUMBER
	DATE 09/26/2025	158TH ST & LORING RD EXISTING INTERSECTION OPERATIONS	15

OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)



OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)



LEGEND

A [100'] — 95th Percentile Queue (ft.) / Movement Level of Service

A* Capacity per Demand

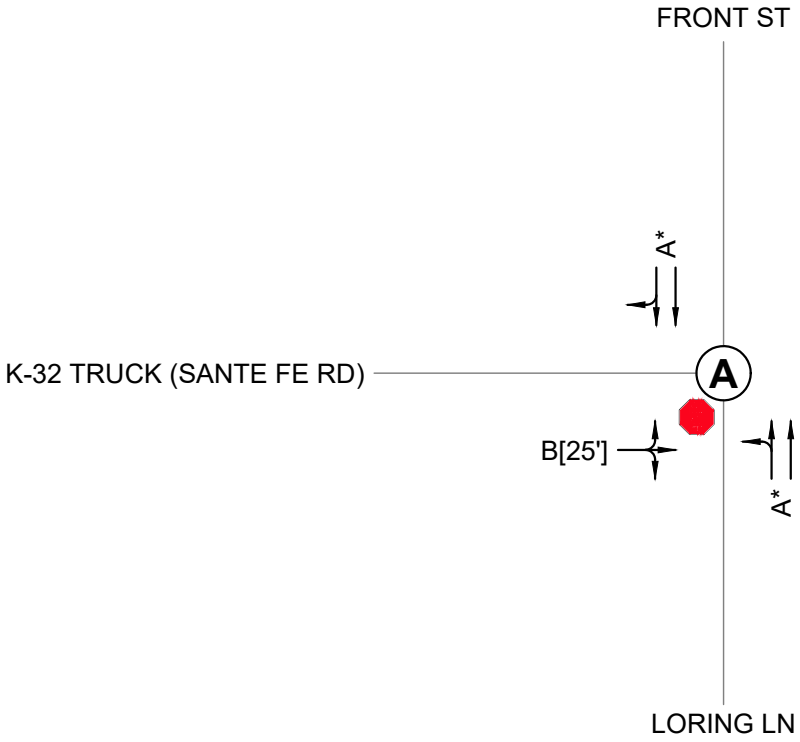
(A) Stop-Controlled Intersection Overall Level of Service

N

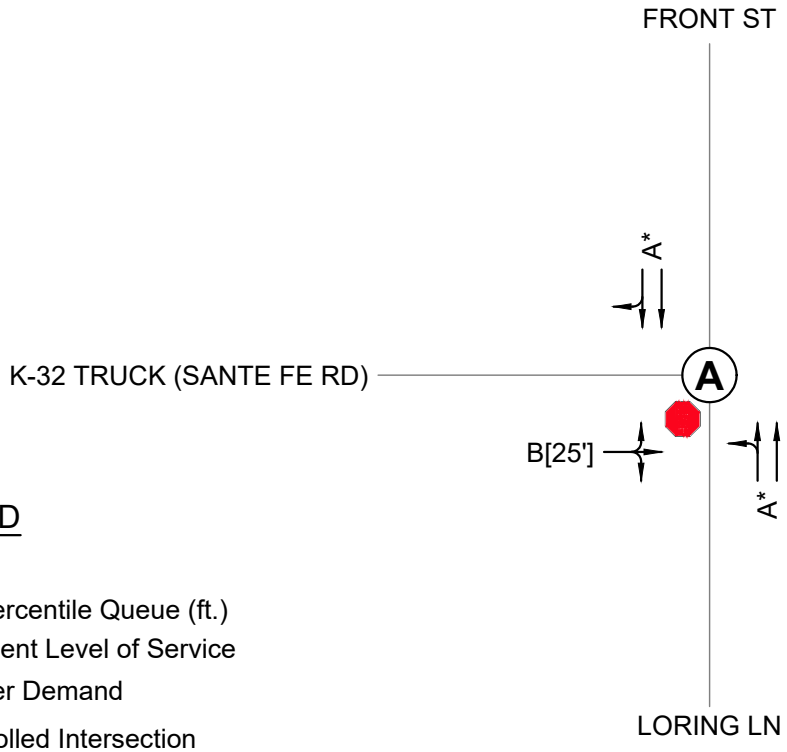
N.T.S.

GBA	PROJECT NUMBER 16477.00	TITLE	FIGURE NUMBER
	DATE 09/26/2025	LORING LN & 142ND ST EXISTING INTERSECTION OPERATIONS	16

OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)



OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)



LEGEND

A [100']
- 95th Percentile Queue (ft.)
- Movement Level of Service

A* Capacity per Demand

(A) Stop-Controlled Intersection Overall Level of Service

N

N.T.S.

	PROJECT NUMBER	TITLE	FIGURE NUMBER
GBA	16477.00	LORING LN / W FRONT ST & K-32 TRUCK (SANTA FE RD) EXISTING INTERSECTION OPERATIONS	17
	DATE 09/26/2025		581

Proposed Trip Generation and Distribution

Proposed trip generation was provided by the developer. It is estimated that the operation will create, on average, 50 round trips per day to the processing facility. Importantly, it is anticipated that the number of trips generated will fluctuate with seasonal changes in temperature, with lower trip generation periods falling in the winter months. For the purposes of this study, a conservative trip generation of 120 round trips per day was used. Furthermore, it is anticipated that the 120 round trips will be spread evenly throughout the operation's off-site hauling hours of 7:00 A.M. to 3:00 P.M. Therefore, a conservative estimate of 15 round trips per hour during its eight hour hauling period each day was used for this study. In addition to round trips to the processing facility, it is expected that the operation will require five employees for general operations. While these trips should occur just outside of the operation hauling hours, they were added to the peak hour trips to create a more conservative estimate of Peak Hour trip generations for the proposed operation. In total, it is expected that the proposed operation will generate 35 A.M. Peak Hour Trips, 35 P.M. Peak Hour Trips, and 250 Daily Trips. A tabulation of proposed trip generation for the site may be seen in **Table 13**.

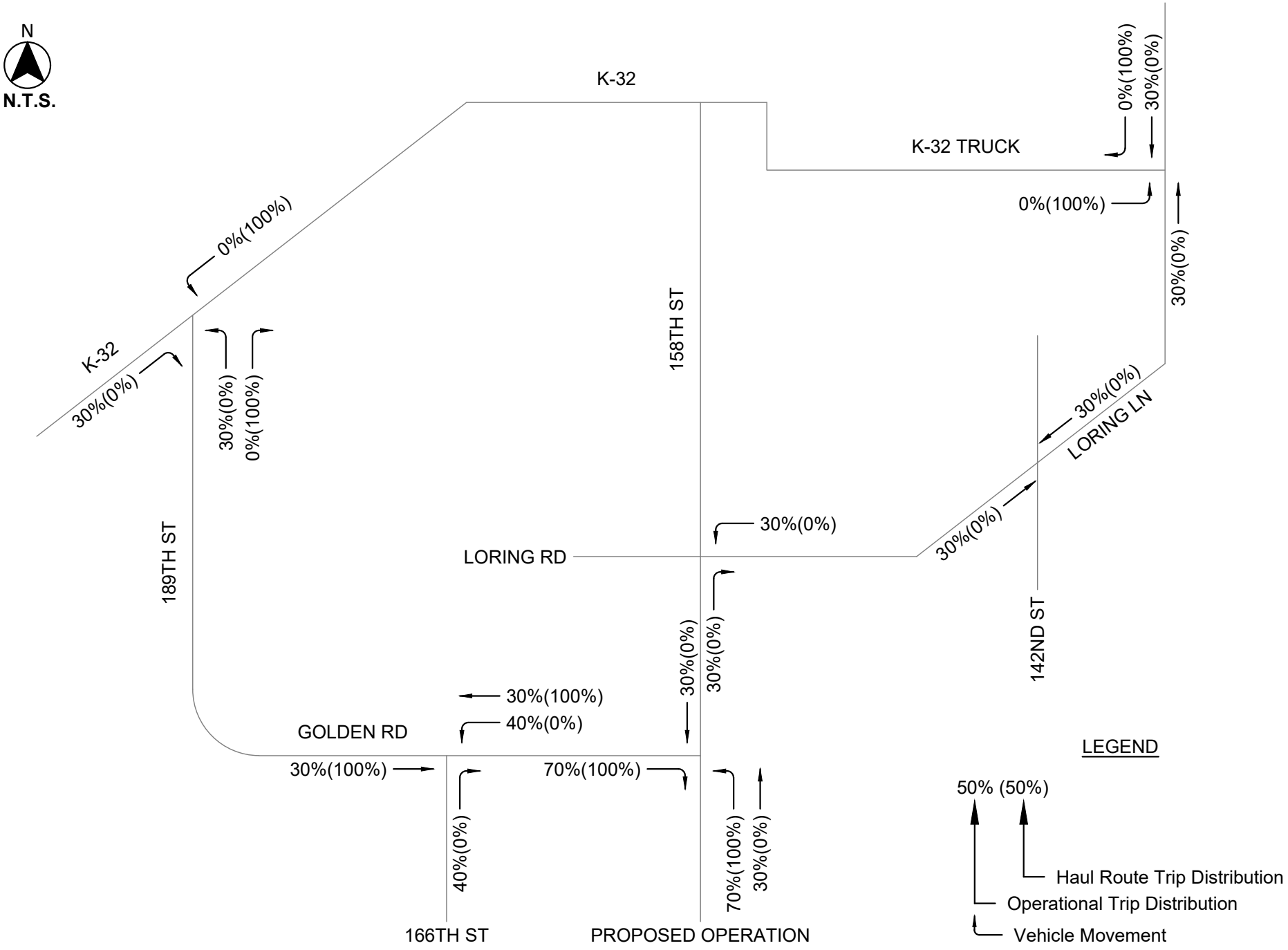
Table 13. Proposed Trip Generation

Trip Generator	A.M. Peak Hour (7:15-8:15 A.M.)			P.M. Peak Hour (2:00-3:00 P.M.)			Daily
	In	Out	Total	In	Out	Total	
Haul Route Traffic	15	15	30	15	15	30	240
General Operations Traffic	5	0	5	0	5	5	10
Site Total	20	15	35	15	20	35	250

Trip distribution for the operation-generated haul traffic was determined based on the Primary and Alternate Routes, as shown previously in **Figure 2**. In addition to haul route traffic, it was estimated that general operations employee traffic coming to and from the site would be roughly split between surrounding residential areas. Trip distribution for both haul route and general operations traffic may be seen in **Figures 18 – 23**.

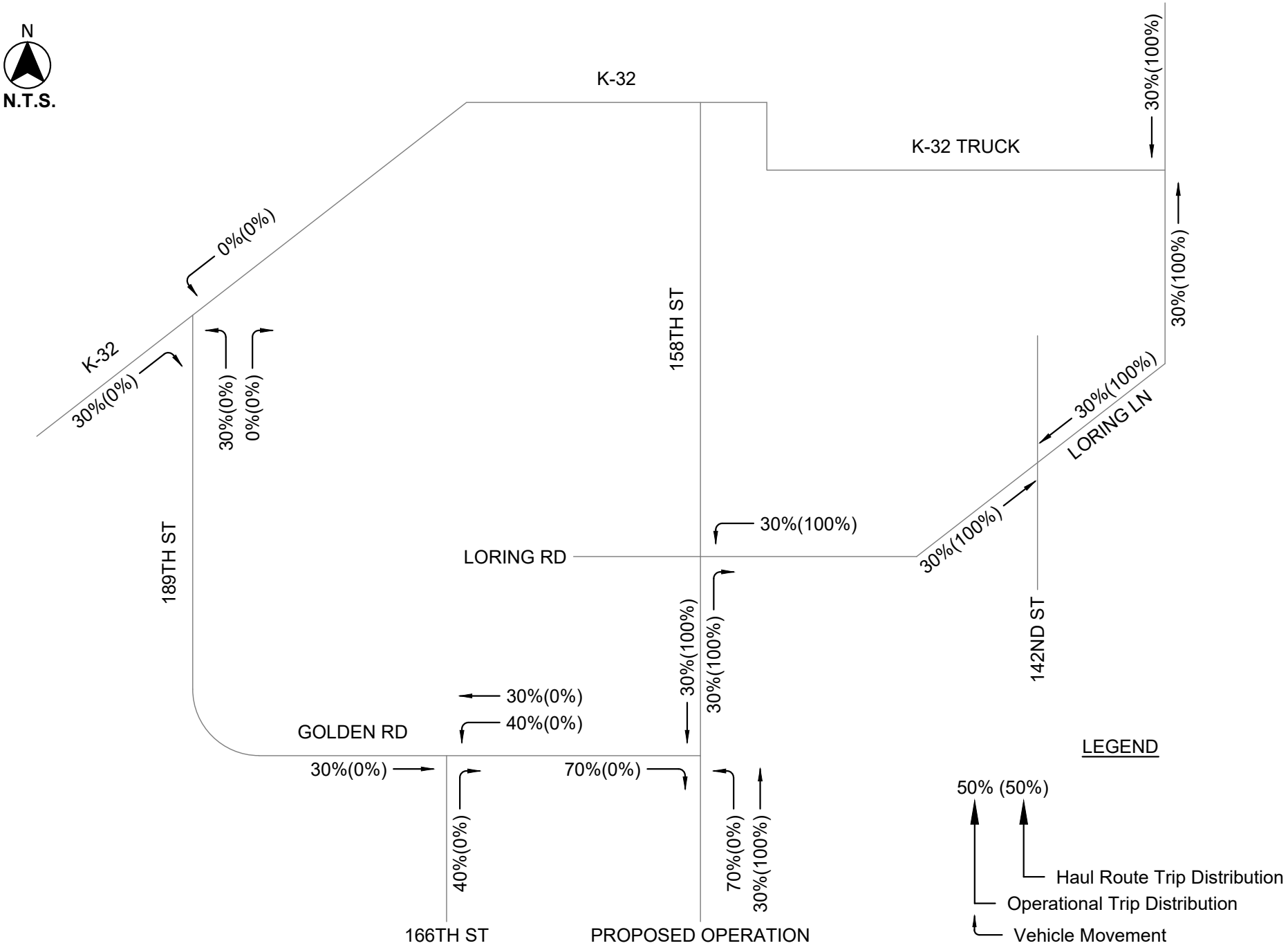
Proposed Traffic Volumes

Upon the determination of the number of site-generated trips by the proposed operation, the expected trips were added to the existing traffic volumes for the existing intersections. The proposed "existing + operation" traffic volumes, which include the total of the existing volumes and site-generated trips for the A.M. and P.M. Peak Hours are presented in **Figures 24 – 35**. Trips shown in **Figures 24 – 29** reflect full distribution on the Primary Route, while **Figures 30 – 35** reflect full distribution on the Alternate Route.



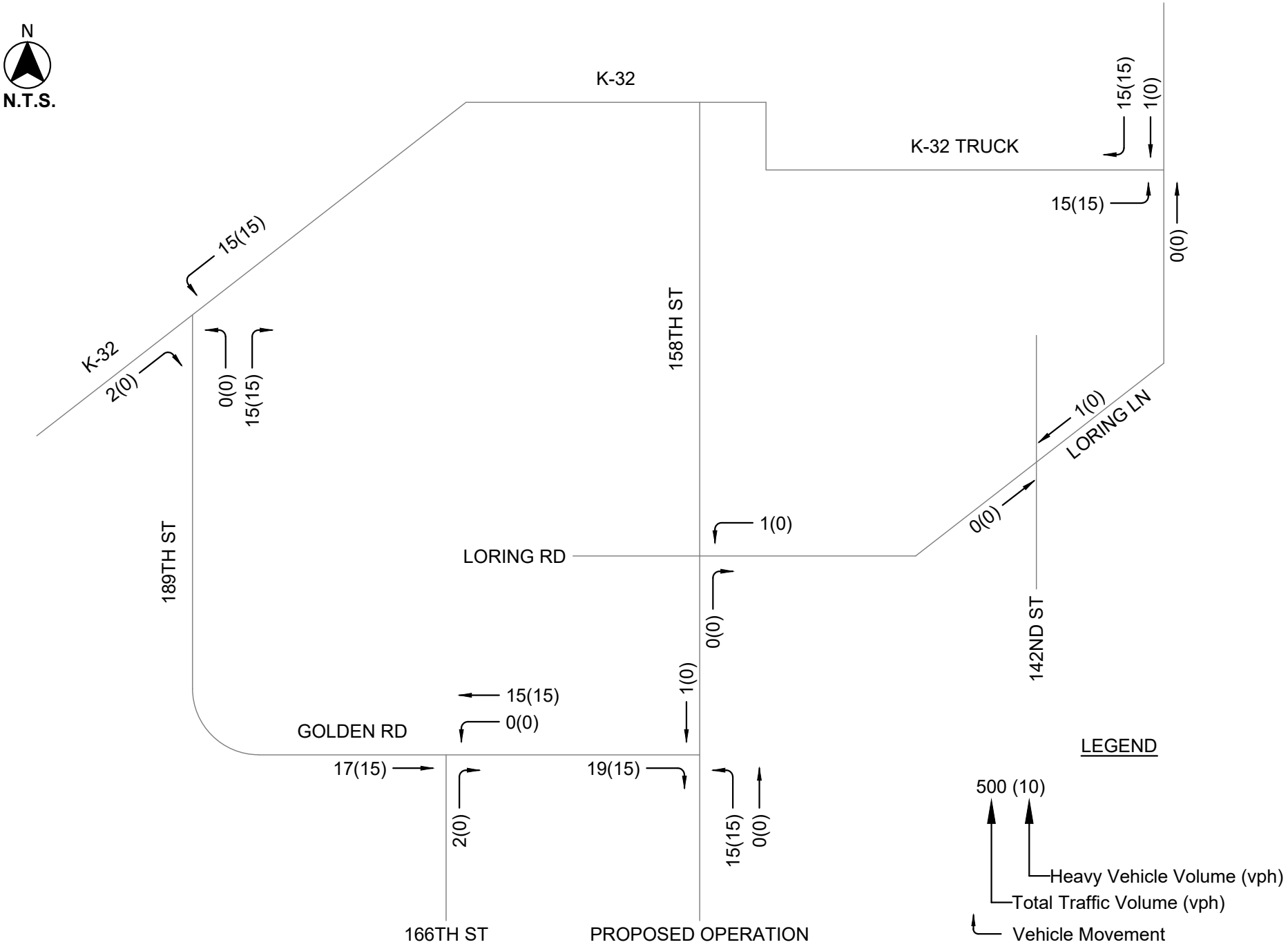
GBA

PROJECT NUMBER	TITLE	FIGURE NUMBER
16477.00	TRIP DISTRIBUTION PRIMARY ROUTE	18
DATE 09/26/2025		



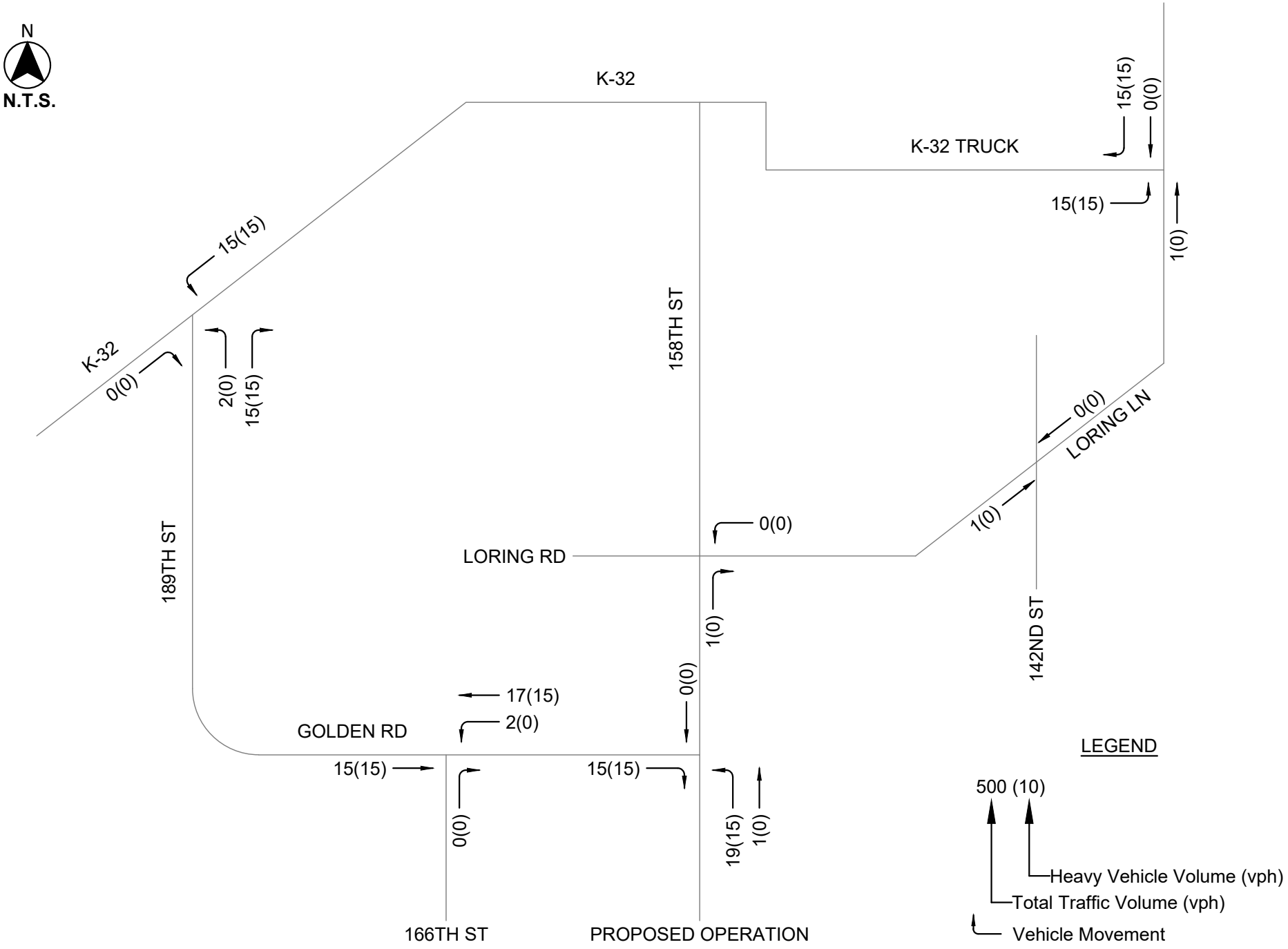
GBA

PROJECT NUMBER	TITLE	FIGURE NUMBER
16477.00	TRIP DISTRIBUTION ALTERNATE ROUTE	19
DATE 09/26/2025		



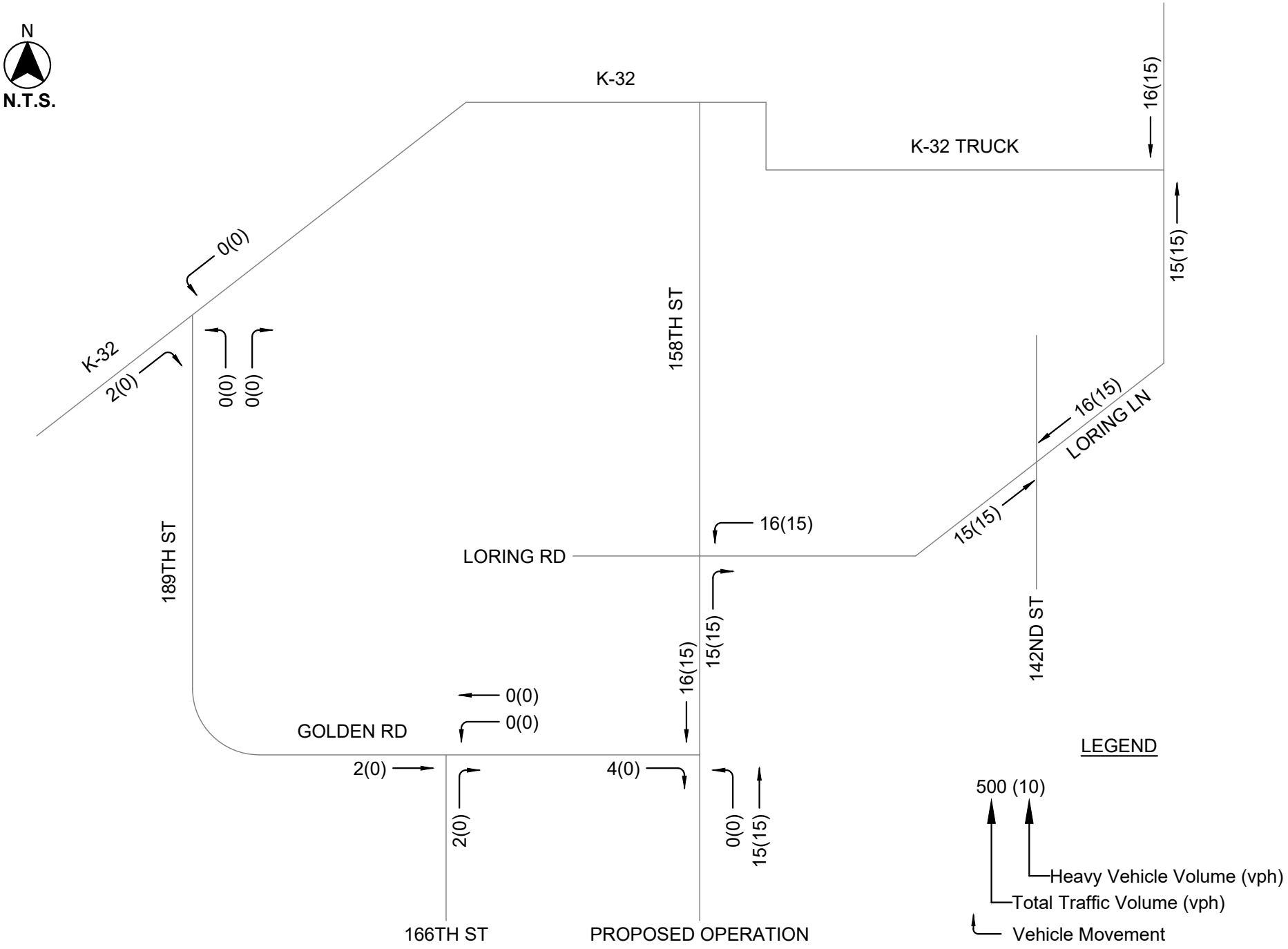
GBA

PROJECT NUMBER	TITLE	FIGURE NUMBER
16477.00	TRIP GENERATION PRIMARY ROUTE OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)	20
DATE 09/26/2025		585



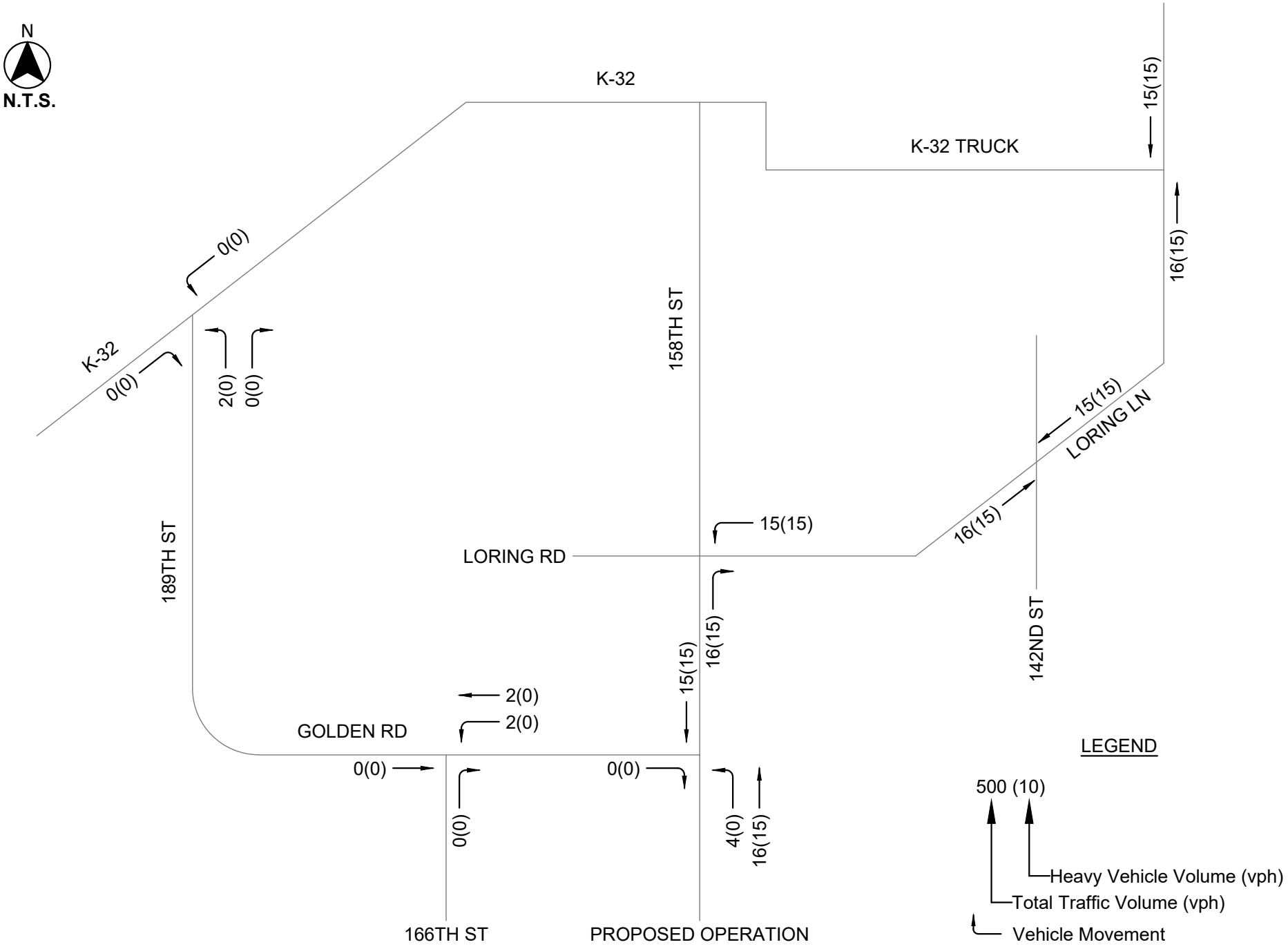
GBA

PROJECT NUMBER	TITLE	FIGURE NUMBER
16477.00	TRIP GENERATION PRIMARY ROUTE OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)	21
DATE 09/26/2025		586



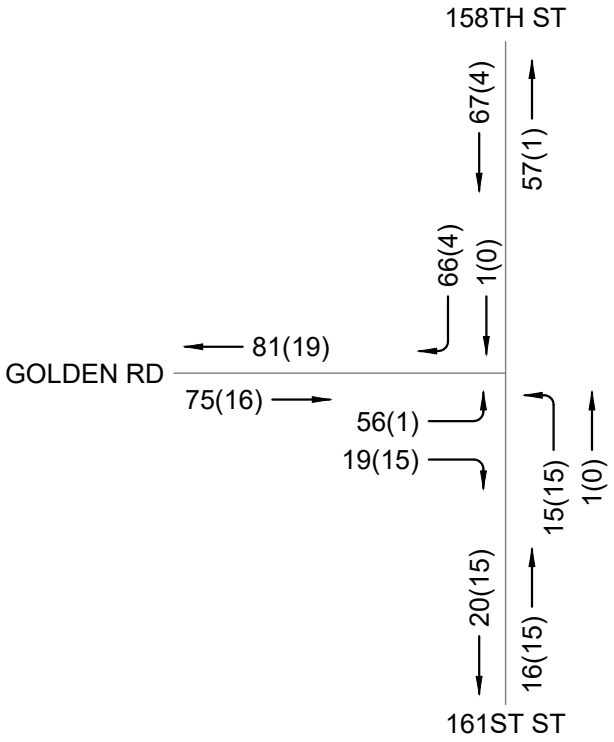
GBA

PROJECT NUMBER	TITLE	FIGURE NUMBER
16477.00	TRIP GENERATION ALTERNATE ROUTE OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)	22
DATE 09/26/2025		587

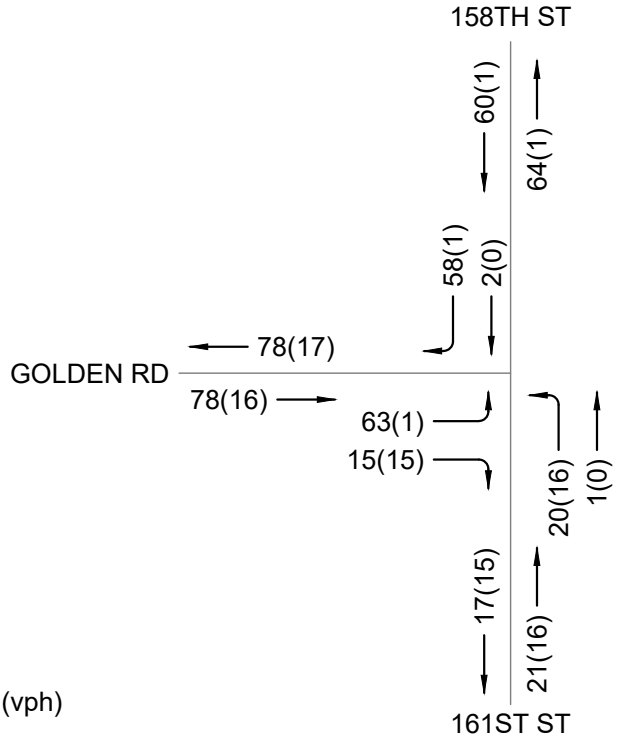


GBA	PROJECT NUMBER 16477.00 DATE 09/26/2025	TITLE TRIP GENERATION ALTERNATE ROUTE OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)	FIGURE NUMBER 23

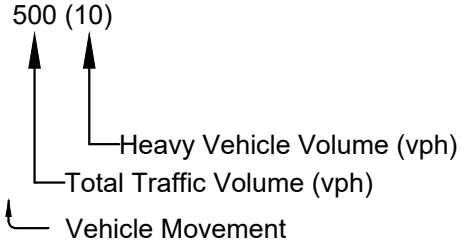
OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)



OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)



LEGEND

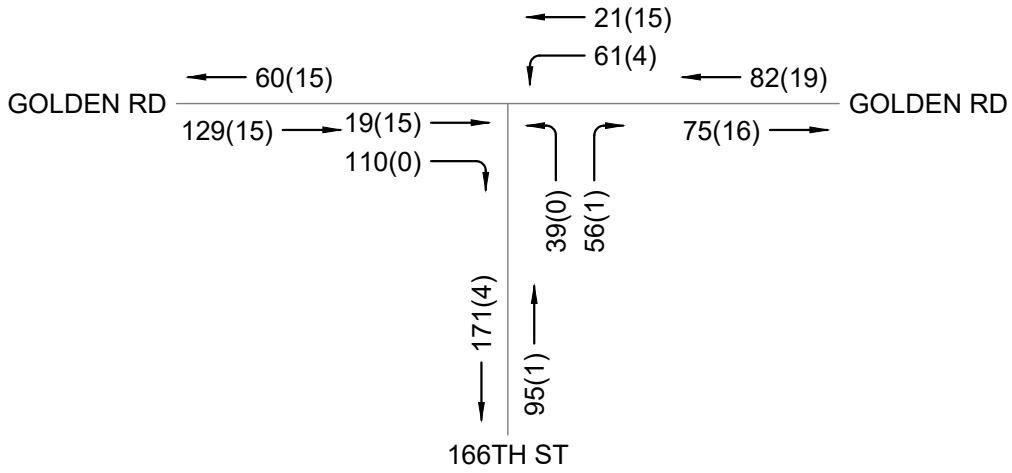


N

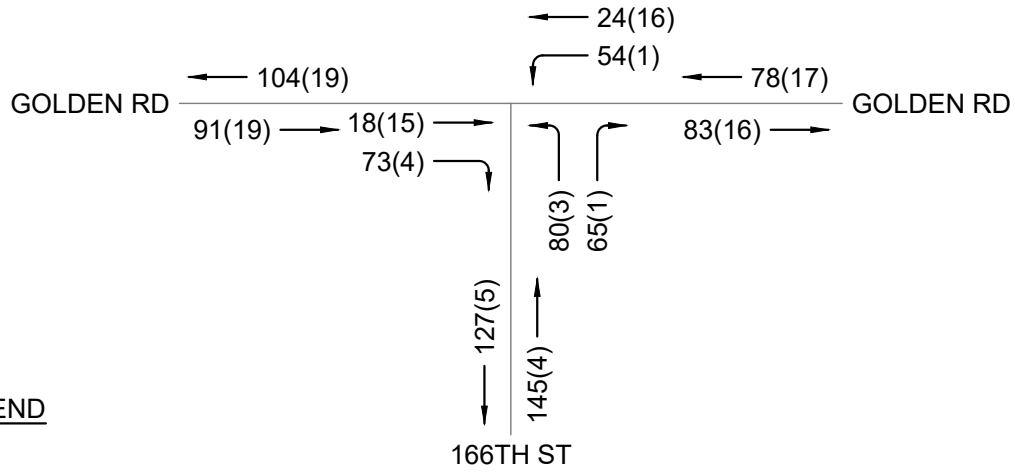
N.T.S.

GBA	PROJECT NUMBER 16477.00 DATE 09/26/2025	TITLE GOLDEN RD / 158TH ST & 161ST ST EXISTING + OPERATION PRIMARY ROUTE TRAFFIC VOLUMES	FIGURE NUMBER 24

OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)



OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)



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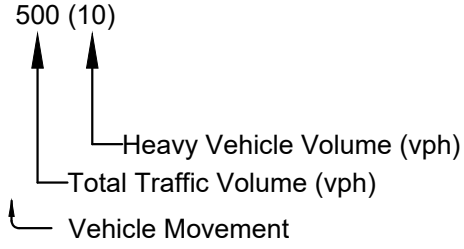
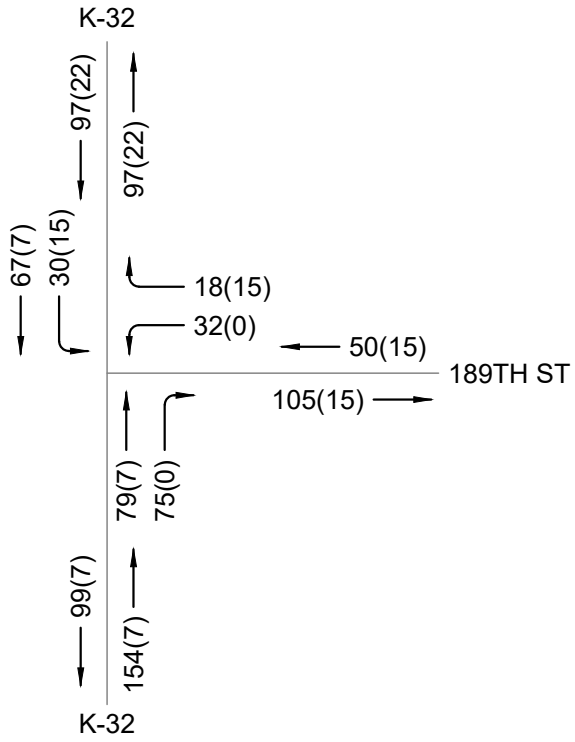


N

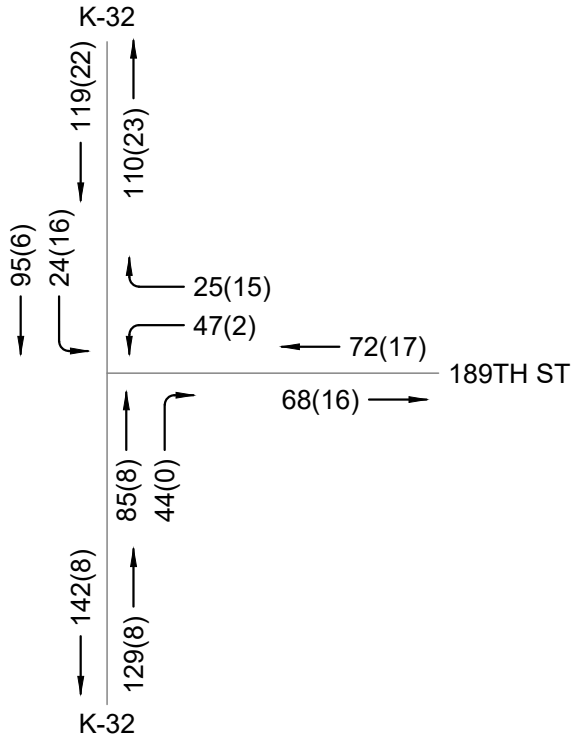
N.T.S.

GBA	PROJECT NUMBER 16477.00	TITLE	FIGURE NUMBER
	DATE 09/26/2025	GOLDEN RD & 166TH ST EXISTING + OPERATION PRIMARY ROUTE TRAFFIC VOLUMES	25

OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)



OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)



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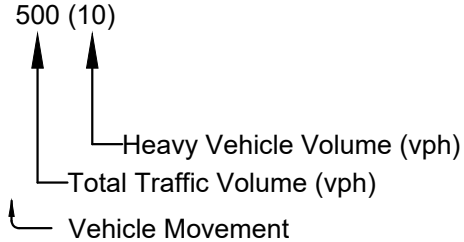
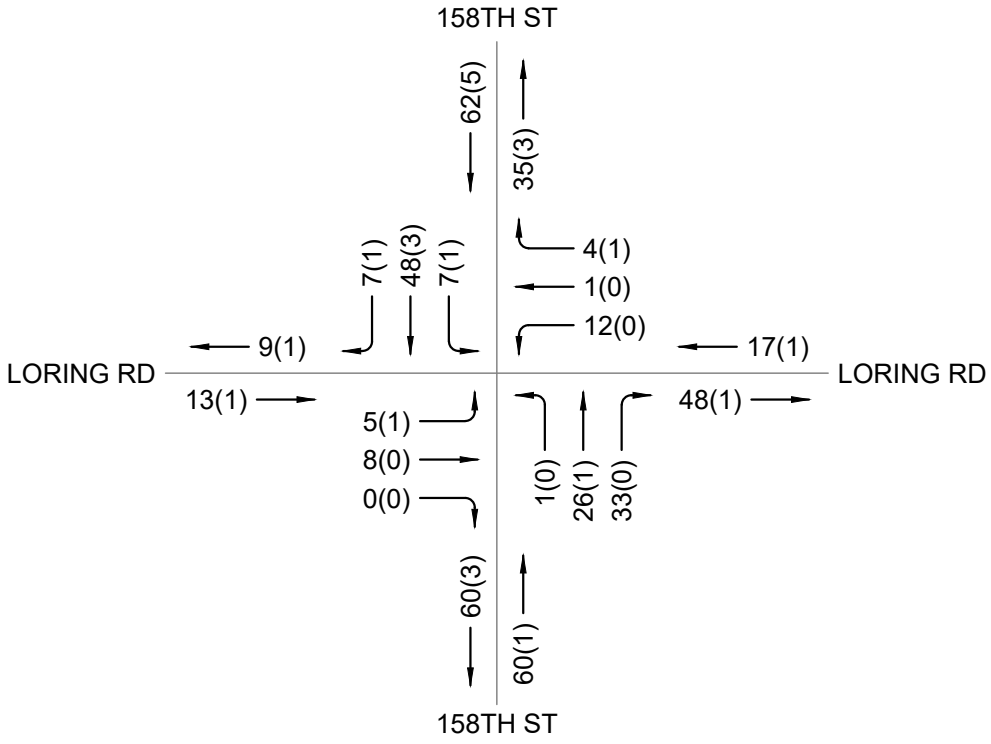


N

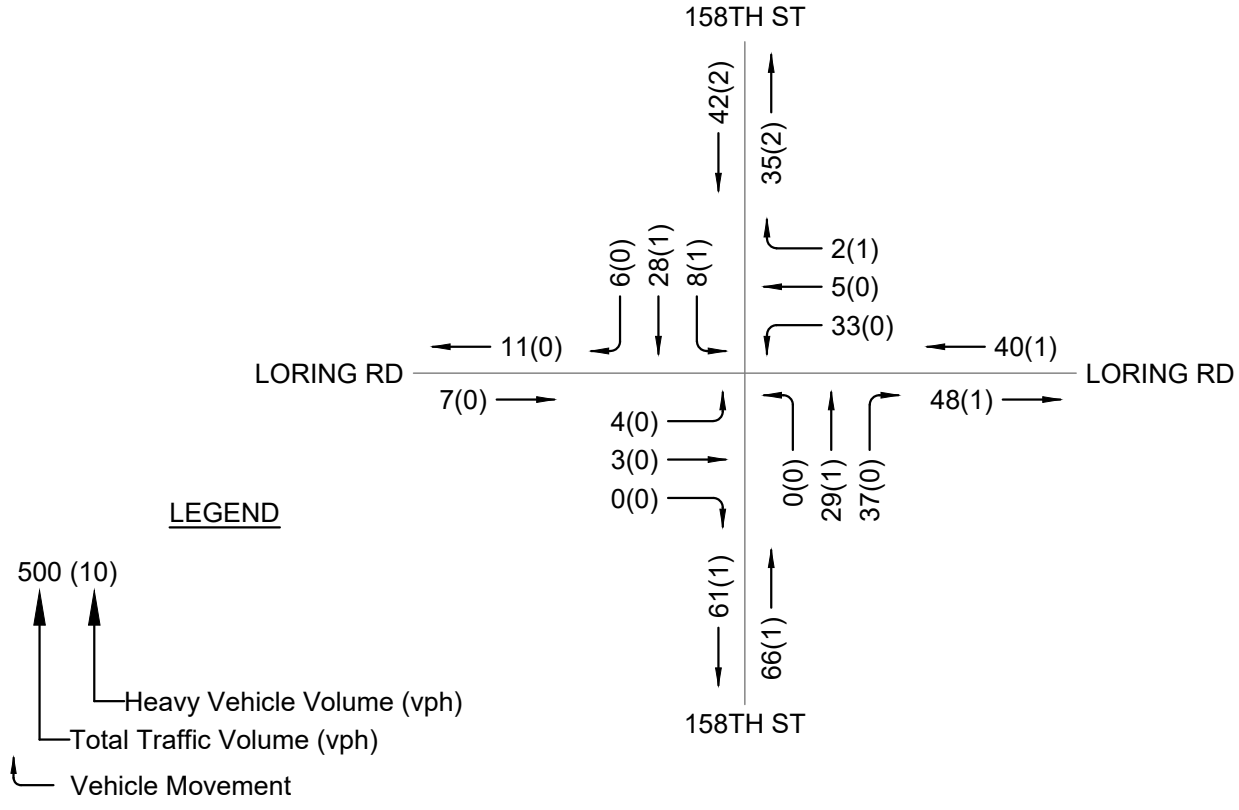
N.T.S.

	PROJECT NUMBER	TITLE	FIGURE NUMBER
GBA	16477.00	K-32 (LINWOOD RD) & 189TH ST / GOLDEN RD EXISTING + OPERATION PRIMARY ROUTE TRAFFIC VOLUMES	26
	DATE 09/26/2025		591

OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)

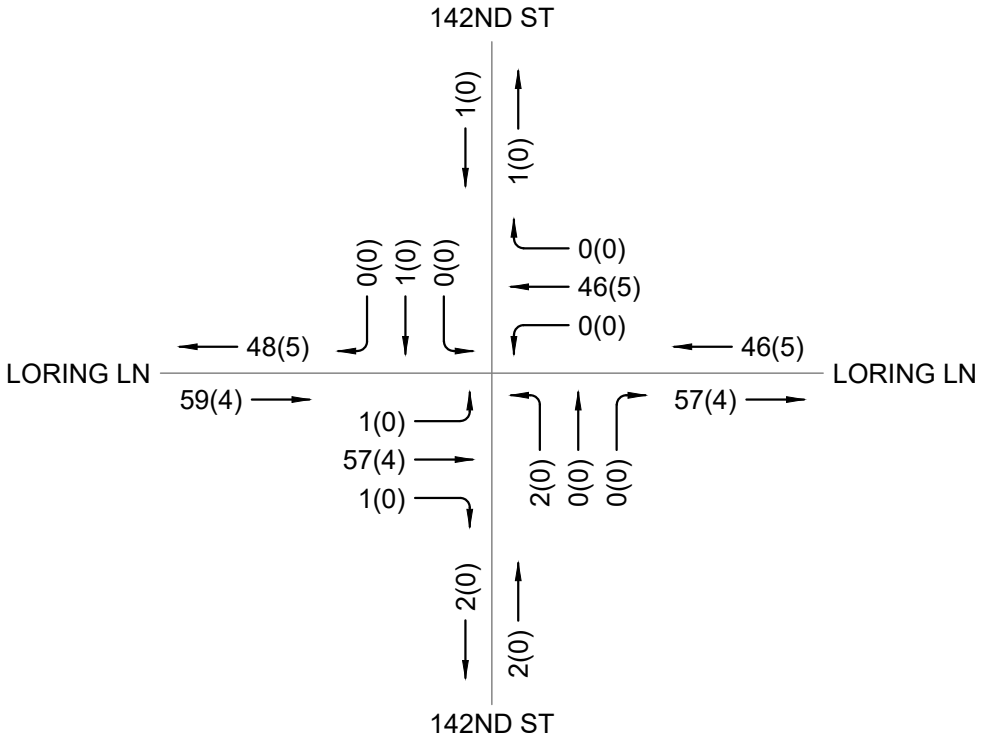


OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)

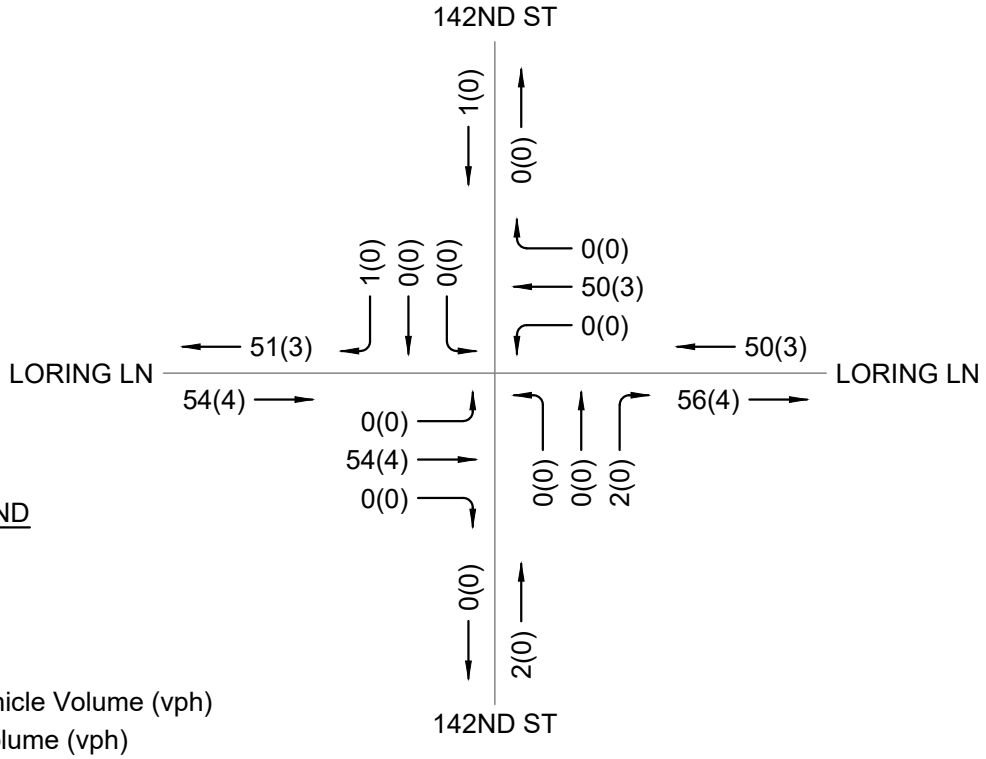


GBA	PROJECT NUMBER 16477.00 DATE 09/26/2025	TITLE 158TH ST & LORING RD EXISTING + OPERATION PRIMARY ROUTE TRAFFIC VOLUMES	FIGURE NUMBER 27 592

OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)



OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)



LEGEND

500 (10)

Heavy Vehicle Volume (vph)

Total Traffic Volume (vph)

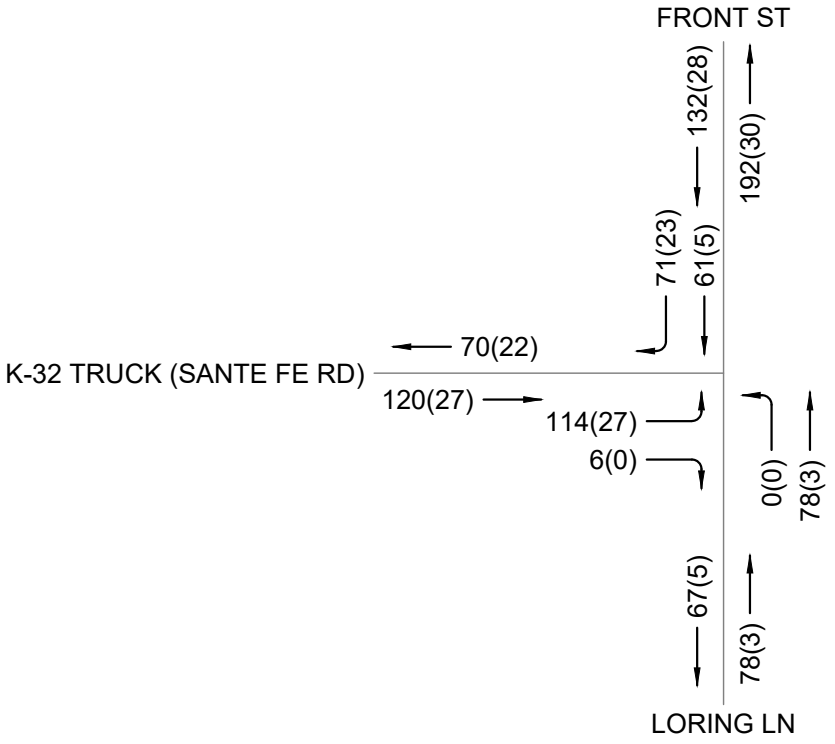
Vehicle Movement

N

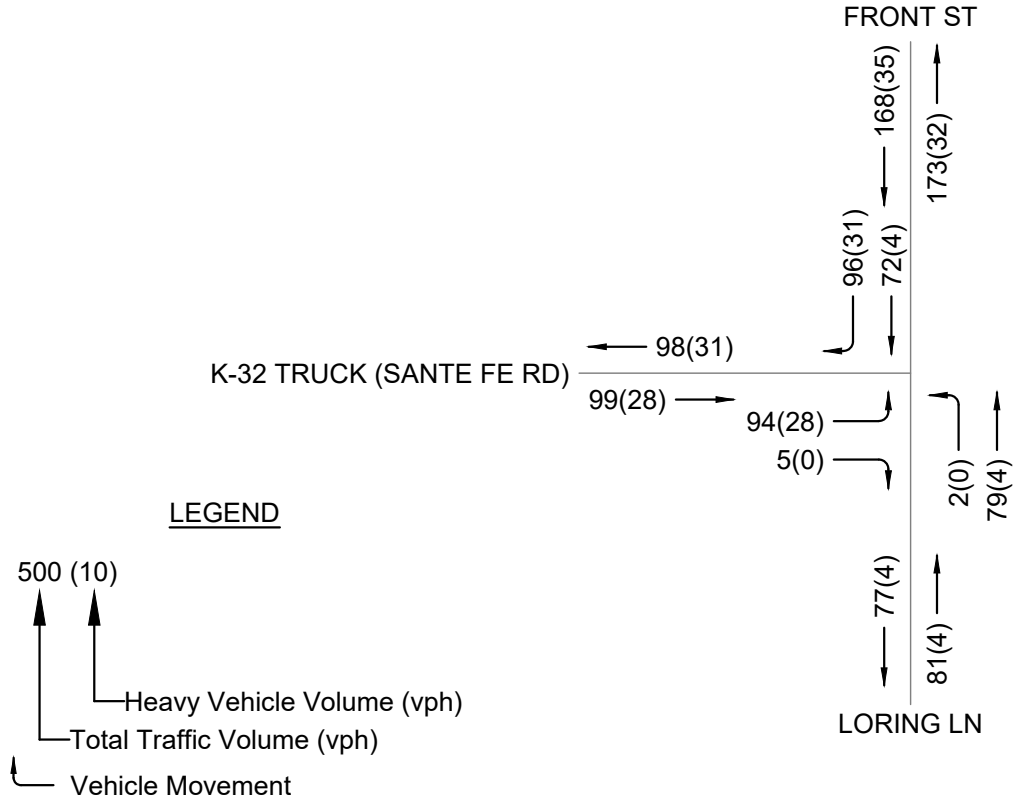
N.T.S.

GBA	PROJECT NUMBER 16477.00	TITLE	FIGURE NUMBER
	DATE 09/26/2025	LORING LN & 142ND ST EXISTING + OPERATION PRIMARY ROUTE TRAFFIC VOLUMES	28

OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)

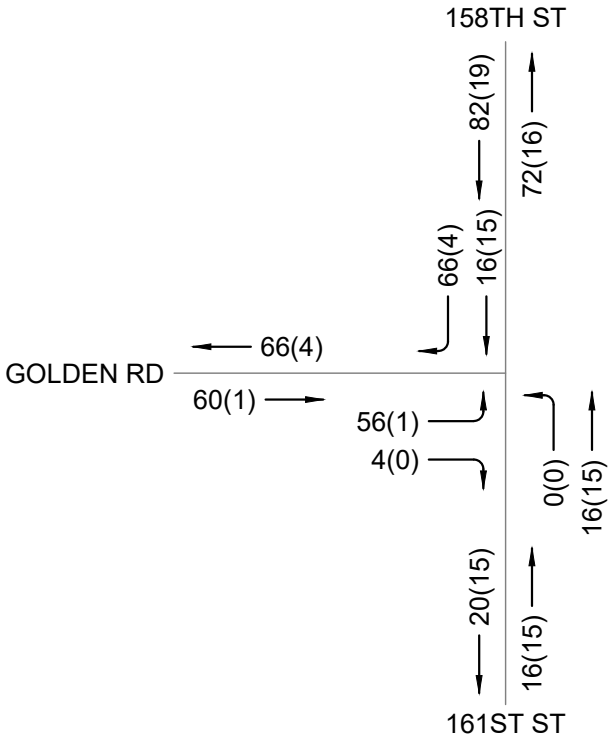


OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)

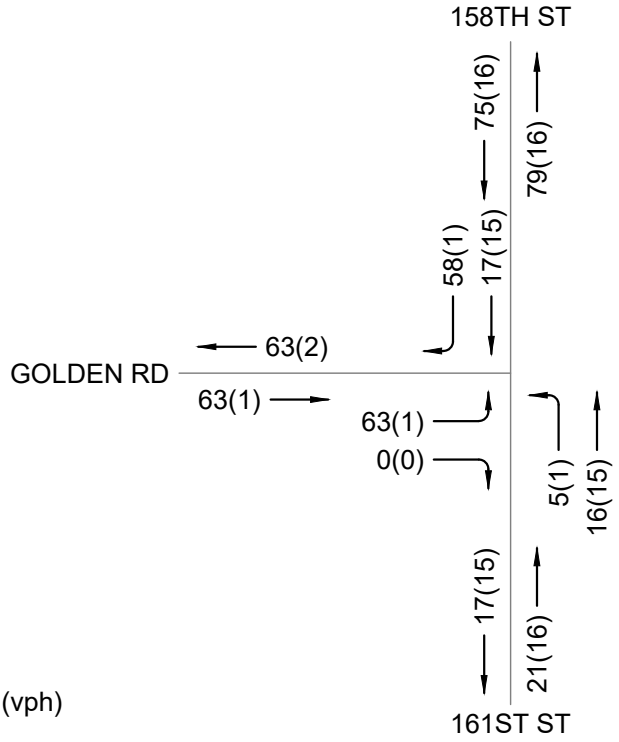


GBA	PROJECT NUMBER 16477.00	TITLE	FIGURE NUMBER 29
	DATE 09/26/2025	LORING LN / W FRONT ST & K-32 TRUCK (SANTA FE RD) EXISTING + OPERATION PRIMARY ROUTE TRAFFIC VOLUMES	594

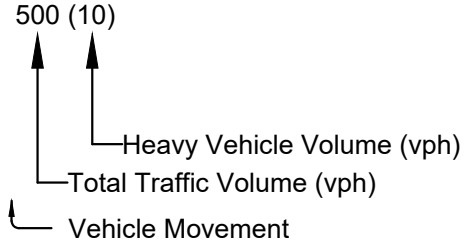
OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)



OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)



LEGEND

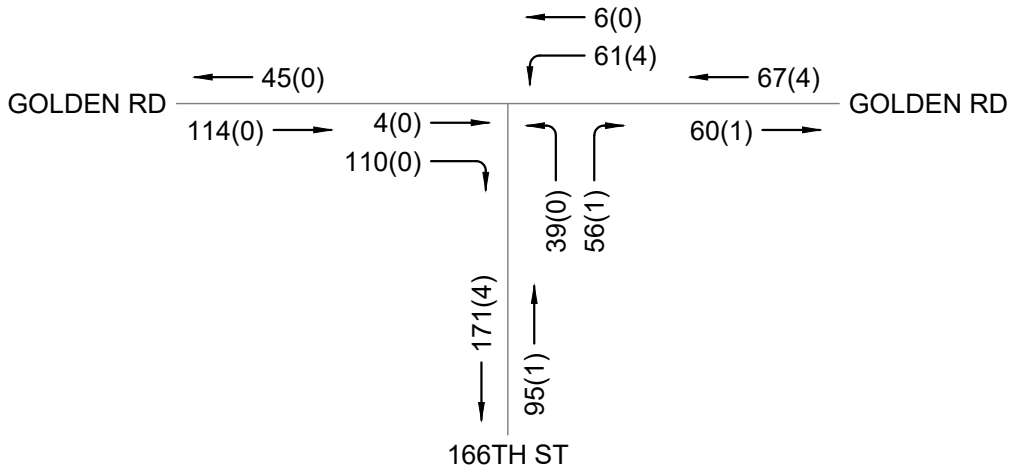




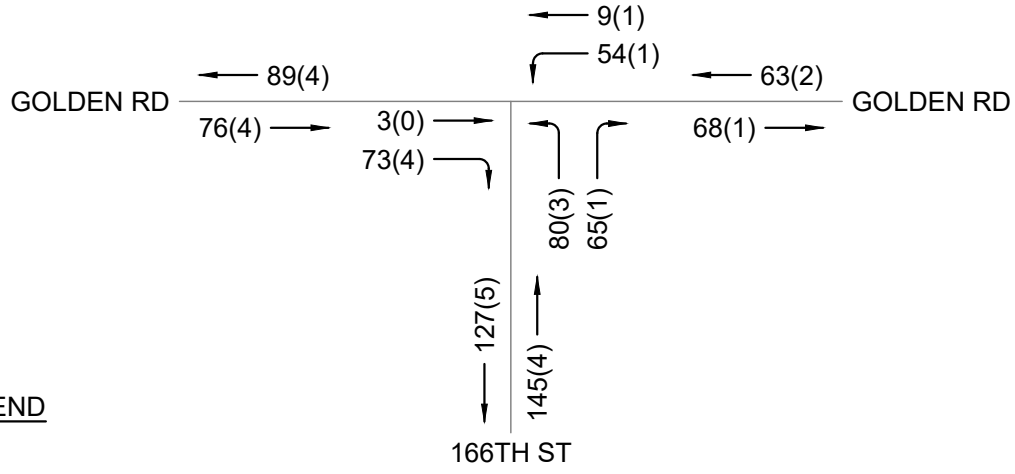
N.T.S.

GBA	PROJECT NUMBER 16477.00 DATE 09/26/2025	TITLE GOLDEN RD / 158TH ST & 161ST ST EXISTING + OPERATION ALTERNATE ROUTE TRAFFIC VOLUMES	FIGURE NUMBER 30

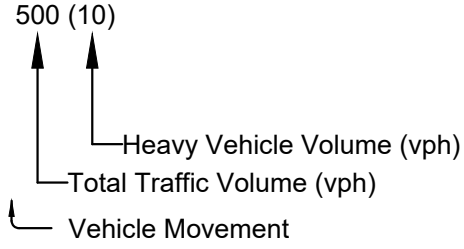
OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)



OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)



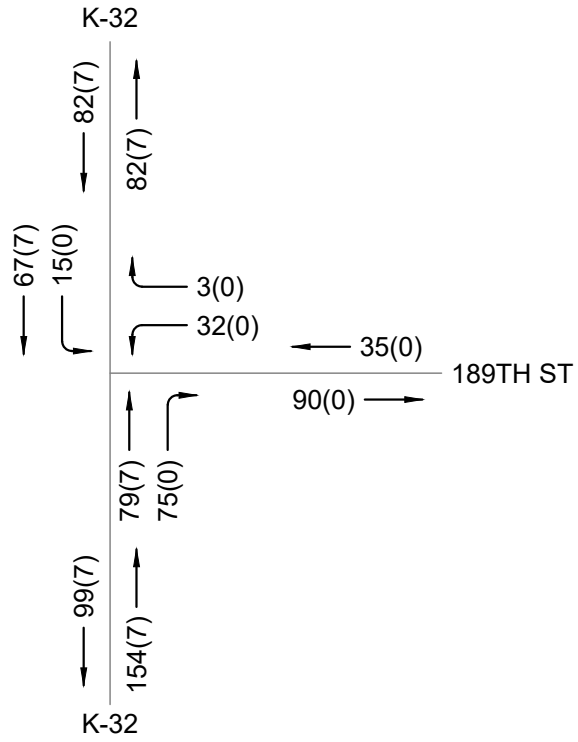
LEGEND



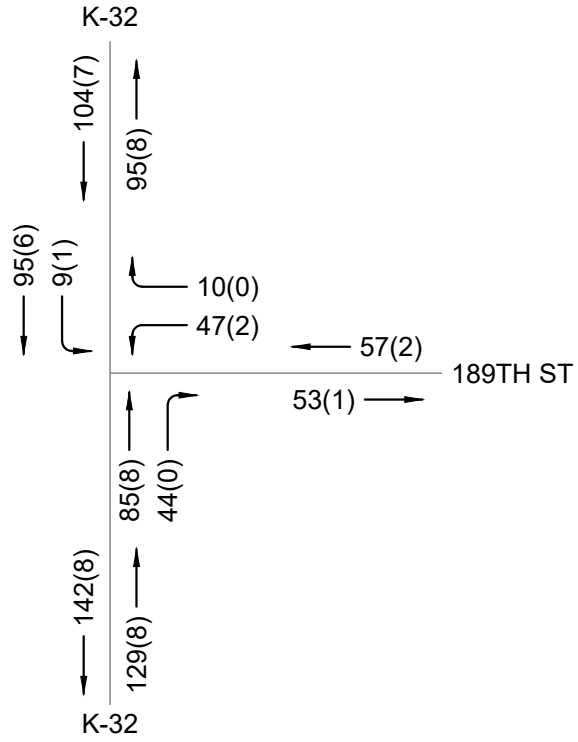


GBA	PROJECT NUMBER 16477.00	TITLE GOLDEN RD & 166TH ST EXISTING + OPERATION ALTERNATE ROUTE TRAFFIC VOLUMES	FIGURE NUMBER 31
	DATE 09/26/2025		596

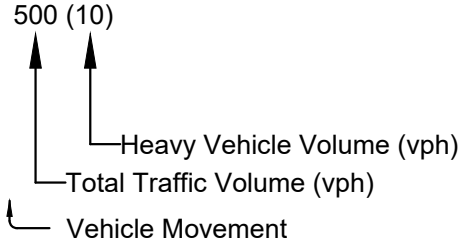
OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)



OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)



LEGEND

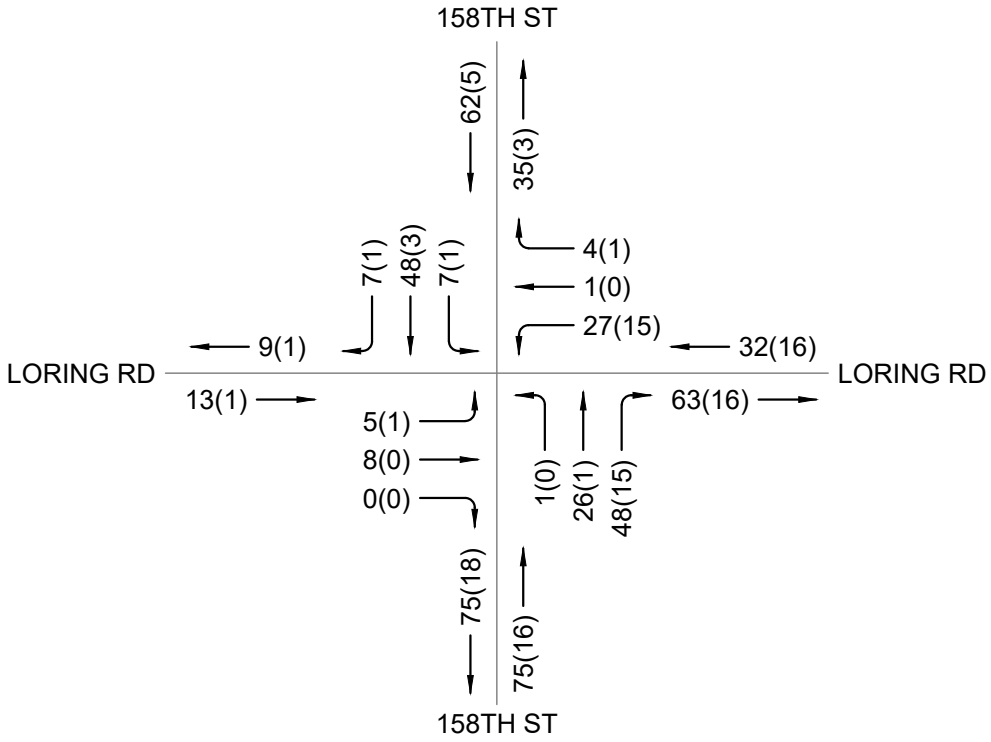


N

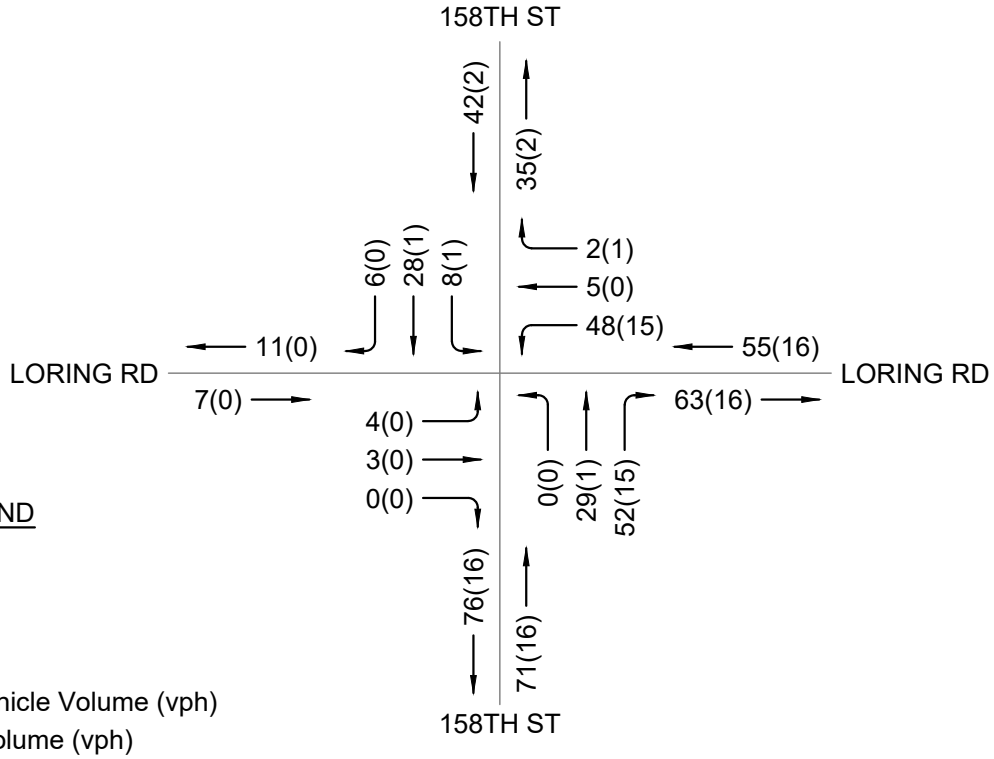
N.T.S.

	PROJECT NUMBER	TITLE	FIGURE NUMBER
GBA	16477.00	K-32 (LINWOOD RD) & 189TH ST / GOLDEN RD EXISTING + OPERATION ALTERNATE ROUTE TRAFFIC VOLUMES	32
	DATE 09/26/2025		597

OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)



OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)



LEGEND

500 (10)

Heavy Vehicle Volume (vph)

Total Traffic Volume (vph)

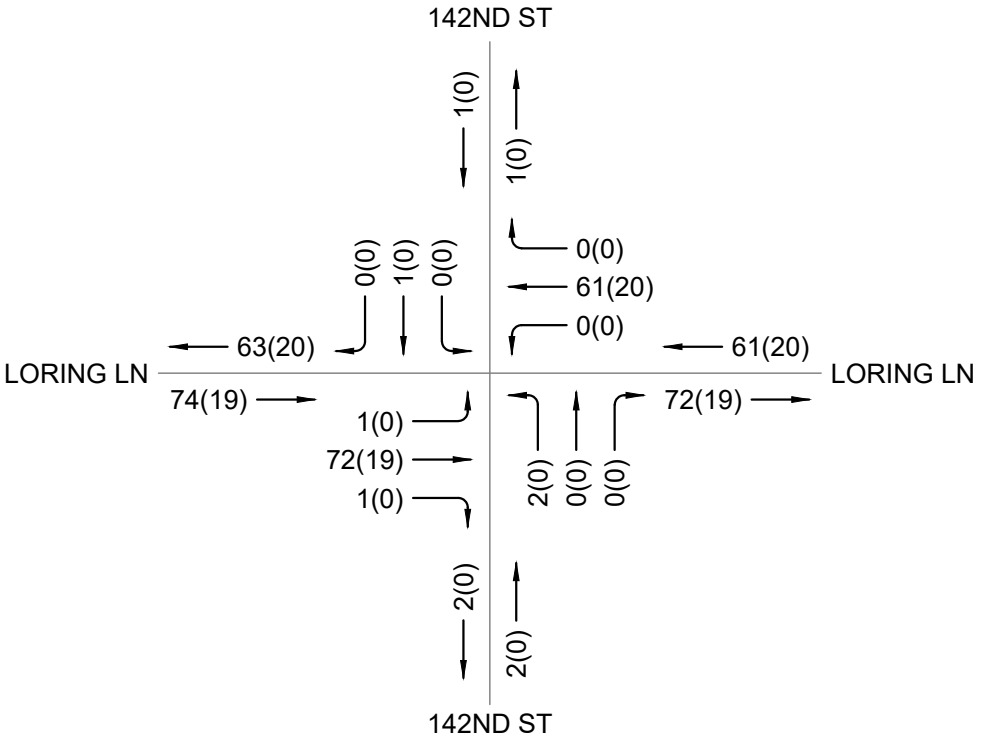
Vehicle Movement

N

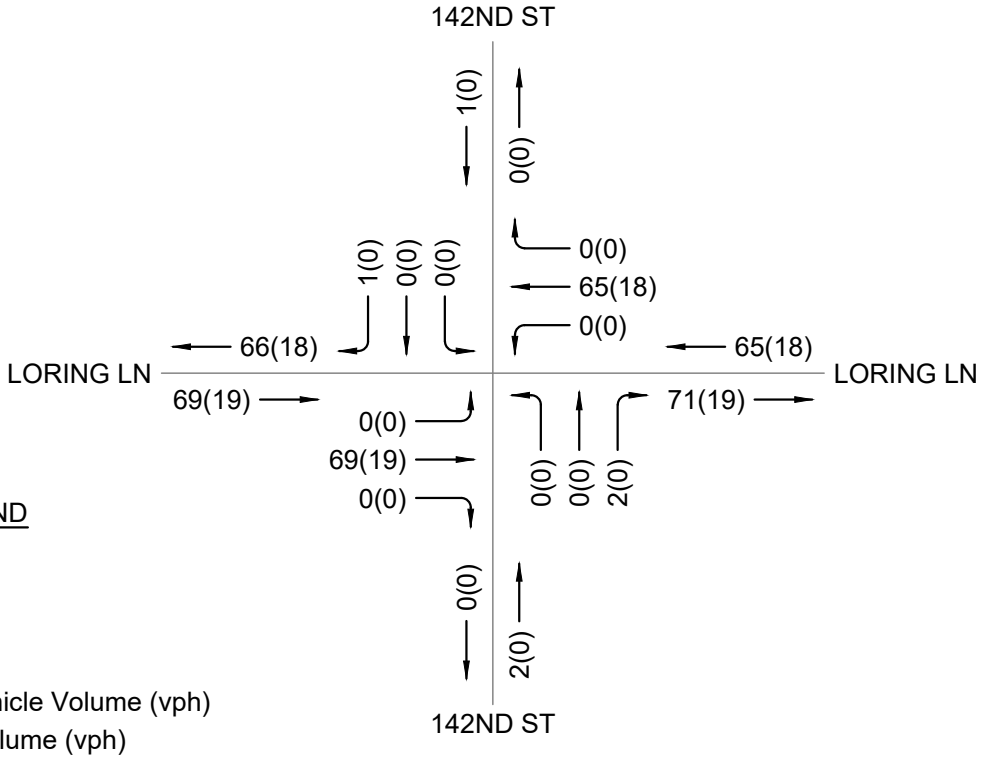
N.T.S.

GBA	PROJECT NUMBER 16477.00 DATE 09/26/2025	TITLE 158TH ST & LORING RD EXISTING + OPERATION ALTERNATE ROUTE TRAFFIC VOLUMES	FIGURE NUMBER 33 598

OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)



OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)



LEGEND

500 (10)

Heavy Vehicle Volume (vph)

Total Traffic Volume (vph)

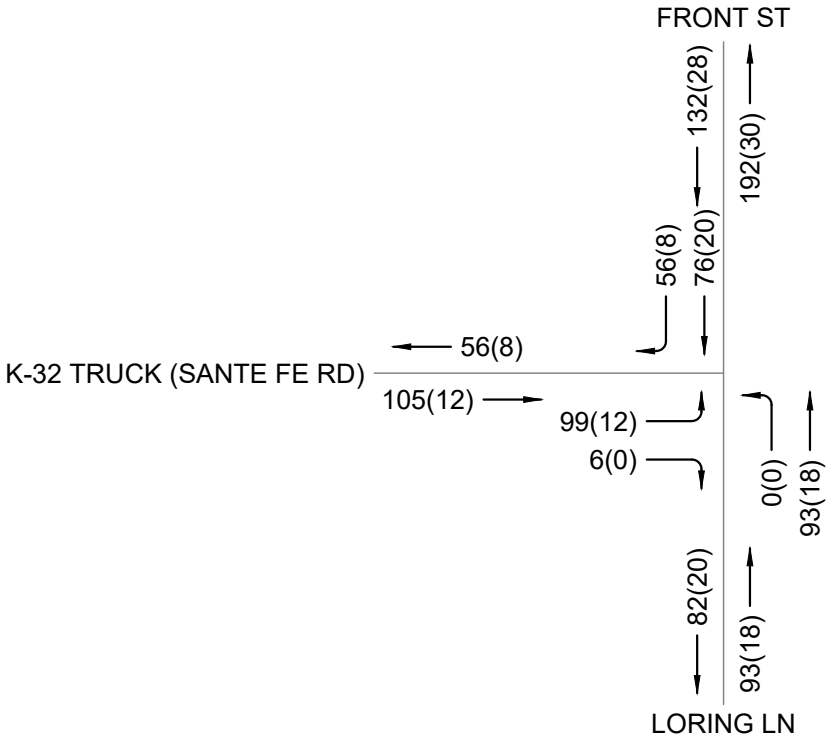
Vehicle Movement

N

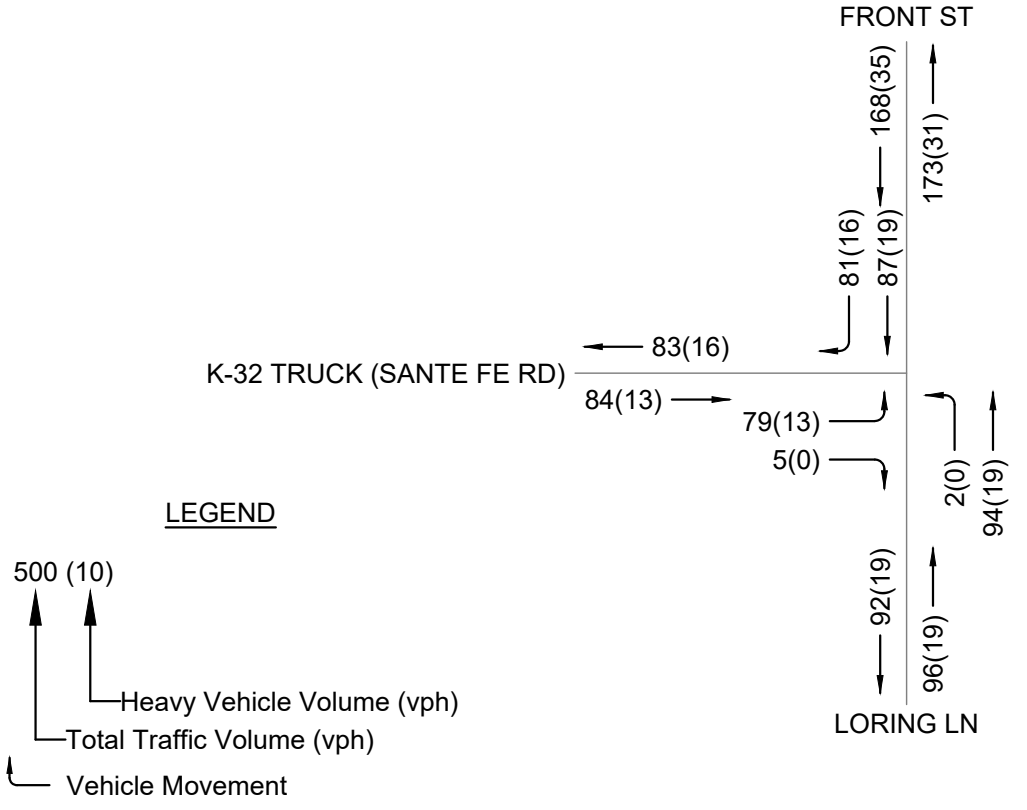
N.T.S.

GBA	PROJECT NUMBER 16477.00	TITLE LORING LN & 142ND ST EXISTING + OPERATION ALTERNATE ROUTE TRAFFIC VOLUMES	FIGURE NUMBER 34
	DATE 09/26/2025		599

OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)



OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)



GBA	PROJECT NUMBER 16477.00 DATE 09/26/2025	TITLE LORING LN / W FRONT ST & K-32 TRUCK (SANTA FE RD) EXISTING + OPERATION PRIMARY ROUTE TRAFFIC VOLUMES	FIGURE NUMBER 35 600

Intersection Turn Lane Warrants

Intersection turn lane warrants were reviewed at each of the six study intersections following the current design criteria presented in the KDOT *Access Management Policy*. A thorough review of turn lane warrants at each study intersection may be seen below. Volumes were based on the maximum increase in turning movement volumes for Primary or Alternate Haul Routes, as shown previously in **Figures 24 – 35**. Full calculations for turn lane warrants at each intersection may be seen in **Appendix H**.

Golden Road / 158th Street & 161st Street- (Primary and Alternate Routes)

Based on the auxiliary turn lane volumetric warrants presented in the KDOT *Access Management Policy*, eastbound right-turn lane and westbound left-turn lane warrants were not satisfied at the Golden Road / 158th Street & 161st Street intersection under the analyzed peak hour volume scenarios.

Golden Road & 166th Street- (Primary Route)

Based on the auxiliary turn lane volumetric warrants presented in the KDOT *Access Management Policy*, eastbound right-turn lane warrants were satisfied, while a westbound left-turn lane warrants were not satisfied at the Golden Road & 166th Street intersection under the analyzed peak hour volume scenarios.

Although warrants are satisfied, eastbound right-turns account for approximately 98% of eastbound movements at the intersection during the Existing Operational A.M. Peak Hour, and operations are acceptable at the intersection. Additionally, the Primary Route will not add any right-turning movements at the intersection. Therefore, it is not recommended that a right-turn lane or right-turn lane taper be constructed. Furthermore, the proposed operation is not anticipated to increase the volume of eastbound right-turns, but will increase the volume of through movements during the operational hours.

K-32 (Linwood Road) & 189th Street / Golden Road- (Primary Route)

Based on the auxiliary turn lane volumetric warrants presented in the KDOT *Access Management Policy*, northbound right-turn lane warrants were satisfied, while southbound left-turn lane warrants were not satisfied at the K-32 (Linwood Road) & 189th Street / Golden Road intersection under the analyzed peak hour volume scenarios.

While the eastbound right-turn lane warrants were satisfied, this auxiliary lane is already in place at the intersection. The right-turn lane length should be adjusted to meet the KDOT *Access Management Policy* Section 4.5.3.A. The existing length of the right-turn lane is 250 ft. with a 140 ft. taper. The required right-turn lane length for the 65 mph speed limit making a right-turn at 15 mph requires a deceleration length of 505 ft. with a 118 ft. taper.

For vehicles making a northbound right-turn onto K-32 (Linwood Road), a 375 ft. acceleration taper is currently provided. However, this taper does not meet the 600 ft. minimum length as outlined in the KDOT *Access Management Policy* Section 4.5.4.D.

158th Street & Loring Road- (Alternate Route)

Based on the auxiliary turn lane volumetric warrants presented in the KDOT *Access Management Policy*, northbound right-turn lane taper warrants are satisfied at the 158th Street & Loring Road intersection under the analyzed peak hour volume scenarios. However, no other northbound or southbound left-turn or right-turn warrants were satisfied under the analyzed volume scenarios.

It is recommended that a northbound right-turn lane taper be constructed in accordance with the current design criteria in the KDOT *Access Management Policy*, and be 250 ft. in length.

Loring Lane & 142nd Street- (Alternate Route)

Based on the auxiliary turn lane volumetric warrants presented in the KDOT *Access Management Policy*, no eastbound or westbound left-turn or right-turn lane warrants were satisfied at the Road / Loring Lane & 142nd Street intersection under the analyzed peak hour volume scenarios.

Loring Lane / West Front Street & K-32 Truck Route (Santa Fe Road)- (Alternate Route)

Based on the auxiliary turn lane volumetric warrants presented in the KDOT *Access Management Policy*, southbound right-turn lane and northbound left-turn lane warrants were not satisfied at the Loring Lane / West Front Street & K-32 Truck Route (Santa Fe Road) intersection under the analyzed peak hour volume scenarios.

Importantly, the warrants for the Loring Lane / West Front Street & K-32 Truck Route (Santa Fe Road) utilized current design criteria for four-lane highways, which differs from the two-lane highway design criteria used for the other five study intersections.

Intersection Capacity Analysis

As was completed for existing volume conditions, intersection capacity analyses under "existing + operation" volumes were completed in Synchro Version 12, with the same judgement criteria of Level of Service (LOS) and queuing. A full listing of LOS conditions for both signalized and unsignalized intersections may be seen in **Exhibit B**. The Synchro results of the LOS analysis for existing traffic counts for the Operational A.M. and P.M. Peak Hours are summarized in **Figures 36 – 47**. The completed analyses indicate that key movements at each intersection perform at LOS "B" or better during the Operational A.M and P.M. Peak Hours. A summary of intersection operations under "existing + operation" volume conditions, as well as a comparison to operations under existing volume conditions, may be seen in **Table 14**. **Appendix B** includes detailed Synchro reports for each analyzed intersection. As shown in **Table 14**, when site-generated operational traffic is distributed on the surrounding roadway network, and operation traffic utilizes the Primary Route, intersection operations are expected to remain acceptable, with all six intersections and key movements operating at LOS "B" or better. Additionally, marginal delay increases are expected at intersections with increased traffic.

Table 14. Comparison of Existing and Existing + Operation Intersection Operations for Primary Route

Intersection	Movement	Existing		Existing + Operation	
		A.M. Peak Hour LOS (Delay (s))	P.M. Peak Hour LOS (Delay (s))	A.M. Peak Hour LOS (Delay (s))	P.M. Peak Hour LOS (Delay (s))
Golden Road / 158th Street & 161st Street	WB	A (8.7)	B (10.6)	B (10.5)	B (10.5)
	SBL	A (0.0)	A (7.4)	A (7.4)	A (7.4)
Golden Road & 166th Street	NB	A (10.0)	B (10.5)	B (10.2)	B (10.7)
	WBL	A (7.7)	A (7.5)	A (7.7)	A (7.5)
K-32 (Linwood Road) & 189th Street / Golden Road	WB	A (9.9)	B (10.5)	B (10.3)	B (10.7)
	SBL	A (7.6)	A (7.7)	A (8.2)	A (8.4)
158th Street & Loring Road	NBL	A (7.4)	A (0.0)	A (7.4)	A (0.0)
	EB	B (10.2)	A (9.5)	B (10.2)	A (9.5)
	WB	A (9.7)	A (9.8)	A (9.7)	A (9.8)
	SBL	A (7.5)	A (7.5)	A (7.5)	A (7.5)
Loring Lane & 142nd Street	NB	`A (9.7)	A (8.7)	A (9.7)	A (8.7)
	EBL	A (7.4)	A (0.0)	A (7.4)	A (0.0)
	WBL	A (0.0)	A (0.0)	A (0.0)	A (0.0)
	SB	A (10.1)	A (8.7)	B (10.1)	A (8.7)
Loring Lane / West Front Street & K-32 Truck Route (Santa Fe Road)	NBL	A (0.0)	A (7.6)	A (0.0)	A (7.6)
	EB	B (10.4)	B (11.2)	B (10.9)	B (11.8)

Note: Movements not shown are free-flowing, and do not have an associated level of service.

As shown in **Table 15**, when site-generated operational traffic is distributed on the surrounding roadway network, and operation traffic utilizes the Alternate Route, intersection operations are expected to remain acceptable, with all six intersections and key movements operating at LOS "B" or better. Additionally, marginal delay increases are expected at intersections with increased traffic.

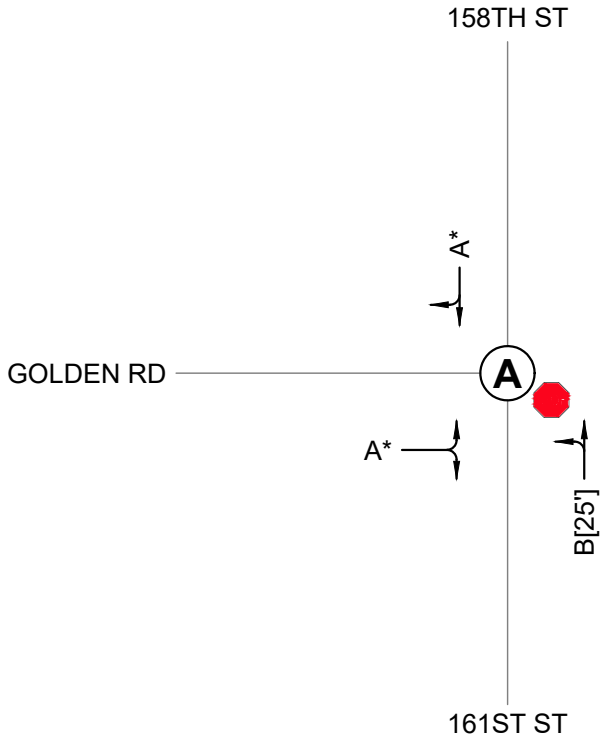
Table 15. Comparison of Existing and Existing + Operation Intersection Operations for Alternate Route

Intersection	Movement	Existing		Existing + Operation	
		A.M. Peak Hour LOS (Delay (s))	P.M. Peak Hour LOS (Delay (s))	A.M. Peak Hour LOS (Delay (s))	P.M. Peak Hour LOS (Delay (s))
Golden Road / 158th Street & 161st Street	WB	A (8.7)	B (10.6)	A (9.9)	A (9.8)
	SBL	A (0.0)	A (7.4)	A (8.3)	A (8.3)
Golden Road & 166th Street	NB	A (10.0)	B (10.5)	A (10.0)	B (10.5)
	WBL	A (7.7)	A (7.5)	A (7.7)	A (7.5)
K-32 (Linwood Road) & 189th Street / Golden Road	WB	A (9.9)	B (10.5)	A (9.9)	B (10.5)
	SBL	A (7.6)	A (7.7)	A (7.6)	A (7.7)
158th Street & Loring Road	NBL	A (7.4)	A (0.0)	A (7.4)	A (0.0)
	EB	B (10.2)	A (9.5)	B (10.3)	A (9.6)
	WB	A (9.7)	A (9.8)	B (10.6)	B (10.3)
	SBL	A (7.5)	A (7.5)	A (7.6)	A (7.5)
Loring Lane & 142nd Street	NB	A (9.7)	A (8.7)	A (9.9)	A (8.8)
	EBL	A (7.4)	A (0.0)	A (7.4)	A (0.0)
	WBL	A (0.0)	A (0.0)	A (0.0)	A (0.0)
	SB	A (10.1)	A (8.7)	B (10.3)	A (8.7)
Loring Lane / West Front Street & K-32 Truck Route (Santa Fe Road)	NBL	A (0.0)	A (7.6)	A (0.0)	A (7.6)
	EB	B (10.4)	B (11.2)	B (10.6)	B (10.2)

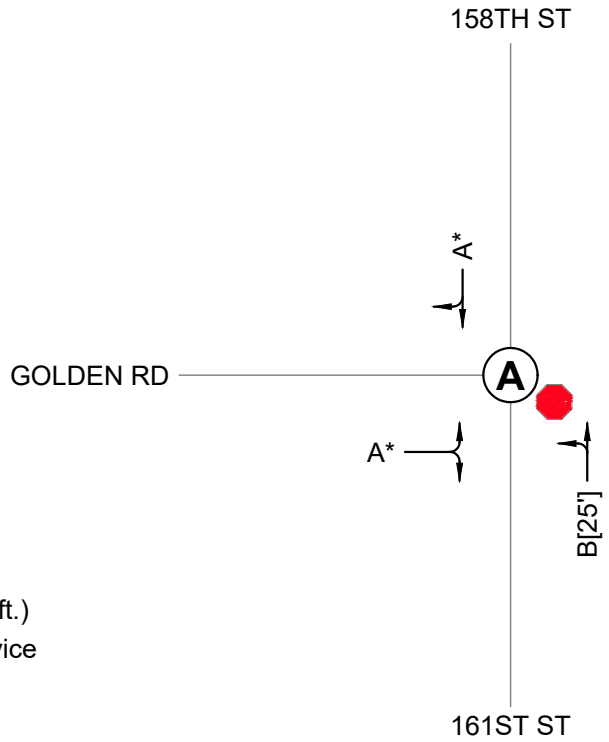
Note: Movements not shown are free-flowing, and do not have an associated level of service.

The sand operation is anticipated to create an increase of daily traffic of 250 vehicles. The existing daily traffic along the Primary Route ranges between 2,300 - 2,670 vehicles per day. Therefore, the sand operation site development would increase traffic along the Primary Route by approximately 10%. Due to the existing capacity of the Primary Route to handle traffic demand, there little operational concern, as the daily capacity of a two-lane roadway is approximately 10,000 vehicles per day.

OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)



OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)



LEGEND

A [100'] — 95th Percentile Queue (ft.) / Movement Level of Service

A* Capacity per Demand

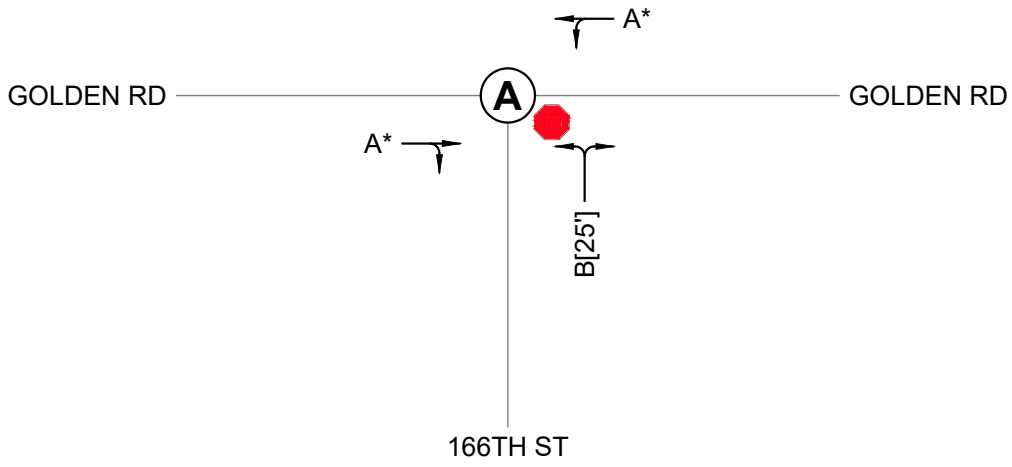
(A) Stop-Controlled Intersection Overall Level of Service

N

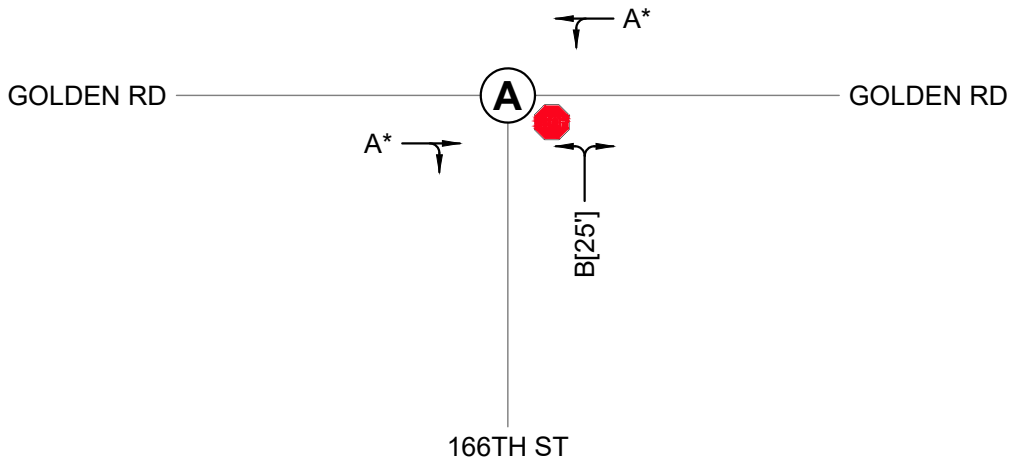
N.T.S.

	PROJECT NUMBER	TITLE	FIGURE NUMBER
GBA	16477.00	GOLDEN RD / 158TH ST & 161ST ST	36
	DATE 09/26/2025	EXISTING + OPERATION PRIMARY ROUTE INTERSECTION OPERATIONS	605

OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)



OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)



LEGEND

A [100'] — 95th Percentile Queue (ft.) / Movement Level of Service

A* Capacity per Demand

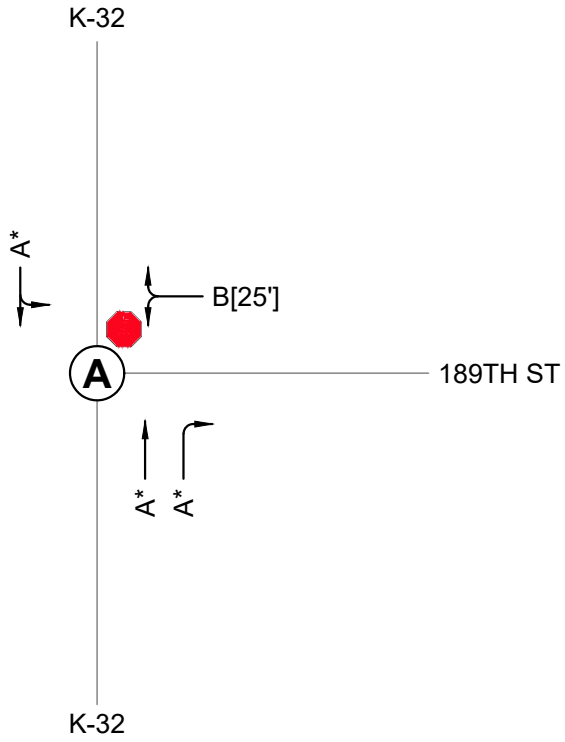
(A) Stop-Controlled Intersection Overall Level of Service

N

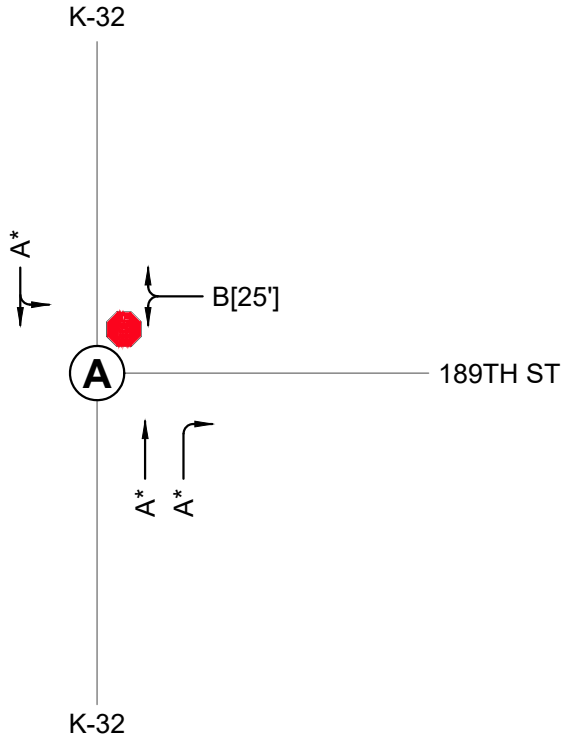
N.T.S.

	PROJECT NUMBER	TITLE	FIGURE NUMBER
GBA	16477.00	GOLDEN RD & 166TH ST	37
	DATE 09/26/2025	EXISTING + OPERATION PRIMARY ROUTE INTERSECTION OPERATIONS	606

OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)



OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)



LEGEND

A [100']
- 95th Percentile Queue (ft.)
- Movement Level of Service

A* Capacity per Demand

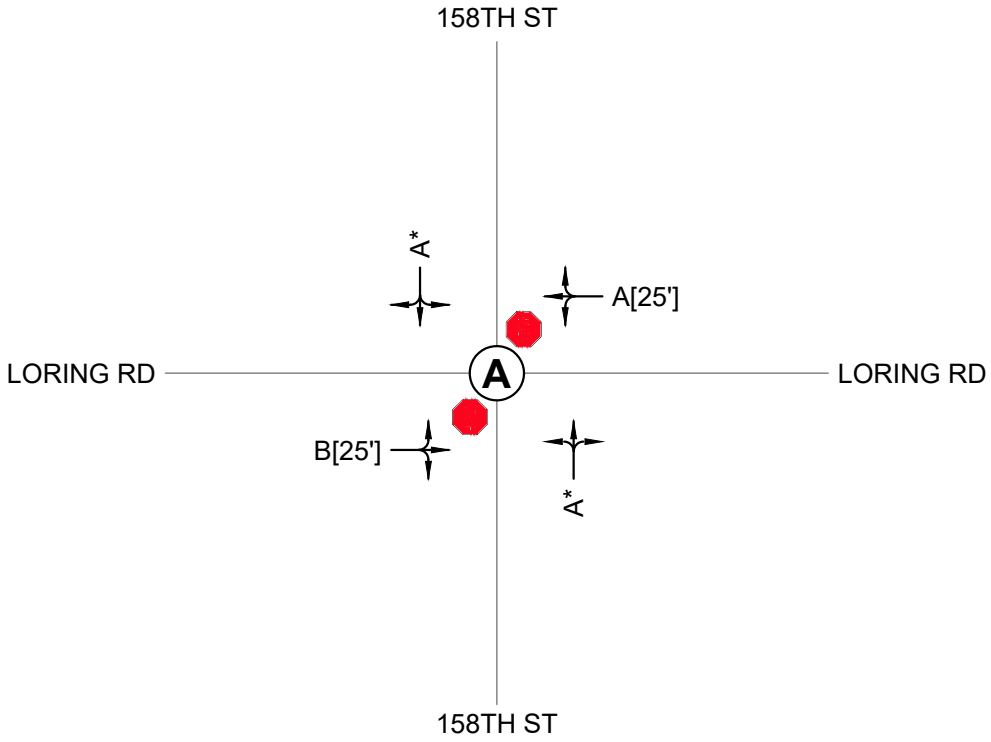
(A) Stop-Controlled Intersection Overall Level of Service

N

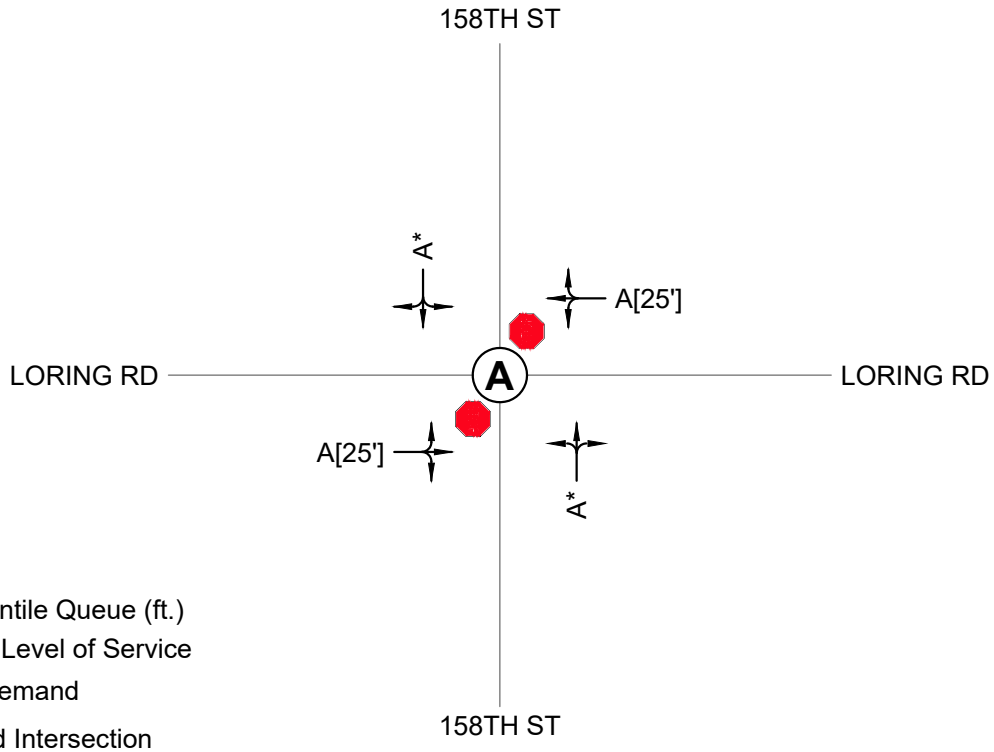
N.T.S.

GBA	PROJECT NUMBER 16477.00 DATE 09/26/2025	TITLE K-32 (LINWOOD RD) & 189TH ST / GOLDEN RD EXISTING + OPERATION PRIMARY ROUTE INTERSECTION OPERATIONS	FIGURE NUMBER 38 607

OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)



OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)



LEGEND

A [100'] — 95th Percentile Queue (ft.) / Movement Level of Service

A* Capacity per Demand

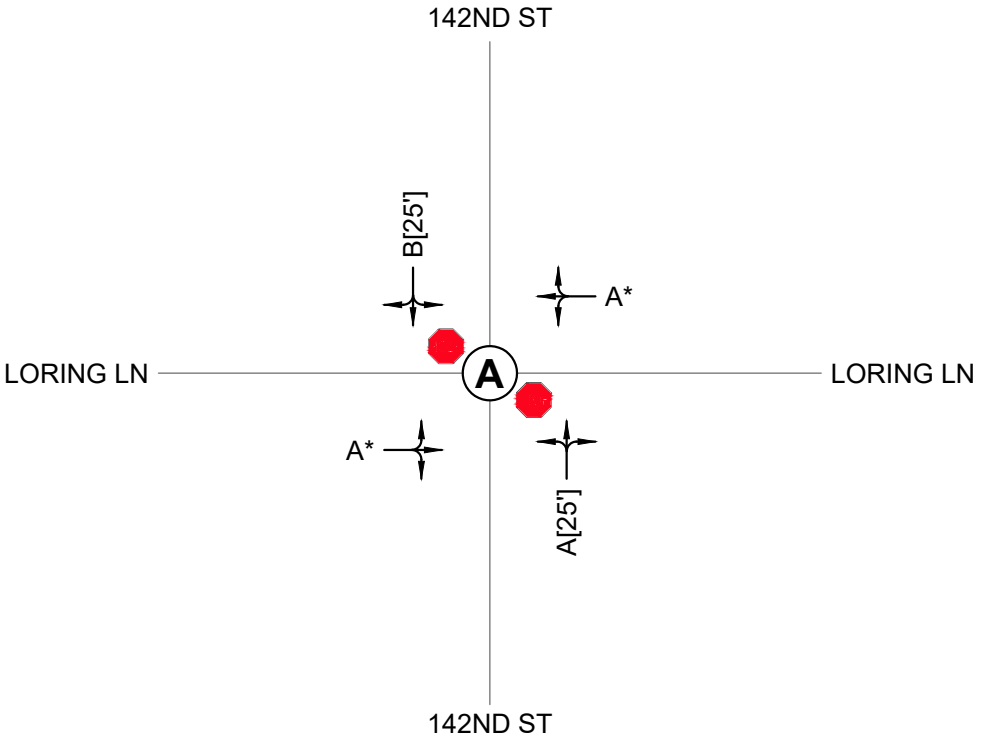
(A) Stop-Controlled Intersection Overall Level of Service

N

N.T.S.

GBA	PROJECT NUMBER 16477.00 DATE 09/26/2025	TITLE 158TH ST & LORING RD EXISTING + OPERATION PRIMARY ROUTE INTERSECTION OPERATIONS	FIGURE NUMBER 39 608

OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)



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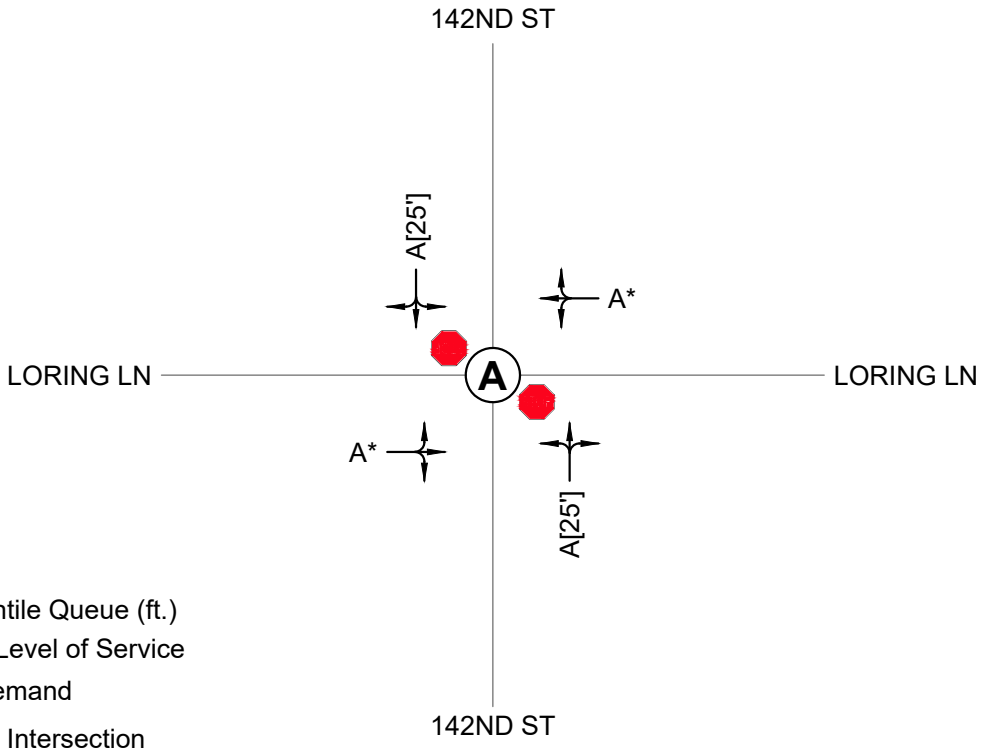


LEGEND

A [100'] — 95th Percentile Queue (ft.) / Movement Level of Service

A* Capacity per Demand

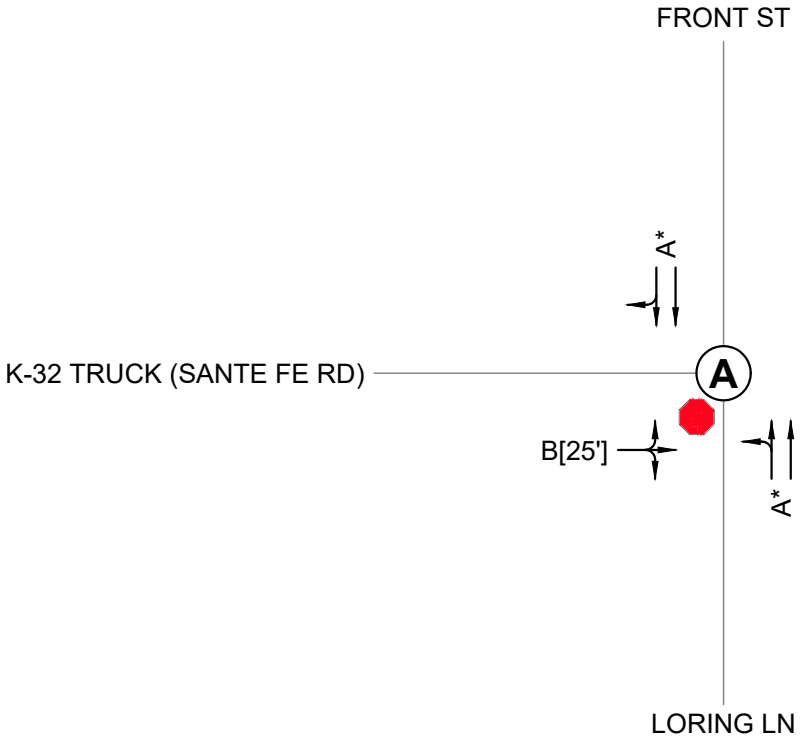
(A) Stop-Controlled Intersection Overall Level of Service

N

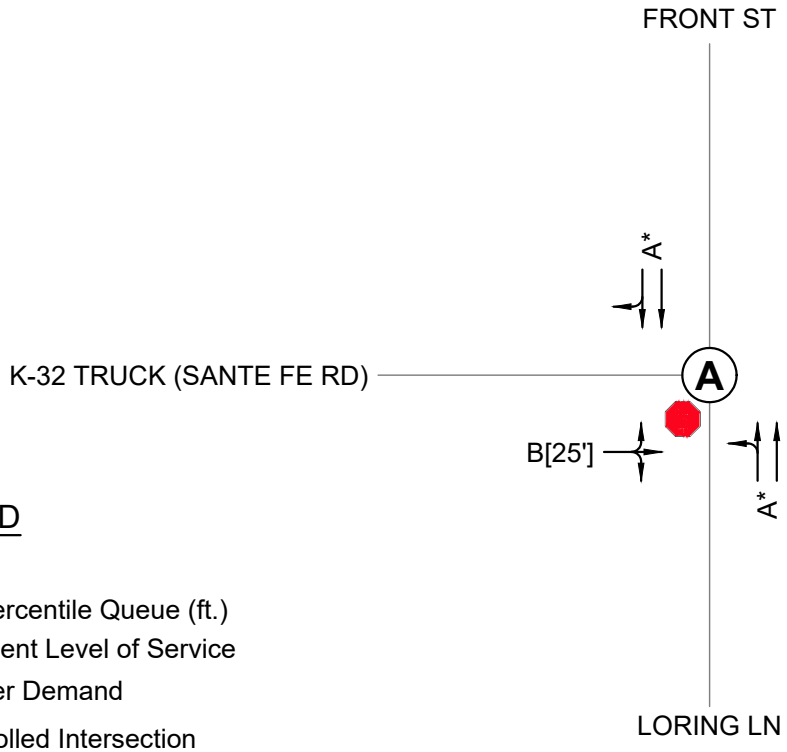
N.T.S.

GBA	PROJECT NUMBER 16477.00	TITLE	FIGURE NUMBER
	DATE 09/26/2025	LORING LN & 142ND ST EXISTING + OPERATION PRIMARY ROUTE INTERSECTION OPERATIONS	40 609

OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)



OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)



LEGEND

A [100']
- 95th Percentile Queue (ft.)
- Movement Level of Service

A* Capacity per Demand

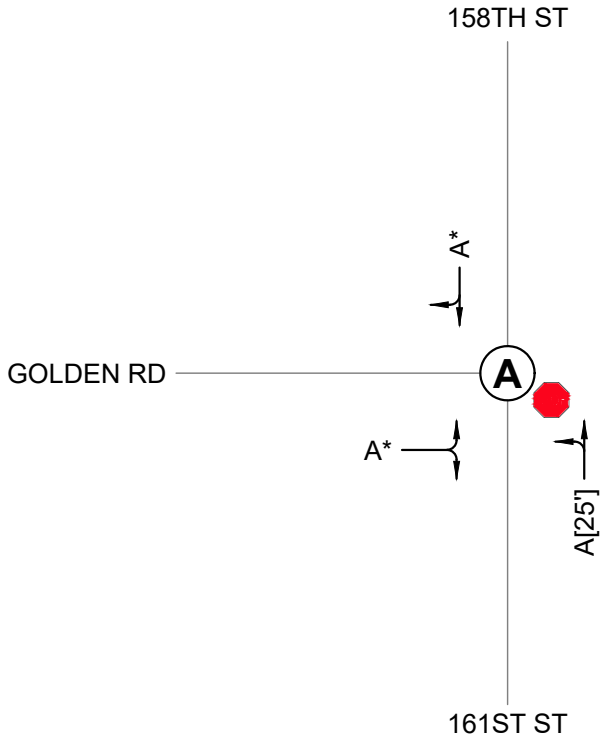
(A) Stop-Controlled Intersection Overall Level of Service

N

N.T.S.

	PROJECT NUMBER	TITLE	FIGURE NUMBER
GBA	16477.00	LORING LN / W FRONT ST & K-32 TRUCK (SANTA FE RD) EXISTING + OPERATION PRIMARY ROUTE INTERSECTION OPERATIONS	41
	DATE 09/26/2025		610

OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)



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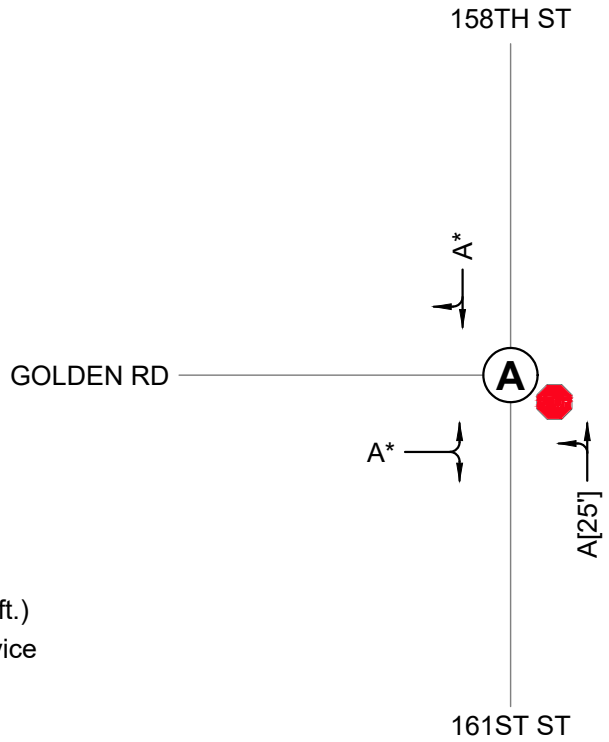


LEGEND

A [100'] — 95th Percentile Queue (ft.) / Movement Level of Service

A* Capacity per Demand

(A) Stop-Controlled Intersection Overall Level of Service

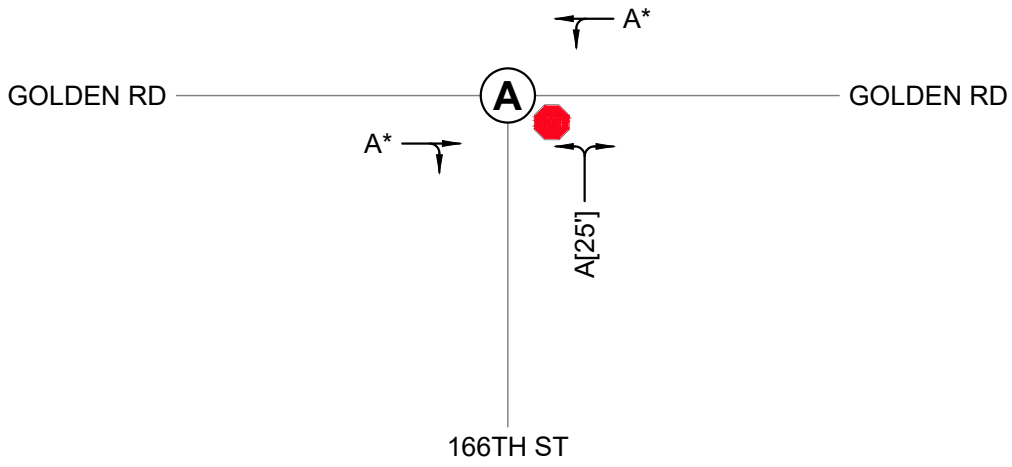
N

N.T.S.

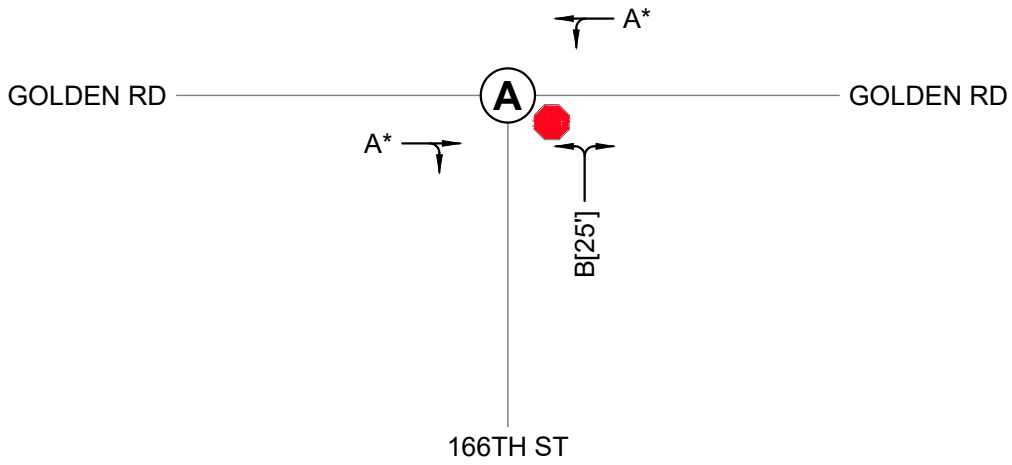
GBA

PROJECT NUMBER	TITLE	FIGURE NUMBER
16477.00	GOLDEN RD / 158TH ST & 161ST ST EXISTING + OPERATION ALTERNATE ROUTE INTERSECTION OPERATIONS	42
DATE 09/26/2025		611

OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)



OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)



LEGEND

A [100'] — 95th Percentile Queue (ft.) / Movement Level of Service

A* Capacity per Demand

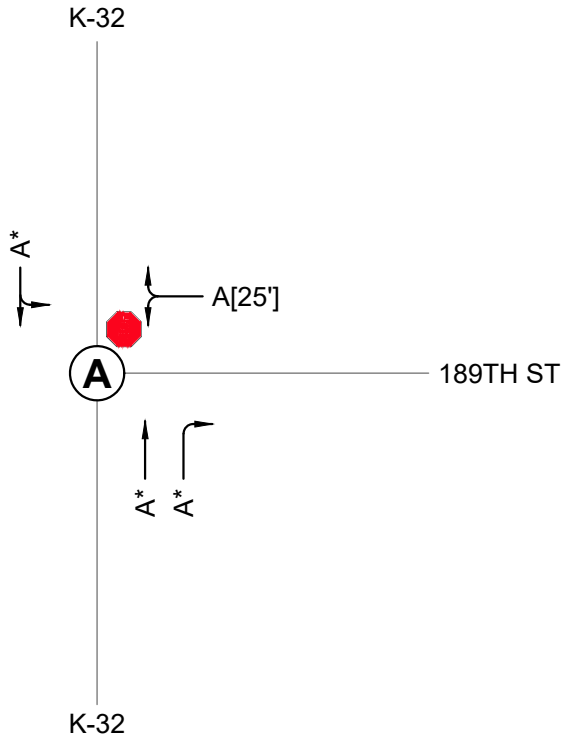
(A) Stop-Controlled Intersection Overall Level of Service

N

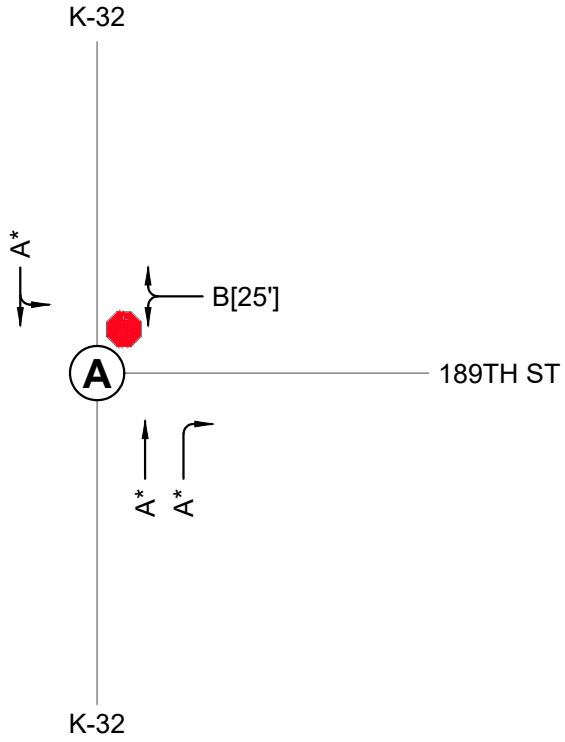
N.T.S.

GBA	PROJECT NUMBER 16477.00	TITLE	FIGURE NUMBER
	DATE 09/26/2025	GOLDEN RD & 166TH ST EXISTING + OPERATION ALTERNATE ROUTE INTERSECTION OPERATIONS	43
			612

OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)



OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)



LEGEND

A [100']
- 95th Percentile Queue (ft.)
- Movement Level of Service

A* Capacity per Demand

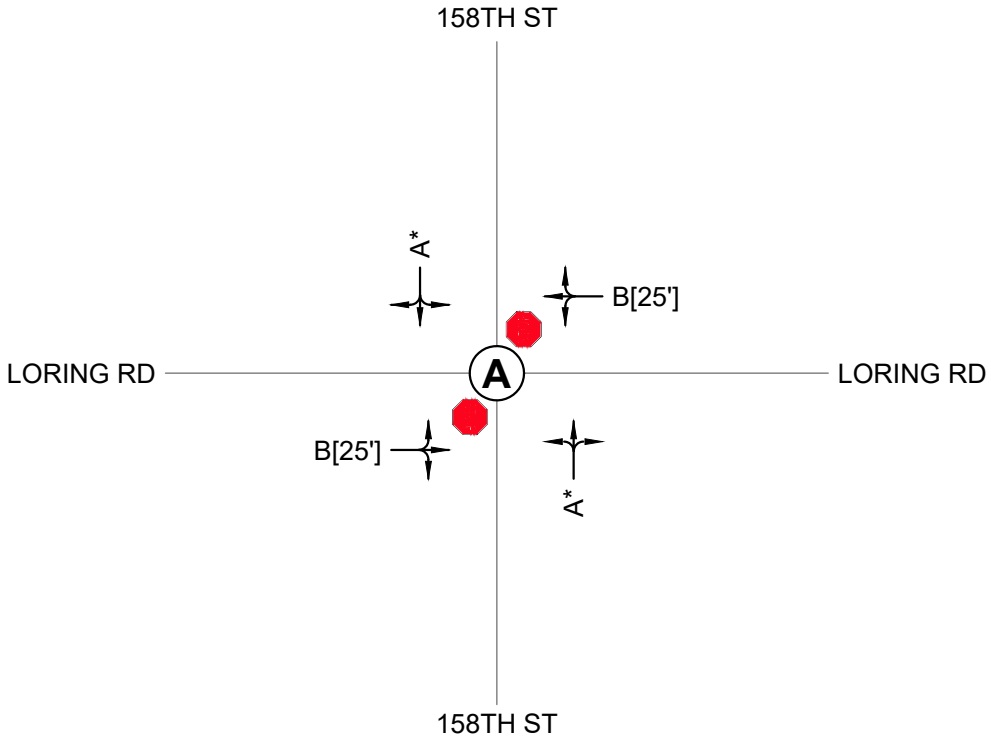
(A) Stop-Controlled Intersection Overall Level of Service

N

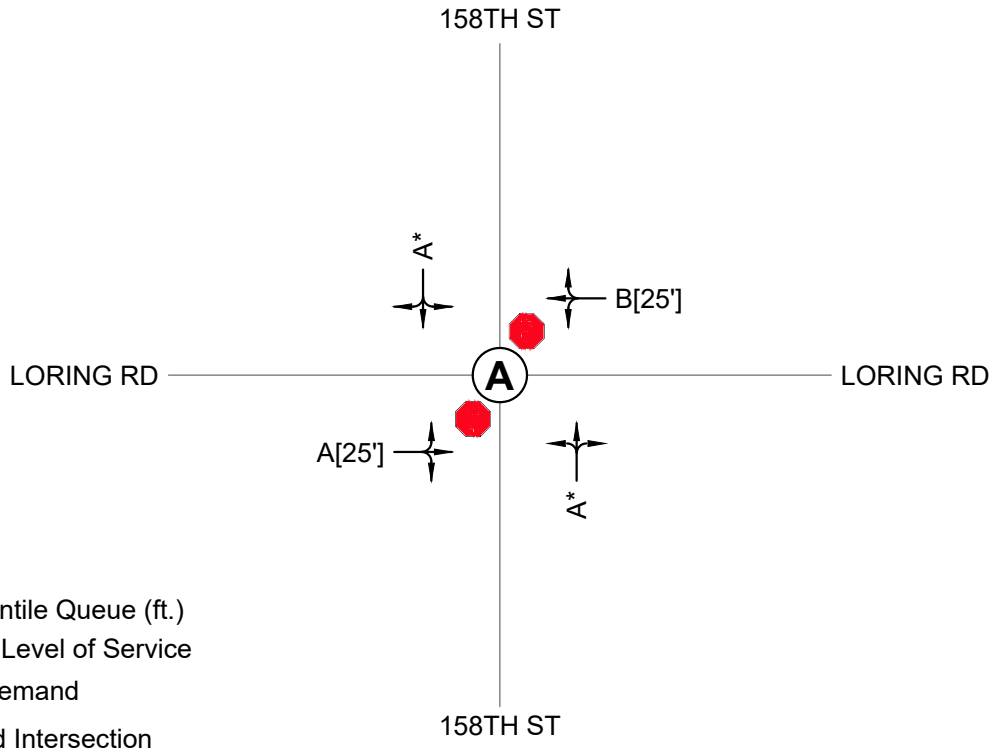
N.T.S.

GBA	PROJECT NUMBER 16477.00 DATE 09/26/2025	TITLE K-32 (LINWOOD RD) & 189TH ST / GOLDEN RD EXISTING + OPERATION ALTERNATE ROUTE INTERSECTION OPERATIONS	FIGURE NUMBER 44 613

OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)



OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)



LEGEND

A [100'] — 95th Percentile Queue (ft.) / Movement Level of Service

A* Capacity per Demand

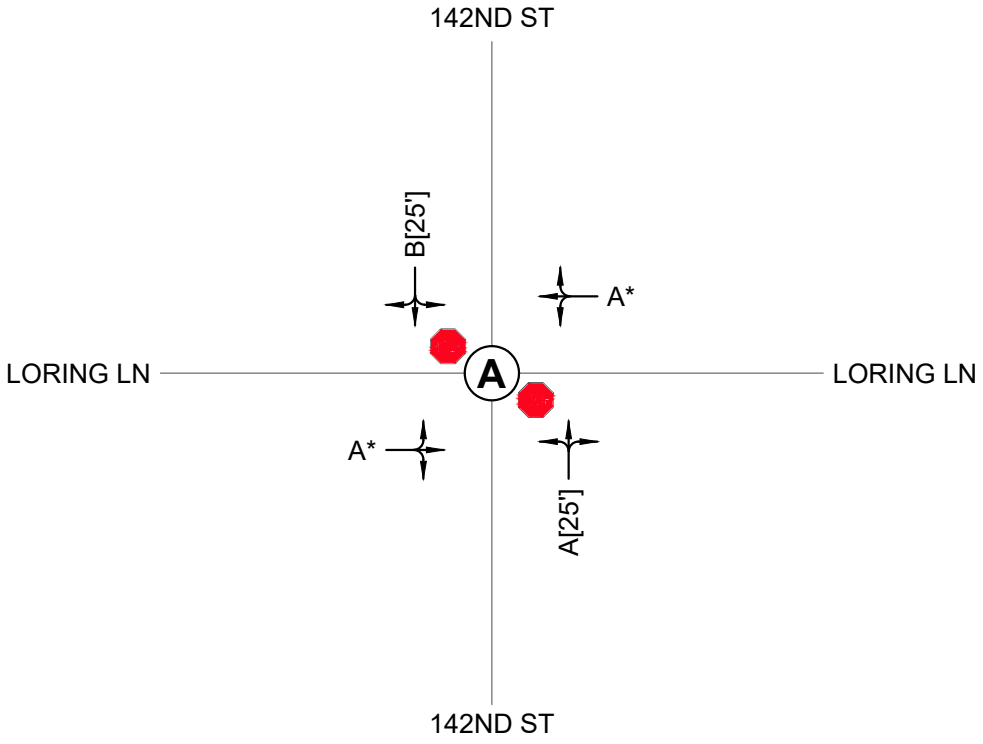
(A) Stop-Controlled Intersection Overall Level of Service

N

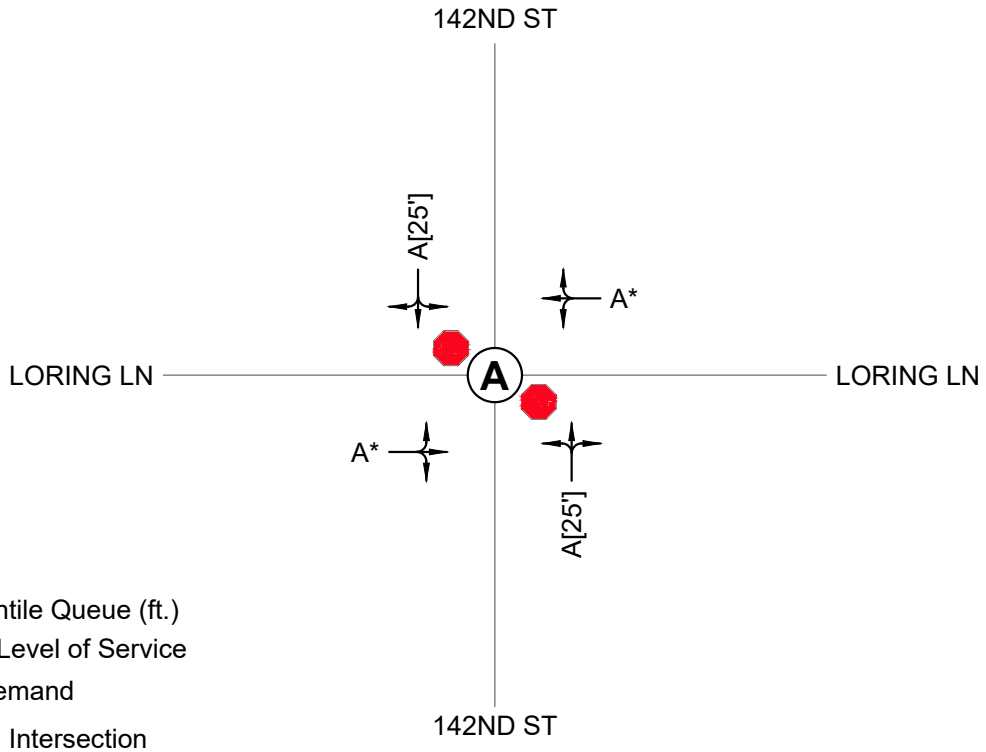
N.T.S.

	PROJECT NUMBER	TITLE	FIGURE NUMBER
GBA	16477.00	158TH ST & LORING RD EXISTING + OPERATION ALTERNATE ROUTE INTERSECTION OPERATIONS	45
	DATE 09/26/2025		614

OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)



OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)



LEGEND

A [100'] — 95th Percentile Queue (ft.) / Movement Level of Service

A* Capacity per Demand

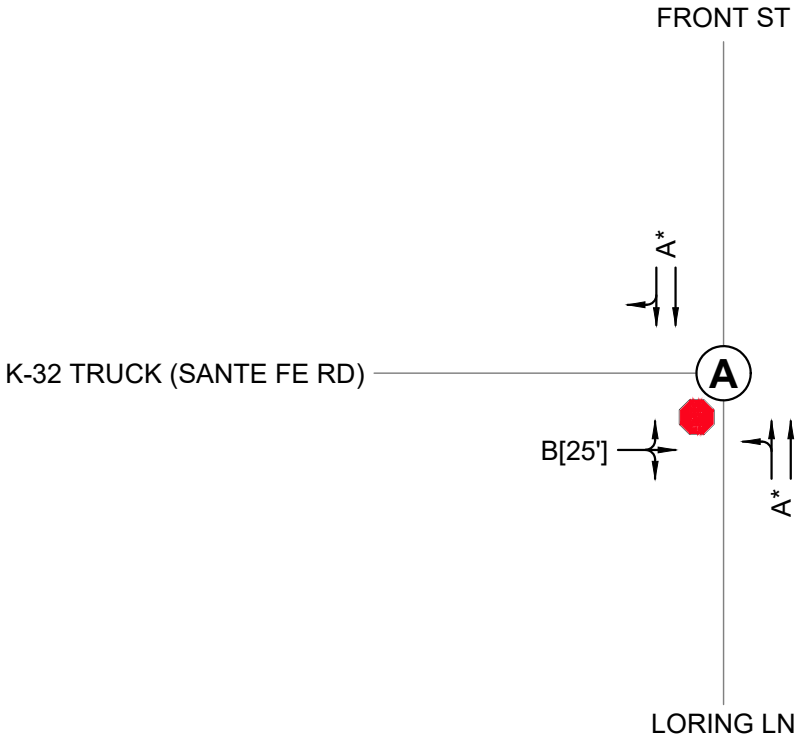
(A) Stop-Controlled Intersection Overall Level of Service

N

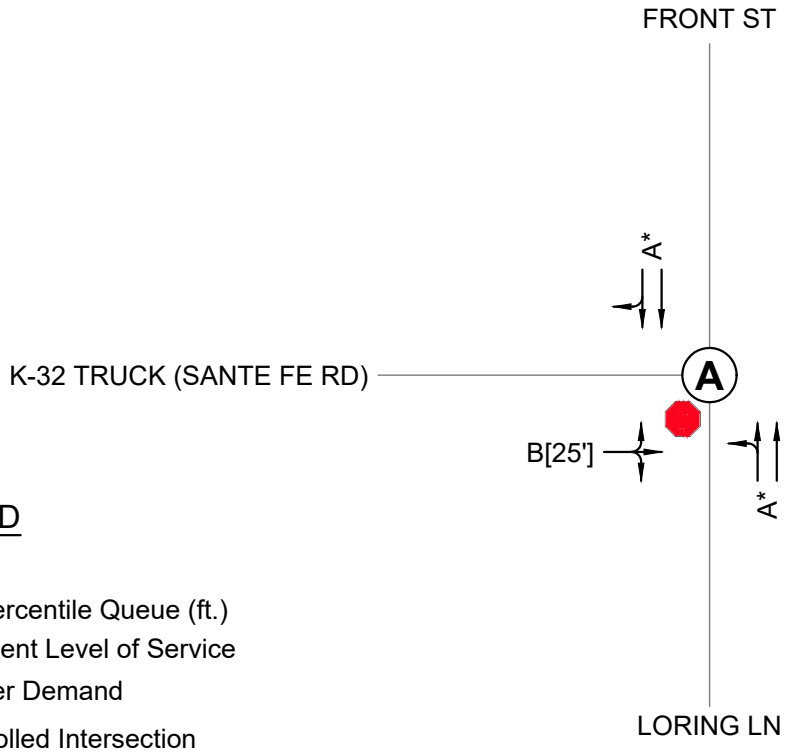
N.T.S.

	PROJECT NUMBER	TITLE	FIGURE NUMBER
GBA	16477.00	LORING LN & 142ND ST EXISTING + OPERATION ALTERNATE ROUTE INTERSECTION OPERATIONS	46
	DATE 09/26/2025		615

OPERATIONAL A.M. PEAK HOUR (7:15 - 8:15 A.M.)



OPERATIONAL P.M. PEAK HOUR (2:00 - 3:00 P.M.)



LEGEND

A [100']
- 95th Percentile Queue (ft.)
- Movement Level of Service

A* Capacity per Demand

(A) Stop-Controlled Intersection Overall Level of Service

N

N.T.S.

	PROJECT NUMBER	TITLE	FIGURE NUMBER
GBA	16477.00	LORING LN / W FRONT ST & K-32 TRUCK (SANTA FE RD) EXISTING + OPERATION ALTERNATE ROUTE INTERSECTION OPERATIONS	47
	DATE 09/26/2025		616

Review of Other Roadway Users

Based on field observations, there is at least one school bus route that travels through the area. However, the exact location and route is unknown. Additionally, no signage is present to indicate where school bus stops are. Separately, no signage indicates the presence of public transit routes in the area, which aligns with the system map for the Kansas City Area Transportation Authority (KCATA).

Currently, no dedicated pedestrian or bicycle facilities are present along the Primary or Alternate Routes. In examining the Leavenworth County Comprehensive Plan, a “Planned Regional Bike Trail” is located in the area. The trail is proposed to connect to De Soto, traversing 166th Street between the Kansas River and Golden Road, Golden Road between 166th Street and 161st Street, and extend north along 158th Street towards Basehor.

7. Safety Evaluation

Existing Crash History

KDOT provided data and reports for crashes that occurred over the five year period from 2018 – 2023. Importantly, 2023 KDOT data is current considered unfinalized at the time of writing this study. However, data obtained suggests that all crashes from 2023 were included as part of the data request. Additionally, crash data was requested from the Leavenworth County Sheriff's Office. The data was not provided as of the writing of this study, but the Sheriff's Office stated that all crashes included as part of the potential dataset have been reported to KDOT. Existing crash locations are shown in **Figure 16**. Tables of all crashes, causes, and locations are provided in **Appendix C**.

Table 16. Summary of Primary Route Crashes

Crash Type	PDO Crash	Injury Crash	Fatal Crash	Total Crashes (2018-2023)
Overturned	1	3	1	5
Collision with Fixed Object	5	6	1	12
Collision with Other Motor Vehicle – Rear End	5	0	0	5
Collision with Other Motor Vehicle – Side Impact	3	1	0	4
Collision with Animal	6	1	0	7
Other – Non Collision	1	1	0	2
Total Crashes (2018-2023)	**21**	**12**	**2**	**35**

Based on analyzation of crashes along the Primary Route, as shown in **Table 16**, collisions with fixed objects (trees, utility poles, etc.) and animals account for approximately 54% of experienced crashes over the five year period. In examining the location of the experienced crashes, they are generally evenly distributed along the Primary Route, with the exception of a cluster of vehicle to vehicle collisions surrounding the 166th Street and Golden Road intersection. Over the study period, six crashes have been reported near the intersection, with four occurring within the intersection itself. In addition to reviewing crashes overall, individual crash reports were reviewed to identify potential roadway design causes. This review revealed that no crashes appear to be definitively attributable to roadway engineering. However, the causes of crashes potentially attributable to roadway engineering along the Primary Route will be discussed at length.

Crash 20200004190 took place approximately 275 ft. west of the Golden Road / 158th Street & 161st Street intersection. The crash was caused by overcorrection of a driver reacting to another vehicle in the roadway. The crash victim was traveling west on Golden Road, and was unable to see the vehicle until they had exited the 158th Street to Golden Road curve. It is possible that limited sight distance from poor roadside brush maintenance played a role in the crash, although the detailed crash report indicates that overcorrection was a significant factor in the crash.

Crash 20200011397 took place approximately 900 ft. west of the Golden Road / 158th Street & 161st Street intersection. The crash victim, a motorcyclist, was traveling east on Golden Road, and left the roadway, resulting in a crash. The factor leading to roadway departure was not determined within the crash report. The crash location is generally flat, and does not have any significant roadway curvature. Therefore, it is unlikely that the crash is a result of roadway geometry.

Crash 20230029858 took place at the Golden Road & 166th Street intersection. Driver A was attempting to make a right-turn from 166th Street to Golden Road. Driver B was attempting to make a left-turn from Golden Road to 166th Street, and struck Driver A as a result of an improper turn. Driver B was issued with a citation for making an improper turn. As the intersection is in a flat area with little roadway curvature and advanced signage is provided to the east, it is unlikely that roadway geometrics played a role in the crash.

Crash 20200022002 took place at the Golden Road & 166th Street intersection. Driver A was stopped adjacent to the stop sign on the 166th Street approach to Golden Road. Driver B attempted to make a right-turn from Golden Road onto 166th Street, was unable to negotiate the turn, and struck Driver A. As the intersection is in a flat area with little roadway curvature and advanced signage is provided to the west, it is unlikely that roadway geometrics played a role in the crash.

Crash 20220020787 took place approximately 7,000 ft. west of the Golden Road & 170th Street intersection. The crash victim struck a guardrail along Golden Road as they were traveling west on Golden Road. The driver stated that as they were negotiating the curves, they were too close to the edge of roadway, and struck the guardrail. Additionally, the crash report cites general inattention as the crash cause. The section of roadway in which the crash occurred does have multiple curves, and thus it is possible that geometry could have played a role in the crash. However, no other crashes were observed in the area for the crash study period, and therefore no extensive history of crashes in the area based on roadway geometrics can be identified.

Crash 20200011395 took place along the 189th Street to Golden Road curve. The crash victims were following a group of other motorcyclists, which began to slow as they entered the 189th Street to Golden Road curve from the north. The lead motorcyclists within the group began to slow, the crash victim did not want to hit the rear motorcyclists in the group, and swerved to the right in an avoidance maneuver. The maneuver resulted in the motorcyclist leaving the roadway, hitting gravel, which caused the operator to lose control. This crash is likely not attributable to roadway design, as the remainder of motorcyclists within the group were able to negotiate the curve without issue.

Crash 20200014367 took place along the 189th Street to Golden Road curve. The crash victim was traveling west on Golden Road, and failed to negotiate the curve to 189th Street and departed the roadway. Due to injuries obtained from the crash, the cause of the roadway departure was not determined within the crash report. However, witness statements state that the tire of the motorcycle may have gone flat or malfunctioned, or that alcohol may have played a role in the roadway departure. Furthermore, the motorcyclist was part of a larger group. Therefore, this crash is likely not attributable to roadway design, as the remainder of motorcyclists within the group were able to negotiate the curve without issue.

Table 17. Summary of Alternate Route Crashes

Crash Type	PDO Crash	Injury Crash	Fatal Crash	Total Crashes (2018-2023)
Overturned	1	1	0	2
Collision with Fixed Object	2	3	1	6
Collision with Other Motor Vehicle – Rear End	1	0	0	1
Collision with Other Motor Vehicle – Side Impact	0	2	0	2
Collision with Other Motor Vehicle – Head On	1	0	0	1
Collision with Other Motor Vehicle – Side Swipe Opposite Direction	1	0	1	2
Collision with Animal	4	0	0	4
Collision with Other Object	1	0	0	1
Other – Non Collision	1	0	0	1
Total Crashes (2018-2023)	**12**	**6**	**2**	**20**

Based upon provided crash data along the Alternate Route, as shown in **Table 17**, 50% of the crashes were either collisions with fixed objects or animals. Of the experienced crashes, four of them occurred near the 158th Street and Loring Road intersection. Furthermore, only two of the crashes at the intersection were vehicle to vehicle crashes, with one overturning crash, and one collision with a fixed object. Remaining crashes along the Alternate Route are generally evenly distributed, without any clusters, as is the case at the 158th and Loring Road intersection. In addition to reviewing crashes overall, individual crash reports were reviewed to identify potential roadway design causes. This review revealed that no crashes appear to be definitively attributable to roadway engineering. However, the causes of crashes potentially attributable to roadway engineering along the Alternate Route will be discussed at length.

Crash 20200005175 occurred approximately one mile east of the Loring Road & 158th Street intersection. The crash report indicates that a vehicle gradually departed from the roadway, and overcorrected twice leading to a rollover crash. The driver indicated that they lost control due to sand alongside the roadway, which is indicative of a roadway departure. While vertical curvature is present on the roadway, no major horizontal curvature is located along the segment.

Crash 20200004187 occurred approximately 1,000 ft. west of the Loring Road & Loring Lane intersection. The motorist was traveling west on Loring Road, and departed the roadway into a junction box. The driver stated they swerved to avoid a deer. However, the crash report cites no tire marks on the roadway, indicating no overt action was taken, and rather the driver gradually drove off the roadway. It is unlikely that the crash was caused by roadway geometrics.

Crash 20210095007 occurred approximately 425 ft. north of the Loring Lane & Stillwell Road intersection. The crash report indicates that the vehicle was unable to negotiate the curve along Loring Lane, and struck a tree. Additionally, it was indicated that the operator of the vehicle had been reported for reckless driving multiple times prior to the crash, and that the operator was likely traveling above the posted speed limit prior to the crash. Therefore, it is unlikely that the crash is attributable to roadway geometry.

Crash 20200095260 occurred approximately 985 ft. north of the Loring Lane & Stillwell Road intersection. No detailed narratives were provided in the report, and thus a crash cause is not attributable. The roadway in the area

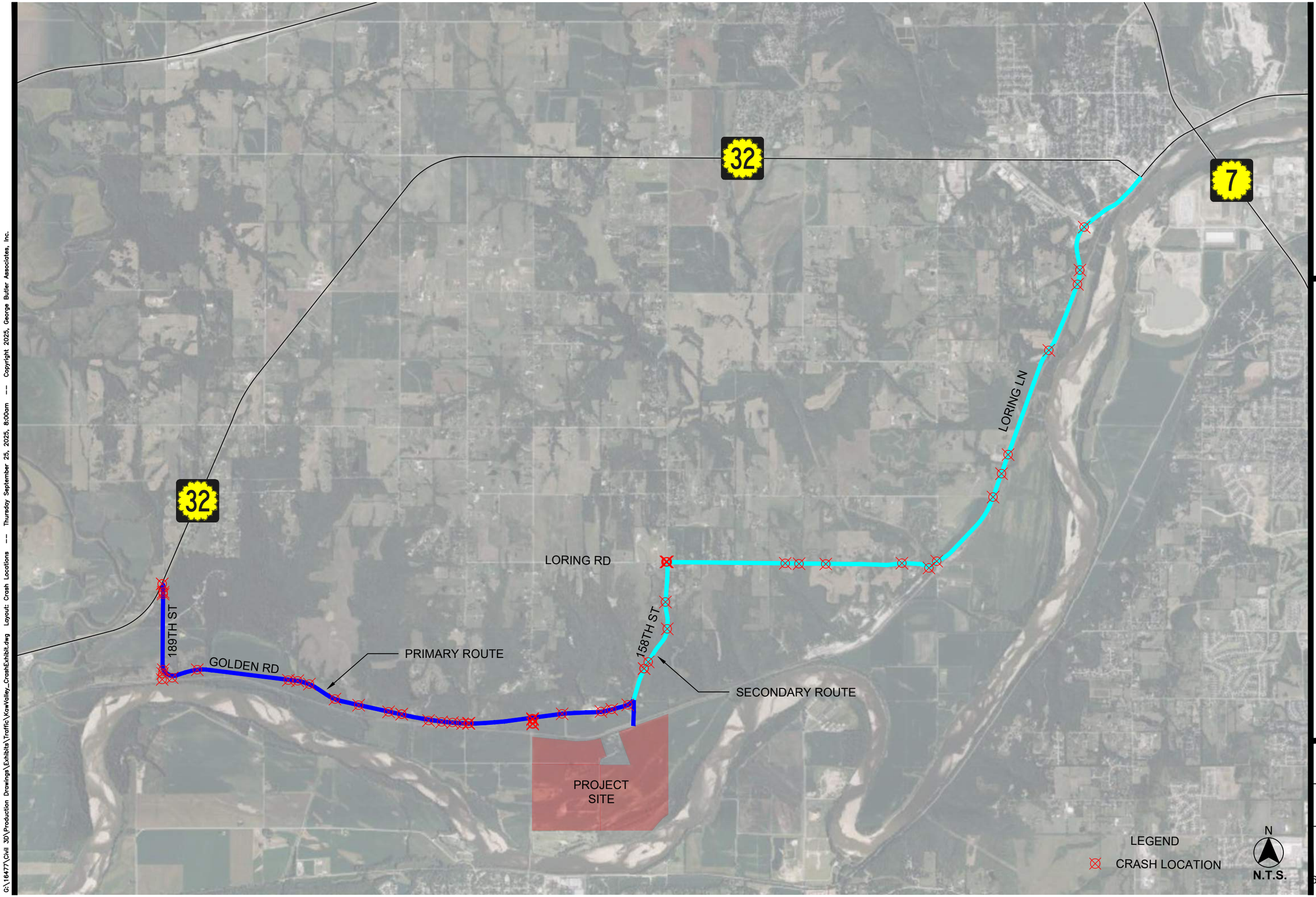
is flat, with gentle horizontal curvature. While unlikely, roadway geometrics cannot be eliminated as crash cause due to a lack of narrative in the crash report. However, there is no demonstrated history of roadway geometrics causing crashes in the roadway area.

In addition to providing a summary of crashes along the Primary and Alternate Routes, a summary of crashes at the study intersections may be seen in **Table 18**.

Table 18. Summary of Intersection Related Crashes

Intersection	Route	PDO Crash	Injury Crash	Fatal Crash	Total Crashes (2018-2023)
(Golden Road / 158th Street & 161st Street	Primary and Alternate	0	0	0	0
Golden Road & 166th Street	Primary	3	1	0	6
K-32 (Linwood Road) & 189th Street / Golden Road	Primary	3	0	0	3
158th Street & Loring Road	Alternate	3	1	0	4
Loring Lane & 142nd Street	Alternate	1	0	0	1
Loring Lane / West Front Street & K-32 Truck Route (Santa Fe Road)	Primary and Alternate	0	0	0	0

While some crashes experienced along the routes may be considered preventable, there is not an existing crash frequency concern along either the Primary or Alternate Routes. Crashes do not have a consistent pattern or cause, and thus no localized areas of concern were identified. Review of crash reports with potential geometric causes was conducted, which revealed that no crash history was demonstrated due to existing geometric deficiencies along the route.



GBA

EXISTING CRASH LOCATIONS
2018 - 2023 DATA

PROJECT NUMBER	16477.00
DATE	09/26/2025
FIGURE	48

G:\16477\Civil 3D\Production Drawings\Exhibits\Traffic\KawValley_CrashExhibit.dwg Layout: Crash Locations -- Thursday September 25, 2025, 8:00am -- Copyright 2025, George Butler Associates, Inc.

Leavenworth County Vision Zero Action Plan Review

The Leavenworth County Vision Zero Action Plan, published in March 2025, provides recommendations and documentation for portions of the Primary and Alternate Routes. Additionally, narrative is provided around crashes and crash trends within Leavenworth County overall. The Action Plan examined contributing circumstances as a percentage of overall crash totals, and did not identify roadway geometrics as a top contributor. In fact, human behavior, such as distracted driving, impaired driving, or speeding.

High Injury and High Risk Networks were identified by the Action Plan. Large portions of the Primary Route were identified in the High Injury Network, and the entirety of the Primary and Alternate Routes within Leavenworth County were identified in the High Risk Network. In targeting improvements, the Action Plan examined roadways and intersections on both the High Injury and High Risk Networks. Although routes may have been identified as part of the High Injury or High Risk Networks, the reasons for such assignments may be due to roadway departures, impaired driving, or other non-geometric factors. Furthermore, the document continually cites crash risk, rather than crash history, when proposing recommendations for the corridor.

Specifically, the 158th Street and Golden Road corridor was identified as a "Catalyst Project" by the Action Plan. The action plan describes the corridor as: "Corridor with 2,000 AADT linking growing De Soto area in Johnson County to K-32 and southeastern Leavenworth County. Key issues include roadway departure and fixed-object crashes, especially for motorcyclists and impaired drivers. Much of [the] corridor includes tight curves, skewed intersections, narrow lanes, steep foreslopes, and limited lighting. Proposed enhancements include shoulder widening, rumble strips, improved signage, intersection realignments, and roundabouts to support anticipated growth and improve safety." While the corridor is cited as having "tight curves, skewed intersections, narrow lanes, steep foreslopes, and limited lighting", such factors are not cited with evidence as an attributable crash cause within the Action Plan along the Primary or Alternate Routes. However, the action plan provides several statements regarding the corridor, which will be discussed in detail within this section.

First, the Action Plan states that a number of roadway departure crashes occur at the 189th Street & K-32 intersection due to narrow, steep shoulders, and poor roadway conditions. The intersection is located along the Primary Route. In the short-term, the Action Plan recommends adding intersection ahead signs to both approaches of 189th Street. In the long-term, the Action Plan recommends roadway realignment to correct the skew at the intersection. Such improvements are a feasible long-term plan at the intersection, but are not recommended in the short-term within this study. These improvements are agreeable, and may be incorporated, but exist irrespective of truck traffic at the intersection. Furthermore, the roadway departures stated likely occur on movements not along the truck route.

Second, in reference to the 189th Street to Golden Road curve, located along the Primary Route, the Action Plan states that "curved roads and steep grades with narrow shoulders increase risk of roadway departure crashes". While several roadway departure crashes were examined as part of the crash analysis within this report, it is unclear if roadway geometry was the true cause of such crashes. Additionally, the Action Plan does not cite any specific crash history attributable to the curve geometrics. Furthermore, the Action Plan simply recommends adding new retroreflective chevron signing, and not reconstructing the roadway curve. This improvement is incorporated into the signing recommendations provided in **Appendix K**.

Third, the Action Plan attributes crashes near the 170th Street & Golden Road intersection, located on the Primary Route, to sight distance issues along the curve on 170th Street in approach of the intersection. The Action Plan

recommends adding additional intersection signage to alert drivers to the intersection, and replacing the nearby culvert. While this recommendation is agreeable, it is based on conditions along 170th Street, which is not located on either the Primary or Alternate Routes.

Fourth, the Action Plan recommends conversion of the 166th Street & Golden Road intersection, located on the Primary Route, to an all-way stop in the long-term. This recommendation is made based upon expected increases in traffic safety, rather than demonstrated crash history. Additionally, intersection conversion is not recommended until the all-way stop warrant is met. In the short-term, it is recommended to add a stop line and move the stop sign on 166th Street closer to the intersection to improve sight distance. While this recommendation is agreeable, sight distance at the intersection was determined to be adequate, as provided in Appendix D of this report.

Finally, the Action Plan discusses the Golden Road to 158th Street curve, located along the Primary Route. The Action Plan states that poor intersection sight distance, as well as narrow shoulders with steep drop offs, create safety issues. In the short term, the Action Plan recommends addition of retroreflective chevron signing through the curve. In the long term, the Action Plan recommends addition of a two to four ft. shoulder on both sides of the roadway through the curve. The short-term recommendation of adding retroreflective chevron signing along the curve is provided in **Appendix K**.

All outlined projects are included as part of the 158th Street and Golden Road Catalyst Project, which has a short term cost estimate of $366,000, and a long term cost estimate of $12,224,000.

Railroad Crossings

Railway crossing 813744D Is located near the Golden Road / 158th Street & 161st Street, Golden Road & 166th Street, and Loring Lane / West Front Street & K-32 Truck Route (Santa Fe Road) intersections. Two tracks are present at the crossing. Based on United States Department of Transportation (USDOT) Crossing Inventory Forms, the crossing has 42 total trains per day, with 21 during the day (6 A.M. to 6 P.M.), and 21 during the night (6 P.M. to 6 A.M.). Intersection analysis during periods of an active crossing were not completed as part of this study. However, based on collected volumes, roadway geometry, and adjacent intersection spacing, it is expected that queuing does not cause major operational or safety concerns during crossing periods.

Based on conversations with the owner of the quarry, it was determined that quarry vehicles would have adequate clearance for the crossing, and therefore, a detailed evaluation of the crossing was not completed as part of this study. Vehicles have adequate clearance or may self-lift to clear the crossing. Additionally, based on collected volumes of vehicles on 161st Street, roadway geometry, and adjacent intersection spacing, it is expected that queuing does not cause major operational or safety concerns during crossing periods. Intersection analysis during periods of an active crossing were not completed as part of this study.

8. Environmental Conditions

Many of the National Environmental Policy Act items that are reviewed as part of infrastructure projects will be handled during preliminary design. The only item considered as part of this report was a noise assessment at the request of the county. See **Appendix N** for this assessment.

9. Community Engagement

Stakeholder Feedback has been gathered through the review of the Route Study report, provided by Leavenworth County officials and their representatives. Presentations may be made to Leavenworth Planning Committee, and Leavenworth County Commission at the conclusion of this Route Study. Public meetings were not held during this phase of the project but should be considered during the preliminary design phase.

10. Conclusions and Recommendations

In association with the proposed Kaw Valley Sand Operation development located in Leavenworth County, Kansas, this study analyzed the potential impacts of the proposed site. The study includes thorough analyses on existing conditions, trip generation and distribution, and proposed conditions.

The proposed site is located near the intersection of 166th Street and Lenape Road, and is made up of three separate parcels. Primary access to the site is proposed to be located near 161st Street and Railroad Road, with all trips to and from the operation using 161st Street and the Golden Road / 158th Street & 161st Street intersection.

A key part of this study was to conduct geometric analyses on the Primary Route, Alternate Route, and six study intersections. The routes are discussed in "Definition of Primary and Alternate Routes", and locations of the Primary Route, Alternate Route, and six study intersections are shown in **Figure 2**. Analyses for the routes and study intersections included the following elements:

- Intersection sight distance review at each of the six study intersections.
- Turning envelope review at each of the six study intersections.
- Horizontal and vertical curve review along the Primary and Alternate Routes.
- Review of lane and shoulder widths along the Primary and Alternate Routes.
- Existing pavement marking and signing review along Primary and Alternate Routes.

Summary of Existing Conditions

Horizontal Curvature and Superelevation Rate

None of the existing horizontal curves would meet current design criteria per AASHTO "A Policy on the Geometric Design of Highways and Streets", 7th Edition, henceforth referred to as the AASHTO *Green Book*. In general, the high side of the curve is nearly flat, while the low side often has sufficient super to meet current criteria. A corrective overlay or reconstruction would be required to improve high side super to meet current criteria; in addition, some curves would need a corrective action to the low side as well, to either improve superelevation to meet current criteria, or a reduction in superelevation to meet excessive superelevation. See **Appendix F** for summary of results. Selection of paving action and revising the existing radius and/or superelevation will be further evaluated and selected during the preliminary design phase to meet current design criteria.

Vertical Curvature

While many vertical curves meet the posted speed limit, a portion of the existing vertical curves either do not meet Stopping Sight Distance (SSD) or K value minimums as recommended in the *Green Book*.

Intersection Sight Distance (ISD)

Existing ISD either meets current design criteria or would meet criteria with brush removal within the existing right of way. Locations for brush removal include Golden Road/158th Street, Golden Road/161st Street, Loring Road and Loring Lane, and 158th and Loring Lane.

Intersection Turn lanes

Based on current and future traffic, an addition of a northbound right-turn taper at the 158th Street & Loring Road intersection.

Swept Path/Off-Tracking

As noted in **Appendix J**, off-tracking was evaluated using Auto-turn software for a WB-62 design vehicle. In most cases, the design vehicle would be able to complete a maneuver without encroaching on the opposing lane. Where off-tracking would cause encroachment, widening of the return radii at the intersection is proposed to eliminate encroachment, as demonstrated in the turning radii diagrams for 158th and Loring Road.

Drainage Structure Improvements

In general, many culverts could use maintenance to repair existing guardrail, culvert ends, and/or wingwalls. Many structures could benefit from cleanout, and preventative scour treatments, typically aggregate installation within current right of way.

Pavement Condition and Recommended Surfacing Actions

Surfacing actions have been identified based on current surfacing needs in **Appendix L**, as well as surfacing actions that would be necessary due to the increased truck traffic impact resulting from the Project.

Signing and Pavement Marking Recommendations

Pavement Marking changes will be needed as a result of both widening and surfacing actions that will be selected for the corridor. Signing Recommendations have been identified and are shown in **Appendix K**.

Noise Impacts

The following measures will be used to mitigate the noise from the site operations. Also, noise levels should be reduced for most of the surrounding properties as excavation progresses and the dredging pits get deeper, with the exception of the properties immediately adjacent to the production area.

- To help mitigate the sound levels for those properties adjacent to the static production area, the equipment used will be electric and the production schedule will be set to reduce impacts to the most effected properties by coordinating the concurrence of sound sources during daylight hours.
- Work activity will be scheduled to build-up material stockpiles later in the afternoons so that processing equipment will not be used during the early morning hours
- All equipment will be turned off when not in use.
- Equipment will be kept well-maintained and lubricated to minimize operating noise.
- Native species of deciduous and coniferous trees will be planted along the site's southern border with Burning Tree Golf Club to provide a visual and noise buffer from the mining operations.

Summary of Proposed Conditions

While there are many features of the roadway that do not meet current design criteria, identified in this report are those specifically relating to the additional truck traffic that would need improvement. They include:

Potential roadway widening for off-tracking at tight radii curves and intersections with turning movements and insufficient roadway width. While maintain lane position is difficult for all vehicles, trucks will be more affected due to their wider swept path. The impacts from off-tracking on horizontal curves would be addressed during the design phase as the selection of the proposed improvement will change what amount of widening may be necessary, if flattening of the curve radius is not selected.

Existing drainage structures that may not have sufficient structural capacity due to their maintenance condition. Drainage structure analysis for structural capacity would occur during the design phase, as replacements that are discussed and selected during that phase of the project would negate the need for those structures to be assessed.

Elevation differences resulting from the proposed surfacing actions due to additional truck traffic, increasing the pavement elevation above the existing ground. Mitigation for these edge drop-offs will be necessary and treatments will be evaluated and selected during the preliminary design phase.

Respectfully submitted,

GEORGE BUTLER ASSOCIATES, INC.



11. Exhibits

Exhibit A – Proposed Site Plan (Page 104)

Exhibit B – Level of Service (LOS) Definitions (Page 105)

12. Appendices

Appendix A – Existing Intersection Turning Movement Counts (Page 106)

Appendix B – Synchro Reports (Page 197)

Appendix C – Detailed Crash Data (Page 240)

Appendix D – Intersection Sight Distance Analyses (Page 246)

Appendix E – Truck Turning Envelopes (Page 272)

Appendix F – Roadway Geometry and Cross Sections (Page 285)

Appendix G – Existing Route Signage (Page 249)

Appendix H – Turn Lane Warrant Analyses (Page 259)

Appendix J – Proposed Intersection Improvements (Page 282)

Appendix K – Proposed Signage Improvements (Page 288)

Appendix L – Pavement Evaluation Report (Page 302)

Appendix M – Drainage Report (Page 388)

Appendix N – Noise Study (Page 545)

Proposed Use of Site

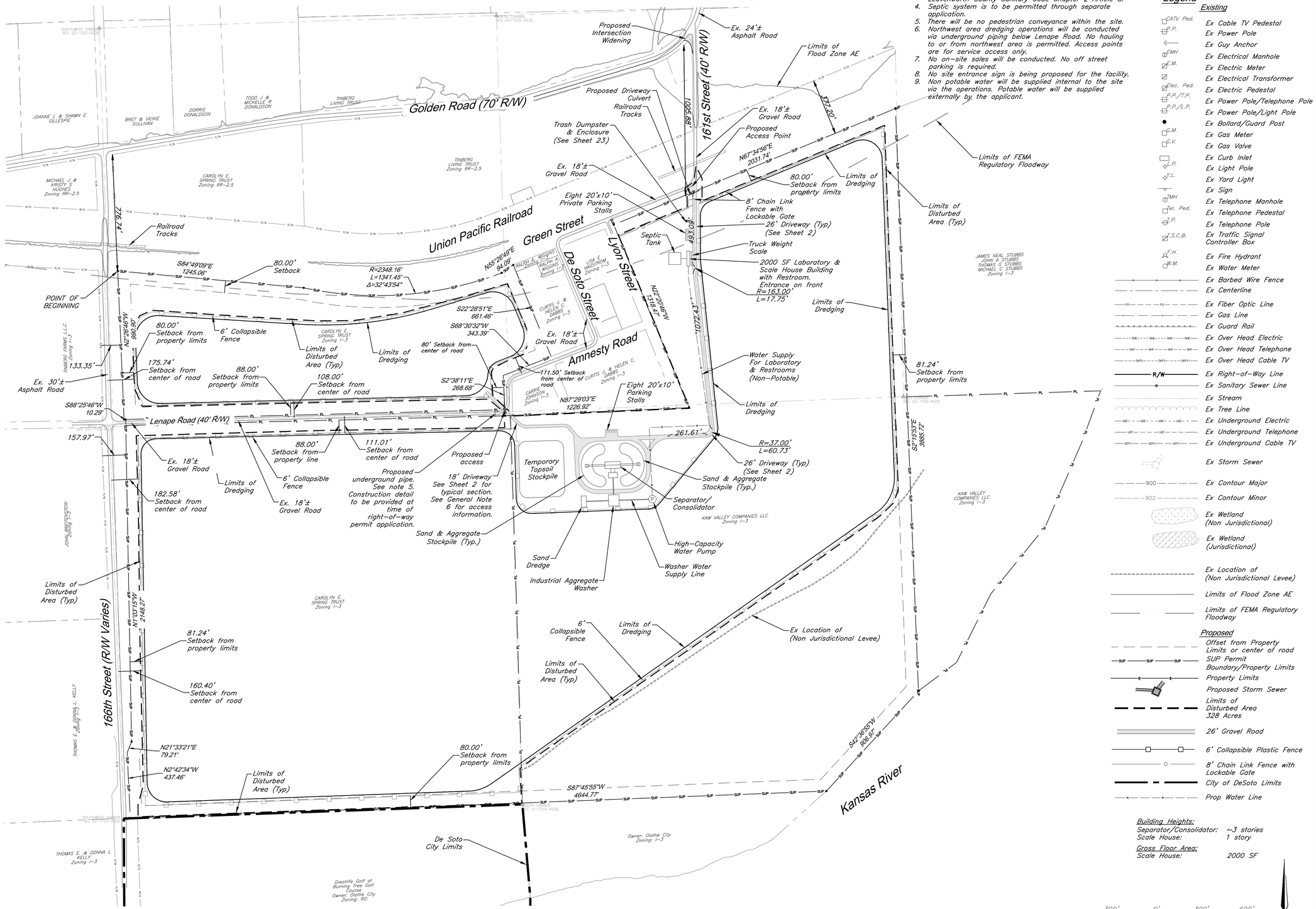
Kaw Valley Companies, Inc. ("Kaw Valley") requests approval of a Special Use Permit to utilize the approximately 435–acre site located at 166th and Lenape Road in rural Leavenworth County, Kansas (the "Property") for a sand excavation and stockpiling operation (the "Sand Operation")

General Notes

1. Collapsible fence will only be used where dredging activities take place and will expand as activity expands.
2. Septic tank system with minimum 5 day holding capacity and not less than 2,000 gallons will be designed by a licensed engineer. Septic tank requires Floodplain permits and will obtained for the septic tank prior to construction. The septic tank will be anchored to meet state guidelines. A contract with a Leavenworth County septic hauler to regularly pump the septic tank will be obtained and provided to Leavenworth County Planning & Zoning prior to use of the system.
3. Septic tank is to be designed in accordance with Leavenworth County Sanitary Code Chapter 2 Article 8.
4. Septic system is to be permitted through separate application.
5. There will be no pedestrian conveyance within the site.
6. Northwest area dredging operations will be conducted via underground piping below Lenape Road. No hauling to or from northwest area is permitted. Access points are for service access only.
7. No on–site sales will be conducted. No off street parking is required.
8. No site entrance sign is being proposed for the facility.
9. Non potable water will be supplied internal to the site via the operations. Potable water will be supplied externally by the applicant.

CAUTION!

Numerous Utilities on Site. Contractor shall verify location and elevation of all utilities prior to commencing construction.



Legend

Existing

- Ex Cable TV Pedestal
- Ex Power Pole
- Ex Guy Anchor
- Ex Electrical Manhole
- Ex Electric Meter
- Ex Electrical Transformer
- Ex Electric Pedestal
- Ex Power Pole/Telephone Pole
- Ex Power Pole/Light Pole
- Ex Bollard/Guard Post
- Ex Gas Meter
- Ex Gas Valve
- Ex Curb Inlet
- Ex Light Pole
- Ex Yard Light
- Ex Sign
- Ex Telephone Manhole
- Ex Telephone Pedestal
- Ex Telephone Pole
- Ex Traffic Signal Controller Box
- Ex Fire Hydrant
- Ex Water Meter
- Ex Barbed Wire Fence
- Ex Centerline
- Ex Fiber Optic Line
- Ex Gas Line
- Ex Guard Rail
- Ex Over Head Electric
- Ex Over Head Telephone
- Ex Over Head Cable TV
- Ex Right–of–Way Line
- Ex Sanitary Sewer Line
- Ex Stream
- Ex Tree Line
- Ex Underground Electric
- Ex Underground Telephone
- Ex Underground Cable TV
- Ex Storm Sewer
- Ex Contour Major
- Ex Contour Minor
- Ex Wetland (Non Jurisdictional)
- Ex Wetland (Jurisdictional)
- Ex Location of (Non Jurisdictional Levee)
- Limits of Flood Zone AE
- Limits of FEMA Regulatory Floodway

Proposed

- Offset from Property Limits or center of road
- SUP Permit Boundary/Property Limits
- Property Limits
- Proposed Storm Sewer
- Limits of Disturbed Area 328 Acres
- 26' Gravel Road
- 6' Collapsible Plastic Fence
- 8' Chain Link Fence with Lockable Gate
- City of DeSoto Limits
- Prop Water Line

Building Heights:
Separator/Consolidator: ~3 stories
Scale House: 1 story

Gross Floor Area:
Scale House: 2000 SF

300' 0' 300' 600'
SCALE : 1 INCH = 300 FEET

GBA
9801 Renner Blvd., Ste. 300
Lenexa, KS 66219
913.492.0400
gbateam.com

LENAPE SAND OPERATION

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

REVISION

PROJECT NUMBER
16477.00

DATE
6/19/2025

DESIGNED
JMS

DRAWN
ELS/GAN

REVIEWED
JMS

SHEET TITLE

Site Plan

EXHIBIT
A

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631

G:\16477\Civil 3D\Production Drawings\Special Use Permit\1647700200.dwg Layout: 3 Site Plan -- Tuesday September 23, 2025, 2:26pm -- © Copyright 2025, George Butler Associates, Inc.

9801 Renner Boulevard
Lenexa, KS 66219

EXHIBIT B

Level of Service Definitions

Level of service criteria are outlined in the latest (i.e., 7th edition) of the *"Highway Capacity Manual"* (HCM) for both signalized and unsignalized intersections. The HCM defines the level of service as a measure of the quality of traffic flow. There are six different levels of service for each facility type, each representing a range of operating conditions. Each level of service is designated by a letter from "A" to "F", with "A" being the most desirable condition and "F" being the least desirable condition. The level of service criteria, as reported by the 7th Ed. HCM for both signalized and unsignalized intersections, are listed below:

Unsignalized Intersections		Signalized Intersections	
Level of Service	**Average Control Delay (sec/veh)**	**Level of Service**	**Control Delay per Vehicle (sec)**
A	≤ 10	A	≤10
B	> 10 and ≤ 15	B	> 10 and ≤ 20
C	> 15 and ≤ 25	C	> 20 and ≤ 35
D	> 25 and ≤ 35	D	> 35 and ≤ 55
E	> 35 and ≤ 50	E	> 55 and ≤ 80
F	> 50	F	> 80

APPENDIX A
EXISTING INTERSECTION TURNING MOVEMENT COUNTS

APPENDIX A.1
GOLDEN ROAD / 158TH STREET & 161ST STREET TURNING MOVEMENT COUNTS

a. Golden Road & 161st Street - TMC

Thu Jul 11, 2024
Full Length (12 AM-12 AM (+1))
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205785, Location: 38.999647, -94.950712

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Golden Rd				161st Street				Golden Rd				
Direction	Southbound				Northbound				Eastbound				
Time	R	T	U	**App**	T	L	U	**App**	R	L	U	**App**	**Int**
2024-07-11 12:00AM	1	0	0	**1**	0	0	0	**0**	0	1	0	**1**	**2**
12:15AM	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	**1**
12:30AM	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	**1**
12:45AM	0	1	0	**1**	0	0	0	**0**	0	1	0	**1**	**2**
Hourly Total	2	1	0	**3**	1	0	0	**1**	0	2	0	**2**	**6**
1:00AM	2	0	0	**2**	0	0	0	**0**	0	0	0	**0**	**2**
1:15AM	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	**0**
1:30AM	3	0	0	**3**	0	0	0	**0**	0	1	0	**1**	**4**
1:45AM	0	0	0	**0**	0	0	0	**0**	0	1	0	**1**	**1**
Hourly Total	5	0	0	**5**	0	0	0	**0**	0	2	0	**2**	**7**
2:00AM	1	0	0	**1**	0	0	0	**0**	0	1	0	**1**	**2**
2:15AM	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	**1**
2:30AM	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	**0**
2:45AM	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	**0**
Hourly Total	2	0	0	**2**	0	0	0	**0**	0	1	0	**1**	**3**
3:00AM	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	**0**
3:15AM	3	0	0	**3**	0	0	0	**0**	0	0	0	**0**	**3**
3:30AM	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	**1**
3:45AM	0	0	0	**0**	0	0	0	**0**	0	2	0	**2**	**2**
Hourly Total	4	0	0	**4**	0	0	0	**0**	0	2	0	**2**	**6**
4:00AM	1	0	0	**1**	0	0	0	**0**	0	1	0	**1**	**2**
4:15AM	1	0	0	**1**	0	0	0	**0**	0	1	0	**1**	**2**
4:30AM	2	0	0	**2**	0	0	0	**0**	0	1	0	**1**	**3**
4:45AM	4	0	0	**4**	0	0	0	**0**	0	4	0	**4**	**8**
Hourly Total	8	0	0	**8**	0	0	0	**0**	0	7	0	**7**	**15**
5:00AM	14	0	0	**14**	0	0	0	**0**	0	4	0	**4**	**18**
5:15AM	10	0	0	**10**	0	0	0	**0**	0	2	0	**2**	**12**
5:30AM	15	0	0	**15**	0	0	0	**0**	0	12	0	**12**	**27**
5:45AM	17	0	0	**17**	0	0	0	**0**	0	14	0	**14**	**31**
Hourly Total	56	0	0	**56**	0	0	0	**0**	0	32	0	**32**	**88**
6:00AM	14	0	0	**14**	0	0	0	**0**	0	10	0	**10**	**24**
6:15AM	17	0	0	**17**	0	0	0	**0**	0	11	0	**11**	**28**
6:30AM	33	0	0	**33**	0	0	0	**0**	0	13	0	**13**	**46**
6:45AM	23	0	0	**23**	0	0	0	**0**	0	17	0	**17**	**40**
Hourly Total	87	0	0	**87**	0	0	0	**0**	0	51	0	**51**	**138**
7:00AM	6	0	0	**6**	0	1	0	**1**	0	13	0	**13**	**20**
7:15AM	22	0	0	**22**	0	0	0	**0**	0	20	0	**20**	**42**
7:30AM	18	0	0	**18**	1	0	0	**1**	0	12	0	**12**	**31**
7:45AM	15	0	0	**15**	0	0	0	**0**	0	14	0	**14**	**29**
Hourly Total	61	0	0	**61**	1	1	0	**2**	0	59	0	**59**	**122**
8:00AM	11	0	0	**11**	0	0	0	**0**	0	10	0	**10**	**21**
8:15AM	13	0	0	**13**	0	0	0	**0**	0	12	0	**12**	**25**
8:30AM	9	0	0	**9**	0	0	0	**0**	0	15	0	**15**	**24**
8:45AM	12	0	0	**12**	0	0	0	**0**	0	12	0	**12**	**24**
Hourly Total	45	0	0	**45**	0	0	0	**0**	0	49	0	**49**	**94**
9:00AM	7	0	0	**7**	0	0	0	**0**	1	9	0	**10**	**17**
9:15AM	11	0	0	**11**	1	0	0	**1**	1	8	0	**9**	**21**
9:30AM	15	0	0	**15**	0	0	0	**0**	1	8	0	**9**	**24**
9:45AM	7	0	0	**7**	0	0	0	**0**	0	5	0	**5**	**12**
Hourly Total	40	0	0	**40**	1	0	0	**1**	3	30	0	**33**	**74**
10:00AM	7	0	0	**7**	0	0	0	**0**	0	14	0	**14**	**21**
10:15AM	11	1	0	**12**	3	0	0	**3**	0	12	0	**12**	**27**
10:30AM	9	0	1	**10**	3	0	0	**3**	1	11	0	**12**	**25**
10:45AM	10	1	0	**11**	2	0	0	**2**	1	12	0	**13**	**26**

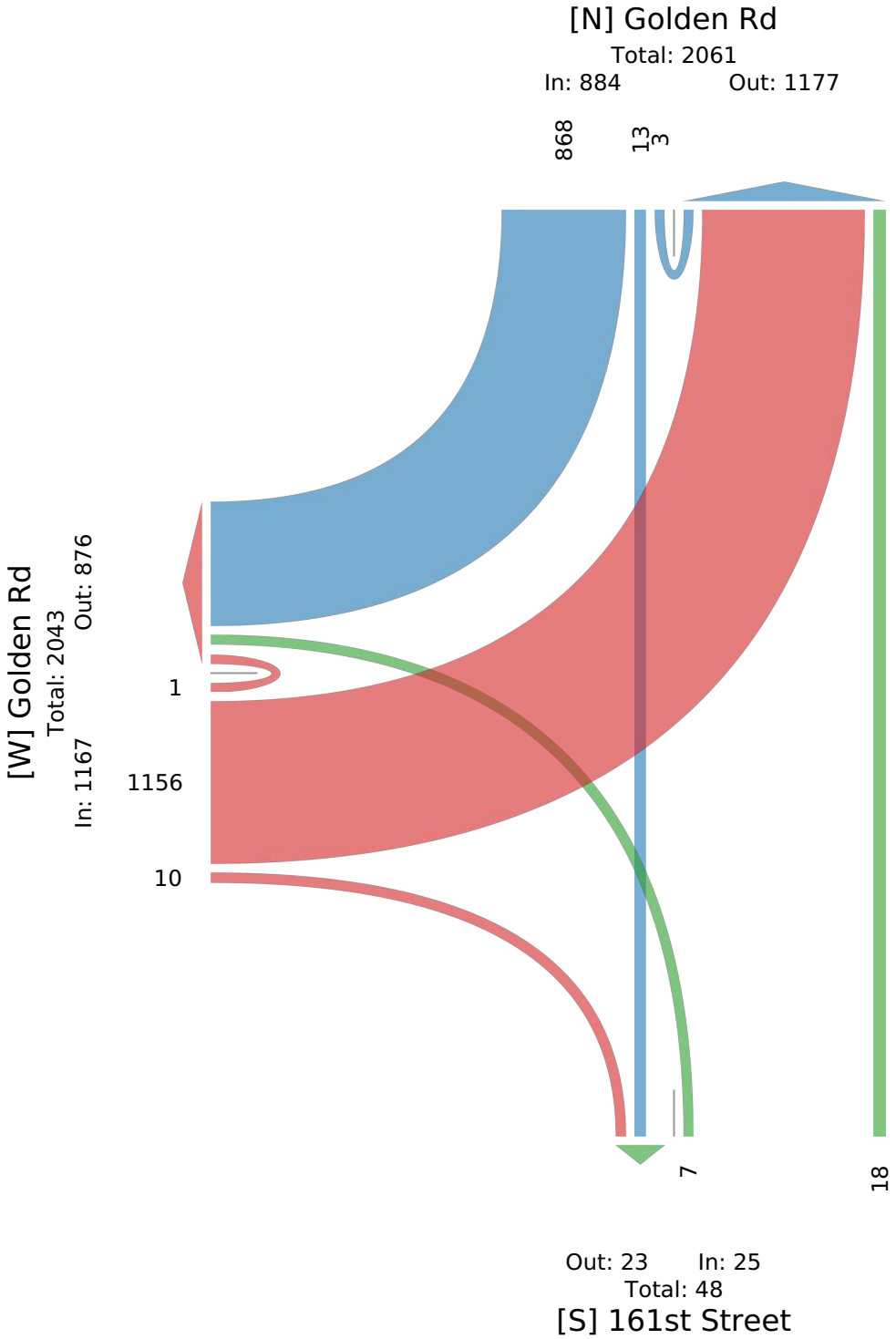
Leg	Golden Rd				161st Street				Golden Rd				
Direction	Southbound				Northbound				Eastbound				
Time	R	T	U	**App**	T	L	U	**App**	R	L	U	**App**	**Int**
Hourly Total	37	2	1	**40**	8	0	0	**8**	2	49	0	**51**	**99**
11:00AM	10	0	1	**11**	0	0	0	**0**	0	13	0	**13**	**24**
11:15AM	5	0	0	**5**	0	0	0	**0**	0	9	0	**9**	**14**
11:30AM	9	0	0	**9**	0	0	0	**0**	0	12	0	**12**	**21**
11:45AM	10	0	0	**10**	0	0	0	**0**	0	6	0	**6**	**16**
Hourly Total	34	0	1	**35**	0	0	0	**0**	0	40	0	**40**	**75**
12:00PM	10	0	0	**10**	0	0	0	**0**	0	11	1	**12**	**22**
12:15PM	12	0	0	**12**	0	1	0	**1**	0	18	0	**18**	**31**
12:30PM	13	0	0	**13**	1	0	0	**1**	0	11	0	**11**	**25**
12:45PM	9	1	0	**10**	0	0	0	**0**	0	12	0	**12**	**22**
Hourly Total	44	1	0	**45**	1	1	0	**2**	0	52	1	**53**	**100**
1:00PM	8	0	0	**8**	0	0	0	**0**	0	20	0	**20**	**28**
1:15PM	8	1	0	**9**	0	1	0	**1**	0	9	0	**9**	**19**
1:30PM	7	1	0	**8**	0	0	0	**0**	0	16	0	**16**	**24**
1:45PM	10	0	0	**10**	2	0	0	**2**	1	10	0	**11**	**23**
Hourly Total	33	2	0	**35**	2	1	0	**3**	1	55	0	**56**	**94**
2:00PM	16	1	0	**17**	0	0	0	**0**	0	21	0	**21**	**38**
2:15PM	12	0	0	**12**	0	0	0	**0**	0	10	0	**10**	**22**
2:30PM	13	0	0	**13**	0	0	0	**0**	0	16	0	**16**	**29**
2:45PM	17	1	0	**18**	0	1	0	**1**	0	16	0	**16**	**35**
Hourly Total	58	2	0	**60**	0	1	0	**1**	0	63	0	**63**	**124**
3:00PM	7	0	0	**7**	2	1	0	**3**	1	23	0	**24**	**34**
3:15PM	7	0	0	**7**	0	0	0	**0**	0	13	0	**13**	**20**
3:30PM	27	0	0	**27**	0	0	0	**0**	0	52	0	**52**	**79**
3:45PM	18	0	0	**18**	0	0	0	**0**	0	25	0	**25**	**43**
Hourly Total	59	0	0	**59**	2	1	0	**3**	1	113	0	**114**	**176**
4:00PM	19	0	1	**20**	0	0	0	**0**	0	30	0	**30**	**50**
4:15PM	20	0	0	**20**	0	0	0	**0**	0	49	0	**49**	**69**
4:30PM	14	0	0	**14**	0	0	0	**0**	1	61	0	**62**	**76**
4:45PM	9	0	0	**9**	0	0	0	**0**	0	61	0	**61**	**70**
Hourly Total	62	0	1	**63**	0	0	0	**0**	1	201	0	**202**	**265**
5:00PM	23	0	0	**23**	0	0	0	**0**	1	60	0	**61**	**84**
5:15PM	23	0	0	**23**	1	0	0	**1**	0	58	0	**58**	**82**
5:30PM	12	1	0	**13**	0	0	0	**0**	0	46	0	**46**	**59**
5:45PM	14	0	0	**14**	0	0	0	**0**	0	33	0	**33**	**47**
Hourly Total	72	1	0	**73**	1	0	0	**1**	1	197	0	**198**	**272**
6:00PM	14	1	0	**15**	0	0	0	**0**	0	23	0	**23**	**38**
6:15PM	25	1	0	**26**	0	0	0	**0**	0	13	0	**13**	**39**
6:30PM	10	0	0	**10**	0	0	0	**0**	0	10	0	**10**	**20**
6:45PM	11	0	0	**11**	0	0	0	**0**	0	9	0	**9**	**20**
Hourly Total	60	2	0	**62**	0	0	0	**0**	0	55	0	**55**	**117**
7:00PM	5	0	0	**5**	0	1	0	**1**	0	6	0	**6**	**12**
7:15PM	8	0	0	**8**	0	0	0	**0**	0	10	0	**10**	**18**
7:30PM	10	1	0	**11**	0	0	0	**0**	0	13	0	**13**	**24**
7:45PM	6	0	0	**6**	0	0	0	**0**	0	5	0	**5**	**11**
Hourly Total	29	1	0	**30**	0	1	0	**1**	0	34	0	**34**	**65**
8:00PM	13	0	0	**13**	0	0	0	**0**	0	7	0	**7**	**20**
8:15PM	8	0	0	**8**	0	1	0	**1**	0	7	0	**7**	**16**
8:30PM	12	0	0	**12**	0	0	0	**0**	1	8	0	**9**	**21**
8:45PM	6	0	0	**6**	1	0	0	**1**	0	3	0	**3**	**10**
Hourly Total	39	0	0	**39**	1	1	0	**2**	1	25	0	**26**	**67**
9:00PM	7	0	0	**7**	0	0	0	**0**	0	7	0	**7**	**14**
9:15PM	1	0	0	**1**	0	0	0	**0**	0	4	0	**4**	**5**
9:30PM	6	1	0	**7**	0	0	0	**0**	0	3	0	**3**	**10**
9:45PM	4	0	0	**4**	0	0	0	**0**	0	4	0	**4**	**8**
Hourly Total	18	1	0	**19**	0	0	0	**0**	0	18	0	**18**	**37**
10:00PM	3	0	0	**3**	0	0	0	**0**	0	6	0	**6**	**9**
10:15PM	4	0	0	**4**	0	0	0	**0**	0	5	0	**5**	**9**
10:30PM	2	0	0	**2**	0	0	0	**0**	0	1	0	**1**	**3**
10:45PM	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	**1**

Leg	Golden Rd				161st Street				Golden Rd				
Direction	Southbound				Northbound				Eastbound				
Time	R	T	U	**App**	T	L	U	**App**	R	L	U	**App**	**Int**
Hourly Total	10	0	0	**10**	0	0	0	**0**	0	12	0	**12**	**22**
11:00PM	2	0	0	**2**	0	0	0	**0**	0	3	0	**3**	**5**
11:15PM	0	0	0	**0**	0	0	0	**0**	0	1	0	**1**	**1**
11:30PM	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	**0**
11:45PM	1	0	0	**1**	0	0	0	**0**	0	3	0	**3**	**4**
Hourly Total	3	0	0	**3**	0	0	0	**0**	0	7	0	**7**	**10**
Total	868	13	3	**884**	18	7	0	**25**	10	1156	1	**1167**	**2076**
% Approach	98.2%	1.5%	0.3%	**-**	72.0%	28.0%	0%	**-**	0.9%	99.1%	0.1%	**-**	-
% Total	41.8%	0.6%	0.1%	**42.6%**	0.9%	0.3%	0%	**1.2%**	0.5%	55.7%	0%	**56.2%**	-
Lights	852	13	3	**868**	17	6	0	**23**	10	1129	1	**1140**	2031
% Lights	98.2%	100%	100%	**98.2%**	94.4%	85.7%	0%	**92.0%**	100%	97.7%	100%	**97.7%**	97.8%
Articulated Trucks	1	0	0	**1**	0	0	0	**0**	0	3	0	**3**	4
% Articulated Trucks	0.1%	0%	0%	**0.1%**	0%	0%	0%	**0%**	0%	0.3%	0%	**0.3%**	0.2%
Buses and Single-Unit Trucks	15	0	0	**15**	1	1	0	**2**	0	24	0	**24**	41
% Buses and Single-Unit Trucks	1.7%	0%	0%	**1.7%**	5.6%	14.3%	0%	**8.0%**	0%	2.1%	0%	**2.1%**	2.0%

*L: Left, R: Right, T: Thru, U: U-Turn

a. Golden Road & 161st Street - TMC
Thu Jul 11, 2024
Full Length (12 AM-12 AM (+1))
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205785, Location: 38.999647, -94.950712

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



a. Golden Road & 161st Street - TMC

Thu Jul 11, 2024
AM Peak (Jul 11 2024 6:30AM - 7:30 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205785, Location: 38.999647, -94.950712

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

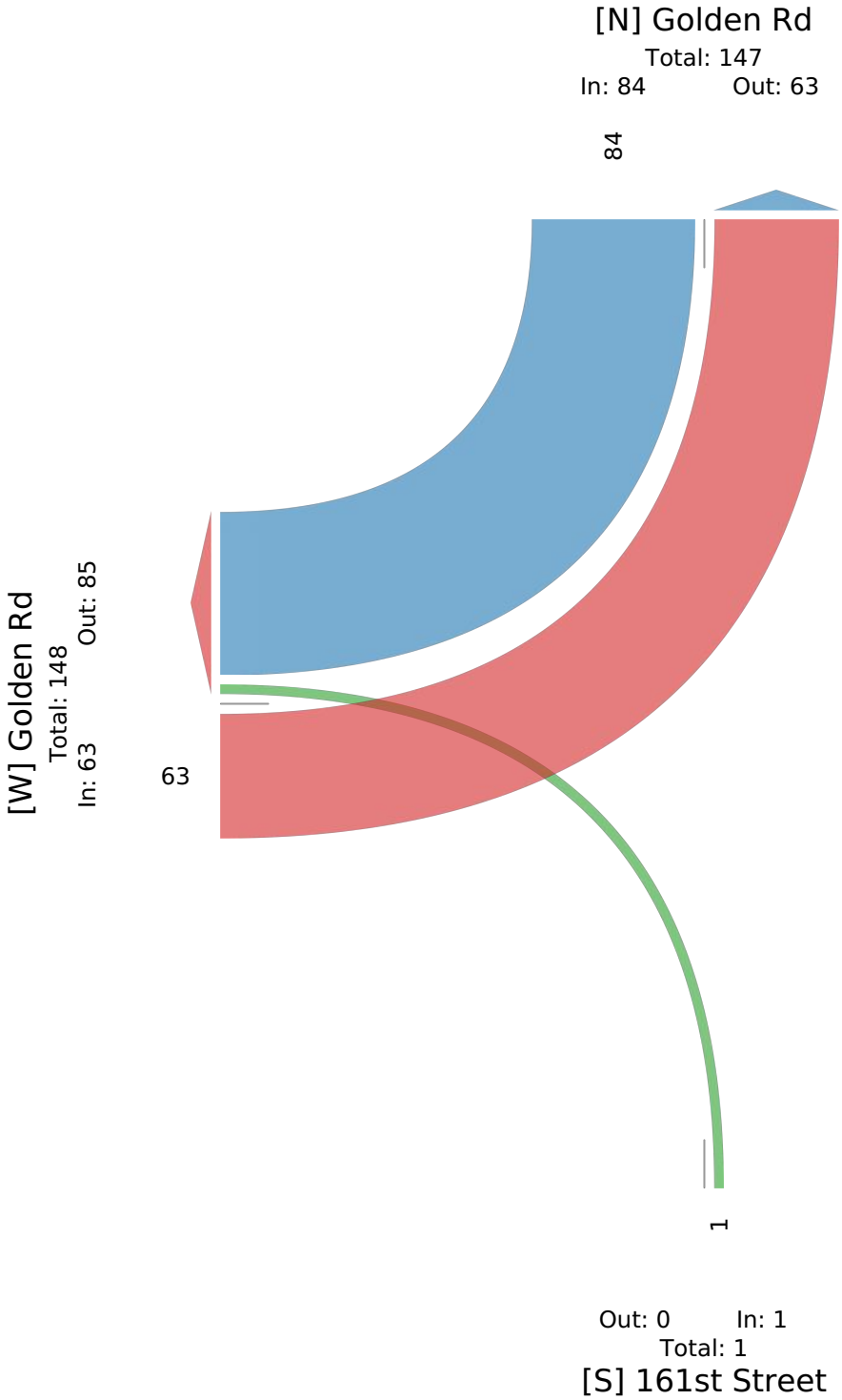
Leg	Golden Rd				161st Street				Golden Rd				
Direction	Southbound				Northbound				Eastbound				
Time	R	T	U	**App**	T	L	U	**App**	R	L	U	**App**	**Int**
2024-07-11 6:30AM	33	0	0	**33**	0	0	0	**0**	0	13	0	**13**	**46**
6:45AM	23	0	0	**23**	0	0	0	**0**	0	17	0	**17**	**40**
7:00AM	6	0	0	**6**	0	1	0	**1**	0	13	0	**13**	**20**
7:15AM	22	0	0	**22**	0	0	0	**0**	0	20	0	**20**	**42**
Total	84	0	0	**84**	0	1	0	**1**	0	63	0	**63**	**148**
% Approach	100%	0%	0%	**-**	0%	100%	0%	**-**	0%	100%	0%	**-**	-
% Total	56.8%	0%	0%	**56.8%**	0%	0.7%	0%	**0.7%**	0%	42.6%	0%	**42.6%**	-
PHF	0.636	-	-	**0.636**	-	0.250	-	**0.250**	-	0.788	-	**0.788**	0.804
Lights	81	0	0	**81**	0	1	0	**1**	0	62	0	**62**	144
% Lights	96.4%	0%	0%	**96.4%**	0%	100%	0%	**100%**	0%	98.4%	0%	**98.4%**	97.3%
Articulated Trucks	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0
% Articulated Trucks	0%	0%	0%	**0%**	0%	0%	0%	**0%**	0%	0%	0%	**0%**	0%
Buses and Single-Unit Trucks	3	0	0	**3**	0	0	0	**0**	0	1	0	**1**	4
% Buses and Single-Unit Trucks	3.6%	0%	0%	**3.6%**	0%	0%	0%	**0%**	0%	1.6%	0%	**1.6%**	2.7%

*L: Left, R: Right, T: Thru, U: U-Turn

a. Golden Road & 161st Street - TMC

Thu Jul 11, 2024
AM Peak (Jul 11 2024 6:30AM - 7:30 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205785, Location: 38.999647, -94.950712

GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



a. Golden Road & 161st Street - TMC

Thu Jul 11, 2024
Forced Peak (Jul 11 2024 7:15AM - 8:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205785, Location: 38.999647, -94.950712

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

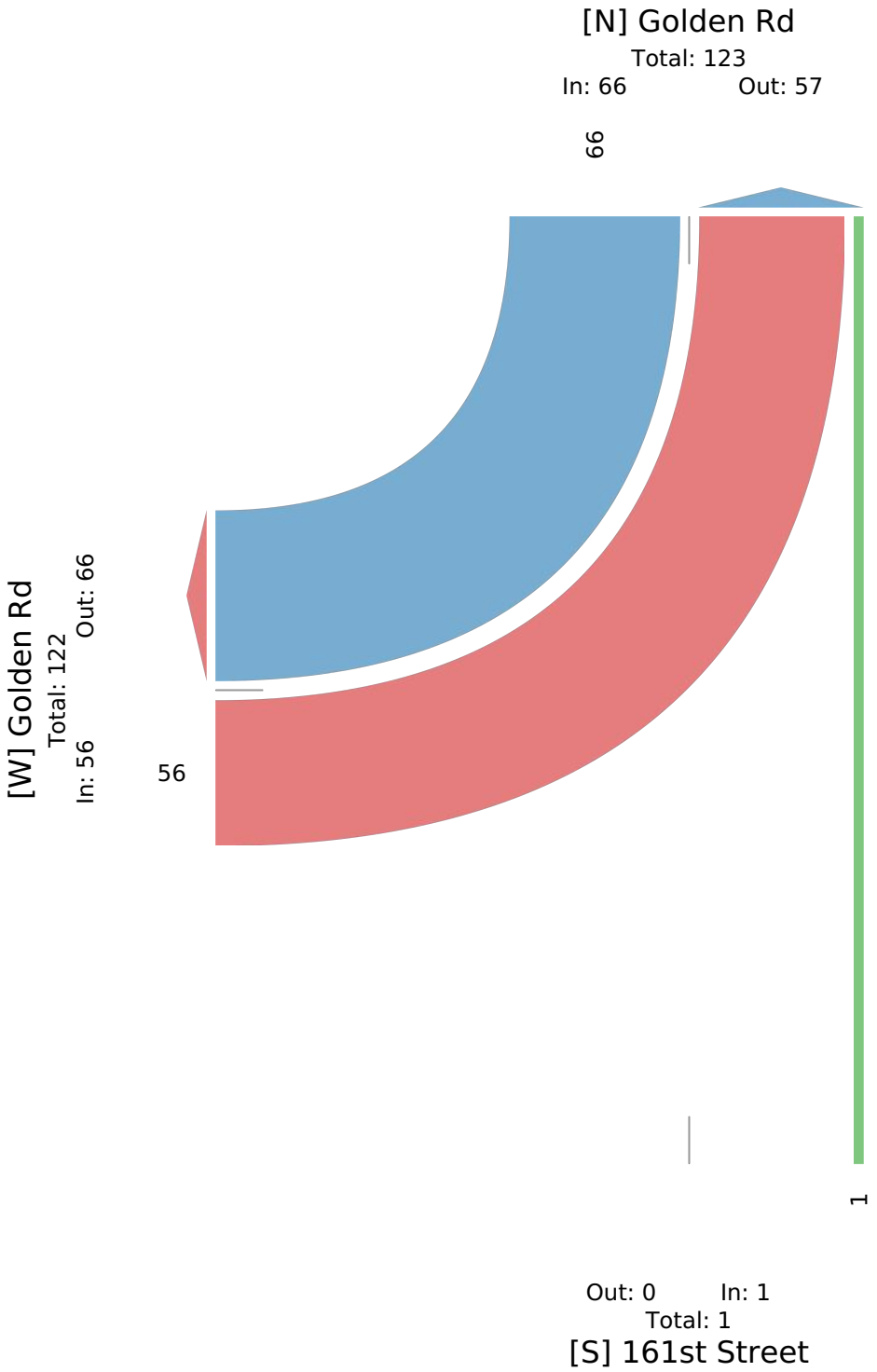
Leg	Golden Rd				161st Street				Golden Rd				
Direction	Southbound				Northbound				Eastbound				
Time	R	T	U	**App**	T	L	U	**App**	R	L	U	**App**	**Int**
2024-07-11 7:15AM	22	0	0	**22**	0	0	0	**0**	0	20	0	**20**	**42**
7:30AM	18	0	0	**18**	1	0	0	**1**	0	12	0	**12**	**31**
7:45AM	15	0	0	**15**	0	0	0	**0**	0	14	0	**14**	**29**
8:00AM	11	0	0	**11**	0	0	0	**0**	0	10	0	**10**	**21**
Total	66	0	0	**66**	1	0	0	**1**	0	56	0	**56**	**123**
% Approach	100%	0%	0%	**-**	100%	0%	0%	**-**	0%	100%	0%	**-**	-
% Total	53.7%	0%	0%	**53.7%**	0.8%	0%	0%	**0.8%**	0%	45.5%	0%	**45.5%**	-
PHF	0.750	-	-	**0.750**	0.250	-	-	**0.250**	-	0.700	-	**0.700**	0.732
Lights	62	0	0	**62**	1	0	0	**1**	0	55	0	**55**	118
% Lights	93.9%	0%	0%	**93.9%**	100%	0%	0%	**100%**	0%	98.2%	0%	**98.2%**	95.9%
Articulated Trucks	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0
% Articulated Trucks	0%	0%	0%	**0%**	0%	0%	0%	**0%**	0%	0%	0%	**0%**	0%
Buses and Single-Unit Trucks	4	0	0	**4**	0	0	0	**0**	0	1	0	**1**	5
% Buses and Single-Unit Trucks	6.1%	0%	0%	**6.1%**	0%	0%	0%	**0%**	0%	1.8%	0%	**1.8%**	4.1%

*L: Left, R: Right, T: Thru, U: U-Turn

a. Golden Road & 161st Street - TMC

Thu Jul 11, 2024
Forced Peak (Jul 11 2024 7:15AM - 8:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205785, Location: 38.999647, -94.950712

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



a. Golden Road & 161st Street - TMC

Thu Jul 11, 2024
Midday Peak (Jul 11 2024 12:15PM - 1:15 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205785, Location: 38.999647, -94.950712

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

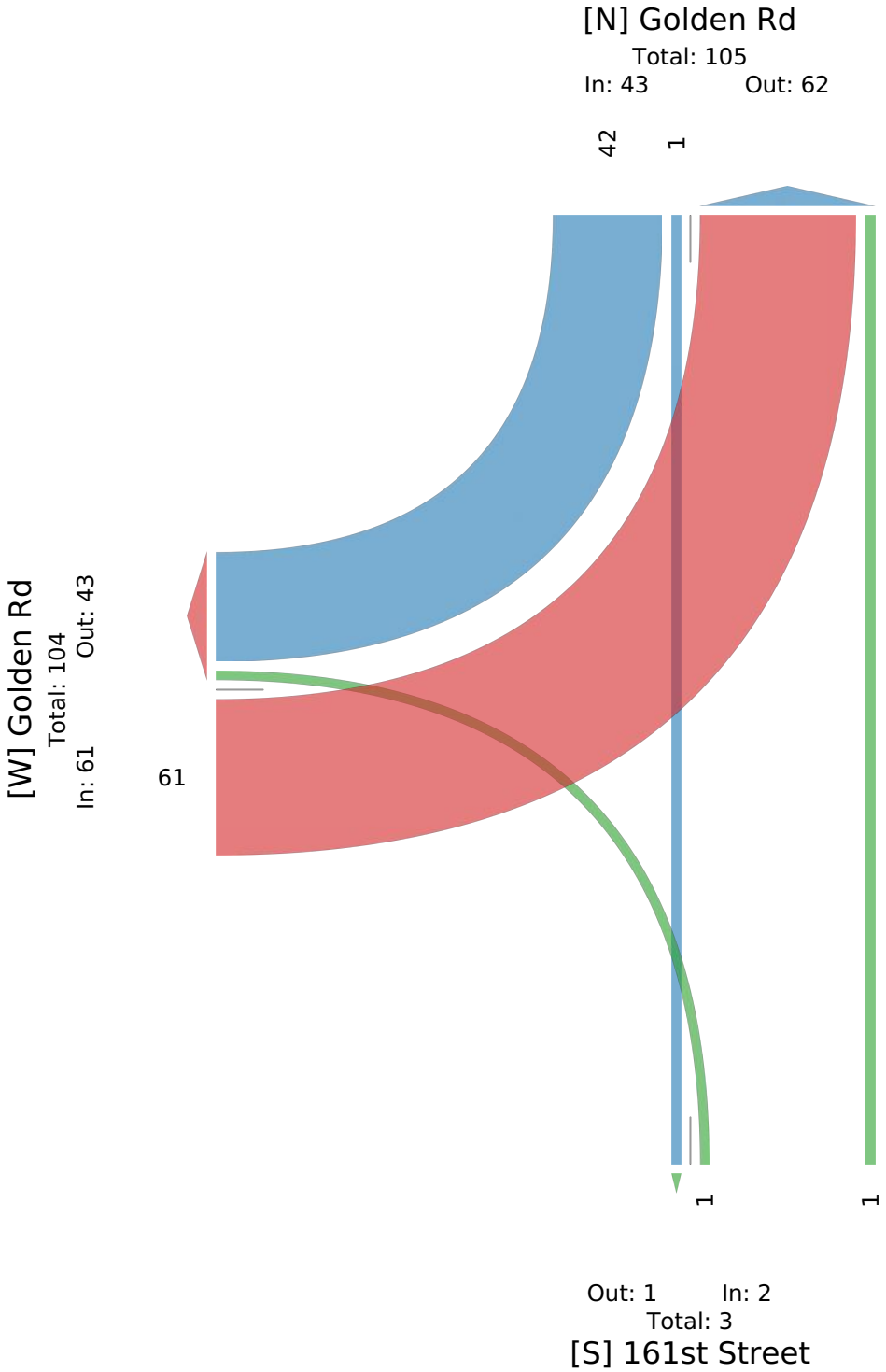
Leg	Golden Rd				161st Street				Golden Rd				
Direction	Southbound				Northbound				Eastbound				
Time	R	T	U	**App**	T	L	U	**App**	R	L	U	**App**	**Int**
2024-07-11 12:15PM	12	0	0	**12**	0	1	0	**1**	0	18	0	**18**	**31**
12:30PM	13	0	0	**13**	1	0	0	**1**	0	11	0	**11**	**25**
12:45PM	9	1	0	**10**	0	0	0	**0**	0	12	0	**12**	**22**
1:00PM	8	0	0	**8**	0	0	0	**0**	0	20	0	**20**	**28**
Total	42	1	0	**43**	1	1	0	**2**	0	61	0	**61**	**106**
% Approach	97.7%	2.3%	0%	**-**	50.0%	50.0%	0%	**-**	0%	100%	0%	**-**	-
% Total	39.6%	0.9%	0%	**40.6%**	0.9%	0.9%	0%	**1.9%**	0%	57.5%	0%	**57.5%**	-
PHF	0.808	0.250	-	**0.827**	0.250	0.250	-	**0.500**	-	0.763	-	**0.763**	0.855
Lights	41	1	0	**42**	1	1	0	**2**	0	58	0	**58**	102
% Lights	97.6%	100%	0%	**97.7%**	100%	100%	0%	**100%**	0%	95.1%	0%	**95.1%**	96.2%
Articulated Trucks	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0
% Articulated Trucks	0%	0%	0%	**0%**	0%	0%	0%	**0%**	0%	0%	0%	**0%**	0%
Buses and Single-Unit Trucks	1	0	0	**1**	0	0	0	**0**	0	3	0	**3**	4
% Buses and Single-Unit Trucks	2.4%	0%	0%	**2.3%**	0%	0%	0%	**0%**	0%	4.9%	0%	**4.9%**	3.8%

*L: Left, R: Right, T: Thru, U: U-Turn

a. Golden Road & 161st Street - TMC

Thu Jul 11, 2024
Midday Peak (Jul 11 2024 12:15PM - 1:15 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205785, Location: 38.999647, -94.950712

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



a. Golden Road & 161st Street - TMC

Thu Jul 11, 2024
Forced Peak (Jul 11 2024 2PM - 3 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205785, Location: 38.999647, -94.950712

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

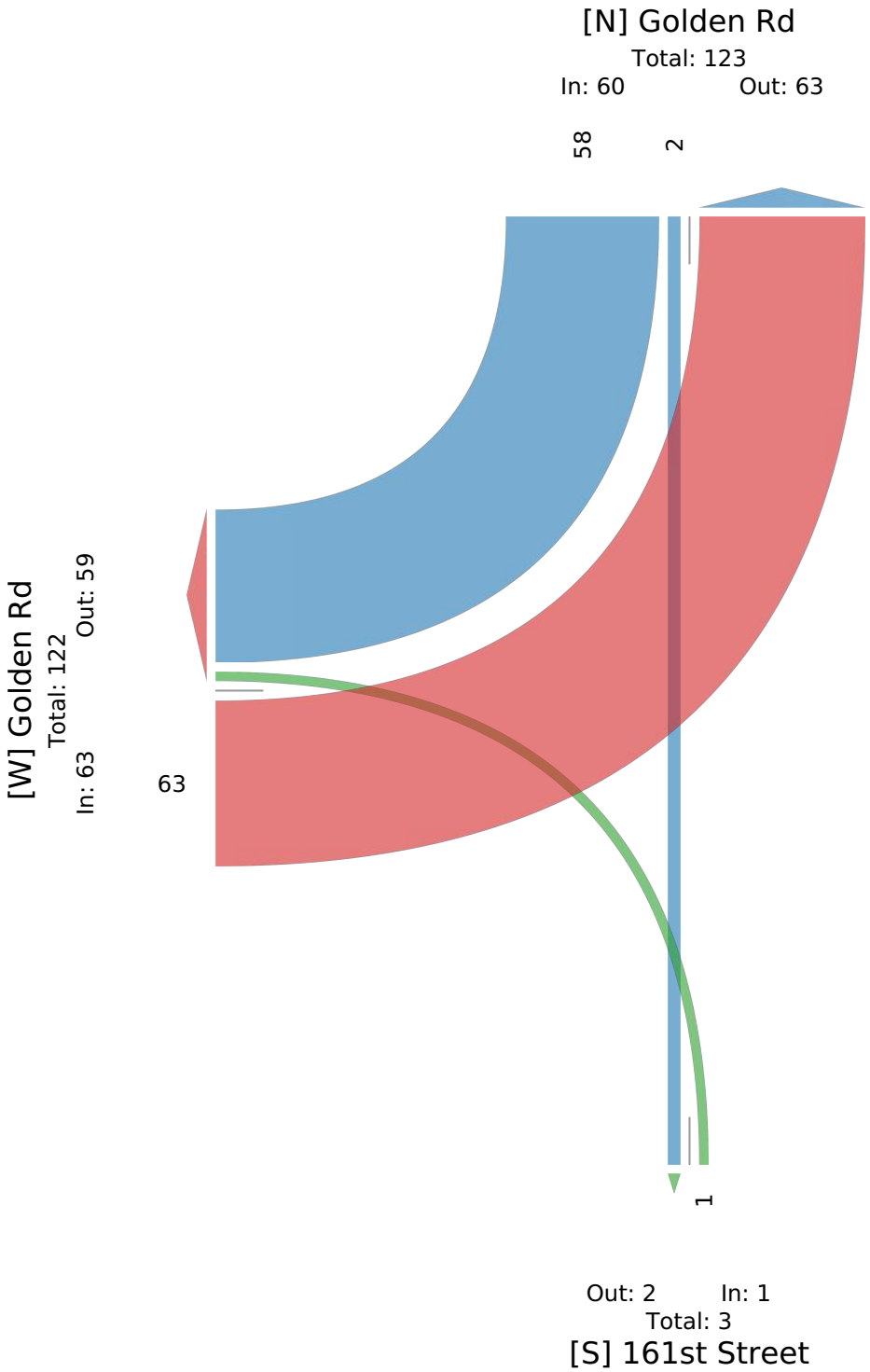
Leg	Golden Rd				161st Street				Golden Rd				
Direction	Southbound				Northbound				Eastbound				
Time	R	T	U	**App**	T	L	U	**App**	R	L	U	**App**	**Int**
2024-07-11 2:00PM	16	1	0	**17**	0	0	0	**0**	0	21	0	**21**	**38**
2:15PM	12	0	0	**12**	0	0	0	**0**	0	10	0	**10**	**22**
2:30PM	13	0	0	**13**	0	0	0	**0**	0	16	0	**16**	**29**
2:45PM	17	1	0	**18**	0	1	0	**1**	0	16	0	**16**	**35**
Total	58	2	0	**60**	0	1	0	**1**	0	63	0	**63**	**124**
% Approach	96.7%	3.3%	0%	**-**	0%	100%	0%	**-**	0%	100%	0%	**-**	-
% Total	46.8%	1.6%	0%	**48.4%**	0%	0.8%	0%	**0.8%**	0%	50.8%	0%	**50.8%**	-
PHF	0.853	0.500	-	**0.833**	-	0.250	-	**0.250**	-	0.750	-	**0.750**	0.816
Lights	57	2	0	**59**	0	0	0	**0**	0	62	0	**62**	121
% Lights	98.3%	100%	0%	**98.3%**	0%	0%	0%	**0%**	0%	98.4%	0%	**98.4%**	97.6%
Articulated Trucks	0	0	0	**0**	0	0	0	**0**	0	1	0	**1**	1
% Articulated Trucks	0%	0%	0%	**0%**	0%	0%	0%	**0%**	0%	1.6%	0%	**1.6%**	0.8%
Buses and Single-Unit Trucks	1	0	0	**1**	0	1	0	**1**	0	0	0	**0**	2
% Buses and Single-Unit Trucks	1.7%	0%	0%	**1.7%**	0%	100%	0%	**100%**	0%	0%	0%	**0%**	1.6%

*L: Left, R: Right, T: Thru, U: U-Turn

a. Golden Road & 161st Street - TMC

Thu Jul 11, 2024
Forced Peak (Jul 11 2024 2PM - 3 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205785, Location: 38.999647, -94.950712

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



a. Golden Road & 161st Street - TMC

Thu Jul 11, 2024
PM Peak (Jul 11 2024 4:30PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205785, Location: 38.999647, -94.950712

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

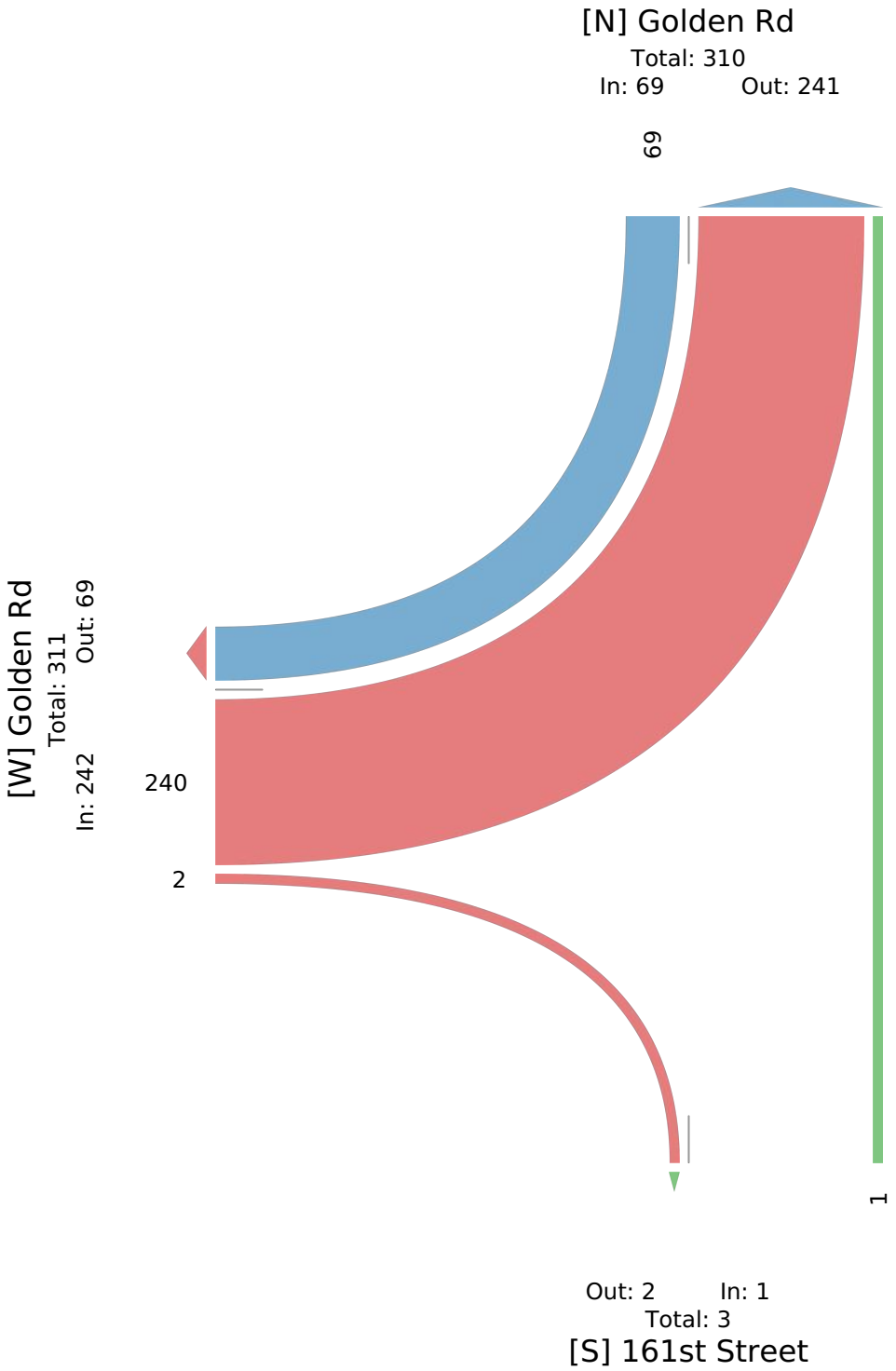
Leg	Golden Rd				161st Street				Golden Rd				
Direction	Southbound				Northbound				Eastbound				
Time	R	T	U	**App**	T	L	U	**App**	R	L	U	**App**	**Int**
2024-07-11 4:30PM	14	0	0	**14**	0	0	0	**0**	1	61	0	**62**	**76**
4:45PM	9	0	0	**9**	0	0	0	**0**	0	61	0	**61**	**70**
5:00PM	23	0	0	**23**	0	0	0	**0**	1	60	0	**61**	**84**
5:15PM	23	0	0	**23**	1	0	0	**1**	0	58	0	**58**	**82**
Total	69	0	0	**69**	1	0	0	**1**	2	240	0	**242**	**312**
% Approach	100%	0%	0%	**-**	100%	0%	0%	**-**	0.8%	99.2%	0%	**-**	-
% Total	22.1%	0%	0%	**22.1%**	0.3%	0%	0%	**0.3%**	0.6%	76.9%	0%	**77.6%**	-
PHF	0.750	-	-	**0.750**	0.250	-	-	**0.250**	0.500	0.984	-	**0.976**	0.929
Lights	69	0	0	**69**	1	0	0	**1**	2	234	0	**236**	306
% Lights	100%	0%	0%	**100%**	100%	0%	0%	**100%**	100%	97.5%	0%	**97.5%**	98.1%
Articulated Trucks	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0
% Articulated Trucks	0%	0%	0%	**0%**	0%	0%	0%	**0%**	0%	0%	0%	**0%**	0%
Buses and Single-Unit Trucks	0	0	0	**0**	0	0	0	**0**	0	6	0	**6**	6
% Buses and Single-Unit Trucks	0%	0%	0%	**0%**	0%	0%	0%	**0%**	0%	2.5%	0%	**2.5%**	1.9%

*L: Left, R: Right, T: Thru, U: U-Turn

a. Golden Road & 161st Street - TMC

Thu Jul 11, 2024
PM Peak (Jul 11 2024 4:30PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205785, Location: 38.999647, -94.950712

GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



APPENDIX A.2
GOLDEN ROAD & 166TH STREET
TURNING MOVEMENT COUNTS

b. Golden Rd & 166th St - TMC

Thu Jul 11, 2024
Full Length (12 AM-12 AM (+1))
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205786, Location: 38.997799, -94.964599

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Golden Rd				166th St				Golden Rd				
Direction	Westbound				Northbound				Eastbound				
Time	T	L	U	App	R	L	U	App	R	T	U	App	Int
2024-07-11 12:00AM	0	1	0	**1**	1	1	0	**2**	1	0	0	**1**	**4**
12:15AM	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	**0**
12:30AM	0	1	0	**1**	0	2	0	**2**	2	0	0	**2**	**5**
12:45AM	0	0	0	**0**	1	2	0	**3**	1	0	0	**1**	**4**
Hourly Total	0	2	0	**2**	2	5	0	**7**	4	0	0	**4**	**13**
1:00AM	0	2	0	**2**	0	2	0	**2**	1	0	0	**1**	**5**
1:15AM	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	**0**
1:30AM	0	3	0	**3**	1	0	0	**1**	0	0	0	**0**	**4**
1:45AM	0	0	0	**0**	1	1	0	**2**	2	0	0	**2**	**4**
Hourly Total	0	5	0	**5**	2	3	0	**5**	3	0	0	**3**	**13**
2:00AM	0	1	0	**1**	1	0	0	**1**	0	0	0	**0**	**2**
2:15AM	0	1	0	**1**	0	1	0	**1**	0	0	0	**0**	**2**
2:30AM	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	**1**
2:45AM	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	**1**
Hourly Total	0	2	0	**2**	1	1	0	**2**	2	0	0	**2**	**6**
3:00AM	0	0	0	**0**	0	2	0	**2**	0	0	0	**0**	**2**
3:15AM	0	3	0	**3**	0	1	0	**1**	0	0	0	**0**	**4**
3:30AM	0	1	0	**1**	1	0	0	**1**	2	0	0	**2**	**4**
3:45AM	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	**1**
Hourly Total	0	4	0	**4**	2	3	0	**5**	2	0	0	**2**	**11**
4:00AM	0	1	0	**1**	1	0	0	**1**	0	0	0	**0**	**2**
4:15AM	0	0	0	**0**	1	2	0	**3**	2	0	0	**2**	**5**
4:30AM	0	3	0	**3**	2	1	0	**3**	5	0	0	**5**	**11**
4:45AM	0	4	0	**4**	3	2	0	**5**	7	0	0	**7**	**16**
Hourly Total	0	8	0	**8**	7	5	0	**12**	14	0	0	**14**	**34**
5:00AM	0	11	0	**11**	2	2	0	**4**	7	1	0	**8**	**23**
5:15AM	0	13	0	**13**	3	3	0	**6**	10	0	0	**10**	**29**
5:30AM	0	16	0	**16**	13	6	0	**19**	16	0	0	**16**	**51**
5:45AM	0	15	0	**15**	10	3	0	**13**	14	0	0	**14**	**42**
Hourly Total	0	55	0	**55**	28	14	0	**42**	47	1	0	**48**	**145**
6:00AM	0	15	0	**15**	9	4	0	**13**	27	0	0	**27**	**55**
6:15AM	0	18	0	**18**	11	1	0	**12**	23	0	0	**23**	**53**
6:30AM	1	31	0	**32**	13	6	0	**19**	42	0	0	**42**	**93**
6:45AM	0	21	0	**21**	12	11	0	**23**	36	2	0	**38**	**82**
Hourly Total	1	85	0	**86**	45	22	0	**67**	128	2	0	**130**	**283**
7:00AM	0	12	0	**12**	16	12	0	**28**	26	0	0	**26**	**66**
7:15AM	0	20	0	**20**	18	10	0	**28**	33	0	0	**33**	**81**
7:30AM	2	18	0	**20**	11	7	0	**18**	34	0	0	**34**	**72**
7:45AM	2	13	0	**15**	15	13	0	**28**	23	1	0	**24**	**67**
Hourly Total	4	63	0	**67**	60	42	0	**102**	116	1	0	**117**	**286**
8:00AM	2	10	0	**12**	10	9	0	**19**	20	1	0	**21**	**52**
8:15AM	2	11	0	**13**	12	19	0	**31**	22	0	0	**22**	**66**
8:30AM	2	9	0	**11**	13	15	0	**28**	25	2	0	**27**	**66**
8:45AM	2	10	0	**12**	11	14	0	**25**	11	0	0	**11**	**48**
Hourly Total	8	40	0	**48**	46	57	0	**103**	78	3	0	**81**	**232**
9:00AM	1	7	0	**8**	9	20	0	**29**	19	2	0	**21**	**58**
9:15AM	0	10	0	**10**	8	12	0	**20**	28	4	0	**32**	**62**
9:30AM	0	15	0	**15**	6	14	0	**20**	17	0	0	**17**	**52**
9:45AM	1	6	0	**7**	6	9	0	**15**	23	0	0	**23**	**45**
Hourly Total	2	38	0	**40**	29	55	0	**84**	87	6	0	**93**	**217**
10:00AM	2	7	0	**9**	11	15	0	**26**	16	3	0	**19**	**54**
10:15AM	2	8	0	**10**	7	15	0	**22**	23	1	0	**24**	**56**
10:30AM	1	9	0	**10**	11	6	0	**17**	14	0	0	**14**	**41**
10:45AM	0	11	0	**11**	14	18	0	**32**	16	1	0	**17**	**60**

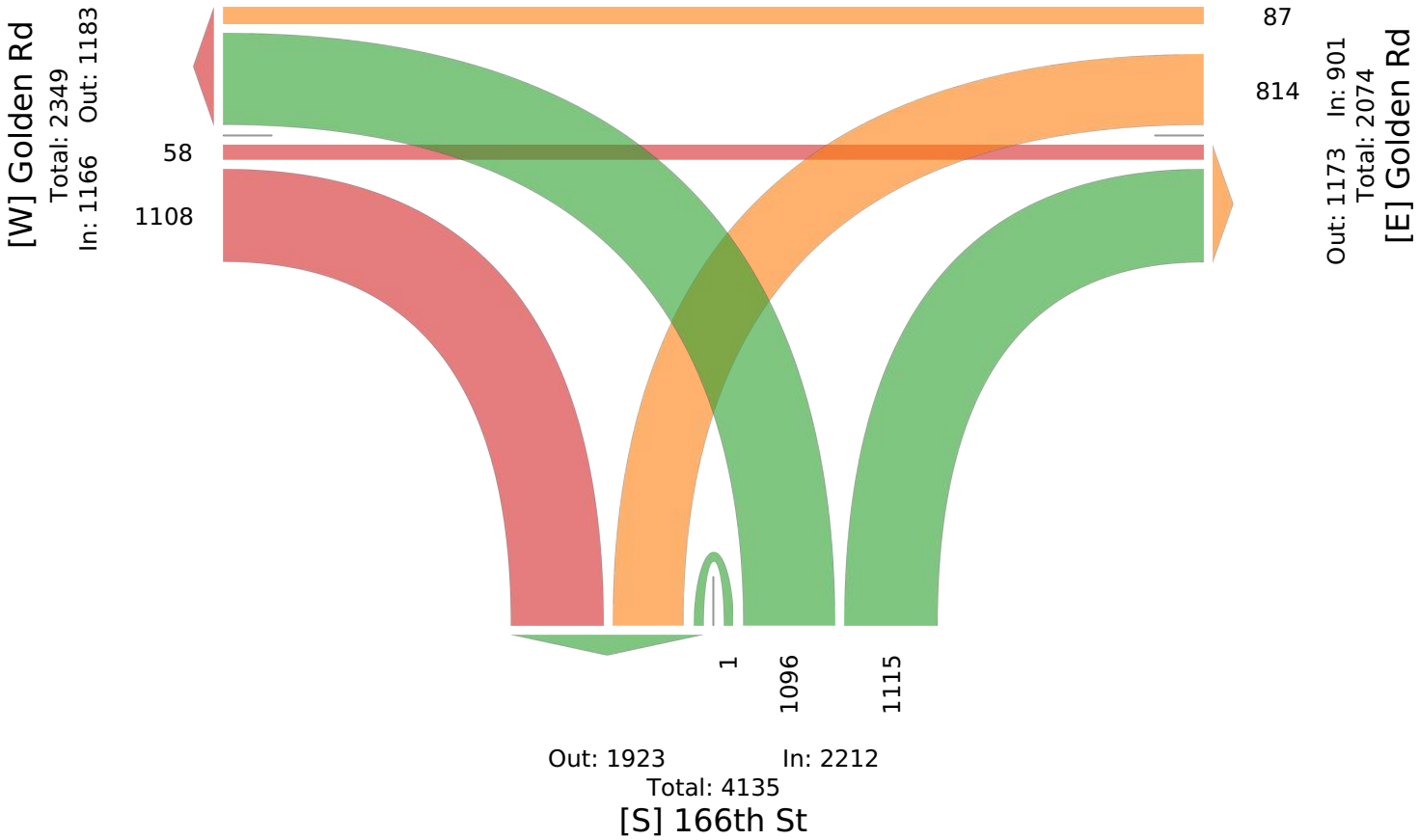
Leg	Golden Rd				166th St				Golden Rd				
Direction	Westbound				Northbound				Eastbound				
Time	T	L	U	**App**	R	L	U	**App**	R	T	U	**App**	**Int**
Hourly Total	5	35	0	**40**	43	54	0	**97**	69	5	0	**74**	**211**
11:00AM	1	5	0	**6**	12	18	0	**30**	12	0	0	**12**	**48**
11:15AM	1	7	0	**8**	9	10	0	**19**	3	2	0	**5**	**32**
11:30AM	0	9	0	**9**	8	12	0	**20**	21	2	0	**23**	**52**
11:45AM	2	9	0	**11**	5	17	0	**22**	12	2	0	**14**	**47**
Hourly Total	4	30	0	**34**	34	57	0	**91**	48	6	0	**54**	**179**
12:00PM	1	10	0	**11**	15	14	0	**29**	11	0	0	**11**	**51**
12:15PM	2	11	0	**13**	15	13	0	**28**	15	0	0	**15**	**56**
12:30PM	0	13	0	**13**	10	12	0	**22**	16	1	0	**17**	**52**
12:45PM	1	9	0	**10**	13	14	0	**27**	17	1	0	**18**	**55**
Hourly Total	4	43	0	**47**	53	53	0	**106**	59	2	0	**61**	**214**
1:00PM	3	7	0	**10**	18	15	0	**33**	9	3	0	**12**	**55**
1:15PM	2	8	0	**10**	6	9	0	**15**	14	4	0	**18**	**43**
1:30PM	0	9	0	**9**	15	13	0	**28**	11	2	0	**13**	**50**
1:45PM	2	11	0	**13**	12	16	0	**28**	13	1	0	**14**	**55**
Hourly Total	7	35	0	**42**	51	53	0	**104**	47	10	0	**57**	**203**
2:00PM	1	14	0	**15**	20	18	0	**38**	20	1	0	**21**	**74**
2:15PM	1	10	0	**11**	10	14	0	**24**	15	0	0	**15**	**50**
2:30PM	0	15	0	**15**	18	19	0	**37**	21	1	0	**22**	**74**
2:45PM	5	13	0	**18**	17	29	0	**46**	17	1	0	**18**	**82**
Hourly Total	7	52	0	**59**	65	80	0	**145**	73	3	0	**76**	**280**
3:00PM	0	8	0	**8**	22	20	0	**42**	13	1	0	**14**	**64**
3:15PM	1	5	0	**6**	11	18	0	**29**	20	0	0	**20**	**55**
3:30PM	1	25	0	**26**	53	39	0	**92**	12	0	0	**12**	**130**
3:45PM	3	15	0	**18**	24	32	0	**56**	16	1	0	**17**	**91**
Hourly Total	5	53	0	**58**	110	109	0	**219**	61	2	0	**63**	**340**
4:00PM	3	13	0	**16**	34	30	0	**64**	20	1	0	**21**	**101**
4:15PM	4	19	0	**23**	50	32	0	**82**	16	0	0	**16**	**121**
4:30PM	1	15	0	**16**	58	29	0	**87**	18	2	0	**20**	**123**
4:45PM	1	9	0	**10**	58	41	0	**99**	17	2	0	**19**	**128**
Hourly Total	9	56	0	**65**	200	132	0	**332**	71	5	0	**76**	**473**
5:00PM	3	19	0	**22**	65	35	0	**100**	13	0	0	**13**	**135**
5:15PM	4	20	0	**24**	57	40	0	**97**	22	1	0	**23**	**144**
5:30PM	1	15	0	**16**	44	21	0	**65**	14	1	0	**15**	**96**
5:45PM	2	11	0	**13**	30	23	0	**53**	17	0	0	**17**	**83**
Hourly Total	10	65	0	**75**	196	119	0	**315**	66	2	0	**68**	**458**
6:00PM	2	14	0	**16**	21	22	0	**43**	15	2	0	**17**	**76**
6:15PM	2	23	0	**25**	12	28	0	**40**	12	2	0	**14**	**79**
6:30PM	1	9	0	**10**	11	11	0	**22**	6	1	0	**7**	**39**
6:45PM	1	10	0	**11**	9	13	0	**22**	5	0	0	**5**	**38**
Hourly Total	6	56	0	**62**	53	74	0	**127**	38	5	0	**43**	**232**
7:00PM	0	5	0	**5**	2	18	0	**20**	5	2	0	**7**	**32**
7:15PM	1	9	0	**10**	11	9	0	**20**	4	0	0	**4**	**34**
7:30PM	1	8	0	**9**	14	22	0	**36**	4	0	0	**4**	**49**
7:45PM	1	5	0	**6**	4	12	0	**16**	5	0	0	**5**	**27**
Hourly Total	3	27	0	**30**	31	61	0	**92**	18	2	0	**20**	**142**
8:00PM	1	12	0	**13**	7	13	0	**20**	3	1	0	**4**	**37**
8:15PM	4	7	0	**11**	7	5	0	**12**	11	1	0	**12**	**35**
8:30PM	1	12	0	**13**	6	11	0	**17**	11	0	0	**11**	**41**
8:45PM	1	4	0	**5**	3	6	0	**9**	7	0	0	**7**	**21**
Hourly Total	7	35	0	**42**	23	35	0	**58**	32	2	0	**34**	**134**
9:00PM	1	6	0	**7**	6	10	0	**16**	7	0	0	**7**	**30**
9:15PM	1	0	0	**1**	3	11	0	**14**	8	1	0	**9**	**24**
9:30PM	0	6	0	**6**	3	7	0	**10**	5	0	0	**5**	**21**
9:45PM	0	4	0	**4**	3	6	0	**9**	6	0	0	**6**	**19**
Hourly Total	2	16	0	**18**	15	34	0	**49**	26	1	0	**27**	**94**
10:00PM	1	1	0	**2**	6	3	0	**9**	4	0	0	**4**	**15**
10:15PM	1	2	0	**3**	5	10	0	**15**	3	0	0	**3**	**21**
10:30PM	0	3	0	**3**	1	6	0	**7**	4	0	0	**4**	**14**
10:45PM	0	1	0	**1**	0	3	1	**4**	2	0	0	**2**	**7**

Leg	Golden Rd				166th St				Golden Rd				
Direction	Westbound				Northbound				Eastbound				
Time	T	L	U	**App**	R	L	U	**App**	R	T	U	**App**	**Int**
Hourly Total	2	7	0	**9**	12	22	1	**35**	13	0	0	**13**	**57**
11:00PM	1	1	0	**2**	3	2	0	**5**	5	0	0	**5**	**12**
11:15PM	0	0	0	**0**	1	1	0	**2**	0	0	0	**0**	**2**
11:30PM	0	0	0	**0**	0	3	0	**3**	0	0	0	**0**	**3**
11:45PM	0	1	0	**1**	3	0	0	**3**	1	0	0	**1**	**5**
Hourly Total	1	2	0	**3**	7	6	0	**13**	6	0	0	**6**	**22**
Total	87	814	0	**901**	1115	1096	1	**2212**	1108	58	0	**1166**	**4279**
% Approach	9.7%	90.3%	0%	**-**	50.4%	49.5%	0%	**-**	95.0%	5.0%	0%	**-**	-
% Total	2.0%	19.0%	0%	**21.1%**	26.1%	25.6%	0%	**51.7%**	25.9%	1.4%	0%	**27.2%**	-
Lights	84	799	0	**883**	1090	1067	1	**2158**	1080	56	0	**1136**	4177
% Lights	96.6%	98.2%	0%	**98.0%**	97.8%	97.4%	100%	**97.6%**	97.5%	96.6%	0%	**97.4%**	97.6%
Articulated Trucks	0	1	0	**1**	6	6	0	**12**	9	0	0	**9**	22
% Articulated Trucks	0%	0.1%	0%	**0.1%**	0.5%	0.5%	0%	**0.5%**	0.8%	0%	0%	**0.8%**	0.5%
Buses and Single-Unit Trucks	3	14	0	**17**	19	23	0	**42**	19	2	0	**21**	80
% Buses and Single-Unit Trucks	3.4%	1.7%	0%	**1.9%**	1.7%	2.1%	0%	**1.9%**	1.7%	3.4%	0%	**1.8%**	1.9%

*L: Left, R: Right, T: Thru, U: U-Turn

b. Golden Rd & 166th St - TMC
Thu Jul 11, 2024
Full Length (12 AM-12 AM (+1))
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205786, Location: 38.997799, -94.964599

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



b. Golden Rd & 166th St - TMC

Thu Jul 11, 2024
AM Peak (Jul 11 2024 6:30AM - 7:30 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205786, Location: 38.997799, -94.964599

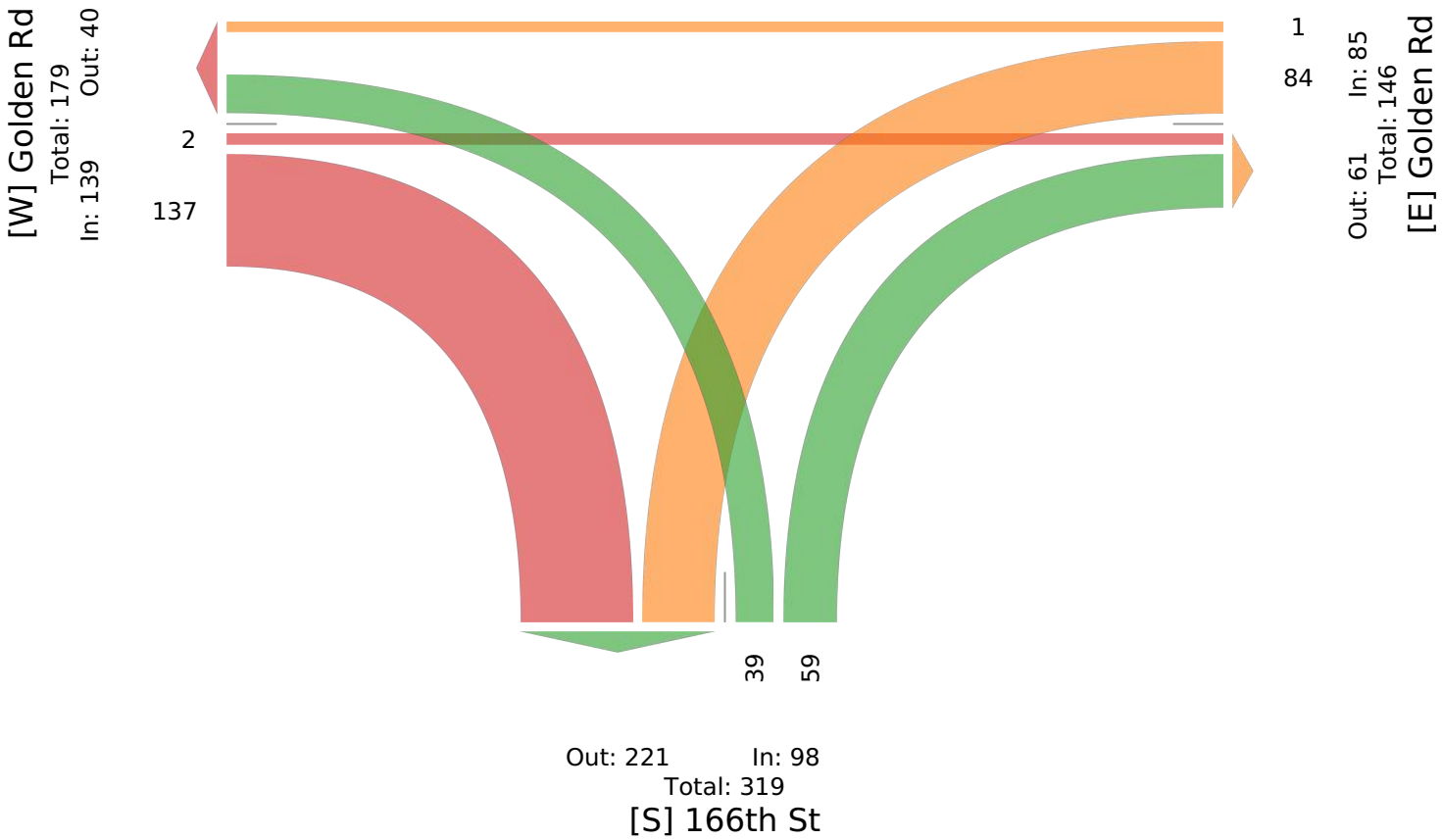
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Golden Rd				166th St				Golden Rd				
Direction	Westbound				Northbound				Eastbound				
Time	T	L	U	**App**	R	L	U	**App**	R	T	U	**App**	**Int**
2024-07-11 6:30AM	1	31	0	**32**	13	6	0	**19**	42	0	0	**42**	**93**
6:45AM	0	21	0	**21**	12	11	0	**23**	36	2	0	**38**	**82**
7:00AM	0	12	0	**12**	16	12	0	**28**	26	0	0	**26**	**66**
7:15AM	0	20	0	**20**	18	10	0	**28**	33	0	0	**33**	**81**
Total	1	84	0	**85**	59	39	0	**98**	137	2	0	**139**	**322**
% Approach	1.2%	98.8%	0%	**-**	60.2%	39.8%	0%	**-**	98.6%	1.4%	0%	**-**	-
% Total	0.3%	26.1%	0%	**26.4%**	18.3%	12.1%	0%	**30.4%**	42.5%	0.6%	0%	**43.2%**	-
PHF	0.250	0.677	-	**0.664**	0.819	0.813	-	**0.875**	0.815	0.250	-	**0.827**	0.866
Lights	1	81	0	**82**	58	39	0	**97**	136	2	0	**138**	317
% Lights	100%	96.4%	0%	**96.5%**	98.3%	100%	0%	**99.0%**	99.3%	100%	0%	**99.3%**	98.4%
Articulated Trucks	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0
% Articulated Trucks	0%	0%	0%	**0%**	0%	0%	0%	**0%**	0%	0%	0%	**0%**	0%
Buses and Single-Unit Trucks	0	3	0	**3**	1	0	0	**1**	1	0	0	**1**	5
% Buses and Single-Unit Trucks	0%	3.6%	0%	**3.5%**	1.7%	0%	0%	**1.0%**	0.7%	0%	0%	**0.7%**	1.6%

*L: Left, R: Right, T: Thru, U: U-Turn

b. Golden Rd & 166th St - TMC
Thu Jul 11, 2024
AM Peak (Jul 11 2024 6:30AM - 7:30 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205786, Location: 38.997799, -94.964599

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



b. Golden Rd & 166th St - TMC

Thu Jul 11, 2024
Forced Peak (Jul 11 2024 7:15AM - 8:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205786, Location: 38.997799, -94.964599

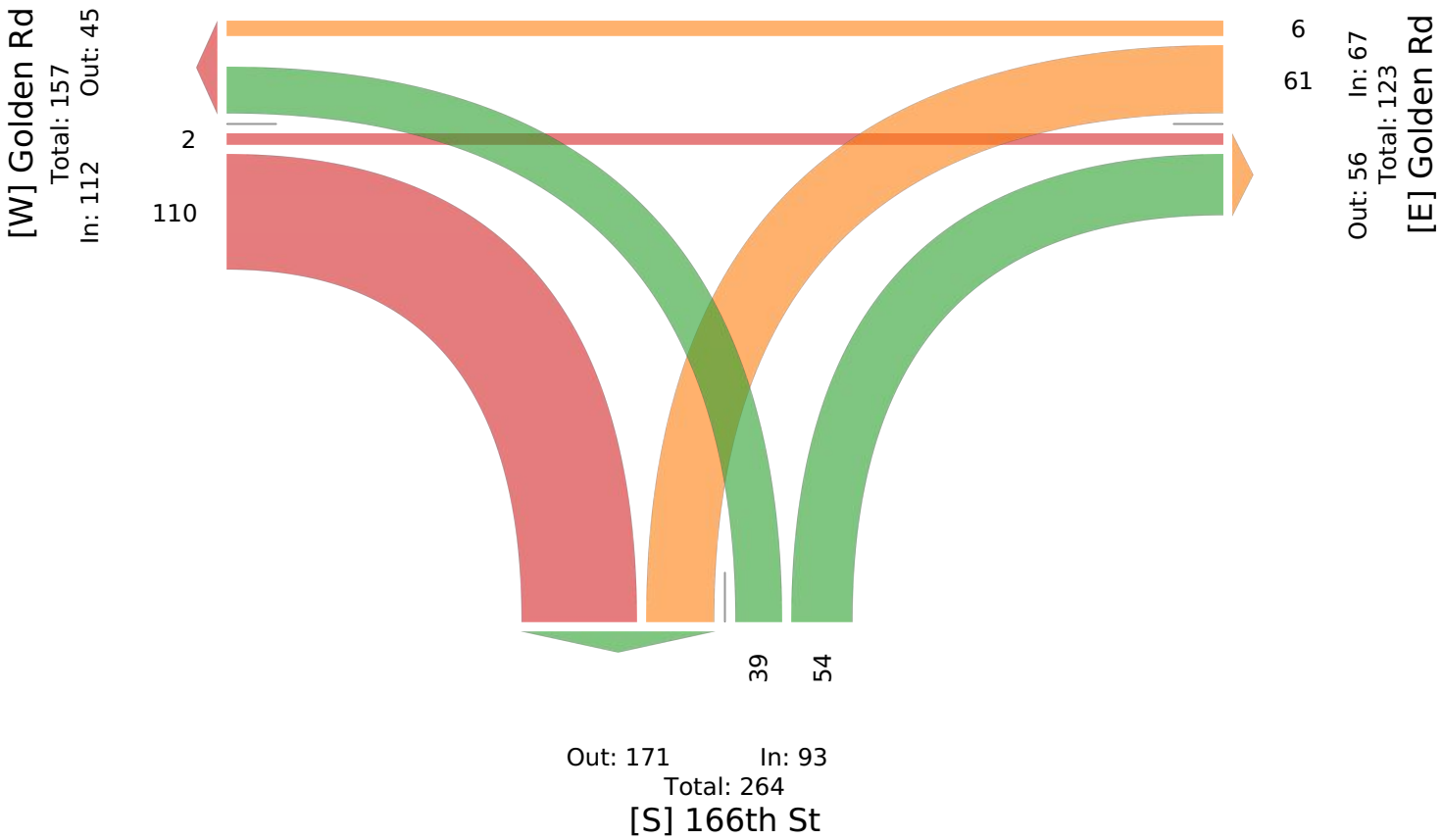
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Golden Rd				166th St				Golden Rd				
Direction	Westbound				Northbound				Eastbound				
Time	T	L	U	**App**	R	L	U	**App**	R	T	U	**App**	**Int**
2024-07-11 7:15AM	0	20	0	**20**	18	10	0	**28**	33	0	0	**33**	**81**
7:30AM	2	18	0	**20**	11	7	0	**18**	34	0	0	**34**	**72**
7:45AM	2	13	0	**15**	15	13	0	**28**	23	1	0	**24**	**67**
8:00AM	2	10	0	**12**	10	9	0	**19**	20	1	0	**21**	**52**
Total	6	61	0	**67**	54	39	0	**93**	110	2	0	**112**	**272**
% Approach	9.0%	91.0%	0%	**-**	58.1%	41.9%	0%	**-**	98.2%	1.8%	0%	**-**	-
% Total	2.2%	22.4%	0%	**24.6%**	19.9%	14.3%	0%	**34.2%**	40.4%	0.7%	0%	**41.2%**	-
PHF	0.750	0.763	-	**0.838**	0.750	0.750	-	**0.830**	0.809	0.500	-	**0.824**	0.840
Lights	6	57	0	**63**	53	39	0	**92**	110	2	0	**112**	267
% Lights	100%	93.4%	0%	**94.0%**	98.1%	100%	0%	**98.9%**	100%	100%	0%	**100%**	98.2%
Articulated Trucks	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0
% Articulated Trucks	0%	0%	0%	**0%**	0%	0%	0%	**0%**	0%	0%	0%	**0%**	0%
Buses and Single-Unit Trucks	0	4	0	**4**	1	0	0	**1**	0	0	0	**0**	5
% Buses and Single-Unit Trucks	0%	6.6%	0%	**6.0%**	1.9%	0%	0%	**1.1%**	0%	0%	0%	**0%**	1.8%

*L: Left, R: Right, T: Thru, U: U-Turn

b. Golden Rd & 166th St - TMC
Thu Jul 11, 2024
Forced Peak (Jul 11 2024 7:15AM - 8:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205786, Location: 38.997799, -94.964599

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



b. Golden Rd & 166th St - TMC

Thu Jul 11, 2024
Midday Peak (Jul 11 2024 12:15PM - 1:15 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205786, Location: 38.997799, -94.964599

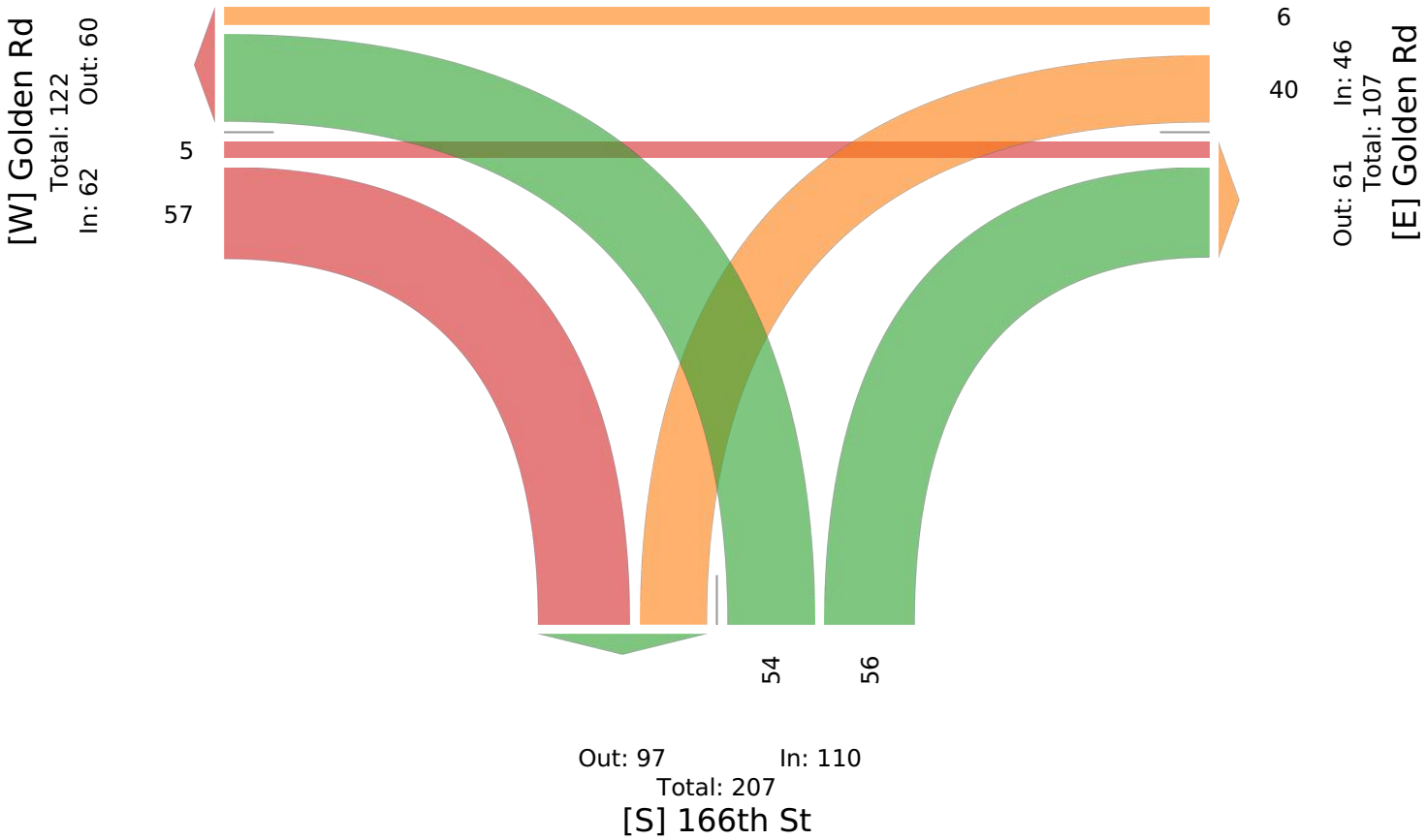
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Golden Rd				166th St				Golden Rd				
Direction	Westbound				Northbound				Eastbound				
Time	T	L	U	**App**	R	L	U	**App**	R	T	U	**App**	**Int**
2024-07-11 12:15PM	2	11	0	**13**	15	13	0	**28**	15	0	0	**15**	**56**
12:30PM	0	13	0	**13**	10	12	0	**22**	16	1	0	**17**	**52**
12:45PM	1	9	0	**10**	13	14	0	**27**	17	1	0	**18**	**55**
1:00PM	3	7	0	**10**	18	15	0	**33**	9	3	0	**12**	**55**
Total	6	40	0	**46**	56	54	0	**110**	57	5	0	**62**	**218**
% Approach	13.0%	87.0%	0%	**-**	50.9%	49.1%	0%	**-**	91.9%	8.1%	0%	**-**	-
% Total	2.8%	18.3%	0%	**21.1%**	25.7%	24.8%	0%	**50.5%**	26.1%	2.3%	0%	**28.4%**	-
PHF	0.500	0.769	-	**0.885**	0.778	0.900	-	**0.833**	0.838	0.417	-	**0.861**	0.973
Lights	5	39	0	**44**	54	51	0	**105**	54	5	0	**59**	208
% Lights	83.3%	97.5%	0%	**95.7%**	96.4%	94.4%	0%	**95.5%**	94.7%	100%	0%	**95.2%**	95.4%
Articulated Trucks	0	0	0	**0**	0	1	0	**1**	0	0	0	**0**	1
% Articulated Trucks	0%	0%	0%	**0%**	0%	1.9%	0%	**0.9%**	0%	0%	0%	**0%**	0.5%
Buses and Single-Unit Trucks	1	1	0	**2**	2	2	0	**4**	3	0	0	**3**	9
% Buses and Single-Unit Trucks	16.7%	2.5%	0%	**4.3%**	3.6%	3.7%	0%	**3.6%**	5.3%	0%	0%	**4.8%**	4.1%

*L: Left, R: Right, T: Thru, U: U-Turn

b. Golden Rd & 166th St - TMC
Thu Jul 11, 2024
Midday Peak (Jul 11 2024 12:15PM - 1:15 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205786, Location: 38.997799, -94.964599

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



b. Golden Rd & 166th St - TMC

Thu Jul 11, 2024
Forced Peak (Jul 11 2024 2PM - 3 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205786, Location: 38.997799, -94.964599

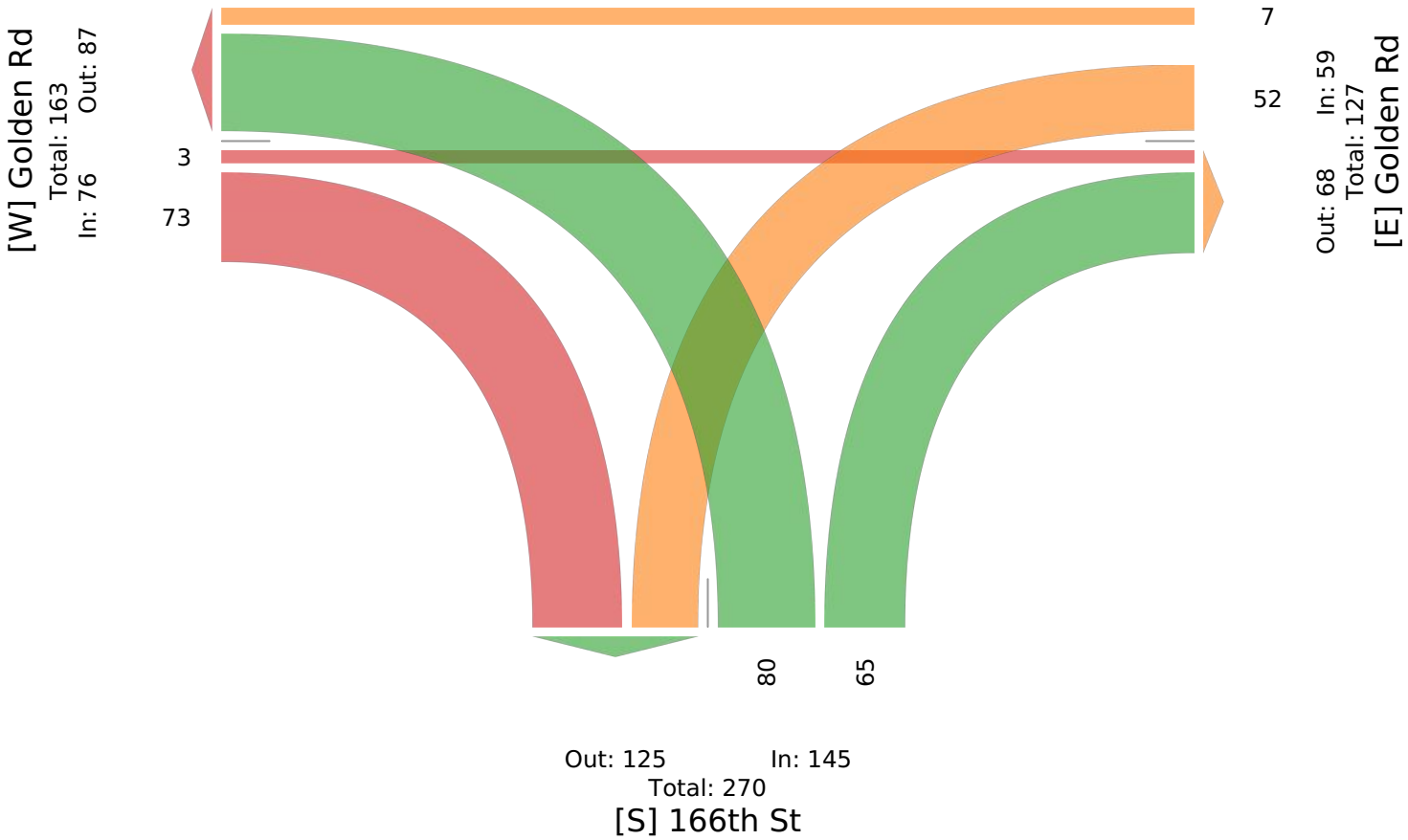
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Golden Rd				166th St				Golden Rd				
Direction	Westbound				Northbound				Eastbound				
Time	T	L	U	**App**	R	L	U	**App**	R	T	U	**App**	**Int**
2024-07-11 2:00PM	1	14	0	**15**	20	18	0	**38**	20	1	0	**21**	**74**
2:15PM	1	10	0	**11**	10	14	0	**24**	15	0	0	**15**	**50**
2:30PM	0	15	0	**15**	18	19	0	**37**	21	1	0	**22**	**74**
2:45PM	5	13	0	**18**	17	29	0	**46**	17	1	0	**18**	**82**
Total	7	52	0	**59**	65	80	0	**145**	73	3	0	**76**	**280**
% Approach	11.9%	88.1%	0%	**-**	44.8%	55.2%	0%	**-**	96.1%	3.9%	0%	**-**	-
% Total	2.5%	18.6%	0%	**21.1%**	23.2%	28.6%	0%	**51.8%**	26.1%	1.1%	0%	**27.1%**	-
PHF	0.350	0.867	-	**0.819**	0.813	0.690	-	**0.788**	0.869	0.750	-	**0.864**	0.854
Lights	6	51	0	**57**	64	77	0	**141**	69	3	0	**72**	270
% Lights	85.7%	98.1%	0%	**96.6%**	98.5%	96.3%	0%	**97.2%**	94.5%	100%	0%	**94.7%**	96.4%
Articulated Trucks	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	1
% Articulated Trucks	0%	0%	0%	**0%**	1.5%	0%	0%	**0.7%**	0%	0%	0%	**0%**	0.4%
Buses and Single-Unit Trucks	1	1	0	**2**	0	3	0	**3**	4	0	0	**4**	9
% Buses and Single-Unit Trucks	14.3%	1.9%	0%	**3.4%**	0%	3.8%	0%	**2.1%**	5.5%	0%	0%	**5.3%**	3.2%

*L: Left, R: Right, T: Thru, U: U-Turn

b. Golden Rd & 166th St - TMC
Thu Jul 11, 2024
Forced Peak (Jul 11 2024 2PM - 3 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205786, Location: 38.997799, -94.964599

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



b. Golden Rd & 166th St - TMC

Thu Jul 11, 2024
PM Peak (Jul 11 2024 4:30PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205786, Location: 38.997799, -94.964599

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

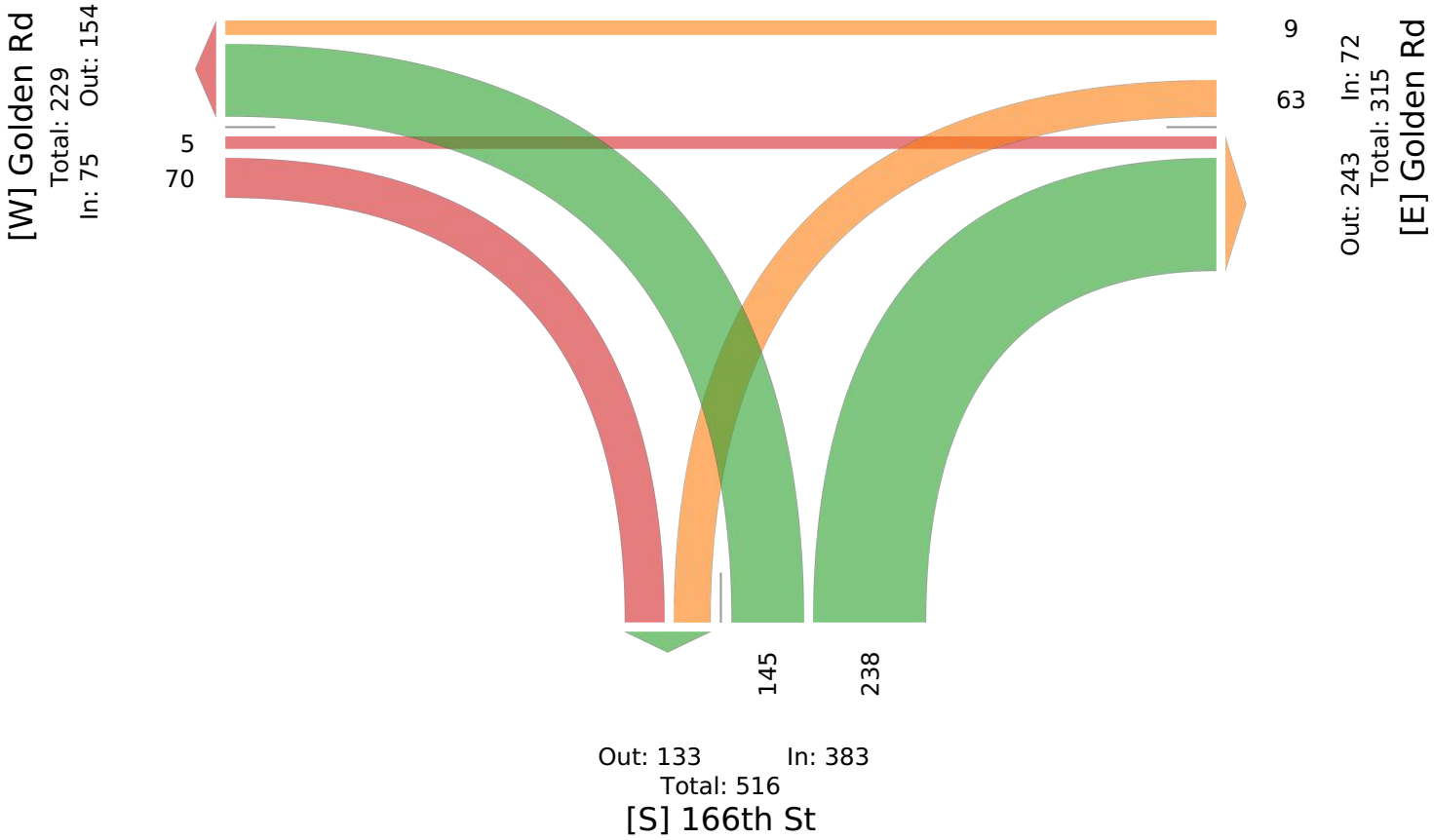
Leg	Golden Rd				166th St				Golden Rd				
Direction	Westbound				Northbound				Eastbound				
Time	T	L	U	**App**	R	L	U	**App**	R	T	U	**App**	**Int**
2024-07-11 4:30PM	1	15	0	**16**	58	29	0	**87**	18	2	0	**20**	**123**
4:45PM	1	9	0	**10**	58	41	0	**99**	17	2	0	**19**	**128**
5:00PM	3	19	0	**22**	65	35	0	**100**	13	0	0	**13**	**135**
5:15PM	4	20	0	**24**	57	40	0	**97**	22	1	0	**23**	**144**
Total	9	63	0	**72**	238	145	0	**383**	70	5	0	**75**	**530**
% Approach	12.5%	87.5%	0%	**-**	62.1%	37.9%	0%	**-**	93.3%	6.7%	0%	**-**	-
% Total	1.7%	11.9%	0%	**13.6%**	44.9%	27.4%	0%	**72.3%**	13.2%	0.9%	0%	**14.2%**	-
PHF	0.563	0.788	-	**0.750**	0.915	0.884	-	**0.958**	0.795	0.625	-	**0.815**	0.920
Lights	9	62	0	**71**	233	142	0	**375**	67	3	0	**70**	516
% Lights	100%	98.4%	0%	**98.6%**	97.9%	97.9%	0%	**97.9%**	95.7%	60.0%	0%	**93.3%**	97.4%
Articulated Trucks	0	0	0	**0**	0	1	0	**1**	1	0	0	**1**	2
% Articulated Trucks	0%	0%	0%	**0%**	0%	0.7%	0%	**0.3%**	1.4%	0%	0%	**1.3%**	0.4%
Buses and Single-Unit Trucks	0	1	0	**1**	5	2	0	**7**	2	2	0	**4**	12
% Buses and Single-Unit Trucks	0%	1.6%	0%	**1.4%**	2.1%	1.4%	0%	**1.8%**	2.9%	40.0%	0%	**5.3%**	2.3%

*L: Left, R: Right, T: Thru, U: U-Turn

b. Golden Rd & 166th St - TMC

Thu Jul 11, 2024
PM Peak (Jul 11 2024 4:30PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205786, Location: 38.997799, -94.964599

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



APPENDIX A.3
K-32 (LINWOOD ROAD) &
189TH STREET / GOLDEN ROAD
TURNING MOVEMENT COUNTS

c. K-32 Hwy (Linwood Rd) & 189th St/Golden Rd - TMC

Thu Jul 11, 2024
Full Length (12 AM-12 AM (+1))
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205787, Location: 39.012173, -95.01573

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	K-32 Hwy (Linwood Rd)				189th St/Golden Rd				K-32 Hwy (Linwood Rd)				
Direction	Southbound				Westbound				Northbound				
Time	T	L	U	**App**	R	L	U	**App**	R	T	U	**App**	**Int**
2024-07-11 12:00AM	2	0	0	**2**	0	0	0	**0**	0	1	0	**1**	**3**
12:15AM	1	0	0	**1**	0	1	0	**1**	0	0	0	**0**	**2**
12:30AM	1	0	0	**1**	0	1	0	**1**	3	0	0	**3**	**5**
12:45AM	1	0	0	**1**	0	2	0	**2**	0	0	0	**0**	**3**
Hourly Total	5	0	0	**5**	0	4	0	**4**	3	1	0	**4**	**13**
1:00AM	0	0	0	**0**	0	1	0	**1**	1	0	0	**1**	**2**
1:15AM	0	0	0	**0**	0	1	0	**1**	1	0	0	**1**	**2**
1:30AM	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	**1**
1:45AM	0	0	0	**0**	0	1	0	**1**	2	1	0	**3**	**4**
Hourly Total	1	0	0	**1**	0	3	0	**3**	4	1	0	**5**	**9**
2:00AM	0	0	0	**0**	0	0	0	**0**	0	3	0	**3**	**3**
2:15AM	1	0	0	**1**	0	0	0	**0**	1	1	0	**2**	**3**
2:30AM	0	0	0	**0**	0	1	0	**1**	0	3	0	**3**	**4**
2:45AM	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	**1**
Hourly Total	1	0	0	**1**	0	1	0	**1**	2	7	0	**9**	**11**
3:00AM	0	0	0	**0**	0	1	0	**1**	0	0	0	**0**	**1**
3:15AM	1	0	0	**1**	1	0	0	**1**	1	0	0	**1**	**3**
3:30AM	1	0	0	**1**	0	1	0	**1**	1	1	0	**2**	**4**
3:45AM	2	0	0	**2**	0	0	0	**0**	0	1	0	**1**	**3**
Hourly Total	4	0	0	**4**	1	2	0	**3**	2	2	0	**4**	**11**
4:00AM	0	0	0	**0**	0	0	0	**0**	1	5	0	**6**	**6**
4:15AM	1	1	0	**2**	0	2	0	**2**	2	2	0	**4**	**8**
4:30AM	2	1	0	**3**	0	2	0	**2**	1	4	0	**5**	**10**
4:45AM	3	1	0	**4**	0	2	0	**2**	5	5	0	**10**	**16**
Hourly Total	6	3	0	**9**	0	6	0	**6**	9	16	0	**25**	**40**
5:00AM	2	1	0	**3**	0	1	0	**1**	4	6	0	**10**	**14**
5:15AM	2	2	0	**4**	0	3	0	**3**	9	10	0	**19**	**26**
5:30AM	9	2	0	**11**	0	3	0	**3**	11	17	0	**28**	**42**
5:45AM	8	0	0	**8**	1	5	0	**6**	15	11	0	**26**	**40**
Hourly Total	21	5	0	**26**	1	12	0	**13**	39	44	0	**83**	**122**
6:00AM	13	2	0	**15**	0	4	0	**4**	16	8	0	**24**	**43**
6:15AM	10	1	0	**11**	0	3	0	**3**	20	22	0	**42**	**56**
6:30AM	19	3	0	**22**	0	3	0	**3**	29	21	0	**50**	**75**
6:45AM	17	3	0	**20**	0	9	0	**9**	24	15	0	**39**	**68**
Hourly Total	59	9	0	**68**	0	19	0	**19**	89	66	0	**155**	**242**
7:00AM	14	5	0	**19**	0	7	0	**7**	19	18	0	**37**	**63**
7:15AM	11	3	0	**14**	1	6	0	**7**	21	14	0	**35**	**56**
7:30AM	24	4	0	**28**	1	9	0	**10**	21	23	0	**44**	**82**
7:45AM	19	3	0	**22**	0	8	0	**8**	15	23	0	**38**	**68**
Hourly Total	68	15	0	**83**	2	30	0	**32**	76	78	0	**154**	**269**
8:00AM	13	5	0	**18**	1	9	0	**10**	16	19	0	**35**	**63**
8:15AM	14	1	0	**15**	0	8	0	**8**	14	18	0	**32**	**55**
8:30AM	13	1	0	**14**	0	14	0	**14**	9	18	0	**27**	**55**
8:45AM	12	1	0	**13**	0	4	0	**4**	6	17	0	**23**	**40**
Hourly Total	52	8	0	**60**	1	35	0	**36**	45	72	0	**117**	**213**
9:00AM	13	3	0	**16**	1	10	0	**11**	9	23	0	**32**	**59**
9:15AM	13	5	0	**18**	0	12	0	**12**	14	20	0	**34**	**64**
9:30AM	13	1	0	**14**	1	7	0	**8**	8	24	0	**32**	**54**
9:45AM	7	1	0	**8**	2	3	0	**5**	9	16	0	**25**	**38**
Hourly Total	46	10	0	**56**	4	32	0	**36**	40	83	0	**123**	**215**
10:00AM	16	3	0	**19**	1	9	0	**10**	14	20	0	**34**	**63**
10:15AM	15	2	0	**17**	0	7	0	**7**	13	11	0	**24**	**48**
10:30AM	11	2	0	**13**	1	1	0	**2**	8	16	0	**24**	**39**
10:45AM	16	1	0	**17**	4	8	0	**12**	10	17	0	**27**	**56**

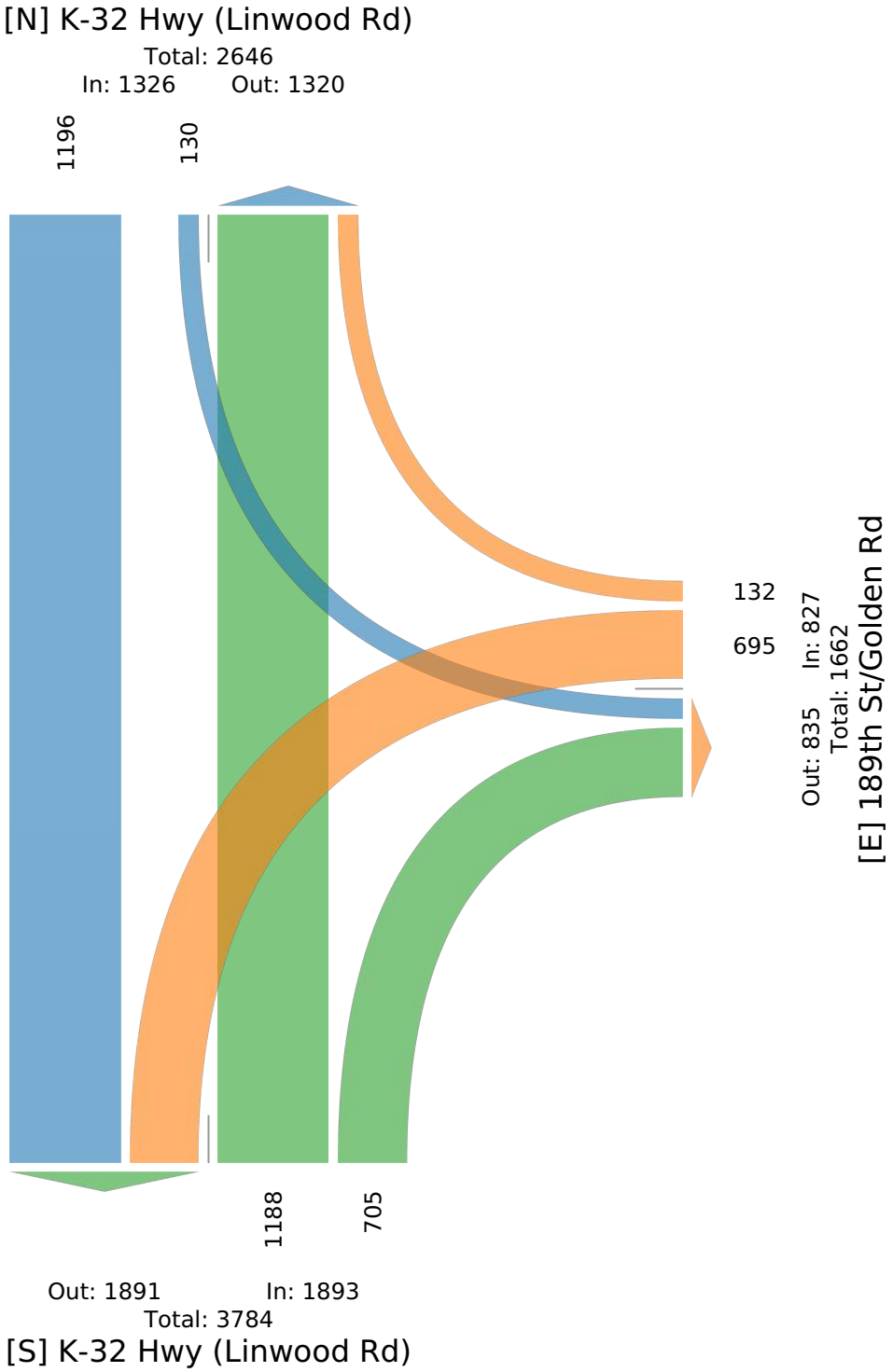
Leg	K-32 Hwy (Linwood Rd)				189th St/Golden Rd				K-32 Hwy (Linwood Rd)				
Direction	Southbound				Westbound				Northbound				
Time	T	L	U	**App**	R	L	U	**App**	R	T	U	**App**	**Int**
Hourly Total	58	8	0	**66**	6	25	0	**31**	45	64	0	**109**	**206**
11:00AM	11	3	0	**14**	4	6	0	**10**	5	11	0	**16**	**40**
11:15AM	14	1	0	**15**	2	7	0	**9**	7	11	0	**18**	**42**
11:30AM	13	2	0	**15**	0	8	0	**8**	7	15	0	**22**	**45**
11:45AM	15	1	0	**16**	4	9	0	**13**	6	14	0	**20**	**49**
Hourly Total	53	7	0	**60**	10	30	0	**40**	25	51	0	**76**	**176**
12:00PM	19	2	0	**21**	3	7	0	**10**	7	14	0	**21**	**52**
12:15PM	17	2	0	**19**	1	2	0	**3**	6	17	0	**23**	**45**
12:30PM	21	3	0	**24**	1	11	0	**12**	8	10	0	**18**	**54**
12:45PM	17	1	0	**18**	2	6	0	**8**	9	17	0	**26**	**52**
Hourly Total	74	8	0	**82**	7	26	0	**33**	30	58	0	**88**	**203**
1:00PM	19	2	0	**21**	2	10	0	**12**	3	15	0	**18**	**51**
1:15PM	17	3	0	**20**	0	11	0	**11**	12	21	0	**33**	**64**
1:30PM	19	3	0	**22**	2	8	0	**10**	8	21	0	**29**	**61**
1:45PM	10	3	0	**13**	1	5	0	**6**	10	16	0	**26**	**45**
Hourly Total	65	11	0	**76**	5	34	0	**39**	33	73	0	**106**	**221**
2:00PM	17	3	0	**20**	3	9	0	**12**	7	15	0	**22**	**54**
2:15PM	17	2	0	**19**	2	15	0	**17**	9	17	0	**26**	**62**
2:30PM	35	3	0	**38**	3	9	0	**12**	13	31	0	**44**	**94**
2:45PM	26	1	0	**27**	2	12	0	**14**	15	22	0	**37**	**78**
Hourly Total	95	9	0	**104**	10	45	0	**55**	44	85	0	**129**	**288**
3:00PM	21	1	0	**22**	1	19	0	**20**	7	12	0	**19**	**61**
3:15PM	24	3	0	**27**	0	13	0	**13**	11	15	0	**26**	**66**
3:30PM	26	2	0	**28**	3	16	0	**19**	9	19	0	**28**	**75**
3:45PM	31	1	0	**32**	2	23	0	**25**	7	17	0	**24**	**81**
Hourly Total	102	7	0	**109**	6	71	0	**77**	34	63	0	**97**	**283**
4:00PM	28	1	0	**29**	7	23	0	**30**	15	24	0	**39**	**98**
4:15PM	30	1	0	**31**	3	20	0	**23**	12	24	0	**36**	**90**
4:30PM	39	2	0	**41**	1	33	0	**34**	16	28	0	**44**	**119**
4:45PM	34	4	0	**38**	5	21	0	**26**	8	27	0	**35**	**99**
Hourly Total	131	8	0	**139**	16	97	0	**113**	51	103	0	**154**	**406**
5:00PM	32	1	0	**33**	4	29	0	**33**	9	29	0	**38**	**104**
5:15PM	34	0	0	**34**	6	24	0	**30**	11	48	0	**59**	**123**
5:30PM	20	0	0	**20**	4	13	0	**17**	14	30	0	**44**	**81**
5:45PM	30	0	0	**30**	4	10	0	**14**	10	23	0	**33**	**77**
Hourly Total	116	1	0	**117**	18	76	0	**94**	44	130	0	**174**	**385**
6:00PM	18	5	0	**23**	5	21	0	**26**	6	20	0	**26**	**75**
6:15PM	14	3	0	**17**	0	20	0	**20**	11	15	0	**26**	**63**
6:30PM	17	1	0	**18**	3	7	0	**10**	5	10	0	**15**	**43**
6:45PM	15	0	0	**15**	1	9	0	**10**	5	10	0	**15**	**40**
Hourly Total	64	9	0	**73**	9	57	0	**66**	27	55	0	**82**	**221**
7:00PM	13	1	0	**14**	3	6	0	**9**	3	13	0	**16**	**39**
7:15PM	21	1	0	**22**	3	8	0	**11**	2	9	0	**11**	**44**
7:30PM	20	1	0	**21**	3	6	0	**9**	2	12	0	**14**	**44**
7:45PM	15	1	0	**16**	2	12	0	**14**	3	14	0	**17**	**47**
Hourly Total	69	4	0	**73**	11	32	0	**43**	10	48	0	**58**	**174**
8:00PM	13	1	0	**14**	6	6	0	**12**	4	13	0	**17**	**43**
8:15PM	14	1	0	**15**	2	6	0	**8**	9	11	0	**20**	**43**
8:30PM	10	1	0	**11**	3	4	0	**7**	8	8	0	**16**	**34**
8:45PM	11	1	0	**12**	4	5	0	**9**	4	11	0	**15**	**36**
Hourly Total	48	4	0	**52**	15	21	0	**36**	25	43	0	**68**	**156**
9:00PM	8	2	0	**10**	0	6	0	**6**	5	10	0	**15**	**31**
9:15PM	13	0	0	**13**	4	2	0	**6**	3	8	0	**11**	**30**
9:30PM	10	0	0	**10**	0	4	0	**4**	4	3	0	**7**	**21**
9:45PM	6	0	0	**6**	0	5	0	**5**	6	3	0	**9**	**20**
Hourly Total	37	2	0	**39**	4	17	0	**21**	18	24	0	**42**	**102**
10:00PM	2	0	0	**2**	0	4	0	**4**	3	2	0	**5**	**11**
10:15PM	4	1	0	**5**	2	6	0	**8**	1	4	0	**5**	**18**
10:30PM	5	0	0	**5**	1	3	0	**4**	1	4	0	**5**	**14**
10:45PM	3	0	0	**3**	1	2	0	**3**	0	2	0	**2**	**8**

Leg Direction	K-32 Hwy (Linwood Rd) Southbound				189th St/Golden Rd Westbound				K-32 Hwy (Linwood Rd) Northbound				
Time	T	L	U	**App**	R	L	U	**App**	R	T	U	**App**	**Int**
Hourly Total	14	1	0	**15**	4	15	0	**19**	5	12	0	**17**	**51**
11:00PM	3	1	0	**4**	2	1	0	**3**	4	3	0	**7**	**14**
11:15PM	2	0	0	**2**	0	0	0	**0**	0	3	0	**3**	**5**
11:30PM	1	0	0	**1**	0	3	0	**3**	1	2	0	**3**	**7**
11:45PM	1	0	0	**1**	0	1	0	**1**	0	1	0	**1**	**3**
Hourly Total	7	1	0	**8**	2	5	0	**7**	5	9	0	**14**	**29**
Total	1196	130	0	**1326**	132	695	0	**827**	705	1188	0	**1893**	**4046**
% Approach	90.2%	9.8%	0%	**-**	16.0%	84.0%	0%	**-**	37.2%	62.8%	0%	**-**	-
% Total	29.6%	3.2%	0%	**32.8%**	3.3%	17.2%	0%	**20.4%**	17.4%	29.4%	0%	**46.8%**	-
Lights	1121	126	0	**1247**	130	678	0	**808**	689	1118	0	**1807**	3862
% Lights	93.7%	96.9%	0%	**94.0%**	98.5%	97.6%	0%	**97.7%**	97.7%	94.1%	0%	**95.5%**	95.5%
Articulated Trucks	29	1	0	**30**	0	2	0	**2**	5	33	0	**38**	70
% Articulated Trucks	2.4%	0.8%	0%	**2.3%**	0%	0.3%	0%	**0.2%**	0.7%	2.8%	0%	**2.0%**	1.7%
Buses and Single-Unit Trucks	46	3	0	**49**	2	15	0	**17**	11	37	0	**48**	114
% Buses and Single-Unit Trucks	3.8%	2.3%	0%	**3.7%**	1.5%	2.2%	0%	**2.1%**	1.6%	3.1%	0%	**2.5%**	2.8%

*L: Left, R: Right, T: Thru, U: U-Turn

c. K-32 Hwy (Linwood Rd) & 189th St/Golden Rd - TMC
Thu Jul 11, 2024
Full Length (12 AM-12 AM (+1))
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205787, Location: 39.012173, -95.01573

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



c. K-32 Hwy (Linwood Rd) & 189th St/Golden Rd - TMC

Thu Jul 11, 2024
AM Peak (Jul 11 2024 6:45AM - 7:45 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205787, Location: 39.012173, -95.01573

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

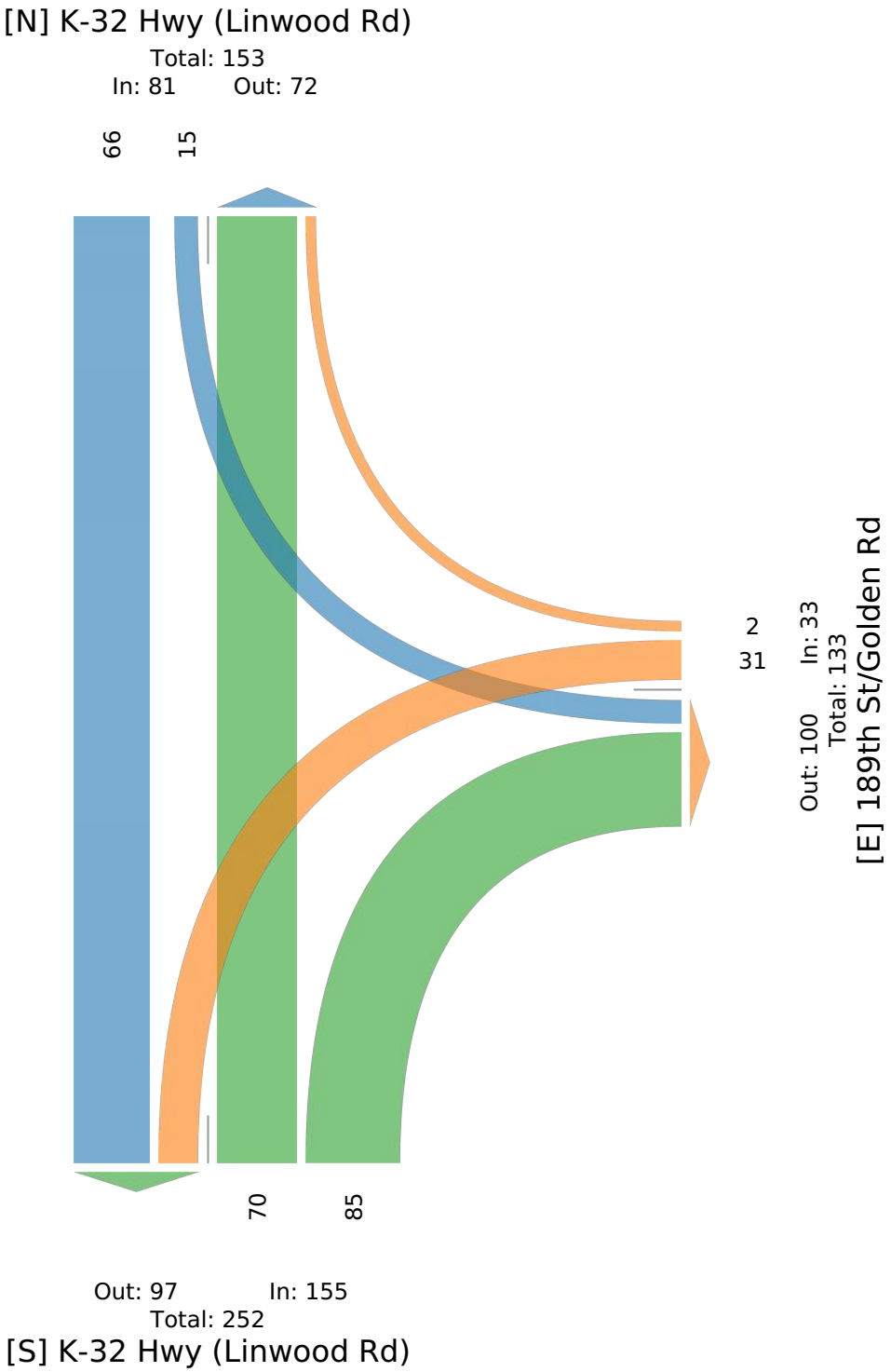
Leg	K-32 Hwy (Linwood Rd)				189th St/Golden Rd				K-32 Hwy (Linwood Rd)				
Direction	Southbound				Westbound				Northbound				
Time	T	L	U	**App**	R	L	U	**App**	R	T	U	**App**	**Int**
2024-07-11 6:45AM	17	3	0	**20**	0	9	0	**9**	24	15	0	**39**	**68**
7:00AM	14	5	0	**19**	0	7	0	**7**	19	18	0	**37**	**63**
7:15AM	11	3	0	**14**	1	6	0	**7**	21	14	0	**35**	**56**
7:30AM	24	4	0	**28**	1	9	0	**10**	21	23	0	**44**	**82**
Total	66	15	0	**81**	2	31	0	**33**	85	70	0	**155**	**269**
% Approach	81.5%	18.5%	0%	**-**	6.1%	93.9%	0%	**-**	54.8%	45.2%	0%	**-**	-
% Total	24.5%	5.6%	0%	**30.1%**	0.7%	11.5%	0%	**12.3%**	31.6%	26.0%	0%	**57.6%**	-
PHF	0.688	0.750	-	**0.723**	0.500	0.861	-	**0.825**	0.885	0.761	-	**0.881**	0.820
Lights	64	15	0	**79**	2	31	0	**33**	85	65	0	**150**	262
% Lights	97.0%	100%	0%	**97.5%**	100%	100%	0%	**100%**	100%	92.9%	0%	**96.8%**	97.4%
Articulated Trucks	1	0	0	**1**	0	0	0	**0**	0	3	0	**3**	4
% Articulated Trucks	1.5%	0%	0%	**1.2%**	0%	0%	0%	**0%**	0%	4.3%	0%	**1.9%**	1.5%
Buses and Single-Unit Trucks	1	0	0	**1**	0	0	0	**0**	0	2	0	**2**	3
% Buses and Single-Unit Trucks	1.5%	0%	0%	**1.2%**	0%	0%	0%	**0%**	0%	2.9%	0%	**1.3%**	1.1%

*L: Left, R: Right, T: Thru, U: U-Turn

c. K-32 Hwy (Linwood Rd) & 189th St/Golden Rd - TMC

Thu Jul 11, 2024
AM Peak (Jul 11 2024 6:45AM - 7:45 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205787, Location: 39.012173, -95.01573

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



c. K-32 Hwy (Linwood Rd) & 189th St/Golden Rd - TMC

Thu Jul 11, 2024
Forced Peak (Jul 11 2024 7:15AM - 8:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205787, Location: 39.012173, -95.01573

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

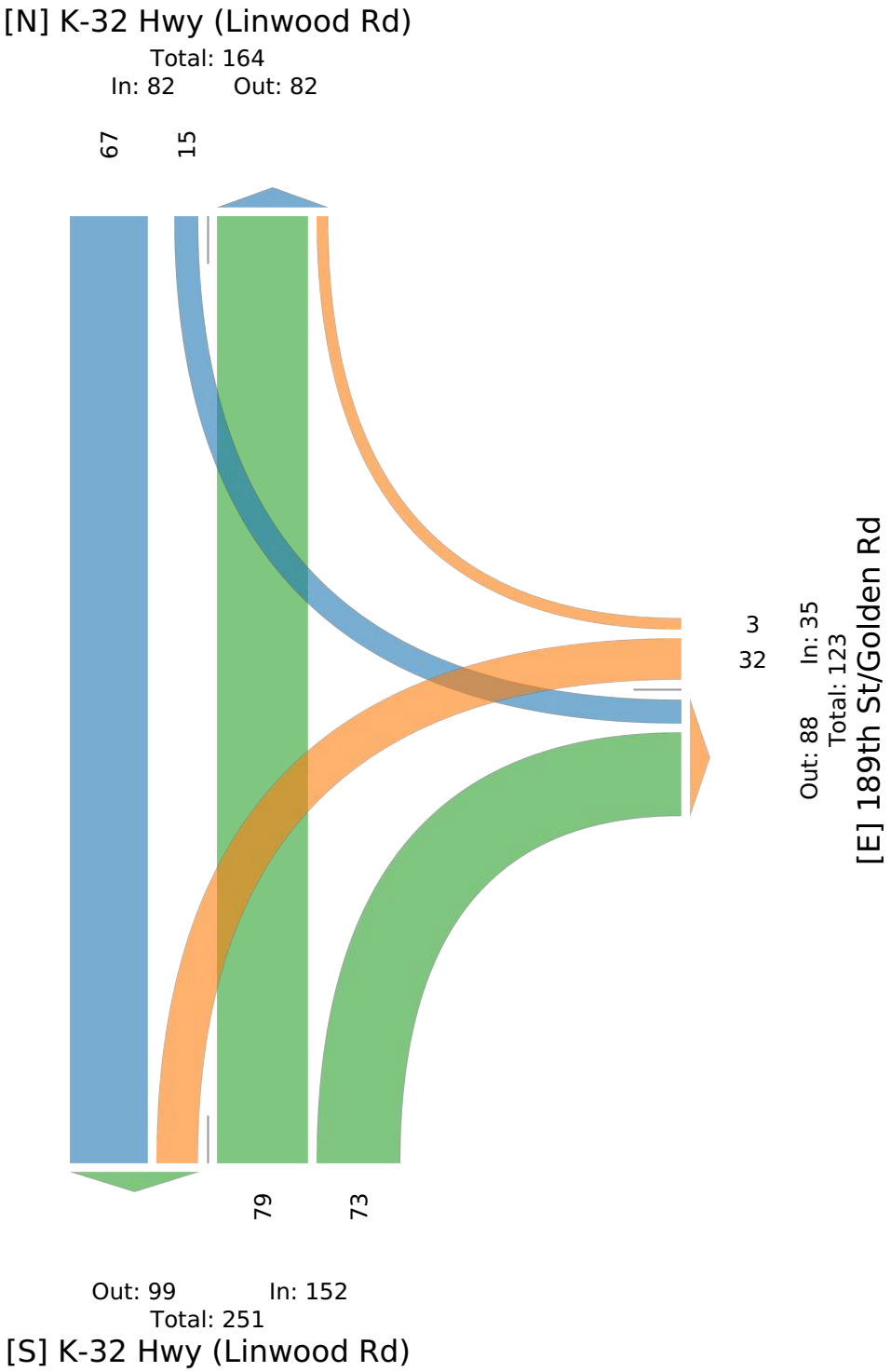
Leg	K-32 Hwy (Linwood Rd)				189th St/Golden Rd				K-32 Hwy (Linwood Rd)				
Direction	Southbound				Westbound				Northbound				
Time	T	L	U	**App**	R	L	U	**App**	R	T	U	**App**	**Int**
2024-07-11 7:15AM	11	3	0	**14**	1	6	0	**7**	21	14	0	**35**	**56**
7:30AM	24	4	0	**28**	1	9	0	**10**	21	23	0	**44**	**82**
7:45AM	19	3	0	**22**	0	8	0	**8**	15	23	0	**38**	**68**
8:00AM	13	5	0	**18**	1	9	0	**10**	16	19	0	**35**	**63**
Total	67	15	0	**82**	3	32	0	**35**	73	79	0	**152**	**269**
% Approach	81.7%	18.3%	0%	**-**	8.6%	91.4%	0%	**-**	48.0%	52.0%	0%	**-**	-
% Total	24.9%	5.6%	0%	**30.5%**	1.1%	11.9%	0%	**13.0%**	27.1%	29.4%	0%	**56.5%**	-
PHF	0.698	0.750	-	**0.732**	0.750	0.889	-	**0.875**	0.869	0.859	-	**0.864**	0.820
Lights	60	15	0	**75**	3	32	0	**35**	73	72	0	**145**	255
% Lights	89.6%	100%	0%	**91.5%**	100%	100%	0%	**100%**	100%	91.1%	0%	**95.4%**	94.8%
Articulated Trucks	0	0	0	**0**	0	0	0	**0**	0	4	0	**4**	4
% Articulated Trucks	0%	0%	0%	**0%**	0%	0%	0%	**0%**	0%	5.1%	0%	**2.6%**	1.5%
Buses and Single-Unit Trucks	7	0	0	**7**	0	0	0	**0**	0	3	0	**3**	10
% Buses and Single-Unit Trucks	10.4%	0%	0%	**8.5%**	0%	0%	0%	**0%**	0%	3.8%	0%	**2.0%**	3.7%

*L: Left, R: Right, T: Thru, U: U-Turn

c. K-32 Hwy (Linwood Rd) & 189th St/Golden Rd - TMC

Thu Jul 11, 2024
Forced Peak (Jul 11 2024 7:15AM - 8:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205787, Location: 39.012173, -95.01573

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



c. K-32 Hwy (Linwood Rd) & 189th St/Golden Rd - TMC

Thu Jul 11, 2024
Midday Peak (Jul 11 2024 12:45PM - 1:45 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205787, Location: 39.012173, -95.01573

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

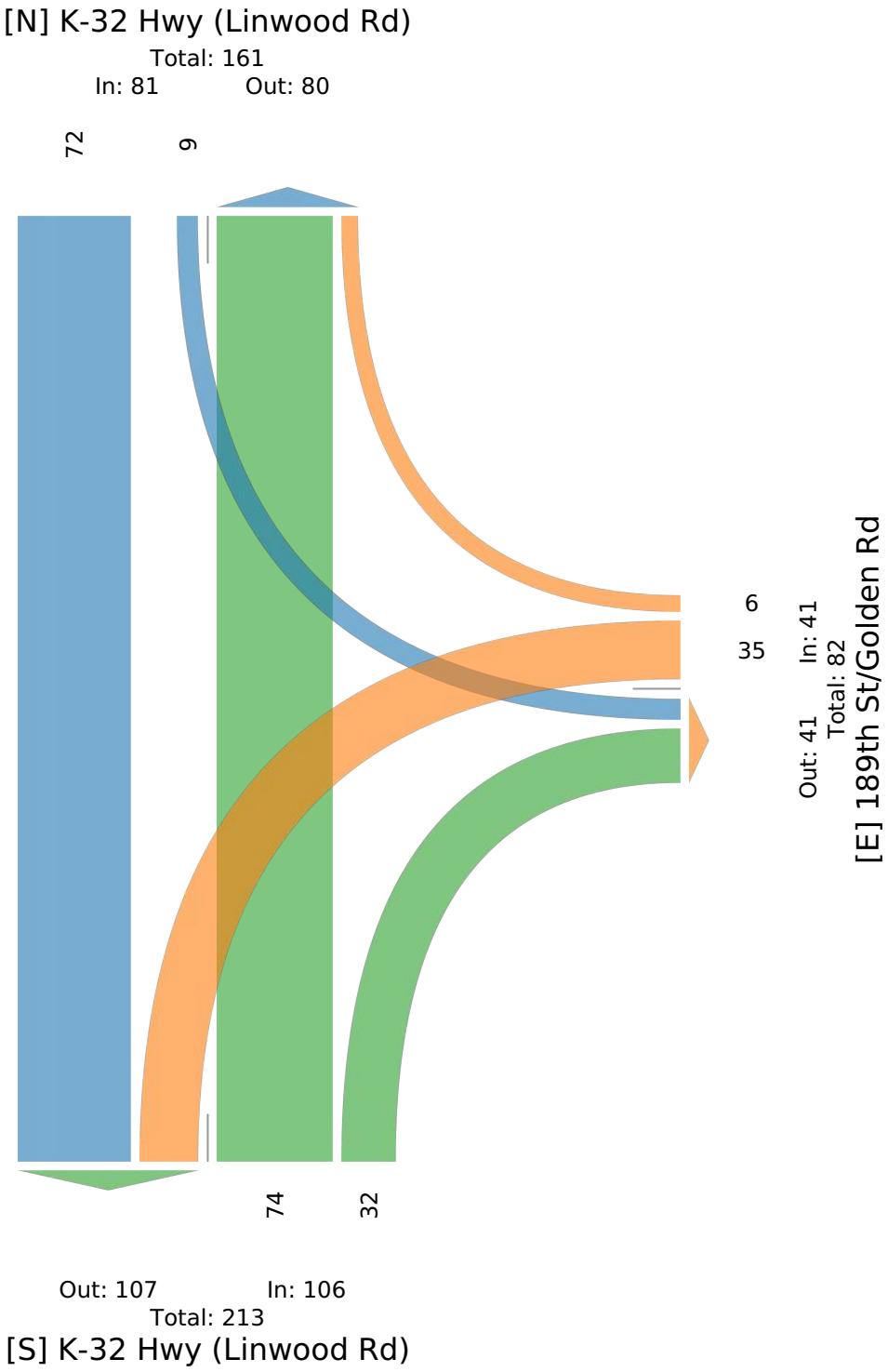
Leg	K-32 Hwy (Linwood Rd)				189th St/Golden Rd				K-32 Hwy (Linwood Rd)				
Direction	Southbound				Westbound				Northbound				
Time	T	L	U	**App**	R	L	U	**App**	R	T	U	**App**	**Int**
2024-07-11 12:45PM	17	1	0	**18**	2	6	0	**8**	9	17	0	**26**	**52**
1:00PM	19	2	0	**21**	2	10	0	**12**	3	15	0	**18**	**51**
1:15PM	17	3	0	**20**	0	11	0	**11**	12	21	0	**33**	**64**
1:30PM	19	3	0	**22**	2	8	0	**10**	8	21	0	**29**	**61**
Total	72	9	0	**81**	6	35	0	**41**	32	74	0	**106**	**228**
% Approach	88.9%	11.1%	0%	**-**	14.6%	85.4%	0%	**-**	30.2%	69.8%	0%	**-**	-
% Total	31.6%	3.9%	0%	**35.5%**	2.6%	15.4%	0%	**18.0%**	14.0%	32.5%	0%	**46.5%**	-
PHF	0.947	0.750	-	**0.920**	0.750	0.795	-	**0.854**	0.667	0.881	-	**0.803**	0.891
Lights	63	9	0	**72**	6	33	0	**39**	31	69	0	**100**	211
% Lights	87.5%	100%	0%	**88.9%**	100%	94.3%	0%	**95.1%**	96.9%	93.2%	0%	**94.3%**	92.5%
Articulated Trucks	5	0	0	**5**	0	0	0	**0**	0	0	0	**0**	5
% Articulated Trucks	6.9%	0%	0%	**6.2%**	0%	0%	0%	**0%**	0%	0%	0%	**0%**	2.2%
Buses and Single-Unit Trucks	4	0	0	**4**	0	2	0	**2**	1	5	0	**6**	12
% Buses and Single-Unit Trucks	5.6%	0%	0%	**4.9%**	0%	5.7%	0%	**4.9%**	3.1%	6.8%	0%	**5.7%**	5.3%

*L: Left, R: Right, T: Thru, U: U-Turn

c. K-32 Hwy (Linwood Rd) & 189th St/Golden Rd - TMC

Thu Jul 11, 2024
Midday Peak (Jul 11 2024 12:45PM - 1:45 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205787, Location: 39.012173, -95.01573

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



c. K-32 Hwy (Linwood Rd) & 189th St/Golden Rd - TMC

Thu Jul 11, 2024
Forced Peak (Jul 11 2024 2PM - 3 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205787, Location: 39.012173, -95.01573

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

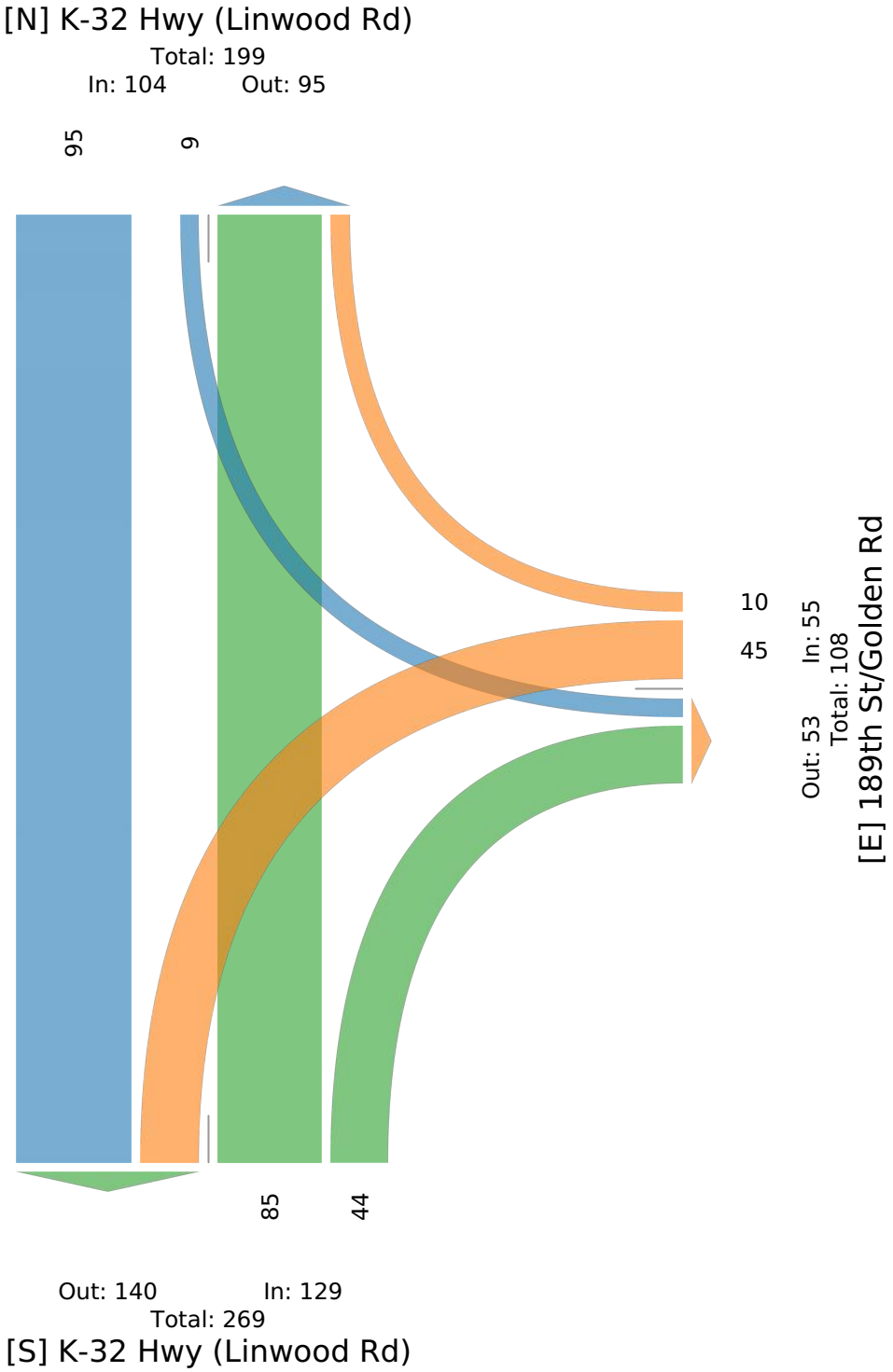
Leg	K-32 Hwy (Linwood Rd)				189th St/Golden Rd				K-32 Hwy (Linwood Rd)				
Direction	Southbound				Westbound				Northbound				
Time	T	L	U	**App**	R	L	U	**App**	R	T	U	**App**	**Int**
2024-07-11 2:00PM	17	3	0	**20**	3	9	0	**12**	7	15	0	**22**	**54**
2:15PM	17	2	0	**19**	2	15	0	**17**	9	17	0	**26**	**62**
2:30PM	35	3	0	**38**	3	9	0	**12**	13	31	0	**44**	**94**
2:45PM	26	1	0	**27**	2	12	0	**14**	15	22	0	**37**	**78**
Total	95	9	0	**104**	10	45	0	**55**	44	85	0	**129**	**288**
% Approach	91.3%	8.7%	0%	**-**	18.2%	81.8%	0%	**-**	34.1%	65.9%	0%	**-**	-
% Total	33.0%	3.1%	0%	**36.1%**	3.5%	15.6%	0%	**19.1%**	15.3%	29.5%	0%	**44.8%**	-
PHF	0.679	0.750	-	**0.684**	0.833	0.750	-	**0.809**	0.733	0.685	-	**0.733**	0.766
Lights	89	8	0	**97**	10	43	0	**53**	44	77	0	**121**	271
% Lights	93.7%	88.9%	0%	**93.3%**	100%	95.6%	0%	**96.4%**	100%	90.6%	0%	**93.8%**	94.1%
Articulated Trucks	3	0	0	**3**	0	0	0	**0**	0	5	0	**5**	8
% Articulated Trucks	3.2%	0%	0%	**2.9%**	0%	0%	0%	**0%**	0%	5.9%	0%	**3.9%**	2.8%
Buses and Single-Unit Trucks	3	1	0	**4**	0	2	0	**2**	0	3	0	**3**	9
% Buses and Single-Unit Trucks	3.2%	11.1%	0%	**3.8%**	0%	4.4%	0%	**3.6%**	0%	3.5%	0%	**2.3%**	3.1%

*L: Left, R: Right, T: Thru, U: U-Turn

c. K-32 Hwy (Linwood Rd) & 189th St/Golden Rd - TMC

Thu Jul 11, 2024
Forced Peak (Jul 11 2024 2PM - 3 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205787, Location: 39.012173, -95.01573

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



c. K-32 Hwy (Linwood Rd) & 189th St/Golden Rd - TMC

Thu Jul 11, 2024
PM Peak (Jul 11 2024 4:30PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205787, Location: 39.012173, -95.01573

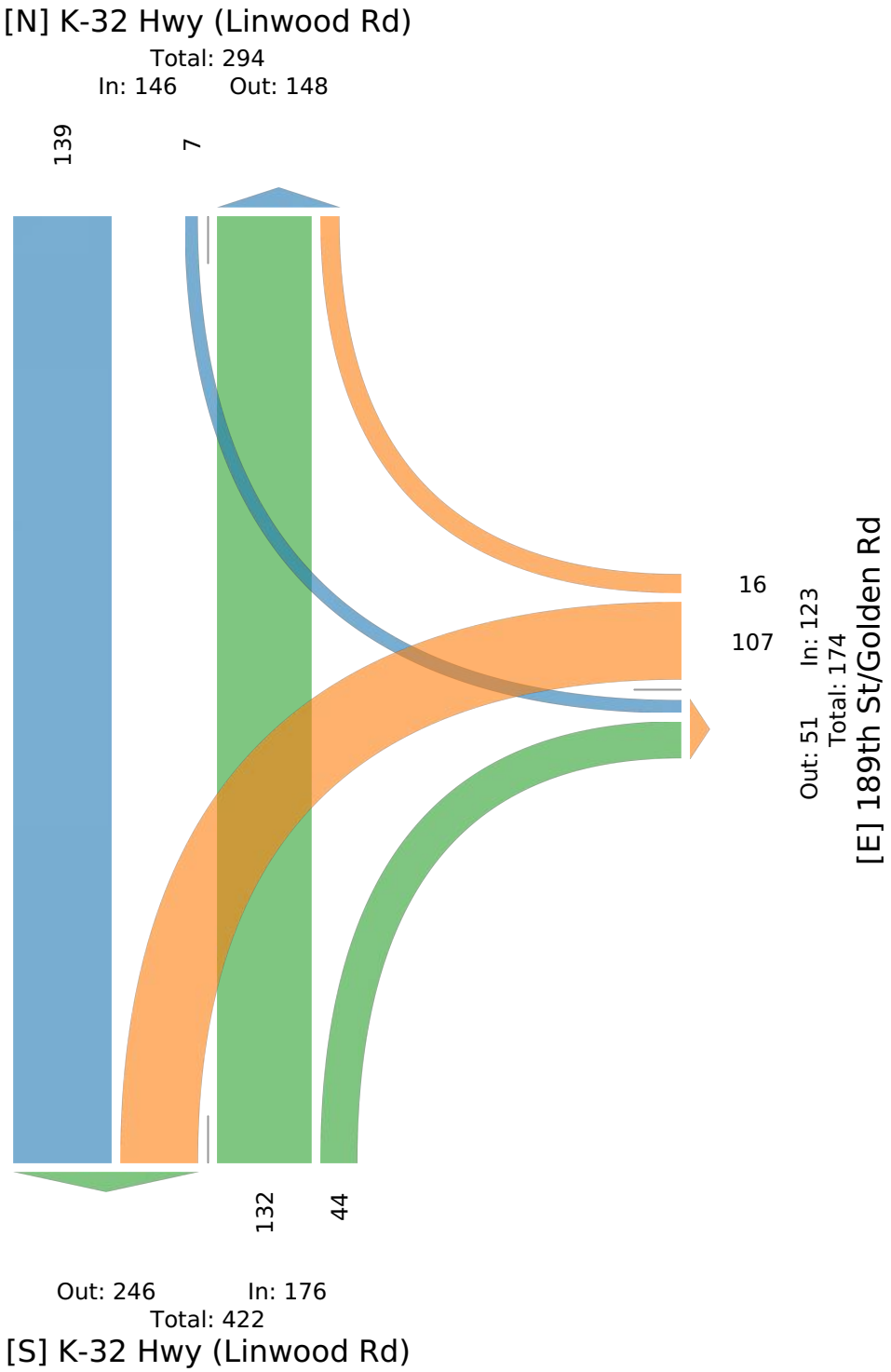
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	K-32 Hwy (Linwood Rd)				189th St/Golden Rd				K-32 Hwy (Linwood Rd)				
Direction	Southbound				Westbound				Northbound				
Time	T	L	U	**App**	R	L	U	**App**	R	T	U	**App**	**Int**
2024-07-11 4:30PM	39	2	0	**41**	1	33	0	**34**	16	28	0	**44**	**119**
4:45PM	34	4	0	**38**	5	21	0	**26**	8	27	0	**35**	**99**
5:00PM	32	1	0	**33**	4	29	0	**33**	9	29	0	**38**	**104**
5:15PM	34	0	0	**34**	6	24	0	**30**	11	48	0	**59**	**123**
Total	139	7	0	**146**	16	107	0	**123**	44	132	0	**176**	**445**
% Approach	95.2%	4.8%	0%	**-**	13.0%	87.0%	0%	**-**	25.0%	75.0%	0%	**-**	-
% Total	31.2%	1.6%	0%	**32.8%**	3.6%	24.0%	0%	**27.6%**	9.9%	29.7%	0%	**39.6%**	-
PHF	0.891	0.438	-	**0.890**	0.667	0.811	-	**0.904**	0.688	0.688	-	**0.746**	0.904
Lights	136	6	0	**142**	16	104	0	**120**	41	130	0	**171**	433
% Lights	97.8%	85.7%	0%	**97.3%**	100%	97.2%	0%	**97.6%**	93.2%	98.5%	0%	**97.2%**	97.3%
Articulated Trucks	0	0	0	**0**	0	1	0	**1**	1	1	0	**2**	3
% Articulated Trucks	0%	0%	0%	**0%**	0%	0.9%	0%	**0.8%**	2.3%	0.8%	0%	**1.1%**	0.7%
Buses and Single-Unit Trucks	3	1	0	**4**	0	2	0	**2**	2	1	0	**3**	9
% Buses and Single-Unit Trucks	2.2%	14.3%	0%	**2.7%**	0%	1.9%	0%	**1.6%**	4.5%	0.8%	0%	**1.7%**	2.0%

*L: Left, R: Right, T: Thru, U: U-Turn

c. K-32 Hwy (Linwood Rd) & 189th St/Golden Rd - TMC
Thu Jul 11, 2024
PM Peak (Jul 11 2024 4:30PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205787, Location: 39.012173, -95.01573

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



APPENDIX A.4
158TH STREET & LORING ROAD
TURNING MOVEMENT COUNTS

d. North 158th Street & Loring Road - TMC

Thu Jul 11, 2024
Full Length (12 AM-12 AM (+1))
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205788, Location: 39.014578, -94.946025

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	North 158th Street					Loring Rd					North 158th Street					Loring Rd					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2024-07-11 12:00AM	0	0	0	0	**0**	0	0	1	0	**1**	1	0	0	0	**1**	0	1	0	0	**1**	**3**
12:15AM	0	0	0	0	**0**	0	0	0	0	**0**	0	1	0	0	**1**	0	0	0	0	**0**	**1**
12:30AM	0	0	0	0	**0**	0	0	1	0	**1**	0	0	0	0	**0**	0	0	0	0	**0**	**1**
12:45AM	0	2	0	0	**2**	0	0	0	0	**0**	1	0	0	0	**1**	0	0	0	0	**0**	**3**
Hourly Total	0	2	0	0	**2**	0	0	2	0	**2**	2	1	0	0	**3**	0	1	0	0	**1**	**8**
1:00AM	0	0	0	0	**0**	0	0	1	0	**1**	0	0	0	0	**0**	0	0	0	0	**0**	**1**
1:15AM	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	**0**
1:30AM	0	1	0	0	**1**	0	0	2	0	**2**	1	0	0	0	**1**	0	0	0	0	**0**	**4**
1:45AM	0	1	0	0	**1**	0	0	0	0	**0**	0	1	0	0	**1**	0	0	0	0	**0**	**2**
Hourly Total	0	2	0	0	**2**	0	0	3	0	**3**	1	1	0	0	**2**	0	0	0	0	**0**	**7**
2:00AM	0	0	0	0	**0**	0	0	1	0	**1**	0	1	0	0	**1**	0	1	0	0	**1**	**3**
2:15AM	0	1	0	0	**1**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	**1**
2:30AM	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	**0**
2:45AM	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	**0**
Hourly Total	0	1	0	0	**1**	0	0	1	0	**1**	0	1	0	0	**1**	0	1	0	0	**1**	**4**
3:00AM	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	**0**
3:15AM	0	2	0	0	**2**	0	0	1	0	**1**	0	0	0	0	**0**	0	0	0	0	**0**	**3**
3:30AM	0	1	0	0	**1**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	**1**
3:45AM	0	0	0	0	**0**	0	0	0	0	**0**	2	0	0	0	**2**	0	0	0	0	**0**	**2**
Hourly Total	0	3	0	0	**3**	0	0	1	0	**1**	2	0	0	0	**2**	0	0	0	0	**0**	**6**
4:00AM	0	1	0	0	**1**	0	0	0	0	**0**	1	1	0	0	**2**	0	0	0	0	**0**	**3**
4:15AM	0	1	0	0	**1**	0	0	1	0	**1**	1	0	0	0	**1**	0	0	0	0	**0**	**3**
4:30AM	0	0	1	0	**1**	0	0	1	0	**1**	0	1	0	0	**1**	0	0	0	0	**0**	**3**
4:45AM	0	2	0	0	**2**	0	0	1	0	**1**	1	2	0	0	**3**	0	0	0	0	**0**	**6**
Hourly Total	0	4	1	0	**5**	0	0	3	0	**3**	3	4	0	0	**7**	0	0	0	0	**0**	**15**
5:00AM	0	10	0	0	**10**	0	1	4	0	**5**	4	0	0	0	**4**	0	1	0	0	**1**	**20**
5:15AM	0	3	1	0	**4**	0	0	6	0	**6**	1	0	0	0	**1**	0	0	0	0	**0**	**11**
5:30AM	0	13	2	0	**15**	0	0	3	0	**3**	8	3	0	0	**11**	0	2	0	0	**2**	**31**
5:45AM	1	10	3	0	**14**	0	0	3	0	**3**	8	4	0	0	**12**	0	3	0	0	**3**	**32**
Hourly Total	1	36	6	0	**43**	0	1	16	0	**17**	21	7	0	0	**28**	0	6	0	0	**6**	**94**
6:00AM	1	9	1	0	**11**	1	0	5	0	**6**	8	4	0	0	**12**	0	2	0	0	**2**	**31**
6:15AM	0	16	2	0	**18**	0	0	5	0	**5**	4	5	0	0	**9**	1	3	0	0	**4**	**36**
6:30AM	0	20	1	0	**21**	2	1	10	0	**13**	6	9	0	0	**15**	0	0	0	0	**0**	**49**
6:45AM	1	9	3	0	**13**	0	0	13	0	**13**	11	5	1	0	**17**	1	3	0	0	**4**	**47**
Hourly Total	2	54	7	0	**63**	3	1	33	0	**37**	29	23	1	0	**53**	2	8	0	0	**10**	**163**
7:00AM	0	3	1	0	**4**	2	1	0	0	**3**	4	8	0	0	**12**	0	1	0	0	**1**	**20**
7:15AM	0	17	1	0	**18**	1	0	4	0	**5**	10	10	0	0	**20**	0	3	1	0	**4**	**47**
7:30AM	2	12	4	0	**18**	0	1	3	0	**4**	10	6	0	0	**16**	0	4	1	0	**5**	**43**
7:45AM	2	11	0	0	**13**	1	0	1	0	**2**	8	5	0	0	**13**	0	0	0	0	**0**	**28**
Hourly Total	4	43	6	0	**53**	4	2	8	0	**14**	32	29	0	0	**61**	0	8	2	0	**10**	**138**
8:00AM	3	8	2	0	**13**	2	0	3	0	**5**	5	5	1	0	**11**	0	1	3	0	**4**	**33**
8:15AM	1	9	2	0	**12**	0	2	4	0	**6**	6	6	0	0	**12**	0	3	1	0	**4**	**34**
8:30AM	0	3	0	0	**3**	1	0	4	0	**5**	7	8	1	0	**16**	0	4	0	0	**4**	**28**
8:45AM	2	7	1	0	**10**	1	2	5	0	**8**	4	8	0	0	**12**	1	0	0	0	**1**	**31**
Hourly Total	6	27	5	0	**38**	4	4	16	0	**24**	22	27	2	0	**51**	1	8	4	0	**13**	**126**
9:00AM	1	3	0	0	**4**	1	1	3	0	**5**	2	6	0	0	**8**	0	1	0	0	**1**	**18**
9:15AM	1	11	2	0	**14**	2	0	3	0	**5**	2	4	1	0	**7**	0	0	2	0	**2**	**28**
9:30AM	1	7	2	0	**10**	0	0	3	0	**3**	6	4	0	0	**10**	2	1	0	0	**3**	**26**
9:45AM	2	5	1	0	**8**	0	2	3	0	**5**	2	2	0	0	**4**	0	0	0	0	**0**	**17**
Hourly Total	5	26	5	0	**36**	3	3	12	0	**18**	12	16	1	0	**29**	2	2	2	0	**6**	**89**
10:00AM	0	3	0	0	**3**	1	2	3	0	**6**	5	6	2	0	**13**	0	1	0	0	**1**	**23**
10:15AM	0	11	2	0	**13**	2	1	3	0	**6**	6	8	1	0	**15**	1	0	2	0	**3**	**37**
10:30AM	0	6	1	0	**7**	0	0	4	0	**4**	4	7	0	0	**11**	0	1	0	0	**1**	**23**
10:45AM	1	6	3	0	**10**	1	0	2	0	**3**	5	8	0	0	**13**	0	1	0	0	**1**	**27**

Leg	North 158th Street					Loring Rd					North 158th Street					Loring Rd					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	**Int**
Hourly Total	1	26	6	0	**33**	4	3	12	0	**19**	20	29	3	0	**52**	1	3	2	0	**6**	**110**
11:00AM	0	4	0	0	**4**	1	1	4	0	**6**	8	8	0	0	**16**	0	0	0	0	**0**	**26**
11:15AM	1	2	1	0	**4**	2	0	3	0	**5**	5	1	1	0	**7**	0	0	1	0	**1**	**17**
11:30AM	0	3	2	0	**5**	1	1	3	0	**5**	7	7	0	0	**14**	2	1	0	0	**3**	**27**
11:45AM	0	5	0	0	**5**	2	0	3	0	**5**	1	6	0	0	**7**	1	0	0	0	**1**	**18**
Hourly Total	1	14	3	0	**18**	6	2	13	0	**21**	21	22	1	0	**44**	3	1	1	0	**5**	**88**
12:00PM	1	7	1	0	**9**	3	2	5	0	**10**	1	11	0	0	**12**	1	0	1	0	**2**	**33**
12:15PM	1	8	1	0	**10**	0	0	5	0	**5**	4	9	1	0	**14**	0	1	0	0	**1**	**30**
12:30PM	0	9	4	0	**13**	0	3	5	0	**8**	8	7	0	0	**15**	0	1	0	0	**1**	**37**
12:45PM	1	4	0	0	**5**	2	1	3	0	**6**	3	9	0	0	**12**	0	1	1	0	**2**	**25**
Hourly Total	3	28	6	0	**37**	5	6	18	0	**29**	16	36	1	0	**53**	1	3	2	0	**6**	**125**
1:00PM	0	7	4	0	**11**	0	0	4	0	**4**	7	11	1	0	**19**	0	0	1	0	**1**	**35**
1:15PM	0	4	1	0	**5**	0	0	6	0	**6**	3	9	1	0	**13**	1	0	1	0	**2**	**26**
1:30PM	0	5	0	0	**5**	3	1	4	0	**8**	4	6	1	0	**11**	1	1	1	0	**3**	**27**
1:45PM	1	3	0	0	**4**	3	0	9	0	**12**	7	10	1	0	**18**	0	3	0	0	**3**	**37**
Hourly Total	1	19	5	0	**25**	6	1	23	0	**30**	21	36	4	0	**61**	2	4	3	0	**9**	**125**
2:00PM	2	9	2	0	**13**	2	2	9	0	**13**	11	9	0	0	**20**	0	1	0	0	**1**	**47**
2:15PM	2	6	2	0	**10**	0	0	6	0	**6**	4	6	0	0	**10**	0	0	0	0	**0**	**26**
2:30PM	1	8	0	0	**9**	0	0	5	0	**5**	10	8	0	0	**18**	0	1	4	0	**5**	**37**
2:45PM	1	5	4	0	**10**	0	3	13	0	**16**	11	6	0	0	**17**	0	1	0	0	**1**	**44**
Hourly Total	6	28	8	0	**42**	2	5	33	0	**40**	36	29	0	0	**65**	0	3	4	0	**7**	**154**
3:00PM	0	6	0	0	**6**	1	0	1	0	**2**	11	12	0	0	**23**	0	2	0	0	**2**	**33**
3:15PM	2	5	0	0	**7**	2	0	2	0	**4**	7	7	0	0	**14**	0	0	0	0	**0**	**25**
3:30PM	1	17	2	0	**20**	1	0	9	0	**10**	23	24	0	0	**47**	0	0	2	0	**2**	**79**
3:45PM	0	6	1	0	**7**	1	3	13	0	**17**	10	18	0	0	**28**	0	1	0	0	**1**	**53**
Hourly Total	3	34	3	0	**40**	5	3	25	0	**33**	51	61	0	0	**112**	0	3	2	0	**5**	**190**
4:00PM	0	13	3	0	**16**	1	4	9	0	**14**	10	21	1	0	**32**	1	0	1	0	**2**	**64**
4:15PM	1	10	0	0	**11**	1	2	10	0	**13**	19	25	0	0	**44**	0	0	1	0	**1**	**69**
4:30PM	0	6	2	0	**8**	2	2	6	0	**10**	29	30	0	0	**59**	0	0	1	0	**1**	**78**
4:45PM	0	2	2	0	**4**	4	0	9	0	**13**	36	28	0	0	**64**	1	0	0	0	**1**	**82**
Hourly Total	1	31	7	0	**39**	8	8	34	0	**50**	94	104	1	0	**199**	2	0	3	0	**5**	**293**
5:00PM	1	8	1	0	**10**	1	4	13	0	**18**	29	32	1	0	**62**	0	0	1	0	**1**	**91**
5:15PM	0	11	4	0	**15**	2	2	11	0	**15**	28	23	0	0	**51**	1	2	0	0	**3**	**84**
5:30PM	0	9	3	0	**12**	2	1	5	0	**8**	23	30	0	0	**53**	0	1	3	0	**4**	**77**
5:45PM	0	6	2	0	**8**	2	6	8	0	**16**	16	14	0	0	**30**	0	1	0	0	**1**	**55**
Hourly Total	1	34	10	0	**45**	7	13	37	0	**57**	96	99	1	0	**196**	1	4	4	0	**9**	**307**
6:00PM	0	7	1	0	**8**	0	0	9	0	**9**	8	13	0	0	**21**	0	0	0	0	**0**	**38**
6:15PM	0	14	1	0	**15**	1	2	7	0	**10**	3	15	0	0	**18**	0	0	0	0	**0**	**43**
6:30PM	1	8	0	0	**9**	1	3	5	0	**9**	3	7	0	0	**10**	0	1	0	0	**1**	**29**
6:45PM	1	8	0	0	**9**	2	1	3	0	**6**	5	2	0	0	**7**	0	0	0	0	**0**	**22**
Hourly Total	2	37	2	0	**41**	4	6	24	0	**34**	19	37	0	0	**56**	0	1	0	0	**1**	**132**
7:00PM	1	2	1	0	**4**	4	1	2	1	**8**	2	5	0	0	**7**	0	2	0	0	**2**	**21**
7:15PM	0	5	0	0	**5**	1	2	3	0	**6**	1	5	0	0	**6**	0	1	0	0	**1**	**18**
7:30PM	0	8	1	0	**9**	0	0	3	0	**3**	2	14	0	0	**16**	0	0	0	0	**0**	**28**
7:45PM	0	4	0	0	**4**	5	1	2	0	**8**	3	2	0	0	**5**	0	1	0	0	**1**	**18**
Hourly Total	1	19	2	0	**22**	10	4	10	1	**25**	8	26	0	0	**34**	0	4	0	0	**4**	**85**
8:00PM	0	6	1	0	**7**	2	2	9	0	**13**	3	4	1	0	**8**	0	0	1	0	**1**	**29**
8:15PM	1	0	3	0	**4**	0	0	4	0	**4**	4	1	0	0	**5**	0	0	0	0	**0**	**13**
8:30PM	0	5	1	0	**6**	1	1	6	0	**8**	0	8	0	0	**8**	0	0	0	0	**0**	**22**
8:45PM	1	3	1	0	**5**	1	1	3	0	**5**	3	2	0	0	**5**	0	0	0	0	**0**	**15**
Hourly Total	2	14	6	0	**22**	4	4	22	0	**30**	10	15	1	0	**26**	0	0	1	0	**1**	**79**
9:00PM	0	1	0	0	**1**	0	0	6	0	**6**	3	3	0	0	**6**	0	1	0	0	**1**	**14**
9:15PM	0	0	0	0	**0**	0	2	1	0	**3**	1	2	0	0	**3**	0	1	0	0	**1**	**7**
9:30PM	1	4	0	0	**5**	0	0	4	0	**4**	0	2	0	0	**2**	0	1	1	0	**2**	**13**
9:45PM	0	2	0	0	**2**	0	0	1	0	**1**	1	2	0	0	**3**	0	0	0	0	**0**	**6**
Hourly Total	1	7	0	0	**8**	0	2	12	0	**14**	5	9	0	0	**14**	0	3	1	0	**4**	**40**
10:00PM	0	3	0	0	**3**	0	1	2	0	**3**	2	3	0	0	**5**	0	0	0	0	**0**	**11**
10:15PM	0	3	0	0	**3**	0	0	1	0	**1**	2	2	0	0	**4**	0	0	0	0	**0**	**8**
10:30PM	0	1	0	0	**1**	0	0	1	0	**1**	0	1	0	0	**1**	0	0	0	0	**0**	**3**
10:45PM	0	0	0	0	**0**	1	0	1	0	**2**	0	2	0	0	**2**	0	0	0	0	**0**	**4**

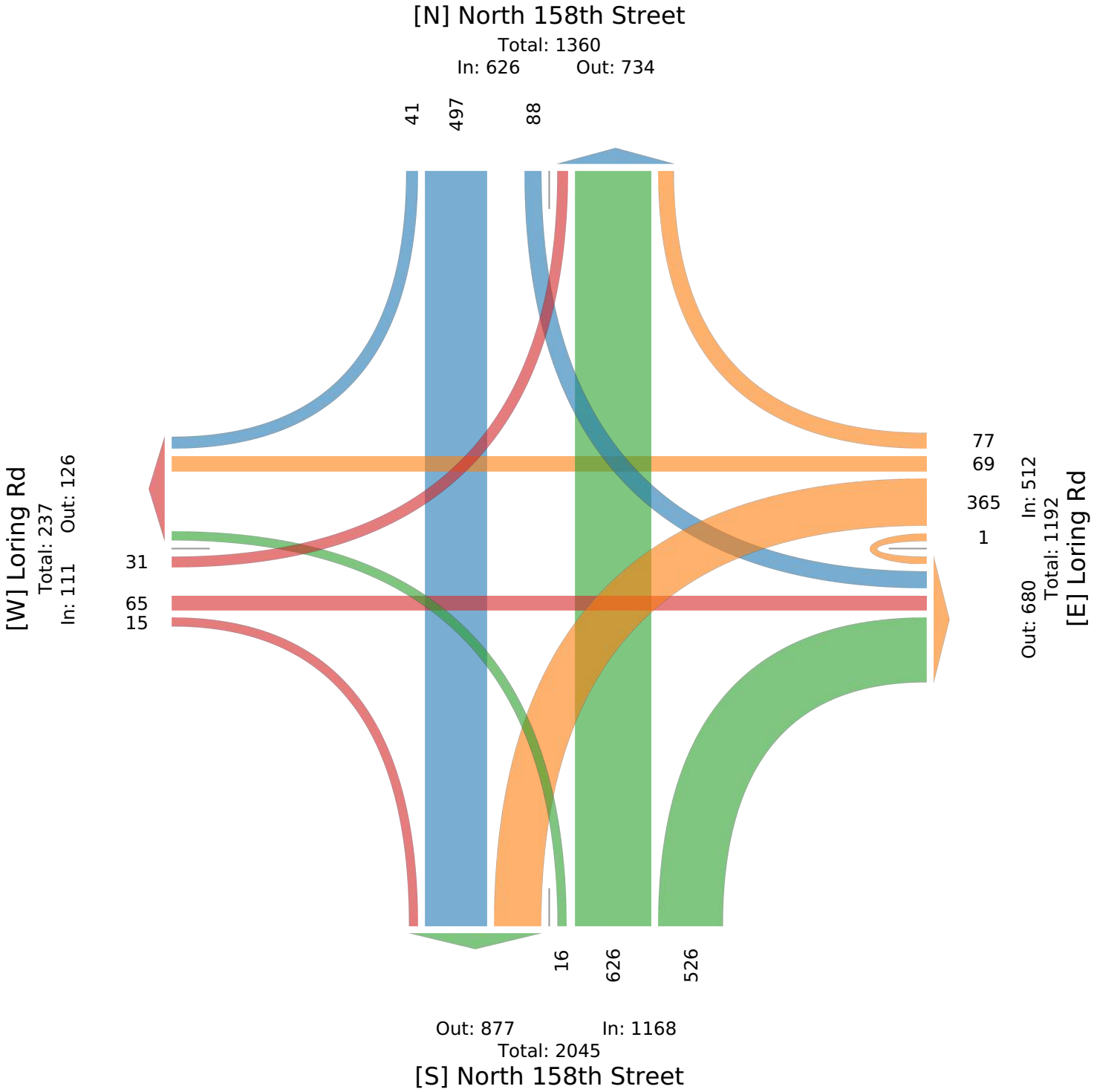
Leg Direction	North 158th Street Southbound					Loring Rd Westbound					North 158th Street Northbound					Loring Rd Eastbound					
Time	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	**Int**
Hourly Total	0	7	0	0	**7**	1	1	5	0	**7**	4	8	0	0	**12**	0	0	0	0	**0**	**26**
11:00PM	0	1	0	0	**1**	0	0	1	0	**1**	1	2	0	0	**3**	0	0	0	0	**0**	**5**
11:15PM	0	0	0	0	**0**	0	0	0	0	**0**	0	1	0	0	**1**	0	1	0	0	**1**	**2**
11:30PM	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	1	0	0	**1**	**1**
11:45PM	0	0	0	0	**0**	1	0	1	0	**2**	0	3	0	0	**3**	0	0	0	0	**0**	**5**
Hourly Total	0	1	0	0	**1**	1	0	2	0	**3**	1	6	0	0	**7**	0	2	0	0	**2**	**13**
Total	41	497	88	0	**626**	77	69	365	1	**512**	526	626	16	0	**1168**	15	65	31	0	**111**	**2417**
% Approach	6.5%	79.4%	14.1%	0%	**-**	15.0%	13.5%	71.3%	0.2%	**-**	45.0%	53.6%	1.4%	0%	**-**	13.5%	58.6%	27.9%	0%	**-**	-
% Total	1.7%	20.6%	3.6%	0%	**25.9%**	3.2%	2.9%	15.1%	0%	**21.2%**	21.8%	25.9%	0.7%	0%	**48.3%**	0.6%	2.7%	1.3%	0%	**4.6%**	-
Lights	40	489	82	0	**611**	73	69	360	1	**503**	523	606	14	0	**1143**	14	65	29	0	**108**	2365
% Lights	97.6%	98.4%	93.2%	0%	**97.6%**	94.8%	100%	98.6%	100%	**98.2%**	99.4%	96.8%	87.5%	0%	**97.9%**	93.3%	100%	93.5%	0%	**97.3%**	97.8%
Articulated Trucks	0	1	2	0	**3**	1	0	0	0	**1**	0	4	0	0	**4**	0	0	0	0	**0**	8
% Articulated Trucks	0%	0.2%	2.3%	0%	**0.5%**	1.3%	0%	0%	0%	**0.2%**	0%	0.6%	0%	0%	**0.3%**	0%	0%	0%	0%	**0%**	0.3%
Buses and Single-Unit Trucks	1	7	4	0	**12**	3	0	5	0	**8**	3	16	2	0	**21**	1	0	2	0	**3**	44
% Buses and Single-Unit Trucks	2.4%	1.4%	4.5%	0%	**1.9%**	3.9%	0%	1.4%	0%	**1.6%**	0.6%	2.6%	12.5%	0%	**1.8%**	6.7%	0%	6.5%	0%	**2.7%**	1.8%

*L: Left, R: Right, T: Thru, U: U-Turn

d. North 158th Street & Loring Road - TMC

Thu Jul 11, 2024
Full Length (12 AM-12 AM (+1))
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205788, Location: 39.014578, -94.946025

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



d. North 158th Street & Loring Road - TMC

Thu Jul 11, 2024
AM Peak (Jul 11 2024 6AM - 7 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205788, Location: 39.014578, -94.946025

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

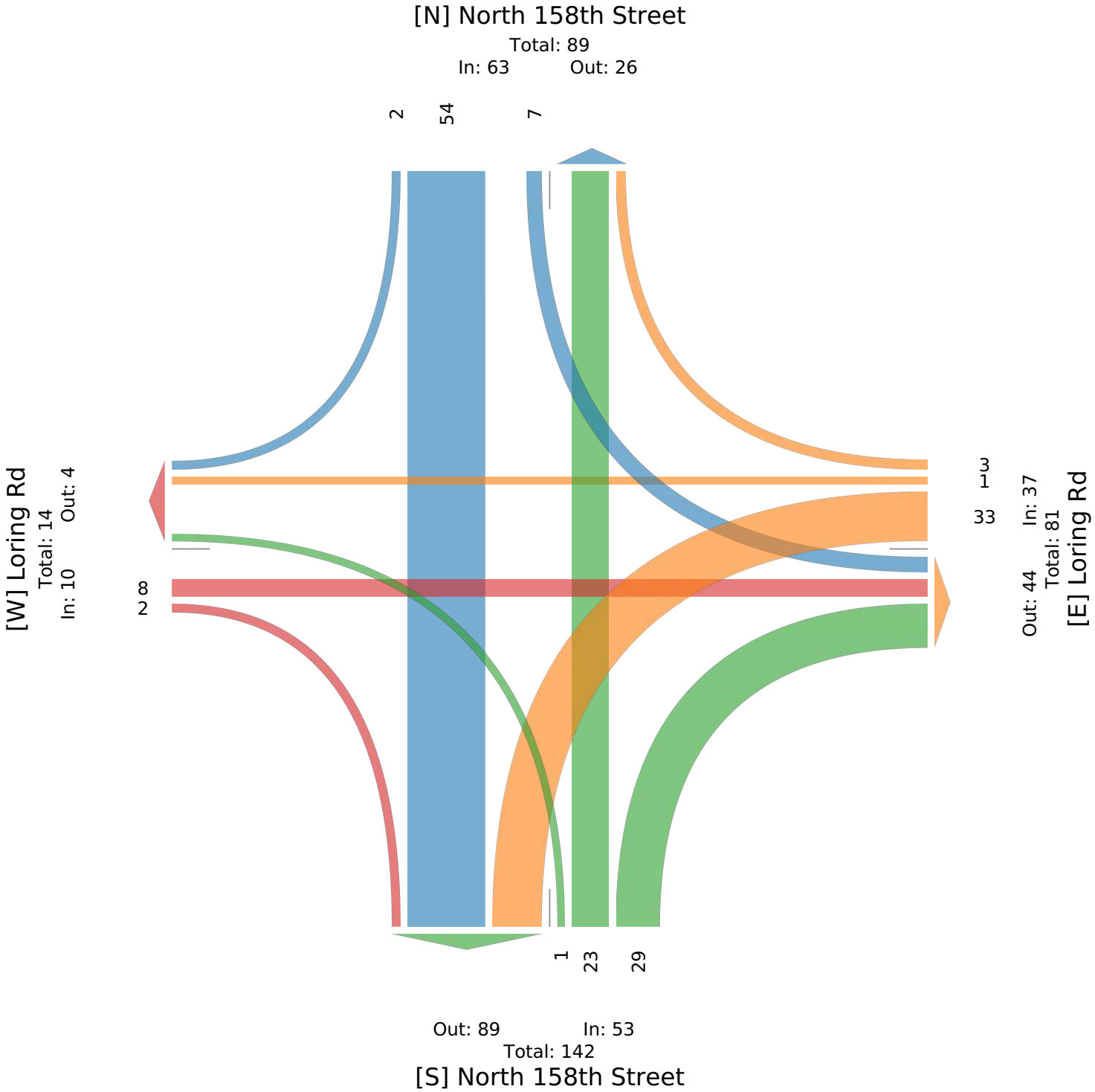
Leg	North 158th Street					Loring Rd					North 158th Street					Loring Rd					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2024-07-11 6:00AM	1	9	1	0	**11**	1	0	5	0	**6**	8	4	0	0	**12**	0	2	0	0	**2**	**31**
6:15AM	0	16	2	0	**18**	0	0	5	0	**5**	4	5	0	0	**9**	1	3	0	0	**4**	**36**
6:30AM	0	20	1	0	**21**	2	1	10	0	**13**	6	9	0	0	**15**	0	0	0	0	**0**	**49**
6:45AM	1	9	3	0	**13**	0	0	13	0	**13**	11	5	1	0	**17**	1	3	0	0	**4**	**47**
Total	2	54	7	0	**63**	3	1	33	0	**37**	29	23	1	0	**53**	2	8	0	0	**10**	**163**
% Approach	3.2%	85.7%	11.1%	0%	**-**	8.1%	2.7%	89.2%	0%	**-**	54.7%	43.4%	1.9%	0%	**-**	20.0%	80.0%	0%	0%	**-**	-
% Total	1.2%	33.1%	4.3%	0%	**38.7%**	1.8%	0.6%	20.2%	0%	**22.7%**	17.8%	14.1%	0.6%	0%	**32.5%**	1.2%	4.9%	0%	0%	**6.1%**	-
PHF	0.500	0.675	0.583	-	**0.750**	0.375	0.250	0.635	-	**0.712**	0.659	0.639	0.250	-	**0.779**	0.500	0.667	-	-	**0.625**	0.832
Lights	2	54	7	0	**63**	3	1	32	0	**36**	28	23	1	0	**52**	2	8	0	0	**10**	161
% Lights	100%	100%	100%	0%	**100%**	100%	100%	97.0%	0%	**97.3%**	96.6%	100%	100%	0%	**98.1%**	100%	100%	0%	0%	**100%**	98.8%
Articulated Trucks	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0
% Articulated Trucks	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%
Buses and Single-Unit Trucks	0	0	0	0	**0**	0	0	1	0	**1**	1	0	0	0	**1**	0	0	0	0	**0**	2
% Buses and Single-Unit Trucks	0%	0%	0%	0%	**0%**	0%	0%	3.0%	0%	**2.7%**	3.4%	0%	0%	0%	**1.9%**	0%	0%	0%	0%	**0%**	1.2%

*L: Left, R: Right, T: Thru, U: U-Turn

d. North 158th Street & Loring Road - TMC

Thu Jul 11, 2024
AM Peak (Jul 11 2024 6AM - 7 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205788, Location: 39.014578, -94.946025

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



d. North 158th Street & Loring Road - TMC

Thu Jul 11, 2024
Forced Peak (Jul 11 2024 7:15AM - 8:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205788, Location: 39.014578, -94.946025

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

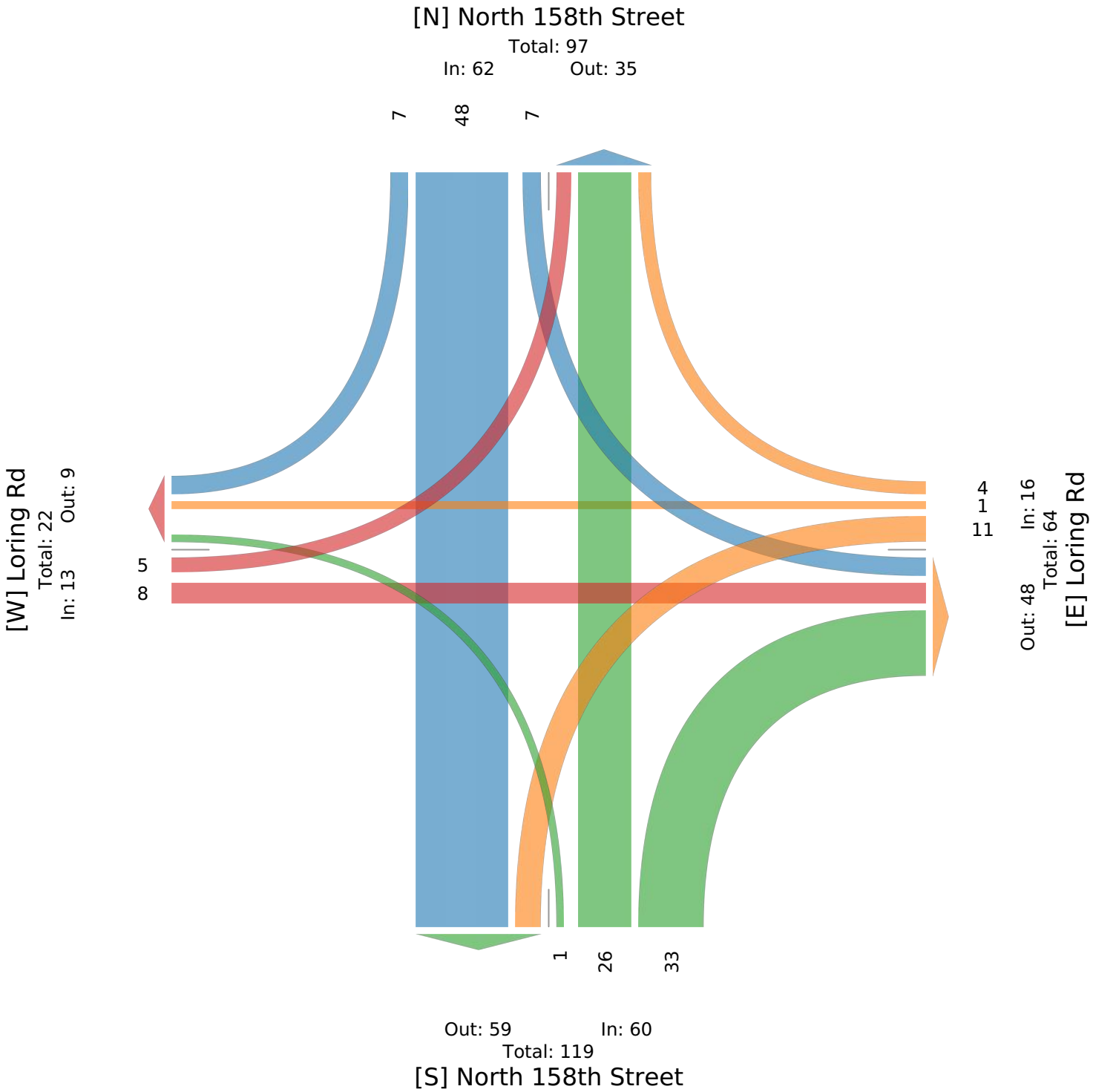
Leg	North 158th Street					Loring Rd					North 158th Street					Loring Rd					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	**Int**
2024-07-11 7:15AM	0	17	1	0	**18**	1	0	4	0	**5**	10	10	0	0	**20**	0	3	1	0	**4**	**47**
7:30AM	2	12	4	0	**18**	0	1	3	0	**4**	10	6	0	0	**16**	0	4	1	0	**5**	**43**
7:45AM	2	11	0	0	**13**	1	0	1	0	**2**	8	5	0	0	**13**	0	0	0	0	**0**	**28**
8:00AM	3	8	2	0	**13**	2	0	3	0	**5**	5	5	1	0	**11**	0	1	3	0	**4**	**33**
Total	7	48	7	0	**62**	4	1	11	0	**16**	33	26	1	0	**60**	0	8	5	0	**13**	**151**
% Approach	11.3%	77.4%	11.3%	0%	**-**	25.0%	6.3%	68.8%	0%	**-**	55.0%	43.3%	1.7%	0%	**-**	0%	61.5%	38.5%	0%	**-**	-
% Total	4.6%	31.8%	4.6%	0%	**41.1%**	2.6%	0.7%	7.3%	0%	**10.6%**	21.9%	17.2%	0.7%	0%	**39.7%**	0%	5.3%	3.3%	0%	**8.6%**	-
PHF	0.583	0.706	0.438	-	**0.861**	0.500	0.250	0.688	-	**0.800**	0.825	0.650	0.250	-	**0.750**	-	0.500	0.417	-	**0.650**	0.803
Lights	6	45	6	0	**57**	3	1	11	0	**15**	33	25	1	0	**59**	0	8	4	0	**12**	143
% Lights	85.7%	93.8%	85.7%	0%	**91.9%**	75.0%	100%	100%	0%	**93.8%**	100%	96.2%	100%	0%	**98.3%**	0%	100%	80.0%	0%	**92.3%**	94.7%
Articulated Trucks	0	1	0	0	**1**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	1
% Articulated Trucks	0%	2.1%	0%	0%	**1.6%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0.7%
Buses and Single-Unit Trucks	1	2	1	0	**4**	1	0	0	0	**1**	0	1	0	0	**1**	0	0	1	0	**1**	7
% Buses and Single-Unit Trucks	14.3%	4.2%	14.3%	0%	**6.5%**	25.0%	0%	0%	0%	**6.3%**	0%	3.8%	0%	0%	**1.7%**	0%	0%	20.0%	0%	**7.7%**	4.6%

*L: Left, R: Right, T: Thru, U: U-Turn

d. North 158th Street & Loring Road - TMC

Thu Jul 11, 2024
Forced Peak (Jul 11 2024 7:15AM - 8:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205788, Location: 39.014578, -94.946025

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



d. North 158th Street & Loring Road - TMC

Thu Jul 11, 2024
Midday Peak (Jul 11 2024 12:15PM - 1:15 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205788, Location: 39.014578, -94.946025

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

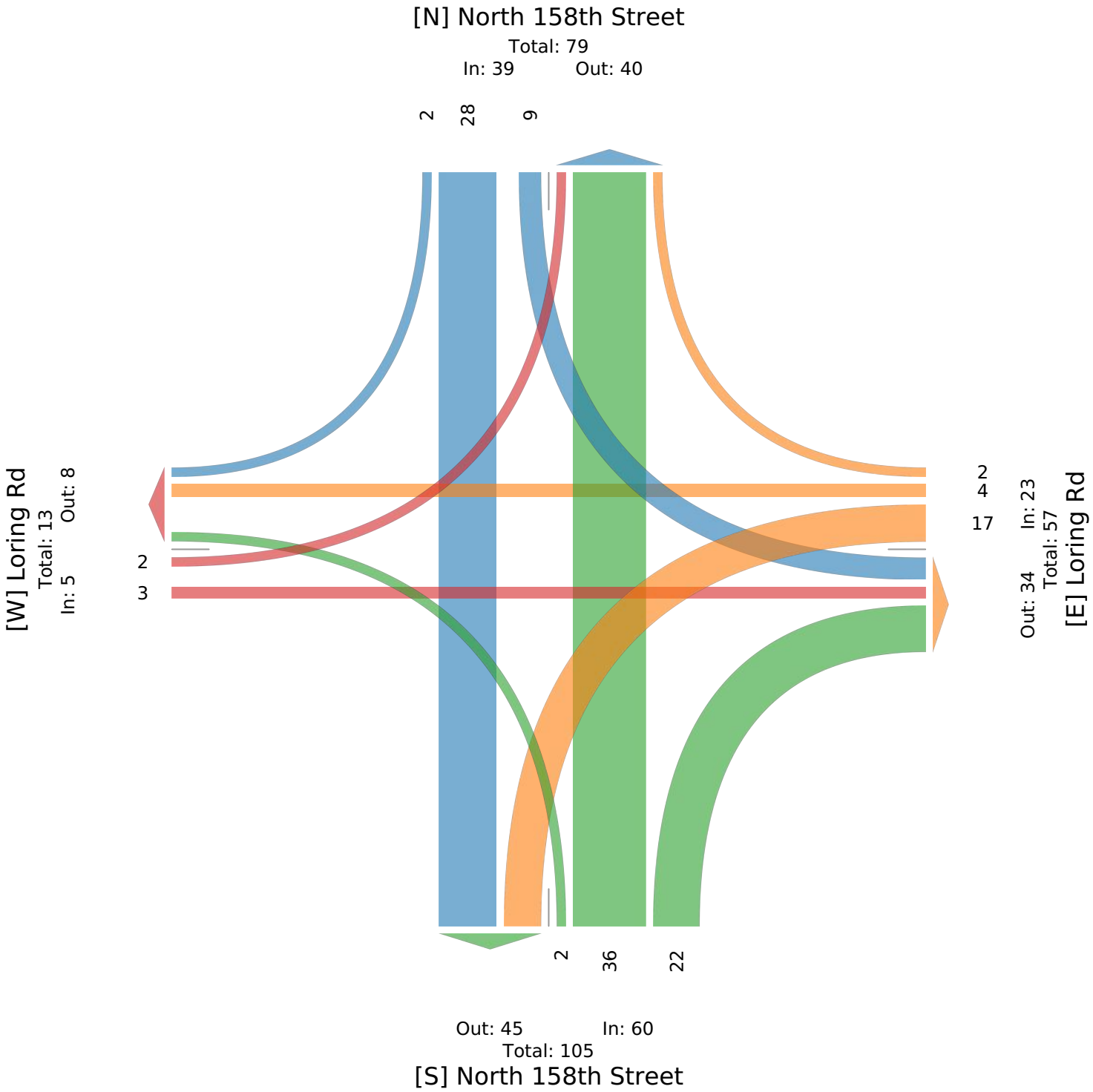
Leg	North 158th Street					Loring Rd					North 158th Street					Loring Rd					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	**Int**
2024-07-11 12:15PM	1	8	1	0	**10**	0	0	5	0	**5**	4	9	1	0	**14**	0	1	0	0	**1**	**30**
12:30PM	0	9	4	0	**13**	0	3	5	0	**8**	8	7	0	0	**15**	0	1	0	0	**1**	**37**
12:45PM	1	4	0	0	**5**	2	1	3	0	**6**	3	9	0	0	**12**	0	1	1	0	**2**	**25**
1:00PM	0	7	4	0	**11**	0	0	4	0	**4**	7	11	1	0	**19**	0	0	1	0	**1**	**35**
Total	2	28	9	0	**39**	2	4	17	0	**23**	22	36	2	0	**60**	0	3	2	0	**5**	**127**
% Approach	5.1%	71.8%	23.1%	0%	**-**	8.7%	17.4%	73.9%	0%	**-**	36.7%	60.0%	3.3%	0%	**-**	0%	60.0%	40.0%	0%	**-**	-
% Total	1.6%	22.0%	7.1%	0%	**30.7%**	1.6%	3.1%	13.4%	0%	**18.1%**	17.3%	28.3%	1.6%	0%	**47.2%**	0%	2.4%	1.6%	0%	**3.9%**	-
PHF	0.500	0.778	0.563	-	**0.750**	0.250	0.333	0.850	-	**0.719**	0.688	0.818	0.500	-	**0.789**	-	0.750	0.500	-	**0.625**	0.858
Lights	2	28	8	0	**38**	2	4	16	0	**22**	22	34	2	0	**58**	0	3	2	0	**5**	123
% Lights	100%	100%	88.9%	0%	**97.4%**	100%	100%	94.1%	0%	**95.7%**	100%	94.4%	100%	0%	**96.7%**	0%	100%	100%	0%	**100%**	96.9%
Articulated Trucks	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0
% Articulated Trucks	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%
Buses and Single-Unit Trucks	0	0	1	0	**1**	0	0	1	0	**1**	0	2	0	0	**2**	0	0	0	0	**0**	4
% Buses and Single-Unit Trucks	0%	0%	11.1%	0%	**2.6%**	0%	0%	5.9%	0%	**4.3%**	0%	5.6%	0%	0%	**3.3%**	0%	0%	0%	0%	**0%**	3.1%

*L: Left, R: Right, T: Thru, U: U-Turn

d. North 158th Street & Loring Road - TMC

Thu Jul 11, 2024
Midday Peak (Jul 11 2024 12:15PM - 1:15 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205788, Location: 39.014578, -94.946025

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



d. North 158th Street & Loring Road - TMC

Thu Jul 11, 2024
Forced Peak (Jul 11 2024 2PM - 3 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205788, Location: 39.014578, -94.946025

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

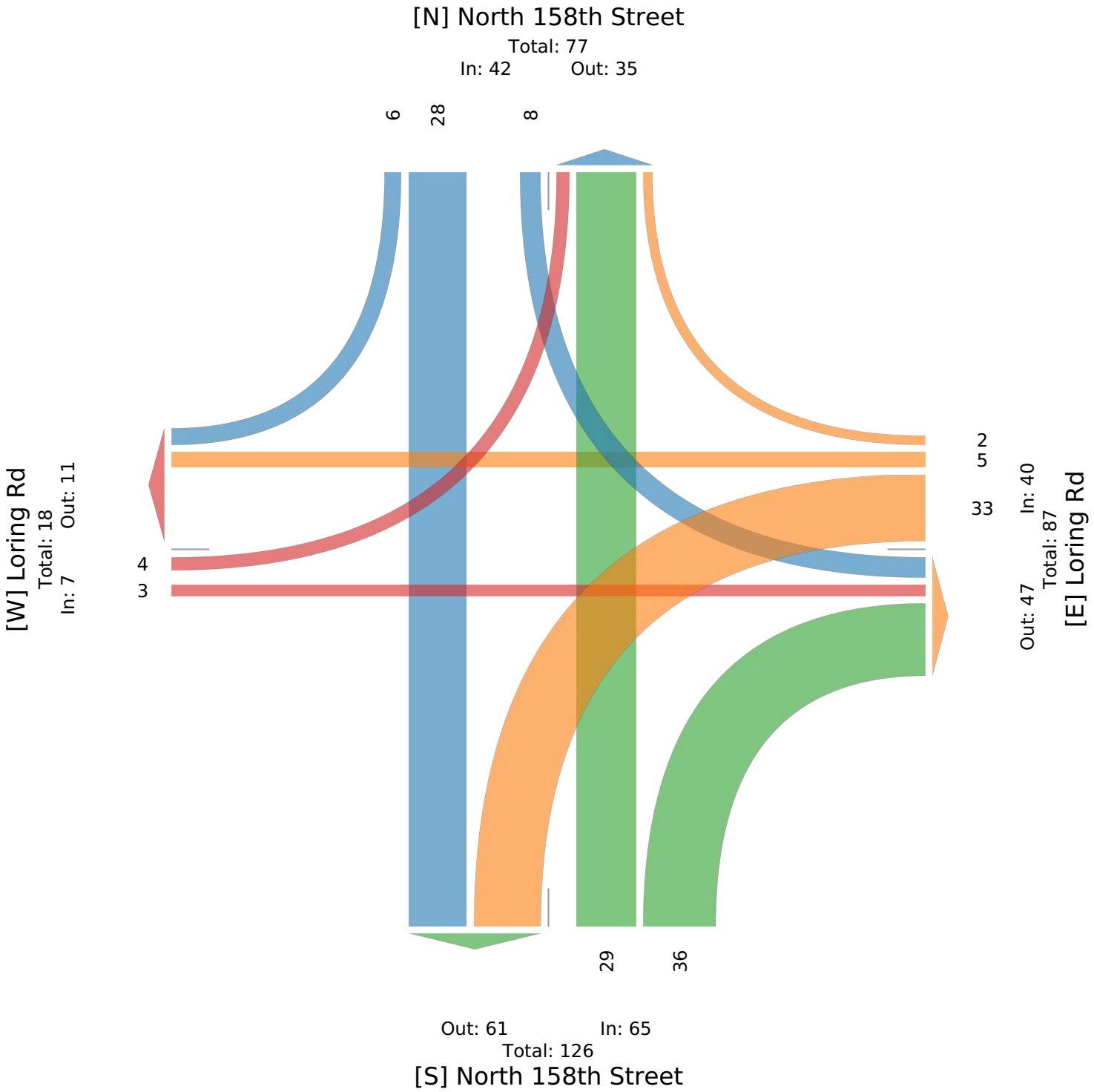
Leg	North 158th Street					Loring Rd					North 158th Street					Loring Rd					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2024-07-11 2:00PM	2	9	2	0	**13**	2	2	9	0	**13**	11	9	0	0	**20**	0	1	0	0	**1**	**47**
2:15PM	2	6	2	0	**10**	0	0	6	0	**6**	4	6	0	0	**10**	0	0	0	0	**0**	**26**
2:30PM	1	8	0	0	**9**	0	0	5	0	**5**	10	8	0	0	**18**	0	1	4	0	**5**	**37**
2:45PM	1	5	4	0	**10**	0	3	13	0	**16**	11	6	0	0	**17**	0	1	0	0	**1**	**44**
Total	6	28	8	0	**42**	2	5	33	0	**40**	36	29	0	0	**65**	0	3	4	0	**7**	**154**
% Approach	14.3%	66.7%	19.0%	0%	**-**	5.0%	12.5%	82.5%	0%	**-**	55.4%	44.6%	0%	0%	**-**	0%	42.9%	57.1%	0%	**-**	-
% Total	3.9%	18.2%	5.2%	0%	**27.3%**	1.3%	3.2%	21.4%	0%	**26.0%**	23.4%	18.8%	0%	0%	**42.2%**	0%	1.9%	2.6%	0%	**4.5%**	-
PHF	0.750	0.778	0.500	-	**0.808**	0.250	0.417	0.635	-	**0.625**	0.818	0.806	-	-	**0.813**	-	0.750	0.250	-	**0.350**	0.819
Lights	6	27	7	0	**40**	1	5	33	0	**39**	36	28	0	0	**64**	0	3	4	0	**7**	150
% Lights	100%	96.4%	87.5%	0%	**95.2%**	50.0%	100%	100%	0%	**97.5%**	100%	96.6%	0%	0%	**98.5%**	0%	100%	100%	0%	**100%**	97.4%
Articulated Trucks	0	0	1	0	**1**	1	0	0	0	**1**	0	1	0	0	**1**	0	0	0	0	**0**	3
% Articulated Trucks	0%	0%	12.5%	0%	**2.4%**	50.0%	0%	0%	0%	**2.5%**	0%	3.4%	0%	0%	**1.5%**	0%	0%	0%	0%	**0%**	1.9%
Buses and Single-Unit Trucks	0	1	0	0	**1**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	1
% Buses and Single-Unit Trucks	0%	3.6%	0%	0%	**2.4%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0.6%

*L: Left, R: Right, T: Thru, U: U-Turn

d. North 158th Street & Loring Road - TMC

Thu Jul 11, 2024
Forced Peak (Jul 11 2024 2PM - 3 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205788, Location: 39.014578, -94.946025

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



d. North 158th Street & Loring Road - TMC

Thu Jul 11, 2024
PM Peak (Jul 11 2024 4:30PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205788, Location: 39.014578, -94.946025

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

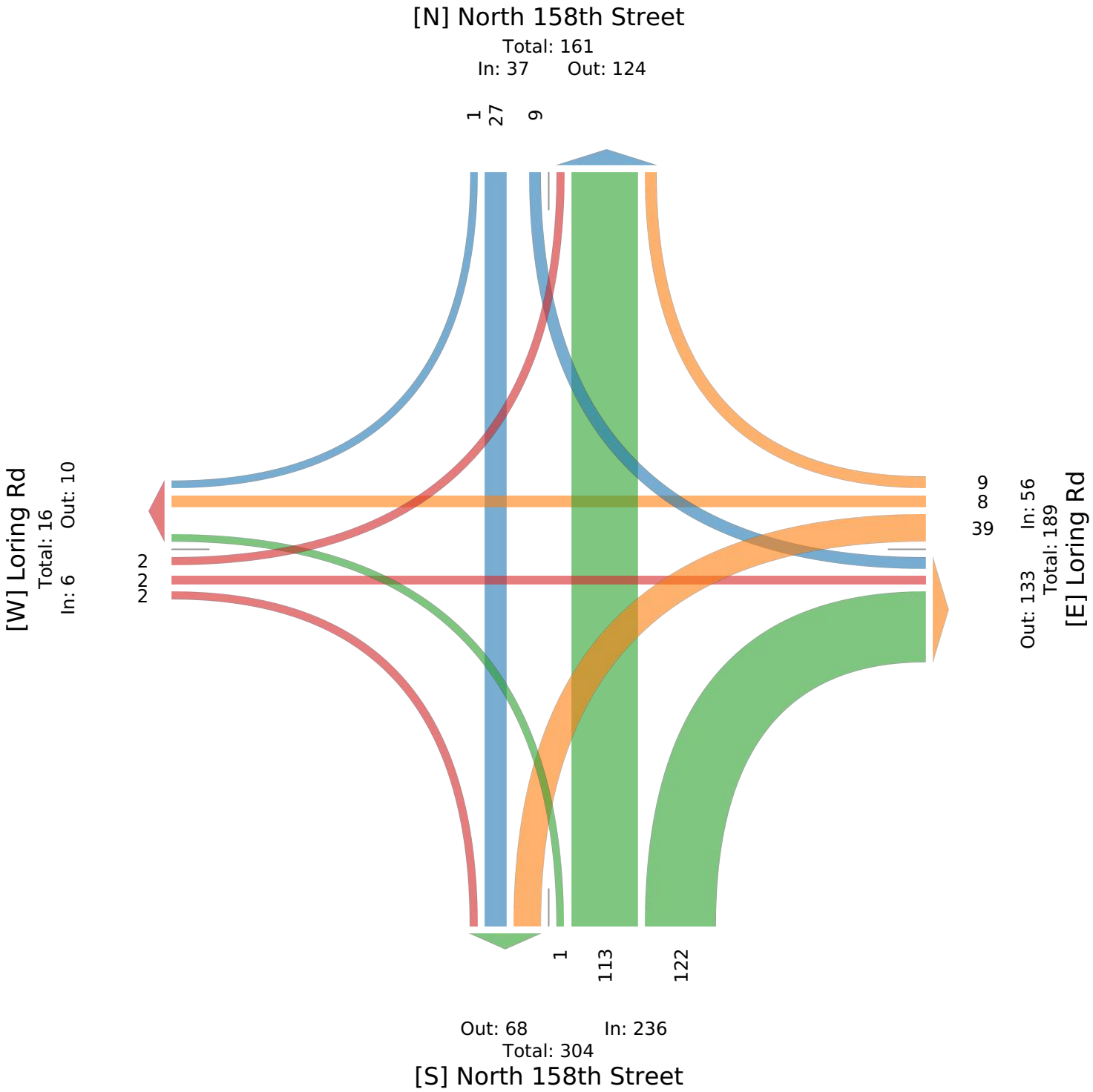
Leg	North 158th Street					Loring Rd					North 158th Street					Loring Rd					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2024-07-11 4:30PM	0	6	2	0	**8**	2	2	6	0	**10**	29	30	0	0	**59**	0	0	1	0	**1**	**78**
4:45PM	0	2	2	0	**4**	4	0	9	0	**13**	36	28	0	0	**64**	1	0	0	0	**1**	**82**
5:00PM	1	8	1	0	**10**	1	4	13	0	**18**	29	32	1	0	**62**	0	0	1	0	**1**	**91**
5:15PM	0	11	4	0	**15**	2	2	11	0	**15**	28	23	0	0	**51**	1	2	0	0	**3**	**84**
Total	1	27	9	0	**37**	9	8	39	0	**56**	122	113	1	0	**236**	2	2	2	0	**6**	**335**
% Approach	2.7%	73.0%	24.3%	0%	**-**	16.1%	14.3%	69.6%	0%	**-**	51.7%	47.9%	0.4%	0%	**-**	33.3%	33.3%	33.3%	0%	**-**	-
% Total	0.3%	8.1%	2.7%	0%	**11.0%**	2.7%	2.4%	11.6%	0%	**16.7%**	36.4%	33.7%	0.3%	0%	**70.4%**	0.6%	0.6%	0.6%	0%	**1.8%**	-
PHF	0.250	0.614	0.563	-	**0.617**	0.563	0.500	0.750	-	**0.778**	0.847	0.883	0.250	-	**0.922**	0.500	0.250	0.500	-	**0.500**	0.920
Lights	1	27	9	0	**37**	9	8	39	0	**56**	121	108	1	0	**230**	2	2	2	0	**6**	329
% Lights	100%	100%	100%	0%	**100%**	100%	100%	100%	0%	**100%**	99.2%	95.6%	100%	0%	**97.5%**	100%	100%	100%	0%	**100%**	98.2%
Articulated Trucks	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0
% Articulated Trucks	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%
Buses and Single-Unit Trucks	0	0	0	0	**0**	0	0	0	0	**0**	1	5	0	0	**6**	0	0	0	0	**0**	6
% Buses and Single-Unit Trucks	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0.8%	4.4%	0%	0%	**2.5%**	0%	0%	0%	0%	**0%**	1.8%

*L: Left, R: Right, T: Thru, U: U-Turn

d. North 158th Street & Loring Road - TMC

Thu Jul 11, 2024
PM Peak (Jul 11 2024 4:30PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205788, Location: 39.014578, -94.946025

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



APPENDIX A.5
LORING LANE & 142ND STREET
TURNING MOVEMENT COUNTS

e. Loring Ln & Loring Rd - TMC

Thu Jul 11, 2024
Full Length (12 AM-12 AM (+1))
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205789, Location: 39.014713, -94.908763

GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	142nd St					Loring Rd					142nd St					Loring Rd					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2024-07-11 12:00AM	1	0	0	0	**1**	0	1	0	0	**1**	0	0	0	0	**0**	0	3	0	0	**3**	**5**
12:15AM	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	1	0	**1**	**1**
12:30AM	0	0	0	0	**0**	0	1	0	0	**1**	0	0	0	0	**0**	0	0	0	0	**0**	**1**
12:45AM	0	0	0	0	**0**	0	1	0	0	**1**	0	0	0	0	**0**	0	1	0	0	**1**	**2**
Hourly Total	1	0	0	0	**1**	0	3	0	0	**3**	0	0	0	0	**0**	0	4	1	0	**5**	**9**
1:00AM	0	0	0	0	**0**	0	2	0	0	**2**	0	0	0	0	**0**	0	0	0	0	**0**	**2**
1:15AM	0	0	0	0	**0**	0	1	0	0	**1**	0	0	0	0	**0**	0	0	0	0	**0**	**1**
1:30AM	0	0	0	0	**0**	0	2	0	0	**2**	0	0	0	0	**0**	0	0	0	0	**0**	**2**
1:45AM	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	1	0	0	**1**	**1**
Hourly Total	0	0	0	0	**0**	0	5	0	0	**5**	0	0	0	0	**0**	0	1	0	0	**1**	**6**
2:00AM	0	0	0	0	**0**	0	1	0	0	**1**	0	0	0	0	**0**	0	1	0	0	**1**	**2**
2:15AM	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	**0**
2:30AM	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	**0**
2:45AM	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	**0**
Hourly Total	0	0	0	0	**0**	0	1	0	0	**1**	0	0	0	0	**0**	0	1	0	0	**1**	**2**
3:00AM	0	0	0	0	**0**	0	1	0	0	**1**	0	0	0	0	**0**	0	0	0	0	**0**	**1**
3:15AM	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	**0**
3:30AM	0	0	0	0	**0**	0	1	0	0	**1**	0	0	0	0	**0**	0	0	0	0	**0**	**1**
3:45AM	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	2	0	0	**2**	**2**
Hourly Total	0	0	0	0	**0**	0	2	0	0	**2**	0	0	0	0	**0**	0	2	0	0	**2**	**4**
4:00AM	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	1	0	0	**1**	**1**
4:15AM	0	0	0	0	**0**	0	2	0	0	**2**	0	0	0	0	**0**	0	1	0	0	**1**	**3**
4:30AM	0	0	0	0	**0**	0	1	0	0	**1**	0	0	0	0	**0**	0	1	0	0	**1**	**2**
4:45AM	0	0	0	0	**0**	0	4	0	0	**4**	0	0	0	0	**0**	0	3	0	0	**3**	**7**
Hourly Total	0	0	0	0	**0**	0	7	0	0	**7**	0	0	0	0	**0**	0	6	0	0	**6**	**13**
5:00AM	0	0	0	0	**0**	0	2	0	0	**2**	0	0	0	0	**0**	0	2	1	0	**3**	**5**
5:15AM	2	0	0	0	**2**	0	6	0	0	**6**	0	0	0	0	**0**	0	5	0	0	**5**	**13**
5:30AM	1	0	0	0	**1**	0	5	0	0	**5**	0	0	0	0	**0**	0	10	0	0	**10**	**16**
5:45AM	0	0	0	0	**0**	0	7	0	0	**7**	0	0	0	0	**0**	0	13	0	0	**13**	**20**
Hourly Total	3	0	0	0	**3**	0	20	0	0	**20**	0	0	0	0	**0**	0	30	1	0	**31**	**54**
6:00AM	0	0	0	0	**0**	0	6	0	0	**6**	0	0	0	0	**0**	0	13	0	0	**13**	**19**
6:15AM	0	0	0	0	**0**	0	5	0	0	**5**	0	0	0	0	**0**	0	15	0	0	**15**	**20**
6:30AM	0	0	0	0	**0**	0	10	0	0	**10**	1	0	0	0	**1**	0	9	0	0	**9**	**20**
6:45AM	0	0	0	0	**0**	0	12	0	0	**12**	0	0	0	0	**0**	1	14	0	0	**15**	**27**
Hourly Total	0	0	0	0	**0**	0	33	0	0	**33**	1	0	0	0	**1**	1	51	0	0	**52**	**86**
7:00AM	0	0	1	0	**1**	0	6	0	0	**6**	0	0	1	0	**1**	1	11	0	0	**12**	**20**
7:15AM	0	0	0	0	**0**	0	3	0	0	**3**	0	0	1	0	**1**	0	13	0	0	**13**	**17**
7:30AM	0	1	0	0	**1**	0	10	0	0	**10**	0	0	0	0	**0**	0	21	0	0	**21**	**32**
7:45AM	0	0	0	0	**0**	0	23	0	0	**23**	0	0	0	0	**0**	0	10	0	0	**10**	**33**
Hourly Total	0	1	1	0	**2**	0	42	0	0	**42**	0	0	2	0	**2**	1	55	0	0	**56**	**102**
8:00AM	0	0	0	0	**0**	0	9	0	0	**9**	0	0	1	0	**1**	1	13	1	0	**15**	**25**
8:15AM	1	0	0	0	**1**	0	8	0	0	**8**	0	0	1	0	**1**	0	11	0	0	**11**	**21**
8:30AM	1	0	0	0	**1**	0	11	0	0	**11**	0	0	0	0	**0**	0	14	0	0	**14**	**26**
8:45AM	0	0	0	0	**0**	0	9	1	0	**10**	0	0	0	0	**0**	0	6	0	0	**6**	**16**
Hourly Total	2	0	0	0	**2**	0	37	1	0	**38**	0	0	2	0	**2**	1	44	1	0	**46**	**88**
9:00AM	0	0	0	0	**0**	0	8	0	0	**8**	0	0	1	0	**1**	1	10	0	0	**11**	**20**
9:15AM	1	0	0	0	**1**	0	7	0	0	**7**	0	0	2	0	**2**	0	3	0	0	**3**	**13**
9:30AM	0	0	0	0	**0**	0	7	0	0	**7**	0	0	1	0	**1**	1	14	0	0	**15**	**23**
9:45AM	1	0	0	0	**1**	0	5	0	0	**5**	0	0	0	0	**0**	0	9	0	0	**9**	**15**
Hourly Total	2	0	0	0	**2**	0	27	0	0	**27**	0	0	4	0	**4**	2	36	0	0	**38**	**71**
10:00AM	1	0	0	0	**1**	0	7	0	0	**7**	0	0	0	0	**0**	0	9	1	0	**10**	**18**
10:15AM	0	0	0	0	**0**	0	7	0	0	**7**	0	0	1	0	**1**	2	10	1	0	**13**	**21**
10:30AM	0	0	0	0	**0**	0	5	0	0	**5**	0	0	0	0	**0**	0	10	0	0	**10**	**15**
10:45AM	0	0	0	0	**0**	0	4	0	0	**4**	0	0	0	0	**0**	0	9	0	0	**9**	**13**

Leg	142nd St					Loring Rd					142nd St					Loring Rd					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	**Int**
Hourly Total	1	0	0	0	**1**	0	23	0	0	**23**	0	0	1	0	**1**	2	38	2	0	**42**	**67**
11:00AM	0	0	0	0	**0**	0	7	2	0	**9**	0	0	0	0	**0**	0	6	0	0	**6**	**15**
11:15AM	0	0	0	0	**0**	0	6	0	0	**6**	1	0	0	0	**1**	0	12	1	0	**13**	**20**
11:30AM	0	0	0	0	**0**	0	14	1	0	**15**	0	0	1	0	**1**	1	6	1	0	**8**	**24**
11:45AM	1	1	0	0	**2**	0	4	0	0	**4**	0	0	1	0	**1**	0	6	0	0	**6**	**13**
Hourly Total	1	1	0	0	**2**	0	31	3	0	**34**	1	0	2	0	**3**	1	30	2	0	**33**	**72**
12:00PM	1	0	1	0	**2**	0	8	0	0	**8**	0	0	0	0	**0**	0	8	0	0	**8**	**18**
12:15PM	2	0	0	0	**2**	1	7	1	1	**10**	0	0	0	0	**0**	1	9	0	0	**10**	**22**
12:30PM	0	0	0	0	**0**	0	12	0	0	**12**	0	0	0	0	**0**	0	15	0	0	**15**	**27**
12:45PM	0	0	0	0	**0**	0	9	0	0	**9**	1	0	0	0	**1**	0	6	1	0	**7**	**17**
Hourly Total	3	0	1	0	**4**	1	36	1	1	**39**	1	0	0	0	**1**	1	38	1	0	**40**	**84**
1:00PM	1	0	0	0	**1**	0	8	0	0	**8**	0	0	0	0	**0**	1	9	0	0	**10**	**19**
1:15PM	0	0	0	0	**0**	0	13	0	0	**13**	0	0	2	0	**2**	1	5	1	0	**7**	**22**
1:30PM	1	0	0	0	**1**	0	17	0	0	**17**	0	0	0	0	**0**	0	10	0	0	**10**	**28**
1:45PM	0	0	0	0	**0**	0	7	0	0	**7**	0	0	0	0	**0**	2	13	0	0	**15**	**22**
Hourly Total	2	0	0	0	**2**	0	45	0	0	**45**	0	0	2	0	**2**	4	37	1	0	**42**	**91**
2:00PM	0	0	0	0	**0**	0	17	0	0	**17**	0	0	0	0	**0**	0	14	0	0	**14**	**31**
2:15PM	0	0	0	0	**0**	0	5	0	0	**5**	1	0	0	0	**1**	0	6	0	0	**6**	**12**
2:30PM	0	0	0	0	**0**	0	8	0	0	**8**	1	0	0	0	**1**	0	12	0	0	**12**	**21**
2:45PM	1	0	0	0	**1**	0	20	0	0	**20**	0	0	0	0	**0**	0	21	0	0	**21**	**42**
Hourly Total	1	0	0	0	**1**	0	50	0	0	**50**	2	0	0	0	**2**	0	53	0	0	**53**	**106**
3:00PM	0	0	0	0	**0**	0	6	0	0	**6**	0	0	0	0	**0**	0	19	0	0	**19**	**25**
3:15PM	2	1	0	0	**3**	0	7	1	0	**8**	0	1	0	0	**1**	0	12	0	0	**12**	**24**
3:30PM	1	0	0	0	**1**	0	14	0	0	**14**	0	0	0	0	**0**	0	23	2	0	**25**	**40**
3:45PM	1	0	0	0	**1**	0	17	0	0	**17**	0	0	0	0	**0**	0	21	1	0	**22**	**40**
Hourly Total	4	1	0	0	**5**	0	44	1	0	**45**	0	1	0	0	**1**	0	75	3	0	**78**	**129**
4:00PM	0	0	0	0	**0**	0	17	0	0	**17**	1	0	0	0	**1**	0	13	0	0	**13**	**31**
4:15PM	1	0	0	0	**1**	0	9	0	0	**9**	0	0	0	0	**0**	0	24	0	1	**25**	**35**
4:30PM	0	0	1	0	**1**	0	11	0	0	**11**	0	0	0	0	**0**	1	29	2	0	**32**	**44**
4:45PM	0	0	0	0	**0**	0	17	0	0	**17**	0	0	0	0	**0**	0	40	2	0	**42**	**59**
Hourly Total	1	0	1	0	**2**	0	54	0	0	**54**	1	0	0	0	**1**	1	106	4	1	**112**	**169**
5:00PM	0	0	0	0	**0**	0	14	1	0	**15**	0	0	1	0	**1**	0	47	0	0	**47**	**63**
5:15PM	1	0	0	0	**1**	1	22	0	0	**23**	1	0	0	0	**1**	1	27	0	0	**28**	**53**
5:30PM	0	0	0	0	**0**	0	15	0	0	**15**	0	0	0	0	**0**	0	42	1	0	**43**	**58**
5:45PM	2	0	0	0	**2**	1	12	0	0	**13**	0	1	0	0	**1**	1	18	0	0	**19**	**35**
Hourly Total	3	0	0	0	**3**	2	63	1	0	**66**	1	1	1	0	**3**	2	134	1	0	**137**	**209**
6:00PM	0	0	0	0	**0**	0	11	0	0	**11**	1	0	0	0	**1**	0	12	2	0	**14**	**26**
6:15PM	2	1	0	0	**3**	1	10	1	0	**12**	0	0	0	0	**0**	0	7	0	0	**7**	**22**
6:30PM	1	0	0	0	**1**	0	10	0	0	**10**	0	0	0	0	**0**	0	4	3	0	**7**	**18**
6:45PM	1	0	0	0	**1**	0	9	0	0	**9**	0	0	0	0	**0**	0	4	2	0	**6**	**16**
Hourly Total	4	1	0	0	**5**	1	40	1	0	**42**	1	0	0	0	**1**	0	27	7	0	**34**	**82**
7:00PM	0	0	1	0	**1**	0	6	0	0	**6**	1	0	1	0	**2**	0	8	0	0	**8**	**17**
7:15PM	1	0	0	1	**2**	0	8	0	0	**8**	0	0	0	0	**0**	0	5	0	0	**5**	**15**
7:30PM	0	0	0	0	**0**	0	4	0	0	**4**	0	0	0	0	**0**	0	2	0	0	**2**	**6**
7:45PM	0	0	0	0	**0**	0	12	0	0	**12**	0	0	0	0	**0**	0	8	0	0	**8**	**20**
Hourly Total	1	0	1	1	**3**	0	30	0	0	**30**	1	0	1	0	**2**	0	23	0	0	**23**	**58**
8:00PM	0	0	0	0	**0**	0	10	0	0	**10**	0	0	0	0	**0**	0	3	0	0	**3**	**13**
8:15PM	0	0	0	0	**0**	0	8	0	0	**8**	0	0	0	0	**0**	0	4	0	0	**4**	**12**
8:30PM	0	0	0	0	**0**	1	3	0	0	**4**	0	0	0	0	**0**	0	4	0	0	**4**	**8**
8:45PM	1	0	0	0	**1**	0	7	0	0	**7**	0	0	0	0	**0**	0	2	1	0	**3**	**11**
Hourly Total	1	0	0	0	**1**	1	28	0	0	**29**	0	0	0	0	**0**	0	13	1	0	**14**	**44**
9:00PM	0	0	0	0	**0**	0	7	0	0	**7**	0	0	0	0	**0**	0	6	0	0	**6**	**13**
9:15PM	0	0	0	0	**0**	0	5	0	0	**5**	0	0	0	0	**0**	0	3	0	0	**3**	**8**
9:30PM	0	0	0	0	**0**	0	3	0	0	**3**	0	0	0	0	**0**	0	3	0	0	**3**	**6**
9:45PM	0	0	0	0	**0**	0	1	0	0	**1**	0	0	0	0	**0**	0	1	0	0	**1**	**2**
Hourly Total	0	0	0	0	**0**	0	16	0	0	**16**	0	0	0	0	**0**	0	13	0	0	**13**	**29**
10:00PM	0	0	0	0	**0**	0	3	0	0	**3**	0	0	0	0	**0**	0	0	0	0	**0**	**3**
10:15PM	0	0	0	0	**0**	0	2	0	0	**2**	0	0	0	0	**0**	0	2	1	0	**3**	**5**
10:30PM	0	0	0	0	**0**	0	3	0	0	**3**	0	0	0	0	**0**	0	0	0	0	**0**	**3**
10:45PM	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	**0**

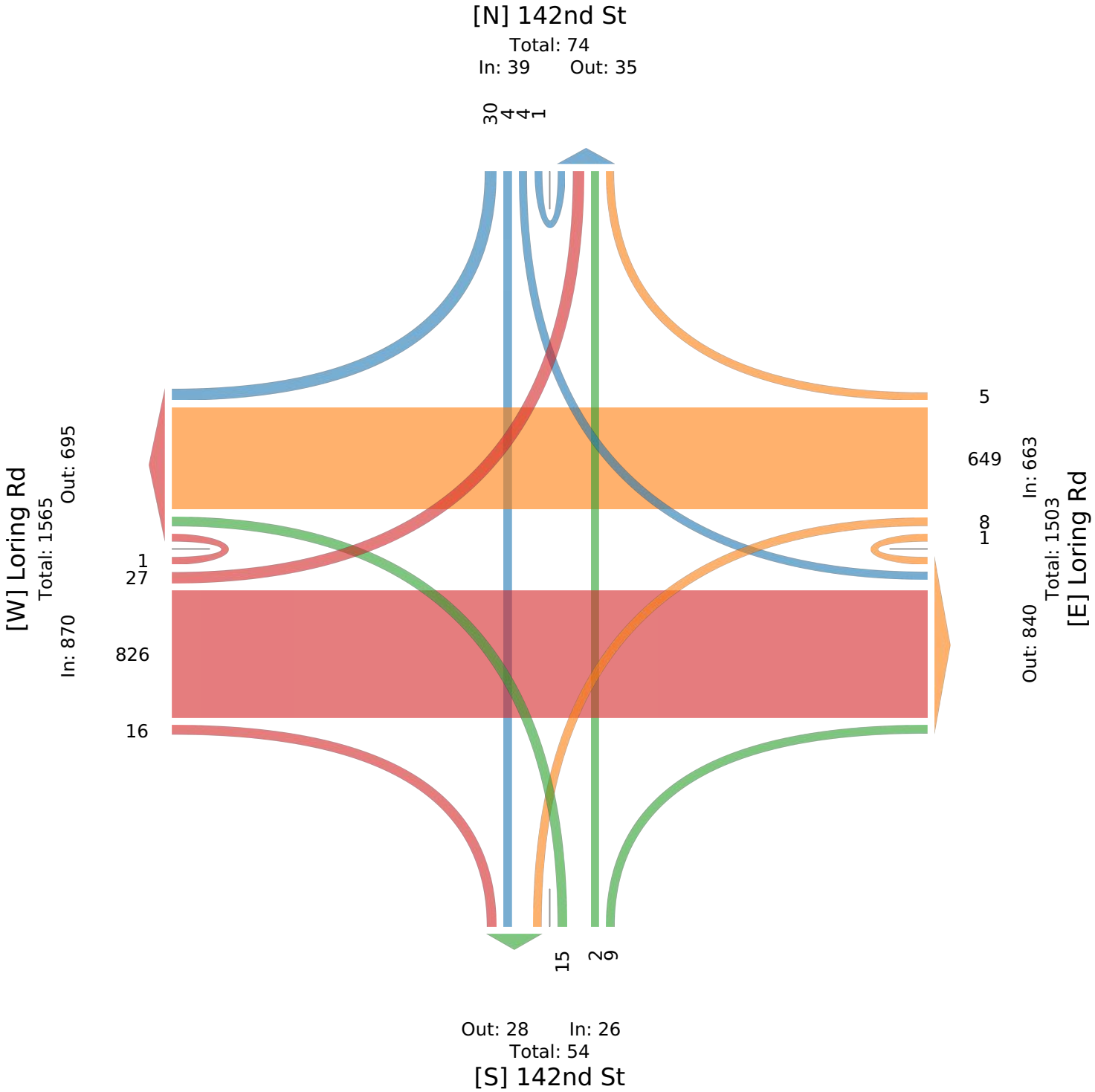
Leg	142nd St					Loring Rd					142nd St					Loring Rd					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	**Int**
Hourly Total	0	0	0	0	**0**	0	8	0	0	**8**	0	0	0	0	**0**	0	2	1	0	**3**	**11**
11:00PM	0	0	0	0	**0**	0	2	0	0	**2**	0	0	0	0	**0**	0	4	1	0	**5**	**7**
11:15PM	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	1	0	0	**1**	**1**
11:30PM	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	1	0	0	**1**	**1**
11:45PM	0	0	0	0	**0**	0	2	0	0	**2**	0	0	0	0	**0**	0	1	0	0	**1**	**3**
Hourly Total	0	0	0	0	**0**	0	4	0	0	**4**	0	0	0	0	**0**	0	7	1	0	**8**	**12**
Total	30	4	4	1	**39**	5	649	8	1	**663**	9	2	15	0	**26**	16	826	27	1	**870**	**1598**
% Approach	76.9%	10.3%	10.3%	2.6%	**-**	0.8%	97.9%	1.2%	0.2%	**-**	34.6%	7.7%	57.7%	0%	**-**	1.8%	94.9%	3.1%	0.1%	**-**	-
% Total	1.9%	0.3%	0.3%	0.1%	**2.4%**	0.3%	40.6%	0.5%	0.1%	**41.5%**	0.6%	0.1%	0.9%	0%	**1.6%**	1.0%	51.7%	1.7%	0.1%	**54.4%**	-
Lights	27	4	4	1	**36**	5	601	8	1	**615**	9	2	15	0	**26**	14	774	24	1	**813**	1490
% Lights	90.0%	100%	100%	100%	**92.3%**	100%	92.6%	100%	100%	**92.8%**	100%	100%	100%	0%	**100%**	87.5%	93.7%	88.9%	100%	**93.4%**	93.2%
Articulated Trucks	0	0	0	0	**0**	0	28	0	0	**28**	0	0	0	0	**0**	0	31	0	0	**31**	59
% Articulated Trucks	0%	0%	0%	0%	**0%**	0%	4.3%	0%	0%	**4.2%**	0%	0%	0%	0%	**0%**	0%	3.8%	0%	0%	**3.6%**	3.7%
Buses and Single-Unit Trucks	3	0	0	0	**3**	0	20	0	0	**20**	0	0	0	0	**0**	2	21	3	0	**26**	49
% Buses and Single-Unit Trucks	10.0%	0%	0%	0%	**7.7%**	0%	3.1%	0%	0%	**3.0%**	0%	0%	0%	0%	**0%**	12.5%	2.5%	11.1%	0%	**3.0%**	3.1%

*L: Left, R: Right, T: Thru, U: U-Turn

e. Loring Ln & Loring Rd - TMC

Thu Jul 11, 2024
Full Length (12 AM-12 AM (+1))
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205789, Location: 39.014713, -94.908763

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



e. Loring Ln & Loring Rd - TMC

Thu Jul 11, 2024
Forced Peak (Jul 11 2024 7:15AM - 8:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205789, Location: 39.014713, -94.908763

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

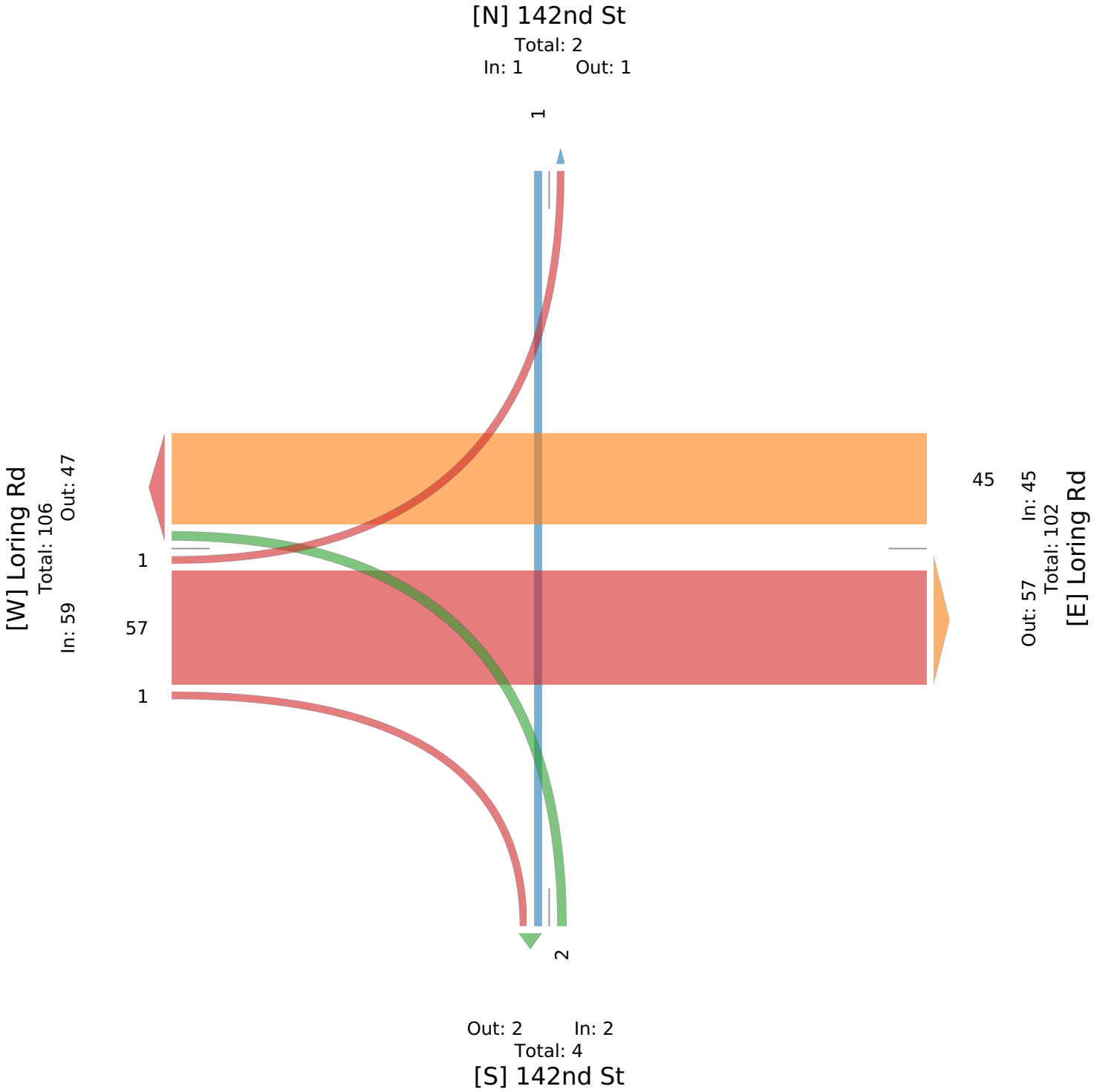
Leg	142nd St					Loring Rd					142nd St					Loring Rd					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2024-07-11 7:15AM	0	0	0	0	**0**	0	3	0	0	**3**	0	0	1	0	**1**	0	13	0	0	**13**	**17**
7:30AM	0	1	0	0	**1**	0	10	0	0	**10**	0	0	0	0	**0**	0	21	0	0	**21**	**32**
7:45AM	0	0	0	0	**0**	0	23	0	0	**23**	0	0	0	0	**0**	0	10	0	0	**10**	**33**
8:00AM	0	0	0	0	**0**	0	9	0	0	**9**	0	0	1	0	**1**	1	13	1	0	**15**	**25**
Total	0	1	0	0	**1**	0	45	0	0	**45**	0	0	2	0	**2**	1	57	1	0	**59**	**107**
% Approach	0%	100%	0%	0%	**-**	0%	100%	0%	0%	**-**	0%	0%	100%	0%	**-**	1.7%	96.6%	1.7%	0%	**-**	-
% Total	0%	0.9%	0%	0%	**0.9%**	0%	42.1%	0%	0%	**42.1%**	0%	0%	1.9%	0%	**1.9%**	0.9%	53.3%	0.9%	0%	**55.1%**	-
PHF	-	0.250	-	-	**0.250**	-	0.489	-	-	**0.489**	-	-	0.500	-	**0.500**	0.250	0.679	0.250	-	**0.702**	0.811
Lights	0	1	0	0	**1**	0	40	0	0	**40**	0	0	2	0	**2**	1	53	1	0	**55**	98
% Lights	0%	100%	0%	0%	**100%**	0%	88.9%	0%	0%	**88.9%**	0%	0%	100%	0%	**100%**	100%	93.0%	100%	0%	**93.2%**	91.6%
Articulated Trucks	0	0	0	0	**0**	0	2	0	0	**2**	0	0	0	0	**0**	0	1	0	0	**1**	3
% Articulated Trucks	0%	0%	0%	0%	**0%**	0%	4.4%	0%	0%	**4.4%**	0%	0%	0%	0%	**0%**	0%	1.8%	0%	0%	**1.7%**	2.8%
Buses and Single-Unit Trucks	0	0	0	0	**0**	0	3	0	0	**3**	0	0	0	0	**0**	0	3	0	0	**3**	6
% Buses and Single-Unit Trucks	0%	0%	0%	0%	**0%**	0%	6.7%	0%	0%	**6.7%**	0%	0%	0%	0%	**0%**	0%	5.3%	0%	0%	**5.1%**	5.6%

*L: Left, R: Right, T: Thru, U: U-Turn

e. Loring Ln & Loring Rd - TMC

Thu Jul 11, 2024
Forced Peak (Jul 11 2024 7:15AM - 8:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205789, Location: 39.014713, -94.908763

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



e. Loring Ln & Loring Rd - TMC

Thu Jul 11, 2024
AM Peak (Jul 11 2024 7:30AM - 8:30 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205789, Location: 39.014713, -94.908763

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

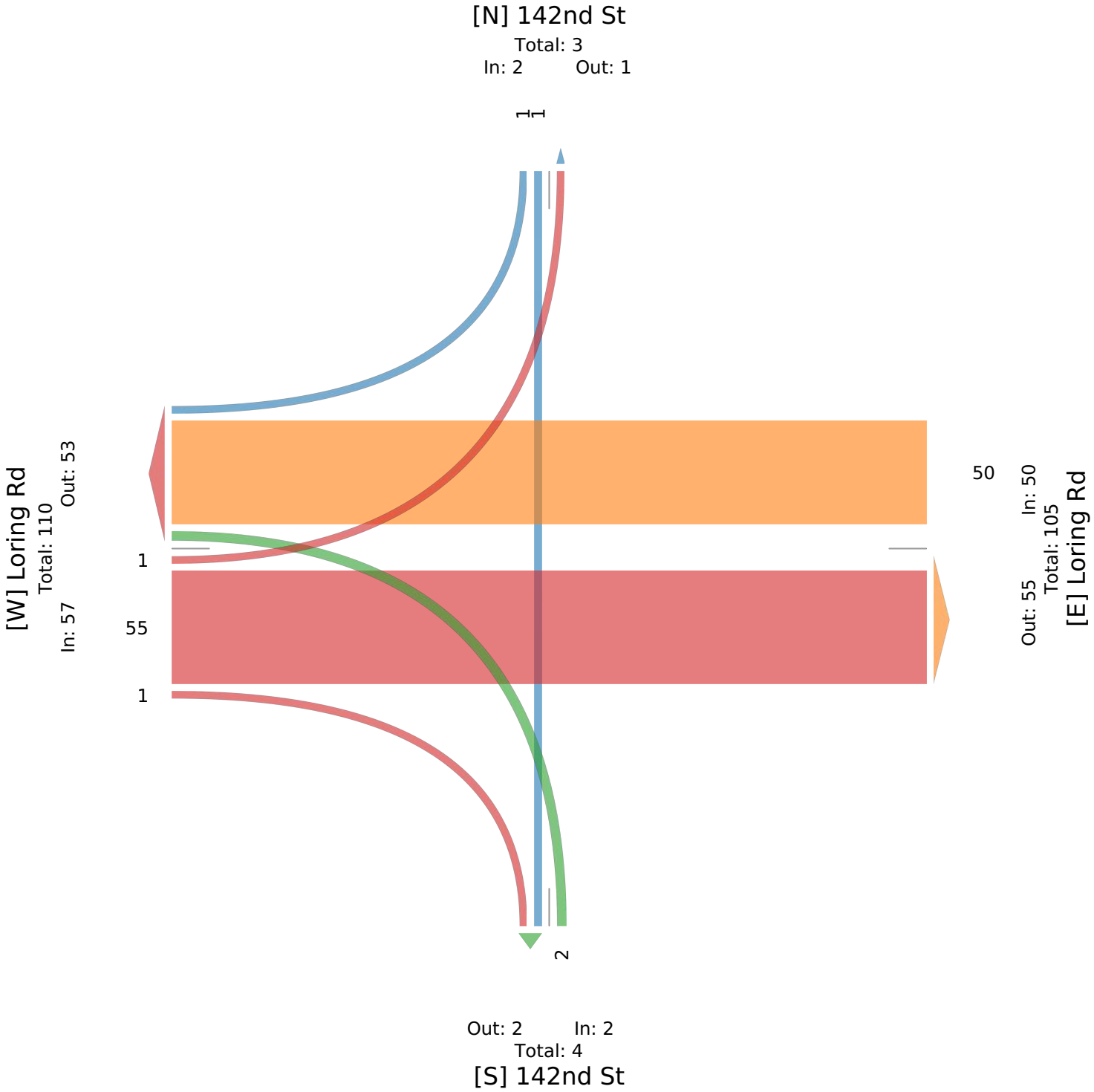
Leg	142nd St					Loring Rd					142nd St					Loring Rd					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2024-07-11 7:30AM	0	1	0	0	**1**	0	10	0	0	**10**	0	0	0	0	**0**	0	21	0	0	**21**	**32**
7:45AM	0	0	0	0	**0**	0	23	0	0	**23**	0	0	0	0	**0**	0	10	0	0	**10**	**33**
8:00AM	0	0	0	0	**0**	0	9	0	0	**9**	0	0	1	0	**1**	1	13	1	0	**15**	**25**
8:15AM	1	0	0	0	**1**	0	8	0	0	**8**	0	0	1	0	**1**	0	11	0	0	**11**	**21**
Total	1	1	0	0	**2**	0	50	0	0	**50**	0	0	2	0	**2**	1	55	1	0	**57**	**111**
% Approach	50.0%	50.0%	0%	0%	**-**	0%	100%	0%	0%	**-**	0%	0%	100%	0%	**-**	1.8%	96.5%	1.8%	0%	**-**	-
% Total	0.9%	0.9%	0%	0%	**1.8%**	0%	45.0%	0%	0%	**45.0%**	0%	0%	1.8%	0%	**1.8%**	0.9%	49.5%	0.9%	0%	**51.4%**	-
PHF	0.250	0.250	-	-	**0.500**	-	0.543	-	-	**0.543**	-	-	0.500	-	**0.500**	0.250	0.655	0.250	-	**0.679**	0.841
Lights	0	1	0	0	**1**	0	45	0	0	**45**	0	0	2	0	**2**	1	50	1	0	**52**	100
% Lights	0%	100%	0%	0%	**50.0%**	0%	90.0%	0%	0%	**90.0%**	0%	0%	100%	0%	**100%**	100%	90.9%	100%	0%	**91.2%**	90.1%
Articulated Trucks	0	0	0	0	**0**	0	2	0	0	**2**	0	0	0	0	**0**	0	2	0	0	**2**	4
% Articulated Trucks	0%	0%	0%	0%	**0%**	0%	4.0%	0%	0%	**4.0%**	0%	0%	0%	0%	**0%**	0%	3.6%	0%	0%	**3.5%**	3.6%
Buses and Single-Unit Trucks	1	0	0	0	**1**	0	3	0	0	**3**	0	0	0	0	**0**	0	3	0	0	**3**	7
% Buses and Single-Unit Trucks	100%	0%	0%	0%	**50.0%**	0%	6.0%	0%	0%	**6.0%**	0%	0%	0%	0%	**0%**	0%	5.5%	0%	0%	**5.3%**	6.3%

*L: Left, R: Right, T: Thru, U: U-Turn

e. Loring Ln & Loring Rd - TMC

Thu Jul 11, 2024
AM Peak (Jul 11 2024 7:30AM - 8:30 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205789, Location: 39.014713, -94.908763

GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



e. Loring Ln & Loring Rd - TMC

Thu Jul 11, 2024
Midday Peak (Jul 11 2024 1PM - 2 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205789, Location: 39.014713, -94.908763

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

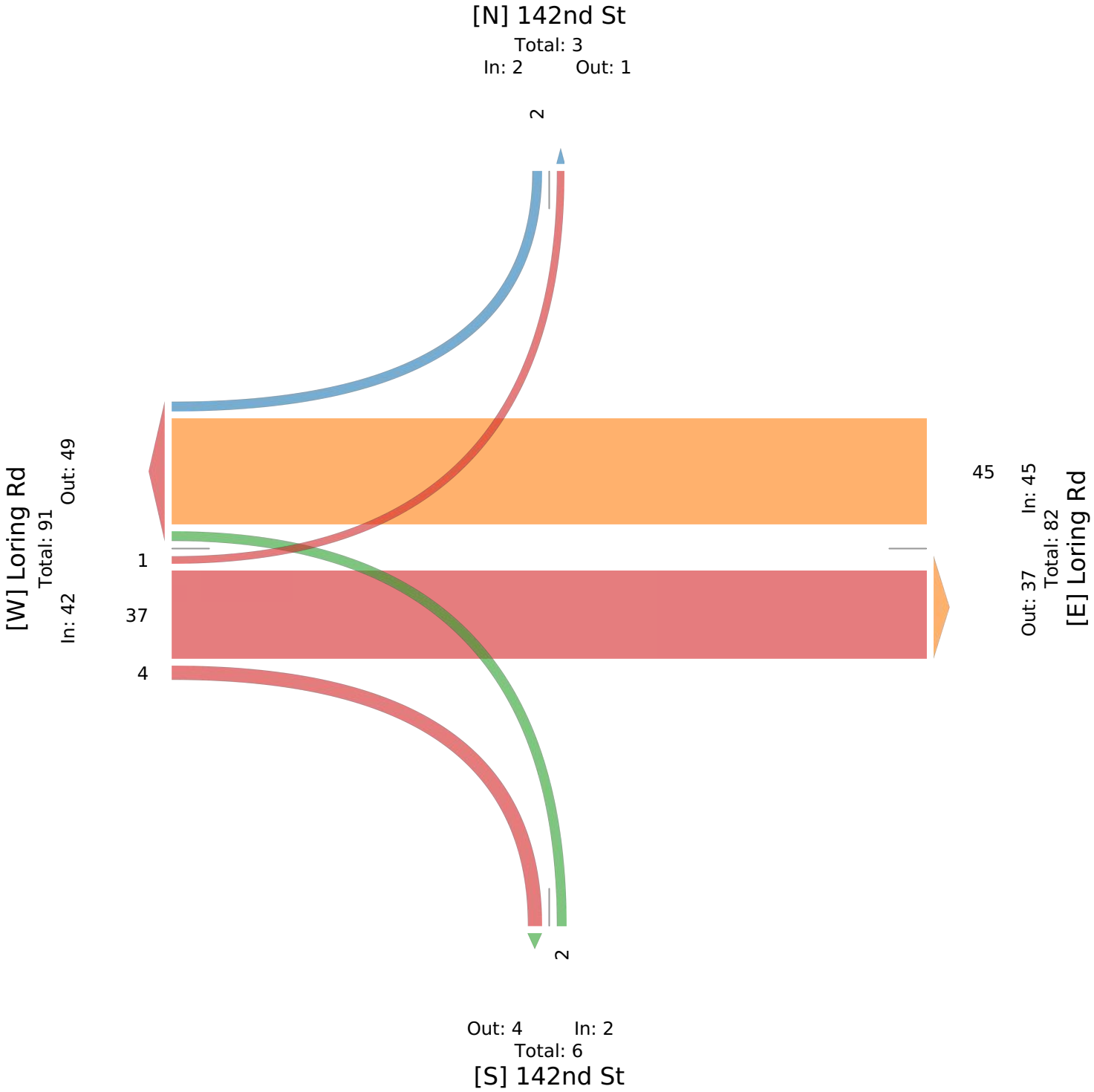
Leg	142nd St					Loring Rd					142nd St					Loring Rd					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2024-07-11 1:00PM	1	0	0	0	**1**	0	8	0	0	**8**	0	0	0	0	**0**	1	9	0	0	**10**	**19**
1:15PM	0	0	0	0	**0**	0	13	0	0	**13**	0	0	2	0	**2**	1	5	1	0	**7**	**22**
1:30PM	1	0	0	0	**1**	0	17	0	0	**17**	0	0	0	0	**0**	0	10	0	0	**10**	**28**
1:45PM	0	0	0	0	**0**	0	7	0	0	**7**	0	0	0	0	**0**	2	13	0	0	**15**	**22**
Total	2	0	0	0	**2**	0	45	0	0	**45**	0	0	2	0	**2**	4	37	1	0	**42**	**91**
% Approach	100%	0%	0%	0%	**-**	0%	100%	0%	0%	**-**	0%	0%	100%	0%	**-**	9.5%	88.1%	2.4%	0%	**-**	-
% Total	2.2%	0%	0%	0%	**2.2%**	0%	49.5%	0%	0%	**49.5%**	0%	0%	2.2%	0%	**2.2%**	4.4%	40.7%	1.1%	0%	**46.2%**	-
PHF	0.500	-	-	-	**0.500**	-	0.662	-	-	**0.662**	-	-	0.250	-	**0.250**	0.500	0.712	0.250	-	**0.700**	0.813
Lights	1	0	0	0	**1**	0	38	0	0	**38**	0	0	2	0	**2**	3	32	1	0	**36**	77
% Lights	50.0%	0%	0%	0%	**50.0%**	0%	84.4%	0%	0%	**84.4%**	0%	0%	100%	0%	**100%**	75.0%	86.5%	100%	0%	**85.7%**	84.6%
Articulated Trucks	0	0	0	0	**0**	0	6	0	0	**6**	0	0	0	0	**0**	0	3	0	0	**3**	9
% Articulated Trucks	0%	0%	0%	0%	**0%**	0%	13.3%	0%	0%	**13.3%**	0%	0%	0%	0%	**0%**	0%	8.1%	0%	0%	**7.1%**	9.9%
Buses and Single-Unit Trucks	1	0	0	0	**1**	0	1	0	0	**1**	0	0	0	0	**0**	1	2	0	0	**3**	5
% Buses and Single-Unit Trucks	50.0%	0%	0%	0%	**50.0%**	0%	2.2%	0%	0%	**2.2%**	0%	0%	0%	0%	**0%**	25.0%	5.4%	0%	0%	**7.1%**	5.5%

*L: Left, R: Right, T: Thru, U: U-Turn

e. Loring Ln & Loring Rd - TMC

Thu Jul 11, 2024
Midday Peak (Jul 11 2024 1PM - 2 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205789, Location: 39.014713, -94.908763

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



e. Loring Ln & Loring Rd - TMC

Thu Jul 11, 2024
Forced Peak (Jul 11 2024 2PM - 3 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205789, Location: 39.014713, -94.908763

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

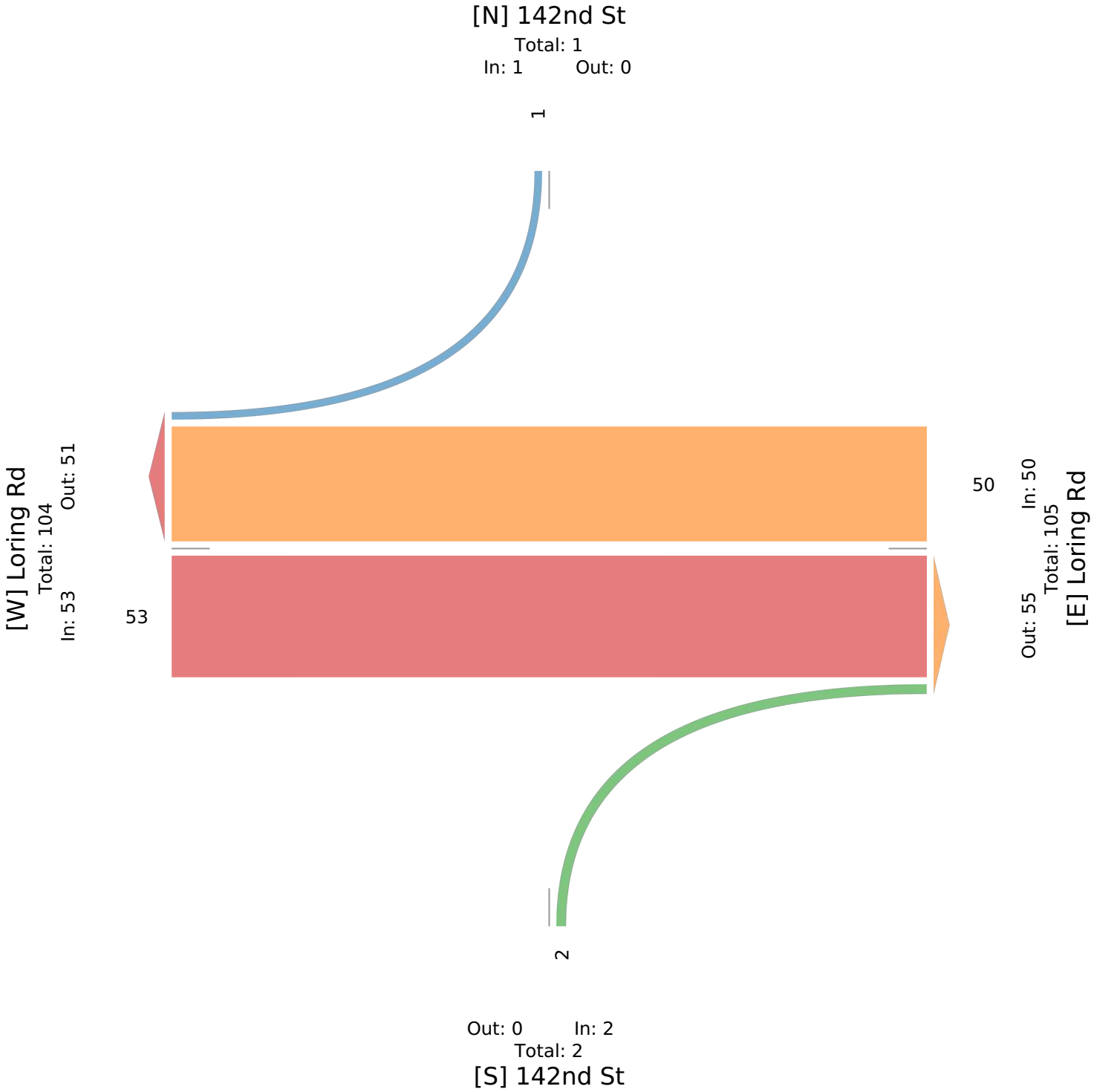
Leg	142nd St					Loring Rd					142nd St					Loring Rd					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2024-07-11 2:00PM	0	0	0	0	**0**	0	17	0	0	**17**	0	0	0	0	**0**	0	14	0	0	**14**	**31**
2:15PM	0	0	0	0	**0**	0	5	0	0	**5**	1	0	0	0	**1**	0	6	0	0	**6**	**12**
2:30PM	0	0	0	0	**0**	0	8	0	0	**8**	1	0	0	0	**1**	0	12	0	0	**12**	**21**
2:45PM	1	0	0	0	**1**	0	20	0	0	**20**	0	0	0	0	**0**	0	21	0	0	**21**	**42**
Total	1	0	0	0	**1**	0	50	0	0	**50**	2	0	0	0	**2**	0	53	0	0	**53**	**106**
% Approach	100%	0%	0%	0%	**-**	0%	100%	0%	0%	**-**	100%	0%	0%	0%	**-**	0%	100%	0%	0%	**-**	-
% Total	0.9%	0%	0%	0%	**0.9%**	0%	47.2%	0%	0%	**47.2%**	1.9%	0%	0%	0%	**1.9%**	0%	50.0%	0%	0%	**50.0%**	-
PHF	0.250	-	-	-	**0.250**	-	0.625	-	-	**0.625**	0.500	-	-	-	**0.500**	-	0.631	-	-	**0.631**	0.631
Lights	1	0	0	0	**1**	0	47	0	0	**47**	2	0	0	0	**2**	0	49	0	0	**49**	99
% Lights	100%	0%	0%	0%	**100%**	0%	94.0%	0%	0%	**94.0%**	100%	0%	0%	0%	**100%**	0%	92.5%	0%	0%	**92.5%**	93.4%
Articulated Trucks	0	0	0	0	**0**	0	2	0	0	**2**	0	0	0	0	**0**	0	3	0	0	**3**	5
% Articulated Trucks	0%	0%	0%	0%	**0%**	0%	4.0%	0%	0%	**4.0%**	0%	0%	0%	0%	**0%**	0%	5.7%	0%	0%	**5.7%**	4.7%
Buses and Single-Unit Trucks	0	0	0	0	**0**	0	1	0	0	**1**	0	0	0	0	**0**	0	1	0	0	**1**	2
% Buses and Single-Unit Trucks	0%	0%	0%	0%	**0%**	0%	2.0%	0%	0%	**2.0%**	0%	0%	0%	0%	**0%**	0%	1.9%	0%	0%	**1.9%**	1.9%

*L: Left, R: Right, T: Thru, U: U-Turn

e. Loring Ln & Loring Rd - TMC

Thu Jul 11, 2024
Forced Peak (Jul 11 2024 2PM - 3 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205789, Location: 39.014713, -94.908763

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



e. Loring Ln & Loring Rd - TMC

Thu Jul 11, 2024
PM Peak (Jul 11 2024 4:45PM - 5:45 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205789, Location: 39.014713, -94.908763

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

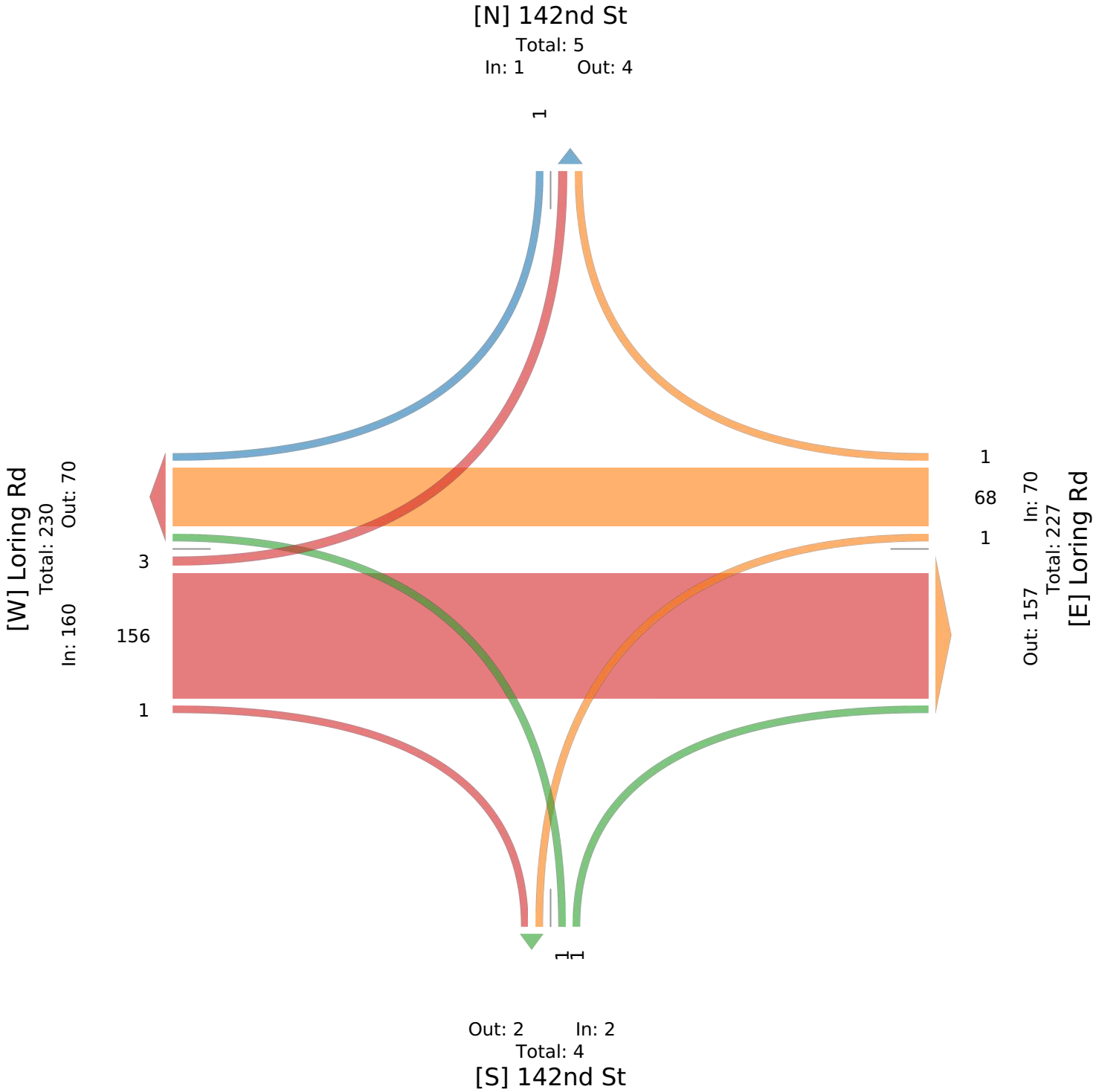
Leg	142nd St					Loring Rd					142nd St					Loring Rd					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2024-07-11 4:45PM	0	0	0	0	**0**	0	17	0	0	**17**	0	0	0	0	**0**	0	40	2	0	**42**	**59**
5:00PM	0	0	0	0	**0**	0	14	1	0	**15**	0	0	1	0	**1**	0	47	0	0	**47**	**63**
5:15PM	1	0	0	0	**1**	1	22	0	0	**23**	1	0	0	0	**1**	1	27	0	0	**28**	**53**
5:30PM	0	0	0	0	**0**	0	15	0	0	**15**	0	0	0	0	**0**	0	42	1	0	**43**	**58**
Total	1	0	0	0	**1**	1	68	1	0	**70**	1	0	1	0	**2**	1	156	3	0	**160**	**233**
% Approach	100%	0%	0%	0%	**-**	1.4%	97.1%	1.4%	0%	**-**	50.0%	0%	50.0%	0%	**-**	0.6%	97.5%	1.9%	0%	**-**	-
% Total	0.4%	0%	0%	0%	**0.4%**	0.4%	29.2%	0.4%	0%	**30.0%**	0.4%	0%	0.4%	0%	**0.9%**	0.4%	67.0%	1.3%	0%	**68.7%**	-
PHF	0.250	-	-	-	**0.250**	0.250	0.773	0.250	-	**0.761**	0.250	-	0.250	-	**0.500**	0.250	0.830	0.375	-	**0.851**	0.925
Lights	1	0	0	0	**1**	1	66	1	0	**68**	1	0	1	0	**2**	1	153	2	0	**156**	227
% Lights	100%	0%	0%	0%	**100%**	100%	97.1%	100%	0%	**97.1%**	100%	0%	100%	0%	**100%**	100%	98.1%	66.7%	0%	**97.5%**	97.4%
Articulated Trucks	0	0	0	0	**0**	0	2	0	0	**2**	0	0	0	0	**0**	0	1	0	0	**1**	3
% Articulated Trucks	0%	0%	0%	0%	**0%**	0%	2.9%	0%	0%	**2.9%**	0%	0%	0%	0%	**0%**	0%	0.6%	0%	0%	**0.6%**	1.3%
Buses and Single-Unit Trucks	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	2	1	0	**3**	3
% Buses and Single-Unit Trucks	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%	1.3%	33.3%	0%	**1.9%**	1.3%

*L: Left, R: Right, T: Thru, U: U-Turn

e. Loring Ln & Loring Rd - TMC

Thu Jul 11, 2024
PM Peak (Jul 11 2024 4:45PM - 5:45 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205789, Location: 39.014713, -94.908763

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



APPENDIX A.6
LORING LANE / WEST FRONT STREET & K-32 TRUCK ROUTE (SANTA FE ROAD) TURNING MOVEMENT COUNTS

d. Loring Ln /W Front St & K-32 Trucks (Sant... - TMC

Thu Jul 11, 2024
Full Length (12 AM-12 AM (+1))
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205790, Location: 39.050799, -94.88855

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	W Front St				Loring Dr				Santa Fe Rd				
Direction	Southbound				Northbound				Eastbound				
Time	R	T	U	**App**	T	L	U	**App**	R	L	U	**App**	**Int**
2024-07-11 12:00AM	5	0	0	**5**	3	0	0	**3**	0	1	0	**1**	**9**
12:15AM	3	1	0	**4**	0	0	0	**0**	0	2	0	**2**	**6**
12:30AM	1	1	0	**2**	0	0	0	**0**	0	0	0	**0**	**2**
12:45AM	4	2	0	**6**	1	0	0	**1**	0	2	0	**2**	**9**
Hourly Total	13	4	0	**17**	4	0	0	**4**	0	5	0	**5**	**26**
1:00AM	6	2	0	**8**	0	0	0	**0**	0	0	0	**0**	**8**
1:15AM	1	3	0	**4**	0	0	0	**0**	0	0	0	**0**	**4**
1:30AM	1	1	0	**2**	0	0	0	**0**	0	0	0	**0**	**2**
1:45AM	0	0	0	**0**	3	0	0	**3**	0	1	0	**1**	**4**
Hourly Total	8	6	0	**14**	3	0	0	**3**	0	1	0	**1**	**18**
2:00AM	0	1	0	**1**	1	1	0	**2**	0	2	0	**2**	**5**
2:15AM	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	**1**
2:30AM	1	0	0	**1**	0	0	0	**0**	0	1	0	**1**	**2**
2:45AM	1	0	0	**1**	2	0	0	**2**	0	0	0	**0**	**3**
Hourly Total	2	1	0	**3**	4	1	0	**5**	0	3	0	**3**	**11**
3:00AM	0	1	0	**1**	0	0	0	**0**	0	2	0	**2**	**3**
3:15AM	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	**0**
3:30AM	1	1	0	**2**	0	0	0	**0**	0	4	0	**4**	**6**
3:45AM	0	0	0	**0**	2	0	0	**2**	0	3	0	**3**	**5**
Hourly Total	1	2	0	**3**	2	0	0	**2**	0	9	0	**9**	**14**
4:00AM	0	0	0	**0**	2	0	0	**2**	0	2	0	**2**	**4**
4:15AM	5	3	0	**8**	1	0	0	**1**	0	5	0	**5**	**14**
4:30AM	2	1	0	**3**	1	0	0	**1**	0	3	0	**3**	**7**
4:45AM	4	4	0	**8**	2	0	0	**2**	0	3	0	**3**	**13**
Hourly Total	11	8	0	**19**	6	0	0	**6**	0	13	0	**13**	**38**
5:00AM	2	4	0	**6**	1	0	0	**1**	0	7	0	**7**	**14**
5:15AM	10	6	0	**16**	8	1	0	**9**	0	8	0	**8**	**33**
5:30AM	16	7	0	**23**	13	0	0	**13**	1	13	0	**14**	**50**
5:45AM	11	5	0	**16**	12	2	0	**14**	0	17	0	**17**	**47**
Hourly Total	39	22	0	**61**	34	3	0	**37**	1	45	0	**46**	**144**
6:00AM	10	6	0	**16**	16	0	0	**16**	0	14	0	**14**	**46**
6:15AM	8	7	0	**15**	18	0	0	**18**	2	23	0	**25**	**58**
6:30AM	12	16	0	**28**	18	1	0	**19**	1	28	0	**29**	**76**
6:45AM	12	14	0	**26**	15	0	0	**15**	0	26	0	**26**	**67**
Hourly Total	42	43	0	**85**	67	1	0	**68**	3	91	0	**94**	**247**
7:00AM	10	7	0	**17**	21	0	0	**21**	0	27	0	**27**	**65**
7:15AM	14	7	0	**21**	22	0	0	**22**	2	27	0	**29**	**72**
7:30AM	14	17	0	**31**	26	0	0	**26**	0	28	0	**28**	**85**
7:45AM	15	22	0	**37**	14	0	0	**14**	2	24	0	**26**	**77**
Hourly Total	53	53	0	**106**	83	0	0	**83**	4	106	0	**110**	**299**
8:00AM	13	14	0	**27**	16	0	0	**16**	2	20	0	**22**	**65**
8:15AM	14	14	0	**28**	15	0	0	**15**	1	25	0	**26**	**69**
8:30AM	12	15	0	**27**	17	1	0	**18**	0	15	0	**15**	**60**
8:45AM	4	11	0	**15**	15	0	0	**15**	0	21	0	**21**	**51**
Hourly Total	43	54	0	**97**	63	1	0	**64**	3	81	0	**84**	**245**
9:00AM	8	11	0	**19**	18	1	0	**19**	0	11	0	**11**	**49**
9:15AM	5	15	0	**20**	7	0	0	**7**	2	16	0	**18**	**45**
9:30AM	7	5	1	**13**	19	1	0	**20**	0	8	0	**8**	**41**
9:45AM	15	12	0	**27**	9	1	0	**10**	0	14	0	**14**	**51**
Hourly Total	35	43	1	**79**	53	3	0	**56**	2	49	0	**51**	**186**
10:00AM	9	9	0	**18**	8	1	0	**9**	3	11	0	**14**	**41**
10:15AM	7	10	0	**17**	22	0	0	**22**	1	11	0	**12**	**51**
10:30AM	10	10	0	**20**	14	1	0	**15**	0	9	0	**9**	**44**
10:45AM	9	12	0	**21**	11	0	0	**11**	1	10	0	**11**	**43**

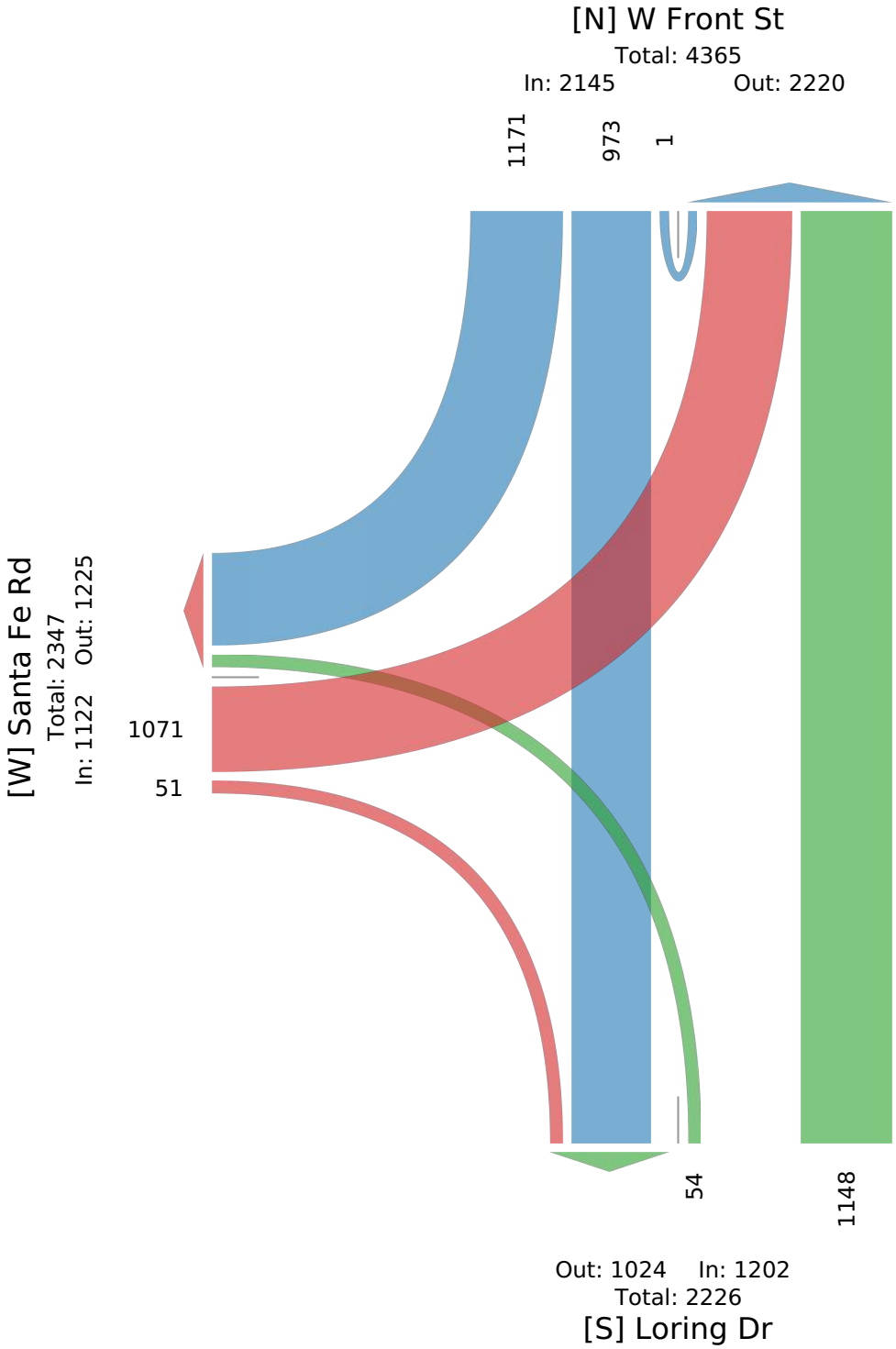
Leg	W Front St				Loring Dr				Santa Fe Rd				
Direction	Southbound				Northbound				Eastbound				
Time	R	T	U	**App**	T	L	U	**App**	R	L	U	**App**	**Int**
Hourly Total	35	41	0	**76**	55	2	0	**57**	5	41	0	**46**	**179**
11:00AM	13	10	0	**23**	11	1	0	**12**	2	15	0	**17**	**52**
11:15AM	11	12	0	**23**	14	6	0	**20**	1	13	0	**14**	**57**
11:30AM	10	18	0	**28**	17	0	0	**17**	1	14	0	**15**	**60**
11:45AM	16	10	0	**26**	9	1	0	**10**	0	13	0	**13**	**49**
Hourly Total	50	50	0	**100**	51	8	0	**59**	4	55	0	**59**	**218**
12:00PM	15	16	0	**31**	15	0	0	**15**	0	19	0	**19**	**65**
12:15PM	20	17	0	**37**	17	1	0	**18**	2	13	0	**15**	**70**
12:30PM	6	21	0	**27**	14	1	0	**15**	0	15	0	**15**	**57**
12:45PM	22	15	0	**37**	20	2	0	**22**	0	13	0	**13**	**72**
Hourly Total	63	69	0	**132**	66	4	0	**70**	2	60	0	**62**	**264**
1:00PM	10	19	0	**29**	9	2	0	**11**	1	10	0	**11**	**51**
1:15PM	21	16	0	**37**	13	1	0	**14**	0	11	0	**11**	**62**
1:30PM	13	15	0	**28**	10	1	0	**11**	1	19	0	**20**	**59**
1:45PM	21	14	0	**35**	18	1	0	**19**	3	15	0	**18**	**72**
Hourly Total	65	64	0	**129**	50	5	0	**55**	5	55	0	**60**	**244**
2:00PM	17	23	0	**40**	26	2	0	**28**	2	12	0	**14**	**82**
2:15PM	27	9	0	**36**	13	0	0	**13**	2	14	0	**16**	**65**
2:30PM	16	18	0	**34**	15	0	0	**15**	1	33	0	**34**	**83**
2:45PM	21	22	0	**43**	24	0	0	**24**	0	20	0	**20**	**87**
Hourly Total	81	72	0	**153**	78	2	0	**80**	5	79	0	**84**	**317**
3:00PM	21	7	0	**28**	23	0	0	**23**	2	9	0	**11**	**62**
3:15PM	22	15	0	**37**	22	2	0	**24**	2	15	0	**17**	**78**
3:30PM	25	24	0	**49**	31	0	0	**31**	1	22	0	**23**	**103**
3:45PM	29	23	0	**52**	22	2	0	**24**	1	16	0	**17**	**93**
Hourly Total	97	69	0	**166**	98	4	0	**102**	6	62	0	**68**	**336**
4:00PM	34	25	0	**59**	21	1	0	**22**	1	20	0	**21**	**102**
4:15PM	26	10	0	**36**	27	0	0	**27**	0	17	0	**17**	**80**
4:30PM	35	26	0	**61**	29	1	0	**30**	0	23	0	**23**	**114**
4:45PM	40	27	0	**67**	45	2	0	**47**	0	10	0	**10**	**124**
Hourly Total	135	88	0	**223**	122	4	0	**126**	1	70	0	**71**	**420**
5:00PM	23	18	0	**41**	52	0	0	**52**	0	12	0	**12**	**105**
5:15PM	34	26	0	**60**	27	1	0	**28**	1	24	0	**25**	**113**
5:30PM	35	27	0	**62**	62	0	0	**62**	0	27	0	**27**	**151**
5:45PM	21	14	0	**35**	29	2	0	**31**	0	19	0	**19**	**85**
Hourly Total	113	85	0	**198**	170	3	0	**173**	1	82	0	**83**	**454**
6:00PM	27	23	0	**50**	20	0	0	**20**	0	25	0	**25**	**95**
6:15PM	20	16	0	**36**	15	2	0	**17**	0	14	0	**14**	**67**
6:30PM	22	18	0	**40**	7	1	0	**8**	1	12	0	**13**	**61**
6:45PM	16	9	0	**25**	7	0	0	**7**	1	13	0	**14**	**46**
Hourly Total	85	66	0	**151**	49	3	0	**52**	2	64	0	**66**	**269**
7:00PM	20	15	0	**35**	11	1	0	**12**	0	7	0	**7**	**54**
7:15PM	17	9	0	**26**	7	2	0	**9**	0	11	0	**11**	**46**
7:30PM	13	9	0	**22**	8	1	0	**9**	1	11	0	**12**	**43**
7:45PM	13	11	0	**24**	7	1	0	**8**	2	7	0	**9**	**41**
Hourly Total	63	44	0	**107**	33	5	0	**38**	3	36	0	**39**	**184**
8:00PM	17	10	0	**27**	6	0	0	**6**	0	7	0	**7**	**40**
8:15PM	19	13	0	**32**	7	0	0	**7**	0	7	0	**7**	**46**
8:30PM	18	9	0	**27**	8	0	0	**8**	1	8	0	**9**	**44**
8:45PM	13	11	0	**24**	9	0	0	**9**	1	4	0	**5**	**38**
Hourly Total	67	43	0	**110**	30	0	0	**30**	2	26	0	**28**	**168**
9:00PM	11	9	0	**20**	9	0	0	**9**	0	5	0	**5**	**34**
9:15PM	12	10	0	**22**	3	2	0	**5**	1	3	0	**4**	**31**
9:30PM	10	5	0	**15**	6	1	0	**7**	0	8	0	**8**	**30**
9:45PM	9	5	0	**14**	1	0	0	**1**	0	4	0	**4**	**19**
Hourly Total	42	29	0	**71**	19	3	0	**22**	1	20	0	**21**	**114**
10:00PM	6	3	0	**9**	0	0	0	**0**	0	3	0	**3**	**12**
10:15PM	6	4	0	**10**	2	0	0	**2**	0	5	0	**5**	**17**
10:30PM	3	3	0	**6**	1	0	0	**1**	0	0	0	**0**	**7**
10:45PM	6	3	0	**9**	0	0	0	**0**	0	2	0	**2**	**11**

Leg	W Front St				Loring Dr				Santa Fe Rd				
Direction	Southbound				Northbound				Eastbound				
Time	R	T	U	**App**	T	L	U	**App**	R	L	U	**App**	**Int**
Hourly Total	21	13	0	**34**	3	0	0	**3**	0	10	0	**10**	**47**
11:00PM	4	0	0	**4**	1	1	0	**2**	0	3	0	**3**	**9**
11:15PM	0	2	0	**2**	3	1	0	**4**	0	4	0	**4**	**10**
11:30PM	1	1	0	**2**	1	0	0	**1**	0	1	0	**1**	**4**
11:45PM	2	1	0	**3**	0	0	0	**0**	1	0	0	**1**	**4**
Hourly Total	7	4	0	**11**	5	2	0	**7**	1	8	0	**9**	**27**
Total	1171	973	1	**2145**	1148	54	0	**1202**	51	1071	0	**1122**	**4469**
% Approach	54.6%	45.4%	0%	**-**	95.5%	4.5%	0%	**-**	4.5%	95.5%	0%	**-**	-
% Total	26.2%	21.8%	0%	**48.0%**	25.7%	1.2%	0%	**26.9%**	1.1%	24.0%	0%	**25.1%**	-
Lights	1062	917	1	**1980**	1090	54	0	**1144**	51	944	0	**995**	4119
% Lights	90.7%	94.2%	100%	**92.3%**	94.9%	100%	0%	**95.2%**	100%	88.1%	0%	**88.7%**	92.2%
Articulated Trucks	71	29	0	**100**	33	0	0	**33**	0	79	0	**79**	212
% Articulated Trucks	6.1%	3.0%	0%	**4.7%**	2.9%	0%	0%	**2.7%**	0%	7.4%	0%	**7.0%**	4.7%
Buses and Single-Unit Trucks	38	27	0	**65**	25	0	0	**25**	0	48	0	**48**	138
% Buses and Single-Unit Trucks	3.2%	2.8%	0%	**3.0%**	2.2%	0%	0%	**2.1%**	0%	4.5%	0%	**4.3%**	3.1%

*L: Left, R: Right, T: Thru, U: U-Turn

d. Loring Ln /W Front St & K-32 Trucks (Sant... - TMC
Thu Jul 11, 2024
Full Length (12 AM-12 AM (+1))
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205790, Location: 39.050799, -94.88855

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



d. Loring Ln /W Front St & K-32 Trucks (Sant... - TMC

Thu Jul 11, 2024
AM Peak (Jul 11 2024 7AM - 8 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205790, Location: 39.050799, -94.88855

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

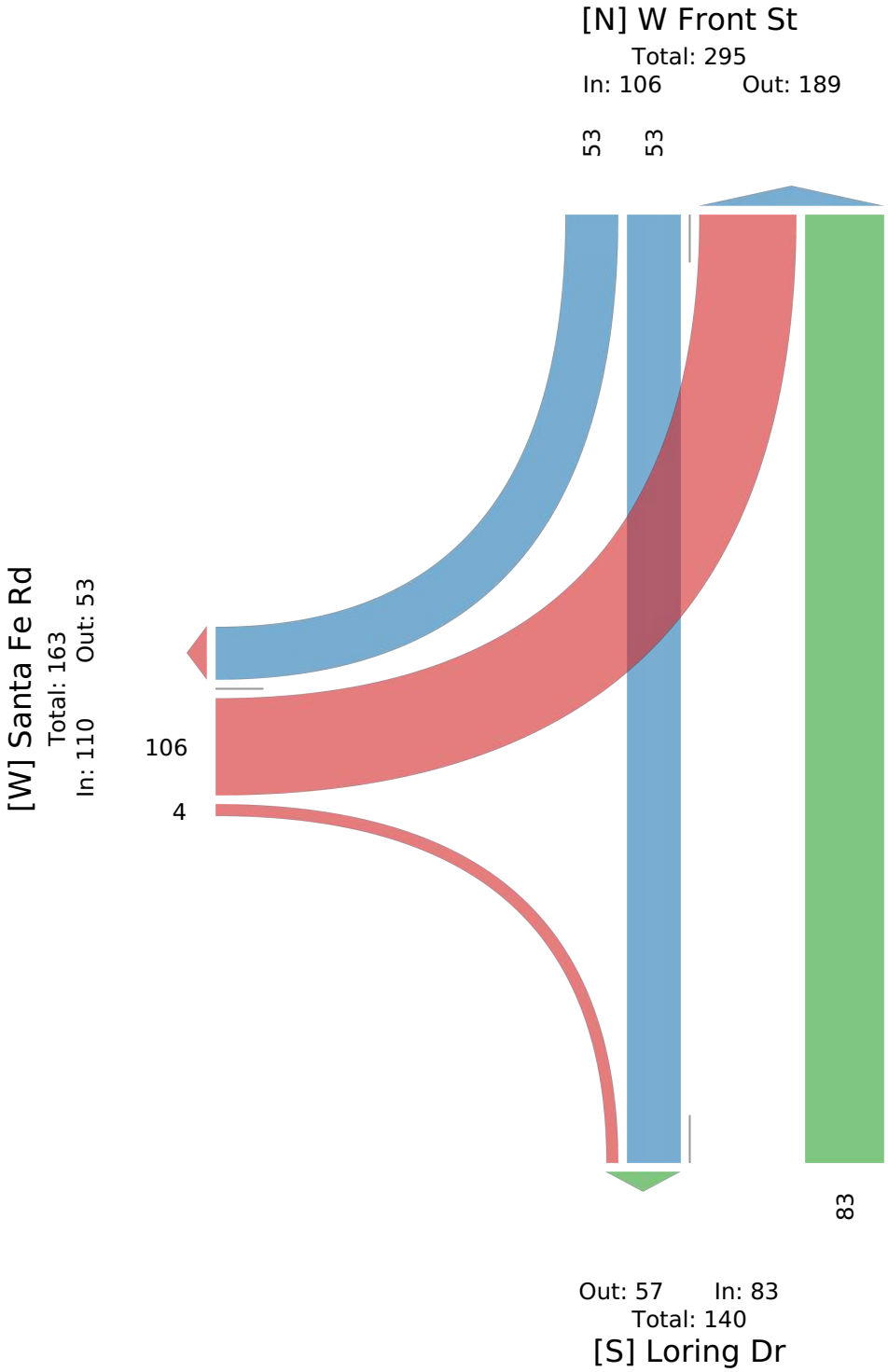
Leg Direction	W Front St Southbound				Loring Dr Northbound				Santa Fe Rd Eastbound				
Time	R	T	U	**App**	T	L	U	**App**	R	L	U	**App**	**Int**
2024-07-11 7:00AM	10	7	0	**17**	21	0	0	**21**	0	27	0	**27**	**65**
7:15AM	14	7	0	**21**	22	0	0	**22**	2	27	0	**29**	**72**
7:30AM	14	17	0	**31**	26	0	0	**26**	0	28	0	**28**	**85**
7:45AM	15	22	0	**37**	14	0	0	**14**	2	24	0	**26**	**77**
Total	53	53	0	**106**	83	0	0	**83**	4	106	0	**110**	**299**
% Approach	50.0%	50.0%	0%	**-**	100%	0%	0%	**-**	3.6%	96.4%	0%	**-**	-
% Total	17.7%	17.7%	0%	**35.5%**	27.8%	0%	0%	**27.8%**	1.3%	35.5%	0%	**36.8%**	-
PHF	0.883	0.602	-	**0.716**	0.798	-	-	**0.798**	0.500	0.946	-	**0.948**	0.879
Lights	46	50	0	**96**	81	0	0	**81**	4	95	0	**99**	276
% Lights	86.8%	94.3%	0%	**90.6%**	97.6%	0%	0%	**97.6%**	100%	89.6%	0%	**90.0%**	92.3%
Articulated Trucks	2	1	0	**3**	1	0	0	**1**	0	5	0	**5**	9
% Articulated Trucks	3.8%	1.9%	0%	**2.8%**	1.2%	0%	0%	**1.2%**	0%	4.7%	0%	**4.5%**	3.0%
Buses and Single-Unit Trucks	5	2	0	**7**	1	0	0	**1**	0	6	0	**6**	14
% Buses and Single-Unit Trucks	9.4%	3.8%	0%	**6.6%**	1.2%	0%	0%	**1.2%**	0%	5.7%	0%	**5.5%**	4.7%

*L: Left, R: Right, T: Thru, U: U-Turn

d. Loring Ln /W Front St & K-32 Trucks (Sant... - TMC

Thu Jul 11, 2024
AM Peak (Jul 11 2024 7AM - 8 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205790, Location: 39.050799, -94.88855

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



d. Loring Ln /W Front St & K-32 Trucks (Sant... - TMC

Thu Jul 11, 2024
Forced Peak (Jul 11 2024 7:15AM - 8:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205790, Location: 39.050799, -94.88855

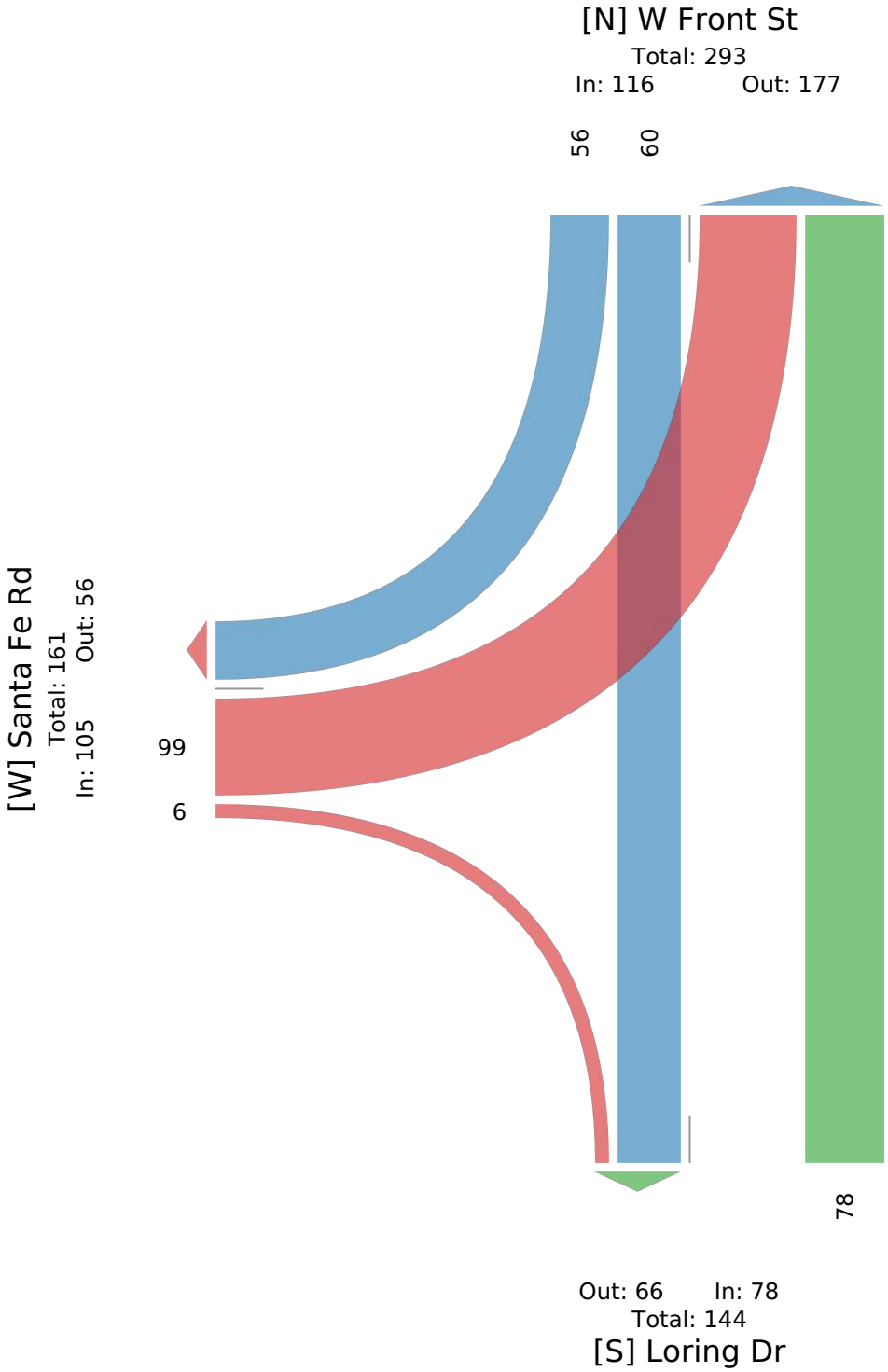
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	W Front St				Loring Dr				Santa Fe Rd				
Direction	Southbound				Northbound				Eastbound				
Time	R	T	U	**App**	T	L	U	**App**	R	L	U	**App**	**Int**
2024-07-11 7:15AM	14	7	0	**21**	22	0	0	**22**	2	27	0	**29**	**72**
7:30AM	14	17	0	**31**	26	0	0	**26**	0	28	0	**28**	**85**
7:45AM	15	22	0	**37**	14	0	0	**14**	2	24	0	**26**	**77**
8:00AM	13	14	0	**27**	16	0	0	**16**	2	20	0	**22**	**65**
Total	56	60	0	**116**	78	0	0	**78**	6	99	0	**105**	**299**
% Approach	48.3%	51.7%	0%	**-**	100%	0%	0%	**-**	5.7%	94.3%	0%	**-**	-
% Total	18.7%	20.1%	0%	**38.8%**	26.1%	0%	0%	**26.1%**	2.0%	33.1%	0%	**35.1%**	-
PHF	0.933	0.682	-	**0.784**	0.750	-	-	**0.750**	0.750	0.884	-	**0.905**	0.879
Lights	48	55	0	**103**	75	0	0	**75**	6	87	0	**93**	271
% Lights	85.7%	91.7%	0%	**88.8%**	96.2%	0%	0%	**96.2%**	100%	87.9%	0%	**88.6%**	90.6%
Articulated Trucks	5	3	0	**8**	1	0	0	**1**	0	7	0	**7**	16
% Articulated Trucks	8.9%	5.0%	0%	**6.9%**	1.3%	0%	0%	**1.3%**	0%	7.1%	0%	**6.7%**	5.4%
Buses and Single-Unit Trucks	3	2	0	**5**	2	0	0	**2**	0	5	0	**5**	12
% Buses and Single-Unit Trucks	5.4%	3.3%	0%	**4.3%**	2.6%	0%	0%	**2.6%**	0%	5.1%	0%	**4.8%**	4.0%

*L: Left, R: Right, T: Thru, U: U-Turn

d. Loring Ln /W Front St & K-32 Trucks (Sant... - TMC
Thu Jul 11, 2024
Forced Peak (Jul 11 2024 7:15AM - 8:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205790, Location: 39.050799, -94.88855

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



d. Loring Ln /W Front St & K-32 Trucks (Sant... - TMC

Thu Jul 11, 2024
Midday Peak (Jul 11 2024 12PM - 1 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205790, Location: 39.050799, -94.88855

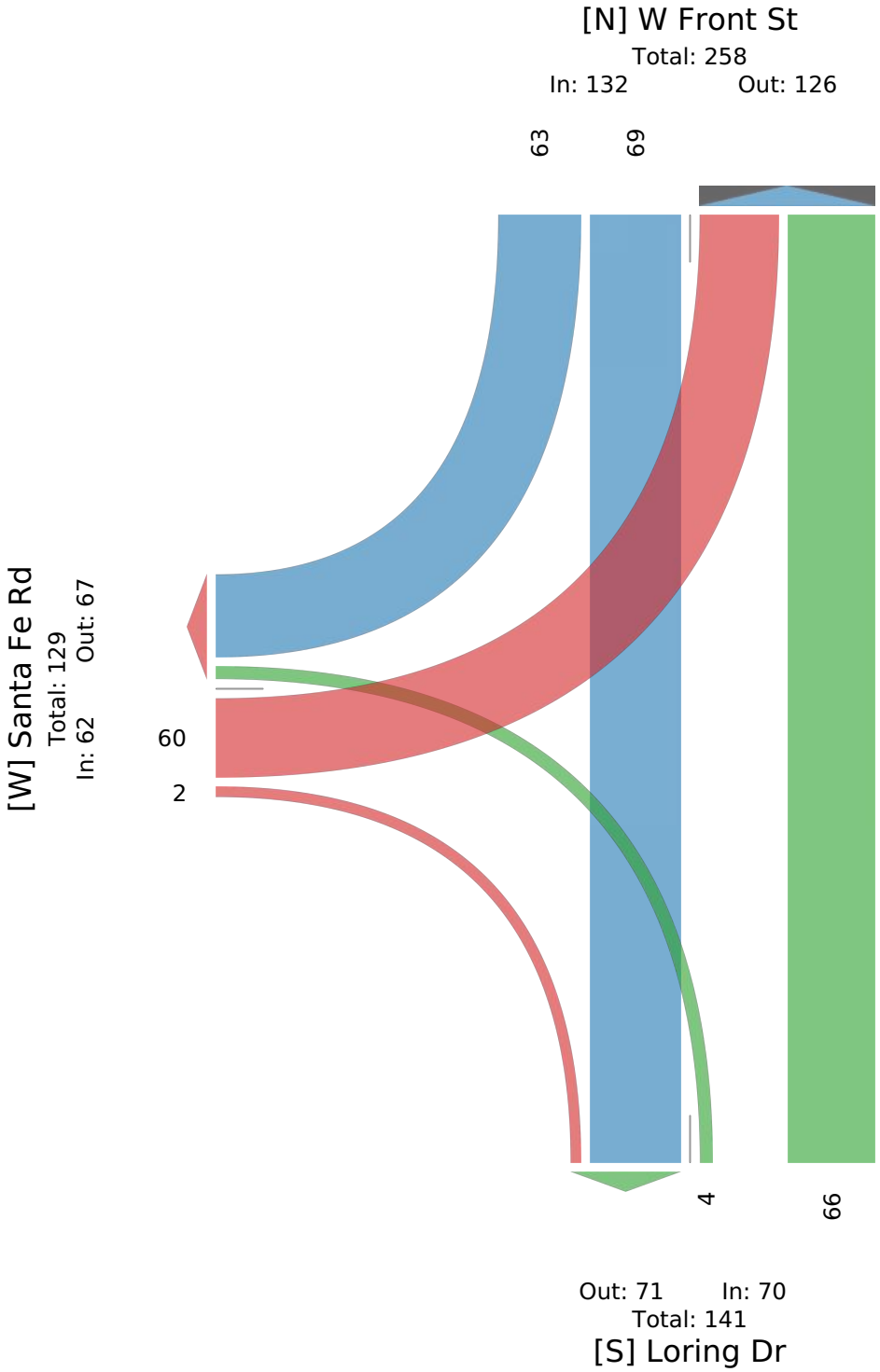
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	W Front St				Loring Dr				Santa Fe Rd				
Direction	Southbound				Northbound				Eastbound				
Time	R	T	U	**App**	T	L	U	**App**	R	L	U	**App**	**Int**
2024-07-11 12:00PM	15	16	0	**31**	15	0	0	**15**	0	19	0	**19**	**65**
12:15PM	20	17	0	**37**	17	1	0	**18**	2	13	0	**15**	**70**
12:30PM	6	21	0	**27**	14	1	0	**15**	0	15	0	**15**	**57**
12:45PM	22	15	0	**37**	20	2	0	**22**	0	13	0	**13**	**72**
Total	63	69	0	**132**	66	4	0	**70**	2	60	0	**62**	**264**
% Approach	47.7%	52.3%	0%	**-**	94.3%	5.7%	0%	**-**	3.2%	96.8%	0%	**-**	-
% Total	23.9%	26.1%	0%	**50.0%**	25.0%	1.5%	0%	**26.5%**	0.8%	22.7%	0%	**23.5%**	-
PHF	0.716	0.821	-	**0.892**	0.825	0.500	-	**0.795**	0.250	0.789	-	**0.816**	0.917
Lights	55	62	0	**117**	64	4	0	**68**	2	46	0	**48**	233
% Lights	87.3%	89.9%	0%	**88.6%**	97.0%	100%	0%	**97.1%**	100%	76.7%	0%	**77.4%**	88.3%
Articulated Trucks	6	0	0	**6**	2	0	0	**2**	0	10	0	**10**	18
% Articulated Trucks	9.5%	0%	0%	**4.5%**	3.0%	0%	0%	**2.9%**	0%	16.7%	0%	**16.1%**	6.8%
Buses and Single-Unit Trucks	2	7	0	**9**	0	0	0	**0**	0	4	0	**4**	13
% Buses and Single-Unit Trucks	3.2%	10.1%	0%	**6.8%**	0%	0%	0%	**0%**	0%	6.7%	0%	**6.5%**	4.9%

*L: Left, R: Right, T: Thru, U: U-Turn

d. Loring Ln /W Front St & K-32 Trucks (Sant... - TMC
Thu Jul 11, 2024
Midday Peak (Jul 11 2024 12PM - 1 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205790, Location: 39.050799, -94.88855

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



d. Loring Ln /W Front St & K-32 Trucks (Sant... - TMC

Thu Jul 11, 2024
Forced Peak (Jul 11 2024 2PM - 3 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205790, Location: 39.050799, -94.88855

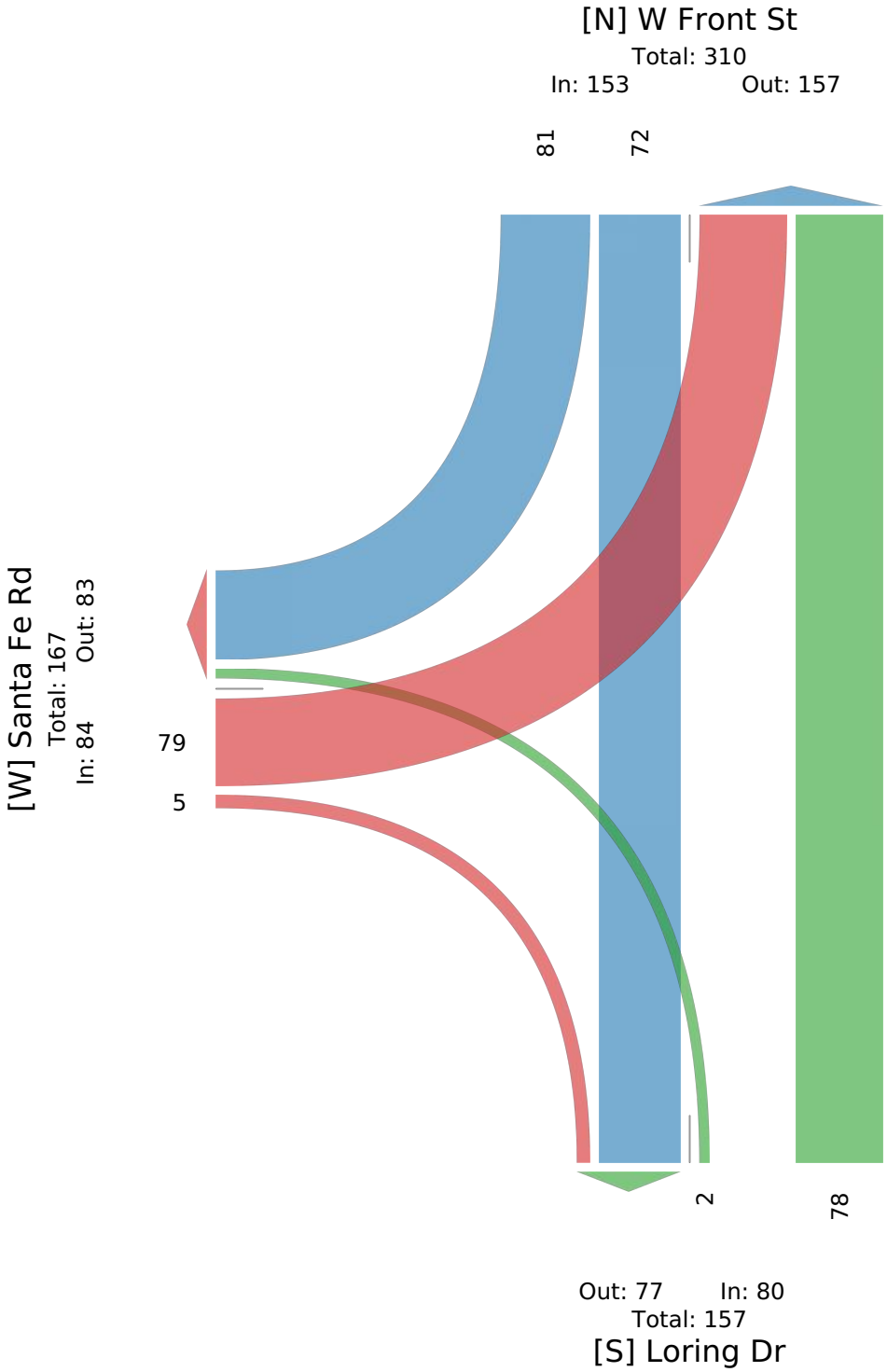
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	W Front St				Loring Dr				Santa Fe Rd				
Direction	Southbound				Northbound				Eastbound				
Time	R	T	U	**App**	T	L	U	**App**	R	L	U	**App**	**Int**
2024-07-11 2:00PM	17	23	0	**40**	26	2	0	**28**	2	12	0	**14**	**82**
2:15PM	27	9	0	**36**	13	0	0	**13**	2	14	0	**16**	**65**
2:30PM	16	18	0	**34**	15	0	0	**15**	1	33	0	**34**	**83**
2:45PM	21	22	0	**43**	24	0	0	**24**	0	20	0	**20**	**87**
Total	81	72	0	**153**	78	2	0	**80**	5	79	0	**84**	**317**
% Approach	52.9%	47.1%	0%	**-**	97.5%	2.5%	0%	**-**	6.0%	94.0%	0%	**-**	-
% Total	25.6%	22.7%	0%	**48.3%**	24.6%	0.6%	0%	**25.2%**	1.6%	24.9%	0%	**26.5%**	-
PHF	0.750	0.783	-	**0.890**	0.750	0.250	-	**0.714**	0.625	0.598	-	**0.618**	0.911
Lights	65	68	0	**133**	74	2	0	**76**	5	66	0	**71**	280
% Lights	80.2%	94.4%	0%	**86.9%**	94.9%	100%	0%	**95.0%**	100%	83.5%	0%	**84.5%**	88.3%
Articulated Trucks	10	2	0	**12**	4	0	0	**4**	0	8	0	**8**	24
% Articulated Trucks	12.3%	2.8%	0%	**7.8%**	5.1%	0%	0%	**5.0%**	0%	10.1%	0%	**9.5%**	7.6%
Buses and Single-Unit Trucks	6	2	0	**8**	0	0	0	**0**	0	5	0	**5**	13
% Buses and Single-Unit Trucks	7.4%	2.8%	0%	**5.2%**	0%	0%	0%	**0%**	0%	6.3%	0%	**6.0%**	4.1%

*L: Left, R: Right, T: Thru, U: U-Turn

d. Loring Ln /W Front St & K-32 Trucks (Sant... - TMC
Thu Jul 11, 2024
Forced Peak (Jul 11 2024 2PM - 3 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205790, Location: 39.050799, -94.88855

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



d. Loring Ln /W Front St & K-32 Trucks (Sant... - TMC

Thu Jul 11, 2024
PM Peak (Jul 11 2024 4:45PM - 5:45 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205790, Location: 39.050799, -94.88855

GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

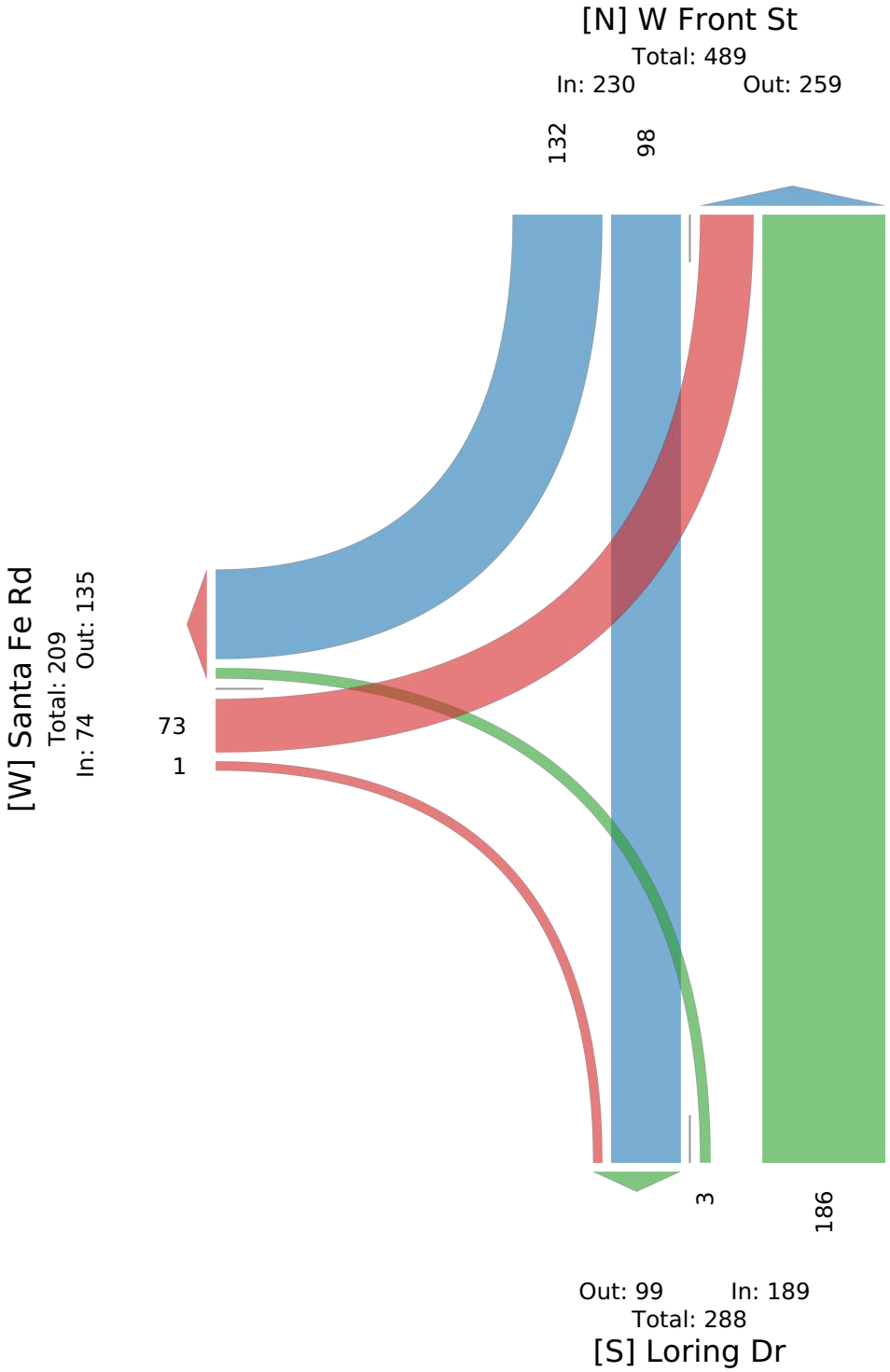
Leg	W Front St				Loring Dr				Santa Fe Rd				
Direction	Southbound				Northbound				Eastbound				
Time	R	T	U	**App**	T	L	U	**App**	R	L	U	**App**	**Int**
2024-07-11 4:45PM	40	27	0	**67**	45	2	0	**47**	0	10	0	**10**	**124**
5:00PM	23	18	0	**41**	52	0	0	**52**	0	12	0	**12**	**105**
5:15PM	34	26	0	**60**	27	1	0	**28**	1	24	0	**25**	**113**
5:30PM	35	27	0	**62**	62	0	0	**62**	0	27	0	**27**	**151**
Total	132	98	0	**230**	186	3	0	**189**	1	73	0	**74**	**493**
% Approach	57.4%	42.6%	0%	**-**	98.4%	1.6%	0%	**-**	1.4%	98.6%	0%	**-**	-
% Total	26.8%	19.9%	0%	**46.7%**	37.7%	0.6%	0%	**38.3%**	0.2%	14.8%	0%	**15.0%**	-
PHF	0.825	0.907	-	**0.858**	0.750	0.375	-	**0.762**	0.250	0.676	-	**0.685**	0.816
Lights	126	96	0	**222**	183	3	0	**186**	1	67	0	**68**	476
% Lights	95.5%	98.0%	0%	**96.5%**	98.4%	100%	0%	**98.4%**	100%	91.8%	0%	**91.9%**	96.6%
Articulated Trucks	3	2	0	**5**	1	0	0	**1**	0	4	0	**4**	10
% Articulated Trucks	2.3%	2.0%	0%	**2.2%**	0.5%	0%	0%	**0.5%**	0%	5.5%	0%	**5.4%**	2.0%
Buses and Single-Unit Trucks	3	0	0	**3**	2	0	0	**2**	0	2	0	**2**	7
% Buses and Single-Unit Trucks	2.3%	0%	0%	**1.3%**	1.1%	0%	0%	**1.1%**	0%	2.7%	0%	**2.7%**	1.4%

*L: Left, R: Right, T: Thru, U: U-Turn

d. Loring Ln /W Front St & K-32 Trucks (Sant... - TMC

Thu Jul 11, 2024
PM Peak (Jul 11 2024 4:45PM - 5:45 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 1205790, Location: 39.050799, -94.88855

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



APPENDIX B
SYNCHRO REPORTS

APPENDIX B.1
GOLDEN ROAD / 158TH STREET & 161ST STREET SYNCHRO REPORTS

Intersection	
Int Delay, s/veh	0.2

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	0	1	56	0	0	66
Future Vol, veh/h	0	1	56	0	0	66
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	25	70	70	100	75
Heavy Vehicles, %	0	0	2	0	0	6
Mvmt Flow	0	4	80	0	0	88

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	168	80	0	0	80	0
Stage 1	80	-	-	-	-	-
Stage 2	88	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	827	986	-	-	1531	-
Stage 1	948	-	-	-	-	-
Stage 2	940	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	827	986	-	-	1531	-
Mov Cap-2 Maneuver	827	-	-	-	-	-
Stage 1	948	-	-	-	-	-
Stage 2	940	-	-	-	-	-

Approach	NW	NE	SW
HCM Ctrl Dly, s/v	8.67	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	986	1531	-
HCM Lane V/C Ratio	-	-	0.004	-	-
HCM Ctrl Dly (s/v)	-	-	8.7	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0.4

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	1	0	63	0	2	58
Future Vol, veh/h	1	0	63	0	2	58
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	25	80	75	80	50	85
Heavy Vehicles, %	100	0	2	0	0	2
Mvmt Flow	4	0	84	0	4	68

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	160	84	0	0	84	0
Stage 1	84	-	-	-	-	-
Stage 2	76	-	-	-	-	-
Critical Hdwy	7.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	6.4	-	-	-	-	-
Critical Hdwy Stg 2	6.4	-	-	-	-	-
Follow-up Hdwy	4.4	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	648	981	-	-	1526	-
Stage 1	741	-	-	-	-	-
Stage 2	748	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	646	981	-	-	1526	-
Mov Cap-2 Maneuver	646	-	-	-	-	-
Stage 1	741	-	-	-	-	-
Stage 2	746	-	-	-	-	-

Approach	NW	NE	SW
HCM Ctrl Dly, s/v	10.6	0	0.41
HCM LOS	B		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	646	100	-
HCM Lane V/C Ratio	-	-	0.006	0.003	-
HCM Ctrl Dly (s/v)	-	-	10.6	7.4	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	1.1

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	15	1	56	19	1	66
Future Vol, veh/h	15	1	56	19	1	66
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	25	70	92	92	75
Heavy Vehicles, %	100	0	2	79	0	6
Mvmt Flow	16	4	80	21	1	88

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	181	90	0	0	101	0
Stage 1	90	-	-	-	-	-
Stage 2	90	-	-	-	-	-
Critical Hdwy	7.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	6.4	-	-	-	-	-
Critical Hdwy Stg 2	6.4	-	-	-	-	-
Follow-up Hdwy	4.4	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	629	973	-	-	1504	-
Stage 1	736	-	-	-	-	-
Stage 2	736	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	629	973	-	-	1504	-
Mov Cap-2 Maneuver	629	-	-	-	-	-
Stage 1	736	-	-	-	-	-
Stage 2	736	-	-	-	-	-

Approach	NW	NE	SW
HCM Ctrl Dly, s/v	10.49	0	0.09
HCM LOS	B		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	676	22	-
HCM Lane V/C Ratio	-	-	0.03	0.001	-
HCM Ctrl Dly (s/v)	-	-	10.5	7.4	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	1.4

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	20	1	63	15	2	58
Future Vol, veh/h	20	1	63	15	2	58
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	89	92	75	92	50	85
Heavy Vehicles, %	80	0	2	100	0	2
Mvmt Flow	22	1	84	16	4	68

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	168	92	0	0	100	0
Stage 1	92	-	-	-	-	-
Stage 2	76	-	-	-	-	-
Critical Hdwy	7.2	6.2	-	-	4.1	-
Critical Hdwy Stg 1	6.2	-	-	-	-	-
Critical Hdwy Stg 2	6.2	-	-	-	-	-
Follow-up Hdwy	4.22	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	671	971	-	-	1505	-
Stage 1	768	-	-	-	-	-
Stage 2	782	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	669	971	-	-	1505	-
Mov Cap-2 Maneuver	669	-	-	-	-	-
Stage 1	768	-	-	-	-	-
Stage 2	780	-	-	-	-	-

Approach	NW	NE	SW
HCM Ctrl Dly, s/v	10.49	0	0.41
HCM LOS	B		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	679	100	-
HCM Lane V/C Ratio	-	-	0.035	0.003	-
HCM Ctrl Dly (s/v)	-	-	10.5	7.4	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	3.3

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	0	16	56	4	16	66
Future Vol, veh/h	0	16	56	4	16	66
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	25	88	92	92	75
Heavy Vehicles, %	0	94	2	0	94	6
Mvmt Flow	0	64	64	4	17	88

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	189	66	0	0	68	0
Stage 1	66	-	-	-	-	-
Stage 2	123	-	-	-	-	-
Critical Hdwy	6.4	7.14	-	-	5.04	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	4.146	-	-	3.046	-
Pot Cap-1 Maneuver	805	791	-	-	1106	-
Stage 1	962	-	-	-	-	-
Stage 2	908	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	792	791	-	-	1106	-
Mov Cap-2 Maneuver	792	-	-	-	-	-
Stage 1	962	-	-	-	-	-
Stage 2	893	-	-	-	-	-

Approach	NW	NE	SW
HCM Ctrl Dly, s/v	9.95	0	1.37
HCM LOS	A		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	791	297	-
HCM Lane V/C Ratio	-	-	0.081	0.016	-
HCM Ctrl Dly (s/v)	-	-	9.9	8.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	2

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	5	16	63	0	17	58
Future Vol, veh/h	5	16	63	0	17	58
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	79	92	75	80	87	85
Heavy Vehicles, %	20	88	2	0	88	2
Mvmt Flow	6	17	84	0	20	68

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	191	84	0	0	84	0
Stage 1	84	-	-	-	-	-
Stage 2	107	-	-	-	-	-
Critical Hdwy	6.6	7.08	-	-	4.98	-
Critical Hdwy Stg 1	5.6	-	-	-	-	-
Critical Hdwy Stg 2	5.6	-	-	-	-	-
Follow-up Hdwy	3.68	4.092	-	-	2.992	-
Pot Cap-1 Maneuver	758	782	-	-	1109	-
Stage 1	896	-	-	-	-	-
Stage 2	874	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	745	782	-	-	1109	-
Mov Cap-2 Maneuver	745	-	-	-	-	-
Stage 1	896	-	-	-	-	-
Stage 2	858	-	-	-	-	-

Approach	NW	NE	SW
HCM Ctrl Dly, s/v	9.81	0	1.85
HCM LOS	A		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	772	401	-
HCM Lane V/C Ratio	-	-	0.031	0.018	-
HCM Ctrl Dly (s/v)	-	-	9.8	8.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

APPENDIX B.2
GOLDEN ROAD & 166TH STREET
SYNCHRO REPORTS

Intersection	
Int Delay, s/veh	5.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	2	110	61	6	39	54
Future Vol, veh/h	2	110	61	6	39	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	50	81	76	75	75	75
Heavy Vehicles, %	0	0	7	0	0	2
Mvmt Flow	4	136	80	8	52	72

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	140	0	240	72
Stage 1	-	-	-	-	72	-
Stage 2	-	-	-	-	169	-
Critical Hdwy	-	-	4.17	-	6.4	6.22
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.263	-	3.5	3.318
Pot Cap-1 Maneuver	-	-	1413	-	752	990
Stage 1	-	-	-	-	956	-
Stage 2	-	-	-	-	866	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1413	-	709	990
Mov Cap-2 Maneuver	-	-	-	-	709	-
Stage 1	-	-	-	-	956	-
Stage 2	-	-	-	-	817	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	7	9.96
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	849	-	-	1407	-
HCM Lane V/C Ratio	0.146	-	-	0.057	-
HCM Ctrl Dly (s/v)	10	-	-	7.7	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0.2	-

Intersection	
Int Delay, s/veh	6.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	3	73	52	7	80	65
Future Vol, veh/h	3	73	52	7	80	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	87	87	35	69	81
Heavy Vehicles, %	0	6	2	14	4	2
Mvmt Flow	4	84	60	20	116	80

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	88	0	185	46
Stage 1	-	-	-	-	46	-
Stage 2	-	-	-	-	140	-
Critical Hdwy	-	-	4.12	-	6.44	6.22
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	-	-	2.218	-	3.536	3.318
Pot Cap-1 Maneuver	-	-	1508	-	799	1024
Stage 1	-	-	-	-	971	-
Stage 2	-	-	-	-	882	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1508	-	767	1024
Mov Cap-2 Maneuver	-	-	-	-	767	-
Stage 1	-	-	-	-	971	-
Stage 2	-	-	-	-	847	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	5.61	10.46
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	855	-	-	1349	-
HCM Lane V/C Ratio	0.23	-	-	0.04	-
HCM Ctrl Dly (s/v)	10.5	-	-	7.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.9	-	-	0.1	-

Intersection	
Int Delay, s/veh	4.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	19	110	61	21	39	56
Future Vol, veh/h	19	110	61	21	39	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	81	76	87	75	76
Heavy Vehicles, %	79	0	7	71	0	2
Mvmt Flow	22	136	80	24	52	74

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	157	0	274	89
Stage 1	-	-	-	-	89	-
Stage 2	-	-	-	-	185	-
Critical Hdwy	-	-	4.17	-	6.4	6.22
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.263	-	3.5	3.318
Pot Cap-1 Maneuver	-	-	1392	-	720	968
Stage 1	-	-	-	-	939	-
Stage 2	-	-	-	-	852	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1392	-	678	968
Mov Cap-2 Maneuver	-	-	-	-	678	-
Stage 1	-	-	-	-	939	-
Stage 2	-	-	-	-	802	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	5.95	10.17
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	822	-	-	1374	-
HCM Lane V/C Ratio	0.153	-	-	0.058	-
HCM Ctrl Dly (s/v)	10.2	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0.2	-

Intersection	
Int Delay, s/veh	6.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	18	73	54	24	80	65
Future Vol, veh/h	18	73	54	24	80	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	87	87	75	69	81
Heavy Vehicles, %	83	6	2	67	4	2
Mvmt Flow	20	84	62	32	116	80

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	104	0	218	62
Stage 1	-	-	-	-	62	-
Stage 2	-	-	-	-	156	-
Critical Hdwy	-	-	4.12	-	6.44	6.22
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	-	-	2.218	-	3.536	3.318
Pot Cap-1 Maneuver	-	-	1487	-	765	1003
Stage 1	-	-	-	-	955	-
Stage 2	-	-	-	-	867	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1487	-	733	1003
Mov Cap-2 Maneuver	-	-	-	-	733	-
Stage 1	-	-	-	-	955	-
Stage 2	-	-	-	-	831	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	4.97	10.73
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	824	-	-	1188	-
HCM Lane V/C Ratio	0.238	-	-	0.042	-
HCM Ctrl Dly (s/v)	10.7	-	-	7.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.9	-	-	0.1	-

Intersection	
Int Delay, s/veh	5.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	4	110	61	6	39	56
Future Vol, veh/h	4	110	61	6	39	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	71	81	76	75	75	76
Heavy Vehicles, %	0	0	7	0	0	2
Mvmt Flow	6	136	80	8	52	74

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	141	0	242	74
Stage 1	-	-	-	-	74	-
Stage 2	-	-	-	-	169	-
Critical Hdwy	-	-	4.17	-	6.4	6.22
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.263	-	3.5	3.318
Pot Cap-1 Maneuver	-	-	1411	-	751	988
Stage 1	-	-	-	-	954	-
Stage 2	-	-	-	-	866	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1411	-	708	988
Mov Cap-2 Maneuver	-	-	-	-	708	-
Stage 1	-	-	-	-	954	-
Stage 2	-	-	-	-	817	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	7.01	9.98
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	849	-	-	1405	-
HCM Lane V/C Ratio	0.148	-	-	0.057	-
HCM Ctrl Dly (s/v)	10	-	-	7.7	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0.2	-

Intersection	
Int Delay, s/veh	6.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	3	73	54	9	80	65
Future Vol, veh/h	3	73	54	9	80	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	87	87	48	69	81
Heavy Vehicles, %	0	6	2	14	4	2
Mvmt Flow	4	84	62	19	116	80

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	88	0	189	46
Stage 1	-	-	-	-	46	-
Stage 2	-	-	-	-	143	-
Critical Hdwy	-	-	4.12	-	6.44	6.22
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	-	-	2.218	-	3.536	3.318
Pot Cap-1 Maneuver	-	-	1508	-	796	1024
Stage 1	-	-	-	-	971	-
Stage 2	-	-	-	-	879	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1508	-	763	1024
Mov Cap-2 Maneuver	-	-	-	-	763	-
Stage 1	-	-	-	-	971	-
Stage 2	-	-	-	-	843	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	5.75	10.49
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	851	-	-	1382	-
HCM Lane V/C Ratio	0.23	-	-	0.041	-
HCM Ctrl Dly (s/v)	10.5	-	-	7.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.9	-	-	0.1	-

APPENDIX B.3
K-32 (LINWOOD ROAD) &
189TH STREET / GOLDEN ROAD
SYNCHRO REPORTS

Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	32	3	79	73	15	67
Future Vol, veh/h	32	3	79	73	15	67
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	165	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	89	75	86	87	75	70
Heavy Vehicles, %	0	0	9	0	0	10
Mvmt Flow	36	4	92	84	20	96

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	228	92	0	0	176	0
Stage 1	92	-	-	-	-	-
Stage 2	136	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	765	971	-	-	1413	-
Stage 1	937	-	-	-	-	-
Stage 2	896	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	754	971	-	-	1413	-
Mov Cap-2 Maneuver	754	-	-	-	-	-
Stage 1	937	-	-	-	-	-
Stage 2	882	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	9.93	0	1.31
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	771	311	-
HCM Lane V/C Ratio	-	-	0.052	0.014	-
HCM Ctrl Dly (s/v)	-	-	9.9	7.6	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	2.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	45	10	85	44	9	95
Future Vol, veh/h	45	10	85	44	9	95
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	165	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	83	69	73	75	68
Heavy Vehicles, %	4	0	9	0	11	6
Mvmt Flow	60	12	123	60	12	140

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	287	123	0	0	183	0
Stage 1	123	-	-	-	-	-
Stage 2	164	-	-	-	-	-
Critical Hdwy	6.44	6.2	-	-	4.21	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.3	-	-	2.299	-
Pot Cap-1 Maneuver	699	933	-	-	1339	-
Stage 1	897	-	-	-	-	-
Stage 2	861	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	692	933	-	-	1339	-
Mov Cap-2 Maneuver	692	-	-	-	-	-
Stage 1	897	-	-	-	-	-
Stage 2	852	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	10.52	0	0.61
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	724	142	-
HCM Lane V/C Ratio	-	-	0.1	0.009	-
HCM Ctrl Dly (s/v)	-	-	10.5	7.7	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	2.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	32	18	79	75	30	67
Future Vol, veh/h	32	18	79	75	30	67
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	165	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	89	89	86	87	84	70
Heavy Vehicles, %	0	83	9	0	50	10
Mvmt Flow	36	20	92	86	36	96

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	259	92	0	0	178	0
Stage 1	92	-	-	-	-	-
Stage 2	167	-	-	-	-	-
Critical Hdwy	6.4	7.03	-	-	4.6	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	4.047	-	-	2.65	-
Pot Cap-1 Maneuver	734	783	-	-	1154	-
Stage 1	937	-	-	-	-	-
Stage 2	867	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	710	783	-	-	1154	-
Mov Cap-2 Maneuver	710	-	-	-	-	-
Stage 1	937	-	-	-	-	-
Stage 2	839	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	10.31	0	2.23
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	735	489	-
HCM Lane V/C Ratio	-	-	0.076	0.031	-
HCM Ctrl Dly (s/v)	-	-	10.3	8.2	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

Intersection	
Int Delay, s/veh	2.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	45	25	85	44	9	95
Future Vol, veh/h	45	25	85	44	9	95
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	165	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	88	69	73	86	68
Heavy Vehicles, %	4	60	9	0	67	6
Mvmt Flow	60	28	123	60	10	140

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	284	123	0	0	183	0
Stage 1	123	-	-	-	-	-
Stage 2	161	-	-	-	-	-
Critical Hdwy	6.44	6.8	-	-	4.77	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.84	-	-	2.803	-
Pot Cap-1 Maneuver	702	793	-	-	1081	-
Stage 1	897	-	-	-	-	-
Stage 2	863	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	695	793	-	-	1081	-
Mov Cap-2 Maneuver	695	-	-	-	-	-
Stage 1	897	-	-	-	-	-
Stage 2	854	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	10.67	0	0.58
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	723	125	-
HCM Lane V/C Ratio	-	-	0.122	0.01	-
HCM Ctrl Dly (s/v)	-	-	10.7	8.4	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0	-

Intersection	
Int Delay, s/veh	1.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	32	3	79	75	15	67
Future Vol, veh/h	32	3	79	75	15	67
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	165	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	89	75	86	87	75	70
Heavy Vehicles, %	0	0	9	0	0	10
Mvmt Flow	36	4	92	86	20	96

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	228	92	0	0	178	0
Stage 1	92	-	-	-	-	-
Stage 2	136	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	765	971	-	-	1410	-
Stage 1	937	-	-	-	-	-
Stage 2	896	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	754	971	-	-	1410	-
Mov Cap-2 Maneuver	754	-	-	-	-	-
Stage 1	937	-	-	-	-	-
Stage 2	882	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	9.93	0	1.31
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	771	311	-
HCM Lane V/C Ratio	-	-	0.052	0.014	-
HCM Ctrl Dly (s/v)	-	-	9.9	7.6	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	2.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	47	10	85	44	9	95
Future Vol, veh/h	47	10	85	44	9	95
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	165	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	76	83	69	73	75	68
Heavy Vehicles, %	4	0	9	0	11	6
Mvmt Flow	62	12	123	60	12	140

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	287	123	0	0	183	0
Stage 1	123	-	-	-	-	-
Stage 2	164	-	-	-	-	-
Critical Hdwy	6.44	6.2	-	-	4.21	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.3	-	-	2.299	-
Pot Cap-1 Maneuver	699	933	-	-	1339	-
Stage 1	897	-	-	-	-	-
Stage 2	861	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	692	933	-	-	1339	-
Mov Cap-2 Maneuver	692	-	-	-	-	-
Stage 1	897	-	-	-	-	-
Stage 2	852	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	10.55	0	0.61
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	723	142	-
HCM Lane V/C Ratio	-	-	0.102	0.009	-
HCM Ctrl Dly (s/v)	-	-	10.5	7.7	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0	-

APPENDIX B.4
158TH STREET & LORING ROAD
SYNCHRO REPORTS

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	8	0	11	1	4	1	26	33	7	48	7
Future Vol, veh/h	5	8	0	11	1	4	1	26	33	7	48	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	42	50	83	69	25	50	25	65	83	44	71	58
Heavy Vehicles, %	20	0	0	0	0	25	0	4	0	14	6	14
Mvmt Flow	12	16	0	16	4	8	4	40	40	16	68	12

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	155	193	74	175	179	60	80	0	0	80	0	0
Stage 1	105	105	-	68	68	-	-	-	-	-	-	-
Stage 2	50	88	-	107	111	-	-	-	-	-	-	-
Critical Hdwy	7.3	6.5	6.2	7.1	6.5	6.45	4.1	-	-	4.24	-	-
Critical Hdwy Stg 1	6.3	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.3	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.68	4	3.3	3.5	4	3.525	2.2	-	-	2.326	-	-
Pot Cap-1 Maneuver	772	706	994	792	718	945	1531	-	-	1446	-	-
Stage 1	858	812	-	947	842	-	-	-	-	-	-	-
Stage 2	919	826	-	903	807	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	750	695	994	763	708	945	1531	-	-	1446	-	-
Mov Cap-2 Maneuver	750	695	-	763	708	-	-	-	-	-	-	-
Stage 1	848	802	-	945	840	-	-	-	-	-	-	-
Stage 2	905	824	-	875	798	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	10.22	9.68	0.35	1.25
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	78	-	-	718	798	291	-	-
HCM Lane V/C Ratio	0.003	-	-	0.039	0.035	0.011	-	-
HCM Ctrl Dly (s/v)	7.4	0	-	10.2	9.7	7.5	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	3	0	33	5	2	0	29	36	8	28	6
Future Vol, veh/h	4	3	0	33	5	2	0	29	36	8	28	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	25	75	83	64	42	25	83	81	82	50	78	75
Heavy Vehicles, %	0	0	0	0	0	50	0	3	0	13	4	0
Mvmt Flow	16	4	0	52	12	8	0	36	44	16	36	8

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	114	152	40	128	134	58	44	0	0	80	0	0
Stage 1	72	72	-	58	58	-	-	-	-	-	-	-
Stage 2	42	80	-	70	76	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.7	4.1	-	-	4.23	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.75	2.2	-	-	2.317	-	-
Pot Cap-1 Maneuver	868	744	1037	850	761	888	1578	-	-	1451	-	-
Stage 1	943	839	-	959	851	-	-	-	-	-	-	-
Stage 2	978	833	-	945	836	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	837	735	1037	836	752	888	1578	-	-	1451	-	-
Mov Cap-2 Maneuver	837	735	-	836	752	-	-	-	-	-	-	-
Stage 1	932	830	-	959	851	-	-	-	-	-	-	-
Stage 2	956	833	-	930	826	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	9.53	9.77	0	2.01
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1578	-	-	815	826	464	-	-
HCM Lane V/C Ratio	-	-	-	0.025	0.086	0.011	-	-
HCM Ctrl Dly (s/v)	0	-	-	9.5	9.8	7.5	0	-
HCM Lane LOS	A	-	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.3	0	-	-

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	8	0	12	1	4	1	26	33	7	48	7
Future Vol, veh/h	5	8	0	12	1	4	1	26	33	7	48	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	42	50	83	71	25	50	25	65	83	44	71	58
Heavy Vehicles, %	20	0	0	0	0	25	0	4	0	14	6	14
Mvmt Flow	12	16	0	17	4	8	4	40	40	16	68	12

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	155	193	74	175	179	60	80	0	0	80	0	0
Stage 1	105	105	-	68	68	-	-	-	-	-	-	-
Stage 2	50	88	-	107	111	-	-	-	-	-	-	-
Critical Hdwy	7.3	6.5	6.2	7.1	6.5	6.45	4.1	-	-	4.24	-	-
Critical Hdwy Stg 1	6.3	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.3	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.68	4	3.3	3.5	4	3.525	2.2	-	-	2.326	-	-
Pot Cap-1 Maneuver	772	706	994	792	718	945	1531	-	-	1446	-	-
Stage 1	858	812	-	947	842	-	-	-	-	-	-	-
Stage 2	919	826	-	903	807	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	750	695	994	763	708	945	1531	-	-	1446	-	-
Mov Cap-2 Maneuver	750	695	-	763	708	-	-	-	-	-	-	-
Stage 1	848	802	-	945	840	-	-	-	-	-	-	-
Stage 2	905	824	-	875	798	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	10.22	9.69	0.35	1.25
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	78	-	-	718	797	291	-	-
HCM Lane V/C Ratio	0.003	-	-	0.039	0.036	0.011	-	-
HCM Ctrl Dly (s/v)	7.4	0	-	10.2	9.7	7.5	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	3	0	33	5	2	0	29	37	8	28	6
Future Vol, veh/h	4	3	0	33	5	2	0	29	37	8	28	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	25	75	83	64	42	25	83	81	82	50	78	75
Heavy Vehicles, %	0	0	0	0	0	50	0	3	0	13	4	0
Mvmt Flow	16	4	0	52	12	8	0	36	45	16	36	8

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	114	153	40	128	134	58	44	0	0	81	0	0
Stage 1	72	72	-	58	58	-	-	-	-	-	-	-
Stage 2	42	81	-	70	76	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.7	4.1	-	-	4.23	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.75	2.2	-	-	2.317	-	-
Pot Cap-1 Maneuver	868	743	1037	850	760	888	1578	-	-	1450	-	-
Stage 1	943	839	-	958	850	-	-	-	-	-	-	-
Stage 2	978	832	-	945	836	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	837	734	1037	835	752	888	1578	-	-	1450	-	-
Mov Cap-2 Maneuver	837	734	-	835	752	-	-	-	-	-	-	-
Stage 1	932	830	-	958	850	-	-	-	-	-	-	-
Stage 2	956	832	-	930	826	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	9.53	9.77	0	2.01
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1578	-	-	814	825	464	-	-
HCM Lane V/C Ratio	-	-	-	0.025	0.087	0.011	-	-
HCM Ctrl Dly (s/v)	0	-	-	9.5	9.8	7.5	0	-
HCM Lane LOS	A	-	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.3	0	-	-

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	8	0	27	1	4	1	26	48	7	48	7
Future Vol, veh/h	5	8	0	27	1	4	1	26	48	7	48	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	42	50	83	83	25	50	25	65	86	44	71	58
Heavy Vehicles, %	20	0	0	56	0	25	0	4	31	14	6	14
Mvmt Flow	12	16	0	33	4	8	4	40	56	16	68	12

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	155	209	74	183	187	68	80	0	0	96	0	0
Stage 1	105	105	-	76	76	-	-	-	-	-	-	-
Stage 2	50	104	-	107	111	-	-	-	-	-	-	-
Critical Hdwy	7.3	6.5	6.2	7.66	6.5	6.45	4.1	-	-	4.24	-	-
Critical Hdwy Stg 1	6.3	5.5	-	6.66	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.3	5.5	-	6.66	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.68	4	3.3	4.004	4	3.525	2.2	-	-	2.326	-	-
Pot Cap-1 Maneuver	772	691	994	673	711	935	1531	-	-	1426	-	-
Stage 1	858	812	-	815	836	-	-	-	-	-	-	-
Stage 2	919	813	-	782	807	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	750	681	994	648	701	935	1531	-	-	1426	-	-
Mov Cap-2 Maneuver	750	681	-	648	701	-	-	-	-	-	-	-
Stage 1	848	802	-	812	833	-	-	-	-	-	-	-
Stage 2	905	811	-	757	798	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	10.29	10.57	0.29	1.26
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	65	-	-	709	691	291	-	-
HCM Lane V/C Ratio	0.003	-	-	0.039	0.064	0.011	-	-
HCM Ctrl Dly (s/v)	7.4	0	-	10.3	10.6	7.6	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.2	0	-	-

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	3	0	48	5	2	0	29	52	8	28	6
Future Vol, veh/h	4	3	0	48	5	2	0	29	52	8	28	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	25	75	83	73	42	25	83	81	85	50	78	75
Heavy Vehicles, %	0	0	0	31	0	50	0	3	29	13	4	0
Mvmt Flow	16	4	0	66	12	8	0	36	61	16	36	8

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	114	169	40	136	142	66	44	0	0	97	0	0
Stage 1	72	72	-	66	66	-	-	-	-	-	-	-
Stage 2	42	97	-	70	76	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.41	6.5	6.7	4.1	-	-	4.23	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.41	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.41	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.779	4	3.75	2.2	-	-	2.317	-	-
Pot Cap-1 Maneuver	868	728	1037	772	753	878	1578	-	-	1430	-	-
Stage 1	943	839	-	876	844	-	-	-	-	-	-	-
Stage 2	978	819	-	872	836	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	837	719	1037	759	744	878	1578	-	-	1430	-	-
Mov Cap-2 Maneuver	837	719	-	759	744	-	-	-	-	-	-	-
Stage 1	932	829	-	876	844	-	-	-	-	-	-	-
Stage 2	955	819	-	858	826	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	9.55	10.28	0	2.02
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1578	-	-	811	767	464	-	-
HCM Lane V/C Ratio	-	-	-	0.025	0.112	0.011	-	-
HCM Ctrl Dly (s/v)	0	-	-	9.6	10.3	7.5	0	-
HCM Lane LOS	A	-	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.4	0	-	-

APPENDIX B.5
LORING LANE & 142ND STREET
SYNCHRO REPORTS

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	57	1	0	45	0	2	0	0	0	1	0
Future Vol, veh/h	1	57	1	0	45	0	2	0	0	0	1	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	25	68	25	78	49	78	50	78	78	78	25	78
Heavy Vehicles, %	0	7	0	0	11	0	0	0	0	0	0	0
Mvmt Flow	4	84	4	0	92	0	4	0	0	0	4	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	92	0	0	88	0	0	188	186	86	184	188	92
Stage 1	-	-	-	-	-	-	94	94	-	92	92	-
Stage 2	-	-	-	-	-	-	94	92	-	92	96	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1516	-	-	1521	-	-	777	712	979	782	711	971
Stage 1	-	-	-	-	-	-	918	821	-	920	823	-
Stage 2	-	-	-	-	-	-	918	823	-	920	820	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1516	-	-	1521	-	-	771	710	979	780	709	971
Mov Cap-2 Maneuver	-	-	-	-	-	-	771	710	-	780	709	-
Stage 1	-	-	-	-	-	-	915	819	-	920	823	-
Stage 2	-	-	-	-	-	-	914	823	-	918	817	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.32	0	9.7	10.11
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	771	78	-	-	1521	-	-	709
HCM Lane V/C Ratio	0.005	0.003	-	-	-	-	-	0.006
HCM Ctrl Dly (s/v)	9.7	7.4	0	-	0	-	-	10.1
HCM Lane LOS	A	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	53	0	0	50	0	0	0	2	0	0	1
Future Vol, veh/h	0	53	0	0	50	0	0	0	2	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	63	78	78	63	78	78	78	50	78	78	25
Heavy Vehicles, %	0	8	0	0	6	0	0	0	0	0	0	0
Mvmt Flow	0	84	0	0	79	0	0	0	4	0	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	79	0	0	84	0	0	163	163	84	163	163	79
Stage 1	-	-	-	-	-	-	84	84	-	79	79	-
Stage 2	-	-	-	-	-	-	79	79	-	84	84	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1531	-	-	1525	-	-	806	733	981	806	733	987
Stage 1	-	-	-	-	-	-	929	829	-	934	833	-
Stage 2	-	-	-	-	-	-	934	833	-	929	829	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1531	-	-	1525	-	-	803	733	981	803	733	987
Mov Cap-2 Maneuver	-	-	-	-	-	-	803	733	-	803	733	-
Stage 1	-	-	-	-	-	-	929	829	-	934	833	-
Stage 2	-	-	-	-	-	-	930	833	-	925	829	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0	0	8.69	8.66
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	981	1531	-	-	1525	-	-	987
HCM Lane V/C Ratio	0.004	-	-	-	-	-	-	0.004
HCM Ctrl Dly (s/v)	8.7	0	-	-	0	-	-	8.7
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	57	1	0	46	0	2	0	0	0	1	0
Future Vol, veh/h	1	57	1	0	46	0	2	0	0	0	1	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	25	68	25	78	50	78	50	78	78	78	25	78
Heavy Vehicles, %	0	7	0	0	11	0	0	0	0	0	0	0
Mvmt Flow	4	84	4	0	92	0	4	0	0	0	4	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	92	0	0	88	0	0	188	186	86	184	188	92
Stage 1	-	-	-	-	-	-	94	94	-	92	92	-
Stage 2	-	-	-	-	-	-	94	92	-	92	96	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1515	-	-	1521	-	-	777	712	979	782	710	971
Stage 1	-	-	-	-	-	-	918	821	-	920	823	-
Stage 2	-	-	-	-	-	-	918	823	-	920	820	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1515	-	-	1521	-	-	770	710	979	779	708	971
Mov Cap-2 Maneuver	-	-	-	-	-	-	770	710	-	779	708	-
Stage 1	-	-	-	-	-	-	915	819	-	920	823	-
Stage 2	-	-	-	-	-	-	913	823	-	918	817	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.32	0	9.7	10.11
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	770	78	-	-	1521	-	-	708
HCM Lane V/C Ratio	0.005	0.003	-	-	-	-	-	0.006
HCM Ctrl Dly (s/v)	9.7	7.4	0	-	0	-	-	10.1
HCM Lane LOS	A	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	54	0	0	50	0	0	0	2	0	0	1
Future Vol, veh/h	0	54	0	0	50	0	0	0	2	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	63	78	78	63	78	78	78	50	78	78	25
Heavy Vehicles, %	0	8	0	0	6	0	0	0	0	0	0	0
Mvmt Flow	0	86	0	0	79	0	0	0	4	0	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	79	0	0	86	0	0	165	165	86	165	165	79
Stage 1	-	-	-	-	-	-	86	86	-	79	79	-
Stage 2	-	-	-	-	-	-	79	79	-	86	86	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1531	-	-	1523	-	-	804	731	979	804	731	987
Stage 1	-	-	-	-	-	-	927	828	-	934	833	-
Stage 2	-	-	-	-	-	-	934	833	-	927	828	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1531	-	-	1523	-	-	801	731	979	801	731	987
Mov Cap-2 Maneuver	-	-	-	-	-	-	801	731	-	801	731	-
Stage 1	-	-	-	-	-	-	927	828	-	934	833	-
Stage 2	-	-	-	-	-	-	930	833	-	923	828	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0	0	8.69	8.66
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	979	1531	-	-	1523	-	-	987
HCM Lane V/C Ratio	0.004	-	-	-	-	-	-	0.004
HCM Ctrl Dly (s/v)	8.7	0	-	-	0	-	-	8.7
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	72	1	0	61	0	2	0	0	0	1	0
Future Vol, veh/h	1	72	1	0	61	0	2	0	0	0	1	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	25	73	25	78	57	78	50	78	78	78	25	78
Heavy Vehicles, %	0	26	0	0	33	0	0	0	0	0	0	0
Mvmt Flow	4	99	4	0	107	0	4	0	0	0	4	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	107	0	0	103	0	0	218	216	101	214	218	107
Stage 1	-	-	-	-	-	-	109	109	-	107	107	-
Stage 2	-	-	-	-	-	-	109	107	-	107	111	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1496	-	-	1502	-	-	743	686	960	747	684	953
Stage 1	-	-	-	-	-	-	902	809	-	903	811	-
Stage 2	-	-	-	-	-	-	901	811	-	904	808	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1496	-	-	1502	-	-	736	684	960	745	682	953
Mov Cap-2 Maneuver	-	-	-	-	-	-	736	684	-	745	682	-
Stage 1	-	-	-	-	-	-	899	807	-	903	811	-
Stage 2	-	-	-	-	-	-	897	811	-	901	805	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.28	0	9.91	10.31
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	736	67	-	-	1502	-	-	682
HCM Lane V/C Ratio	0.005	0.003	-	-	-	-	-	0.006
HCM Ctrl Dly (s/v)	9.9	7.4	0	-	0	-	-	10.3
HCM Lane LOS	A	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	69	0	0	65	0	0	0	2	0	0	1
Future Vol, veh/h	0	69	0	0	65	0	0	0	2	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	70	78	78	70	78	78	78	50	78	78	25
Heavy Vehicles, %	0	28	0	0	28	0	0	0	0	0	0	0
Mvmt Flow	0	99	0	0	93	0	0	0	4	0	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	93	0	0	99	0	0	191	191	99	191	191	93
Stage 1	-	-	-	-	-	-	99	99	-	93	93	-
Stage 2	-	-	-	-	-	-	93	93	-	99	99	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1514	-	-	1507	-	-	773	707	963	773	707	970
Stage 1	-	-	-	-	-	-	913	817	-	919	822	-
Stage 2	-	-	-	-	-	-	919	822	-	913	817	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1514	-	-	1507	-	-	770	707	963	770	707	970
Mov Cap-2 Maneuver	-	-	-	-	-	-	770	707	-	770	707	-
Stage 1	-	-	-	-	-	-	913	817	-	919	822	-
Stage 2	-	-	-	-	-	-	915	822	-	909	817	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0	0	8.75	8.73
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	963	1514	-	-	1507	-	-	970
HCM Lane V/C Ratio	0.004	-	-	-	-	-	-	0.004
HCM Ctrl Dly (s/v)	8.8	0	-	-	0	-	-	8.7
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

APPENDIX B.6
LORING LANE / WEST FRONT STREET & K-32 TRUCK ROUTE (SANTA FE ROAD) SYNCHRO REPORTS

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	99	6	0	78	60	56
Future Vol, veh/h	99	6	0	78	60	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	75	92	75	68	93
Heavy Vehicles, %	12	0	0	4	8	14
Mvmt Flow	113	8	0	104	88	60

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	170	74	148	0	-	0
Stage 1	118	-	-	-	-	-
Stage 2	52	-	-	-	-	-
Critical Hdwy	7.04	6.9	4.1	-	-	-
Critical Hdwy Stg 1	6.04	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.62	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	776	979	1445	-	-	-
Stage 1	865	-	-	-	-	-
Stage 2	935	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	776	979	1445	-	-	-
Mov Cap-2 Maneuver	776	-	-	-	-	-
Stage 1	865	-	-	-	-	-
Stage 2	935	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	10.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1445	-	786	-	-
HCM Lane V/C Ratio	-	-	0.153	-	-
HCM Ctrl Dly (s/v)	0	-	10.4	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	79	5	2	78	72	81
Future Vol, veh/h	79	5	2	78	72	81
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	60	63	25	75	78	75
Heavy Vehicles, %	16	0	0	5	6	20
Mvmt Flow	132	8	8	104	92	108

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	214	100	200	0	-	0
Stage 1	146	-	-	-	-	-
Stage 2	68	-	-	-	-	-
Critical Hdwy	7.12	6.9	4.1	-	-	-
Critical Hdwy Stg 1	6.12	-	-	-	-	-
Critical Hdwy Stg 2	6.12	-	-	-	-	-
Follow-up Hdwy	3.66	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	716	942	1384	-	-	-
Stage 1	825	-	-	-	-	-
Stage 2	907	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	712	942	1384	-	-	-
Mov Cap-2 Maneuver	712	-	-	-	-	-
Stage 1	821	-	-	-	-	-
Stage 2	907	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	11.17	0.58	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	257	-	722	-	-
HCM Lane V/C Ratio	0.006	-	0.193	-	-
HCM Ctrl Dly (s/v)	7.6	0	11.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.7	-	-

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	114	6	0	78	61	71
Future Vol, veh/h	114	6	0	78	61	71
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	75	92	75	68	93
Heavy Vehicles, %	24	0	0	4	8	32
Mvmt Flow	128	8	0	104	90	76

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	180	83	166	0	-	0
Stage 1	128	-	-	-	-	-
Stage 2	52	-	-	-	-	-
Critical Hdwy	7.28	6.9	4.1	-	-	-
Critical Hdwy Stg 1	6.28	-	-	-	-	-
Critical Hdwy Stg 2	6.28	-	-	-	-	-
Follow-up Hdwy	3.74	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	734	966	1424	-	-	-
Stage 1	822	-	-	-	-	-
Stage 2	903	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	734	966	1424	-	-	-
Mov Cap-2 Maneuver	734	-	-	-	-	-
Stage 1	822	-	-	-	-	-
Stage 2	903	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	10.92	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1424	-	744	-	-
HCM Lane V/C Ratio	-	-	0.183	-	-
HCM Ctrl Dly (s/v)	0	-	10.9	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.7	-	-

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	94	5	2	79	72	96
Future Vol, veh/h	94	5	2	79	72	96
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	65	63	25	75	78	78
Heavy Vehicles, %	30	0	0	5	6	20
Mvmt Flow	145	8	8	105	92	123

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	223	108	215	0	-	0
Stage 1	154	-	-	-	-	-
Stage 2	69	-	-	-	-	-
Critical Hdwy	7.4	6.9	4.1	-	-	-
Critical Hdwy Stg 1	6.4	-	-	-	-	-
Critical Hdwy Stg 2	6.4	-	-	-	-	-
Follow-up Hdwy	3.8	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	673	932	1367	-	-	-
Stage 1	781	-	-	-	-	-
Stage 2	869	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	669	932	1367	-	-	-
Mov Cap-2 Maneuver	669	-	-	-	-	-
Stage 1	776	-	-	-	-	-
Stage 2	869	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	11.84	0.58	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	254	-	679	-	-
HCM Lane V/C Ratio	0.006	-	0.225	-	-
HCM Ctrl Dly (s/v)	7.6	0	11.8	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.9	-	-

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	99	6	0	93	76	56
Future Vol, veh/h	99	6	0	93	76	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	75	92	78	73	93
Heavy Vehicles, %	12	0	0	19	26	14
Mvmt Flow	113	8	0	119	104	60

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	194	82	164	0	-	0
Stage 1	134	-	-	-	-	-
Stage 2	60	-	-	-	-	-
Critical Hdwy	7.04	6.9	4.1	-	-	-
Critical Hdwy Stg 1	6.04	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.62	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	749	967	1426	-	-	-
Stage 1	849	-	-	-	-	-
Stage 2	927	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	749	967	1426	-	-	-
Mov Cap-2 Maneuver	749	-	-	-	-	-
Stage 1	849	-	-	-	-	-
Stage 2	927	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	10.62	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1426	-	761	-	-
HCM Lane V/C Ratio	-	-	0.158	-	-
HCM Ctrl Dly (s/v)	0	-	10.6	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.6	-	-

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	79	5	2	94	72	81
Future Vol, veh/h	79	5	2	94	72	81
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	60	63	25	78	80	75
Heavy Vehicles, %	16	0	0	20	22	20
Mvmt Flow	132	8	8	121	90	108

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	220	99	198	0	-	0
Stage 1	144	-	-	-	-	-
Stage 2	76	-	-	-	-	-
Critical Hdwy	7.12	6.9	4.1	-	-	-
Critical Hdwy Stg 1	6.12	-	-	-	-	-
Critical Hdwy Stg 2	6.12	-	-	-	-	-
Follow-up Hdwy	3.66	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	710	944	1387	-	-	-
Stage 1	828	-	-	-	-	-
Stage 2	898	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	706	944	1387	-	-	-
Mov Cap-2 Maneuver	706	-	-	-	-	-
Stage 1	823	-	-	-	-	-
Stage 2	898	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	11.24	0.51	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	224	-	716	-	-
HCM Lane V/C Ratio	0.006	-	0.195	-	-
HCM Ctrl Dly (s/v)	7.6	0	11.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.7	-	-

APPENDIX C
DETAILED CRASH DATA

APPENDIX C.1
PRIMARY ROUTE
DETAILED CRASH DATA

Detailed Crash Data for Primary Route																			
Accident Year	Accident Key	Date Of Accident	On-Road KDOT Name	At-Road KDOT Name	Accident Class - First Harmful Event (FHE) Description	Collision with Other Vehicle - First Harmful Event (FHE) Description	Fixed Object Type - First Harmful Event (FHE) Description	Accident Location Description	Crash Total Count of Vehicles	Count of Accidents	Count of Fatal Accidents	Count of Injury Accidents	Count of Property Damage Only (PDO) Accidents	Crash Total Count of Fatalities	Crash Total Count of Injuries (Suspected Serious, Suspected Minor, or Possible)	Time Of Accident	Weather Conditions Description	Light Conditions Description	KDOT Latitude	KDOT Longitude
2019	20190004580	3/17/2019	189TH	K032	OVERTURNED			ROADSIDE-NO SHLDR-OFF RDWY	1	1	0	1	0	0	1	310	NO ADVERSE CONDITIONS	DARK--NO STREET LIGHTS	39.0109961	-95.0156182
2019	20190006552	4/16/2019	189TH	K032	COLL W OTHER MOTOR VEHICLE	REAR END		INTRSECTION-RELATED-ON ROADWAY	2	1	0	0	1	0	0	1625	NO ADVERSE CONDITIONS	DAYLIGHT	39.0120918	-95.0157547
2019	20190016997	9/19/2019	189	K032	COLL W OTHER MOTOR VEHICLE	REAR END		NON-INTERSECTION-ON ROADWAY	2	1	0	0	1	0	0	1640	NO ADVERSE CONDITIONS	DAYLIGHT	39.0112441	-95.0156225
2020	20200002897	2/16/2020	GOLDEN	170TH	COLL W FIXED OBJECT		TREE	ROADSIDE-NO SHLDR-OFF RDWY	1	1	0	1	0	0	1	1406	NO ADVERSE CONDITIONS	DAYLIGHT	38.9973891	-94.9771914
2020	20200004190	3/1/2020	GOLDEN	161ST	COLL W FIXED OBJECT		EMBANKMENT	ROADSIDE-NO SHLDR-OFF RDWY	1	1	0	0	1	0	0	1513	NO ADVERSE CONDITIONS	DAYLIGHT	38.9992201	-94.9514284
2020	20200007594	5/13/2020	GOLDEN	161ST	OVERTURNED			NON-INTERSECTION-ON ROADWAY	1	1	0	0	1	0	0	1953	NO ADVERSE CONDITIONS	DAYLIGHT	38.99845	-94.9550798
2020	20200009304	6/17/2020	GOLDEN	170TH	COLL W ANIMAL			NON-INTERSECTION-ON ROADWAY	1	1	0	0	1	0	0	735	NO ADVERSE CONDITIONS	DAYLIGHT	38.9981299	-94.9826848
2020	20200011397	7/12/2020	GOLDEN	161ST	COLL W FIXED OBJECT		DITCH	SHOULDER	1	1	0	1	0	0	1	143	NO ADVERSE CONDITIONS	DARK--NO STREET LIGHTS	38.9987347	-94.9536399
2020	20200014367	8/15/2020	GOLDEN	189TH	OVERTURNED			NON-INTERSECTION-ON ROADWAY	1	1	0	1	0	0	1	1619	NO ADVERSE CONDITIONS	DAYLIGHT	39.0020094	-95.014349
2020	20200014373	8/27/2020	GOLDEN	170TH	COLL W ANIMAL			NON-INTERSECTION-ON ROADWAY	1	1	0	1	0	0	2	2136	NO ADVERSE CONDITIONS	DARK--NO STREET LIGHTS	38.9981299	-94.9826848
2020	20200015759	9/18/2020	GOLDEN	170TH	COLL W FIXED OBJECT		DITCH	ROADSIDE-NO SHLDR-OFF RDWY	1	1	0	0	1	0	0	540	NO ADVERSE CONDITIONS	DARK--STREET LIGHTS ON	38.9982147	-94.960545
2020	20200015760	9/18/2020	GOLDEN	170TH	COLL W FIXED OBJECT		EMBANKMENT	ROADSIDE-NO SHLDR-OFF RDWY	1	1	0	0	1	0	0	240	NO ADVERSE CONDITIONS	DARK--NO STREET LIGHTS	38.9971547	-94.9734795
2020	20200019033	10/28/2020	GOLDEN	170TH	COLL W ANIMAL			NON-INTERSECTION-ON ROADWAY	1	1	0	0	1	0	0	809	NO ADVERSE CONDITIONS	DAYLIGHT	38.9984364	-94.9845056
2020	20200011395	7/11/2020	189TH	GOLDEN	COLL W FIXED OBJECT		OTHER	SHOULDER	1	1	0	1	0	0	2	1419	NO ADVERSE CONDITIONS	DAYLIGHT	39.0025262	-95.0156482
2020	20200022002	11/25/2020	166TH	GOLDEN	COLL W OTHER MOTOR VEHICLE	ANGLE - SIDE IMPACT		INTRSECTION-RELATED-ON ROADWAY	2	1	0	0	1	0	0	2000	NO ADVERSE CONDITIONS	DARK--NO STREET LIGHTS	38.9976656	-94.9646317
2021	20210005233	3/13/2021	GOLDEN	170TH	COLL W ANIMAL			NON-INTERSECTION-ON ROADWAY	1	1	0	0	1	0	0	2304	NO ADVERSE CONDITIONS	DARK--NO STREET LIGHTS	38.9997332	-94.991763
2021	20210016190	8/1/2021	GOLDEN	170TH	OVERTURNED			NON-INTERSECTION-ON ROADWAY	1	1	0	1	0	0	3	1902	NO ADVERSE CONDITIONS	DAYLIGHT	38.9972713	-94.975704
2021	20210021415	10/13/2021	GOLDEN	170	COLL W ANIMAL			NON-INTERSECTION-ON ROADWAY	1	1	0	0	1	0	0	749	RAIN, MIST OR DRIZZLE	DAYLIGHT		
2021	20210001253	1/19/2021	158TH	GOLDEN	COLL W ANIMAL			NON-INTERSECTION-ON ROADWAY	1	1	0	0	1	0	0	1018	NO ADVERSE CONDITIONS	DAYLIGHT	39.0029906	-94.9493108
2022	20220003197	1/30/2022	GOLDEN	170TH	COLL W FIXED OBJECT		TREE	ROADSIDE-NO SHLDR-OFF RDWY	1	1	0	1	0	0	1	1817	NO ADVERSE CONDITIONS	DARK--NO STREET LIGHTS	38.9971524	-94.973374
2022	20220017733	9/4/2022	GOLDEN	170TH	COLL W FIXED OBJECT		UTILITY DEVICES: POLE, METER, ETC.	ROADSIDE-NO SHLDR-OFF RDWY	1	1	1	0	0	1	0	729	NO ADVERSE CONDITIONS	DAYLIGHT	38.9991318	-94.9885882
2022	20220018616	9/16/2022	GOLDEN	170TH	COLL W ANIMAL			NON-INTERSECTION-ON ROADWAY	1	1	0	0	1	0	0	2007	NO ADVERSE CONDITIONS	DARK--NO STREET LIGHTS	39.0018208	-94.9982218
2022	20220020787	10/4/2022	GOLDEN	170TH	COLL W FIXED OBJECT		GUARDRAIL	NON-INTERSECTION-ON ROADWAY	1	1	0	0	1	0	0	1817	NO ADVERSE CONDITIONS	DUSK	39.0017018	-94.99692
2022	20220117828	10/20/2022	GOLDEN	170TH	OTHER NON-COLLISION			ROADSIDE-NO SHLDR-OFF RDWY	1	1	0	1	0	0	1	730	NO ADVERSE CONDITIONS	DAYLIGHT	38.9975761	-94.9790271
2022	20220019162	9/24/2022	166TH	GOLDEN	COLL W OTHER MOTOR VEHICLE	REAR END		NON-INTERSECTION-ON ROADWAY	2	1	0	0	1	0	0	1523	NO ADVERSE CONDITIONS	DAYLIGHT	38.997185	-94.9646201
2022	20220027256	12/10/2022	166TH	GOLDEN	COLL W OTHER MOTOR VEHICLE	REAR END		INTRSECTION-RELATED-ON ROADWAY	2	1	0	0	1	0	0	1650	NO ADVERSE CONDITIONS	DUSK	38.9976586	-94.9646241
2023	20230003802	3/5/2023	GOLDEN	189TH	OVERTURNED			ROADSIDE-NO SHLDR-OFF RDWY	1	1	1	0	0	1	0	1512	NO ADVERSE CONDITIONS	DAYLIGHT	39.0028814	-95.0155218
2023	20230005444	3/21/2023	GOLDEN	189TH	COLL W FIXED OBJECT		TREE	ROADSIDE-NO SHLDR-OFF RDWY	1	1	0	0	1	0	0	1011	RAIN AND FOG	DAYLIGHT	39.0028965	-95.0108309
2023	20230007566	4/21/2023	GOLDEN	170TH	COLL W FIXED OBJECT		DITCH	ROADSIDE-NO SHLDR-OFF RDWY	1	1	0	1	0	0	1	932	NO ADVERSE CONDITIONS	DAYLIGHT	38.9971882	-94.9742701
2023	20230015751	7/17/2023	GOLDEN	189TH	OTHER NON-COLLISION			INTERSECTION-ON ROADWAY	1	1	0	0	1	0	0	1448	NO ADVERSE CONDITIONS	DAYLIGHT	39.0018258	-95.0156951
2023	20230017645	7/31/2023	GOLDEN	189TH	COLL W FIXED OBJECT		DITCH	ROADSIDE-NO SHLDR-OFF RDWY	1	1	0	1	0	0	1	1656	NO ADVERSE CONDITIONS	DAYLIGHT	39.0013103	-94.9952672
2023	20230018976	9/15/2023	GOLDEN	166TH	COLL W OTHER MOTOR VEHICLE	ANGLE - SIDE IMPACT		INTERSECTION-ON ROADWAY	2	1	0	1	0	0	1	1655	NO ADVERSE CONDITIONS	DAYLIGHT	38.9977959	-94.9646254
2023	20230029858	12/19/2023	GOLDEN	166TH	COLL W OTHER MOTOR VEHICLE	ANGLE - SIDE IMPACT		INTERSECTION-ON ROADWAY	2	1	0	0	1	0	0	1706	NO ADVERSE CONDITIONS	DARK--NO STREET LIGHTS	38.9977959	-94.9646254
2023	20230014483	7/4/2023	K032	189TH	COLL W OTHER MOTOR VEHICLE	ANGLE - SIDE IMPACT		INTERSECTION-ON ROADWAY	2	1	0	0	1	0	0	1550	NO ADVERSE CONDITIONS	DAYLIGHT	39.0121155	-95.0157725
2023	20230018216	9/7/2023	166TH	GOLDEN	COLL W OTHER MOTOR VEHICLE	REAR END		NON-INTERSECTION-ON ROADWAY	2	1	0	0	1	0	0	637	NO ADVERSE CONDITIONS	DAWN	38.9973017	-94.9646211

APPENDIX C.2
SECONDARY ROUTE
DETAILED CRASH DATA

Detailed Crash Data for Secondary Route																			
Accident Year	Accident Key	Date Of Accident	On-Road KDOT Name	At-Road KDOT Name	Accident Class - First Harmful Event (FHE) Description	Collision with Other Vehicle - First Harmful Event (FHE) Description	Fixed Object Type - First Harmful Event (FHE) Description	Accident Location Description	Crash Total Count of Vehicles	Count of Accidents	Count of Fatal Accidents	Count of Injury Accidents	Count of Property Damage Only (PDO) Accidents	Crash Total Count of Fatalities	Crash Total Count of Injuries (Suspected Serious, Suspected Minor, or Possible)	Time Of Accident	Weather Conditions Description	Light Conditions Description	KDOT Latitude	KDOT Longitude
2019	20190009416	5/28/2019	LORING	156TH	COLL W OTHER MOTOR VEHICLE	REAR END		NON-INTERSECTION-ON ROADWAY	3	1	0	1	0	0	1	1710	NO ADVERSE CONDITIONS	DAYLIGHT	39.0143906	-94.9239925
2019	20190011204	6/25/2019	LORING	142ND	COLL W OTHER MOTOR VEHICLE	SIDESWIPE: OPPOSITE DIRECTION		INTERSECTION-ON ROADWAY	2	1	0	0	1	0	0	1030	NO ADVERSE CONDITIONS	DAYLIGHT	39.014707	-94.9087654
2019	20190029498	1/4/2019	LORING	SANTA FE	COLL W ANIMAL			NON-INTERSECTION-ON ROADWAY	1	1	0	0	1	0	0	2150	NO ADVERSE CONDITIONS	DARK--NO STREET LIGHTS	39.0507047	-94.8885578
2019	20190029539	5/10/2019	LORING	KREIDER	COLL W ANIMAL			NON-INTERSECTION-ON ROADWAY	1	1	0	0	1	0	0	2150	NO ADVERSE CONDITIONS	DARK--NO STREET LIGHTS	39.0216736	-94.9011087
2019	20190029499	1/5/2019	FRONT	CEDAR	COLL W FIXED OBJECT		OTHER	NON-INTERSECTION-ON ROADWAY	1	1	0	0	1	0	0	1930	NO ADVERSE CONDITIONS	DARK--STREET LIGHTS ON	39.0559666	-94.8807761
2019	20190029518	3/8/2019	KAW	K007	COLL W OTHER MOTOR VEHICLE	ANGLE - SIDE IMPACT		INTERSECTION-ON ROADWAY	2	1	0	1	0	0	2	1710	NO ADVERSE CONDITIONS	DAYLIGHT	39.0612573	-94.8735356
2019	20190029507	2/1/2019	K032	K007	COLL W OTHER MOTOR VEHICLE	ANGLE - SIDE IMPACT		INTERSECTION-ON ROADWAY	2	1	0	0	1	0	0	1441	NO ADVERSE CONDITIONS	DAYLIGHT	39.0612573	-94.8735356
2019	20190029521	3/19/2019	K032	K007	COLL W OTHER MOTOR VEHICLE	REAR END		INTERSECTION-ON ROADWAY	2	1	0	0	1	0	0	1250	NO ADVERSE CONDITIONS	DAYLIGHT	39.0612573	-94.8735356
2019	20190029536	5/8/2019	K032	K007	COLL W OTHER MOTOR VEHICLE	ANGLE - SIDE IMPACT		INTERSECTION-ON ROADWAY	2	1	0	0	1	0	0	722	NO ADVERSE CONDITIONS	DAWN	39.0612573	-94.8735356
2019	20190029546	5/29/2019	K032	K007	COLL W OTHER MOTOR VEHICLE	ANGLE - SIDE IMPACT		INTERSECTION-ON ROADWAY	2	1	0	0	1	0	0	603	NO ADVERSE CONDITIONS	DAWN	39.0612573	-94.8735356
2019	20190029547	5/28/2019	K032	K007	COLL W OTHER MOTOR VEHICLE	REAR END		INTRSECTION-RELATED-ON ROADWAY	2	1	0	1	0	0	1	1850	RAIN AND WINDS	DUSK	39.061294	-94.8734638
2019	20190029561	6/28/2019	K032	K007	COLL W OTHER MOTOR VEHICLE	ANGLE - SIDE IMPACT		INTERSECTION-ON ROADWAY	2	1	0	1	0	0	1	2045	NO ADVERSE CONDITIONS	DAYLIGHT	39.0612573	-94.8735356
2019	20190029577	8/12/2019	K032	K007	COLL W FIXED OBJECT		SIGN POST	INTERCHANGE AREA-ON ROADWAY	1	1	0	0	1	0	0	1630	NO ADVERSE CONDITIONS	DAYLIGHT	39.0612573	-94.8735356
2019	20190029608	10/8/2019	K032	K007	COLL W OTHER MOTOR VEHICLE	ANGLE - SIDE IMPACT		INTERSECTION-ON ROADWAY	2	1	0	1	0	0	2	1606	NO ADVERSE CONDITIONS	DAYLIGHT	39.0612573	-94.8735356
2019	20190029578	8/12/2019	K007	K032	COLL W OTHER MOTOR VEHICLE	SIDESWIPE: SAME DIRECTION		INTERSECTION-ON ROADWAY	2	1	0	0	1	0	0	1905	NO ADVERSE CONDITIONS	DAYLIGHT	39.0612573	-94.8735356
2019	20190029634	11/8/2019	K007	KAW	COLL W OTHER MOTOR VEHICLE	REAR END		INTRSECTION-RELATED-ON ROADWAY	2	1	0	0	1	0	0	720	NO ADVERSE CONDITIONS	DAYLIGHT	39.0612573	-94.8735356
2019	20190109729	4/23/2019	K007	K032	COLL W OTHER MOTOR VEHICLE	REAR END		INTERCHANGE AREA-ON ROADWAY	2	1	0	0	1	0	0	1606	NO ADVERSE CONDITIONS	DAYLIGHT	39.0612573	-94.8735356
2019	20190117724	7/30/2019	K007	K032	COLL W OTHER MOTOR VEHICLE	REAR END		INTERCHANGE AREA-ON ROADWAY	2	1	0	0	1	0	0	935	NO ADVERSE CONDITIONS	DAYLIGHT	39.0612867	-94.8735635
2019	20190128660	11/6/2019	K007	K032	COLL W OTHER MOTOR VEHICLE	REAR END		INTERCHANGE AREA-ON ROADWAY	2	1	0	0	1	0	0	1736	NO ADVERSE CONDITIONS	DARK--STREET LIGHTS ON	39.0611487	-94.8734481
2020	20200016442	10/4/2020	158TH	GOLDEN	COLL W FIXED OBJECT		DITCH	ROADSIDE-NO SHLDR-OFF RDWY	1	1	0	1	0	0	1	2225	NO ADVERSE CONDITIONS	DARK--NO STREET LIGHTS	39.0037487	-94.9487176
2020	20200022000	11/25/2020	158TH	LORING	COLL W ANIMAL			NON-INTERSECTION-ON ROADWAY	1	1	0	0	1	0	0	1715	NO ADVERSE CONDITIONS	DARK--NO STREET LIGHTS	39.0073311	-94.9460615
2020	20200023160	12/11/2020	158TH	LORING	OVERTURNED			ROADSIDE-NO SHLDR-OFF RDWY	1	1	0	0	1	0	0	434	NO ADVERSE CONDITIONS	DARK--NO STREET LIGHTS	39.0145802	-94.9460324
2020	20200004187	2/25/2020	LORING	LORING	COLL W FIXED OBJECT		UTILITY DEVICES: POLE, METER, ETC.	ROADSIDE-NO SHLDR-OFF RDWY	1	1	0	0	1	0	0	2145	NO ADVERSE CONDITIONS	DARK--NO STREET LIGHTS	39.0144869	-94.9136149
2020	20200005175	3/16/2020	LORING	156TH	OVERTURNED			ROADSIDE-NO SHLDR-OFF RDWY	1	1	0	1	0	0	2	1402	NO ADVERSE CONDITIONS	DAYLIGHT	39.0144058	-94.9277092
2020	20200095260	8/25/2020	LORING	STILLWELL	COLL W OTHER MOTOR VEHICLE	SIDESWIPE: OPPOSITE DIRECTION		NON-INTERSECTION-ON ROADWAY	2	1	1	0	0	1	1	2040	NO ADVERSE CONDITIONS	DARK--NO STREET LIGHTS	39.044454	-94.8895108
2020	20200015249	3/16/2020	FRONT	CEDAR	COLL W OTHER MOTOR VEHICLE	REAR END		INTRSECTION-RELATED-ON ROADWAY	2	1	0	0	1	0	0	1218	RAIN, MIST OR DRIZZLE	DAYLIGHT	39.056025	-94.8807044
2020	20200015261	5/4/2020	FRONT	CEDAR	COLL W OTHER MOTOR VEHICLE	ANGLE - SIDE IMPACT		INTERSECTION-ON ROADWAY	2	1	0	0	1	0	0	630	NO ADVERSE CONDITIONS	DAYLIGHT	39.056025	-94.8807044
2020	20200015271	6/21/2020	FRONT	K007	COLL W OTHER MOTOR VEHICLE	HEAD ON		INTERSECTION-ON ROADWAY	2	1	0	0	1	0	0	1822	NO ADVERSE CONDITIONS	DAYLIGHT	39.0607821	-94.8744595
2020	20200015273	7/4/2020	FRONT	CEDAR	COLL W OTHER MOTOR VEHICLE	REAR END		INTRSECTION-RELATED-ON ROADWAY	2	1	0	0	1	0	0	1037	NO ADVERSE CONDITIONS	DAYLIGHT	39.056025	-94.8807044
2020	20200015258	4/25/2020	CEDAR	FRONT	OTHER NON-COLLISION			INTRSECTION-RELATED-ON ROADWAY	1	1	0	1	0	0	1	45	RAIN, MIST OR DRIZZLE	DARK--STREET LIGHTS ON	39.0561781	-94.880957
2020	20200015267	6/6/2020	K032	K007	COLL W OTHER MOTOR VEHICLE	SIDESWIPE: OPPOSITE DIRECTION		INTERSECTION-ON ROADWAY	2	1	0	0	1	0	0	1207	NO ADVERSE CONDITIONS	DAYLIGHT	39.0612573	-94.8735356
2020	20200015281	8/6/2020	K007	K032	COLL W FIXED OBJECT		DIVIDER-MEDIAN BARRIER	NON-INTERSECTION-ON ROADWAY	1	1	0	0	1	0	0	1232	NO ADVERSE CONDITIONS	DAYLIGHT	39.0612573	-94.8735356
2021	20210001253	1/19/2021	158TH	GOLDEN	COLL W ANIMAL			NON-INTERSECTION-ON ROADWAY	1	1	0	0	1	0	0	1018	NO ADVERSE CONDITIONS	DAYLIGHT	39.0029906	-94.9493108
2021	20210100752	1/19/2021	158TH	LORING	COLL W OTHER MOTOR VEHICLE	ANGLE - SIDE IMPACT		INTERSECTION-ON ROADWAY	2	1	0	1	0	0	2	1645	NO ADVERSE CONDITIONS	DAYLIGHT	39.0145802	-94.9460324
2021	20210013538	6/24/2021	LORING	156TH	COLL W FIXED OBJECT		DITCH	ROADSIDE-NO SHLDR-OFF RDWY	1	1	0	1	0	0	1	1820	NO ADVERSE CONDITIONS	DAYLIGHT	39.0144531	-94.9295595
2021	20210095007	1/20/2021	LORING	STILLWELL	COLL W FIXED OBJECT		SIGN POST	ROADSIDE-NO SHLDR-OFF RDWY	1	1	1	0	0	1	1	57	NO ADVERSE CONDITIONS	DARK--NO STREET LIGHTS	39.0460023	-94.8891523
2021	20210016729	7/28/2021	K032	K007	COLL W OTHER MOTOR VEHICLE	ANGLE - SIDE IMPACT		INTERCHANGE AREA-ON ROADWAY	2	1	0	0	1	0	0	1308	NO ADVERSE CONDITIONS	DAYLIGHT	39.061189	-94.8734655
2021	20210119045	10/16/2021	K032	K007	COLL W OTHER MOTOR VEHICLE	ANGLE - SIDE IMPACT		INTERCHANGE AREA-ON ROADWAY	2	1	0	0	1	0	0	1352	NO ADVERSE CONDITIONS	DAYLIGHT	39.0613805	-94.872997
2021	20210001039	1/6/2021	K007	K032	COLL W OTHER MOTOR VEHICLE	REAR END		INTRSECTION-RELATED-ON ROADWAY	2	1	0	0	1	0	0	935	RAIN, MIST OR DRIZZLE	DAYLIGHT	39.0612114	-94.8734858
2021	20210123144	12/6/2021	K007	K032	COLL W OTHER MOTOR VEHICLE	REAR END		INTERCHANGE AREA-ON ROADWAY	2	1	0	1	0	0	1	1630	NO ADVERSE CONDITIONS	DAYLIGHT	39.0612226	-94.8734961
2022	20220001542	1/26/2022	158TH	LORING	COLL W OTHER OBJECT			NON-INTERSECTION-ON ROADWAY	2	1	0	0	1	0	0	2015	NO ADVERSE CONDITIONS	DARK--NO STREET LIGHTS	39.0102358	-94.9463006
2022	20220015599	2/24/2022	LORING	ARCHER	COLL W FIXED OBJECT		TREE	ROADSIDE-NO SHLDR-OFF RDWY	1	1	0	1	0	0	1	1107	SNOW	DAYLIGHT	39.0373913	-94.8934667
2022	20220015652	5/31/2022	LORING	KRIEDER	COLL W OTHER MOTOR VEHICLE	HEAD ON		NON-INTERSECTION-ON ROADWAY	3	1	0	0	1	0	0	1105	RAIN, MIST OR DRIZZLE	DAYLIGHT	39.0241781	-94.8999306

2022	20220105769	4/16/2022	K032	K007	COLL W OTHER MOTOR VEHICLE	ANGLE - SIDE IMPACT		INTERCHANGE AREA-ON ROADWAY	2	1	0	0	1	0	0	1320	NO ADVERSE CONDITIONS	DAYLIGHT	39.061189	-94.8734655
2022	20220110992	7/9/2022	K032	K007	COLL W OTHER MOTOR VEHICLE	ANGLE - SIDE IMPACT		INTERCHANGE AREA-ON ROADWAY	2	1	0	1	0	0	1	1425	NO ADVERSE CONDITIONS	DAYLIGHT	39.061189	-94.8734655
2022	20220123058	12/22/2022	PINE	FRONT	COLL W FIXED OBJECT		SIGN POST	NON-INTERSECTION-ON ROADWAY	1	1	0	0	1	0	0	1855	SNOW	DARK--STREET LIGHTS ON	39.0579317	-94.8787212
2022	20220107123	3/30/2022	K007	K032	COLL W OTHER MOTOR VEHICLE	REAR END		INTERSECTION-ON ROADWAY	2	1	0	0	1	0	0	1041	NO ADVERSE CONDITIONS	DAYLIGHT	39.061189	-94.8734655
2022	20220107615	5/6/2022	K007	K032	OTHER NON-COLLISION			NON-INTERSECTION-ON ROADWAY	1	1	0	1	0	0	1	200	RAIN, MIST OR DRIZZLE	DARK--STREET LIGHTS ON	39.0613006	-94.873568
2022	20220113123	8/9/2022	K007	K032	COLL W OTHER MOTOR VEHICLE	REAR END		INTRSECTION-RELATED-ON ROADWAY	2	1	0	0	1	0	0	1526	NO ADVERSE CONDITIONS	DAYLIGHT	39.0612337	-94.8735063
2022	20220121118	11/18/2022	K007	K032	COLL W OTHER MOTOR VEHICLE	REAR END		INTERCHANGE AREA-ON ROADWAY	2	1	0	0	1	0	0	1406	NO ADVERSE CONDITIONS	DAYLIGHT	39.061256	-94.8735269
2023	20230000519	1/5/2023	LORING	158TH	COLL W OTHER MOTOR VEHICLE	REAR END		INTRSECTION-RELATED-ON ROADWAY	2	1	0	0	1	0	0	1530	NO ADVERSE CONDITIONS	DAYLIGHT	39.0145803	-94.9460676
2023	20230011400	6/14/2023	LORING	LORING	OTHER NON-COLLISION			NON-INTERSECTION-ON ROADWAY	1	1	0	0	1	0	0	2208	NO ADVERSE CONDITIONS	DARK--NO STREET LIGHTS	39.0140099	-94.9099264
2023	20230019531	6/6/2023	LORING	KREIDER	COLL W ANIMAL			NON-INTERSECTION-ON ROADWAY	1	1	0	0	1	0	0	557	NO ADVERSE CONDITIONS	DARK--NO STREET LIGHTS	39.0262253	-94.8989899
2023	20230030077	12/31/2023	LORING	158TH	COLL W FIXED OBJECT		FENCE / GATE	ROADSIDE-NO SHLDR-OFF RDWY	1	1	0	0	1	0	0		NO ADVERSE CONDITIONS	DARK--NO STREET LIGHTS	39.0145805	-94.9461616
2023	20230101057	1/23/2023	K032	K007	COLL W OTHER MOTOR VEHICLE	ANGLE - SIDE IMPACT		INTERSECTION-ON ROADWAY	2	1	0	0	1	0	0	1800	NO ADVERSE CONDITIONS	DARK--STREET LIGHTS ON	39.061189	-94.8734655
2023	20230101227	1/30/2023	K032	K007	COLL W OTHER MOTOR VEHICLE	ANGLE - SIDE IMPACT		INTERCHANGE AREA-ON ROADWAY	2	1	0	0	1	0	0	1624	NO ADVERSE CONDITIONS	DAYLIGHT	39.061189	-94.8734655
2023	20230107018	5/7/2023	K032	K007	COLL W OTHER MOTOR VEHICLE	SIDESWIPE: SAME DIRECTION		INTERCHANGE AREA-ON ROADWAY	2	1	0	0	1	0	0	1440	NO ADVERSE CONDITIONS	DAYLIGHT	39.061189	-94.8734655
2023	20230113265	8/24/2023	K032	K007	COLL W OTHER MOTOR VEHICLE	HEAD ON		INTERCHANGE AREA-ON ROADWAY	2	1	0	0	1	0	0	705	NO ADVERSE CONDITIONS	DAYLIGHT	39.061189	-94.8734655
2023	20230122364	12/11/2023	K032	KAW	COLL W OTHER MOTOR VEHICLE	ANGLE - SIDE IMPACT		PKLOT-DRVWAY ACCESS-ON ROADWAY	2	1	0	1	0	0	2	1319	NO ADVERSE CONDITIONS	DAYLIGHT	39.0606853	-94.8746769
2023	20230115207	9/13/2023	CORNELL	FRONT	COLL W OTHER MOTOR VEHICLE	ANGLE - SIDE IMPACT		NON-INTERSECTION-ON ROADWAY	2	1	0	0	1	0	0	1210	NO ADVERSE CONDITIONS	DAYLIGHT	39.0584048	-94.8785284
2023	20230108164	5/26/2023	K007	K032	COLL W OTHER MOTOR VEHICLE	REAR END		INTERCHANGE AREA-ON ROADWAY	2	1	0	0	1	0	0	1150	NO ADVERSE CONDITIONS	DAYLIGHT	39.0612003	-94.8734755
2023	20230119685	11/13/2023	K007	K032	COLL W OTHER MOTOR VEHICLE	REAR END		INTRSECTION-RELATED-ON ROADWAY	2	1	0	0	1	0	0	1726	NO ADVERSE CONDITIONS	DARK--STREET LIGHTS ON	39.0611913	-94.8734673

APPENDIX D
INTERSECTION SIGHT DISTANCE ANALYSES

APPENDIX D.1
GOLDEN ROAD / 158TH STREET & 161ST STREET INTERSECTION SIGHT DISTANCE ANALYSIS



161st Street Sight Distance Looking North



161st Street Sight Distance Looking West

Northbound Left-Turn Sight Distance for Golden Road / 158th Street & 161st Street

Sight Distance Case (AASHTO) = B1 (Left-Turn From Minor Road)
Highway Speed = 50 mph
Required Intersection Sight Distance = 1.47 * 50 mph * 11.5 s = 846 ft.
Measured Sight Distance North = N/A Confirmed Visually
Measured Sight Distance West = 400 ft.

Sight Distance Not Satisfied (Looking West Only)

Northbound Right-Turn Sight Distance for Golden Road / 158th Street & 161st Street

Sight Distance Case (AASHTO) = B2 (Right-Turn From Minor Road)
Highway Speed = 50 mph
Required Intersection Sight Distance = 1.47 * 50 mph * 11.5 s = 846 ft.
Measured Sight Distance West = 400 ft.

Sight Distance Not Satisfied

APPENDIX D.2
GOLDEN ROAD & 166TH STREET INTERSECTION SIGHT DISTANCE ANALYSIS



166th Street Sight Distance Looking East



166th Street Sight Distance Looking West

Northbound Left-Turn Sight Distance for Golden Road & 166th Street

Sight Distance Case (AASHTO) = B1 (Left-Turn From Minor Road)
Highway Speed = 50 mph
Required Intersection Sight Distance = 1.47 * 50 mph * 11.5 s = 846 ft.
Measured Sight Distance East = N/A Confirmed Visually
Measured Sight Distance West = N/A Confirmed Visually

Sight Distance Satisfied

Northbound Right-Turn Sight Distance for Golden Road & 166th Street

Sight Distance Case (AASHTO) = B2 (Right-Turn From Minor Road)
Highway Speed = 50 mph
Required Intersection Sight Distance = 1.47 * 50 mph * 11.5 s = 846 ft.
Measured Sight Distance West = N/A Confirmed Visually

Sight Distance Satisfied

APPENDIX D.3
K-32 (LINWOOD ROAD) & 189TH STREET / GOLDEN ROAD INTERSECTION SIGHT DISTANCE ANALYSIS



189th Street / Golden Road Street Sight Distance Looking North



189th Street / Golden Road Street Sight Distance Looking South

Westbound Left-Turn Sight Distance for K-32 (Linwood Road) & 189th Street / Golden Road

Sight Distance Case (AASHTO) = B1 (Left-Turn From Minor Road)
Highway Speed = 65 mph
Required Intersection Sight Distance = 1.47 * 65 mph * 11.5 s = 1,099 ft.
Measured Sight Distance North = N/A Confirmed Visually
Measured Sight Distance South = N/A Confirmed Visually

Sight Distance Satisfied

Westbound Right-Turn Sight Distance for K-32 (Linwood Road) & 189th Street / Golden Road

Sight Distance Case (AASHTO) = B2 (Right-Turn From Minor Road)
Highway Speed = 65 mph
Required Intersection Sight Distance = 1.47 * 65 mph * 11.5 s = 1,099 ft.
Measured Sight Distance South = N/A Confirmed Visually

Sight Distance Satisfied

APPENDIX D.4
158TH STREET & LORING ROAD INTERSECTION SIGHT DISTANCE ANALYSIS



Loring Road Eastbound Sight Distance Looking South



Loring Road Eastbound Sight Distance Looking North

Eastbound Left-Turn Sight Distance for 158th Street & Loring Road

Sight Distance Case (AASHTO) = B1 (Left-Turn From Minor Road)
Highway Speed = 50 mph
Required Intersection Sight Distance = 1.47 * 50 mph * 11.5 s = 846 ft.
Measured Sight Distance North = Minimum Requirement Confirmed
Measured Sight Distance South = N/A Confirmed Visually

Sight Distance Satisfied

Eastbound Right-Turn Sight Distance for 158th Street & Loring Road

Sight Distance Case (AASHTO) = B2 (Right-Turn From Minor Road)
Highway Speed = 50 mph
Required Intersection Sight Distance = 1.47 * 50 mph * 11.5 s = 846 ft.
Measured Sight Distance North = Minimum Requirement Confirmed

Sight Distance Satisfied



Loring Road Westbound Sight Distance Looking South



Loring Road Westbound Sight Distance Looking North

Westbound Left-Turn Sight Distance for 158th Street & Loring Road

Sight Distance Case (AASHTO) = B1 (Left-Turn From Minor Road)
Highway Speed = 50 mph
Required Intersection Sight Distance = 1.47 * 50 mph * 11.5 s = 846 ft.
Measured Sight Distance North = Minimum Requirement Confirmed
Measured Sight Distance South = N/A Confirmed Visually

Sight Distance Satisfied

Westbound Right-Turn Sight Distance for 158th Street & Loring Road

Sight Distance Case (AASHTO) = B2 (Right-Turn From Minor Road)
Highway Speed = 50 mph
Required Intersection Sight Distance = 1.47 * 50 mph * 11.5 s = 846 ft.
Measured Sight Distance South = N/A Confirmed Visually

Sight Distance Satisfied

APPENDIX D.5
LORING ROAD & LORING LANE INTERSECTION SIGHT DISTANCE ANALYSIS



Loring Road Eastbound Sight Distance Looking South



Loring Road Eastbound Sight Distance Looking North

Left-Turn Sight Distance for Loring Road & Loring Lane

Sight Distance Case (AASHTO) = B1 (Left-Turn From Minor Road)
Highway Speed = 35 mph
Required Intersection Sight Distance (North) = 1.47 * 45 mph * 11.5 s = 761 ft.
Required Intersection Sight Distance (South) = 1.47 * 35 mph * 11.5 s = 592 ft.
Measured Sight Distance North = N/A Confirmed Visually
Measured Sight Distance South = N/A Confirmed Visually

Sight Distance Not Satisfied (Looking South Only)

Right-Turn Sight Distance for Loring Road & Loring Lane

Sight Distance Case (AASHTO) = B2 (Right-Turn From Minor Road)
Highway Speed = 45 mph
Required Intersection Sight Distance = 1.47 * 45 mph * 11.5 s = 761 ft.
Measured Sight Distance North = N/A Confirmed Visually

Sight Distance Satisfied

APPENDIX D.6
LORING LANE & 142ND STREET INTERSECTION SIGHT DISTANCE ANALYSIS



142nd Street Northbound Sight Distance Looking East



142nd Street Northbound Sight Distance Looking West

Left-Turn Sight Distance for Loring Lane & 142nd Street

Sight Distance Case (AASHTO) = B1 (Left-Turn From Minor Road)
Highway Speed = 45 mph
Required Intersection Sight Distance = 1.47 * 45 mph * 11.5 s = 761 ft.
Measured Sight Distance North = Minimum Requirement Confirmed
Measured Sight Distance South = 296 ft.

Sight Distance Not Satisfied

Right-Turn Sight Distance for Loring Lane & 142nd Street

Sight Distance Case (AASHTO) = B2 (Right-Turn From Minor Road)
Highway Speed = 45 mph
Required Intersection Sight Distance = 1.47 * 45 mph * 11.5 s = 761 ft.
Measured Sight Distance South = 296 ft.

Sight Distance Not Satisfied



142nd Street Southbound Sight Distance Looking East



142nd Street Southbound Sight Distance Looking West

Left-Turn Sight Distance for Loring Lane & 142nd Street

Sight Distance Case (AASHTO) = B1 (Left-Turn From Minor Road)
Highway Speed = 45 mph
Required Intersection Sight Distance = 1.47 * 45 mph * 11.5 s = 761 ft.
Measured Sight Distance North = Minimum Requirement Confirmed
Measured Sight Distance South = 471 ft

Sight Distance Not Satisfied

Right-Turn Sight Distance for Loring Lane & 142nd Street

Sight Distance Case (AASHTO) = B2 (Right-Turn From Minor Road)
Highway Speed = 45 mph
Required Intersection Sight Distance = 1.47 * 45 mph * 11.5 s = 761 ft.
Measured Sight Distance North = Minimum Requirement Confirmed

Sight Distance Satisfied

APPENDIX D.7
LORING LANE / WEST FRONT STREET & K-32 TRUCK ROUTE (SANTA FE ROAD) INTERSECTION SIGHT DISTANCE ANALYSIS



K-32 Truck / Santa Fe Road Sight Distance Looking North



K-32 Truck / Santa Fe Road Sight Distance Looking South

Eastbound Left-Turn Sight Distance for Loring Lane / West Front Street & K-32 Truck Route (Santa Fe Road)

Sight Distance Case (AASHTO) = B1 (Left-Turn From Minor Road)
Highway Speed = 35 mph
Required Intersection Sight Distance = 1.47 * 35 mph * 11.5 s = 592 ft.
Measured Sight Distance North = N/A Confirmed Visually
Measured Sight Distance South = N/A Confirmed Visually

Sight Distance Satisfied

Eastbound Right-Turn Sight Distance for Loring Lane / West Front Street & K-32 Truck Route (Santa Fe Road)

Sight Distance Case (AASHTO) = B2 (Right-Turn From Minor Road)
Highway Speed = 35 mph
Required Intersection Sight Distance = 1.47 * 35 mph * 11.5 s = 592 ft.
Measured Sight Distance North = N/A Confirmed Visually

Sight Distance Satisfied

APPENDIX E
TRUCK TURNING ENVELOPES



Legend:

Ultimate design tied to reconstruction

Interim design to address offtracking

25' 0' 25' 50'

SCALE : 1 INCH = 50 FEET

189th Street & Golden Road
Existing Truck Turning

GBA
9801 Renner Blvd., Ste. 300
Lenexa, KS 66219
913.492.0400
gbateam.com

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

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Legend:

- Ultimate design tied to reconstruction
- Interim design to address offtracking

25' 0' 25' 50'

SCALE : 1 INCH = 50 FEET

189th Street & Golden Road
Existing Truck Turning

GBA
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Lenexa, KS 66219
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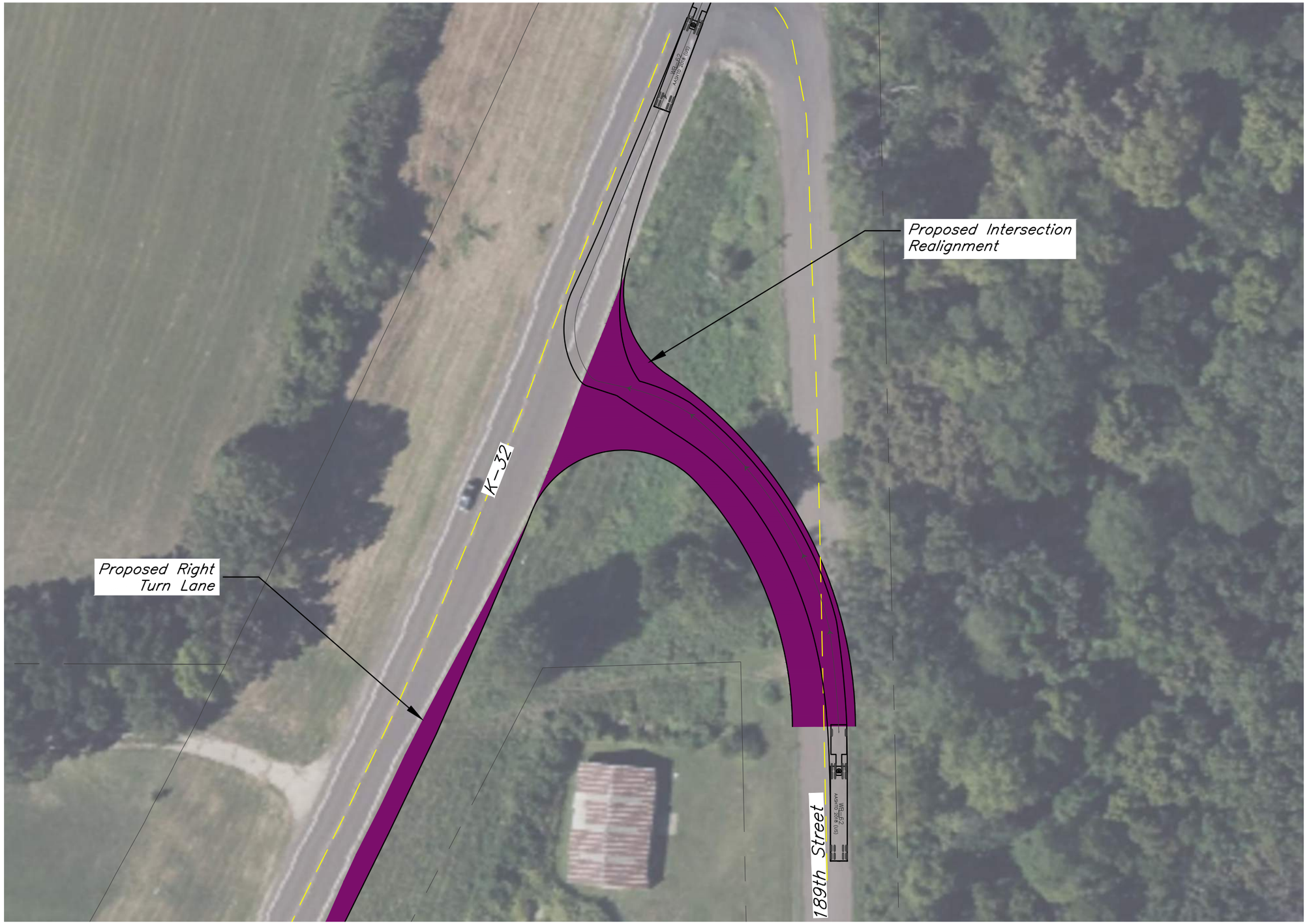

Legend:

- Ultimate design tied to reconstruction
- Interim design to address offtracking

25' 0' 25' 50'

SCALE : 1 INCH = 50 FEET

189th Street & K-32 Highway
Proposed Truck Turning

GBA
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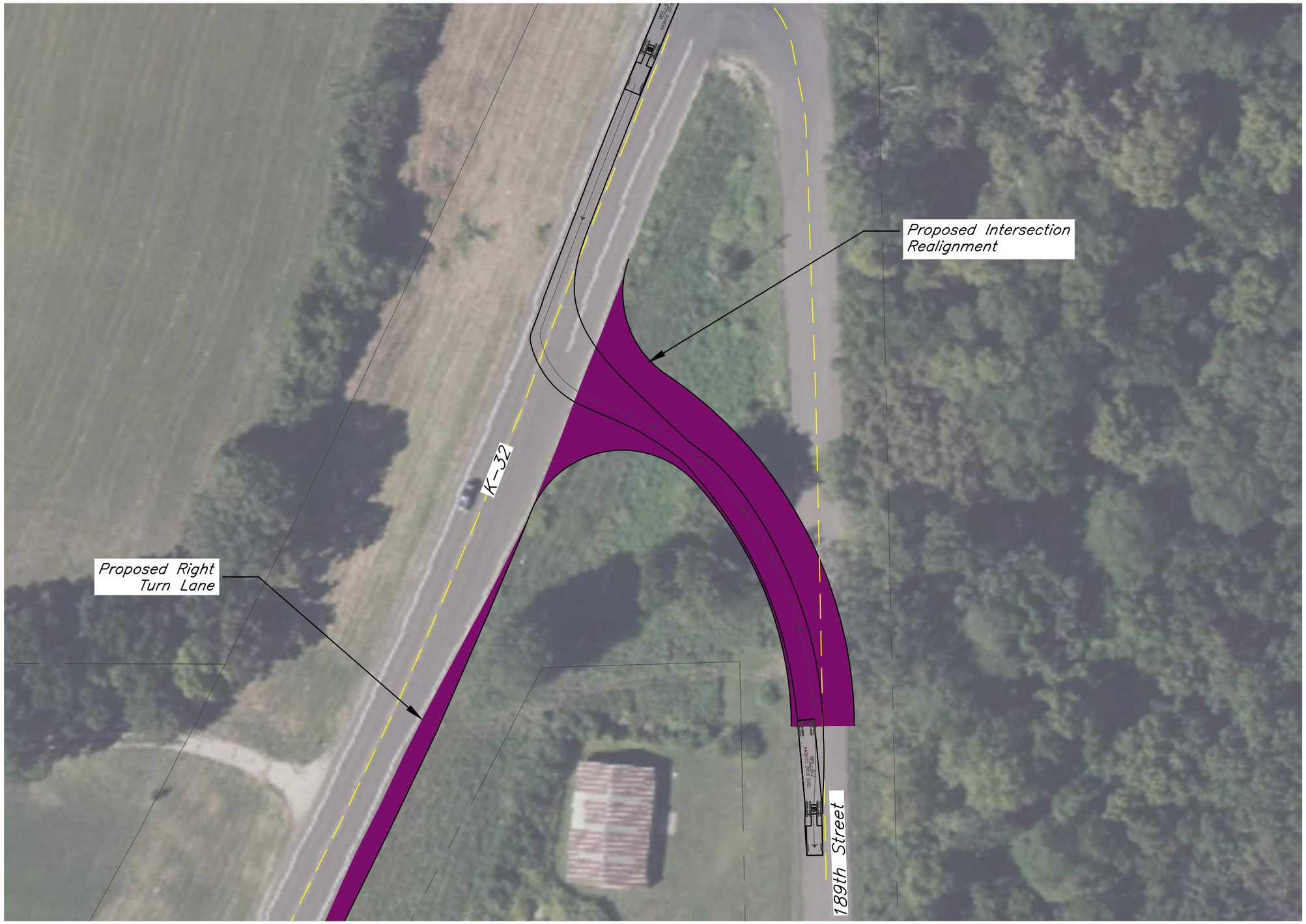

Legend:

- Ultimate design tied to reconstruction
- Interim design to address offtracking

25' 0' 25' 50'

SCALE : 1 INCH = 50 FEET

189th Street & K-32 Highway
Proposed Truck Turning

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Legend:

- Ultimate design tied to reconstruction
- Interim design to address offtracking

25' 0' 25' 50'

SCALE : 1 INCH = 50 FEET

161st Street & Golden Road
Truck Turning

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Legend:

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- Interim design to address offtracking

25' 0' 25' 50'

SCALE : 1 INCH = 50 FEET

161st Street & Golden Road
Truck Turning

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Legend:

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- Interim design to address offtracking

25' 0' 25' 50'

SCALE : 1 INCH = 50 FEET

158th Street & Loring Road
Truck Turning

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Legend:

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- Interim design to address offtracking

25' 0' 25' 50'

SCALE : 1 INCH = 50 FEET

158th Street & Loring Road
Truck Turning

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Legend:

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- Interim design to address offtracking

25' 0' 25' 50'

SCALE : 1 INCH = 50 FEET

Loring Road & Loring Lane
Truck Turning

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Legend:

- Ultimate design tied to reconstruction
- Interim design to address offtracking

25' 0' 25' 50'

SCALE : 1 INCH = 50 FEET

Loring Road & Loring Lane
Truck Turning

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Legend:

- Ultimate design tied to reconstruction
- Interim design to address offtracking

25' 0' 25' 50'

SCALE : 1 INCH = 50 FEET

Loring Lane & Santa Fe Road
Truck Turning

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Legend:

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25' 0' 25' 50'

SCALE : 1 INCH = 50 FEET

Loring Lane & Santa Fe Road
Truck Turning

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LENAPE SAND OPERATION

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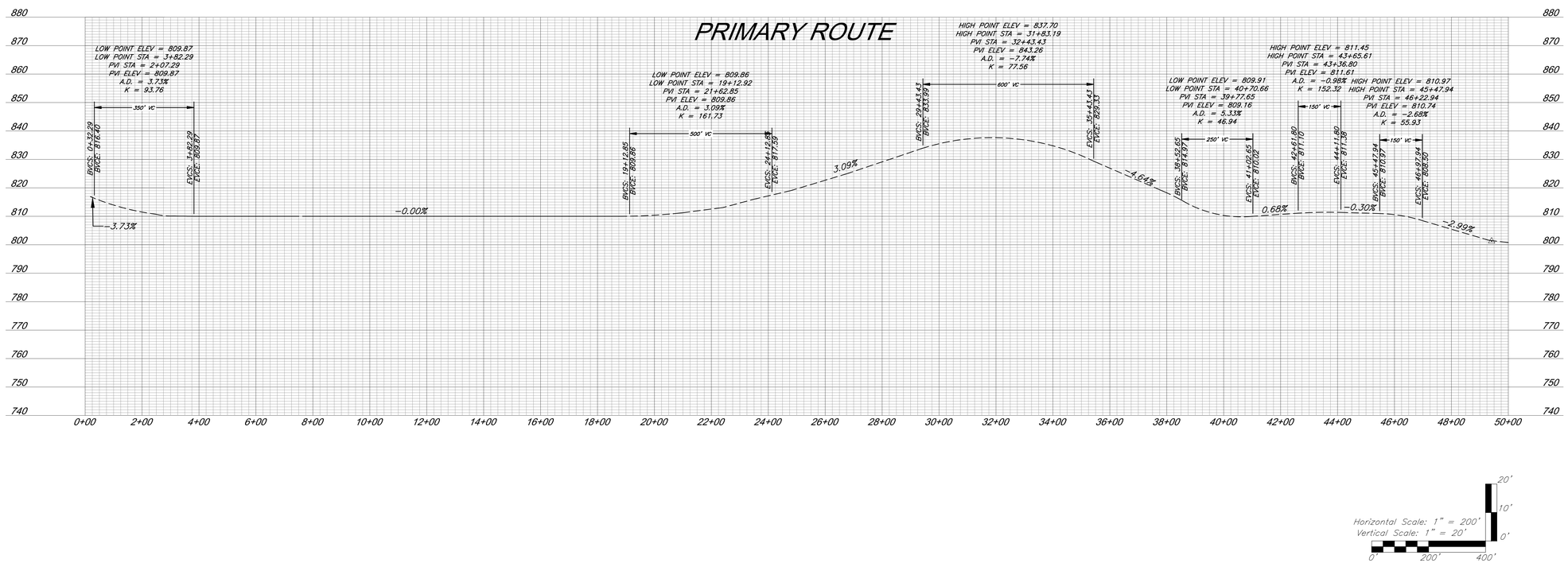
APPENDIX F
ROADWAY GEOMETRY AND CROSS SECTIONS





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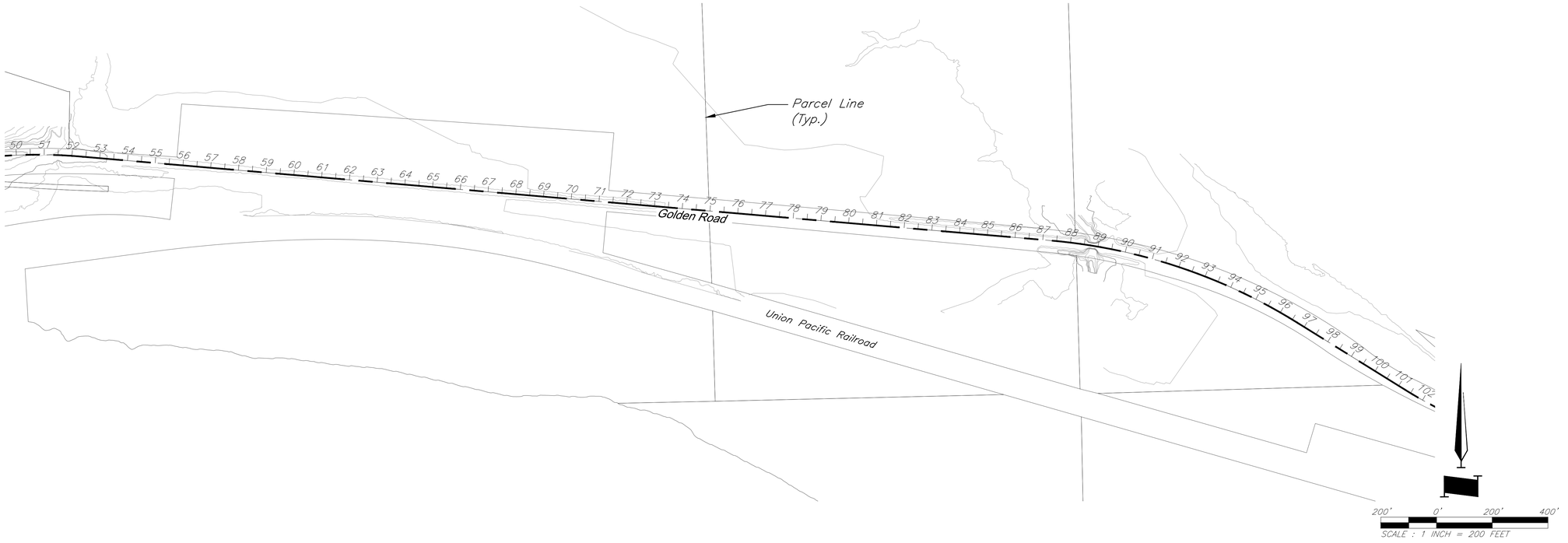

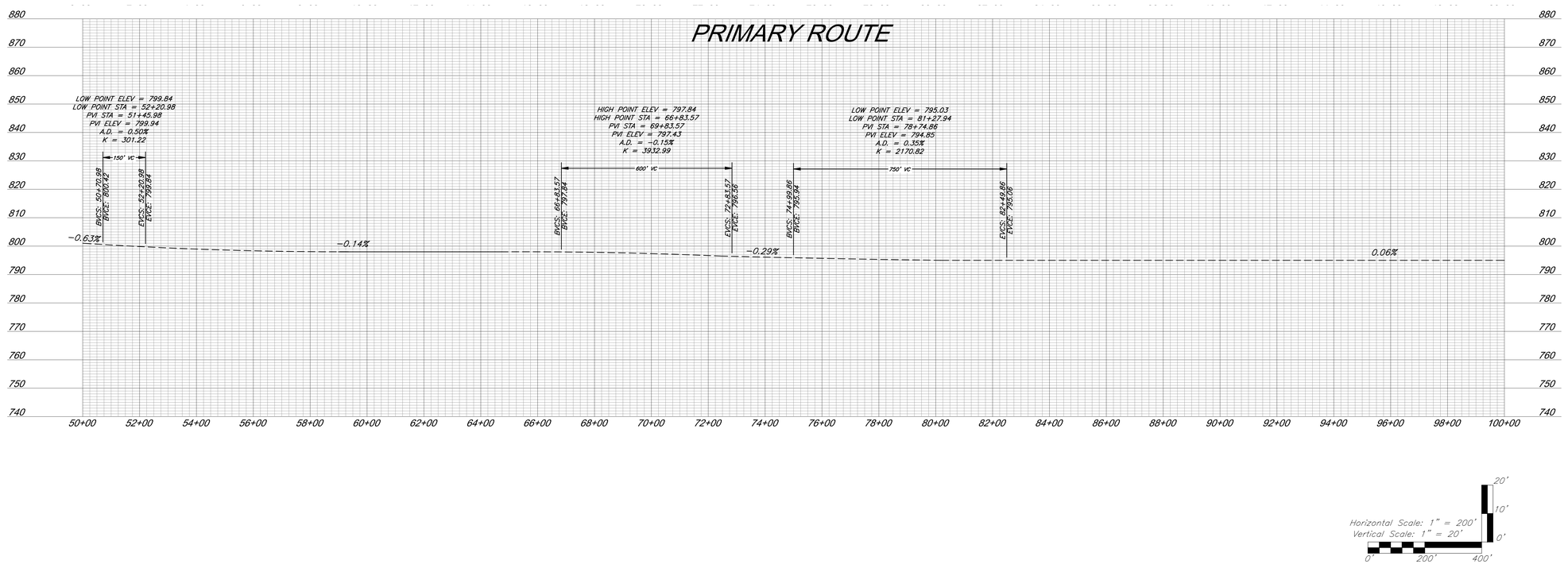

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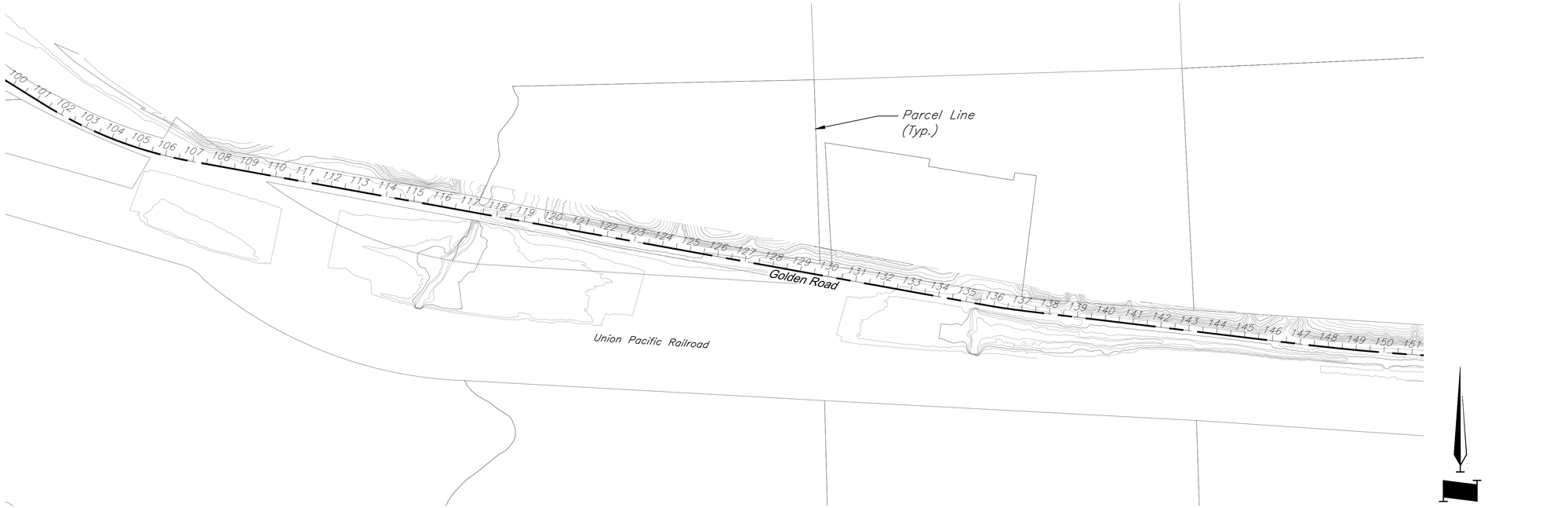
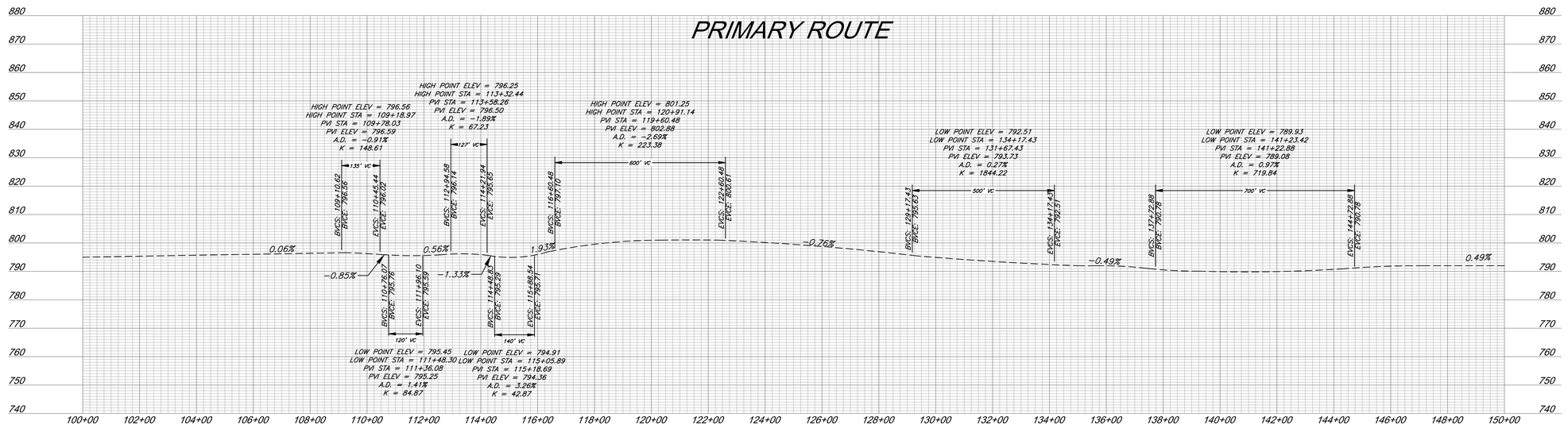


200' 0' 200' 400'

SCALE : 1 INCH = 200 FEET



Horizontal Scale: 1" = 200'
Vertical Scale: 1" = 20'

20' 10' 0'

0' 200' 400'

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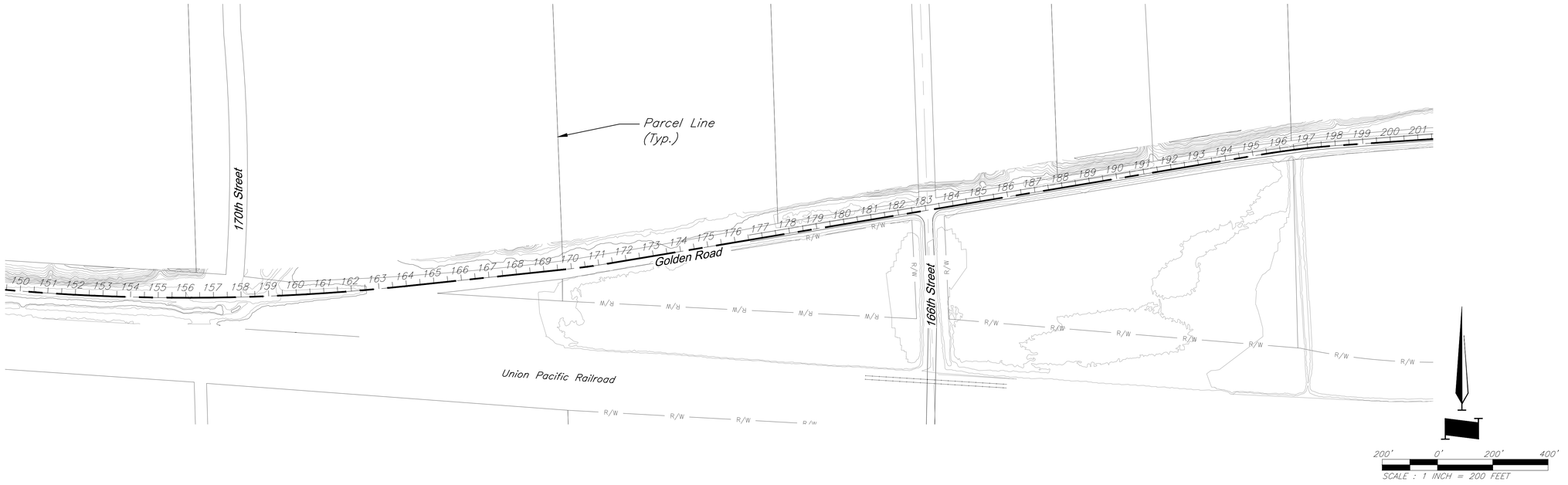

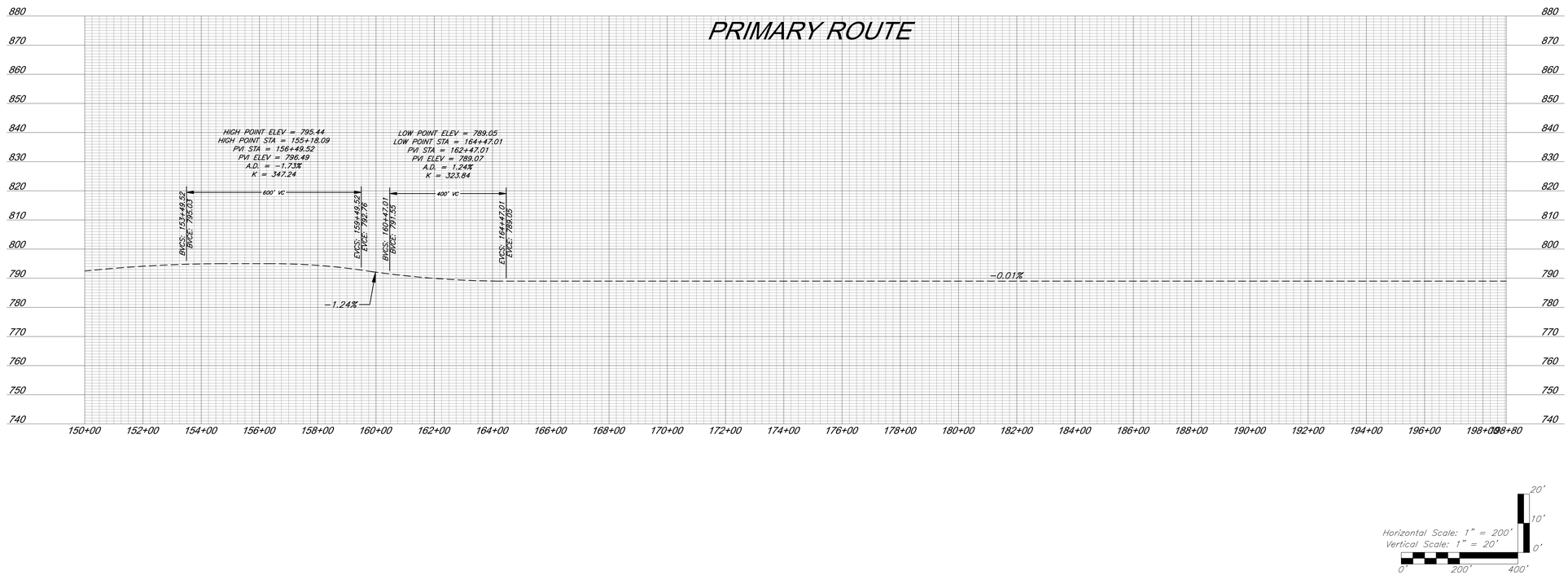

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PROPOSED FACILITY FOR:

LENAPE SAND OPERATION

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Leavenworth County, Kansas

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Existing Vertical Profiles Primary Route

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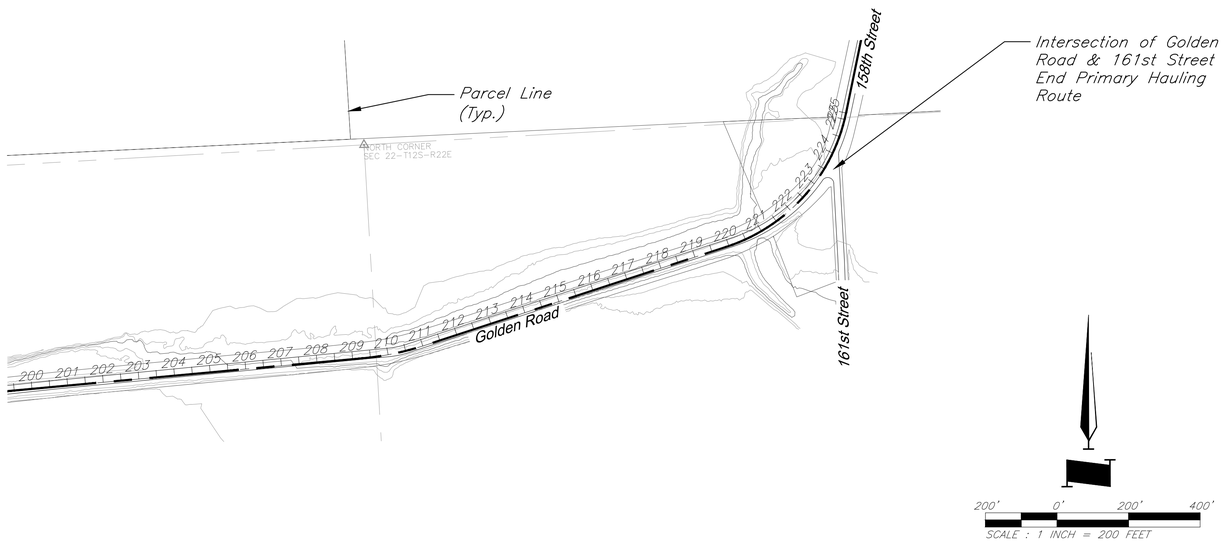

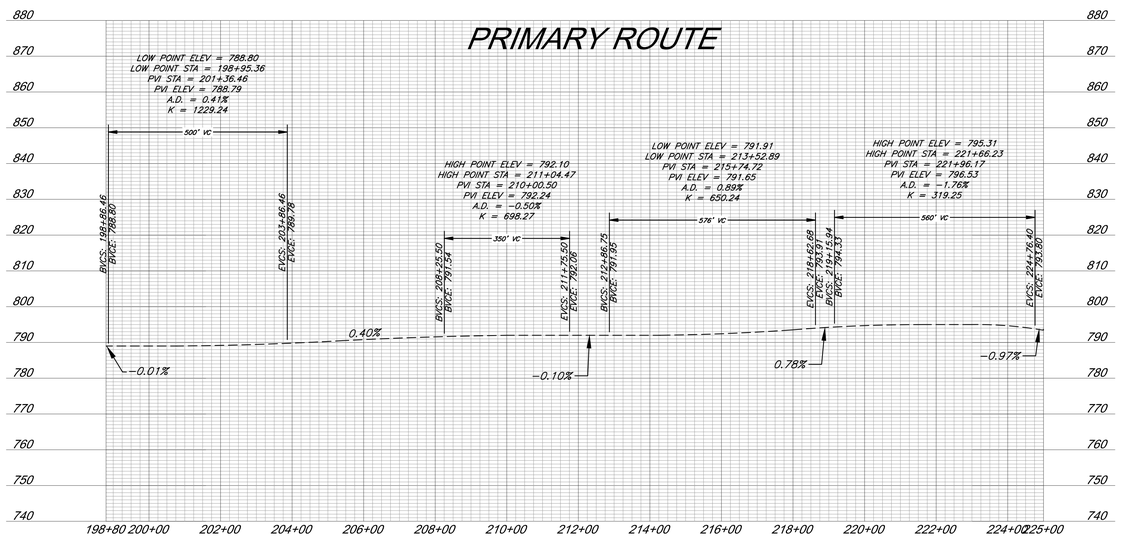

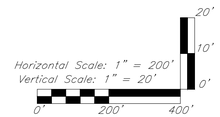

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PROPOSED FACILITY FOR:

LENAPE SAND OPERATION

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

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16477.00

DATE
9/26/2025

DESIGNED

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SHEET TITLE

Existing Vertical Profiles Primary Route

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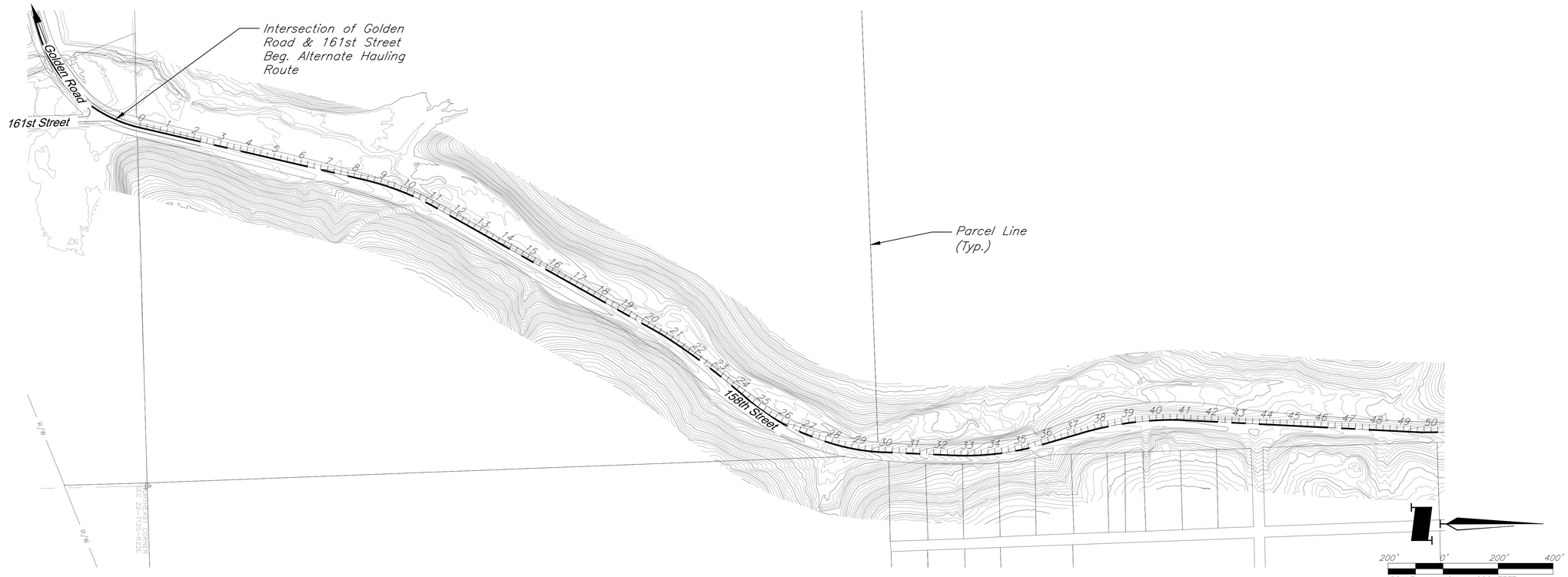
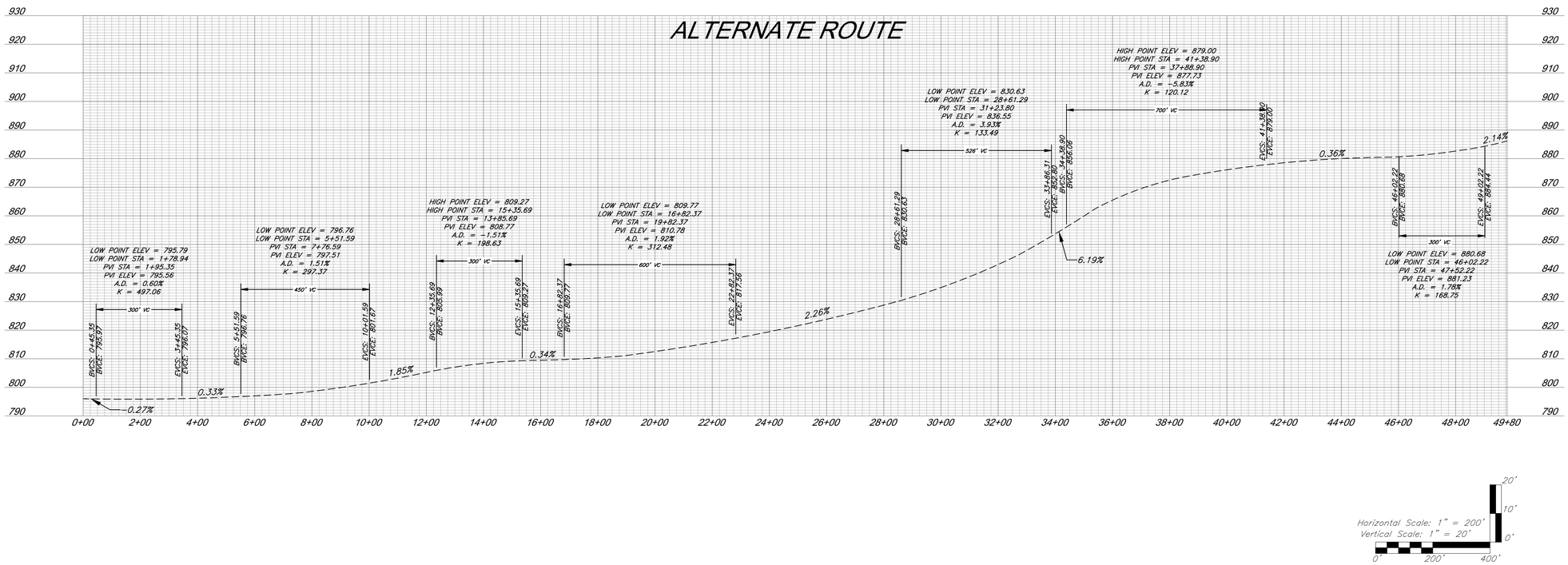
Architecture COA# A-45
Land Surveying COA# LS-8





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PROPOSED FACILITY FOR:

LENAPE SAND OPERATION

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Leavenworth County, Kansas

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SHEET TITLE

Existing Vertical Profiles Alternate Route

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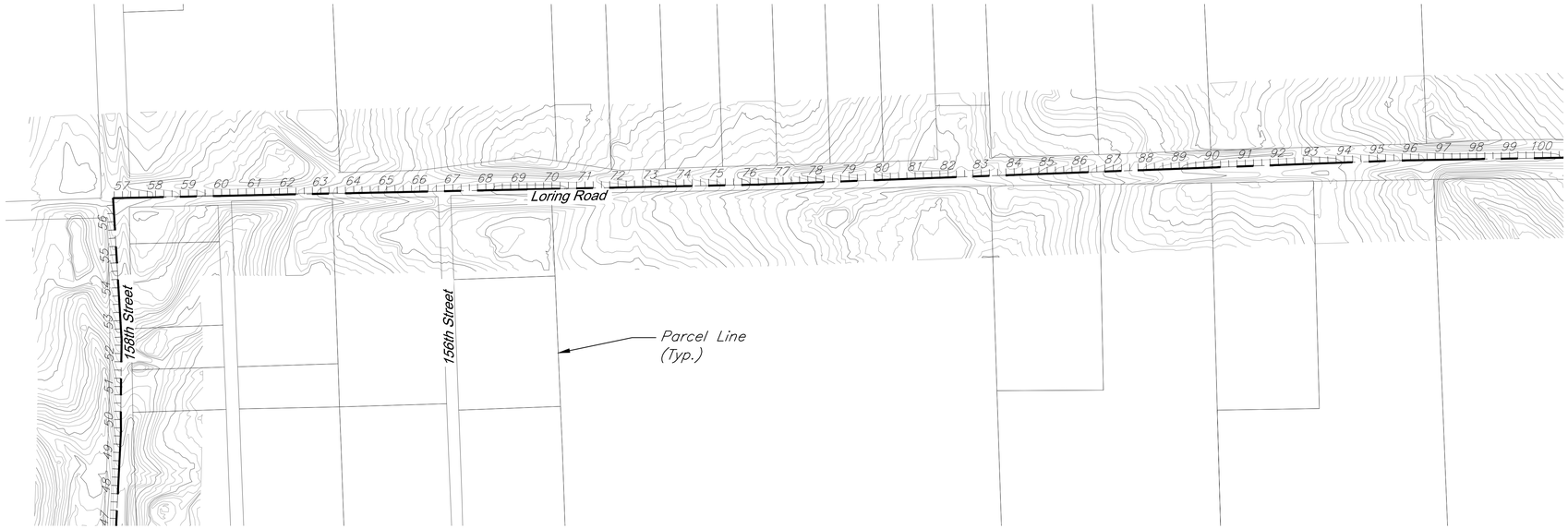
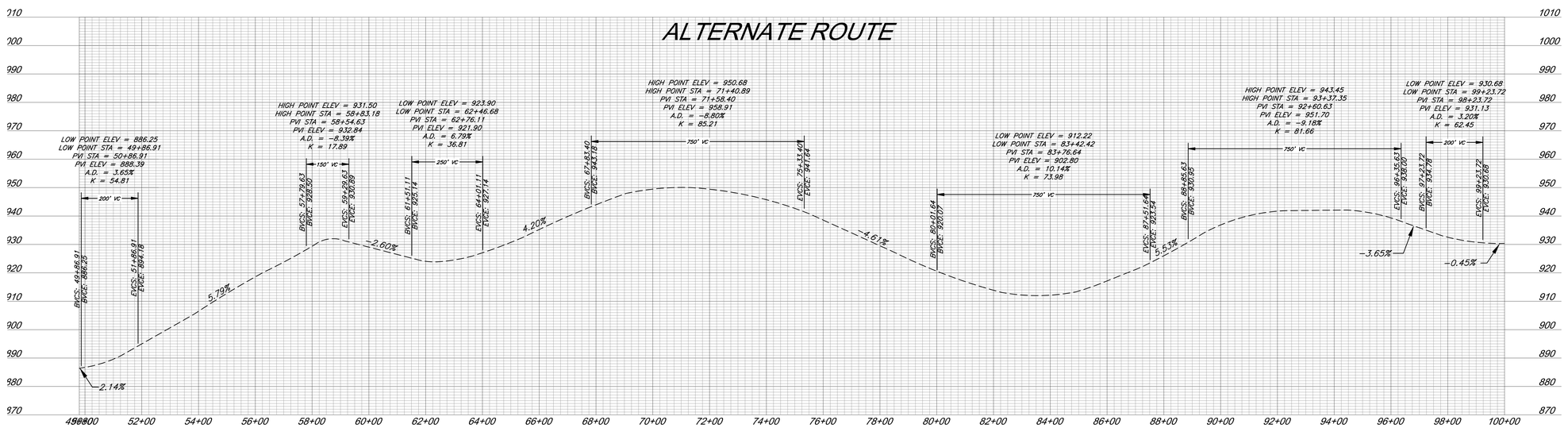
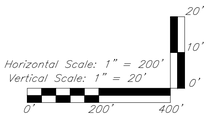


200' 0' 200' 400'
SCALE : 1 INCH = 200 FEET





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PROPOSED FACILITY FOR:

LENAPE SAND OPERATION

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

REVISION

PROJECT NUMBER
16477.00

DATE
9/26/2025

DESIGNED

DRAWN

REVIEWED

SHEET TITLE

Existing Vertical Profiles Alternate Route

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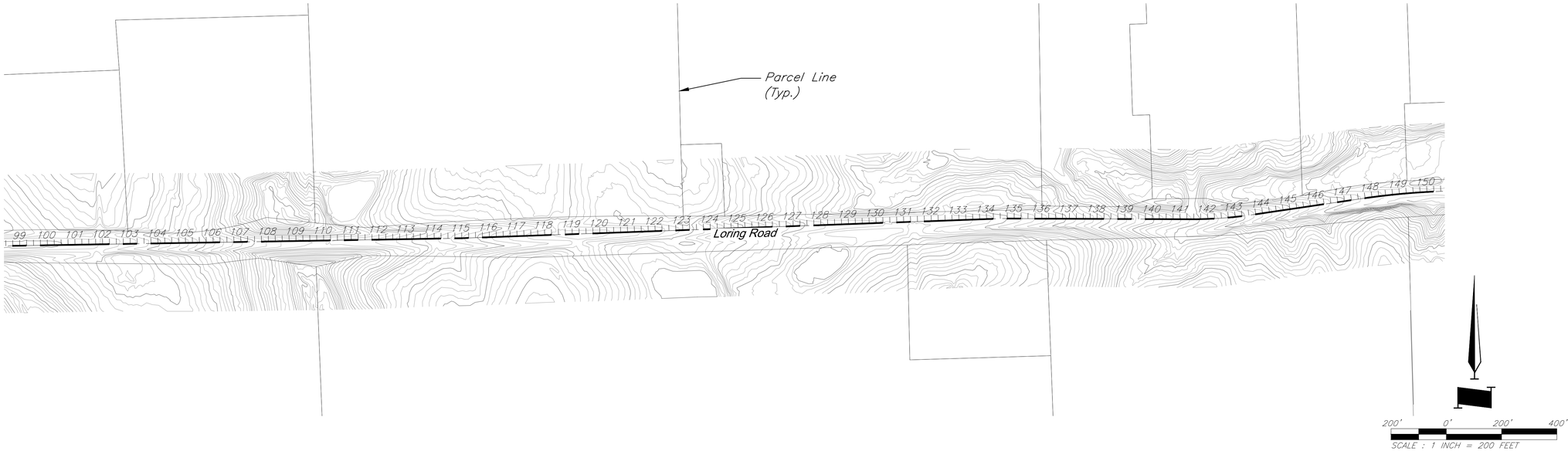
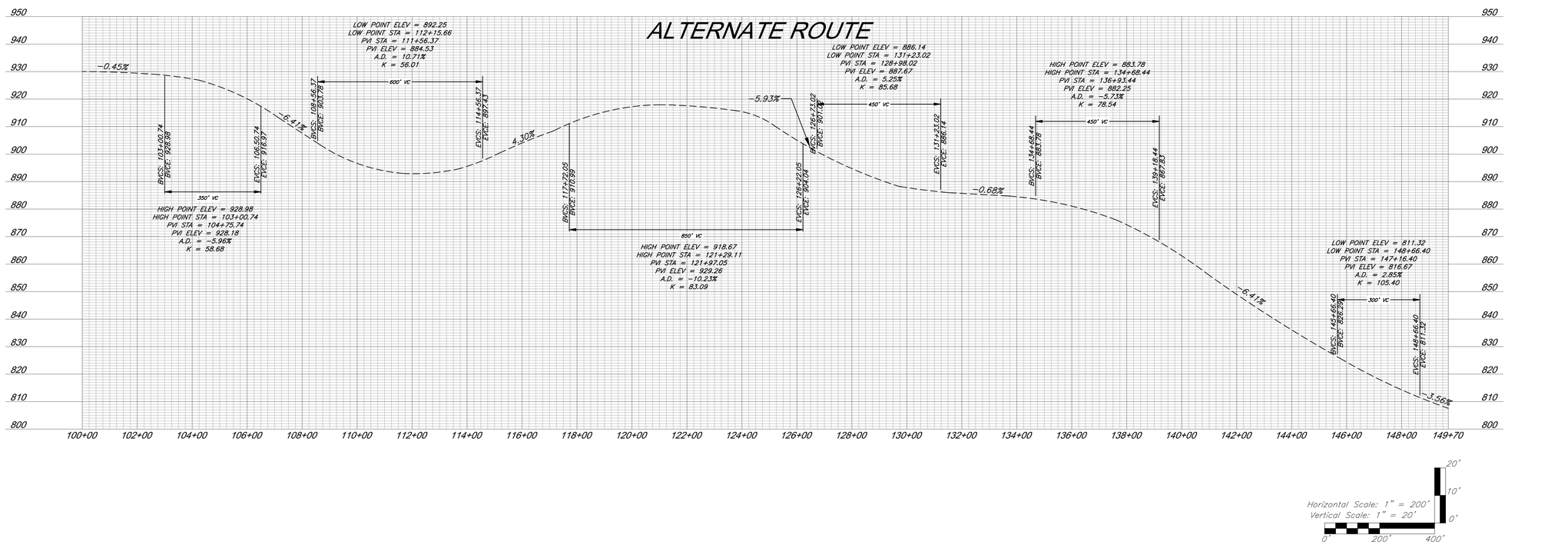
Architecture COA# A-45
Land Surveying COA# LS-8





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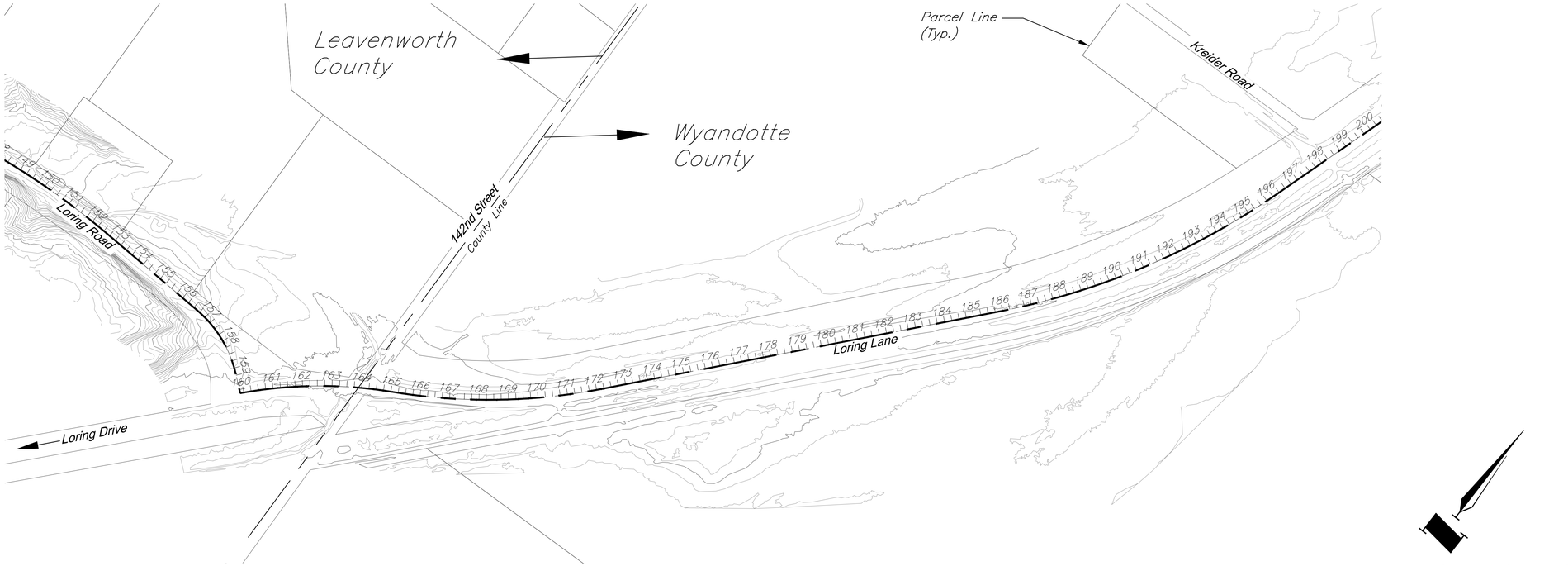
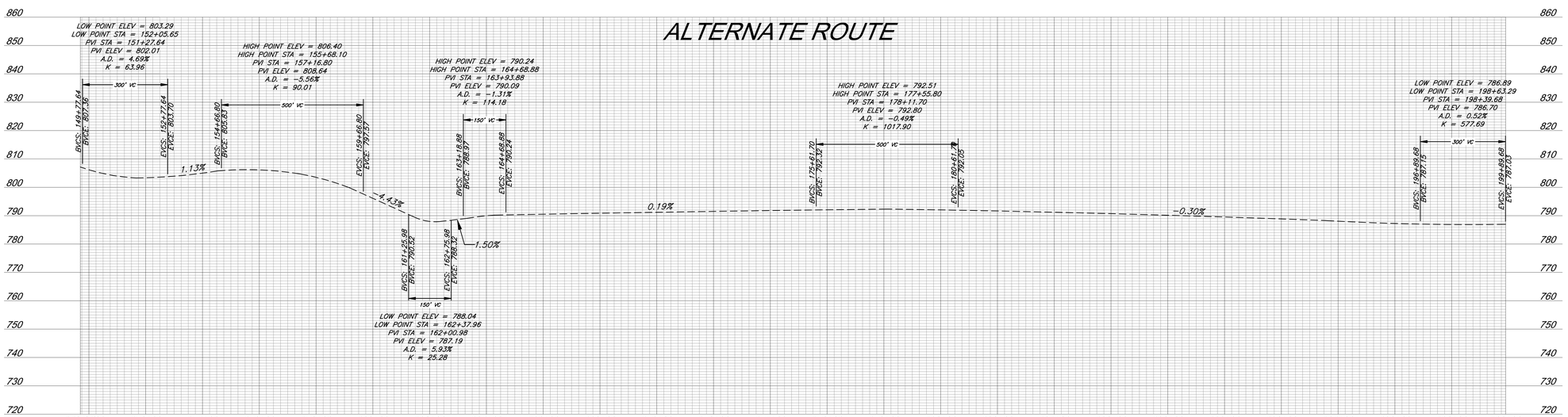


200' 0' 200' 400'

SCALE : 1 INCH = 200 FEET



Horizontal Scale: 1" = 200'
Vertical Scale: 1" = 20'

20' 10' 0'

0' 200' 400'

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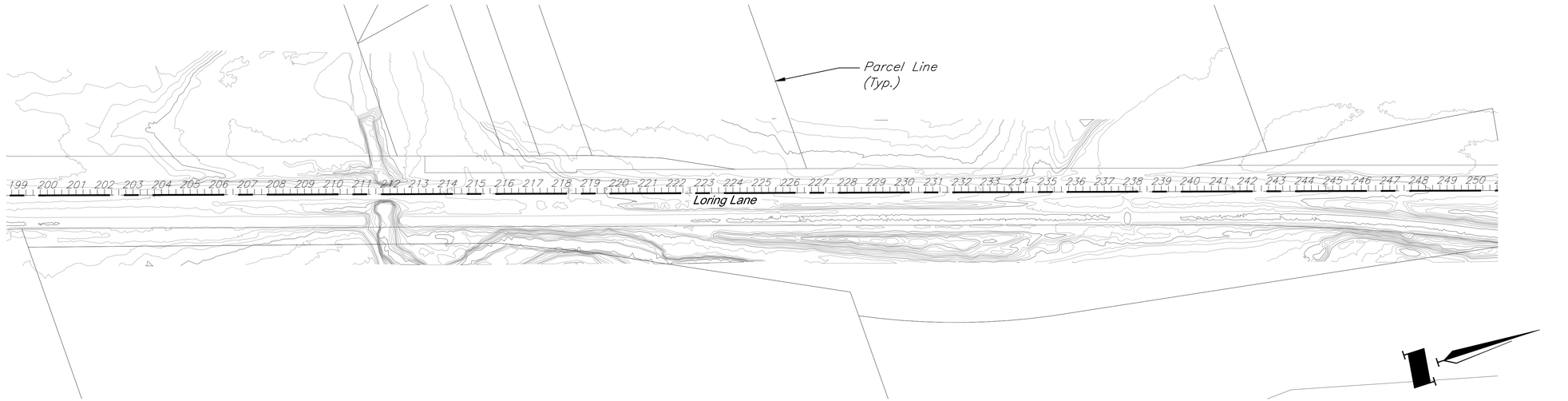

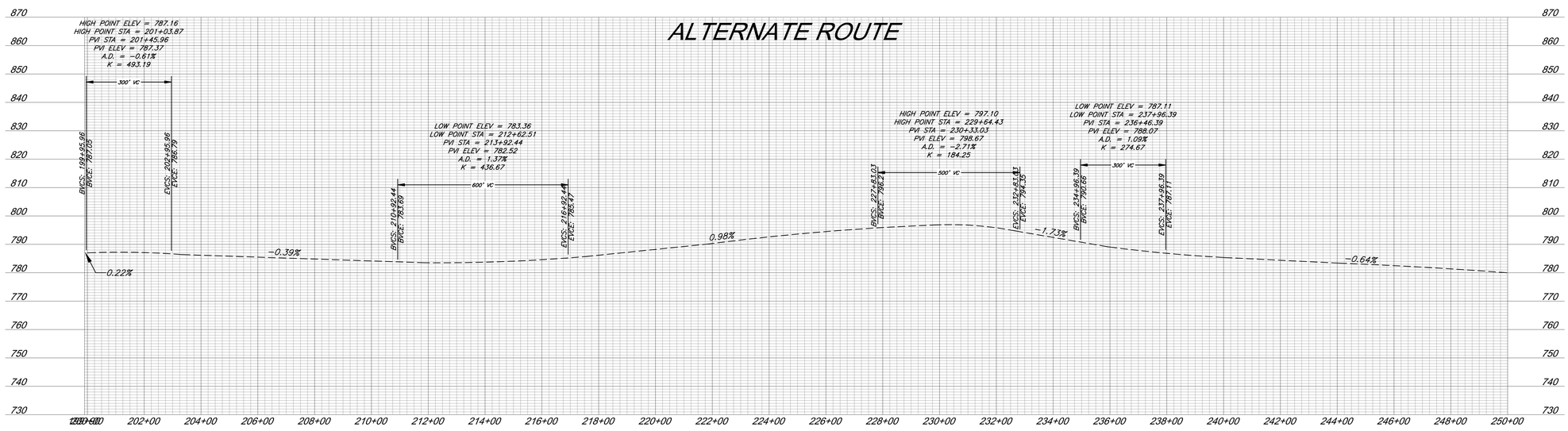

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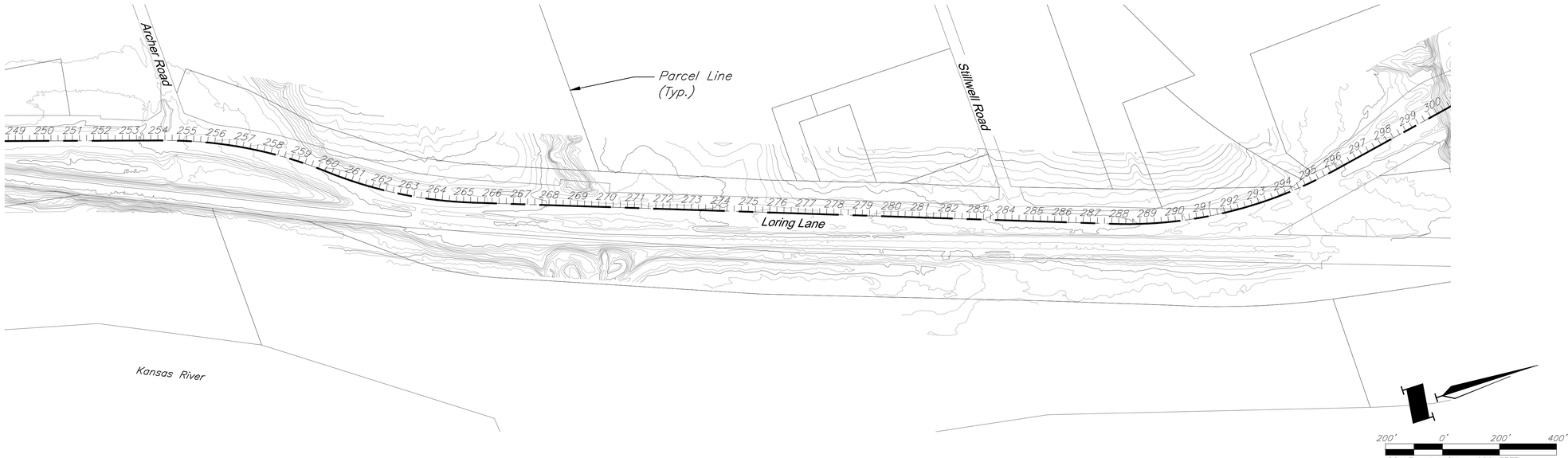

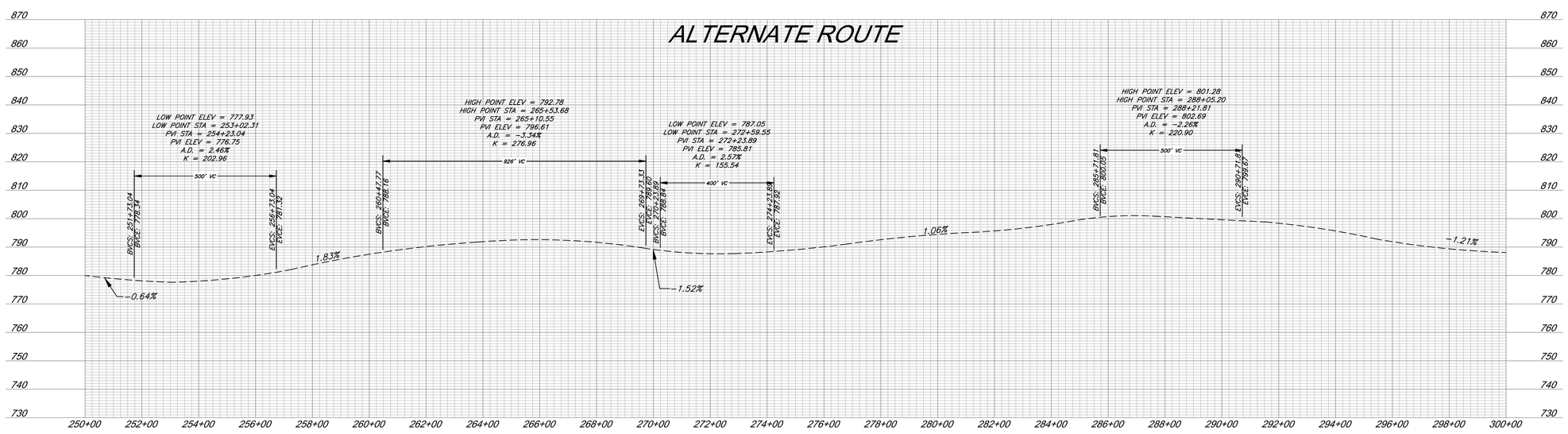

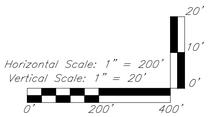

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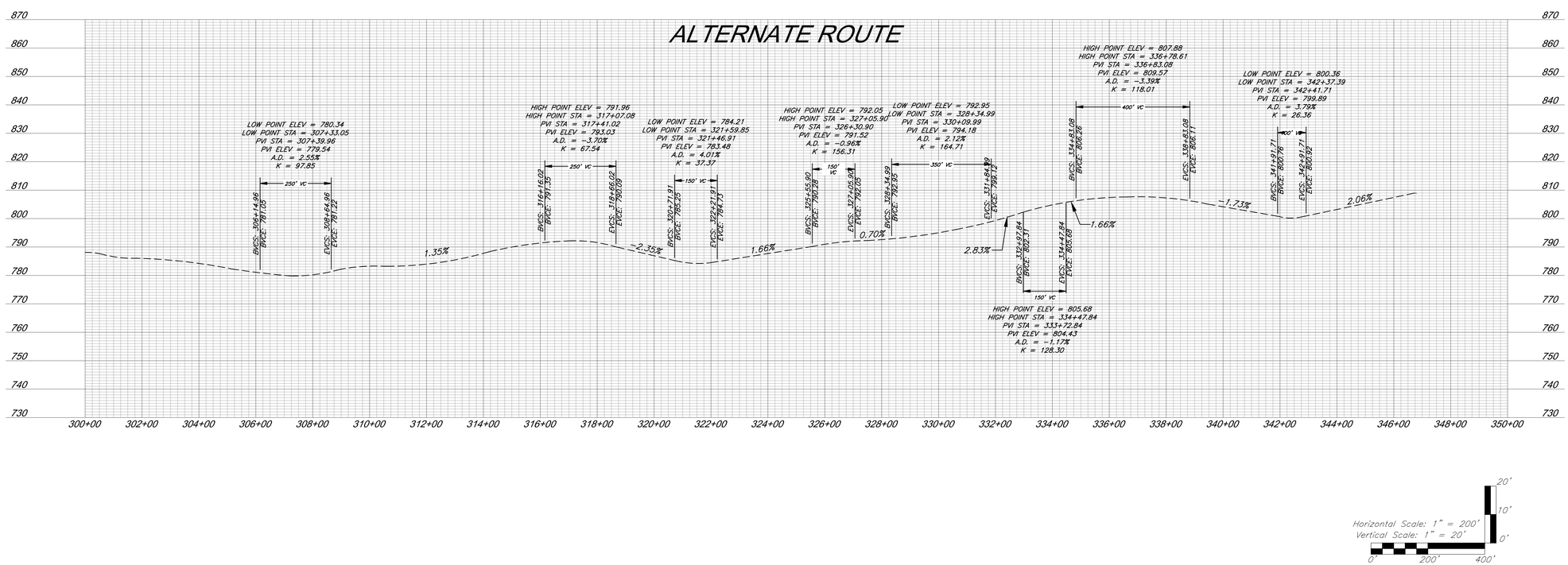

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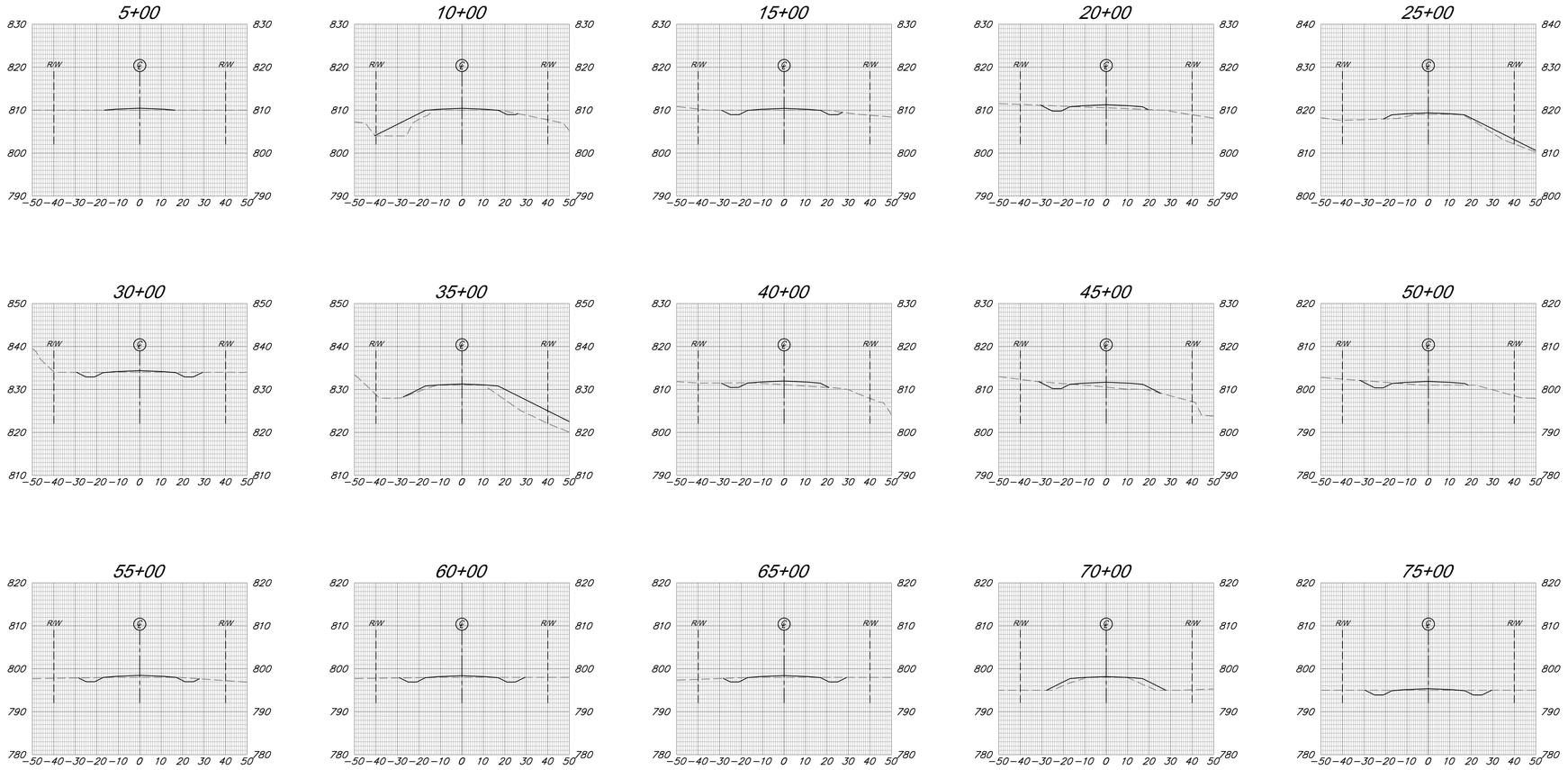
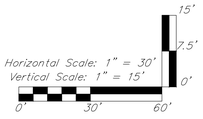


Legend:

- Existing Grade
- Typical Section Overlay

Cross Section Notes:

1. Sections based on GIS data, and should be viewed as conceptual at this time. Actual conditions may vary and will be evaluated at the time of final design.
2. Right of way width (80') shown is based on the typical section required by Leavenworth County. Actual right of way width varies.
3. Standard section shown. Based on field conditions, the guardrail section may be used as required due to grades, culverts, streams, or other conditions where the graded out slope is not feasible.



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SHEET TITLE

Primary Hauling Route Cross Sections

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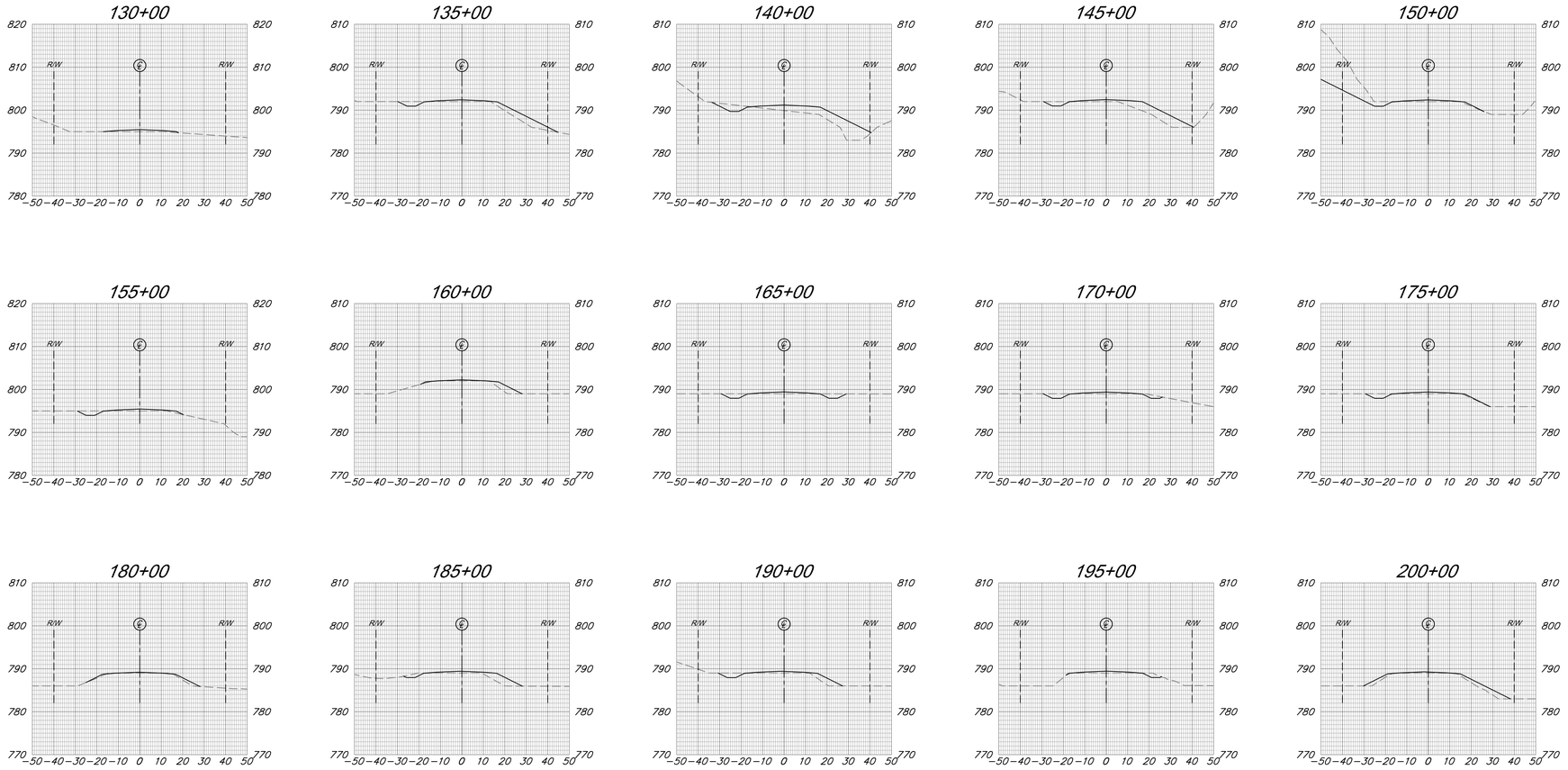
G:\16477\Civil 3D\Production Drawings\Exhibits\Civil\Traffic Study Exhibits\Truck Route Cross Sections.dwg Layout: 24 Truck Route Cross Sections — Primary Rte 1 — Tuesday May 20, 2025, 1:57pm — Copyright 2025, George Butler Associates, Inc.

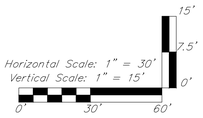


Legend:

- *Existing Grade*
- *Typical Section Overlay*

Cross Section Notes:

1. *Sections based on GIS data, and should be viewed as conceptual at this time. Actual conditions may vary and will be evaluated at the time of final design.*
2. *Right of way width (80') shown is based on the typical section required by Leavenworth County. Actual right of way width varies.*
3. *Standard section shown. Based on field conditions, the guardrail section may be used as required due to grades, culverts, streams, or other conditions where the graded out slope is not feasible.*



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PROPOSED FACILITY FOR:

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Primary Hauling Route Cross Sections

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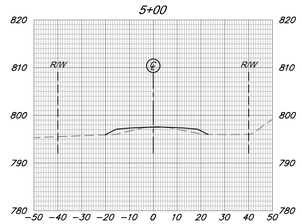

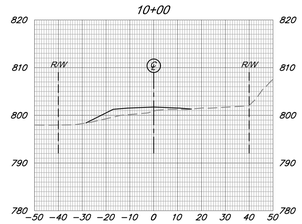

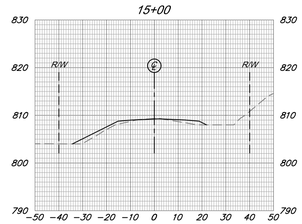

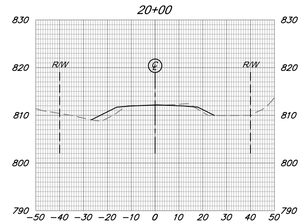

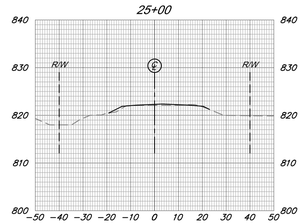

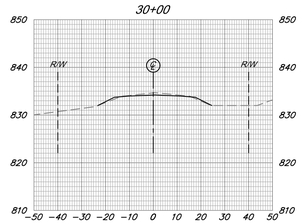

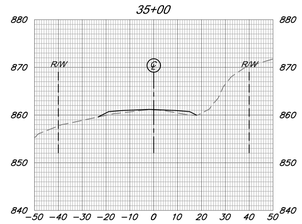

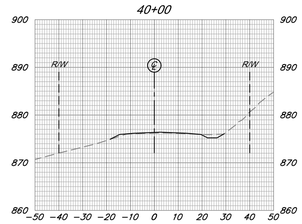

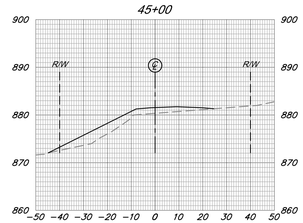

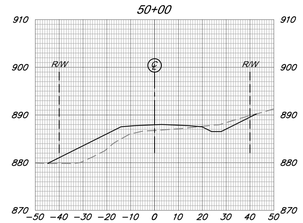

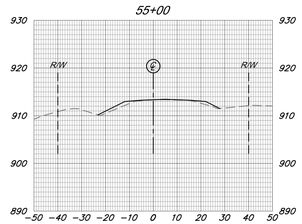

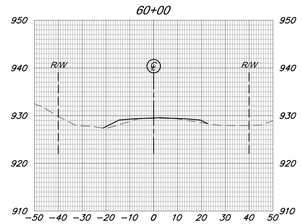

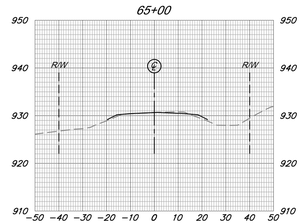

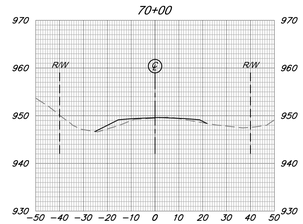

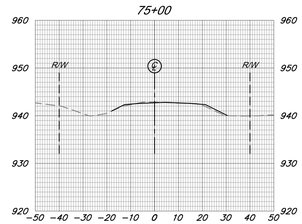

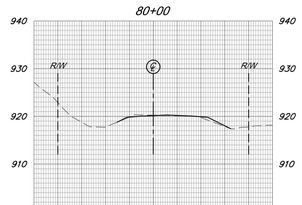

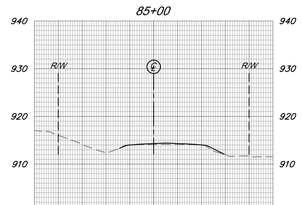

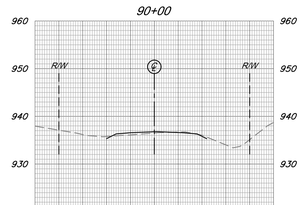

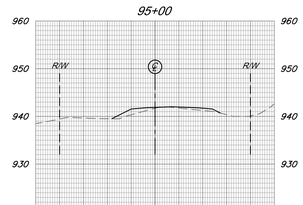

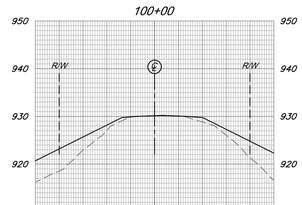

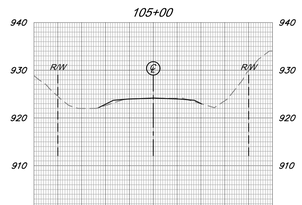

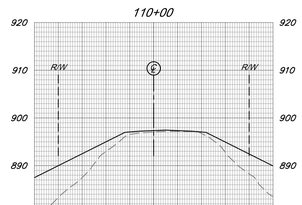

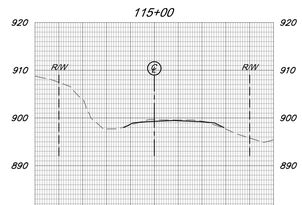

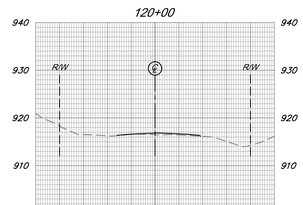

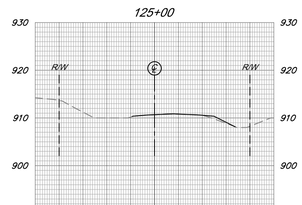

Legend:

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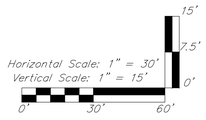

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PROPOSED FACILITY FOR:

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166th St. & Lenape Rd.
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REVISION

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DATE
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Alternate Hauling Route Cross Sections

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Engineering COA# E-92
Architecture COA# A-45
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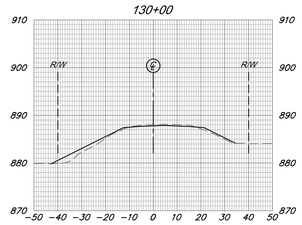
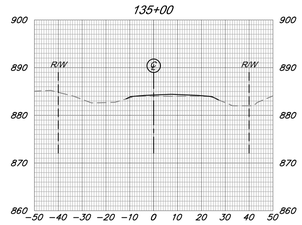
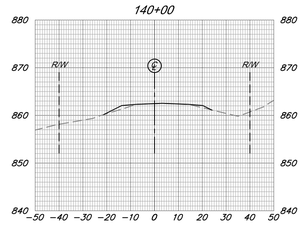
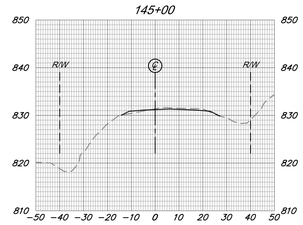
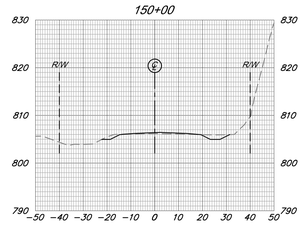
G:\16477\Civil 3D\Production Drawings\Exhibits\Civil\Traffic Study Exhibits\Truck Route Cross Sections.dwg Layout: 26 Truck Route Cross Sections — Alt Rte 1 — Tuesday May 20, 2025, 1:57pm — Copyright 2025, George Butler Associates, Inc.

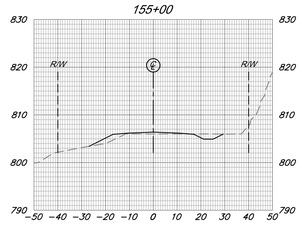


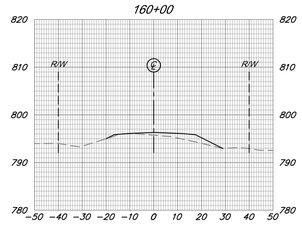


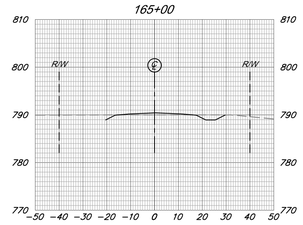




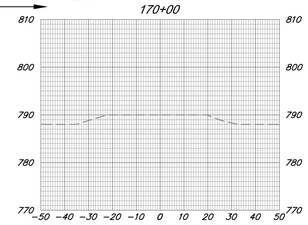


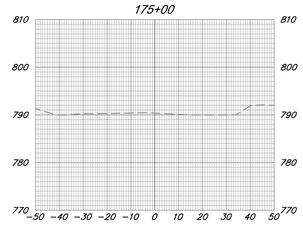


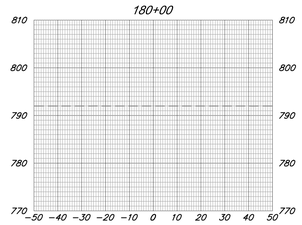


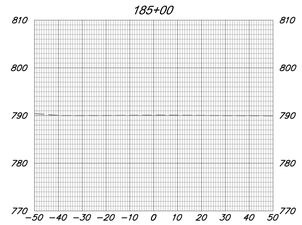


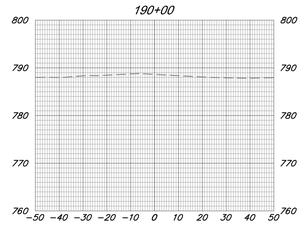
Subsequent cross sections are located in the Wyandotte County portion of the route. Leavenworth County typical sections are not applied.

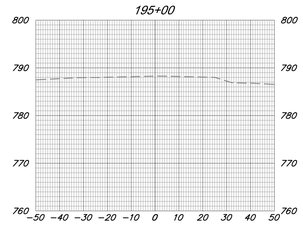


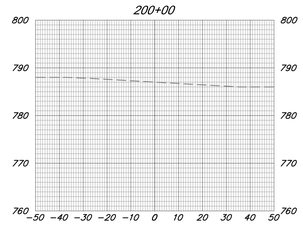


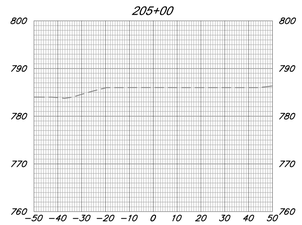


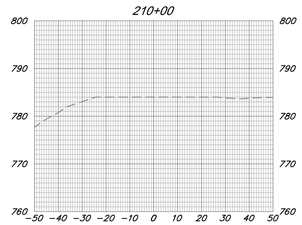


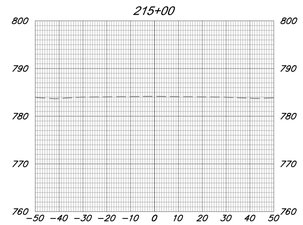


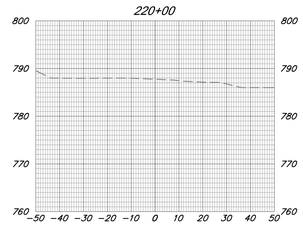


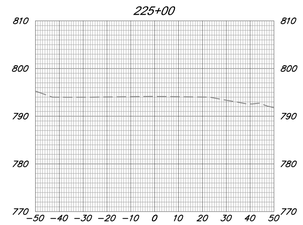


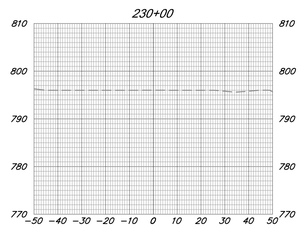


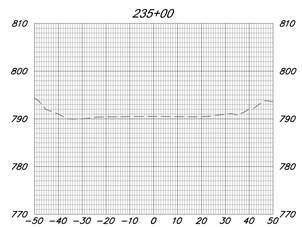


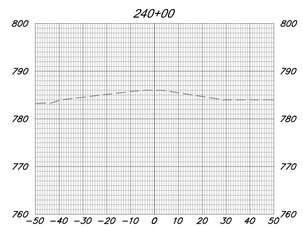


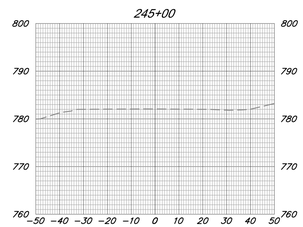


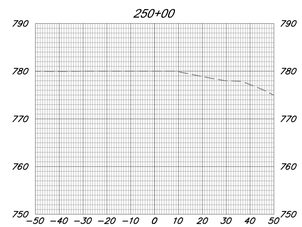












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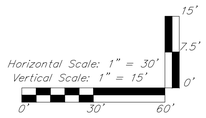

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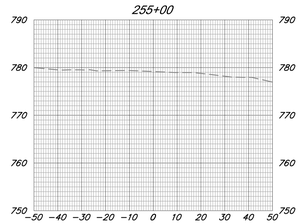
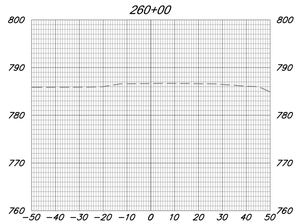
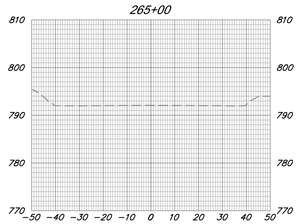
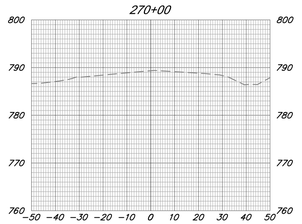
Engineering COA# E-92
Architecture COA# A-65
Land Surveying COA# LS-8

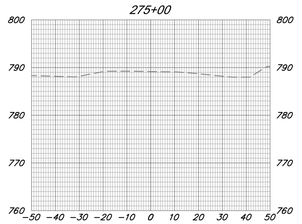
G:\16477\Civil 3D\Production Drawings\Exhibits\Civil\Traffic Study Exhibits\Truck Route Cross Sections.dwg Layout: 27 Truck Route Cross Sections -- Alt Rte 2 -- Tuesday May 20, 2025, 1:57pm -- Copyright 2025, George Butler Associates, Inc.

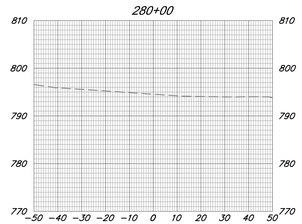


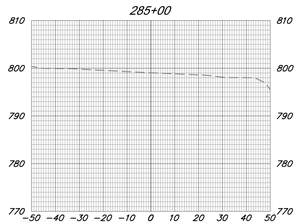


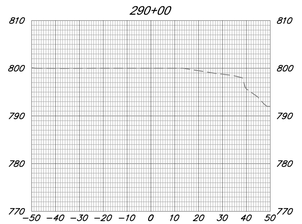


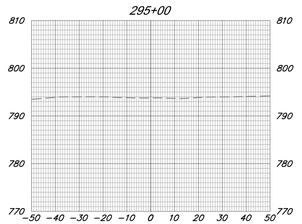


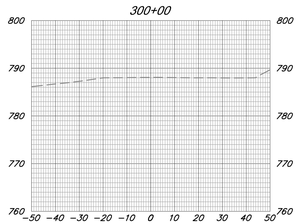


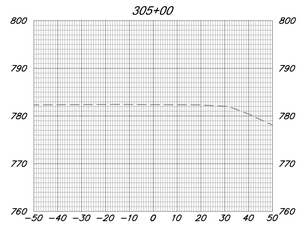


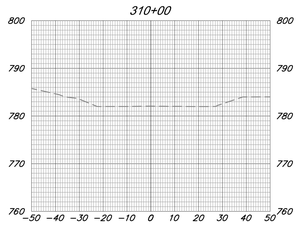


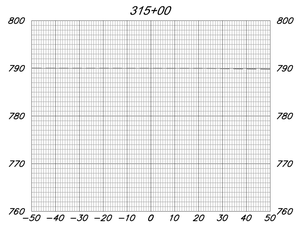


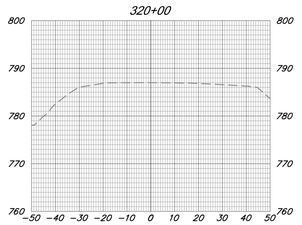


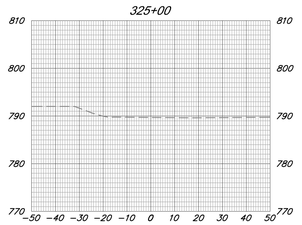


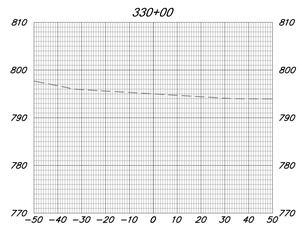


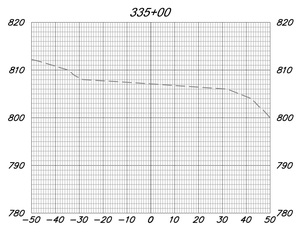


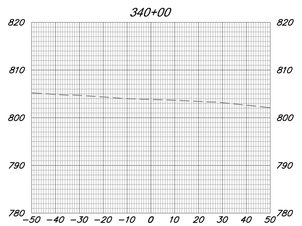


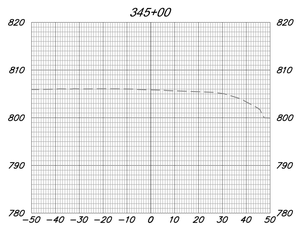












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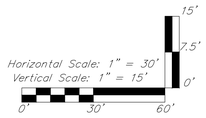

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PROPOSED FACILITY FOR:

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Land Surveying COA# LS-8

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400' 0' 400' 800'

SCALE : 1 INCH = 400 FEET

BOC = Beginnning of Curve
EOC = End of Curve

G:\16477\Civil 3D\Production Drawings\Exhibits\Civil\Traffic Study Exhibits\Geometry Exhibit.dwg Layout: 29 Geometry Exhibit -- Primary Route -- Monday September 22, 2025, 2:46pm -- Copyright 2025, George Butler Associates, Inc.

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gbateam.com

PROPOSED FACILITY FOR:

LENAPE SAND OPERATION

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

REVISION

PROJECT NUMBER
16477.00

DATE
9/22/2025

DESIGNED

DRAWN

REVIEWED

SHEET TITLE

Existing Roadway Geometry Primary Route

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Engineering COA# E-92
Architecture COA# A-45
Land Surveying COA# LS-8



400' 0' 400' 800'

SCALE : 1 INCH = 400 FEET

BOC = Beginnning of Curve
EOC = End of Curve

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PROPOSED FACILITY FOR:

LENAPE SAND OPERATION

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

REVISION

PROJECT NUMBER
16477.00

DATE
9/22/2025

DESIGNED

DRAWN

REVIEWED

SHEET TITLE

Existing
Roadway Geometry
Alternate Route

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Architecture COA# A-45
Land Surveying COA# LS-8

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400' 0' 400' 800'
SCALE : 1 INCH = 400 FEET

BOC = Beginnning of Curve
EOC = End of Curve

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PROPOSED FACILITY FOR:

LENAPE SAND OPERATION

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

REVISION

PROJECT NUMBER
16477.00

DATE
9/22/2025

DESIGNED

DRAWN

REVIEWED

SHEET TITLE
Existing Roadway Geometry Alternate Route

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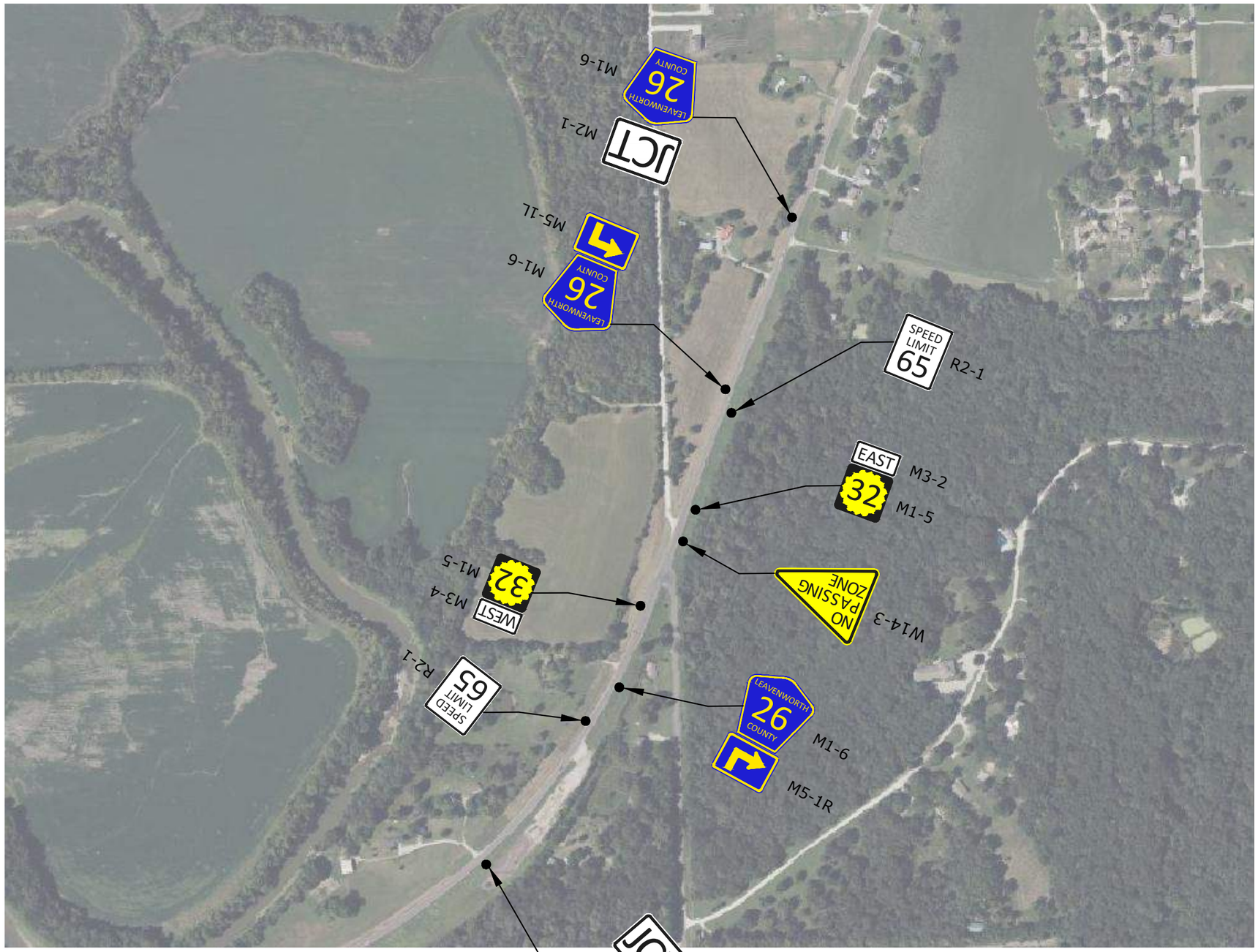
Architecture COA# A-45
Land Surveying COA# LS-8

APPENDIX G
EXISTING ROUTE SIGNAGE



Note:
- Street name signs are present at intersections but are not shown on these sheets

250' 0' 250' 500'
SCALE : 1 INCH = 500 FEET

K-32 Highway @ 189th Street
Existing Signing

GBA
9801 Renner Blvd., Ste. 300
Lenexa, KS 66219
913.492.0400
gbateam.com

LENAPE SAND OPERATION
166th St. & Lenape Rd.
Leavenworth County, Kansas
Existing Signing Conditions

PROJECT NUMBER
16477.00

DATE
9/27/2024

334

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Note:
- Street name signs are present at intersections but are not shown on these sheets

250' 0' 250' 500'
SCALE : 1 INCH = 500 FEET

189th Street & Golden Road
Existing Signing

GBA
9801 Renner Blvd., Ste. 300
Lenexa, KS 66219
913.492.0400
gbateam.com

LENAPE SAND OPERATION
166th St. & Lenape Rd.
Leavenworth County, Kansas
Existing Signing Conditions

PROJECT NUMBER
16477.00

DATE
9/27/2024

335

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G:\16477\Civil 3D\Production Drawings\Exhibits\Civil\Traffic Study Exhibits\Existing Signing.dwg Layout: 5 Existing Signing - 170thGolden -- Friday September 27, 2024, 9:53am -- Copyright 2024, George Butler Associates, Inc.

Note:
- *Street name signs are present at intersections but are not shown on these sheets*

170th Street & Golden Road
Existing Signing

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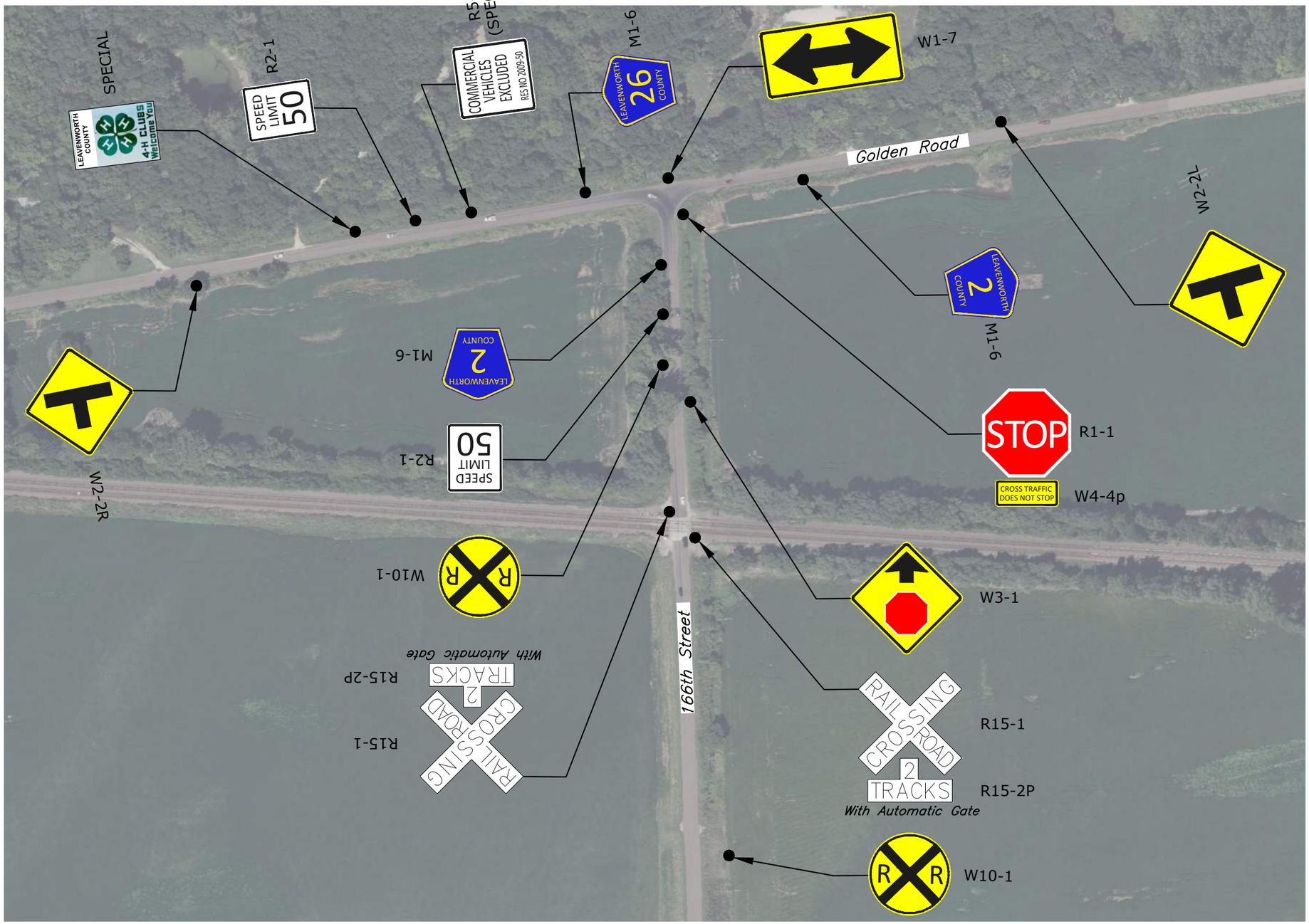
913.492.0400
gbateam.com

LENAPE SAND OPERATION
166th St. & Lenape Rd.
Leavenworth County, Kansas
Existing Signing Conditions

PROJECT NUMBER
16477.00

DATE
9/27/2024



Note:
- *Street name signs are present at intersections but are not shown on these sheets*

100' 0' 100' 200'
SCALE : 1 INCH = 200 FEET

166th Street & Golden Road
Existing Signing

GBA
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Lenexa, KS 66219
913.492.0400
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LENAPE SAND OPERATION
166th St. & Lenape Rd.
Leavenworth County , Kansas
Existing Signing Conditions

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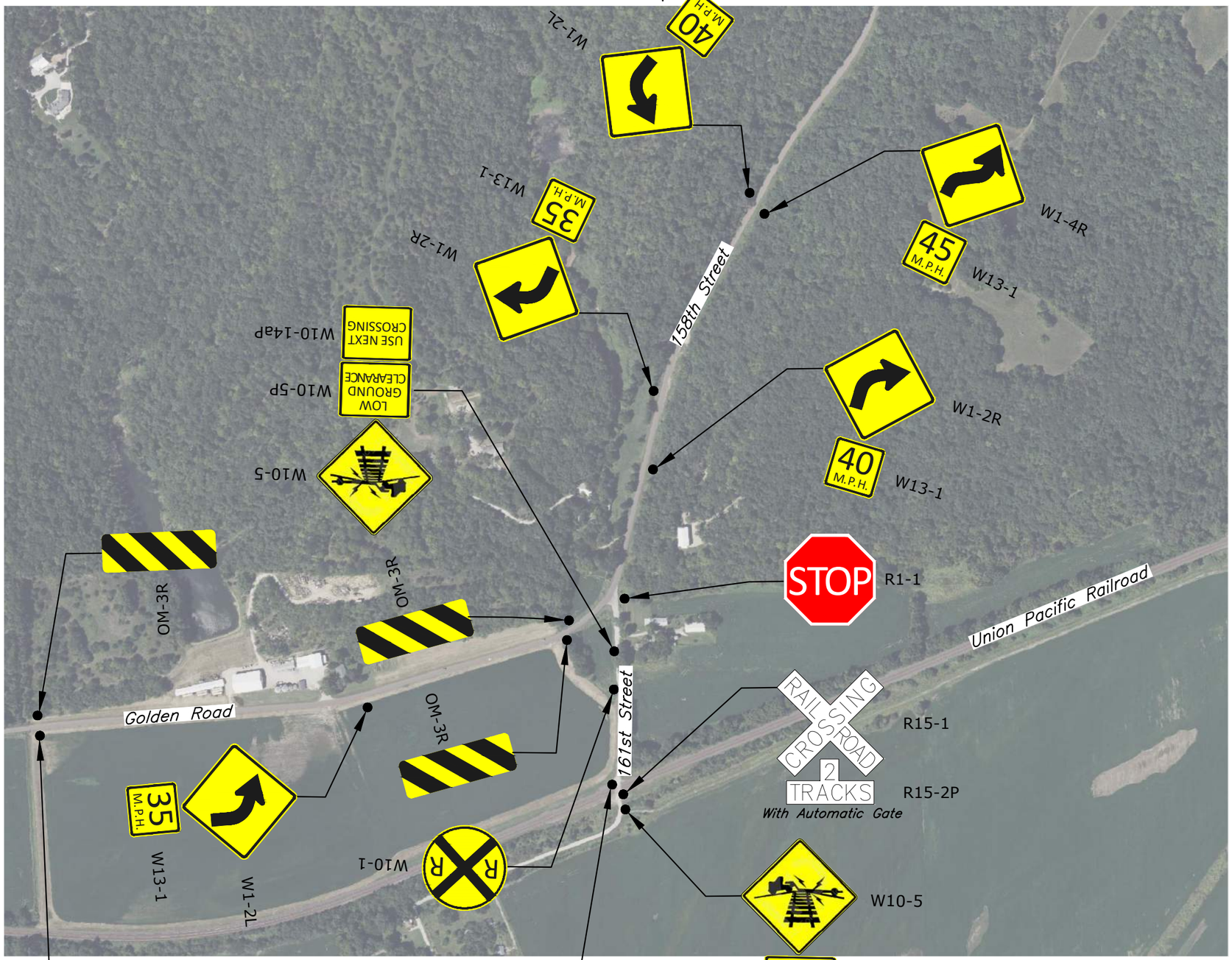
337

G:\16477\Civil 3D\Production Drawings\Exhibits\Civil\Traffic Study Exhibits\Existing Signing.dwg Layout: 6 Existing Signing -- 166thAndGolden -- Friday September 27, 2024, 9:53am -- Copyright 2024, George Butler Associates, Inc.

G:\16477\Civil 3D\Production Drawings\Exhibits\Civil\Traffic Study Exhibits\Existing Signing.dwg Layout: 7 Existing Signing -- 158thAtGolden -- Friday September 27, 2024, 9:53am -- Copyright 2024, George Butler Associates, Inc.



Note:
- *Street name signs are present at intersections but are not shown on these sheets*

250' 0' 250' 500'
SCALE : 1 INCH = 500 FEET

158th Street & Golden Road
Existing Signing

GBA
9801 Renner Blvd., Ste. 300
Lenexa, KS 66219
913.492.0400
gbateam.com

LENAPE SAND OPERATION
166th St. & Lenape Rd.
Leavenworth County, Kansas
Existing Signing Conditions

PROJECT NUMBER
16477.00
DATE
9/27/2024

Note:
- *Street name signs are present at intersections but are not shown on these sheets*

250' 0' 250' 500'
SCALE : 1 INCH = 500 FEET

158th Street & Loring Road
Existing Signing

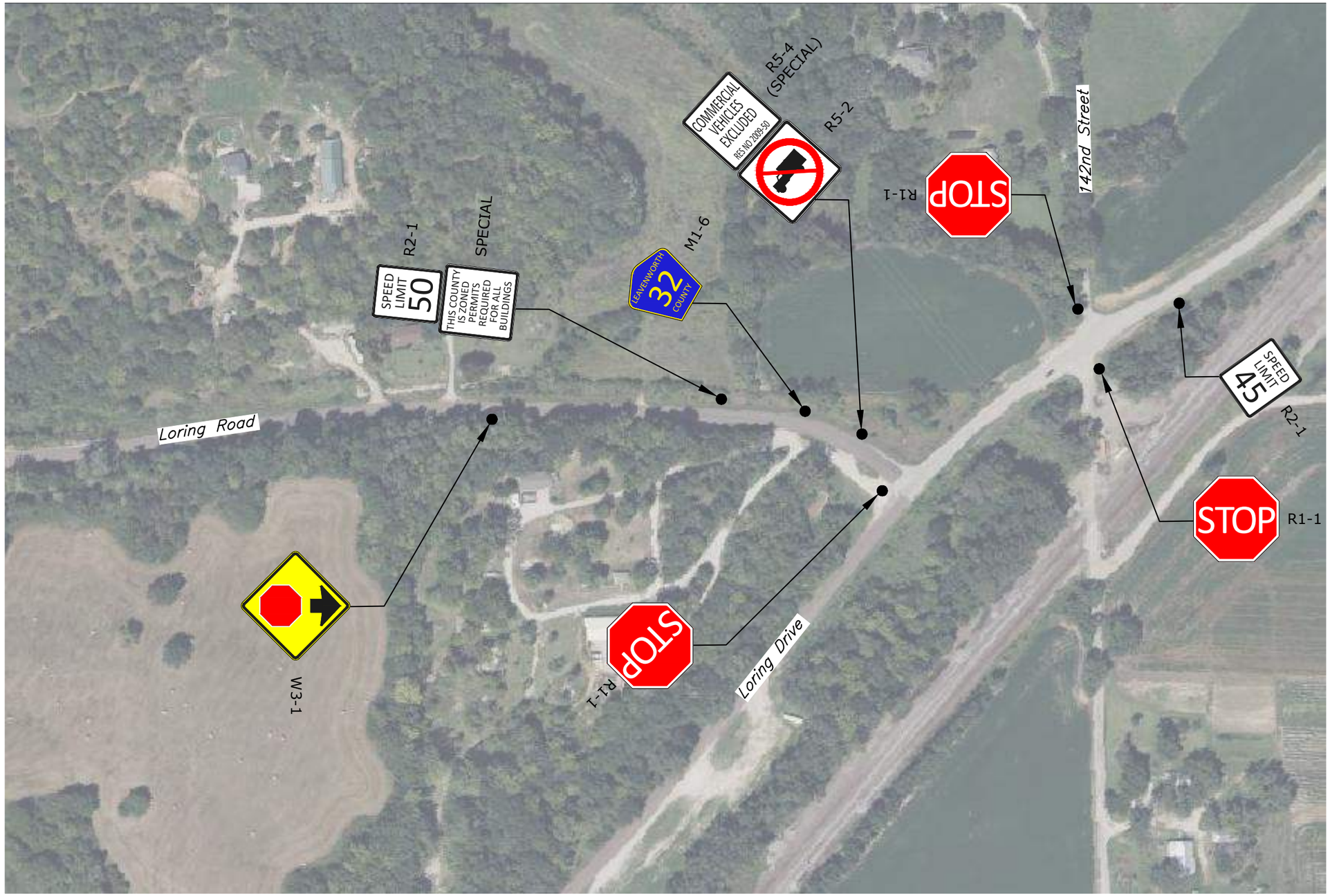
GBA
9801 Renner Blvd., Ste. 300
Lenexa, KS 66219
913.492.0400
gbateam.com

LENAPE SAND OPERATION
166th St. & Lenape Rd.
Leavenworth County, Kansas
Existing Signing Conditions

PROJECT NUMBER
16477.00
DATE
9/27/2024

339

G:\16477\Civil 3D\Production Drawings\Exhibits\Civil\Traffic Study Exhibits\Existing Signing.dwg Layout: 8 Existing Signing - 158thNLoring --- Friday September 27, 2024, 9:53am --- Copyright 2024, George Butler Associates, Inc.



Note:
- *Street name signs are present at intersections but are not shown on these sheets*

100' 0' 100' 200'
SCALE : 1 INCH = 200 FEET

Loring Road & Loring Lane
Existing Signage

GBA
9801 Renner Blvd., Ste. 300
Lenexa, KS 66219
913.492.0400
gbateam.com

LENAPE SAND OPERATION
166th St. & Lenape Rd.
Leavenworth County, Kansas
Existing Signing Conditions

PROJECT NUMBER
16477.00

DATE
9/27/2024

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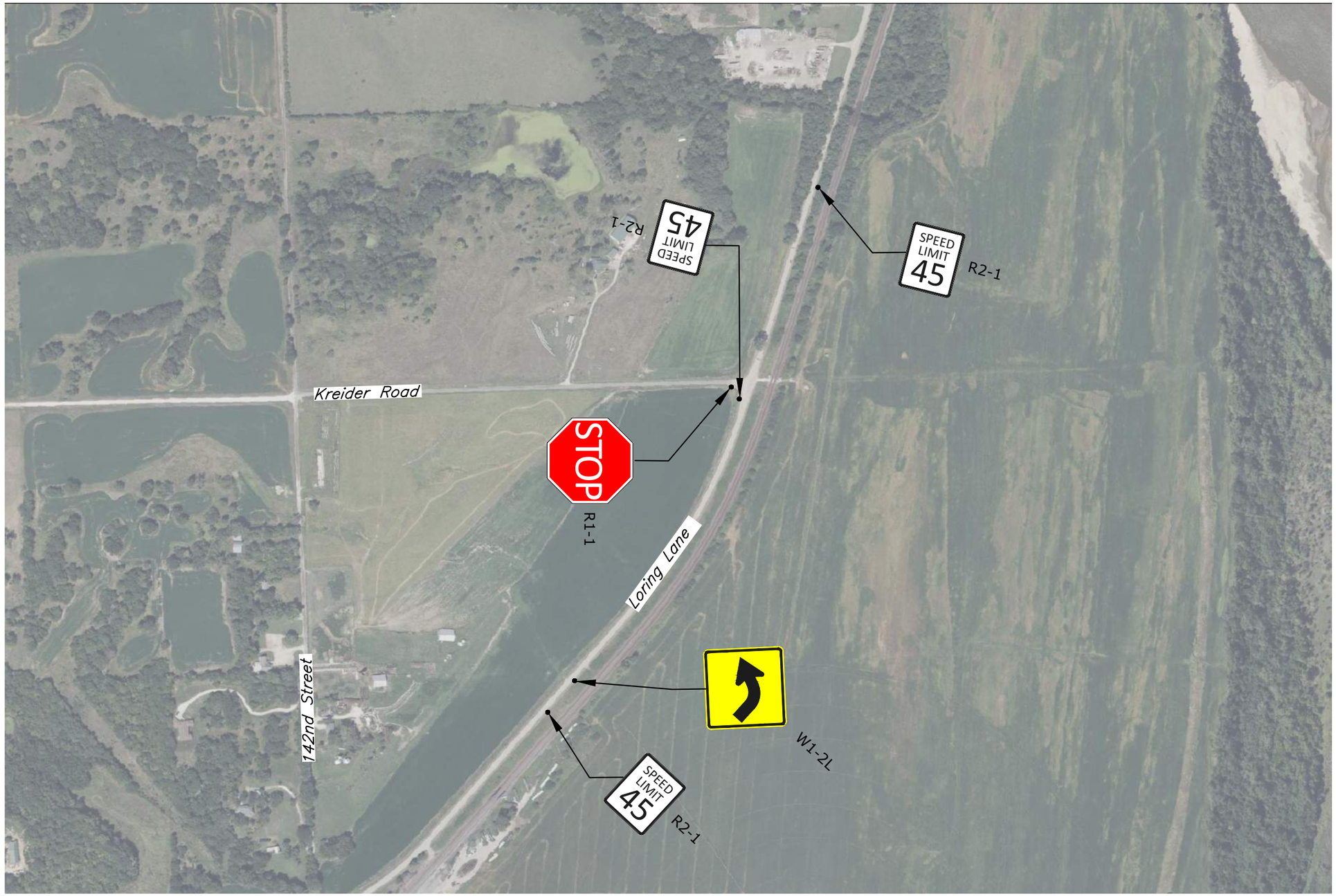
C:\16477\Civil 3D\Production Drawings\Exhibits\Civil\Traffic Study Exhibits\Existing Signing.dwg Layout: 9 Existing Signing - Loring&Loring -- Tuesday June 17, 2025, 1:28pm -- Copyright 2025, George Butler Associates, Inc.



Note:
- Street name signs are present at intersections but are not shown on these sheets

250' 0' 250' 500'
SCALE : 1 INCH = 500 FEET

Loring Lane
Existing Signage

GBA
9801 Renner Blvd., Ste. 300
Lenexa, KS 66219
913.492.0400
gbateam.com

LENAPE SAND OPERATION
166th St. & Lenape Rd.
Leavenworth County, Kansas
Existing Signing Conditions

PROJECT NUMBER
16477.00

DATE
9/27/2024

341

G:\16477\Civil 3D\Production Drawings\Exhibits\Civil\Traffic Study Exhibits\Existing Signing.dwg Layout: 10 Existing Signing - Loring 1 -- Friday September 27, 2024, 9:53am -- Copyright 2024, George Butler Associates, Inc.

G:\16477\Civil 3D\Production Drawings\Exhibits\Civil\Traffic Study Exhibits\Existing Signing.dwg Layout: 11 Existing Signing - Loring 2 -- Friday September 27, 2024, 9:53am -- Copyright 2024, George Butler Associates, Inc.

Note:
- Street name signs are present at intersections but are not shown on these sheets

250' 0' 250' 500'
SCALE : 1 INCH = 500 FEET

Loring Lane
Existing Signage

GBA
9801 Renner Blvd., Ste. 300
Lenexa, KS 66219
913.492.0400
gbateam.com

LENAPE SAND OPERATION
166th St. & Lenape Rd.
Leavenworth County, Kansas
Existing Signing Conditions

PROJECT NUMBER
16477.00

DATE
9/27/2024

APPENDIX H
INTERSECTION TURN LANE WARRANT ANALYSES

APPENDIX H.1
GOLDEN ROAD / 158TH STREET & 161ST STREET INTERSECTION TURN LANE WARRANT ANALYSIS

Eastbound Right-Turn Lane Warrants for Golden Road / 158th Street & 161st Street

Highway Speed: 50 mph
Highway DDHV = (2,040 / 2) * 0.10 = 103 vph
Maximum Right-Turn Volume = 18 (Existing + Operation Primary Route Operational A.M. Peak Hour)

Eastbound Right-Turn Lane Not Warranted

Table 4-25. Right-turn treatment guidelines for two-lane highways

Highway DDHV (vph)	Highway Operating Speed (mph)											
	40		45		50		55		60		65	
	Lane	Taper	Lane	Taper	Lane	Taper	Lane	Taper	Lane	Taper	Lane	Taper
200				83	73	30	35	14	20	8	15	7
300			120	40	41	19	24	9	15	7	12	6
400	200	85	52	27	30	14	19	8	12	6	11	5
600	50	27	26	13	20	9	14	6	10	5	9	4
800	25	12	16	8	15	7	11	5	9	4	8	3
1000	14	8	12	5	11	5	9	4	8	3	7	3
1200	10	6	9	4	9	4	8	4	7	3	7	3

Source : "Guidelines for right-turn treatments at unsignalized intersections and driveways," K-Tran:KSU-95-5, Kansas Department of Transportation, Kansas State University, Tanweer Hasan, Dr. Robert W. Stokes

- Turning speed is 15 mph (right-turn)
- The values presented in this table represent minimum right-turn design hour volumes (vph) required to warrant right-turn treatments (lane or taper)
- DDHV = directional design hourly volumes

Southbound Left-Turn Lane Warrants for Golden Road / 158th Street & 161st Street

Highway Speed: 50 mph
Highway DDHV = (2,040 / 2) * 0.10 = 103 vph
Maximum Left-Turn / Straight Volume = 16 (Existing + Operation Secondary Route Operational A.M. Peak Hour)
Left Turn Percentage = 16 / 103 = 15.5%

Southbound Left-Turn Lane Not Warranted

Table 4-27. Recommended left-turn lane warrants for two-lane highways

Opposing Volume V_o (vph)	Advancing Volume V_a (vph)			
	5% Left turns	10% Left turns	20% Left turns	30% Left turns
40-mph speed				
800	136	99	74	65
700	159	116	87	76
600	186	135	101	88
500	218	158	119	103
400	255	185	139	121
300	301	218	164	143
200	356	259	194	169
100	426	309	232	202
50-mph speed				
800	118	86	64	56
700	138	100	75	66
600	161	117	88	77
500	188	137	103	90
400	221	161	120	105
300	260	189	142	124
200	309	224	168	147
100	369	268	201	175
60-mph speed				
800	96	70	53	46
700	113	82	61	54
600	131	95	72	63
500	154	112	84	73
400	181	131	98	86
300	213	154	116	101
200	252	183	137	120
100	301	219	164	143
70-mph speed				
800	68	50	37	32
700	80	58	43	38
600	93	68	51	44
500	109	79	59	52
400	128	93	70	61
300	150	109	82	72
200	178	129	97	85
100	213	155	116	101

Source: Adapted from Van Schalkwyk, I., and V. Stover. Revisiting Existing Warrants for Left-Turn Lanes at Unsignalized Intersections on Two-Way Roadways, TRB 2007 Annual Meeting CD-ROM, National Research Council, Washington, D.C. (2007).
Note: Critical gap = 8.0 seconds, time to turn left = 4.3 seconds, time to clear lane = 3.2 seconds

APPENDIX H.2
GOLDEN ROAD & 166TH STREET
INTERSECTION TURN LANE
WARRANT ANALYSIS

Eastbound Right-Turn Lane Warrants for Golden Road & 166th Street

Highway Speed: 50 mph
Highway DDHV = (2,067 / 2) * 0.10 = 103 vph
Maximum Right-Turn Volume = 110 (Existing Operational A.M. Peak Hour)

Eastbound Right-Turn Lane Warranted

Table 4-25. Right-turn treatment guidelines for two-lane highways

Highway DDHV (vph)	Highway Operating Speed (mph)											
	40		45		50		55		60		65	
	Lane	Taper	Lane	Taper	Lane	Taper	Lane	Taper	Lane	Taper	Lane	Taper
200				83	73	30	35	14	20	8	15	7
300			120	40	41	19	24	9	15	7	12	6
400	200	85	52	27	30	14	19	8	12	6	11	5
600	50	27	26	13	20	9	14	6	10	5	9	4
800	25	12	16	8	15	7	11	5	9	4	8	3
1000	14	8	12	5	11	5	9	4	8	3	7	3
1200	10	6	9	4	9	4	8	4	7	3	7	3

Source : "Guidelines for right-turn treatments at unsignalized intersections and driveways," K-Tran:KSU-95-5, Kansas Department of Transportation, Kansas State University, Tanweer Hasan, Dr. Robert W. Stokes

- Turning speed is 15 mph (right-turn)
- The values presented in this table represent minimum right-turn design hour volumes (vph) required to warrant right-turn treatments (lane or taper)
- DDHV = directional design hourly volumes

Westbound Left-Turn Lane Warrants for Golden Road & 166th Street

Highway Speed: 50 mph
Highway DDHV = (2,067 / 2) * 0.10 = 103 vph
Maximum Left-Turn Volume = 61 (Existing Operational A.M. Peak Hour)
Left Turn Percentage = 61 / 103 = 59.2%

Westbound Left-Turn Lane Not Warranted

Table 4-27. Recommended left-turn lane warrants for two-lane highways

Opposing Volume V_o (vph)	Advancing Volume V_a (vph)			
	5% Left turns	10% Left turns	20% Left turns	30% Left turns
40-mph speed				
800	136	99	74	65
700	159	116	87	76
600	186	135	101	88
500	218	158	119	103
400	255	185	139	121
300	301	218	164	143
200	356	259	194	169
100	426	309	232	202
50-mph speed				
800	118	86	64	56
700	138	100	75	66
600	161	117	88	77
500	188	137	103	90
400	221	161	120	105
300	260	189	142	124
200	309	224	168	147
100	369	268	201	175
60-mph speed				
800	96	70	53	46
700	113	82	61	54
600	131	95	72	63
500	154	112	84	73
400	181	131	98	86
300	213	154	116	101
200	252	183	137	120
100	301	219	164	143
70-mph speed				
800	68	50	37	32
700	80	58	43	38
600	93	68	51	44
500	109	79	59	52
400	128	93	70	61
300	150	109	82	72
200	178	129	97	85
100	213	155	116	101

Source: Adapted from Van Schalkwyk, I., and V. Stover. Revisiting Existing Warrants for Left-Turn Lanes at Unsignalized Intersections on Two-Way Roadways, TRB 2007 Annual Meeting CD-ROM, National Research Council, Washington, D.C. (2007).
Note: Critical gap = 8.0 seconds, time to turn left = 4.3 seconds, time to clear lane = 3.2 seconds

APPENDIX H.3
K-32 (LINWOOD ROAD) & 189TH STREET / GOLDEN ROAD INTERSECTION TURN LANE WARRANT ANALYSIS

Northbound Right-Turn Lane Warrants for K-32 (Linwood Road) & 189th Street / Golden Road

Highway Speed: 65 mph
Highway DDHV = (3,219 / 2) * 0.10 = 161 vph
Maximum Right-Turn Volume = 75 (Existing + Operation Primary Route Operational A.M. Peak Hour)

Northbound Right-Turn Lane Warranted; Currently Constructed

Table 4-25. Right-turn treatment guidelines for two-lane highways

Highway DDHV (vph)	Highway Operating Speed (mph)											
	40		45		50		55		60		65	
	Lane	Taper	Lane	Taper	Lane	Taper	Lane	Taper	Lane	Taper	Lane	Taper
200				83	73	30	35	14	20	8	15	7
300			120	40	41	19	24	9	15	7	12	6
400	200	85	52	27	30	14	19	8	12	6	11	5
600	50	27	26	13	20	9	14	6	10	5	9	4
800	25	12	16	8	15	7	11	5	9	4	8	3
1000	14	8	12	5	11	5	9	4	8	3	7	3
1200	10	6	9	4	9	4	8	4	7	3	7	3

Source : "Guidelines for right-turn treatments at unsignalized intersections and driveways," K-Tran:KSU-95-5, Kansas Department of Transportation, Kansas State University, Tanweer Hasan, Dr. Robert W. Stokes

- Turning speed is 15 mph (right-turn)
- The values presented in this table represent minimum right-turn design hour volumes (vph) required to warrant right-turn treatments (lane or taper)
- DDHV = directional design hourly volumes

Southbound Left-Turn Lane Warrants for K-32 (Linwood Road) & 189th Street / Golden Road

Highway Speed: 65 mph
Highway DDHV = (3,219 / 2) * 0.10 = 161 vph
Maximum Left-Turn Volume = 29 (Existing + Operation Primary Route Operational A.M. Peak Hour)
Left Turn Percentage = 61 / 103 = 30.2%

Southbound Left-Turn Lane Not Warranted

Table 4-27. Recommended left-turn lane warrants for two-lane highways

Opposing Volume V_o (vph)	Advancing Volume V_a (vph)			
	5% Left turns	10% Left turns	20% Left turns	30% Left turns
40-mph speed				
800	136	99	74	65
700	159	116	87	76
600	186	135	101	88
500	218	158	119	103
400	255	185	139	121
300	301	218	164	143
200	356	259	194	169
100	426	309	232	202
50-mph speed				
800	118	86	64	56
700	138	100	75	66
600	161	117	88	77
500	188	137	103	90
400	221	161	120	105
300	260	189	142	124
200	309	224	168	147
100	369	268	201	175
60-mph speed				
800	96	70	53	46
700	113	82	61	54
600	131	95	72	63
500	154	112	84	73
400	181	131	98	86
300	213	154	116	101
200	252	183	137	120
100	301	219	164	143
70-mph speed				
800	68	50	37	32
700	80	58	43	38
600	93	68	51	44
500	109	79	59	52
400	128	93	70	61
300	150	109	82	72
200	178	129	97	85
100	213	155	116	101

Source: Adapted from Van Schalkwyk, I., and V. Stover. Revisiting Existing Warrants for Left-Turn Lanes at Unsignalized Intersections on Two-Way Roadways, TRB 2007 Annual Meeting CD-ROM, National Research Council, Washington, D.C. (2007).
Note: Critical gap = 8.0 seconds, time to turn left = 4.3 seconds, time to clear lane = 3.2 seconds

APPENDIX H.4
158TH STREET & LORING ROAD
INTERSECTION TURN LANE
WARRANT ANALYSIS

Northbound Right-Turn Lane Warrants for 158th Street & Loring Road

Highway Speed: 50 mph
Highway DDHV = (1,794 / 2) * 0.10 = 90 vph
Maximum Right-Turn Volume = 51 (Existing + Operation Secondary Route Operational A.M. Peak Hour)

Northbound Right-Turn Lane Taper Warranted

Table 4-25. Right-turn treatment guidelines for two-lane highways

Highway DDHV (vph)	Highway Operating Speed (mph)											
	40		45		50		55		60		65	
	Lane	Taper	Lane	Taper	Lane	Taper	Lane	Taper	Lane	Taper	Lane	Taper
200				83	73	30	35	14	20	8	15	7
300			120	40	41	19	24	9	15	7	12	6
400	200	85	52	27	30	14	19	8	12	6	11	5
600	50	27	26	13	20	9	14	6	10	5	9	4
800	25	12	16	8	15	7	11	5	9	4	8	3
1000	14	8	12	5	11	5	9	4	8	3	7	3
1200	10	6	9	4	9	4	8	4	7	3	7	3

Source : "Guidelines for right-turn treatments at unsignalized intersections and driveways," K-Tran:KSU-95-5, Kansas Department of Transportation, Kansas State University, Tanweer Hasan, Dr. Robert W. Stokes

- Turning speed is 15 mph (right-turn)
- The values presented in this table represent minimum right-turn design hour volumes (vph) required to warrant right-turn treatments (lane or taper)
- DDHV = directional design hourly volumes

Southbound Left-Turn Lane Warrants for 158th Street & Loring Road

Highway Speed: 50 mph
Highway DDHV = (1,794 / 2) * 0.10 = 90 vph
Maximum Left-Turn Volume = 7 (Existing + Operation Primary Route Operational A.M. Peak Hour)
Left Turn Percentage = 7 / 62 = 11.3%

Southbound Left-Turn Lane Not Warranted

Table 4-27. Recommended left-turn lane warrants for two-lane highways

Opposing Volume V_o (vph)	Advancing Volume V_a (vph)			
	5% Left turns	10% Left turns	20% Left turns	30% Left turns
40-mph speed				
800	136	99	74	65
700	159	116	87	76
600	186	135	101	88
500	218	158	119	103
400	255	185	139	121
300	301	218	164	143
200	356	259	194	169
100	426	309	232	202
50-mph speed				
800	118	86	64	56
700	138	100	75	66
600	161	117	88	77
500	188	137	103	90
400	221	161	120	105
300	260	189	142	124
200	309	224	168	147
100	369	268	201	175
60-mph speed				
800	96	70	53	46
700	113	82	61	54
600	131	95	72	63
500	154	112	84	73
400	181	131	98	86
300	213	154	116	101
200	252	183	137	120
100	301	219	164	143
70-mph speed				
800	68	50	37	32
700	80	58	43	38
600	93	68	51	44
500	109	79	59	52
400	128	93	70	61
300	150	109	82	72
200	178	129	97	85
100	213	155	116	101

Source: Adapted from Van Schalkwyk, I., and V. Stover. Revisiting Existing Warrants for Left-Turn Lanes at Unsignalized Intersections on Two-Way Roadways, TRB 2007 Annual Meeting CD-ROM, National Research Council, Washington, D.C. (2007).
Note: Critical gap = 8.0 seconds, time to turn left = 4.3 seconds, time to clear lane = 3.2 seconds

Southbound Right-Turn Lane Warrants for 158th Street & Loring Road

Highway Speed: 50 mph
Highway DDHV = (1,794 / 2) * 0.10 = 90 vph
Maximum Right-Turn Volume = 7 (Existing Operational A.M. Peak Hour)

Southbound Right-Turn Lane Not Warranted

Table 4-25. Right-turn treatment guidelines for two-lane highways

Highway DDHV (vph)	Highway Operating Speed (mph)											
	40		45		50		55		60		65	
	Lane	Taper	Lane	Taper	Lane	Taper	Lane	Taper	Lane	Taper	Lane	Taper
200				83	73	30	35	14	20	8	15	7
300			120	40	41	19	24	9	15	7	12	6
400	200	85	52	27	30	14	19	8	12	6	11	5
600	50	27	26	13	20	9	14	6	10	5	9	4
800	25	12	16	8	15	7	11	5	9	4	8	3
1000	14	8	12	5	11	5	9	4	8	3	7	3
1200	10	6	9	4	9	4	8	4	7	3	7	3

Source : "Guidelines for right-turn treatments at unsignalized intersections and driveways," K-Tran:KSU-95-5, Kansas Department of Transportation, Kansas State University, Tanweer Hasan, Dr. Robert W. Stokes

- Turning speed is 15 mph (right-turn)
- The values presented in this table represent minimum right-turn design hour volumes (vph) required to warrant right-turn treatments (lane or taper)
- DDHV = directional design hourly volumes

Northbound Left-Turn Lane Warrants for 158th Street & Loring Road

Highway Speed: 50 mph
Highway DDHV = (1,794 / 2) * 0.10 = 90 vph
Maximum Left-Turn Volume = 8 (Existing Operational P.M. Peak Hour)
Left Turn Percentage = 8 / 42 = 19.0%

Northbound Left-Turn Lane Not Warranted

Table 4-27. Recommended left-turn lane warrants for two-lane highways

Opposing Volume V_o (vph)	Advancing Volume V_a (vph)			
	5% Left turns	10% Left turns	20% Left turns	30% Left turns
40-mph speed				
800	136	99	74	65
700	159	116	87	76
600	186	135	101	88
500	218	158	119	103
400	255	185	139	121
300	301	218	164	143
200	356	259	194	169
100	426	309	232	202
50-mph speed				
800	118	86	64	56
700	138	100	75	66
600	161	117	88	77
500	188	137	103	90
400	221	161	120	105
300	260	189	142	124
200	309	224	168	147
100	369	268	201	175
60-mph speed				
800	96	70	53	46
700	113	82	61	54
600	131	95	72	63
500	154	112	84	73
400	181	131	98	86
300	213	154	116	101
200	252	183	137	120
100	301	219	164	143
70-mph speed				
800	68	50	37	32
700	80	58	43	38
600	93	68	51	44
500	109	79	59	52
400	128	93	70	61
300	150	109	82	72
200	178	129	97	85
100	213	155	116	101

Source: Adapted from Van Schalkwyk, I., and V. Stover. Revisiting Existing Warrants for Left-Turn Lanes at Unsignalized Intersections on Two-Way Roadways, TRB 2007 Annual Meeting CD-ROM, National Research Council, Washington, D.C. (2007).
Note: Critical gap = 8.0 seconds, time to turn left = 4.3 seconds, time to clear lane = 3.2 seconds

APPENDIX H.5
LORING LANE & 142ND STREET
INTERSECTION TURN LANE
WARRANT ANALYSIS

Eastbound Right-Turn Lane Warrants for Loring Lane & 142nd Street

Highway Speed: 45 mph
Highway DDHV = (1,533 / 2) * 0.10 = 77 vph
Maximum Right-Turn Volume = 1 (Existing Operational A.M. Peak Hour)

Eastbound Right-Turn Lane Taper Not Warranted

Table 4-25. Right-turn treatment guidelines for two-lane highways

Highway DDHV (vph)	Highway Operating Speed (mph)											
	40		45		50		55		60		65	
	Lane	Taper	Lane	Taper	Lane	Taper	Lane	Taper	Lane	Taper	Lane	Taper
200				83	73	30	35	14	20	8	15	7
300			120	40	41	19	24	9	15	7	12	6
400	200	85	52	27	30	14	19	8	12	6	11	5
600	50	27	26	13	20	9	14	6	10	5	9	4
800	25	12	16	8	15	7	11	5	9	4	8	3
1000	14	8	12	5	11	5	9	4	8	3	7	3
1200	10	6	9	4	9	4	8	4	7	3	7	3

Source : "Guidelines for right-turn treatments at unsignalized intersections and driveways," K-Tran:KSU-95-5, Kansas Department of Transportation, Kansas State University, Tanweer Hasan, Dr. Robert W. Stokes

- Turning speed is 15 mph (right-turn)
- The values presented in this table represent minimum right-turn design hour volumes (vph) required to warrant right-turn treatments (lane or taper)
- DDHV = directional design hourly volumes

Westbound Left-Turn Lane Warrants for Loring Lane & 142nd Street

Highway Speed: 45 mph
Highway DDHV = (1,533 / 2) * 0.10 = 77 vph
Maximum Left-Turn Volume = 0 (Existing Operational A.M. Peak Hour)
Left Turn Percentage = 0.0%

Westbound Left-Turn Lane Not Warranted

Table 4-27. Recommended left-turn lane warrants for two-lane highways

Opposing Volume V_o (vph)	Advancing Volume V_a (vph)			
	5% Left turns	10% Left turns	20% Left turns	30% Left turns
40-mph speed				
800	136	99	74	65
700	159	116	87	76
600	186	135	101	88
500	218	158	119	103
400	255	185	139	121
300	301	218	164	143
200	356	259	194	169
100	426	309	232	202
50-mph speed				
800	118	86	64	56
700	138	100	75	66
600	161	117	88	77
500	188	137	103	90
400	221	161	120	105
300	260	189	142	124
200	309	224	168	147
100	369	268	201	175
60-mph speed				
800	96	70	53	46
700	113	82	61	54
600	131	95	72	63
500	154	112	84	73
400	181	131	98	86
300	213	154	116	101
200	252	183	137	120
100	301	219	164	143
70-mph speed				
800	68	50	37	32
700	80	58	43	38
600	93	68	51	44
500	109	79	59	52
400	128	93	70	61
300	150	109	82	72
200	178	129	97	85
100	213	155	116	101

Source: Adapted from Van Schalkwyk, I., and V. Stover. Revisiting Existing Warrants for Left-Turn Lanes at Unsignalized Intersections on Two-Way Roadways, TRB 2007 Annual Meeting CD-ROM, National Research Council, Washington, D.C. (2007).
Note: Critical gap = 8.0 seconds, time to turn left = 4.3 seconds, time to clear lane = 3.2 seconds

Westbound Right-Turn Lane Warrants for Loring Lane & 142nd Street

Highway Speed: 45 mph
Highway DDHV = (1,533 / 2) * 0.10 = 77 vph
Maximum Right-Turn Volume = 0 (Existing Operational A.M. Peak Hour)

Westbound Right-Turn Lane Not Warranted

Table 4-25. Right-turn treatment guidelines for two-lane highways

Highway DDHV (vph)	Highway Operating Speed (mph)											
	40		45		50		55		60		65	
	Lane	Taper	Lane	Taper	Lane	Taper	Lane	Taper	Lane	Taper	Lane	Taper
200				83	73	30	35	14	20	8	15	7
300			120	40	41	19	24	9	15	7	12	6
400	200	85	52	27	30	14	19	8	12	6	11	5
600	50	27	26	13	20	9	14	6	10	5	9	4
800	25	12	16	8	15	7	11	5	9	4	8	3
1000	14	8	12	5	11	5	9	4	8	3	7	3
1200	10	6	9	4	9	4	8	4	7	3	7	3

Source : "Guidelines for right-turn treatments at unsignalized intersections and driveways," K-Tran:KSU-95-5, Kansas Department of Transportation, Kansas State University, Tanweer Hasan, Dr. Robert W. Stokes

- Turning speed is 15 mph (right-turn)
- The values presented in this table represent minimum right-turn design hour volumes (vph) required to warrant right-turn treatments (lane or taper)
- DDHV = directional design hourly volumes

Eastbound Left-Turn Lane Warrants for Loring Lane & 142nd Street

Highway Speed: 45 mph
Highway DDHV = (1,533 / 2) * 0.10 = 77 vph
Maximum Left-Turn Volume = 0 (Existing Operational P.M. Peak Hour)
Left Turn Percentage = 0.0%

Eastbound Left-Turn Lane Not Warranted

Table 4-27. Recommended left-turn lane warrants for two-lane highways

Opposing Volume V_o (vph)	Advancing Volume V_a (vph)			
	5% Left turns	10% Left turns	20% Left turns	30% Left turns
40-mph speed				
800	136	99	74	65
700	159	116	87	76
600	186	135	101	88
500	218	158	119	103
400	255	185	139	121
300	301	218	164	143
200	356	259	194	169
100	426	309	232	202
50-mph speed				
800	118	86	64	56
700	138	100	75	66
600	161	117	88	77
500	188	137	103	90
400	221	161	120	105
300	260	189	142	124
200	309	224	168	147
100	369	268	201	175
60-mph speed				
800	96	70	53	46
700	113	82	61	54
600	131	95	72	63
500	154	112	84	73
400	181	131	98	86
300	213	154	116	101
200	252	183	137	120
100	301	219	164	143
70-mph speed				
800	68	50	37	32
700	80	58	43	38
600	93	68	51	44
500	109	79	59	52
400	128	93	70	61
300	150	109	82	72
200	178	129	97	85
100	213	155	116	101

Source: Adapted from Van Schalkwyk, I., and V. Stover. Revisiting Existing Warrants for Left-Turn Lanes at Unsignalized Intersections on Two-Way Roadways, TRB 2007 Annual Meeting CD-ROM, National Research Council, Washington, D.C. (2007).
Note: Critical gap = 8.0 seconds, time to turn left = 4.3 seconds, time to clear lane = 3.2 seconds

APPENDIX H.6
LORING LANE / WEST FRONT STREET & K-32 TRUCK ROUTE (SANTA FE ROAD) INTERSECTION TURN LANE WARRANT ANALYSIS

Southbound Right-Turn Lane Warrants for Loring Lane / West Front Street & K-32 Truck Route (Santa Fe Road)

Highway Speed: 35 mph
Highway DDHV = (3,347 / 2) * 0.10 = 168 vph
Maximum Right-Turn Volume = 66 (Existing + Operation Primary Route Operational A.M. Peak Hour)

Southbound Right-Turn Lane Not Warranted

Table 4-26. Right-turn treatment guidelines for four-lane highways

Highway DDHV (vph)	Highway Operating Speed (mph)											
	40		45		50		55		60		65	
	Lane	Taper	Lane	Taper	Lane	Taper	Lane	Taper	Lane	Taper	Lane	Taper
300						55	75	25	19	9	19	9
400			145	65	75	30	40	17	16	8	15	8
500		140	95	50	57	25	32	14	14	7	13	7
600	160	80	65	30	42	18	26	11	12	6	12	6
800	70	40	37	18	28	12	19	8	11	5	11	5
1200	25	14	20	10	18	8	14	6	8	4	8	4
1600	15	8	14	6	13	6	10	5	7	3	7	3
2000	10	6	9	6	9	4	8	4	6	3	6	3

Source: "Guidelines for right-turn treatments at unsignalized intersections and driveways," K-Tran:KSU-95-5, Kansas Department of Transportation, Kansas State University, Tanweer Hasan, Dr. Robert W. Stokes

- Turning speed is 15 mph (right-turn)
- The values presented in this table represent minimum right-turn design hour volumes (vph) required to warrant right-turn treatments (lane or taper)
- DDHV = directional design hourly volumes

Northbound Left-Turn Lane Warrants for Loring Lane / West Front Street & K-32 Truck Route (Santa Fe Road)

Highway Speed: 35 mph
Highway DDHV = (3,347 / 2) * 0.10 = 168 vph
Maximum Left-Turn Volume = 2 (Existing Operational A.M. Peak Hour)
Left Turn Percentage = 2 / 80 = 2.5%

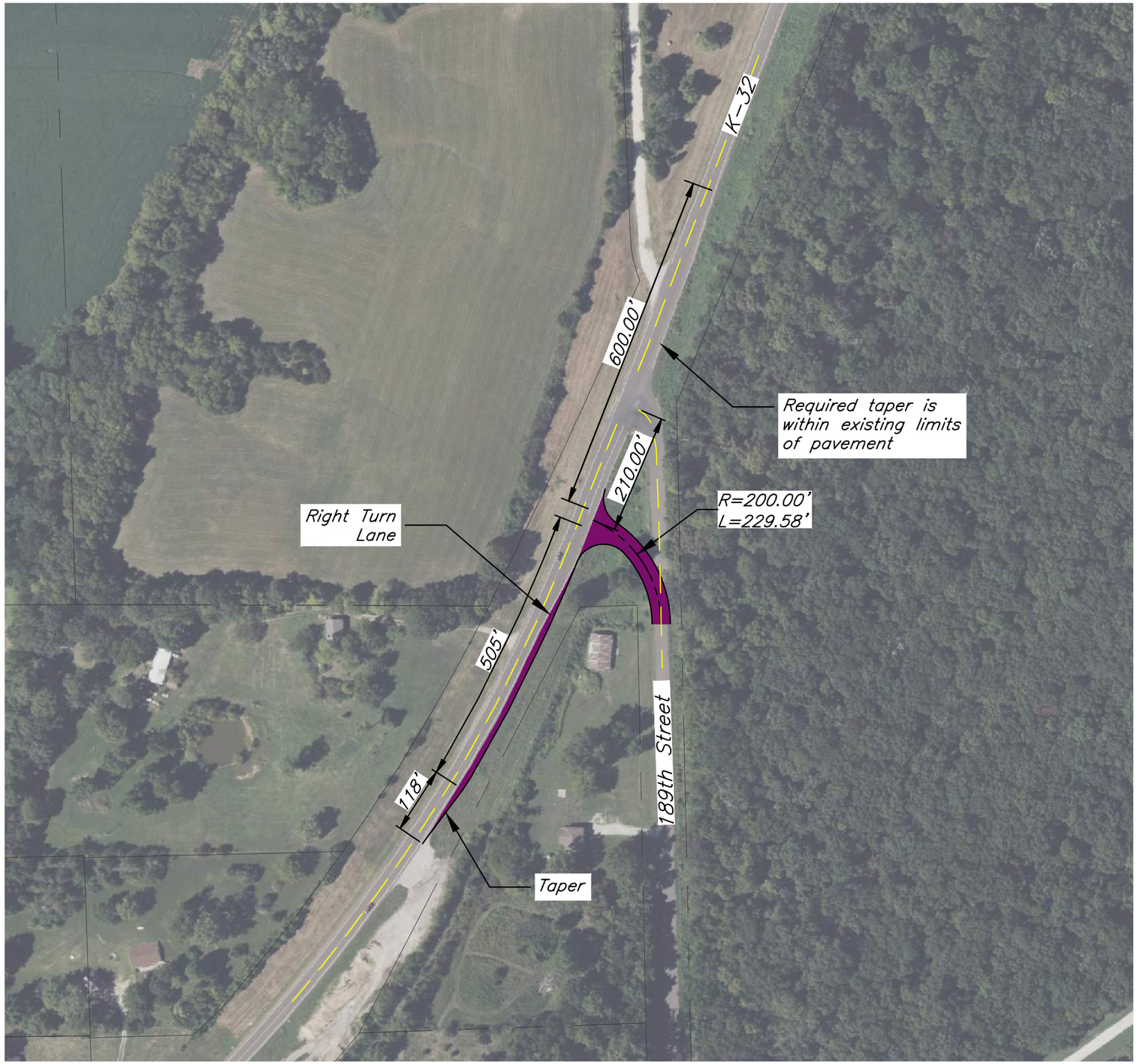
Northbound Left-Turn Lane Not Warranted

Table 4-28. Recommended left-turn lane warrants for four-lane highways

Left-Turn Volume V_L (vph)	4-Lane Undivided Opposing Volume V_o (vph)	4-Lane Divided Opposing Volume V_o (vph)
≥ 29	Turn lane not warranted unless V_a > 400 vph	Turn lane not warranted unless V_a > 400 vph
28		422
26		474
24		530
22		589
20		652
18		719
16		793
14		873
12	414	962
10	542	1062
8	690	1179
6	867	1319
4	1094	1499
2	1429	1762

Source: Adapted from Harmelink, M. D. Volume Warrants for Left-Turn Storage Lanes at Unsignalized Grade Intersections, Highway Research Record, No. 211, Highway Research Board, National Research Council, Washington, D.C. (1967), pp. 1-18.
Note: Critical gap = 8.0 seconds, time to turn left = 5.3 seconds

APPENDIX J
PROPOSED INTERSECTION IMPROVEMENTS



100' 0' 100' 200'
SCALE : 1 INCH = 200 FEET

189th Street & K-32 Highway
Intersection Improvements

GBA
9801 Renner Blvd., Ste. 300
Lenexa, KS 66219
913.492.0400
gbateam.com

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

PROJECT NUMBER
16477.00

DATE
9/25/2025

367

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25' 0' 25' 50'
SCALE : 1 INCH = 50 FEET

161st Street & Golden Road
Intersection Improvements

GBA
9801 Renner Blvd., Ste. 300
Lenexa, KS 66219
913.492.0400
gbateam.com

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

PROJECT NUMBER
16477.00

DATE
9/25/2025



25' 0' 25' 50'

SCALE : 1 INCH = 50 FEET

158th Street & Loring Road
Intersection Improvements

GBA
9801 Renner Blvd., Ste. 300
Lenexa, KS 66219
913.492.0400
gbateam.com

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

PROJECT NUMBER
16477.00

DATE
9/25/2025

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25' 0' 25' 50'

SCALE : 1 INCH = 50 FEET

Loring Road & Loring Lane
Intersection Improvements

GBA
9801 Renner Blvd., Ste. 300
Lenexa, KS 66219
913.492.0400
gbateam.com

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

PROJECT NUMBER
16477.00

DATE
9/25/2025

370

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25' 0' 25' 50'
SCALE : 1 INCH = 50 FEET

Loring Road & Santa Fe Road Intersection Improvements

GBA
9801 Renner Blvd., Ste. 300
Lenexa, KS 66219
913.492.0400
gbateam.com

Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

PROJECT NUMBER
16477.00

DATE
9/25/2025

371

APPENDIX K
PROPOSED SIGNAGE IMPROVEMENTS

Legend

- Existing Sign
- Proposed Sign

Note:
Street name signs are present at intersections, but are not shown.

125' 0' 125' 250'
SCALE : 1 INCH = 250 FEET

GBA

LENAPE SAND OPERATION
PROPOSED SIGNING
K-32 & 189TH STREET

PROJECT NUMBER
16477.00

DATE
09/26/2025

373

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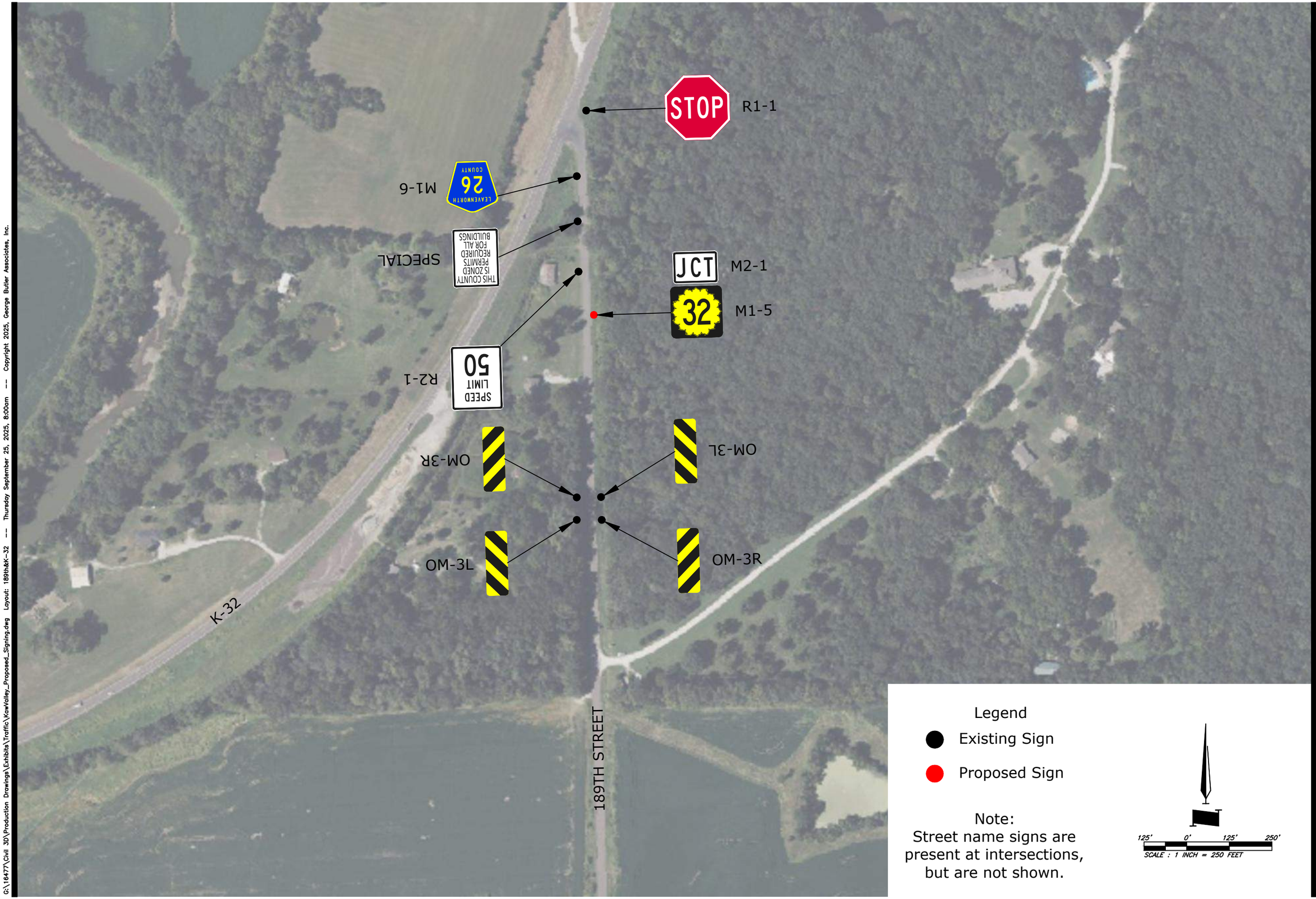

Legend

- Existing Sign
- Proposed Sign

Note:
Street name signs are present at intersections, but are not shown.

125' 0' 125' 250'
SCALE : 1 INCH = 250 FEET

GBA

LENAPE SAND OPERATION
PROPOSED SIGNING
GOLDEN ROAD / 189TH STREET

PROJECT NUMBER
16477.00

DATE
09/26/2025

374

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189TH STREET

W13-1

30 M.P.H.

W1-1L

W1-8L W1-8R

R1-1

STOP

W1-8L W1-8R

W1-1R

W13-1

30 M.P.H.

GOLDEN ROAD

OM-3R

W1-8L W1-8R

NO OUTLET

W14-2

STOP

R1-1

Legend

Existing Sign

Proposed Sign

Note:
Street name signs are present at intersections, but are not shown.

125' 0' 125' 250'

SCALE : 1 INCH = 250 FEET

GBA

LENAPE SAND OPERATION
PROPOSED SIGNING
GOLDEN ROAD / 189TH STREET

PROJECT NUMBER
16477.00

DATE
09/26/2025

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LENAPE SAND OPERATION
PROPOSED SIGNING
GOLDEN ROAD

PROJECT NUMBER
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DATE
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GOLDEN ROAD

170TH STREET

OM-3R

OM-3R

OM-3L

M1-6

M6-1R

R12-1

WEIGHT LIMIT 11 TONS

OM-3R

M1-6

M5-1R

M1-6

M1-6

R1-1

STOP

M5-1L

M1-6

OM4-3

M6-1L

M1-6

R12-1

WEIGHT LIMIT 11 TONS

OM-3L

OM-3R

M6-4

M1-6

M1-6

M4-6

W1-7

Legend

- Existing Sign
- Proposed Sign

Note:
Street name signs are present at intersections, but are not shown.

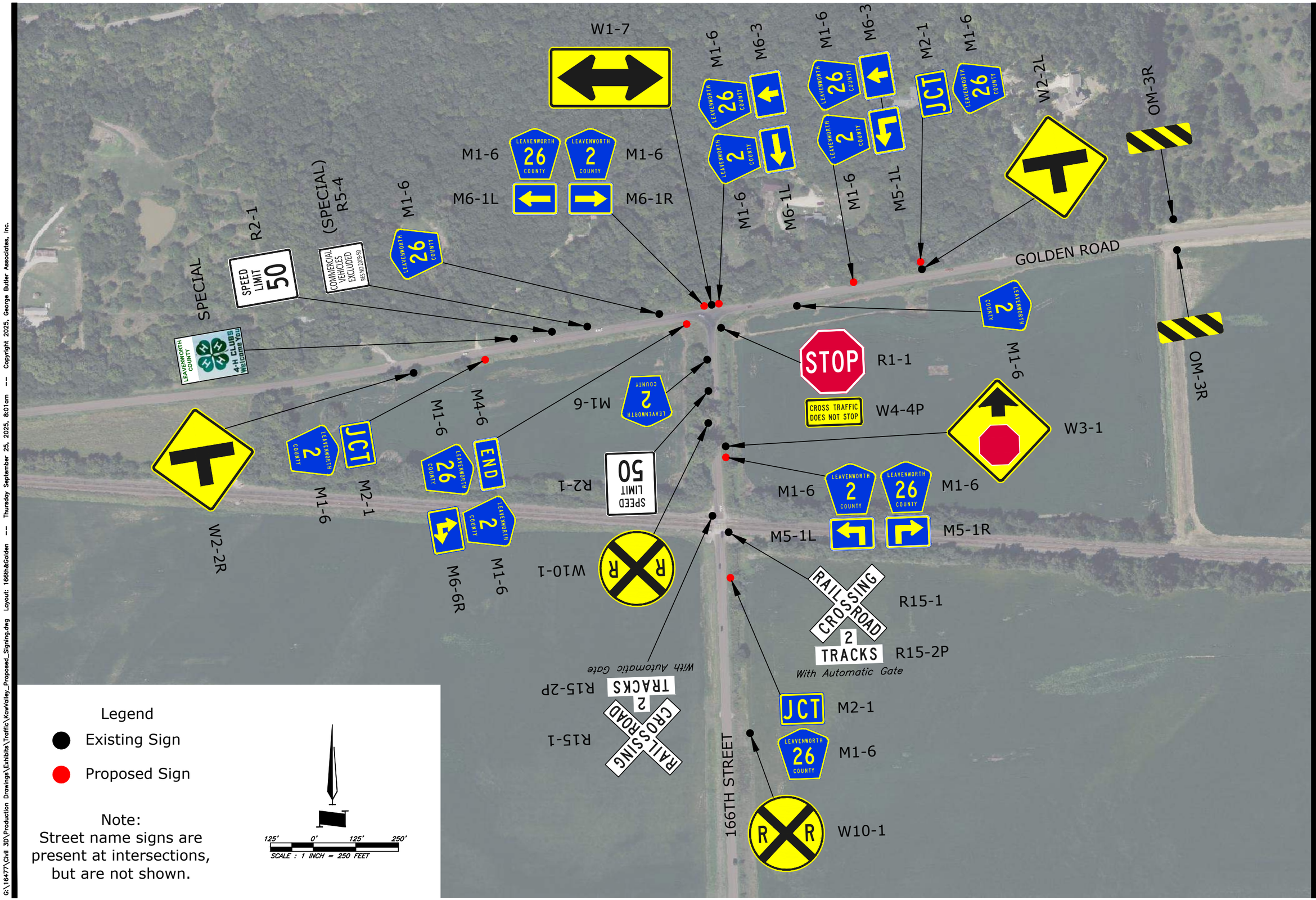
125' 0' 125' 250'
SCALE : 1 INCH = 250 FEET

GBA

LENAPE SAND OPERATION
PROPOSED SIGNING
GOLDEN ROAD

PROJECT NUMBER
16477.00

DATE
09/26/2025



Legend

- Existing Sign
- Proposed Sign

Note:
Street name signs are present at intersections, but are not shown.

GBA

LENAPE SAND OPERATION
PROPOSED SIGNING
GOLDEN ROAD & 166TH STREET

PROJECT NUMBER
16477.00

DATE
09/26/2025

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Legend

- Existing Sign
- Proposed Sign

Note:
Street name signs are present at intersections, but are not shown.

125' 0' 125' 250'
SCALE : 1 INCH = 250 FEET

158TH STREET

LORING ROAD

M1-6 M2-1 M5-1L M6-3 M1-6 M6-1L M6-3 M1-6 R1-1 M1-6 M4-6 M1-6 M1-6 M6-4 M1-6 M2-1 M1-6 W3-1 R2-1 R5-2 R5-4 (SPECIAL) M1-6 M6-3 M6-1R M1-6 M6-3 M5-1R M2-1 M1-6 W1-4L M5-1L M1-6 M6-3 M1-6 M6-1L M6-3 M1-6 M2-1 M1-6 M1-6 M6-3 M1-6 M6-1L M6-3 M1-6 R1-1 M1-6

SPEED LIMIT 50

COMMERCIAL VEHICLES EXCLUDED
RES NO. 2009-50

GBA

LENAPE SAND OPERATION
PROPOSED SIGNING
LORING ROAD & 158TH STREET

PROJECT NUMBER
16477.00

DATE
09/26/2025

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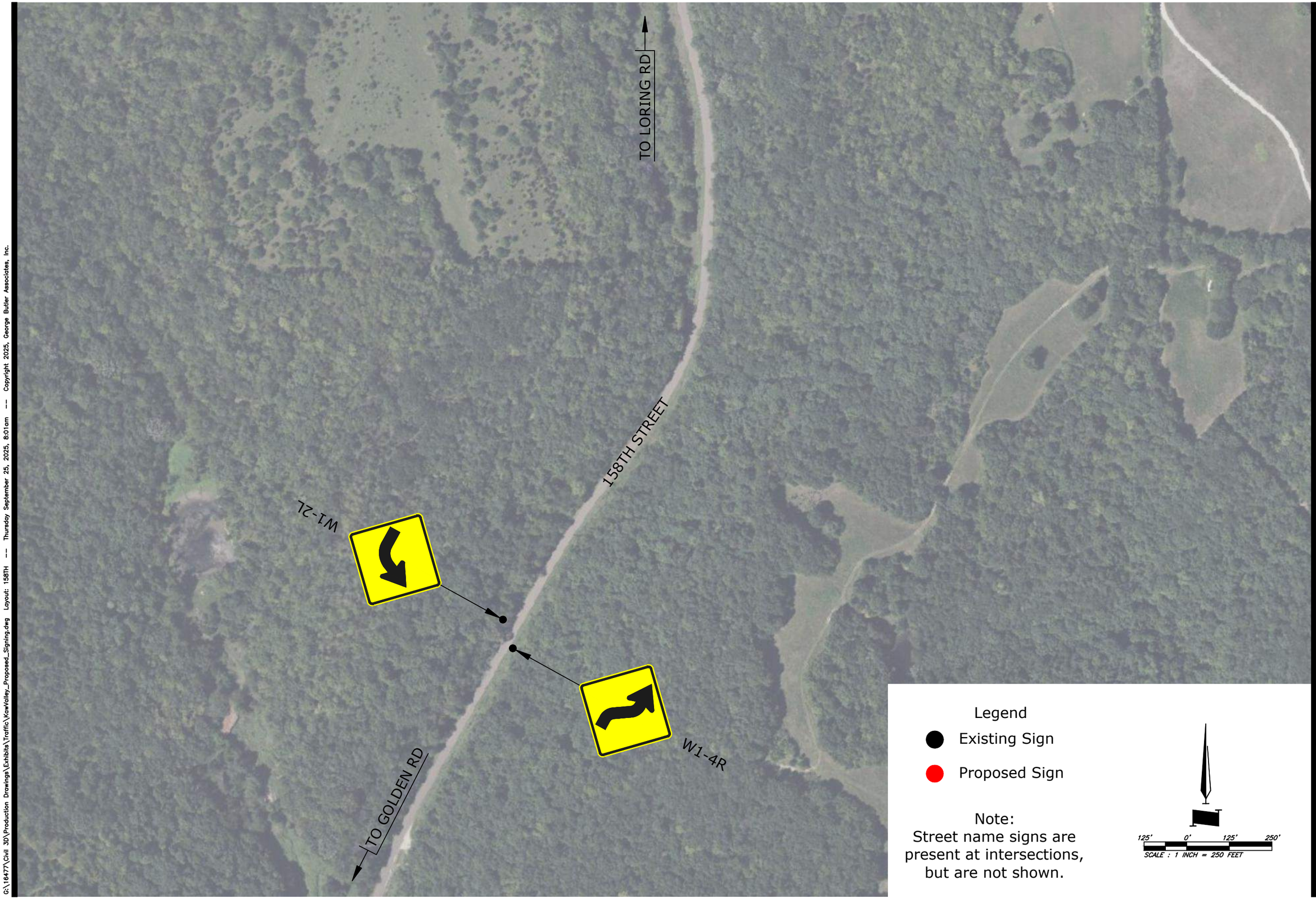

Legend

- Existing Sign
- Proposed Sign

Note:
Street name signs are present at intersections, but are not shown.

125' 0' 125' 250'
SCALE : 1 INCH = 250 FEET

GBA

LENAPE SAND OPERATION
PROPOSED SIGNING
158TH STREET

PROJECT NUMBER
16477.00

DATE
09/26/2025

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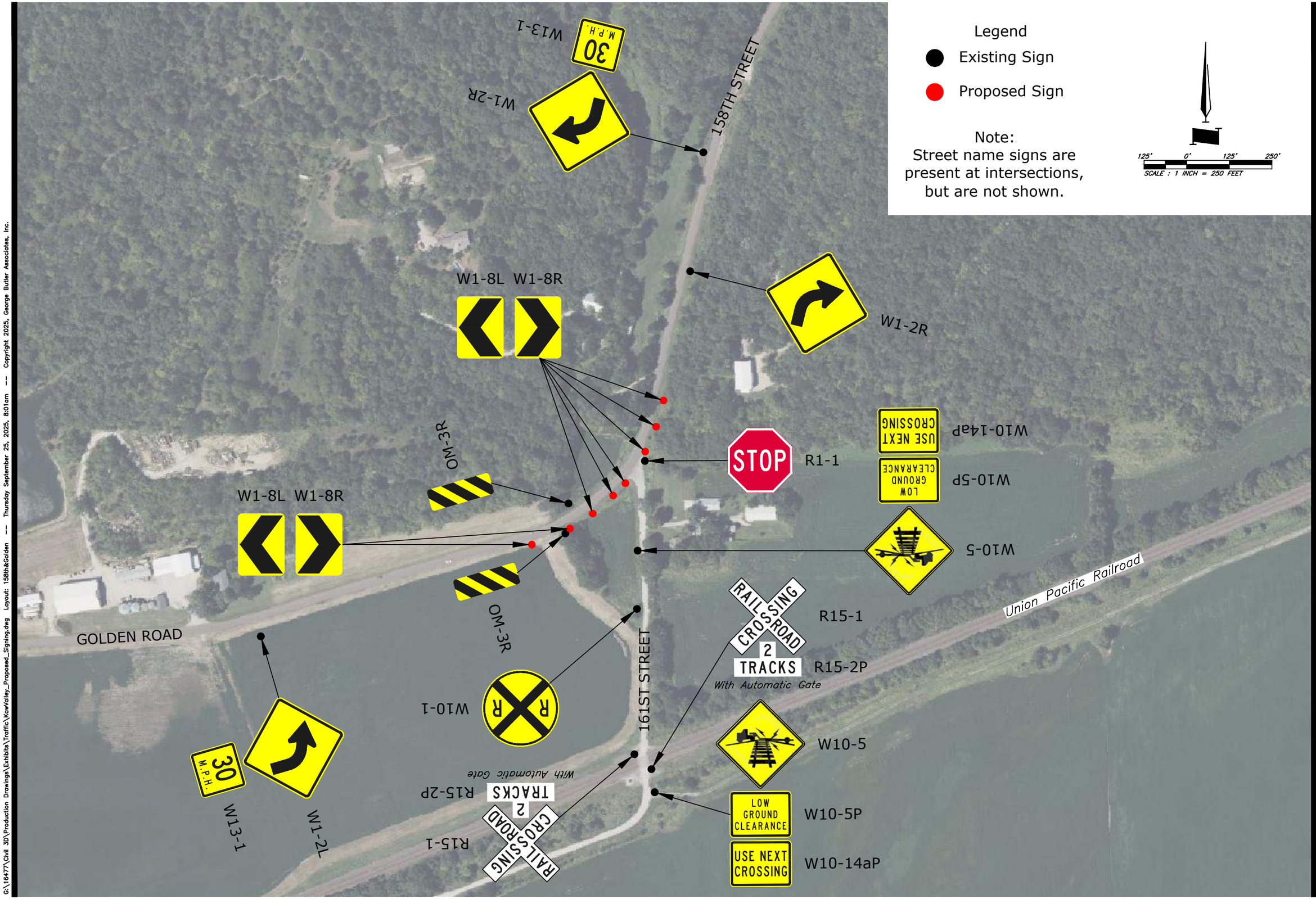

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GBA

LENAPE SAND OPERATION
PROPOSED SIGNING
GOLDEN ROAD / 158TH STREET & 161ST STREET

PROJECT NUMBER
16477.00

DATE
09/26/2025

Legend

- Existing Sign
- Proposed Sign

Note:
Street name signs are present at intersections, but are not shown.

125' 0' 125' 250'
SCALE : 1 INCH = 250 FEET

GBA

LENAPE SAND OPERATION
PROPOSED SIGNING
LORING ROAD & LORING LANE

PROJECT NUMBER
16477.00

DATE
09/26/2025

882

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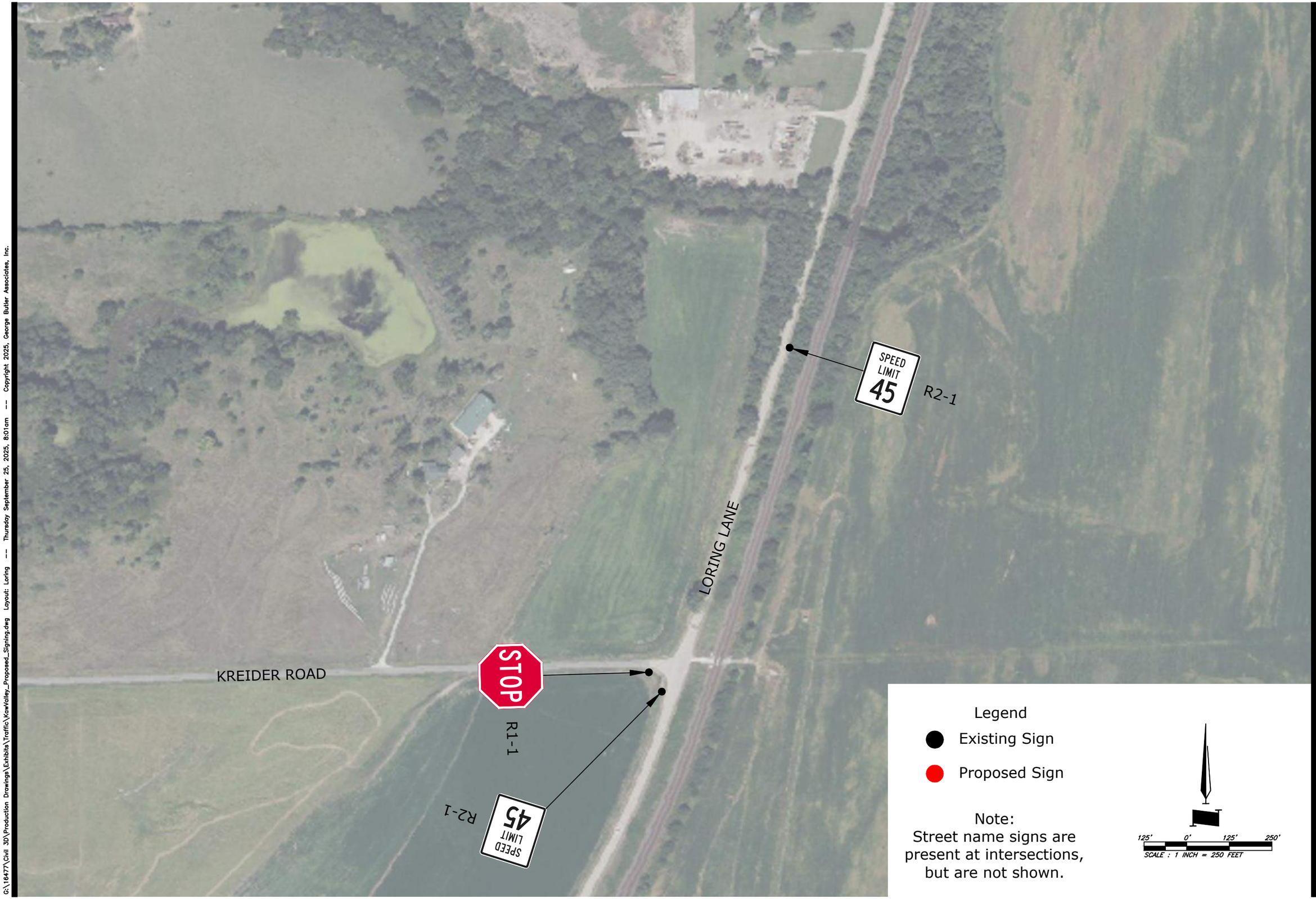

Legend

- Existing Sign
- Proposed Sign

Note:
Street name signs are present at intersections, but are not shown.

125' 0' 125' 250'
SCALE : 1 INCH = 250 FEET

GBA

LENAPE SAND OPERATION
PROPOSED SIGNING
LORING LANE

PROJECT NUMBER
16477.00

DATE
09/26/2025

Legend

- Existing Sign
- Proposed Sign

Note:
Street name signs are present at intersections, but are not shown.

125' 0' 125' 250'
SCALE : 1 INCH = 250 FEET

GBA

LENAPE SAND OPERATION
PROPOSED SIGNING
LORING LANE

PROJECT NUMBER
16477.00

DATE
09/26/2025

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GBA

LENAPE SAND OPERATION
PROPOSED SIGNING
LORING LANE & K-32 TRUCK

PROJECT NUMBER
16477.00

DATE
09/26/2025

385

G:\16477\Civil 3D\Production Drawings\Exhibits\Traffic\KawValley_Proposed_Signing.dwg Layout: Loring&K32 -- Thursday September 25, 2025, 8:01am -- Copyright 2025, George Butler Associates, Inc.

APPENDIX L
PAVEMENT EVALUATION REPORT

Golden Road Pavement Evaluation

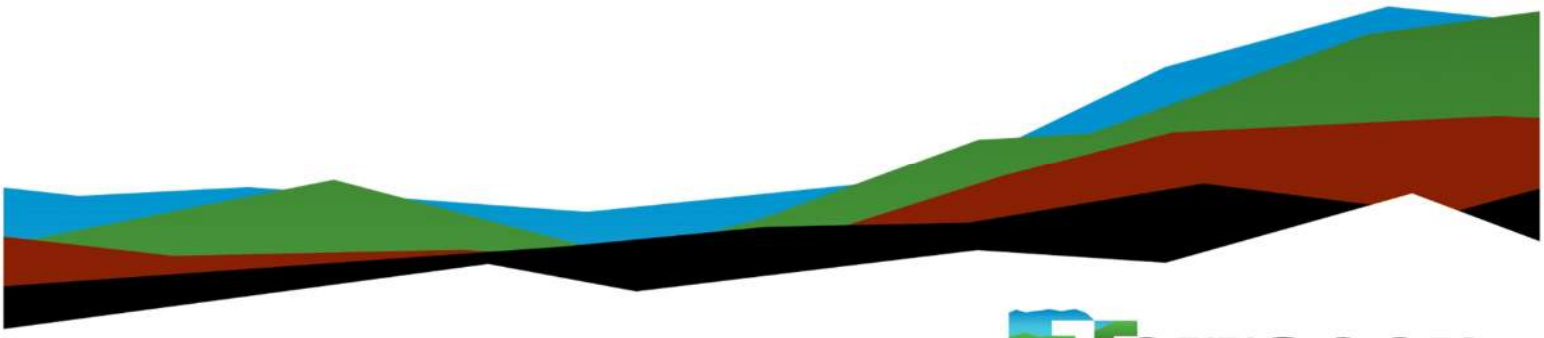
Pavement Evaluation Report

Leavenworth County, Kansas

September 23, 2025 | Terracon Project No. 02245065.rev2

Prepared for:

George Butler Associates Inc
Kansas City, Kansas 66106



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September 23, 2025

George Butler Associates Inc
5600 Kansas Avenue
Kansas City, Kansas 66106

Attn: Evan Horowitz, Chief Financial Officer

Re: Pavement Evaluation Report
Golden Road Pavement Evaluation
Golden Road, N 158th Street, and Loring Road
Leavenworth County, Kansas
Terracon Project No. 02245065.rev2

Dear Mr. Horowitz:

We have completed a subsurface exploration and geotechnical engineering evaluation for the referenced project in general accordance with Terracon Proposal No. P02245065 dated March 1, 2024. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning evaluation of existing pavements and design and construction of future pavements for the project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,

Terracon

✔

Thomas R. Mast, P.E.
Senior Staff Engineer

Kevin D. Friedrichs, P.E
Senior Engineer
Kansas: 22981

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Project Description 1
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GeoModel

Attachments

Exploration and Testing Procedures
Pavement Core Photography Log
Site Location and Exploration Plans
Exploration and Laboratory Results
Supporting Information

Note: This report was originally delivered in a web-based format. Blue Bold text in the report indicates a referenced section heading. The PDF version also includes hyperlinks which direct the reader to that section and clicking on the Terracon logo will bring you back to this page. For more interactive features, please view your project online at client.terracon.com.

Refer to each individual Attachment for a listing of contents.

Introduction

This report presents the results of our subsurface exploration and Pavement Evaluation services performed for Golden Road, N 158th Street, and Loring Road in Leavenworth County, Kansas. The purpose of these services was to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil and rock conditions
- Groundwater conditions
- Analysis of existing pavement conditions
- Pavement recommendations

Drawings showing the site and boring locations are shown on the attached Site Location Plan and Exploration Plan. The results of the laboratory testing performed on soil samples obtained from the site during our field exploration are included on the boring logs in Exploration Results.

Project Description

Our initial understanding of the project was provided in our proposal and was discussed during project planning. A period of collaboration has transpired since the project was initiated, and our final understanding of the project conditions is as follows:

Item	Description
Information Provided	An email request for services was provided by Clint Loumaster with GBA on February 23, 2024. The request included Google Earth file of the site. On July 12, 2024, an additional roadway route was added to the scope. On May 13, 2025, Brian Boyd with GBA provided Terracon with comments from Leavenworth County Public Works regarding our report. Based on these comments, we have completed two additional borings, and have updated the parameters of our analysis and our recommendations to better serve the project. On September 19, 2025, Terracon met with GBA and Leavenworth County representatives to discuss comments regarding our analysis. This report contains revised language and figures to clarify the items discussed.

Item	Description
Project Description	The project includes a pavement evaluation of an approximately 4¼ mile stretch of Golden Road in Leavenworth County. As well as a 3-mile alternate route along N 158th Street and Loring Road. The client is seeking information on current state of the roadway, and recommendations for the roadway to support additional truck traffic.
Pavements	GBA completed a traffic study at the site. An approximate vehicles per day (VPD) of 2,100 was provided to use in our analysis. The existing traffic consists of less than 1% articulated trucks and, amongst all routes, an average of 2% buses/single-unit trucks. Truck traffic of 120 round trips of tandem axle dump trucks is expected to be added to the existing traffic.

Terracon should be notified if any of the above information is inconsistent with the planned construction, as modifications to our recommendations may be necessary.

Site Conditions

The following description of site conditions is derived from our site visit in association with the field exploration and our review of publicly available geologic and topographic maps.

Item	Description
Project Location	The project is located along Golden Road, N 158th Street, and Loring Road in Leavenworth County, Kansas. Approximate Latitude/Longitude: 38.9985, -94.9843 (See Exhibit D)
Existing Improvements	Asphalt paved roadway
Existing Topography	Elevations at the site range from 780 feet to 840 feet. In general, the site slopes downward to the east.
Geology	The subsurface at the site consists of alluvial soils overlying the bedrock strata of the Lansing Group.

We also collected photographs at the time of our field exploration program. Representative photos are provided in our Photography Log.

Geotechnical Characterization

We have developed a general characterization of the subsurface conditions based on the subsurface exploration, laboratory data, geologic setting, and our understanding of the project. This characterization, termed GeoModel, forms the basis of our geotechnical evaluation. Conditions observed at each boring location are indicated on the individual logs. The individual logs are in the Exploration Results and the GeoModel is in the Figures attachment of this report.

As part of our analyses, we identified the following model layers within the subsurface profile. For a more detailed view of the model layer depths at each boring location, refer to the GeoModel.

Model Layer	Layer Name	General Description
1	Residual Soils	Lean to fat clay, brown and gray, with sand to sandy, medium stiff to hard
2	Bedrock	Limestone

The borings were observed during drilling and shortly after completion of drilling for the presence and level of water. Groundwater was not encountered in the borings at these times. A longer period of time may be required for groundwater to develop and stabilize in a borehole. Longer term observations in piezometers or observation wells, sealed from the influence of surface water, are often required to define groundwater levels.

Groundwater levels may fluctuate due to seasonal variations in the amount of rainfall, runoff, and other factors not evident at the time the borings were performed. Therefore, groundwater conditions at other times may be different than the conditions encountered in our exploratory borings. The potential for water level fluctuations and perched water should be considered when developing design and construction plans and specifications for the project.

Analysis of Existing Pavement

Pavement Analysis Parameters

Analyses for the pavement design of the project have been based on the procedures of the AASHTO Guide for Design of Pavement Structures (1993). The following design parameters were utilized for pavement engineering analyses and the determination of design alternatives for the project:

Pavement Analysis and Design Parameters			
		Existing Pavement	New Pavement
Reliability	Level of Reliability	90%	85%
	Flexible Overall Standard Deviation	0.49	0.49
Serviceability	Flexible Initial PSI	3.8	4.2
	Flexible Terminal PSI	2.0	2.0
Subgrade Conditions	CBR	3	
	Correlated Resilient Modulus, M_r	5,000 psi	
Layer Properties	Asphalt Concrete (AC) Layer Coefficient	0.40	0.44
	Aggregate Base (ABC) Layer Coefficient	0.14	0.14

A traffic study was conducted at this site, and an Average Daily Traffic (ADT) of approximately 2,100 vehicles was determined. We have made the assumption that approximately 5% of the existing traffic consists of trucks, and a truck equivalency factor of 0.47 was used in our calculations. With the information provided and the assumptions stated above, we estimate that the existing needs of the roadways studied to be 600,000 18-kip equivalent single axle loads (ESALs) over a 25-year design period. With the new truck traffic, we anticipate approximately 13,600,000 ESALs for a 25-year design period. The following table documents the observed thickness of the existing pavement sections, and compares structural values to existing and future needs.

Existing Pavement Thickness

Route	Boring Location	Asphalt	Concrete	Aggregate Base	Meets Existing Criteria	Meets New Criteria
Route 1, Golden Road	B-1	7	-	2	N	N
	B-2	6	-	3	N	N
	B-3	3	-	2	N	N
	B-4	5.5	-	2	N	N
	B-5	4.5	-	2	N	N

Existing Pavement Thickness

Route	Boring Location	Asphalt	Concrete	Aggregate Base	Meets Existing Criteria	Meets New Criteria
	B-6	5	-	1	N	N
	B-7	4.5	-	2	N	N
	B-8	6	-	2	N	N
	B-9	6.5	-	2	N	N
	B-10	6.5	-	2	N	N
	B-11	2.5	-	4	N	N
	B-12	4	-	2	N	N
	B-13	7	-	2	N	N
	B-14	4	-	3	N	N
	B-15	5	-	2	N	N
	B-16	7	-	2	N	N
	B-17	6.5	-	2	N	N
	B-18	7	-	2	N	N
Route 2, N 158th Street and Loring Road	B-19	6	-	5	N	N
	B-20	8.25	-	3	Y	N
	B-21	10	-	4	Y	N
	B-22	9.5	-	4	Y	N
	B-23	7	-	12	Y	N
	B-24	7	-	3	N	N
	B-25	6.5	-	4	N	N
	B-26	6.5	-	3	N	N
	B-27	3	-	12	N	N
	B-28	3.5	-	4	N	N

Existing Pavement Thickness

Route	Boring Location	Asphalt	Concrete	Aggregate Base	Meets Existing Criteria	Meets New Criteria
	B-29	5	-	7	N	N
	B-30	7	3.5	-	Y	N
	B-31	-	9	6	Y	Y
	B-32	-	9	-	Y	Y
161st Street	B-101	-	-	4	N	N
	B-102	-	-	12	N	N

Based on the results listed above, Route 1 is currently not suitable to withstand the current loading or increased loading. To meet the current criteria recommended thickness an average of 2 additional inches and a maximum of 3.5 additional inches would be anticipated along this route to provide a minimum thickness of 7.5 inches. To meet the new truck loading criteria, asphalt overlays averaging 7 additional inches and a maximum overlay of 8.5 additional inches would be anticipated along this entire route to provide a minimum thickness of 11.5 inches of asphalt.

Route 2, along N 158th Street and Loring Road, is the most suitable of the existing pavements to withstand the new loading. However, not all areas of this route are able to support the new traffic for a 25-year design period. Some sections of this route may only be able to accommodate the new traffic for one year before repairs would be expected. To meet the current criteria recommended thickness an average of 0.5 additional inches and a maximum of 4 additional inches would be anticipated along this route to provide a minimum thickness of 7 inches. To meet the new truck loading criteria, segments extending from B-19 to B-30 are expected to need asphalt overlays averaging 6 additional inches and a maximum overlay of 8 additional inches. The existing rigid pavement segment B-31 to B-32 is expected to have the capacity to withstand the new loading for a 25-year design period, not factoring in the serviceability loss between placement and present time.

Pavement Recommendations

Pavement Section Thicknesses

Pavement thickness depends upon many factors including but not limited to:

- applied wheel/axle loads and number of repetitions
- subgrade and pavement material characteristics
- climate conditions
- site and pavement drainage

Due to the variable thickness of the existing aggregate base in the sections observed, we have developed new minimum pavement section thicknesses to utilize a value of 2 inches of aggregate base at existing route 1 locations and 3 inches of aggregate base at existing route 2 locations. For 161st Street a thickness of 4 inches of aggregate base was used.

To meet the anticipated future loading of 13,600,000 ESALs, we recommend that route 1 asphalt section be thickened to 11.5 total inches. For route 2, we recommend that the asphalt section be thickened to 11 total inches. For 161st street segment, we recommend an asphalt section of 11 total inches overlying the existing gravel roadway. Values for additional asphalt to meet existing traffic needs as well as the new truck traffic are provided in the table below.

Recommended Pavement Thicknesses				
		To Support Current Traffic		
Route	Existing Aggregate Base Used in Analysis (in)	Average Additional Asphalt Needed (in)	Maximum Additional Asphalt Needed (in)	Total Asphalt Needed (in)
Route 1	2	1.5	4.5	7
Route 2	3	0.5	4	7
161st Street	4	6.5	6.5	6.5
		To Support Current and Additional Traffic		
Route 1	2	6	9	11.5
Route 2	3	4.5	8	11
161st Street	4	11	11	11

The decision on the method used to achieve the recommended thickness (removal and replacement, mill and overlay, or direct overlay) should be made in the roadway design phase of the project. Typically, when existing asphalt sections are modified, one to two inches of surface asphalt is milled prior to placement of new asphalt overlay. At the time of our study, it appears that the existing asphalt surface is in fair to good condition, and milling procedures may not be necessary depending on the conditions of the pavement surface at the time of construction. If milling procedures are not utilized at this site, the existing surface would need to be thoroughly cleaned prior to placement of the tack coat and new surface course overlay to ensure that new overlay materials properly adhere to the existing pavements. If a new asphalt overlay is placed on dirty/dusty existing pavements, the owner must accept the risk that debonding could occur between the older and newer sections, which could lead to rapid deterioration of the asphalt surface.

Construction traffic on the pavements was considered to be negligible in developing our opinions of minimum pavement thickness. If the pavements will be subject to repetitive passes of construction equipment/vehicles, the pavement sections should be revised to consider the additional loading.

Modifications to the existing pavement thickness increase the risk of loss of edge support. To prevent this, consideration should be given to improving drainage infrastructure, installing a curb, or widening shoulders. The decision on how to best address this risk should be made by the roadway design team in the design phase of the project.

Pavements and subgrades will be subject to freeze-thaw cycles and seasonal fluctuations in moisture content. Pavement thickness design methods are intended to provide adequate thickness of structural materials over a particular subgrade such that wheel loads are reduced to a level that the subgrade can support. The subgrade support parameters for pavement thickness design do not account for shrink/swell movements of a subgrade constructed of expansive clay soils. Therefore, the pavement may be adequate from a structural standpoint, yet still experience cracking and deformation due to shrink/swell related movement of the subgrade.

The pavement sections provided above consider that the subgrade soils will not experience significant increases in moisture content. Paved areas should be sloped to provide rapid drainage of surface water and to drain water away from the pavement edges. Pavements should be designed so water does not accumulate on or adjacent to the pavement, since this could saturate and soften the subgrade soils and subsequently accelerate pavement deterioration.

Pavement Maintenance

The pavement sections represent minimum recommended thicknesses, and periodic maintenance and repairs should be anticipated. Preventive maintenance should be

planned and provided for through an on-going pavement management program. Maintenance activities are intended to slow the rate of pavement deterioration and to preserve the pavement investment. Pavement care consists of both localized (e.g., crack sealing, joint sealing, and patching) and global maintenance (e.g., surface sealing). Additional engineering consultation is recommended to determine the type and extent of a cost-effective program. Even with periodic maintenance, some movements and related cracking may still occur, and repairs may be required.

General Comments

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Variations will occur between boring locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly impact excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety, cost estimating,

excavation support, and dewatering requirements/design are the responsibility of others. Construction and site development have the potential to affect adjacent properties. Such impacts can include damages due to vibration, modification of groundwater/surface water flow during construction, foundation movement due to undermining or subsidence from excavation, as well as noise or air quality concerns. Evaluation of these items on nearby properties are commonly associated with contractor means and methods and are not addressed in this report. The owner and contractor should consider a preconstruction/precondition survey of surrounding development. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

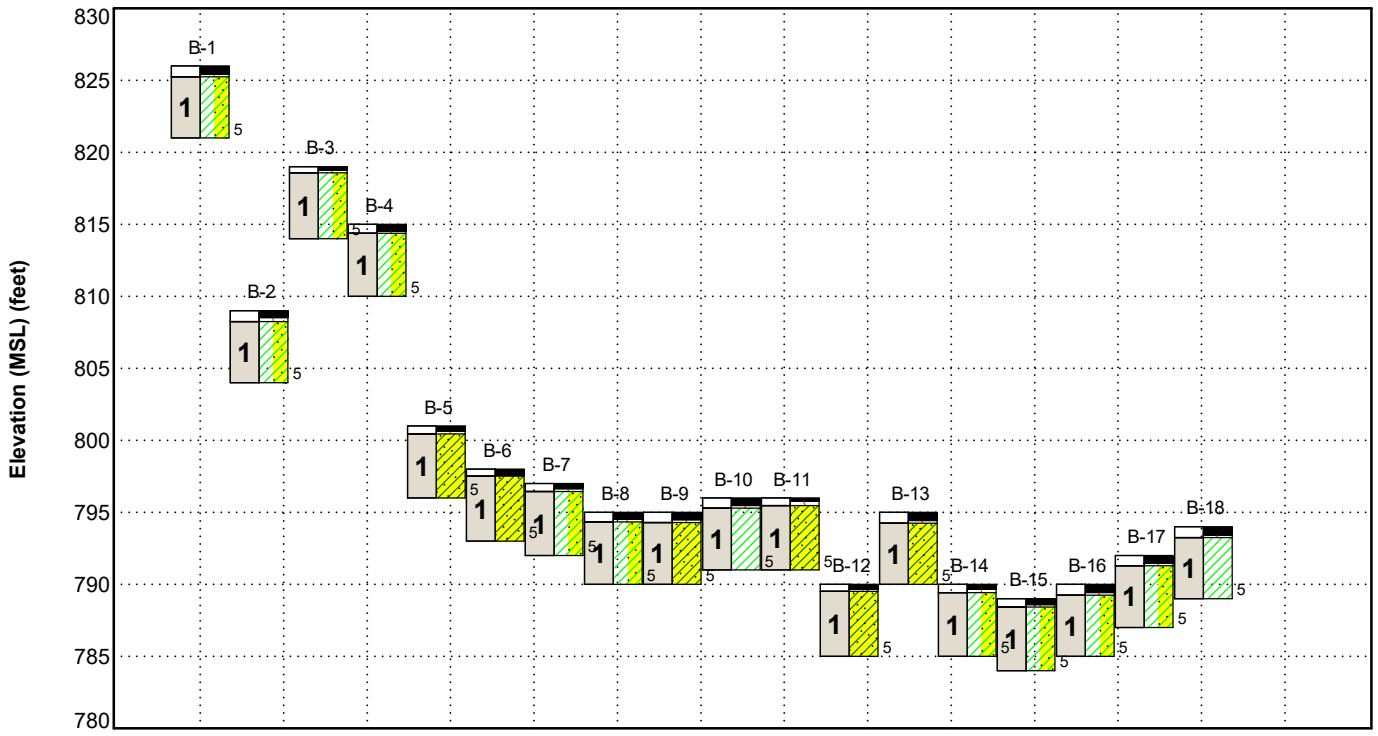
Figures

Contents:

GeoModel (4 pages)

Terracon
15620 W 113th St
Lenexa, KS

GeoModel



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	**Residual Soils**	Lean to fat, brown and gray, with sand to sandy, medium stiff to hard
2	**Bedrock**	Limestone

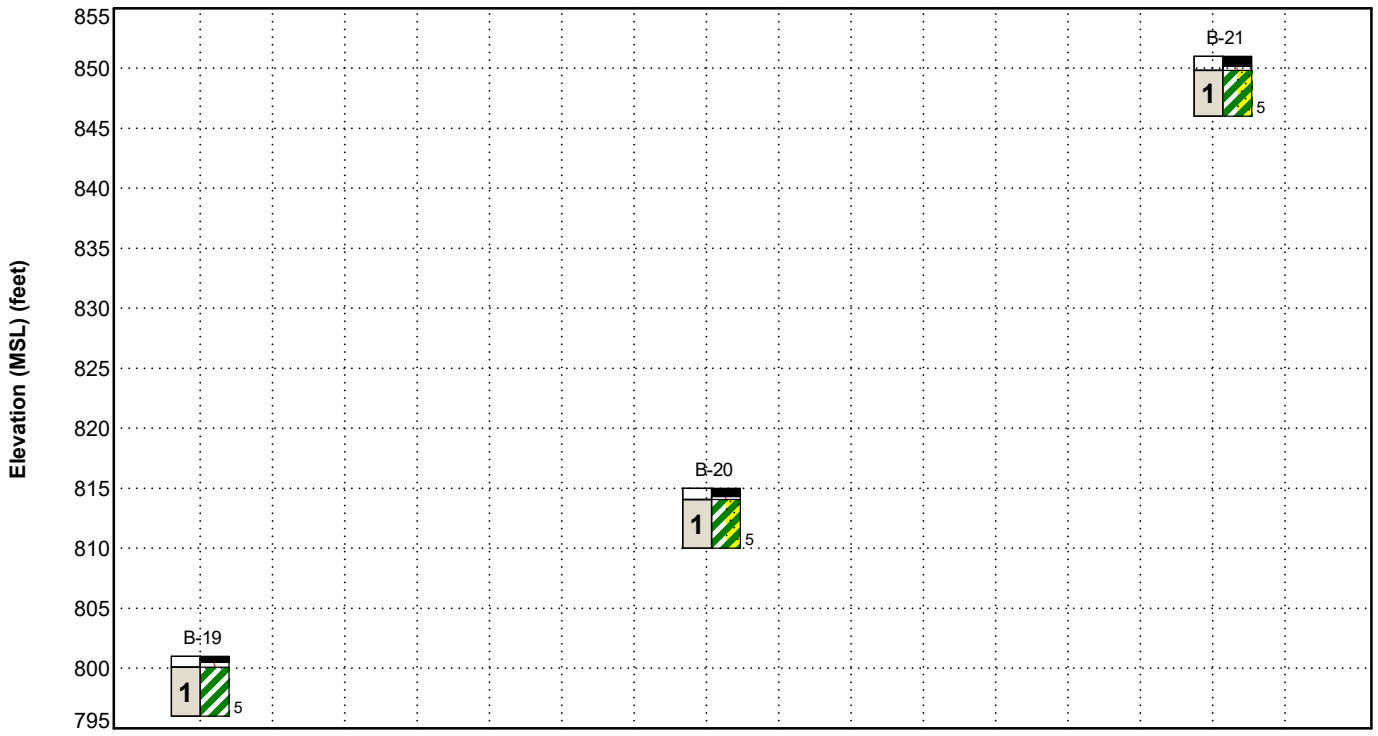
LEGEND

- Asphalt
- Aggregate Base Course
- Lean Clay with Sand
- Sandy Lean Clay
- Lean Clay

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.

15620 W 113th St
Lenexa, KS

GeoModel



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	**Residual Soils**	Lean to fat, brown and gray, with sand to sandy, medium stiff to hard
2	**Bedrock**	Limestone

LEGEND

Asphalt

Aggregate Base Course

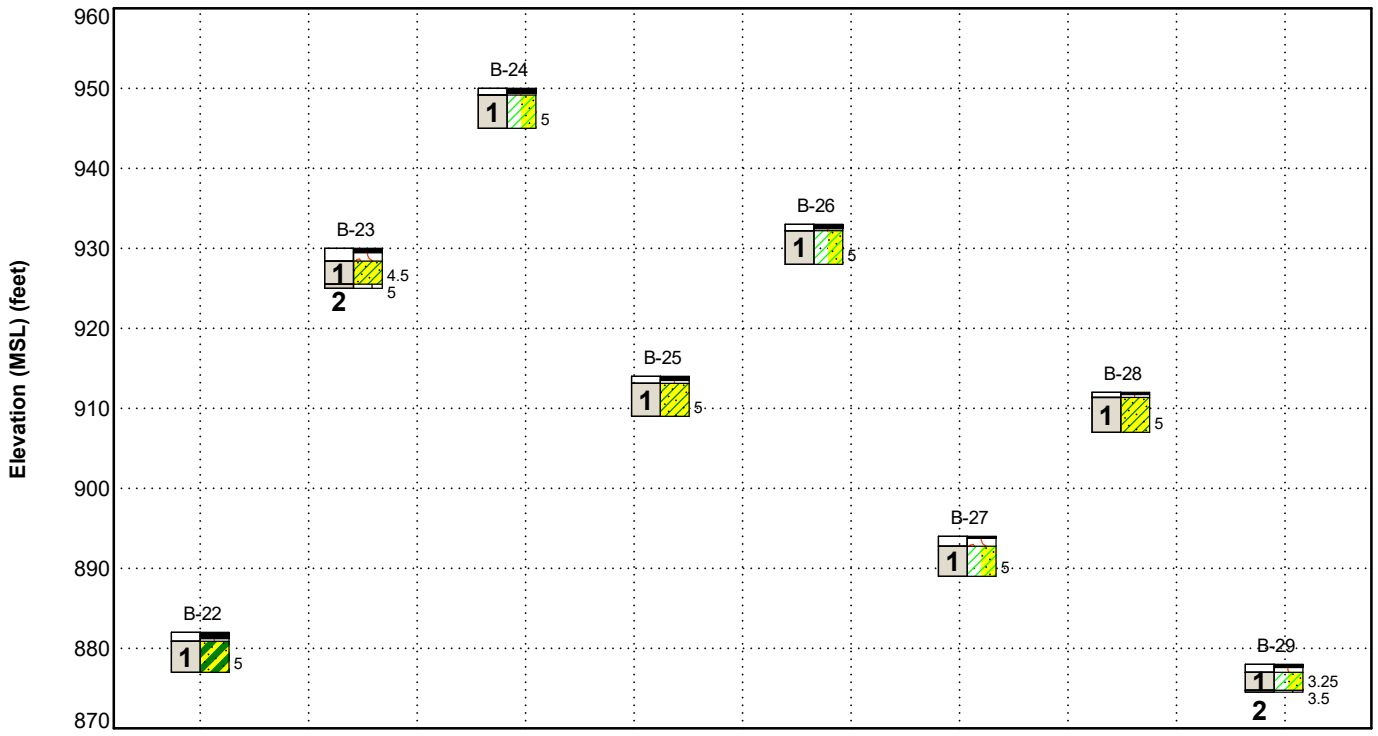
Fat Clay

Fat Clay with Sand

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.

15620 W 113th St
Lenexa, KS

GeoModel



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	**Residual Soils**	Lean to fat, brown and gray, with sand to sandy, medium stiff to hard
2	**Bedrock**	Limestone

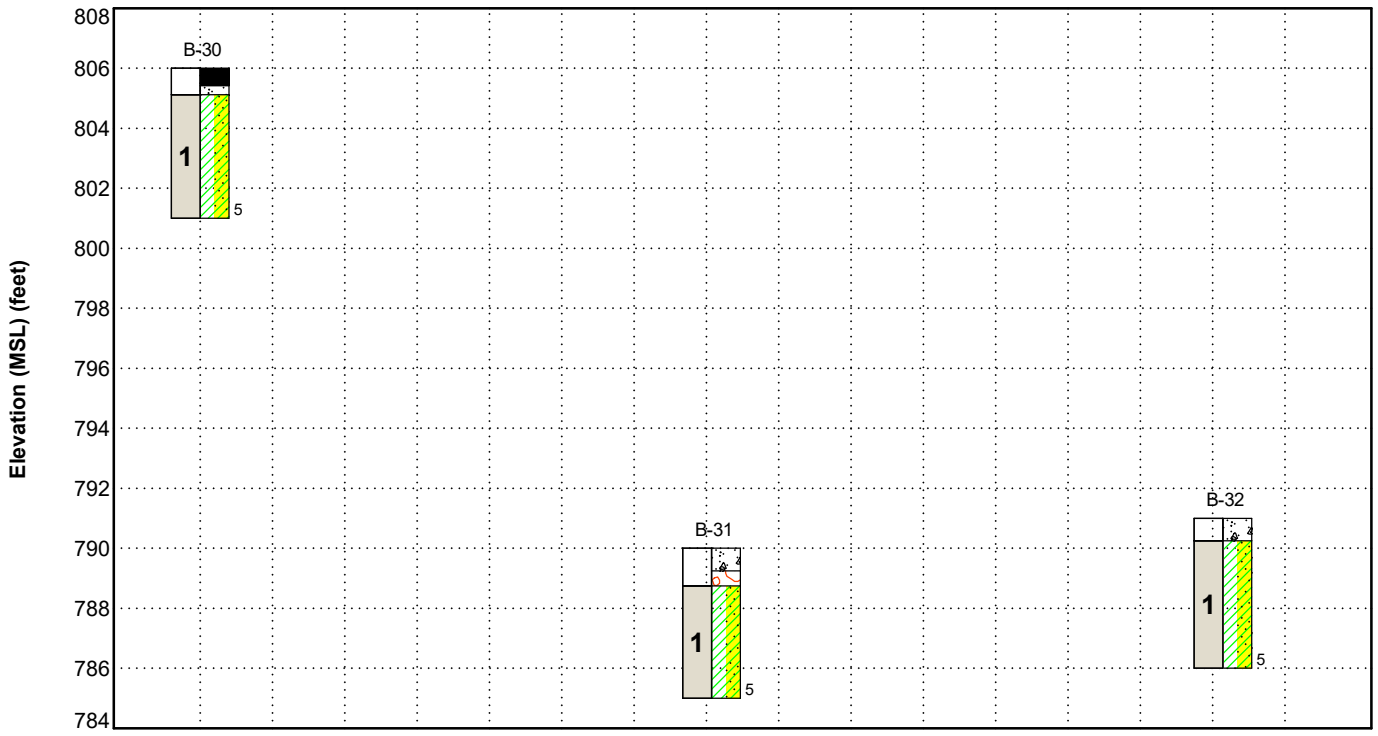
LEGEND

- Asphalt
- Aggregate Base Course
- Sandy Fat Clay
- Sandy Lean Clay
- Limestone
- Lean Clay with Sand

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.

15620 W 113th St
Lenexa, KS

GeoModel



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	**Residual Soils**	Lean to fat, brown and gray, with sand to sandy, medium stiff to hard
2	**Bedrock**	Limestone

LEGEND

Asphalt
Aggregate Base Course
Concrete
Lean Clay with Sand

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.

Attachments

Exploration and Testing Procedures

Field Exploration

Number of Borings	Approximate Boring Depth (feet)	Location
18	5	Route 1 (Golden Road)
14	5	Route 2 (N 158th Street & Loring Road)
2	5	161st Street

Boring Layout and Elevations: Terracon personnel provided the boring layout using handheld GPS equipment (estimated horizontal precision of about ±10 feet) and referencing existing site features. Approximate ground surface elevations were estimated using an online mapping application.

Subsurface Exploration Procedures: We advanced the borings with an ATV-mounted rotary drill rig using continuous flight augers. Samples were obtained from the borings using thin-walled tube and split-barrel sampling procedures. In the thin-walled tube sampling procedure, a thin-walled, seamless steel tube with a sharp cutting edge was pushed hydraulically into the soil to obtain a relatively undisturbed sample. In the split-barrel sampling procedure, a standard 2-inch outer diameter split-barrel sampling spoon was driven into the ground by a 140-pound automatic hammer falling a distance of 30 inches. The number of blows required to advance the sampling spoon the last 12 inches of a normal 18-inch penetration is recorded as the Standard Penetration Test (SPT) resistance value. The SPT resistance values, also referred to as N-values, are indicated on the boring logs at the test depths. The borings were backfilled with auger cuttings after their completion. The upper few inches of borehole penetrations through pavements were surface patched with cold-mix asphalt and/or pre-mixed concrete.

We also observed the boreholes while drilling and at the completion of drilling for the presence of groundwater. Groundwater was not observed in the boreholes at these times.

Our exploration team prepared field boring logs to record the sampling depths, penetration distances, other sampling information, visual classifications of the materials observed during drilling, and our interpretation of the subsurface conditions between samples. The samples were placed in appropriate containers and taken to our laboratory for testing and classification. The final boring logs provided with this report include modifications based on the results of the laboratory tests and observations of the recovered samples.

Laboratory Testing

The project engineer reviewed the field data and assigned laboratory tests. The laboratory testing program included the following tests on selected samples:

- Moisture Content
- Dry Unit Weight
- Grain Size Analysis
- Atterberg Limits

The laboratory testing program included examination of soil samples by an engineer. Based on the results of our field and laboratory programs, we described and classified the soil samples in general accordance with the Unified Soil Classification System.

Rock classification was conducted using locally accepted practices for engineering purposes; core samples and petrographic analysis may indicate other rock types. The rock classifications on the boring logs were determined using the attached Rock Classification Notes.

Photography Log



B-1, Asphalt: 7 inches



B-2, Asphalt: 6 inches



B-3, Asphalt: 3 inches



B-4, Asphalt: 5½ inches



B-5, Asphalt: 4½ inches



B-6, Asphalt: 5 inches



B-7, Asphalt: 4½ inches



B-8, Asphalt: 6 inches



B-9, Asphalt: 6½ inches



B-10, Asphalt: 6½ inches



B-11, Asphalt: 2½ inches



B-12, Asphalt: 4 inches



B-13, Asphalt: 7 inches



B-14, Asphalt: 4 inches



B-15, Asphalt: 5 inches



B-16, Asphalt: 7 inches



B-17, Asphalt: 6½ inches



B-18, Asphalt: 7 inches



B-19, Asphalt: 6 inches



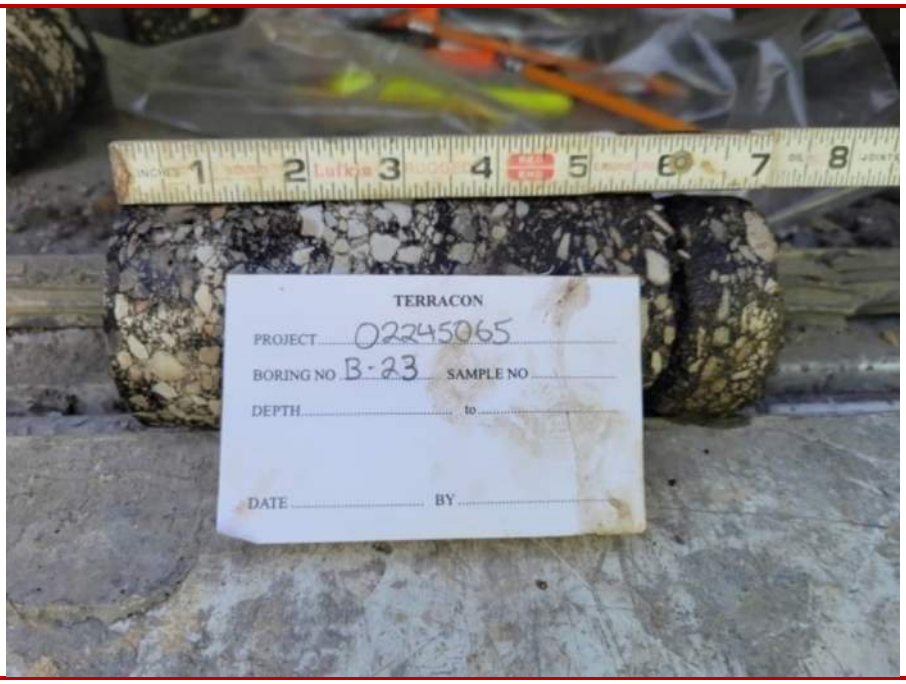
B-20, Asphalt: 8¼ inches



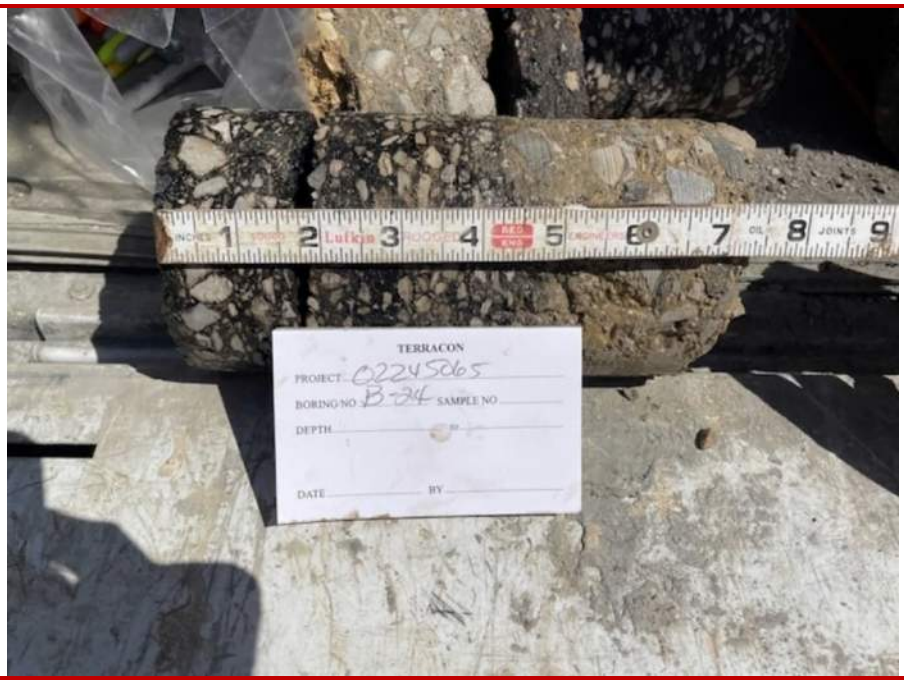
B-21, Asphalt: 10 inches



B-22, Asphalt: 9½ inches



B-23, Asphalt: 7 inches



B-24, Asphalt: 7 inches



B-25, Asphalt: 6½ inches



B-26, Asphalt: 6½ inches



B-27, Asphalt: 3 inches



B-28, Asphalt: 3½ inches



B-29, Asphalt: 5 inches



B-30, Asphalt: 7 inches, Concrete: 3½ inches



B-31, Concrete: 9 inches



B-32, Concrete: 9 inches

Site Location and Exploration Plans

Contents:

Site Location Plan
Exploration Plan (7 pages)

Note: All attachments are one page unless noted above.

Site Location

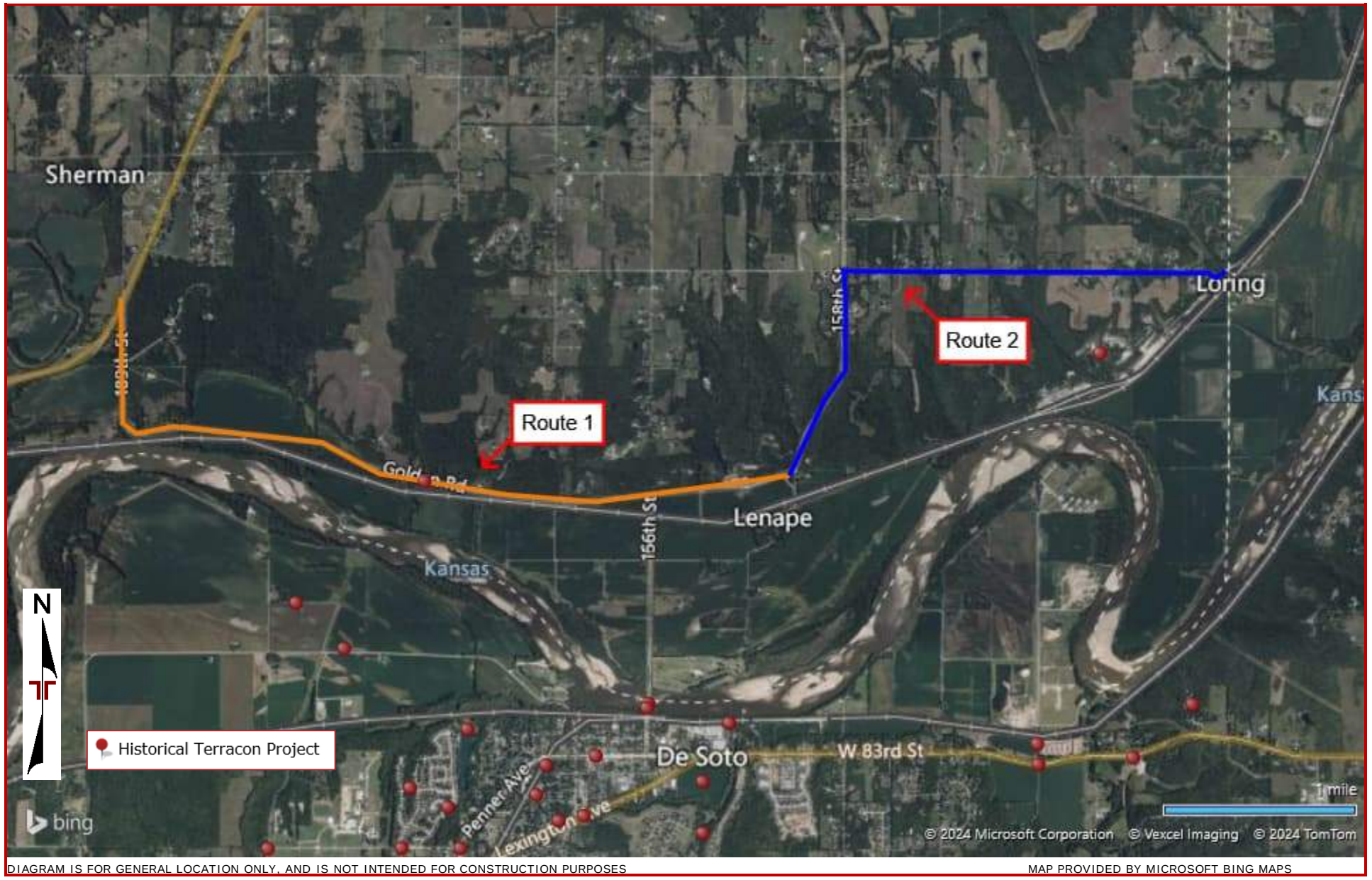


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration Plan



DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration Plan



DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration Plan



DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration Plan



DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration Plan

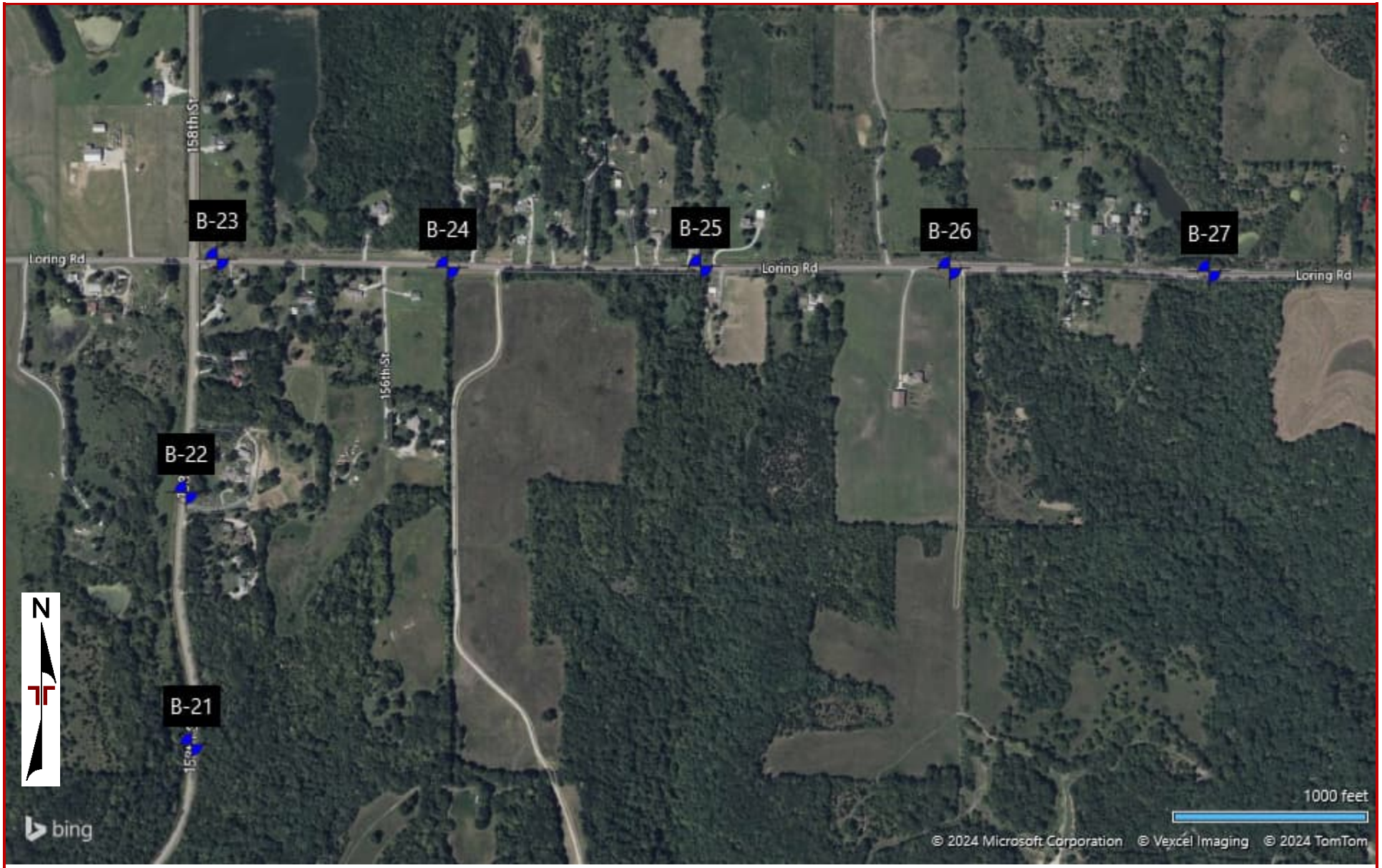


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration Plan



DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration Plan (Additional Borings)



DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration and Laboratory Results

Contents:

Boring Logs (B-1 to B-32; B-101 and B-102)

Note: All attachments are one page unless noted above.

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-1

Location: See Exploration Plan

Latitude: 39.0119° Longitude: -95.0156°

Depth (Ft.) Elevation: 826 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (")	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (7 inches) 0.6 / 825.42								
		AGGREGATE BASE COURSE (2 inches) 0.8 / 825.25								
1		**LEAN CLAY WITH SAND (CL)**, dark gray and light brown, very stiff			19		13.7	115	39-16-23	81
					13	4-7-10 N=17	19.5			
		5.0 / 821								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
04-30-2024

Boring Completed
04-30-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-2

Location: See Exploration Plan

Latitude: 39.0085° Longitude: -95.0157°

Depth (Ft.) Elevation: 809 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (6 inches) 0.5 / 808.5								
		AGGREGATE BASE COURSE (3 inches) 0.8 / 808.25								
1		**LEAN CLAY WITH SAND (CL)**, dark gray and light brown, very stiff to medium stiff								
		1								
		2			11	6-8-8 N=16	17.2			
		3								
		4			14	3-4-3 N=7	22.7			
		5.0 / 804								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
04-30-2024

Boring Completed
04-30-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-3

Location: See Exploration Plan

Latitude: 39.0048° Longitude: -95.0157°

Depth (Ft.) Elevation: 819 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (3 inches) 0.3 / 818.75								
		AGGREGATE BASE COURSE (2 inches) 0.4 / 818.58								
1		**LEAN CLAY WITH SAND (CL)**, light brown and dark gray, very stiff			12	3-7-8 N=15	14.5			
					13	5-7-10 N=17	16.6			
		5.0 / 814								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
04-30-2024

Boring Completed
04-30-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-4

Location: See Exploration Plan

Latitude: 39.0023° Longitude: -95.0136°

Depth (Ft.) Elevation: 815 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (")	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (5.5 inches) 0.5 / 814.54								
		AGGREGATE BASE COURSE (2 inches) 0.6 / 814.37								
1		**LEAN CLAY WITH SAND (CL)**, red brown, stiff								
		1								
		2			11		11.5		32-16-16	72
		3								
		4			14	3-4-7 N=11	19.5			
		5.0 / 810								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
04-30-2024

Boring Completed
04-30-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-5

Location: See Exploration Plan

Latitude: 39.0029° Longitude: -95.0092°

Depth (Ft.) Elevation: 801 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (4.5 inches) 0.4 / 800.62								
		AGGREGATE BASE COURSE (2 inches) 0.6 / 800.45								
1		**SANDY LEAN CLAY (CL)**, light brown and dark gray, hard								
		1								
		2			14	6-12-22 N=34	17.2			
		3								
		4			12	18-18-14 N=32	9.8			
		5.0 / 796								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
05-01-2024

Boring Completed
05-01-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-6

Location: See Exploration Plan

Latitude: 39.0024° Longitude: -95.0045°

Depth (Ft.) Elevation: 798 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (5 inches) 0.4 / 797.58								
		AGGREGATE BASE COURSE (1 inch) 0.5 / 797.5								
1		**SANDY LEAN CLAY (CL)**, brown and dark gray, very stiff								
		1								
		2			10	9-10-10 N=20	17.8			
		3								
		4			14	8-10-11 N=21	15.4			
		5.0 / 793								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes

Elevation Reference: Elevations estimated using an online mapping application

Water Level Observations

Groundwater not encountered

Advancement Method

CFA

Abandonment Method

Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
04-30-2024

Boring Completed
04-30-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-7

Location: See Exploration Plan

Latitude: 39.0020° Longitude: -94.9999°

Depth (Ft.) Elevation: 797 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (4.5 inches) 0.4 / 796.62								
		AGGREGATE BASE COURSE (2 inches) 0.6 / 796.45								
1		**LEAN CLAY WITH SAND (CL)**, brown and dark gray, medium stiff								
		1								
		2			13		21.0	100	33-20-13	78
		3								
		4			17	2-2-3 N=5	26.2			
		5.0 / 792								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
05-01-2024

Boring Completed
05-01-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-8

Location: See Exploration Plan

Latitude: 39.0014° Longitude: -94.9958°

Depth (Ft.) Elevation: 795 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (")	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (6 inches) 0.5 / 794.5								
		AGGREGATE BASE COURSE (2 inches) 0.7 / 794.33								
1		**LEAN CLAY WITH SAND (CL)**, dark gray and light brown, very stiff to medium stiff								
					9	4-7-10 N=17	19.3			
					12	4-3-4 N=7	27.9			
		5.0 / 790								
		Boring Terminated at 5 Feet								

1 2 3 4 5

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
04-30-2024

Boring Completed
04-30-2024

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-9

Location: See Exploration Plan

Latitude: 38.9998° Longitude: -94.9919°

Depth (Ft.) Elevation: 795 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (6.5 inches) 0.5 (794.46)								
		AGGREGATE BASE COURSE (2 inches) 0.7 (794.29)								
1		**SANDY LEAN CLAY (CL)**, dark gray and light brown, very stiff								
		1								
		2			12	6-9-12 N=21	18.1			
		3								
		4			12	4-8-8 N=16	17.0			
		5.0 (790)								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
05-01-2024

Boring Completed
05-01-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-10

Location: See Exploration Plan

Latitude: 38.9989° Longitude: -94.9875°

Depth (Ft.) Elevation: 796 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (6.5 inches) 0.5 795.46								
		AGGREGATE BASE COURSE (2 inches) 0.7 795.29								
1		**LEAN CLAY (CL)**, dark gray and light brown, medium stiff			13		21.3	104	47-18-29	89
					11	1-2-2 N=4	24.1			
		5.0 791 ***Boring Terminated at 5 Feet***								

1
2
3
4
5

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
04-30-2024

Boring Completed
04-30-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-11

Location: See Exploration Plan

Latitude: 38.9982° Longitude: -94.9829°

Model Layer	Graphic Log	Depth (Ft.)	Elevation: 796 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		0.2	**ASPHALT (2.5 inches)** 795.8									
		0.5	**AGGREGATE BASE COURSE (4 inches)** 795.46									
1			**SANDY LEAN CLAY (CL)**, light brown and dark gray, very stiff	1								
				2			14	7-10-12 N=22	14.1			
				3								
				4			12	5-8-12 N=20	11.9			
		5.0	791	5								
			Boring Terminated at 5 Feet									

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
05-01-2024

Boring Completed
05-01-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-12

Location: See Exploration Plan

Latitude: 38.9975° Longitude: -94.9785°

Depth (Ft.) Elevation: 790 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (4 inches) 0.3 / 789.67								
		AGGREGATE BASE COURSE (2 inches) 0.5 / 789.5								
1		**SANDY LEAN CLAY (CL)**, light brown and dark gray, very stiff			23		12.3	118	33-17-16	60
					8	8-9-11 N=20	14.6			
		5.0 / 785								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
04-30-2024

Boring Completed
04-30-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-13

Location: See Exploration Plan

Latitude: 38.9972° Longitude: -94.9738°

Depth (Ft.) Elevation: 795 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (7 inches) 0.6 / 794.42								
		AGGREGATE BASE COURSE (2 inches) 0.8 / 794.25								
1		**SANDY LEAN CLAY (CL)**, dark gray and brown, very stiff								
		1								
		2			15	5-10-13 N=23	11.4			
		3								
		4			16	5-8-8 N=16	15.0			
		5.0 / 790								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
05-01-2024

Boring Completed
05-01-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-14

Location: See Exploration Plan

Latitude: 38.9973° Longitude: -94.9692°

Depth (Ft.) Elevation: 790 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (4 inches) 0.3 / 789.67								
		AGGREGATE BASE COURSE (3 inches) 0.6 / 789.42								
1		**LEAN CLAY WITH SAND (CL)**, dark gray and brown, very stiff								
		1								
		2			9	5-7-8 N=15	15.2			
		3								
		4			12	5-9-10 N=19	14.8			
		5.0 / 785								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
04-30-2024

Boring Completed
04-30-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-15

Location: See Exploration Plan

Latitude: 38.9978° Longitude: -94.9651°

Depth (Ft.) Elevation: 789 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (5 inches) 0.4 / 788.58								
		AGGREGATE BASE COURSE (2 inches) 0.6 / 788.42								
1		**LEAN CLAY WITH SAND (CL)**, dark gray and brown, very stiff								
					13	7-10-10 N=20	13.5			
					16	4-7-12 N=19	14.3			
		5.0 / 784								
		Boring Terminated at 5 Feet								

1 2 3 4 5

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
05-01-2024

Boring Completed
05-01-2024

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-16

Location: See Exploration Plan

Latitude: 38.9982° Longitude: -94.9604°

Depth (Ft.) Elevation: 790 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (")	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (7 inches) 0.6 / 789.42								
		AGGREGATE BASE COURSE (2 inches) 0.8 / 789.25								
1		**LEAN CLAY WITH SAND (CL)**, dark gray and brown, very stiff								
					13	9-10-10 N=20	16.1			
					12	4-6-9 N=15	17.3			
		5.0 / 785								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
04-30-2024

Boring Completed
04-30-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-17

Location: See Exploration Plan

Latitude: 38.9984° Longitude: -94.9559°

Depth (Ft.) Elevation: 792 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (")	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (6.5 inches) 0.5 / 791.46								
		AGGREGATE BASE COURSE (2 inches) 0.7 / 791.29								
1		**LEAN CLAY WITH SAND (CL)**, dark gray and brown, medium stiff to stiff								
		1								
		2			15	4-3-4 N=7	24.2			
		3								
		4			14	2-5-5 N=10	20.0			
		5.0 / 787								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
05-01-2024

Boring Completed
05-01-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-18

Location: See Exploration Plan

Latitude: 38.9993° Longitude: -94.9513°

Depth (Ft.) Elevation: 794 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (7 inches) 0.6 / 793.42								
		AGGREGATE BASE COURSE (2 inches) 0.8 / 793.25								
1		**LEAN CLAY (CL)**, dark gray and light brown, stiff								
		1								
		2			14		20.7	108	47-19-28	90
		3								
		4			14	4-4-6 N=10	23.8			
		5.0 / 789								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
04-30-2024

Boring Completed
04-30-2024

Golden Road Pavement Evaluation
Golden Road from Linwood Road to N 158th Street | Leavenworth County, KS
Terracon Project No. 02245065

15620 W 113th St
Lenexa, KS

Boring Log No. B-19

Location: See Exploration Plan

Latitude: 39.0021° Longitude: -94.9498°

Model Layer	Depth (Ft.)	Elevation: 801 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (")	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
	0.5	**ASPHALT (6 inches)** 800.5									
	0.9	**AGGREGATE BASE COURSE (5 inches)** 800.08									
1		**FAT CLAY (CH)**, dark gray and brown, very stiff	1								
			2			22		20.8	110	53-20-33	87
			3								
			4			12	9-10-8 N=18	14.6			
	5.0	796	5								
		Boring Terminated at 5 Feet									

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes

Elevation Reference: Elevations estimated using an online mapping application

Water Level Observations

Groundwater not encountered

Advancement Method

CFA

Abandonment Method

Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
CME 550X

Hammer Type
Automatic

Driller
CJ

Logged by
FG

Boring Started
08-19-2024

Boring Completed
08-19-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-20

Location: See Exploration Plan

Latitude: 39.0048° Longitude: -94.9478°

Depth (Ft.) Elevation: 815 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (")	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (8.25 inches) 0.7 / 814.31								
		AGGREGATE BASE COURSE (3 inches) 0.9 / 814.06								
1		**FAT CLAY WITH SAND (CH)**, dark gray and brown, stiff								
					12	4-4-5 N=9	19.7			
					10	2-4-8 N=12	24.5			
		5.0 / 810								
		Boring Terminated at 5 Feet								

1 2 3 4 5

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
CME 550X

Hammer Type
Automatic

Driller
CJ

Logged by
FG

Boring Started
08-16-2024

Boring Completed
08-16-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-21

Location: See Exploration Plan

Latitude: 39.0078° Longitude: -94.9461°

Depth (Ft.) Elevation: 851 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (")	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (10 inches) 0.8 / 850.17								
		AGGREGATE BASE COURSE (4 inches) 1.2 / 849.83								
1		**FAT CLAY WITH SAND (CH)**, gray and brown, very stiff to stiff								
					10	5-9-9 N=18	14.0			
					13	10-5-6 N=11	22.1			
		5.0 / 846								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes

Elevation Reference: Elevations estimated using an online mapping application

Water Level Observations

Groundwater not encountered

Advancement Method

CFA

Abandonment Method

Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
CME 550X

Hammer Type
Automatic

Driller
CJ

Logged by
FG

Boring Started
08-19-2024

Boring Completed
08-19-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-22

Location: See Exploration Plan

Latitude: 39.0113° Longitude: -94.9462°

Depth (Ft.) Elevation: 882 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (")	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (9.5 inches) 0.8 / 881.21								
		AGGREGATE BASE COURSE (4 inches) 1.1 / 880.87								
1		**SANDY FAT CLAY (CH)**, gray and brown, stiff			12		18.2	115	50-20-30	69
					15	2-4-5 N=9	24.3			
		5.0 / 877								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
CME 550X

Hammer Type
Automatic

Driller
CJ

Logged by
FG

Boring Started
08-16-2024

Boring Completed
08-16-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-23

Location: See Exploration Plan

Latitude: 39.0146° Longitude: -94.9456°

Depth (Ft.) Elevation: 930 (Ft.) +/-

Model Layer	Graphic Log		Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (7 inches) 0.6 929.42									
		AGGREGATE BASE COURSE (12 inches) 1.6 928.42	1								
1		**SANDY LEAN CLAY (CL)**, light brown, very stiff to hard	2			14	5-10-9 N=19	10.8			
			3								
			4			10	15-25-50/2"	4.7			
2		**LIMESTONE** 5.0 925									
		Boring Terminated at 5 Feet	5								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
CME 550X

Hammer Type
Automatic

Driller
CJ

Logged by
FG

Boring Started
08-19-2024

Boring Completed
08-19-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-24

Location: See Exploration Plan

Latitude: 39.0145° Longitude: -94.9414°

Depth (Ft.) Elevation: 950 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (")	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (7 inches) 0.6 / 949.42								
		AGGREGATE BASE COURSE (3 inches) 0.8 / 949.17								
1		**LEAN CLAY WITH SAND (CL)**, light brown, medium stiff			18	3-2-4 N=6	20.1			
					18	2-3-2 N=5	19.0			
		5.0 / 945								
		Boring Terminated at 5 Feet								

1 2 3 4 5

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Drill Rig
CME 550X

Hammer Type
Automatic

Driller
CJ

Logged by
FG

Boring Started
08-16-2024

Boring Completed
08-16-2024

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-25

Location: See Exploration Plan

Latitude: 39.0145° Longitude: -94.9368°

Depth (Ft.) Elevation: 914 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (6.5 inches) 0.5 / 913.46								
		AGGREGATE BASE COURSE (4 inches) 0.9 / 913.12								
1		**SANDY LEAN CLAY (CL)**, gray and light brown, stiff			13		15.9	117	44-17-27	70
					14	5-6-7 N=13	16.7			
		5.0 / 909								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
CME 550X

Hammer Type
Automatic

Driller
CJ

Logged by
FG

Boring Started
08-19-2024

Boring Completed
08-19-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-26

Location: See Exploration Plan

Latitude: 39.0145° Longitude: -94.9323°

Depth (Ft.) Elevation: 933 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (")	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (6.5 inches) 0.5 / 932.46								
		AGGREGATE BASE COURSE (3 inches) 0.8 / 932.21								
1		**LEAN CLAY WITH SAND (CL)**, gray and light brown, stiff to medium stiff			14	4-5-7 N=12	15.4			
					15	2-3-3 N=6	17.5			
		5.0 / 928								
		Boring Terminated at 5 Feet								

1
2
3
4
5

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
CME 550X

Hammer Type
Automatic

Driller
CJ

Logged by
FG

Boring Started
08-16-2024

Boring Completed
08-16-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-27

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 39.0144° Longitude: -94.9276° Depth (Ft.) / Elevation: 894 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (%)	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (3 inches) 0.3 / 893.75									
		AGGREGATE BASE COURSE (12 inches) 1.3 / 892.75	1								
1		**LEAN CLAY WITH SAND (CL)**, gray and light brown, medium stiff to stiff	2			12	3-3-4 N=7	16.6			
			3								
			4			14	3-4-5 N=9	19.2			
		5.0 / 889	5								
		Boring Terminated at 5 Feet									

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
CME 550X

Hammer Type
Automatic

Driller
CJ

Logged by
FG

Boring Started
08-19-2024

Boring Completed
08-19-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-28

Location: See Exploration Plan

Latitude: 39.0144° Longitude: -94.9229°

Model Layer	Graphic Log	Depth (Ft.)	Elevation: 912 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		0.3	**ASPHALT (3.5 inches)** 911.71									
		0.6	**AGGREGATE BASE COURSE (4 inches)** 911.37									
1			**SANDY LEAN CLAY (CL)**, light brown, stiff	1								
				2			13		18.6	117	47-17-30	70
				3								
				4			12	3-5-7 N=12	17.5			
		5.0	907	5								
			Boring Terminated at 5 Feet									

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
CME 550X

Hammer Type
Automatic

Driller
CJ

Logged by
FG

Boring Started
08-16-2024

Boring Completed
08-16-2024

Golden Road Pavement Evaluation
Golden Road from Linwood Road to N 158th Street | Leavenworth County, KS
Terracon Project No. 02245065

15620 W 113th St
Lenexa, KS

Boring Log No. B-29

Location: See Exploration Plan

Latitude: 39.0144° Longitude: -94.9184°

Depth (Ft.) | Elevation: 878 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (")	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (5 inches) 0.4 / 877.58								
		AGGREGATE BASE COURSE (7 inches) 1.0 / 877								
1		**LEAN CLAY WITH SAND (CL)**, light brown, stiff 3.3 / 874.75			10	4-5-6 N=11	16.2			
2		**LIMESTONE** 3.5 / 874.5			0	50/0"				
		Auger Refusal at 3.5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
CME 550X

Hammer Type
Automatic

Driller
CJ

Logged by
FG

Boring Started
08-19-2024

Boring Completed
08-19-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-30

Location: See Exploration Plan

Latitude: 39.0144° Longitude: -94.9139°

Depth (Ft.) Elevation: 806 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (7 inches) 0.6 / 805.42								
		CONCRETE (3.5 inches) 0.9 / 805.12								
1		**LEAN CLAY WITH SAND (CL)**, dark gray to light brown, very stiff to stiff								
					10	6-9-11 N=20	12.6			
					12	6-6-7 N=13	10.1			
		5.0 / 801								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
CME 550X

Hammer Type
Automatic

Driller
CJ

Logged by
FG

Boring Started
08-16-2024

Boring Completed
08-16-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-31

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 39.0141° Longitude: -94.9098° Depth (Ft.) / Elevation: 790 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		CONCRETE (9 inches) 0.8 / 789.25									
		AGGREGATE BASE COURSE (6 inches) 1.3 / 788.75	1								
1		**LEAN CLAY WITH SAND (CL)**, brown, medium stiff to stiff	2			5	5-2-3 N=5	13.9			
			3								
			4			10	5-6-4 N=10	51.4			
		5.0 / 785	5								
		Boring Terminated at 5 Feet									

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
CME 550X

Hammer Type
Automatic

Driller
CJ

Logged by
FG

Boring Started
08-19-2024

Boring Completed
08-19-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-32

Location: See Exploration Plan

Latitude: 39.0156° Longitude: -94.9070°

Depth (Ft.) Elevation: 791 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		CONCRETE (9 inches) 0.8 790.25								
1		**LEAN CLAY WITH SAND (CL)**, dark gray to light brown, very stiff to stiff								
		1								
		2			16	6-9-12 N=21	22.6			
		3								
		4			16	8-8-5 N=13	20.6			
		5.0 786								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
CME 550X

Hammer Type
Automatic

Driller
CJ

Logged by
FG

Boring Started
08-16-2024

Boring Completed
08-16-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-101

Location: See Exploration Plan

Latitude: 38.9987° Longitude: -94.9507°

Depth (Ft.) Elevation: 792 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		AGGREGATE BASE COURSE (4 inches) 0.3 / 791.67								
1		**CLAYEY SAND WITH GRAVEL (SC)**, brown, medium dense			6		23.1			
					8	12-10-4 N=14	9.4			
		3.5 / 788.5								
		LEAN CLAY WITH SAND (CL), brown, stiff			15	3-3-9 N=12	13.3			
		5.0 / 787								
		Boring Terminated at 5 Feet								

1
2
3
4
5

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes

Elevation Reference: Elevations estimated using an online mapping application

Water Level Observations

Groundwater not encountered

Advancement Method

CFA

Abandonment Method

Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
CME 550X

Hammer Type
Automatic

Driller
CJ

Logged by
FG

Boring Started
06-10-2025

Boring Completed
06-10-2025

Golden Road Pavement Evaluation
Golden Road from Linwood Road to N 158th Street | Leavenworth County, KS
Terracon Project No. 02245065

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-102

Location: See Exploration Plan

Latitude: 38.9969° Longitude: -94.9507°

Depth (Ft.) Elevation: 784 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		AGGREGATE BASE COURSE (12 inches)								
		1.0 783								
1		**LEAN CLAY WITH SAND (CL)**, brown			15		21.1	97		
		3.0 781								
		FAT CLAY (CH), brown, medium stiff			18	2-2-3 N=5	31.5			
		5.0 779								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
CME 550X

Hammer Type
Automatic

Driller
CJ

Logged by
FG

Boring Started
06-10-2025

Boring Completed
06-10-2025

Supporting Information

Contents:

General Notes
Unified Soil Classification System
Rock Classification Notes

Note: All attachments are one page unless noted above.

15620 W 113th St
Lenexa, KS

General Notes

Sampling	Water Level	Field Tests
Shelby Tube Split Spoon	Water Initially Encountered Water Level After a Specified Period of Time Water Level After a Specified Period of Time Cave In Encountered Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.	N Standard Penetration Test Resistance (Blows/Ft.) (HP) Hand Penetrometer (T) Torvane (DCP) Dynamic Cone Penetrometer UC Unconfined Compressive Strength (PID) Photo-Ionization Detector (OVA) Organic Vapor Analyzer

Descriptive Soil Classification

Soil classification as noted on the soil boring logs is based Unified Soil Classification System. Where sufficient laboratory data exist to classify the soils consistent with ASTM D2487 "Classification of Soils for Engineering Purposes" this procedure is used. ASTM D2488 "Description and Identification of Soils (Visual-Manual Procedure)" is also used to classify the soils, particularly where insufficient laboratory data exist to classify the soils in accordance with ASTM D2487. In addition to USCS classification, coarse grained soils are classified on the basis of their in-place relative density, and fine-grained soils are classified on the basis of their consistency. See "Strength Terms" table below for details. The ASTM standards noted above are for reference to methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgment.

Location And Elevation Notes

Exploration point locations as shown on the Exploration Plan and as noted on the soil boring logs in the form of Latitude and Longitude are approximate. See Exploration and Testing Procedures in the report for the methods used to locate the exploration points for this project. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

Strength Terms

Relative Density of Coarse-Grained Soils
(More than 50% retained on No. 200 sieve.)
Density determined by Standard Penetration Resistance

Relative Density	Standard Penetration or N-Value (Blows/Ft.)
Very Loose	0 - 3
Loose	4 - 9
Medium Dense	10 - 29
Dense	30 - 50
Very Dense	> 50

Consistency of Fine-Grained Soils
(50% or more passing the No. 200 sieve.)
Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance

Consistency	Unconfined Compressive Strength Qu (tsf)	Standard Penetration or N-Value (Blows/Ft.)
Very Soft	less than 0.25	0 - 1
Soft	0.25 to 0.50	2 - 4
Medium Stiff	0.50 to 1.00	4 - 8
Stiff	1.00 to 2.00	8 - 15
Very Stiff	2.00 to 4.00	15 - 30
Hard	> 4.00	> 30

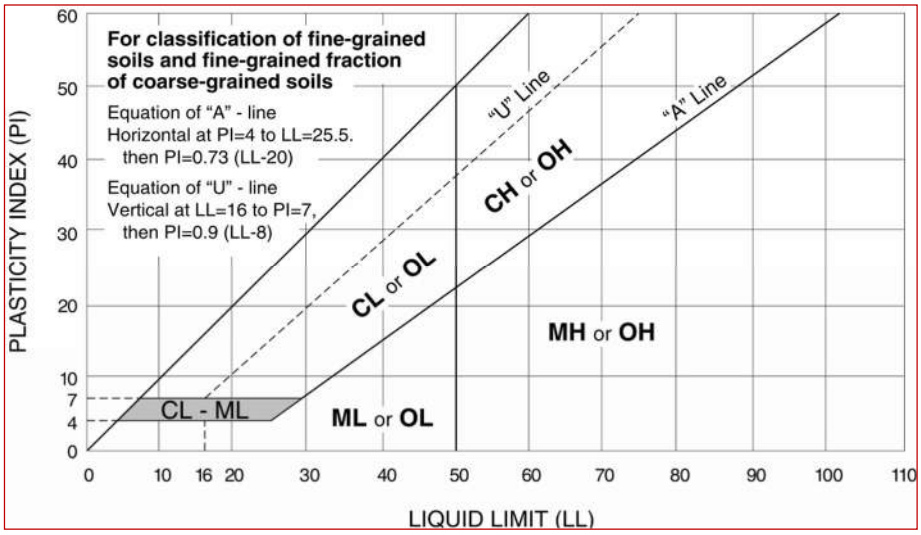
Relevance of Exploration and Laboratory Test Results

Exploration/field results and/or laboratory test data contained within this document are intended for application to the project as described in this document. Use of such exploration/field results and/or laboratory test data should not be used independently of this document.

Unified Soil Classification System

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]				Soil Classification	
				Group Symbol	Group Name [B]
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	Gravels: More than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels: Less than 5% fines [C]	Cu≥4 and 1≤Cc≤3 [E]	GW	Well-graded gravel [F]
			Cu<4 and/or [Cc<1 or Cc>3.0] [E]	GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH	GM	Silty gravel [F, G, H]
			Fines classify as CL or CH	GC	Clayey gravel [F, G, H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	Clean Sands: Less than 5% fines [D]	Cu≥6 and 1≤Cc≤3 [E]	SW	Well-graded sand [I]
			Cu<6 and/or [Cc<1 or Cc>3.0] [E]	SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH	SM	Silty sand [G, H, I]
			Fines classify as CL or CH	SC	Clayey sand [G, H, I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	Silts and Clays: Liquid limit less than 50	Inorganic:	PI > 7 and plots above "A" line [J]	CL	Lean clay [K, L, M]
			PI < 4 or plots below "A" line [J]	ML	Silt [K, L, M]
		Organic:	$\frac{LL\ oven\ dried}{LL\ not\ dried}$ < 0.75	OL	Organic clay [K, L, M, N]
					Organic silt [K, L, M, O]
	Silts and Clays: Liquid limit 50 or more	Inorganic:	PI plots on or above "A" line	CH	Fat clay [K, L, M]
			PI plots below "A" line	MH	Elastic silt [K, L, M]
		Organic:	$\frac{LL\ oven\ dried}{LL\ not\ dried}$ < 0.75	OH	Organic clay [K, L, M, P]
					Organic silt [K, L, M, Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor			PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve.
[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.
[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.
[E] $Cu = D_{60}/D_{10}$ $Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$
[F] If soil contains ≥ 15% sand, add "with sand" to group name.
[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.
[H] If fines are organic, add "with organic fines" to group name.
[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.
[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.
[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.
[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.
[N] PI ≥ 4 and plots on or above "A" line.
[O] PI < 4 or plots below "A" line.
[P] PI plots on or above "A" line.
[Q] PI plots below "A" line.



Rock Classification Notes

WEATHERING	
Term	**Description**
Fresh	Mineral crystals appear bright; show no discoloration. Features show little or no staining on surfaces. Discoloration does not extend into intact rock.
Slightly weathered	Rock generally fresh except along fractures. Some fractures stained and discoloration may extend <0.5 inches into rock.
Moderately weathered	Significant portions of rock are dull and discolored. Rock may be significantly weaker than in fresh state near fractures. Soil zones of limited extent may occur along some fractures.
Highly weathered	Rock dull and discolored throughout. Majority of rock mass is significantly weaker and has decomposed and/or disintegrated; isolated zones of stronger rock and/or soil may occur throughout.
Completely weathered	All rock material is decomposed and/or disintegrated to soil. The rock mass or fabric is still evident and largely intact. Isolated zones of stronger rock may occur locally.

STRENGTH OR HARDNESS		
Description	**Field Identification**	**Uniaxial Compressive Strength, psi**
Extremely strong	Can only be chipped with geological hammer. Rock rings on hammer blows. Cannot be scratched with a sharp pick. Hand specimens require several hard hammer blows to break.	>36,000
Very strong	Several blows of a geological hammer to fracture. Cannot be scratched with a 20d common steel nail. Can be scratched with a geologist's pick only with difficulty.	15,000-36,000
Strong	More than one blow of a geological hammer needed to fracture. Can be scratched with a 20d nail or geologist's pick. Gouges or grooves to ¼ inch deep can be excavated by a hard blow of a geologist's pick. Hand specimens can be detached by a moderate blow.	7,500-15,000
Medium strong	One blow of geological hammer needed to fracture. Can be distinctly scratched with 20d nail. Can be grooved or gouged 1/16 in. deep by firm pressure with a geologist's pick point. Can be fractured with single firm blow of geological hammer. Can be excavated in small chips (about 1-in. maximum size) by hard blows of the point of a geologist's pick;	3,500-7,500
Weak	Shallow indent by firm blow with geological hammer point. Can be gouged or grooved readily with geologist's pick point. Can be excavated in pieces several inches in size by moderate blows of a pick point. Small thin pieces can be broken by finger pressure.	700-3,500
Very weak	Crumbles under firm blow with geological hammer point. Can be excavated readily with the point of a geologist's pick. Pieces 1-in. or more in thickness can be broken with finger pressure. Can be scratched readily by fingernail.	150-700

DISCONTINUITY DESCRIPTION			
Fracture Spacing (Joints, Faults, Other Fractures)		Bedding Spacing (May Include Foliation or Banding)	
Description	**Spacing**	**Description**	**Spacing**
Intensely fractured	< 2.5 inches	Laminated	< ½-inch
Highly fractured	2.5 – 8 inches	Very thin	½ – 2 inches
Moderately fractured	8 inches to 2 feet	Thin	2 inches – 1 foot
Slightly fractured	2 to 6.5 feet	Medium	1 – 3 feet
Very slightly fractured	> 6.5 feet	Thick	3 – 10 feet
		Massive	> 10 feet

ROCK QUALITY DESIGNATION (RQD) [1]	
Description	**RQD Value (%)**
Very Poor	0 - 25
Poor	25 – 50
Fair	50 – 75
Good	75 – 90
Excellent	90 - 100

1. The combined length of all sound and intact core segments equal to or greater than 4 inches in length, expressed as a percentage of the total core run length.

APPENDIX M
DRAINAGE REPORT



GBA

LENAPE SAND OPERATION DRAINAGE STRUCTURES

LEAVENWORTH COUNTY, KANSAS

GBA PROJECT NO. 16477

9801 Renner Boulevard
Lenexa, KS 66219-9745
913.492.0400 | www.gbateam.com

September 26, 2025

Kaw Valley Sand & Gravel
Lenape Sand Operation
166th & Lenape Road
Southern Leavenworth County, Kansas
GBA Project No. 16477

Drainage Structures Study
September 26, 2025

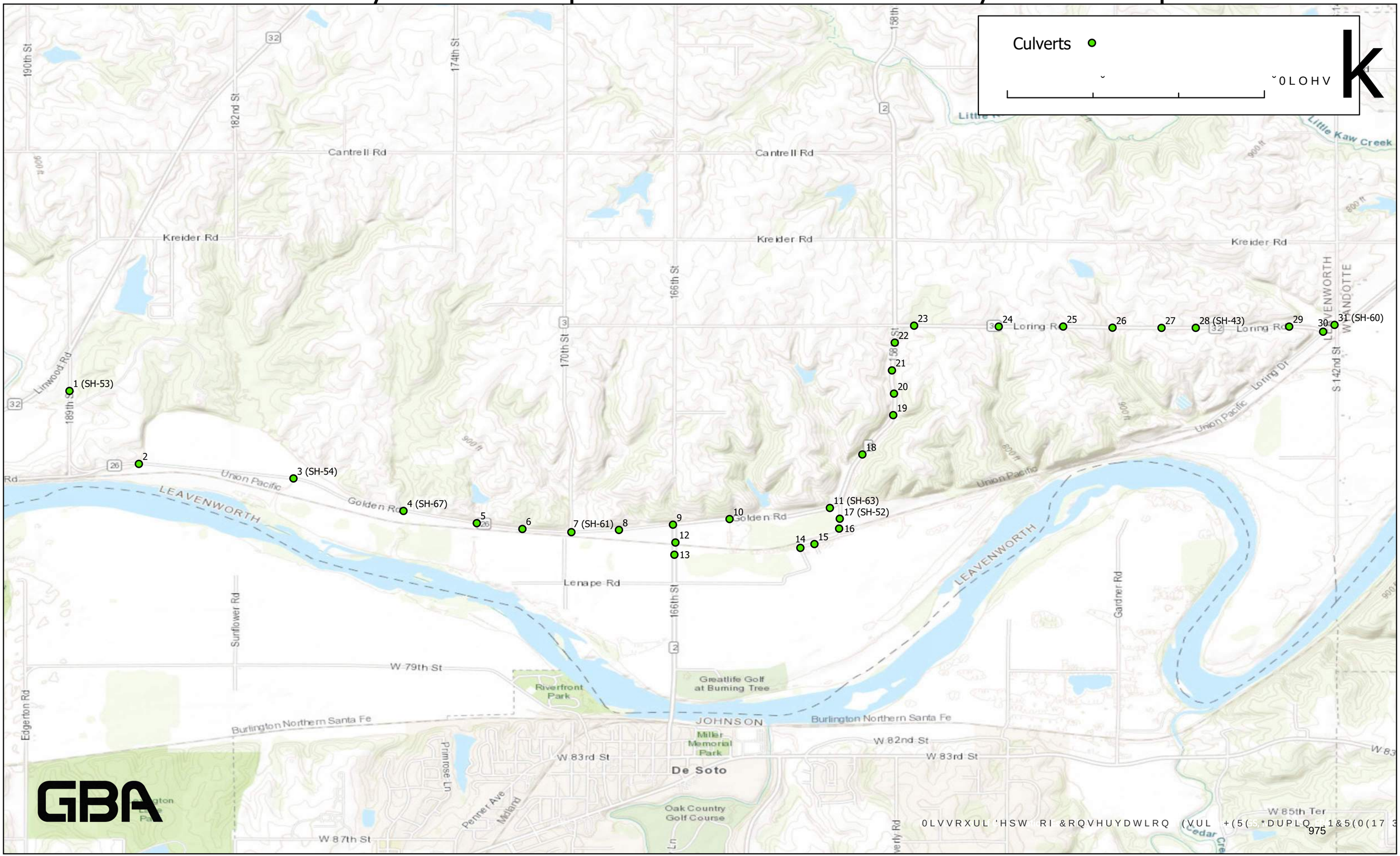
Disclaimer:
This report is an evaluation from a visual assessment perspective only. Structural analysis, hydrologic and hydraulic analysis, geometric and safety upgrades, including lane width and shoulder improvements, are outside the scope of the drainage structures study.

Prepared for:
Kaw Valley Companies, Inc.
5600 Kansas Avenue
Kansas City, Kansas 66106
(913) 281-9950

Prepared by:
George Butler Associates, Inc
9801 Renner Boulevard
Lenexa, Kansas 66219
(913) 492-0400



16477 Kaw Valley Sand - Lenape Site - Leavenworth County Culvert Inspections



Identification

Owner: Leavenworth County
Culvert ID: 1 (SH-53)
Span Configuration: 11.25'x6.58'
Year Built: Unknown
Longitude: -95.01563911
Feature Intersected: Stream
Route Carried: 189th St
Latitude: 39.00905862
No. of Lanes: 2
Location: 0.2 S of K-32
Posting: None
Structure Type: Corrugated Metal Arch
Length: 30'
Structure Type Additional Feature:
Roadway Width: 23'

Schedule

Inspection Date: December 17, 2024
Temperature: 45°F
Inspection Frequency: N/A
Weather: Partly Cloudy
Inspector(s): RAM, CFL

Condition

Culvert: Corrugated metal arch with concrete floor. Metal arch is in good condition with minor corrosion along seams and along bottom. Concrete headwalls in poor condition with large amount of deterioration and spalling with exposed rebar, worse on west end.

Condition Rating: 7

Channel: Poor alignment upstream with main channel entering culvert at 45° from the NE. Separate smaller roadway drainage channel coming from the SE meeting at the culvert. Good vegetation on banks. Up to 6" of scour on upstream end. Minor silt in cell.

Condition Rating: 6

Scour: Up to 6" of scour on upstream end.

Condition Rating: 7

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: NW,NE,SW,SE

Maintenance Recommendations

Reconstruct headwalls with new guardrail.



Approach - Looking North



Approach - Looking South



Upstream - Looking Northeast



Downstream - Looking West



Elevation - Looking East



Elevation - Looking West



Scour at Upstream End - Looking West



Typical Headwall Condition - Looking East



Typical View Through Arch - Looking East

Identification

Owner: Leavenworth County
Culvert ID: 2
Span Configuration: 3’x1.83’
Year Built: Unknown
Longitude: -95.00978663
Feature Intersected: Drainage ditch
Route Carried: Golden Rd
Latitude: 39.00290432
No. of Lanes: 2
Location: 0.3 E of 189th St
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 39'
Structure Type Additional Feature:
Roadway Width: 23’

Schedule

Inspection Date: December 17, 2024
Temperature: 50°F
Inspection Frequency: N/A
Weather: Cloudy
Inspector(s): RAM,CFL

Condition

Culvert: Corrugated metal pipe in fair condition with minor corrosion typical along bottom. Areas of heavy corrosion with minor to moderate section loss along bottom and along seams. A few areas with minor deflection in top and bottom of pipe.

Condition Rating: 6

Channel: Small drainage channel with generally good alignment and a few small trees in channel. 8’ diameter x 2.5’ deep scour hole downstream with 1.5’ of undermining. Moderate bank erosion around downstream end of pipe.

Condition Rating: 6

Scour: 8’ diameter x 2.5’ deep scour hole downstream with 1.5’ of undermining.

Condition Rating: 6

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: SW

Maintenance Recommendations

Fill downstream scour hole with rip rap.



Approach - Looking West



Approach - Looking East



Upstream - Looking North



Downstream - Looking South



Elevation - Looking South



Typical View Through Pipe - Looking South



Elevation - Looking South

Identification

Owner: Leavenworth County
Year Built: Unknown
Route Carried: Golden Rd
Location: 1.0 E of 189th St
Structure Type: Steel Beam, Simple Span
Structure Type Additional Feature:

Culvert ID: 3 (SH-54)
Longitude: -94.9967456
Latitude: 39.00167888

Span Configuration: 29.75’
Feature Intersected: Stream
No. of Lanes: 2
Posting: None
Length: 24.5’
Roadway Width: 23’

Schedule

Inspection Date: December 17, 2024
Inspection Frequency: N/A
Inspector(s): RAM,CFL

Temperature: 50°F
Weather: Cloudy

Condition

Culvert: Bottom of deck has heavy corrosion on north half and south edge. Steel beams have areas of heavy section loss in north 5 beams and south 3 beams. Steel pile caps and piles have areas of heavy section loss. Horizontal pile braces have 100% section loss. Corrugated steel backwalls have areas of moderate section loss. East backwall is bulging near groundline.

Condition Rating: 4

Channel: Rocky bottom channel with steep banks with exposed tree roots. Channel favors east abutment with ~3' of scour along abutment. Large drift caught in channel.

Condition Rating: 6

Scour: Channel favors east abutment with ~3' of scour along abutment.

Condition Rating: 6

Miscellaneous: Load rating performed on structure in 2019. NBI#: 000000000520160

Overall Condition Rating: Poor

Roadside Hardware

Bridge Railing: 0
Bridge Railing Transitions: 0

Approach Guardrail: 0
Approach Guardrail Ends: 0

Railing/Guardrail Notes: North side guardrail posts are broken off for entirety of span. Guardrail is unsupported for ~40’.

Hazard Markers: NW,NE,SW,SE

Maintenance Recommendations

Structure is scheduled for replacement. Construction to begin December 15, 2025. Structure to be completed in August 2026.



Approach Roadway - Looking East



Approach Roadway - Looking West



Upstream Channel - Looking North



Downstream Channel - Looking South



Approach Roadway Settlement at SE Corner - Looking East



North Guardrail Condition - Looking Northwest



Elevation - Looking South



Elevation - Looking North



East Abutment - Looking East



West Abutment - Looking West



Typical Superstructure - Looking West



Typical Superstructure and Substructure Condition - Looking North

Identification

Owner: Leavenworth County
Culvert ID: 4 (SH-67)
Span Configuration: 12'x7.75'
Year Built: Unknown
Longitude: -94.98746424
Feature Intersected: Stream
Route Carried: Golden Rd
Latitude: 38.99893823
No. of Lanes: 2
Location: 0.8 W of 170th St
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 66.75'
Structure Type Additional Feature:
Roadway Width: 23'

Schedule

Inspection Date: December 17, 2024
Temperature: 50°F
Inspection Frequency: N/A
Weather: Cloudy
Inspector(s): RAM,CFL

Condition

Culvert: Minor to moderate corrosion typical along bottom and seams. A few areas with minor to moderate section loss. One area of heaving bottom near north end.

Condition Rating: 6

Channel: Good alignment. Large trees with exposed roots line banks. Large amount of drift caught in channel upstream. 6" of scour with 6" undermining at south end.

Condition Rating: 6

Scour: 6" of scour with 6" undermining at south end.

Condition Rating: 7

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

Clean drift out of upstream channel.



Approach - Looking West



Approach - Looking East



Upstream - Looking North



Downstream - Looking South



Elevation - Looking South



Elevation - Looking North



Typical View Through Pipe - Looking North



ID Sign - Looking North

Identification

Owner: Leavenworth County
Culvert ID: 5
Span Configuration: 5'x6'
Year Built: Unknown
Longitude: -94.98128073
Feature Intersected: Drainage ditch
Route Carried: Golden Rd
Latitude: 38.99790552
No. of Lanes: 2
Location: 0.4 W of 170th St
Posting: None
Structure Type: Reinforced Concrete Box
Length: 28.5'
Structure Type Additional Feature:
Roadway Width: 23'

Schedule

Inspection Date: December 17, 2024
Temperature: 50°F
Inspection Frequency: N/A
Weather: Cloudy
Inspector(s): RAM,CFL

Condition

Culvert: RCB in generally good condition. Area of poor consolidation in top slab at north end. Several shallow spalls with exposed rebar in top slab due to shallow cover. Large spall with exposed rebar at west end of south head wall/barrier.

Condition Rating: 7

Channel: Upstream is 3-16" corrugated metal pipes coming from the W, N, & E. Moderate amount of debris around each pipe. Downstream is shallow banks with several small to large trees. 9" of scour at the end of downstream apron.

Condition Rating: 7

Scour: 9" of scour at the end of downstream apron.

Condition Rating: 7

Miscellaneous:

Overall Condition Rating: Good

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: NE, SW

Maintenance Recommendations

None at this time.



Approach - Looking West



Approach - Looking East



Upstream - Looking North



Downstream - Looking South



Elevation - Looking Southwest



Elevation - Looking Northeast



Scour at Downstream End - Looking North



Typical View Through Cell - Looking South



Poor Consolidation in Top Slab at North End - Looking Southwest



Shallow Spalls w/ Exposed Rebar in Top Slab - Looking South

Identification

Owner: Leavenworth County
Culvert ID: 6
Span Configuration: 3’
Year Built: Unknown
Longitude: -94.97743333
Feature Intersected: Stream
Route Carried: Golden Rd
Latitude: 38.99741546
No. of Lanes: 2
Location: 0.2 W of 170th St
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 39.5’
Structure Type Additional Feature:
Roadway Width: 23’

Schedule

Inspection Date: December 17, 2024
Temperature: 50°F
Inspection Frequency: N/A
Weather: Cloudy
Inspector(s): RAM, CFL

Condition

Culvert: Corrugated metal pipe in good condition. Moderate impact damage at north end.

Condition Rating: 7

Channel: Good alignment. Upstream is narrow winding channel with small to moderate trees along banks. Downstream T’s into roadway drainage ditch 15’ downstream of pipe. 1’ of silt/debris accumulation at upstream end of pipe, 6” at downstream end.

Condition Rating: 6

Scour: Minimal scour at downstream end.

Condition Rating: 8

Miscellaneous: Bank above downstream end of pipe has erosion that is enchroaching on roadway.

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

Clear silt/debris from upstream and downstream end.



Approach - Looking East



Approach - Looking West



Upstream - Looking North



Downstream - Looking South



Elevation - Looking South



Typical View Through Pipe - Looking South



Impact Damage at North End - Looking South



Elevation - Looking Northwest

Identification

Owner: Leavenworth County
Year Built: Unknown
Route Carried: Golden Rd
Location: E of 170th St
Structure Type: Reinforced Concrete Box
Structure Type Additional Feature:

Culvert ID: 7 (SH-61)
Longitude: -94.97330054
Latitude: 38.99714699

Span Configuration: 3-7'x4' (45° skew)
Feature Intersected: Stream
No. of Lanes: 2
Posting: 11 Tons
Length: 42'
Roadway Width: 23'

Schedule

Inspection Date: December 17, 2024
Inspection Frequency: N/A
Inspector(s): RAM, CFL

Temperature: 50°F
Weather: Cloudy

Condition

Culvert: Hairline transverse cracks typical in top slab and walls. Both headwalls and ends of center walls have heavy deterioration/spalling with exposed rebar with section loss. Deterioration in top slab extends up to 1' into cell. NE wing wall has large spall with exposed rebar at joint with box allowing roadway fill material to fall through.

Condition Rating: 5

Channel: Upstream channel is flat and grassy then becomes more defined with thick vegetation ~50' upstream. Downstream has moderate bank scarring and moderate to large trees. Flow is primarily through east cell. Up to 1' of silt accumulation in west and center cells, 15% of total area blocked. Minor drift in channel.

Condition Rating: 5

Scour: 9" of scour on upstream end of east cell.

Condition Rating: 7

Miscellaneous: NBI#: 000000000520180

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: 0
Bridge Railing Transitions: N

Approach Guardrail: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: NW,NE,SW,SE

Maintenance Recommendations

Structure is scheduled for replacement. Construction to begin December 15, 2025. Structure to be completed in August 2026.



Approach - Looking East



Approach - Looking West



Upstream - Looking Northeast



Downstream - Looking Southwest



Elevation - Looking Northeast



Typical Headwall Condition - Looking Northwest



Typical View Through Cell - Looking Northeast



Elevation - Looking Southwest



Typical Top Slab Condition at Ends - Looking West

Identification

Owner: Leavenworth County
Culvert ID: 8
Span Configuration: 3.5'x2'
Year Built: Unknown
Longitude: -94.96928809
Feature Intersected: Drainage ditch
Route Carried: Golden Rd
Latitude: 38.99733484
No. of Lanes: 2
Location: 0.2 E of 170th St
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 41.5'
Structure Type Additional Feature:
Roadway Width: 23'

Schedule

Inspection Date: December 17, 2024
Temperature: 50°F
Inspection Frequency: N/A
Weather: Cloudy
Inspector(s): RAM, CFL

Condition

Culvert: Top of corrugated metal pipe in good condition. Bottom of pipe not visible due to 4" of standing water. Near waterline is moderate corrosion with some minor section loss. Moderate impact damage to north end of pipe. Minor impact damage to south end.

Condition Rating: 6

Channel: Upstream is roadway drainage ditch. Downstream in shallow and flat grassy channel with large trees. Minor debris caught downstream.

Condition Rating: 7

Scour: No scour.

Condition Rating: 8

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

None at this time.



Approach - Looking East



Approach - Looking West



Upstream - Looking North



Downstream - Looking South



Elevation - Looking North



Typical View Through Pipe - Looking North



Elevation - Looking South

Identification

Owner: Leavenworth County
Culvert ID: 9
Span Configuration: 3.5’
Year Built: Unknown
Longitude: -94.96473068
Feature Intersected: Drainage ditch
Route Carried: Golden Rd
Latitude: 38.997777
No. of Lanes: 2
Location: W of 166th St
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 54.5’
Structure Type Additional Feature:
Roadway Width: 35’

Schedule

Inspection Date: December 18, 2024
Temperature: 36°F
Inspection Frequency: N/A
Weather: Cloudy
Inspector(s): RAM,CFL

Condition

Culvert: Corrugated metal pipe in generally good condition with a few areas of moderate corrosion along seams and minor deflection throughout. Upstream end has large impact damage with top of pipe bent down 1’.

Condition Rating: 6

Channel: Upstream and downstream is grassy roadway drainage channel.

Condition Rating: 8

Scour: No scour.

Condition Rating: 8

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

None at this time.



Approach - Looking West



Approach - Looking East



Upstream - Looking North



Downstream - Looking South



Elevation - Looking North



Elevation - Looking South



Typical View Through Pipe - Looking North

Identification

Owner: Leavenworth County
Culvert ID: 10
Span Configuration: 4'x5'
Year Built: Unknown
Longitude: -94.95995868
Feature Intersected: Drainage ditch
Route Carried: Golden Rd
Latitude: 38.99825315
No. of Lanes: 2
Location: 0.3 E of 166th St
Posting: None
Structure Type: Reinforced Concrete Box
Length: 27'
Structure Type Additional Feature:
Roadway Width: 23'

Schedule

Inspection Date: December 18, 2024
Temperature: 36°F
Inspection Frequency: N/A
Weather: Cloudy
Inspector(s): RAM, CFL

Condition

Culvert: Culvert in good condition.

Condition Rating: 7

Channel: Upstream and downstream is grassy drainage ditch. 5' deep x 15' diameter scour hole downstream. Up to 5' back x full width undermining under downstream apron. 3" diameter tree growing on upstream end of culvert.

Condition Rating: 5

Scour: 5' deep x 15' diameter scour hole downstream. Up to 5' back x full width undermining under downstream apron.

Condition Rating: 5

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: SW. NE marker is knocked down.

Maintenance Recommendations

Put NE hazard marker up. Remove tree on north end of culvert. Repair scour hole downstream with rip rap and backfill undermining.



Approach - Looking East



Approach - Looking West



Upstream - Looking North



Downstream - Looking South



Elevation - Looking Northwest



Typical View Through Cell - Looking North



Elevation - Looking South



Undermining at South End - Looking Northeast



Undermining at South End - Looking East

Identification

Owner: Leavenworth County
Culvert ID: 11 (SH-63)
Span Configuration: 18.25'x5.75'
Year Built: Unknown
Longitude: -94.95149325
Feature Intersected: Stream
Route Carried: Golden Rd
Latitude: 38.99918836
No. of Lanes: 2
Location: 0.1 W of 161st St
Posting: None
Structure Type: Corrugated Metal Arch
Length: 59'
Structure Type Additional Feature:
Roadway Width: 23'

Schedule

Inspection Date: December 18, 2024
Temperature: 38°F
Inspection Frequency: N/A
Weather: Cloudy
Inspector(s): RAM,CFL

Condition

Culvert: Corrugated metal arch in good condition.

Condition Rating: 8

Channel: Upstream is flat and grassy then becomes more defined channel ~50' upstream with large trees lining banks. Downstream has large trees along east bank and well graded west bank. Rip rap in place around all wings and at downstream end.

Condition Rating: 8

Scour: Insignificant scour.

Condition Rating: 8

Miscellaneous:

Overall Condition Rating: Good

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

None at this time.



Approach - Looking East



Approach - Looking West



Upstream - Looking North



Downstream - Looking South



Elevation - Looking North



Elevation - Looking South



Typical View Through Pipe - Looking South

Identification

Owner: Leavenworth County
Culvert ID: 12
Span Configuration: 4.5’
Year Built: Unknown
Longitude: -94.96461037
Feature Intersected: Drainage ditch
Route Carried: 166th St
Latitude: 38.99627358
No. of Lanes: 2
Location: 0.1 S of Golden Rd
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 84’
Structure Type Additional Feature:
Roadway Width: 24’

Schedule

Inspection Date: May 2, 2025
Temperature: 60°F
Inspection Frequency: N/A
Weather: Cloudy
Inspector(s): RAM,CFL

Condition

Culvert: Top of corrugated metal pipe in good condition. Bottom of pipe has minor to moderate surface corrosion throughout with a few areas of heavy corrosion with moderate section loss.

Condition Rating: 6

Channel: Pipe is at intersection of roadway drainage ditch coming from the north and railroad drainage ditch coming from the west. Channel is grassy with north banks lined with trees and south banks being a rock/grass lined railroad embankment. Moderate brush slightly blocking ends of pipe. Up to 6” of standing water in east half of pipe.

Condition Rating: 6

Scour: No scour.

Condition Rating: 8

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

Clear brush at ends of pipe.



Approach - Looking South



Approach - Looking North



Upstream - Looking West



Downstream - Looking East



Typical View Through Pipe - Looking East



Typical Bottom of Pipe Condition



Elevation - Looking West



Elevation - Looking East

Identification

Owner: Leavenworth County
Culvert ID: 13
Span Configuration: 3.5'x2'
Year Built: Unknown
Longitude: -94.96461104
Feature Intersected: Drainage ditch
Route Carried: 166th St
Latitude: 38.9952427
No. of Lanes: 2
Location: 0.2 S of Golden Rd
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 66’
Structure Type Additional Feature:
Roadway Width: 24.5’

Schedule

Inspection Date: May 2, 2025
Temperature: 60°F
Inspection Frequency: N/A
Weather: Cloudy
Inspector(s): RAM,CFL

Condition

Culvert: Top of corrugated metal pipe is in good condition. Bottom of pipe has severe corrosion/section loss. Bottom completely rusted out for majority of length, up to 2’ wide at east end. West end of pipe has large impact damage with top bent down ~1’.

Condition Rating: 3

Channel: Upstream and downstream end of pipe Ts into field drainage ditch on both sides. Upstream is grassy, downstream has thick brush throughout. 1’ of scour at downstream end with ~3’ of undermining.

Condition Rating: 6

Scour: 1’ of scour at downsteam end of pipe with ~3’ of undermining.

Condition Rating: 6

Miscellaneous:

Overall Condition Rating: Poor

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

Replace structure.



Elevation - Looking East



View Through Pipe - Looking East



Upstream - Looking West



Approach - Looking South



Approach - Looking North



Elevation - Looking West



View Through Pipe - Looking West



Downstream - Looking East

Identification

Owner: Leavenworth County
Culvert ID: 14
Span Configuration: 4’x4’
Year Built: Unknown
Longitude: -94.95398352
Feature Intersected: Stream
Route Carried: De Soto St
Latitude: 38.9958212
No. of Lanes: 2
Location: At corner of Desoto St/Amnesty Rd
Posting: None
Structure Type: Reinforced Concrete Frame, no Floor
Length: 23’
Structure Type Additional Feature:
Roadway Width: 17.5'

Schedule

Inspection Date: May 2, 2025
Temperature: 60°F
Inspection Frequency: N/A
Weather: Partly cloudy
Inspector(s): RAM,CFL

Condition

Culvert: Concrete frame in generally good condition. A few areas with poor consolidation. A few minor spalls in headwalls and wingwalls.

Condition Rating: 7

Channel: Downstream is grassy drainage ditch with trees along banks, upstream is more defined channel with trees and thick brush throughout. Moderate drift/debris in channel. Small tree growing in center of channel at downstream headwall. Footings exposed with 9” of scour along entire length of culvert.

Condition Rating: 5

Scour: Footings exposed with 9” of scour along entire length of culvert. No undermining.

Condition Rating: 5

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: NW, SE

Maintenance Recommendations

None at this time.



Approach - Looking South



Approach - Looking North



Elevation - Looking West



Typical View Through Culvert - Looking West



Typical Wall Condition



Typical Bottom of Top Slab Condition



Elevation - Looking East



Upstream - Looking East



Downstream - Looking West

Identification

Owner: Leavenworth County
Culvert ID: 15
Span Configuration: 4’
Year Built: Unknown
Longitude: -94.95279739
Feature Intersected: Drainage ditch
Route Carried: Lyon St
Latitude: 38.99614497
No. of Lanes: 1
Location: S of Amnesty Rd
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 23’
Structure Type Additional Feature:
Roadway Width: 13’

Schedule

Inspection Date: May 2, 2025
Temperature: 60°F
Inspection Frequency: N/A
Weather: Partly cloudy
Inspector(s): RAM,CFL

Condition

Culvert: Corrugated metal pipe in good condition.

Condition Rating: 8

Channel: Good alignment. Grassy channel with stable banks lined with trees. Asphalt poured around both ends of pipe. Up to 1’ of asphalt/silt buildup at ends of pipe, ~15% cross section blocked.

Condition Rating: 7

Scour: No scour.

Condition Rating: 8

Miscellaneous:

Overall Condition Rating: Good

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: NW, SE

Maintenance Recommendations

None at this time.



Approach - Looking South



Approach - Looking North



Upstream - Looking West



Downstream - Looking East



Elevation - Looking East



Typical View Through Pipe - Looking East



Elevation - Looking West

Identification

Owner: Leavenworth County
Culvert ID: 16
Span Configuration: 2’
Year Built: Unknown
Longitude: -94.95071633
Feature Intersected: Drainage ditch
Route Carried: 161st St
Latitude: 38.99744694
No. of Lanes: 2
Location: N Side of Railroad Tracks
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 51’
Structure Type Additional Feature:
Roadway Width: 21’

Schedule

Inspection Date: May 2, 2025
Temperature: 60°F
Inspection Frequency: N/A
Weather: Cloudy
Inspector(s): RAM,CFL

Condition

Culvert: Majority of corrugated steel pipe is buried. Visible portions have minor surface corrosion.

Condition Rating: 7

Channel: South banks are grassy railroad embankments. Upstream north bank is also grassy, downstream north bank has trees and thick brush throughout. Pipe is mostly buried with up to 21” silt build up, ~90% cross section blocked.

Condition Rating: 4

Scour: No scour.

Condition Rating: 8

Miscellaneous:

Overall Condition Rating: Poor

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

Replace structure.



Approach - Looking North



Approach - Looking South



Upstream - Looking West



Downstream - Looking East



Elevation - Looking East



Typical View Through Pipe



Elevation - Looking West

Identification

Owner: Leavenworth County
Culvert ID: 17 (SH-52)
Span Configuration: 13’x8’
Year Built: Unknown
Longitude: -94.95066094
Feature Intersected: Stream
Route Carried: 161st St
Latitude: 38.99828057
No. of Lanes: 2
Location: 0.1 S of Golden Rd
Posting: None
Structure Type: Corrugated Metal Arch
Length: 58’
Structure Type Additional Feature:
Roadway Width: 18.5'

Schedule

Inspection Date: May 2, 2025
Temperature: 60°F
Inspection Frequency: N/A
Weather: Cloudy
Inspector(s): RAM,CFL

Condition

Culvert: Corrugated metal arch in generally good condition. West 20’ appears to be a newer section. ~4” of misalignment and/or defelction at joint with steel plates added to hold backfill. A couple large punctures in top of arch with steel plates added near east end.

Condition Rating: 7

Channel: Upstream has good alignment. Channel turns south and flows parallel to road immediately downstream of pipe. Upstream has shallow grassy north bank, and steeper grassy south bank, both appear stable. Stone retaining wall at northwest corner of arch is undermined up to 2’ and appears to be moving. Downstream banks have large stones and thick trees/brush. ~3’ of standing water inside arch with ~1’ of silt.

Condition Rating: 6

Scour: Stone retaining wall at northwest corner of arch is undermined up to 2’ and appears to be moving.

Condition Rating: 5

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

Monitor retaining wall movement at northwest corner.



Approach - Looking South



Approach - Looking North



ID Sign - Looking East


Upstream - Looking Northwest



Downstream - Looking South



Elevation - Looking Southwest



Elevation - Looking East



Undermining of Northwest Retaining Wall - Looking East



Typical View Through Arch



Punctures in Top of Arch Near East End - Looking West

Identification

Owner: Leavenworth County
Culvert ID: 18
Span Configuration: 5'x3'
Year Built: Unknown
Longitude: -94.94875307
Feature Intersected: Drainage ditch
Route Carried: 158th St
Latitude: 39.00369999
No. of Lanes: 2
Location: 0.3 N of Golden Rd
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 48'
Structure Type Additional Feature:
Roadway Width: 22.5'

Schedule

Inspection Date: May 2, 2025
Temperature: 60°F
Inspection Frequency: N/A
Weather: Partly cloudy
Inspector(s): RAM,CFL

Condition

Culvert: Top of corrugated metal pipe in good condition. Bottom of pipe has surface corrosion with a few areas of minor section loss. Bottom has moderate heaving near center of pipe. Ends of pipe have moderate impact damage with top bent down up to ~9".

Condition Rating: 6

Channel: Upstream and downstream T into roadway drainage ditches. Thick trees/brush along outside banks. Moderate drift/debris in downstream channel.

Condition Rating: 6

Scour: No scour.

Condition Rating: 8

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

None at this time.



Approach - Looking South



Typical View Through Pipe - Looking West



Elevation - Looking Southwest



Upstream - Looking East



Downstream - Looking West



Elevation - Looking East



Approach - Looking North

Identification

Owner: Leavenworth County
Culvert ID: 19
Span Configuration: 3.5'x2'
Year Built: Unknown
Longitude: -94.94615155
Feature Intersected: Stream
Route Carried: 158th St
Latitude: 39.00701927
No. of Lanes: 2
Location: 0.5 S of Loring Rd
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 48'
Structure Type Additional Feature:
Roadway Width: 23'

Schedule

Inspection Date: May 2, 2025
Temperature: 60°F
Inspection Frequency: N/A
Weather: Partly Cloudy
Inspector(s): RAM,CFL

Condition

Culvert: Bottom of pipe has moderate surface corrosion. ~2-3" dent in top of pipe 5' from west end. Impact damage to west end with top bent down ~9".

Condition Rating: 6

Channel: Upstream channel meanders from the east, downstream channel curves south and flows parallel to roadway. Thick trees/brush throughout. Up to 6" of silt/debris in pipe with moderate drift/debris in channel throughout.

Condition Rating: 6

Scour: No scour.

Condition Rating: 8

Miscellaneous: West edge of roadway is eroding above end of pipe.

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

Replace structure.



Approach - Looking South



Approach - Looking North



Elevation - Looking East



Typical View Through Pipe - Looking East



Downstream - Looking West



Elevation - Looking West



Upstream - Looking East



West Edge of Roadway Condition - Looking South

Identification

Owner: Leavenworth County
Culvert ID: 20
Span Configuration: 2’
Year Built: Unknown
Longitude: -94.94608688
Feature Intersected: Stream
Route Carried: 158th St
Latitude: 39.00883359
No. of Lanes: 2
Location: 0.4 S of Loring Rd
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 70’
Structure Type Additional Feature:
Roadway Width: 22.5’

Schedule

Inspection Date: May 5, 2025
Temperature: 68°F
Inspection Frequency: N/A
Weather: Sunny
Inspector(s): RAM

Condition

Culvert: Top of corrugated metal pipe in generally good condition. Bottom has heavy corrosion with moderate section loss typical. 5’ section of pipe at east end has completely rusted out bottom, up to 1’ wide.

Condition Rating: 4

Channel: Small meandering rocky bottom channel. Trees and thick brush up and downstream. Moderate drift/debris in channel. 1-2’ deep scour hole at downstream end.

Condition Rating: 6

Scour: 1-2’ deep scour hole at downstream end.

Condition Rating: 7

Miscellaneous:

Overall Condition Rating: Poor

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

Replace structure.



Approach - Looking South



Approach - Looking North



Downstream - Looking West



Elevation - Looking East



View Through Pipe - Looking East



Elevation - Looking West



Upstream - Looking Northeast



View Through Pipe - Looking West

Identification

Owner: Leavenworth County
Culvert ID: 21
Span Configuration: 2.5’
Year Built: Unknown
Longitude: -94.94625776
Feature Intersected: Drainage ditch
Route Carried: 158th St
Latitude: 39.01079109
No. of Lanes: 2
Location: 0.3 S of Loring Rd
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 44.5’
Structure Type Additional Feature:
Roadway Width: 23’

Schedule

Inspection Date: May 5, 2025
Temperature: 72°F
Inspection Frequency: N/A
Weather: Sunny
Inspector(s): RAM

Condition

Culvert: Moderate surface corrosion along bottom of pipe at waterline. A few areas of minor section loss. Rest of pipe in generally good condition with a couple small dents.

Condition Rating: 7

Channel: Upstream channel is roadway drainage ditch coming from the north. Downstream flows to the southwest. Grassy slopes with small trees throughout. Minor drift/debris upstream. ~2-3’ deep x ~8’ wide scour hole at downstream end with 3’ of undermining.

Condition Rating: 6

Scour: ~2-3’ deep x ~8’ wide scour hole at downstream end with 3’ of undermining.

Condition Rating: 6

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

None at this time.



Approach - Looking North



Approach - Looking South



Upstream - Looking Northeast



Downstream - Looking Southwest



Elevation - Looking Northwest



View Through Pipe - Looking East



Elevation - Looking Northeast

Identification

Owner: Leavenworth County
Culvert ID: 22
Span Configuration: 4'x4'
Year Built: Unknown
Longitude: -94.94601972
Feature Intersected: Stream
Route Carried: 156th St
Latitude: 39.01313476
No. of Lanes: 2
Location: 0.1 S of Loring Rd
Posting: None
Structure Type: Reinforced Concrete Box
Length: 70'
Structure Type Additional Feature:
Roadway Width: 22.5'

Schedule

Inspection Date: May 5, 2025
Temperature: 72°F
Inspection Frequency: N/A
Weather: Sunny
Inspector(s): RAM

Condition

Culvert: Concrete box in generally good condition. Moderate leakage through west joint. Minor abrasion in bottom slab. Large spall with exposed rebar at end of southwest wing.

Condition Rating: 7

Channel: Upstream has steep banks lined with stones, trees, and thick brush. South bank is unstable with large pile of stones falling into end of box. Downstream has thick brush throughout that is partially blocking end of box. Fence immediately downstream of box collecting drift/debris.

Condition Rating: 5

Scour: Minimal scour downstream.

Condition Rating: 8

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

Clear stones/debris/brush at ends of box. Stabilize upstream banks.



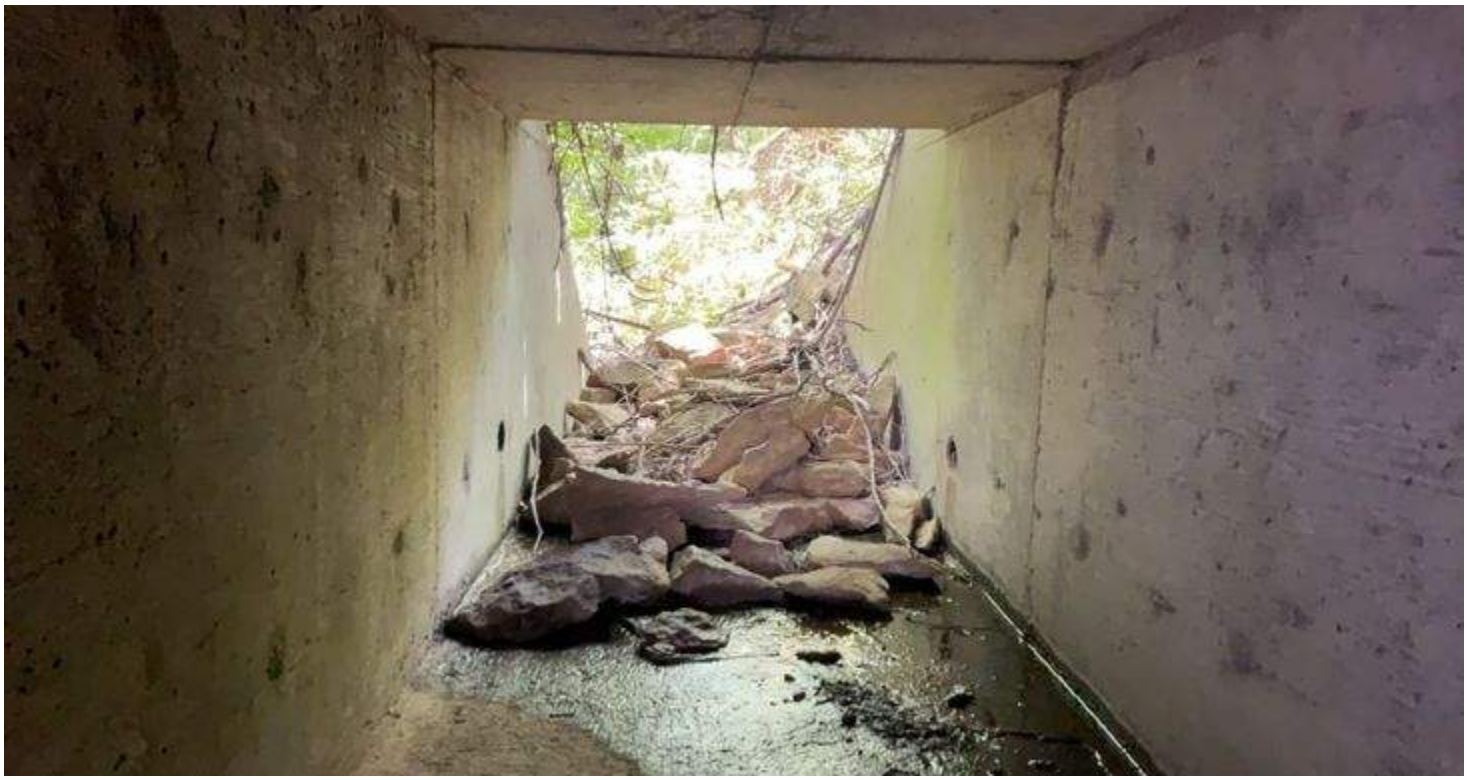
Elevation - Looking West



Upstream - Looking East



Typical View Through Cell - Looking West



Stones Falling Into East End of Box - Looking East



West Joint Leakage - Looking Northwest



Downstream - Looking West



Elevation - Looking East



Spall with Exposed Rebar on Southwest Wing - Looking Southeast



Approach - Looking North



Approach - Looking South

Identification

Owner: Leavenworth County
Culvert ID: 23
Span Configuration: 4’
Year Built: Unknown
Longitude: -94.94438817
Feature Intersected: Stream
Route Carried: Loring Rd
Latitude: 39.01456559
No. of Lanes: 2
Location: 0.1 E of 158th St
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 107’
Structure Type Additional Feature:
Roadway Width: 24’

Schedule

Inspection Date: May 5, 2025
Temperature: 75°F
Inspection Frequency: N/A
Weather: Sunny
Inspector(s): RAM

Condition

Culvert: Top of corrugated metal pipe in generally good condition. Bottom is heavily corroded with north 20’ rusted out up to 1’ wide. Two 4” diameter punctures in side/bottom of pipe ~10’ from north end.

Condition Rating: 4

Channel: Upstream has cluster of several small trees around and in front of end of pipe. 4’ from the downstream end of pipe the channel impacts a 3.5’ diameter tree then flows southwest. Shallow banks with trees and thick brush throughout. South end of pipe has 2’ of silt build up, 50% of cross section blocked.

Condition Rating: 5

Scour: No scour.

Condition Rating: 8

Miscellaneous:

Overall Condition Rating: Poor

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

Replace structure.



Approach - Looking East



Approach - Looking West



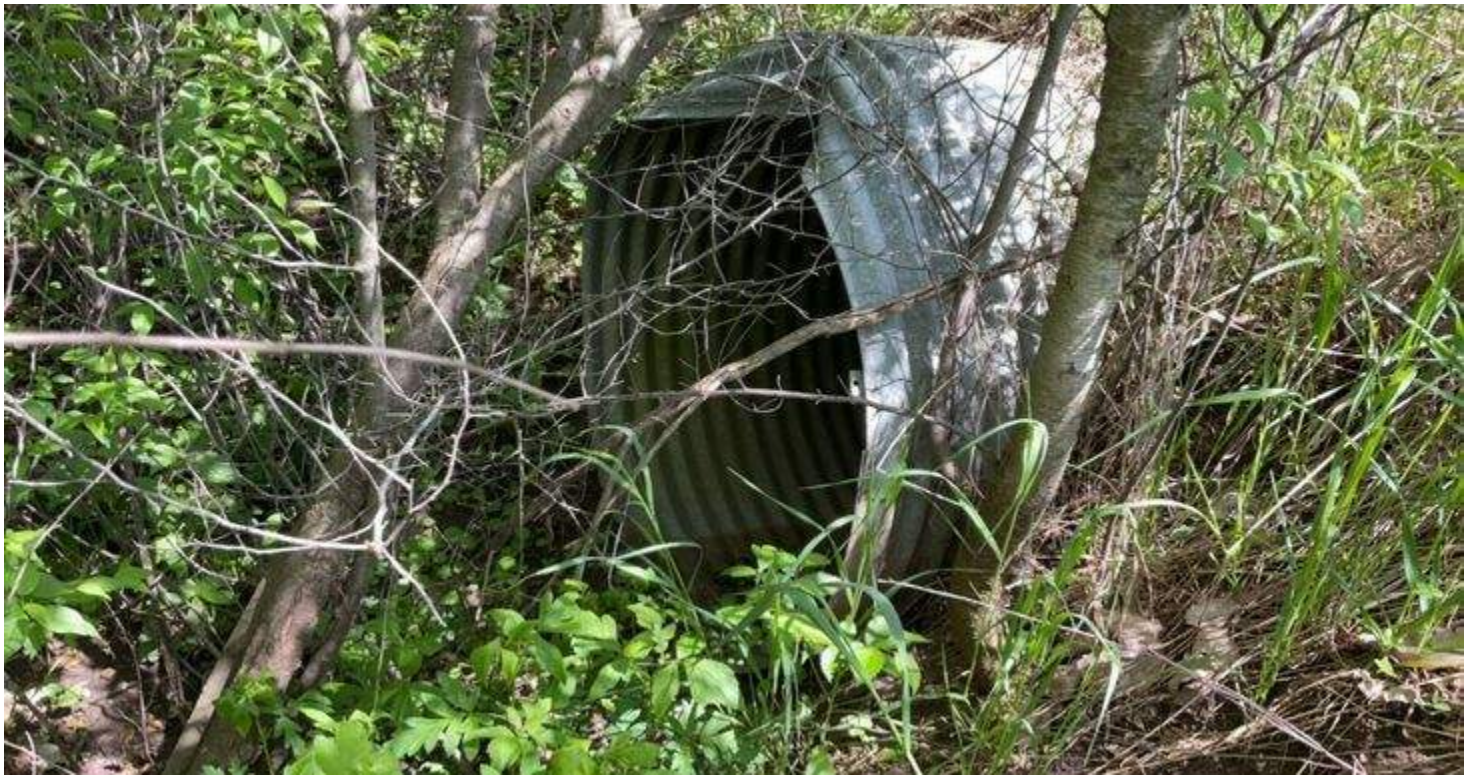
Upstream - Looking Southwest



Elevation - Looking Northeast



View Through Pipe - Looking North



Elevation - Looking Southeast



Upstream - Looking North



Bottom of Pipe Condition at North End - Looking South



Punctures in Pipe Near North End - Looking South

Identification

Owner: Leavenworth County
Culvert ID: 24
Span Configuration: 5’
Year Built: Unknown
Longitude: -94.93725019
Feature Intersected: Stream
Route Carried: Loring Rd
Latitude: 39.01448654
No. of Lanes: 2
Location: 0.3 E of 156th St
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 90’
Structure Type Additional Feature: North end encased in sloped concrete headwall.
Roadway Width: 24’

Schedule

Inspection Date: May 5, 2025
Temperature: 75°F
Inspection Frequency: N/A
Weather: Sunny
Inspector(s): RAM

Condition

Culvert: North end of pipe is encased in a sloped concrete headwall with ~13’ long section that drops ~30°. Top of corrugated metal pipe in generally good condition. Bottom is is heavily corroded with moderate section loss throughout with a few areas with corrosion holes. Pipe has approximately 2" of deflection throughout.

Condition Rating: 5

Channel: Upstream is grassy roadway drainage ditches coming from the east and west and small stream coming from the north. The stream from the north goes through 8” pipe that drops directly into end of pipe. Downstream has trees and thick brush throughout. Large amount of drift/debris caught in downstream channel.

Condition Rating: 6

Scour: Insignificant scour.

Condition Rating: 8

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

Clear drift/debris in downstream channel. Monitor corrosion to bottom of pipe.



Approach - Looking West



Approach - Looking East



Upstream - Looking North



Elevation - Looking South



View Through Pipe - Looking South



Downstream - Looking South



Elevation - Looking North



View Through Pipe - Looking North



Bottom of Pipe Condition - Looking South

Identification

Owner: Leavenworth County
Culvert ID: 25
Span Configuration: 3’
Year Built: Unknown
Longitude: -94.93181312
Feature Intersected: Stream
Route Carried: Loring Rd
Latitude: 39.01449141
No. of Lanes: 2
Location: 0.6 E of 156th St
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 141’
Structure Type Additional Feature:
Roadway Width: 25’

Schedule

Inspection Date: May 7, 2025
Temperature: 60°F
Inspection Frequency: N/A
Weather: Cloudy
Inspector(s): RAM

Condition

Culvert: Top of corrugated metal pipe in generally good condition. Minor surface corrosion typical throughout bottom along flow line. Moderate leakage in walls along seams. These locations have heavier corrosion with some minor section loss.

Condition Rating: 6

Channel: Small stream with shallow banks. Downstream has rocky bottom and good alignment. Poor alignment upstream with channel curving right before entering pipe. The pipe is angled to the northwest and stream enters from the northeast. This is causing some minor erosion at the upstream end of pipe along east edge. A few large pieces of debris caught at upstream end blocking flow. Trees and thick brush throughout.

Condition Rating: 6

Scour: Minor erosion at upstream end of pipe.

Condition Rating: 7

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: 0
Bridge Railing Transitions: N
Approach Guardrail Ends: 0

Railing/Guardrail Notes: Moderate to heavy decay at bottom of many guardrail posts.

Hazard Markers: None

Maintenance Recommendations

Clear debris at upstream end. Replace guardrails.



Elevation - Looking South



Upstream - Looking North



Typical View Through Pipe



Typical Pipe Condition at Seams



Downstream - Looking South



Elevation - Looking North



Approach - Looking East



Approach - Looking West



Typical Guardrail Post Condition

Identification

Owner: Leavenworth County
Culvert ID: 26
Span Configuration: 4’
Year Built: Unknown
Longitude: -94.92765214
Feature Intersected: Stream
Route Carried: Loring Rd
Latitude: 39.01439531
No. of Lanes: 2
Location: 0.8 E of 156th St
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 155’
Structure Type Additional Feature:
Roadway Width: 25’

Schedule

Inspection Date: May 7, 2025
Temperature: 62°F
Inspection Frequency: N/A
Weather: Cloudy
Inspector(s): RAM

Condition

Culvert: Top of corrugated metal pipe in generally good condition. Bottom has moderate surface corrosion along flow line. Moderate leakage at seams throughout. These locations have heavier corrosion with some minor section loss. Approximately 2” of deflection in pipe under roadway.

Condition Rating: 6

Channel: Rocky bottom channel. Approximately 30’ west and 12’ north of the pipe the upstream channel coming from the north makes a right angle curve to flow along a large gravel path for 30’ and then make another right angle curve to enter pipe. Minor erosion around west side of upstream end of pipe. 3’ deep x 10’ diameter scour hole at downstream end with minimal undermining. Large amount of drift/debris caught in downstream channel. Trees and thick brush throughout.

Condition Rating: 6

Scour: Minor erosion around west side of upstream end of pipe. 3’ deep x 10’ diameter scour hole at downstream end with minnimal undermining.

Condition Rating: 6

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: 0
Bridge Railing Transitions: N
Approach Guardrail Ends: 0

Railing/Guardrail Notes: Moderate to heavy decay at bottom of many guardrail posts.

Hazard Markers: None

Maintenance Recommendations

Replace guardrails. Fill downstream scour hole with rip rap. Clear drift/debris in downstream channel.



Approach - Looking East



Typical Guardrail Post Condition



Approach - Looking West



Upstream - Looking North



Elevation - Looking South



Typical View Through Pipe



Typical Condition of Pipe at Seams



Downstream - Looking South



Elevation - Looking East

Identification

Owner: Leavenworth County
Culvert ID: 27
Span Configuration: 3’
Year Built: Unknown
Longitude: -94.92351782
Feature Intersected: Drainage ditch
Route Carried: Loring Rd
Latitude: 39.01437857
No. of Lanes: 2
Location: 0.8 W of 142nd St
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 84’
Structure Type Additional Feature:
Roadway Width: 24’

Schedule

Inspection Date: May 7, 2025
Temperature: 62°F
Inspection Frequency: N/A
Weather: Cloudy
Inspector(s): RAM

Condition

Culvert: Top of corrugated metal pipe in generally good condition. Bottom has corrosion with some minor to moderate section loss. North half of pipe has steeper slope with south half being more level. South half appears to have approximately 1-2” of deflection under roadway.

Condition Rating: 6

Channel: Upstream is grassy pasture drainage with trees and thick brush around end of pipe. Minor drift caught at upstream end. Downstream flows directly into east edge of 3.5’ diameter tree. It is then a flat grassy pasture that drains into a pond ~200’ downstream. ~1’ of scour along base of tree. 6” of standing water in downstream half of pipe.

Condition Rating: 5

Scour: ~1’ of scour along base off tree at downstream end.

Condition Rating: 7

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

None at this time.



Approach - Looking East



Approach - Looking West



Downstream - Looking South



Elevation - Looking West



Upstream - Looking North



Elevation - Looking East



View Through Pipe - Looking South



Typical Bottom of Pipe Condition



View Through Pipe - Looking North

Identification

Owner: Leavenworth County
Culvert ID: 28 (SH-43)
Span Configuration: 3’
Year Built: Unknown
Longitude: -94.92063018
Feature Intersected: Drainage ditch
Route Carried: Loring Rd
Latitude: 39.01438176
No. of Lanes: 2
Location: 0.6 W of 142nd St
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 102’
Structure Type Additional Feature: Concrete drop inlet at south end
Roadway Width: 24’

Schedule

Inspection Date: May 7, 2025
Temperature: 65°F
Inspection Frequency: N/A
Weather: Cloudy
Inspector(s): RAM

Condition

Culvert: South end of pipe is 2.5’x4’x11’ deep concrete drop inlet. Inlet in generally good condition with some areas of poor consolidation. Top of corrugated metal pipe in generally good condition. Bottom has moderate surface corrosion throughout. Moderate leakage at seams throughout. These locations have heavier corrosion with some minor section loss. Pipe appears to have approximately 1-2” of deflection under roadway.

Condition Rating: 6

Channel: Upstream is grassy roadway drainage ditch coming from the east and west that flow into drop inlet. There is also a 1.5’ diameter pipe coming from the south pond overflow at the bottom of the inlet. Downstream flows into pasture with slight ponding and then drains to the east with trees and brush throughout. Downstream end of pipe is silted in up to 1.5’ deep, 50% of cross section blocked.

Condition Rating: 5

Scour: Insignificant scour.

Condition Rating: 8

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: 0
Bridge Railing Transitions: N
Approach Guardrail Ends: 0

Railing/Guardrail Notes: Moderate to heavy decay at bottom of many guardrail posts.

Hazard Markers: None

Maintenance Recommendations

Clear silt in downstream end of pipe. Replace guardrails.



Approach - Looking East



Approach - Looking West



Typical Guardrail Post Condition



ID Sign - Looking North



Upstream - Looking West



Elevation - Looking North



View Through Drop Inlet - Looking North



View Through Pipe - Looking North



View Through Upstream Pond Overflow Pipe - Looking South



Elevation - Looking Southwest



Downstream - Looking East



View Through Pipe - Looking South

Identification

Owner: Leavenworth County
Culvert ID: 29
Span Configuration: 3.5’
Year Built: Unknown
Longitude: -94.91275695
Feature Intersected: Stream
Route Carried: Loring Rd
Latitude: 39.0144941
No. of Lanes: 2
Location: 0.2 W of 142nd St
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 69’
Structure Type Additional Feature:
Roadway Width: 24’

Schedule

Inspection Date: May 8, 2025
Temperature: 70°F
Inspection Frequency: N/A
Weather: Sunny
Inspector(s): RAM

Condition

Culvert: Top of corrugated metal pipe in generally good condition. North half has minor surface corrosion on bottom. South half has heavy corrosion with heavy section loss to bottom, ~1’ wide. Minor impact damage to north end.

Condition Rating: 6

Channel: Upstream is combination of roadway drainage ditch coming from east and west as well as a stream coming from the south ~100’ west of pipe. Rocky bottom channel with very tall and steep south bank. Minor drift/debris caught upstream. Downstream T’s into roadway drainage ditch/stream flowing east. Channel has concrete lined bottom for ~10’ then rocky bottom. ~6” of silt buildup in north end of pipe and on concrete channel. North bank is concrete lined. Trees and thick brush throughout upstream and downstream.

Condition Rating: 7

Scour: Insignificant scour.

Condition Rating: 8

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

None at this time.



Approach - Looking West



Approach - Looking East



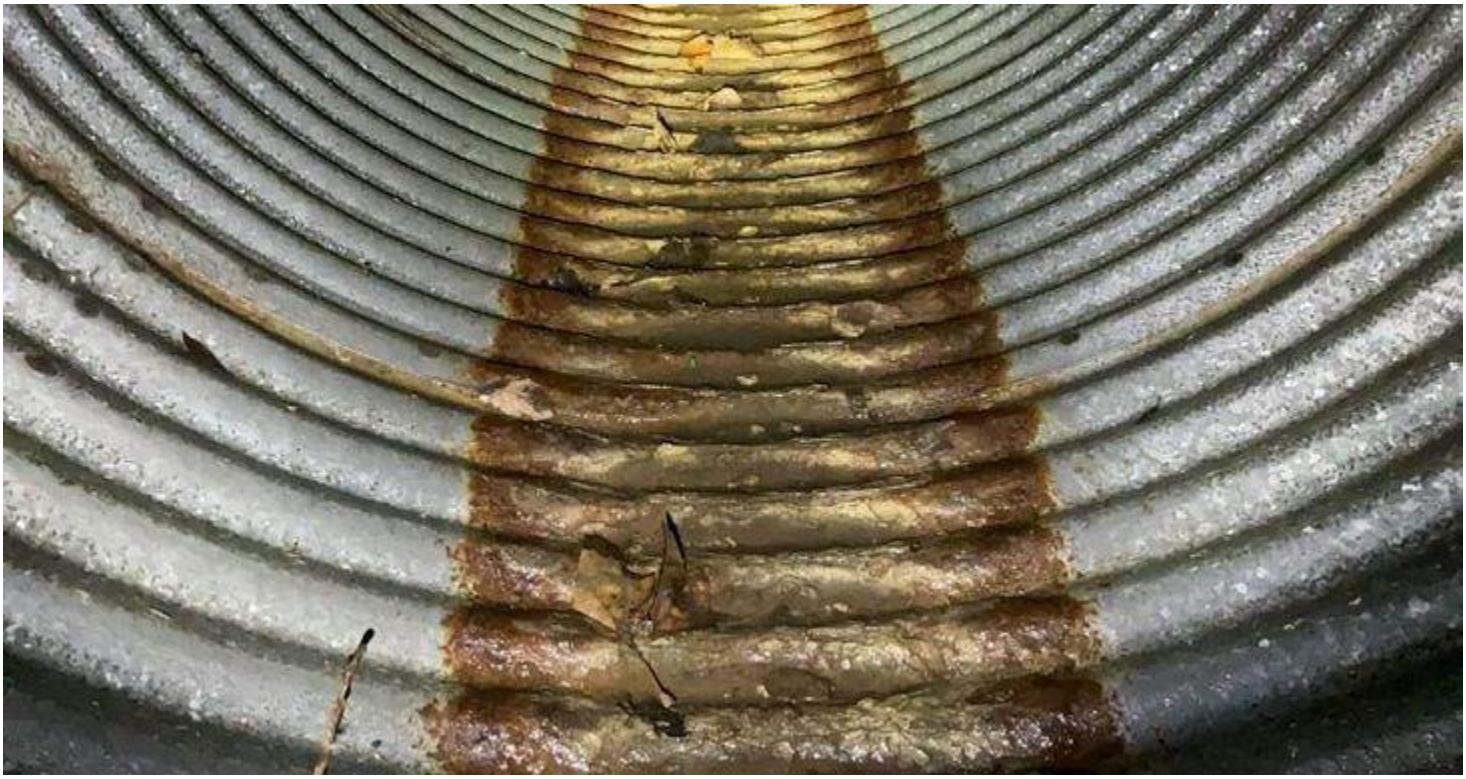
Downstream - Looking East



Elevation - Looking South



Typical View Through Pipe



Bottom of Pipe Condition in South Half - Looking North



Elevation - Looking Northeast



Upstream - Looking West

Identification

Owner: Leavenworth County
Culvert ID: 30
Span Configuration: 2’
Year Built: Unknown
Longitude: -94.90988449
Feature Intersected: Drainage ditch
Route Carried: Loring Dr
Latitude: 39.0140564
No. of Lanes: 2
Location: N of Loring Rd
Posting: None
Structure Type: Corrugated Metal Pipe
Length: 61’
Structure Type Additional Feature: Flared metal end sections at both ends
Roadway Width: 24'

Schedule

Inspection Date: May 8, 2025
Temperature: 70°F
Inspection Frequency: N/A
Weather: Sunny
Inspector(s): RAM

Condition

Culvert: Corrugated metal pipe in generally good condition. Unable to to see bottom due to 3-6” of silt/water. Visible portions along flowline have minor surface corrosion.

Condition Rating: 7

Channel: Upstream is grassy roadway drainage ditches coming from the northwest and northeast. Small erosion channel coming from the roadway along south edge of upstream end of pipe. Downstream has trees and thick brush throughout with several small trees directly in front of end of pipe. Moderate drift/debris caught downstream.

Condition Rating: 6

Scour: Insignificant scour.

Condition Rating: 8

Miscellaneous:

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: N
Bridge Railing Transitions: N
Approach Guardrail Ends: N

Railing/Guardrail Notes: None

Hazard Markers: None

Maintenance Recommendations

Clear trees/brush around donwstream end of pipe.



Approach - Looking Southwest



Approach - Looking Northeast



Elevation - Looking Southeast



Upstream - Looking Northwest



Upstream - Looking Northeast



View Through Pipe - Looking Southeast



Downstream - Looking East



Elevation - Looking Northwest



View Through Pipe - Looking Northwest

Identification

Owner: Leavenworth County
Culvert ID: 31 (SH-60)
Span Configuration: 3-8'x4' (30° Rotation)
Year Built: 1975
Longitude: -94.9089244
Feature Intersected: Stream
Route Carried: Loring Dr
Latitude: 39.01463095
No. of Lanes: 2
Location: W of 142nd St
Posting: None
Structure Type: Reinforced Concrete Box
Length: 91'
Structure Type Additional Feature:
Roadway Width: 24'

Schedule

Inspection Date: May 8, 2025
Temperature: 70°F
Inspection Frequency: N/A
Weather: Sunny
Inspector(s): RAM

Condition

Culvert: Hairline vertical cracks typical in walls. Hairline transverse cracks with efflorescence typical in bottom of top slab. Large spalls along upstream headwall and end of interior walls. One spall in headwall has exposed rebar. Minor spalls in downstream headwall. Large spall along top of southeast wingwall.

Condition Rating: 7

Channel: Upstream channel has large silt bar in front of west two cells. Channel flows along northeast wing and primarily through the east cell. Large amount of drift/debris caught at upstream and downstream ends. Trees and thick brush throughout. Up to 2' of silt accumulation in all cells, 50% cross section blocked.

Condition Rating: 5

Scour: No scour.

Condition Rating: 8

Miscellaneous: NBI#: 000000000520190

Overall Condition Rating: Fair

Roadside Hardware

Bridge Railing: N
Approach Guardrail: 0
Bridge Railing Transitions: N
Approach Guardrail Ends: 0

Railing/Guardrail Notes: North guardrail has completely failed (see photo).

Hazard Markers: NE,SW,SE

Maintenance Recommendations

Replace guardrails. Clear silt/debris in box and channel.



Approach - Looking Northeast



Approach - Looking Southwest



North Guardrail Condition - Looking Southwest



ID Sign - Looking South



Upstream - Looking North



Elevation - Looking Southwest



Typical Upstream End of Wall Condition



Typical View Through Cell



Typical Wall Condition



Typical Bottom of Top Slab Condition



Downstream - Looking South



Elevation - Looking North

APPENDIX N
NOISE STUDY



DUSTIN HOYT
LICENSED
27628
09/23/2025
KANSAS
PROFESSIONAL ENGINEER

GBA

LENAPE SAND OPERATION NOISE STUDY

LEAVENWORTH COUNTY, KANSAS

GBA PROJECT NO. 16477

9801 Renner Boulevard
Lenexa, KS 66219-9745
913.492.0400 | www.gbateam.com

SEPTEMBER 2025

1151

Project Background

This study was prepared to analyze the potential noise impacts of the sand operation in unincorporated Leavenworth County. This study is an update to the previously completed noise study by Cook, Flatt & Strobel (CFS) Engineers due to proposed changes in the sand operation and site layout.

The updated proposed site is located near 166th Street and Lenape Road in unincorporated Leavenworth County, as shown in Figure 1: Project Site Location. The site is approximately 435 acres, spread across three parcels, as shown in Figure 2.

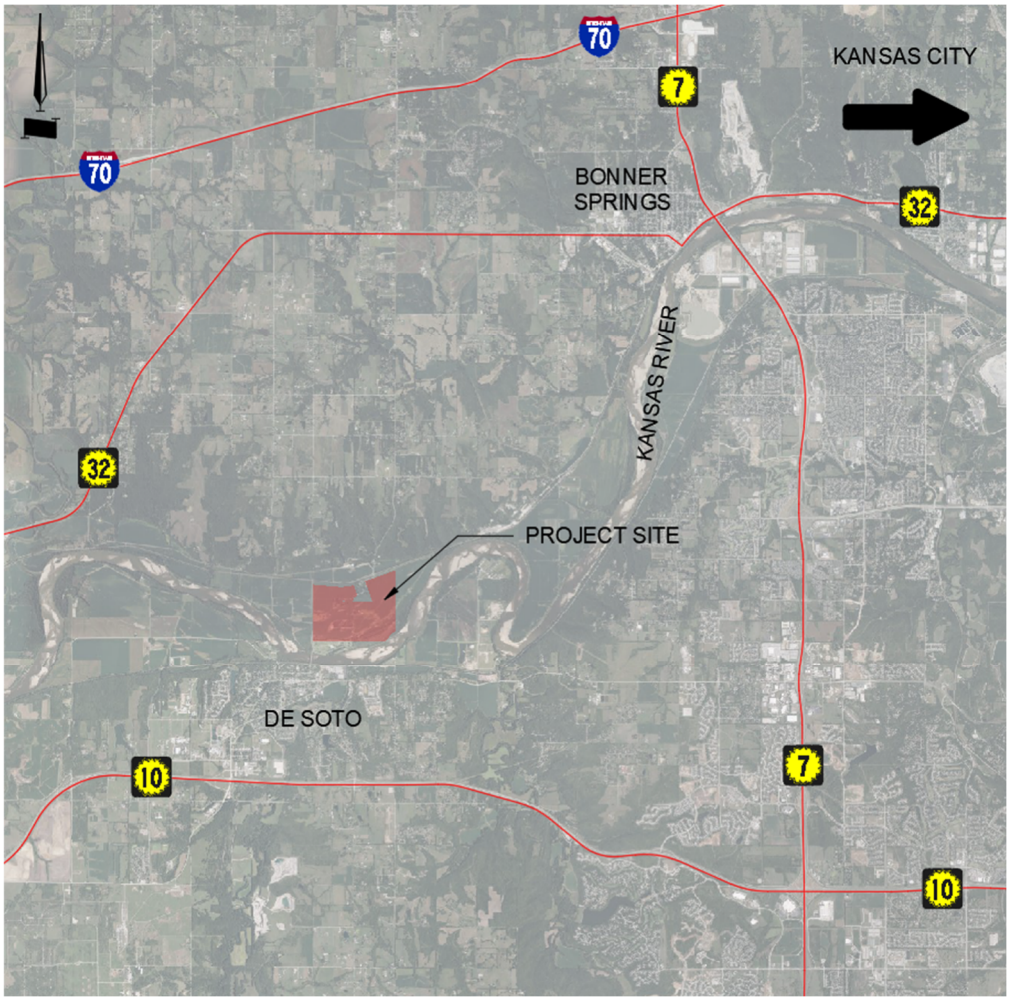


Figure 1: Project Site Location

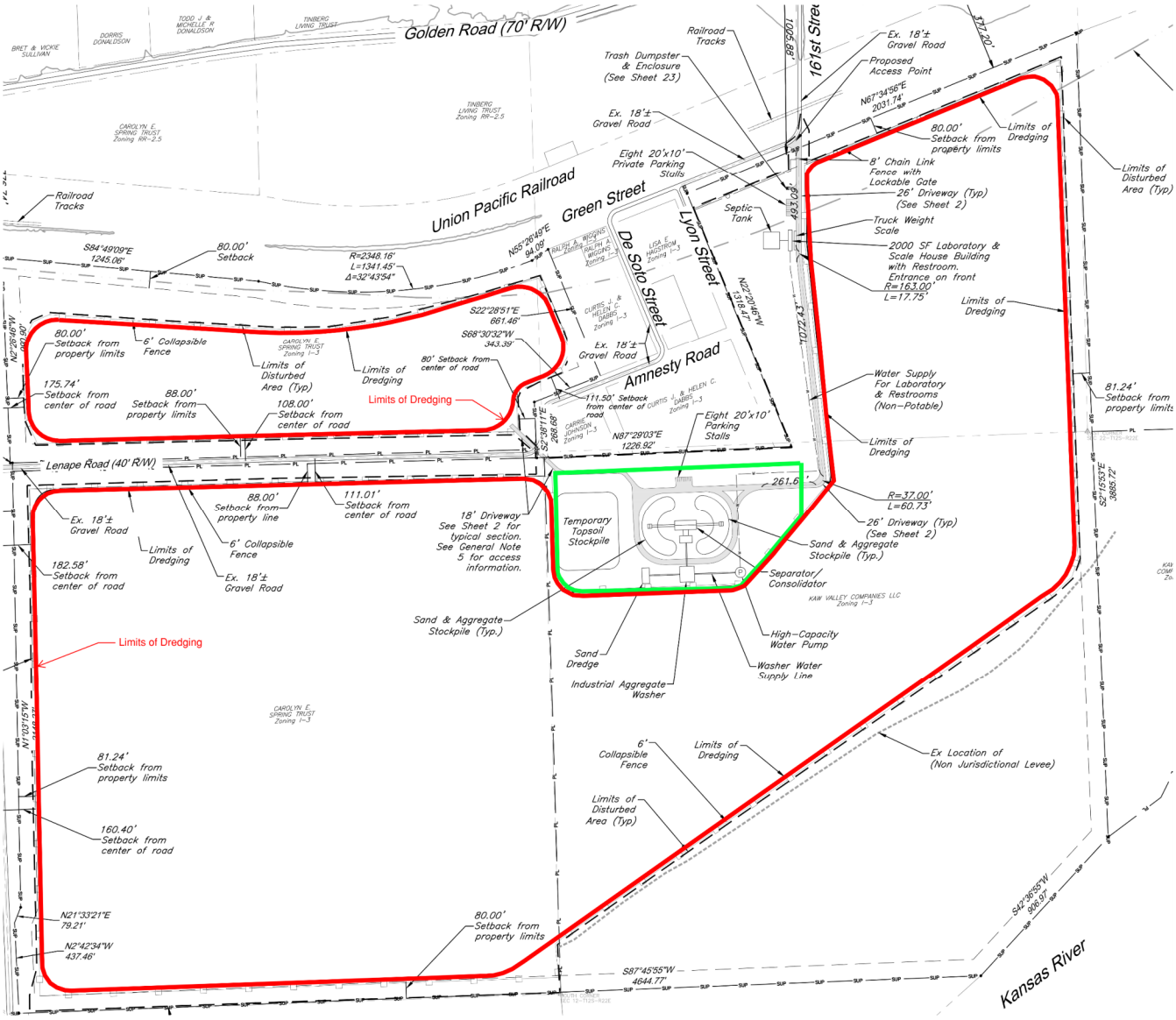


Figure 2: Proposed Site Plan

Site Characteristics and Production Process

With a new size of the proposed site, the resulting calculations of estimated sound pressure value was determined at seven key locations. Each of the locations chosen are at the boundary of the property and were chosen to evaluate results in proximity to the production area, electric dredging barge, and booster barge.

Noise Generation Calculations

The distances from each calculation point to the various sound sources were estimated and those distances were used to determine the individual sound pressure values for each sound source using Equation 1. Those values were then used to calculate the estimated composite sound pressure values for each of the calculation locations using Equation 2. All of the locations where total values were calculated are shown in Figure 3, and each individual location is shown in Figure 5 through Figure 11**.** The decibel readings shown in Table 1 below were taken from the previously completed sound study and were used to calculate the estimated sound pressure values. Additionally 95 dBA at 50 ft (+/-) was used based on the sound of a diesel barge, which was referenced from the previous report's conclusions, to represent a booster barge that would most likely be necessary for the equipment scenarios shown.

Equation 1: Inverse Square Law

$$L_2 = L_1 - 20 * \log\left(\frac{R_2}{R_1}\right)$$

Equation 2: Total Sound Pressure Level for Multiple Sources

$$L_{Combined} = 10 * \log(10^{L_1/10} + 10^{L_2/10} + \cdots + 10^{L_n/10})$$

Table 1: Field Measurements of Sound Sources at Morris and 43rd & Frisbee Sand Quarries (from CFS Study)

Sound Source	Decibel Reading	Reading Distance
Electric Dredging Barge	62 dBA	50 ft +/- from banks of Kansas River
Front-End Wheeled Loader	80 dBA	50 ft +/-
Semi-Truck & Trailer	72 dBA	30 ft +/-
Washer/Pump/Conveyor	72 dBA	25 ft +/-

The analysis of potential sound generated by the mobile and stationary equipment on the proposed Lenape Sand Operation was made to estimate the potential sound levels on the surrounding properties: the Burning Tree Golf Course, the residential homes immediately adjacent to the operation site, the residential homes along Golden Road, and the residential property on 161st Street. The terrain surrounding the proposed operation site was assumed to be level with no barriers or reductions for noise dampening from trees or berms. There are plans for sound mitigation as stated in the previous sound study.

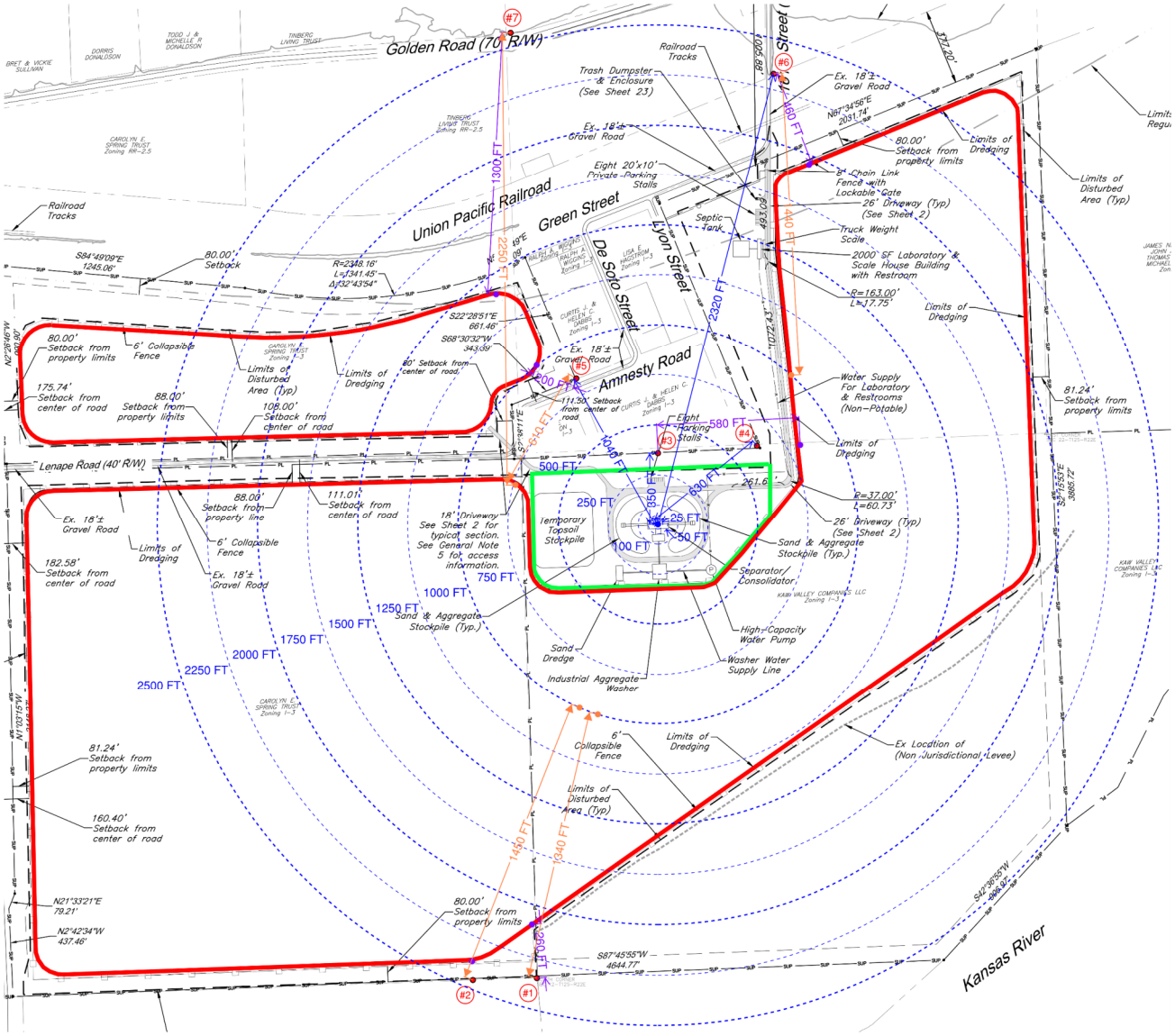


Figure 3: Sound Source Locations and Locations of Calculated Composite Sound Pressure Values

- Washer/Pump/Conveyor Location
- Distance from Washer/Pump/Conveyor (FT)
- Electric Dredging Barge Locations for Calculations
- Booster Barge Locations for Calculations
- # Noise Level Calculation Points

Figure 4: Legend

The noise generated by the production area of the operation where the washer/pump/conveyor would process sand is assumed to be 72 dBA at approximately 25 ft from the center of the production area,

or 140 dBA at the source. The loading of two semi-trucks by the wheel loader is assumed to occur approximately 200 ft from the center of the washer/pump/conveyor center along the shortest distance between the calculation point and the center of the production area to conservatively calculate the highest composite sound pressure possible. The electric dredging barge was assumed to be at the edge of the dredging area, closest to the calculation point, and the distance to the property boundary estimated, at a minimum of 80 ft. The composite sound pressure values calculated for the seven calculation points are shown in Table 2. The booster barge is the loudest single point source based on the assumption that a diesel booster will be used, however a booster should not be required within the first five years of production, and within this time a quieter, or more far-reaching option is likely to be more economical.

Table 2: Calculated Sound Pressure Values

Calculation Location	Estimated Sound Pressure Value
#1 – Burning Tree Golf Course	66.7 dBA
#2 – Burning Tree Golf Course	66.6 dBA
#3 – Adjacent Properties	70.1 dBA
#4 – Adjacent Properties	63.9 dBA
#5 – Adjacent Properties	73.5 dBA
#6 – 161st Street Property	66.1 dBA
#7 – Golden Road Properties	62.2 dBA

Location #5 was determined to be the highest estimated composite sound pressure of 73.5 dBA due to the proximity of the production area to the property boundary, as well as the proximity of the electric dredging barge and booster barge. The sound levels would be similar, though slightly lower for all of the remaining residential properties directly adjacent to the operation's proposed property.

The estimated sound level for location #3 is the second highest value at 70.1 dBA. This value is due to the immediate vicinity of the production area and will be the most consistent estimated sound level throughout the life of the operation.

All other estimated sound level values are relatively consistent between 62 dBA and 67 dBA. Locations #1, #2, #5, #6, and #7 include a booster pump in the calculations for the estimated values.

Noise Mitigation Measures

The following measures will be used to mitigate the noise from the site operations. Also, noise levels should be reduced for most of the surrounding properties as excavation progresses and the dredging pits get deeper, with the exception of the properties immediately adjacent to the production area.

- To help mitigate the sound levels for those properties adjacent to the static production area, the equipment used will be electric and the production schedule will be set to reduce impacts to the most effected properties by coordinating the concurrence of sound sources during daylight hours.
- Work activity will be scheduled to build-up material stockpiles later in the afternoons so that processing equipment will not be used during the early morning hours
- All equipment will be turned off when not in use.
- Equipment will be kept well-maintained and lubricated to minimize operating noise.
- Native species of deciduous and coniferous trees will be planted along the site's southern border with Burning Tree Golf Club to provide a visual and noise buffer from the mining operations.

Conclusions and Recommendations

The noise levels estimated in this study are assumed to be the peak volumes with no mitigation measures factored into the values, with all equipment running simultaneously, and represent static placements of the mobile operation equipment such as the electric dredging barge. In general, the sound levels will be comparable to an isolated industrial zone (approximately 65 dBA) for all surrounding properties. The highest of the estimated noise levels are still below the threshold of industrial operations (80 dBA).

The estimated sand operation's noise generation calculations used actual sound measurements of similar equipment in operation at similar dredging sites. The sound levels were estimated based on level-ground transmission without any deductions figured into the calculations. Based on the estimated noise levels that would be generated by the plant within the near future, the worst-case noise levels projected onto the surrounding properties would be within the noise control areas for industrial areas during daytime hours.

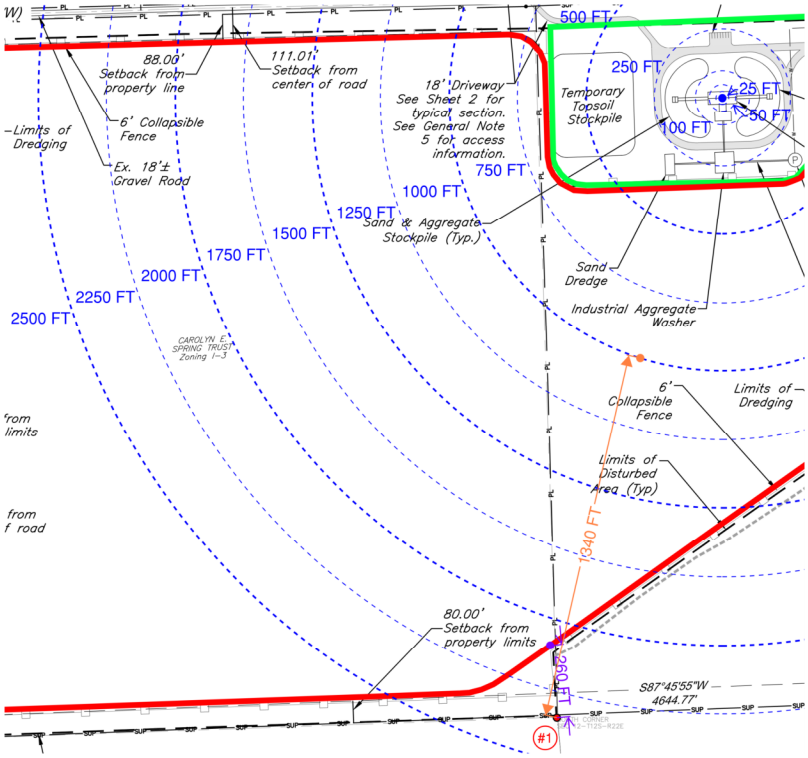


Figure 5: Distances Between Sound Source and Calculation Location #1

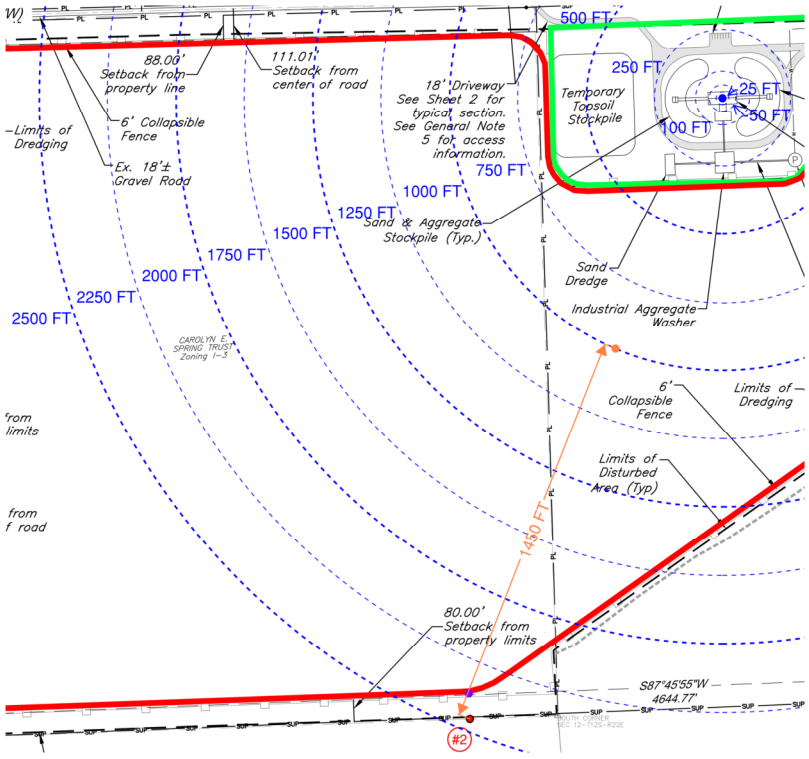


Figure 6: Distances Between Sound Sources and Calculation Location #2

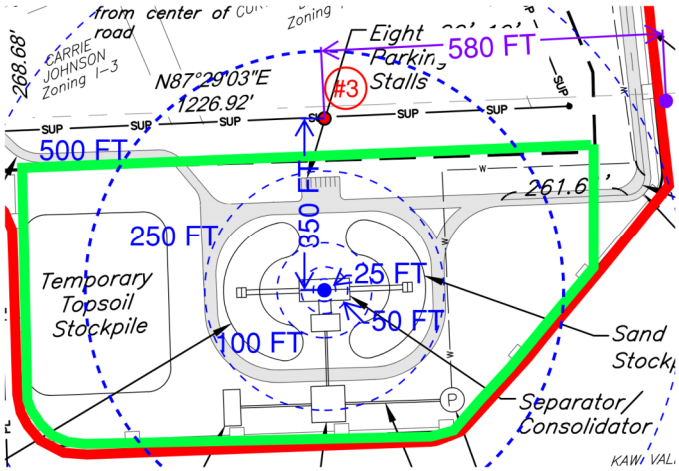


Figure 7: Distances Between Sound Source and Calculation Location #3

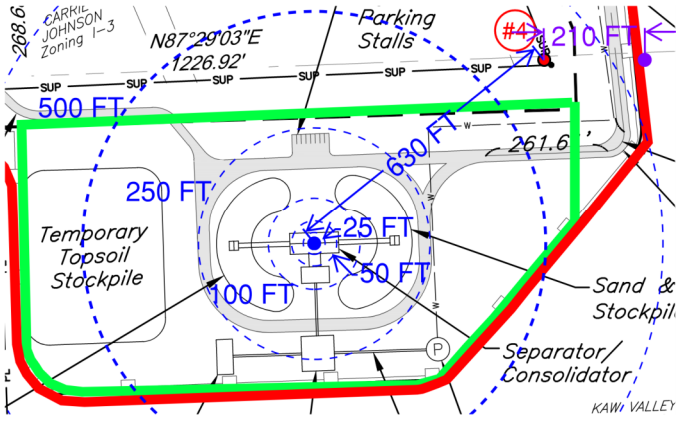


Figure 8: Distances Between Sound Source and Calculation Location #4

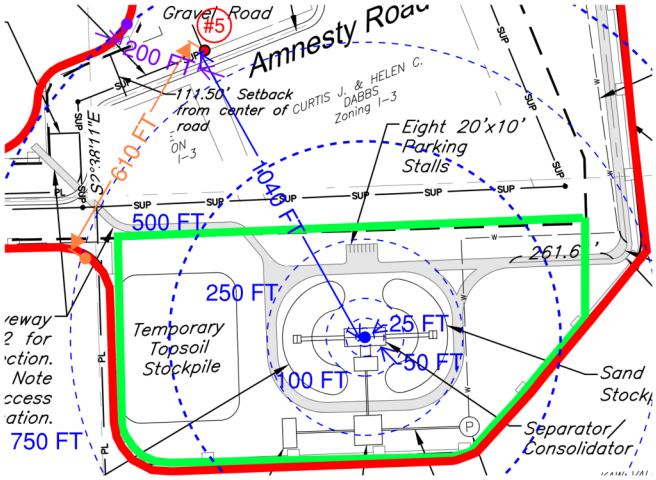


Figure 9: Distances Between Sound Source and Calculation Location #5

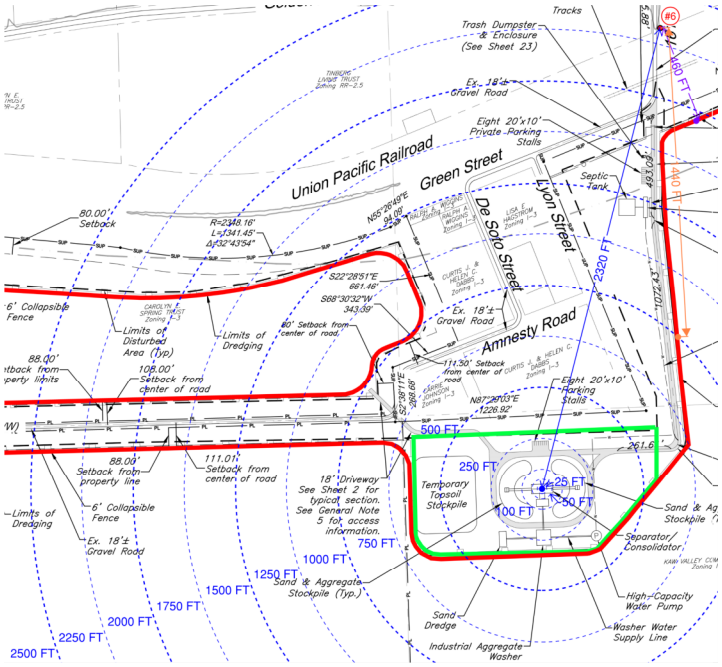


Figure 10: Distances Between Sound Source and Calculation Location #6

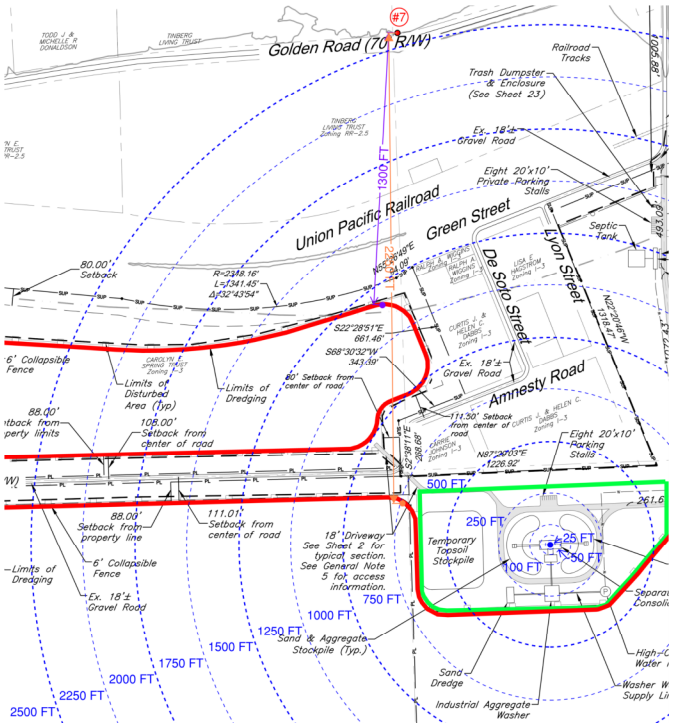


Figure 11: Distances Between Sound Source and Calculation Location #7

APPENDIX L
PAVEMENT EVALUATION REPORT

Golden Road Pavement Evaluation

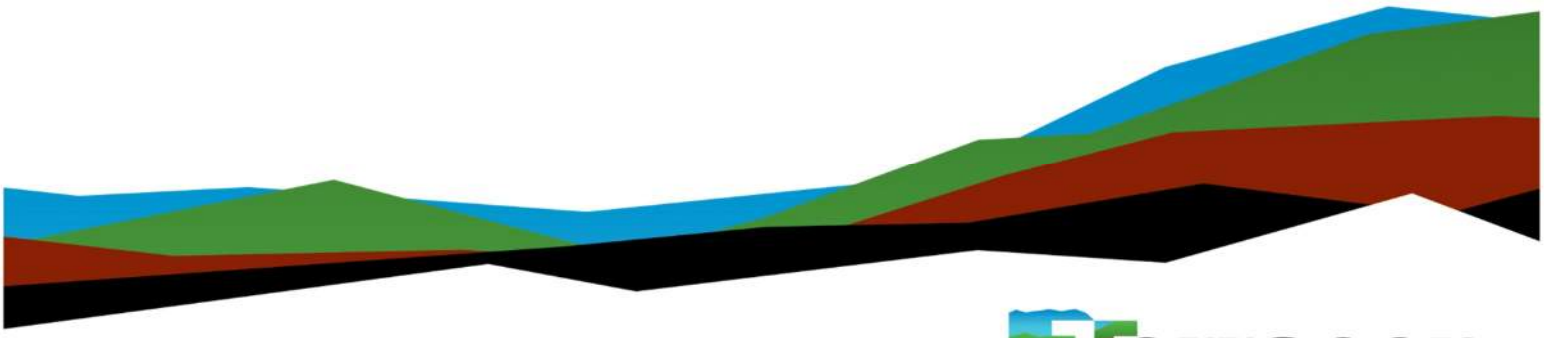
Pavement Evaluation Report

Leavenworth County, Kansas

September 23, 2025 | Terracon Project No. 02245065.rev2

Prepared for:

George Butler Associates Inc
Kansas City, Kansas 66106



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September 23, 2025

George Butler Associates Inc
5600 Kansas Avenue
Kansas City, Kansas 66106

Attn: Evan Horowitz, Chief Financial Officer

Re: Pavement Evaluation Report
Golden Road Pavement Evaluation
Golden Road, N 158th Street, and Loring Road
Leavenworth County, Kansas
Terracon Project No. 02245065.rev2

Dear Mr. Horowitz:

We have completed a subsurface exploration and geotechnical engineering evaluation for the referenced project in general accordance with Terracon Proposal No. P02245065 dated March 1, 2024. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning evaluation of existing pavements and design and construction of future pavements for the project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,

Terracon

✔

Thomas R. Mast, P.E.
Senior Staff Engineer

Kevin D. Friedrichs, P.E
Senior Engineer
Kansas: 22981

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    Pavement Maintenance 8
General Comments 9

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GeoModel

Attachments

Exploration and Testing Procedures
Pavement Core Photography Log
Site Location and Exploration Plans
Exploration and Laboratory Results
Supporting Information

Note: This report was originally delivered in a web-based format. Blue Bold text in the report indicates a referenced section heading. The PDF version also includes hyperlinks which direct the reader to that section and clicking on the Terracon logo will bring you back to this page. For more interactive features, please view your project online at client.terracon.com.

Refer to each individual Attachment for a listing of contents.

Introduction

This report presents the results of our subsurface exploration and Pavement Evaluation services performed for Golden Road, N 158th Street, and Loring Road in Leavenworth County, Kansas. The purpose of these services was to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil and rock conditions
- Groundwater conditions
- Analysis of existing pavement conditions
- Pavement recommendations

Drawings showing the site and boring locations are shown on the attached Site Location Plan and Exploration Plan. The results of the laboratory testing performed on soil samples obtained from the site during our field exploration are included on the boring logs in Exploration Results.

Project Description

Our initial understanding of the project was provided in our proposal and was discussed during project planning. A period of collaboration has transpired since the project was initiated, and our final understanding of the project conditions is as follows:

Item	Description
Information Provided	An email request for services was provided by Clint Loumaster with GBA on February 23, 2024. The request included Google Earth file of the site. On July 12, 2024, an additional roadway route was added to the scope. On May 13, 2025, Brian Boyd with GBA provided Terracon with comments from Leavenworth County Public Works regarding our report. Based on these comments, we have completed two additional borings, and have updated the parameters of our analysis and our recommendations to better serve the project. On September 19, 2025, Terracon met with GBA and Leavenworth County representatives to discuss comments regarding our analysis. This report contains revised language and figures to clarify the items discussed.

Item	Description
Project Description	The project includes a pavement evaluation of an approximately 4¼ mile stretch of Golden Road in Leavenworth County. As well as a 3-mile alternate route along N 158th Street and Loring Road. The client is seeking information on current state of the roadway, and recommendations for the roadway to support additional truck traffic.
Pavements	GBA completed a traffic study at the site. An approximate vehicles per day (VPD) of 2,100 was provided to use in our analysis. The existing traffic consists of less than 1% articulated trucks and, amongst all routes, an average of 2% buses/single-unit trucks. Truck traffic of 120 round trips of tandem axle dump trucks is expected to be added to the existing traffic.

Terracon should be notified if any of the above information is inconsistent with the planned construction, as modifications to our recommendations may be necessary.

Site Conditions

The following description of site conditions is derived from our site visit in association with the field exploration and our review of publicly available geologic and topographic maps.

Item	Description
Project Location	The project is located along Golden Road, N 158th Street, and Loring Road in Leavenworth County, Kansas. Approximate Latitude/Longitude: 38.9985, -94.9843 (See Exhibit D)
Existing Improvements	Asphalt paved roadway
Existing Topography	Elevations at the site range from 780 feet to 840 feet. In general, the site slopes downward to the east.
Geology	The subsurface at the site consists of alluvial soils overlying the bedrock strata of the Lansing Group.

We also collected photographs at the time of our field exploration program. Representative photos are provided in our Photography Log.

Geotechnical Characterization

We have developed a general characterization of the subsurface conditions based on the subsurface exploration, laboratory data, geologic setting, and our understanding of the project. This characterization, termed GeoModel, forms the basis of our geotechnical evaluation. Conditions observed at each boring location are indicated on the individual logs. The individual logs are in the Exploration Results and the GeoModel is in the Figures attachment of this report.

As part of our analyses, we identified the following model layers within the subsurface profile. For a more detailed view of the model layer depths at each boring location, refer to the GeoModel.

Model Layer	Layer Name	General Description
1	Residual Soils	Lean to fat clay, brown and gray, with sand to sandy, medium stiff to hard
2	Bedrock	Limestone

The borings were observed during drilling and shortly after completion of drilling for the presence and level of water. Groundwater was not encountered in the borings at these times. A longer period of time may be required for groundwater to develop and stabilize in a borehole. Longer term observations in piezometers or observation wells, sealed from the influence of surface water, are often required to define groundwater levels.

Groundwater levels may fluctuate due to seasonal variations in the amount of rainfall, runoff, and other factors not evident at the time the borings were performed. Therefore, groundwater conditions at other times may be different than the conditions encountered in our exploratory borings. The potential for water level fluctuations and perched water should be considered when developing design and construction plans and specifications for the project.

Analysis of Existing Pavement

Pavement Analysis Parameters

Analyses for the pavement design of the project have been based on the procedures of the AASHTO Guide for Design of Pavement Structures (1993). The following design parameters were utilized for pavement engineering analyses and the determination of design alternatives for the project:

Pavement Analysis and Design Parameters			
		Existing Pavement	New Pavement
Reliability	Level of Reliability	90%	85%
	Flexible Overall Standard Deviation	0.49	0.49
Serviceability	Flexible Initial PSI	3.8	4.2
	Flexible Terminal PSI	2.0	2.0
Subgrade Conditions	CBR	3	
	Correlated Resilient Modulus, M_r	5,000 psi	
Layer Properties	Asphalt Concrete (AC) Layer Coefficient	0.40	0.44
	Aggregate Base (ABC) Layer Coefficient	0.14	0.14

A traffic study was conducted at this site, and an Average Daily Traffic (ADT) of approximately 2,100 vehicles was determined. We have made the assumption that approximately 5% of the existing traffic consists of trucks, and a truck equivalency factor of 0.47 was used in our calculations. With the information provided and the assumptions stated above, we estimate that the existing needs of the roadways studied to be 600,000 18-kip equivalent single axle loads (ESALs) over a 25-year design period. With the new truck traffic, we anticipate approximately 13,600,000 ESALs for a 25-year design period. The following table documents the observed thickness of the existing pavement sections, and compares structural values to existing and future needs.

Existing Pavement Thickness

Route	Boring Location	Asphalt	Concrete	Aggregate Base	Meets Existing Criteria	Meets New Criteria
Route 1, Golden Road	B-1	7	-	2	N	N
	B-2	6	-	3	N	N
	B-3	3	-	2	N	N
	B-4	5.5	-	2	N	N
	B-5	4.5	-	2	N	N

Existing Pavement Thickness

Route	Boring Location	Asphalt	Concrete	Aggregate Base	Meets Existing Criteria	Meets New Criteria
	B-6	5	-	1	N	N
	B-7	4.5	-	2	N	N
	B-8	6	-	2	N	N
	B-9	6.5	-	2	N	N
	B-10	6.5	-	2	N	N
	B-11	2.5	-	4	N	N
	B-12	4	-	2	N	N
	B-13	7	-	2	N	N
	B-14	4	-	3	N	N
	B-15	5	-	2	N	N
	B-16	7	-	2	N	N
	B-17	6.5	-	2	N	N
	B-18	7	-	2	N	N
Route 2, N 158th Street and Loring Road	B-19	6	-	5	N	N
	B-20	8.25	-	3	Y	N
	B-21	10	-	4	Y	N
	B-22	9.5	-	4	Y	N
	B-23	7	-	12	Y	N
	B-24	7	-	3	N	N
	B-25	6.5	-	4	N	N
	B-26	6.5	-	3	N	N
	B-27	3	-	12	N	N
	B-28	3.5	-	4	N	N

Existing Pavement Thickness

Route	Boring Location	Asphalt	Concrete	Aggregate Base	Meets Existing Criteria	Meets New Criteria
	B-29	5	-	7	N	N
	B-30	7	3.5	-	Y	N
	B-31	-	9	6	Y	Y
	B-32	-	9	-	Y	Y
161st Street	B-101	-	-	4	N	N
	B-102	-	-	12	N	N

Based on the results listed above, Route 1 is currently not suitable to withstand the current loading or increased loading. To meet the current criteria recommended thickness an average of 2 additional inches and a maximum of 3.5 additional inches would be anticipated along this route to provide a minimum thickness of 7.5 inches. To meet the new truck loading criteria, asphalt overlays averaging 7 additional inches and a maximum overlay of 8.5 additional inches would be anticipated along this entire route to provide a minimum thickness of 11.5 inches of asphalt.

Route 2, along N 158th Street and Loring Road, is the most suitable of the existing pavements to withstand the new loading. However, not all areas of this route are able to support the new traffic for a 25-year design period. Some sections of this route may only be able to accommodate the new traffic for one year before repairs would be expected. To meet the current criteria recommended thickness an average of 0.5 additional inches and a maximum of 4 additional inches would be anticipated along this route to provide a minimum thickness of 7 inches. To meet the new truck loading criteria, segments extending from B-19 to B-30 are expected to need asphalt overlays averaging 6 additional inches and a maximum overlay of 8 additional inches. The existing rigid pavement segment B-31 to B-32 is expected to have the capacity to withstand the new loading for a 25-year design period, not factoring in the serviceability loss between placement and present time.

Pavement Recommendations

Pavement Section Thicknesses

Pavement thickness depends upon many factors including but not limited to:

- applied wheel/axle loads and number of repetitions
- subgrade and pavement material characteristics
- climate conditions
- site and pavement drainage

Due to the variable thickness of the existing aggregate base in the sections observed, we have developed new minimum pavement section thicknesses to utilize a value of 2 inches of aggregate base at existing route 1 locations and 3 inches of aggregate base at existing route 2 locations. For 161st Street a thickness of 4 inches of aggregate base was used.

To meet the anticipated future loading of 13,600,000 ESALs, we recommend that route 1 asphalt section be thickened to 11.5 total inches. For route 2, we recommend that the asphalt section be thickened to 11 total inches. For 161st street segment, we recommend an asphalt section of 11 total inches overlying the existing gravel roadway. Values for additional asphalt to meet existing traffic needs as well as the new truck traffic are provided in the table below.

Recommended Pavement Thicknesses				
		To Support Current Traffic		
Route	Existing Aggregate Base Used in Analysis (in)	Average Additional Asphalt Needed (in)	Maximum Additional Asphalt Needed (in)	Total Asphalt Needed (in)
Route 1	2	1.5	4.5	7
Route 2	3	0.5	4	7
161st Street	4	6.5	6.5	6.5
		To Support Current and Additional Traffic		
Route 1	2	6	9	11.5
Route 2	3	4.5	8	11
161st Street	4	11	11	11

The decision on the method used to achieve the recommended thickness (removal and replacement, mill and overlay, or direct overlay) should be made in the roadway design phase of the project. Typically, when existing asphalt sections are modified, one to two inches of surface asphalt is milled prior to placement of new asphalt overlay. At the time of our study, it appears that the existing asphalt surface is in fair to good condition, and milling procedures may not be necessary depending on the conditions of the pavement surface at the time of construction. If milling procedures are not utilized at this site, the existing surface would need to be thoroughly cleaned prior to placement of the tack coat and new surface course overlay to ensure that new overlay materials properly adhere to the existing pavements. If a new asphalt overlay is placed on dirty/dusty existing pavements, the owner must accept the risk that debonding could occur between the older and newer sections, which could lead to rapid deterioration of the asphalt surface.

Construction traffic on the pavements was considered to be negligible in developing our opinions of minimum pavement thickness. If the pavements will be subject to repetitive passes of construction equipment/vehicles, the pavement sections should be revised to consider the additional loading.

Modifications to the existing pavement thickness increase the risk of loss of edge support. To prevent this, consideration should be given to improving drainage infrastructure, installing a curb, or widening shoulders. The decision on how to best address this risk should be made by the roadway design team in the design phase of the project.

Pavements and subgrades will be subject to freeze-thaw cycles and seasonal fluctuations in moisture content. Pavement thickness design methods are intended to provide adequate thickness of structural materials over a particular subgrade such that wheel loads are reduced to a level that the subgrade can support. The subgrade support parameters for pavement thickness design do not account for shrink/swell movements of a subgrade constructed of expansive clay soils. Therefore, the pavement may be adequate from a structural standpoint, yet still experience cracking and deformation due to shrink/swell related movement of the subgrade.

The pavement sections provided above consider that the subgrade soils will not experience significant increases in moisture content. Paved areas should be sloped to provide rapid drainage of surface water and to drain water away from the pavement edges. Pavements should be designed so water does not accumulate on or adjacent to the pavement, since this could saturate and soften the subgrade soils and subsequently accelerate pavement deterioration.

Pavement Maintenance

The pavement sections represent minimum recommended thicknesses, and periodic maintenance and repairs should be anticipated. Preventive maintenance should be

planned and provided for through an on-going pavement management program. Maintenance activities are intended to slow the rate of pavement deterioration and to preserve the pavement investment. Pavement care consists of both localized (e.g., crack sealing, joint sealing, and patching) and global maintenance (e.g., surface sealing). Additional engineering consultation is recommended to determine the type and extent of a cost-effective program. Even with periodic maintenance, some movements and related cracking may still occur, and repairs may be required.

General Comments

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Variations will occur between boring locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly impact excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety, cost estimating,

excavation support, and dewatering requirements/design are the responsibility of others. Construction and site development have the potential to affect adjacent properties. Such impacts can include damages due to vibration, modification of groundwater/surface water flow during construction, foundation movement due to undermining or subsidence from excavation, as well as noise or air quality concerns. Evaluation of these items on nearby properties are commonly associated with contractor means and methods and are not addressed in this report. The owner and contractor should consider a preconstruction/precondition survey of surrounding development. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

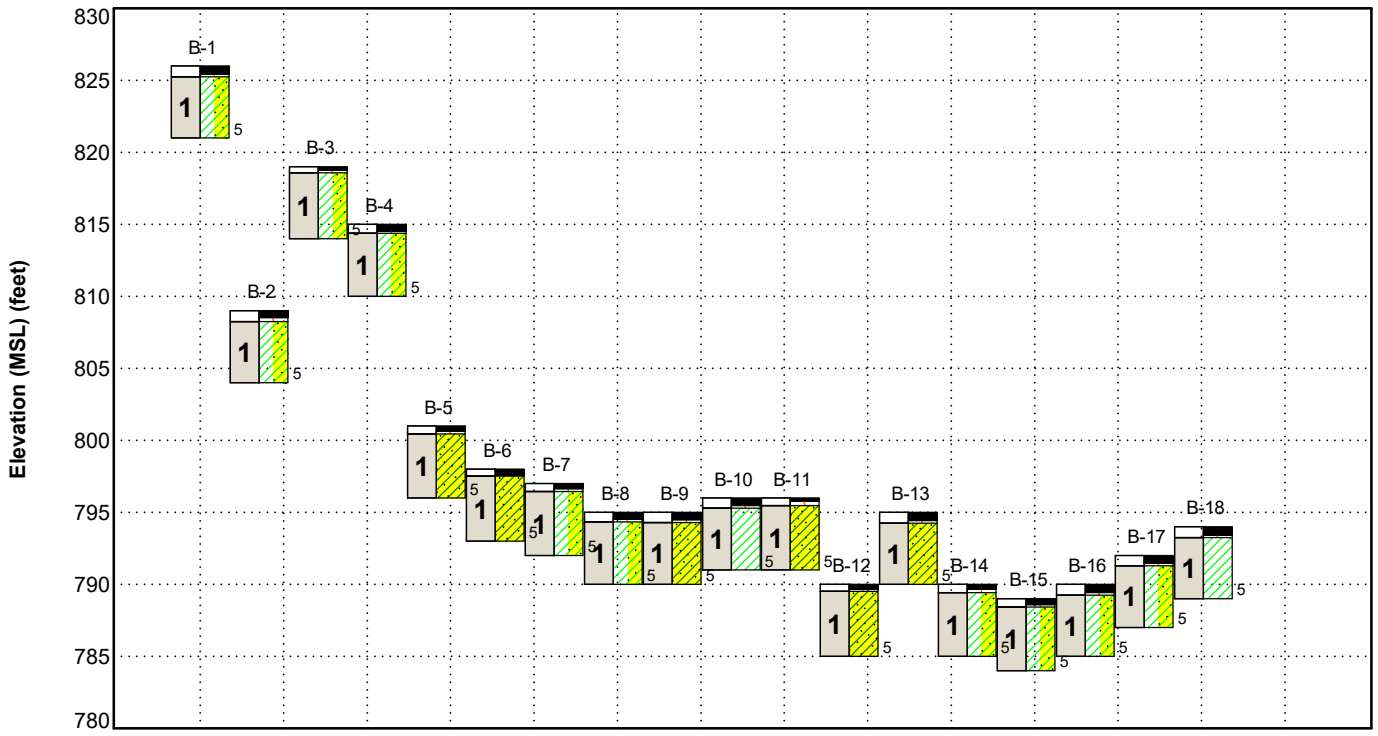
Figures

Contents:

GeoModel (4 pages)

Terracon
15620 W 113th St
Lenexa, KS

GeoModel



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	**Residual Soils**	Lean to fat, brown and gray, with sand to sandy, medium stiff to hard
2	**Bedrock**	Limestone

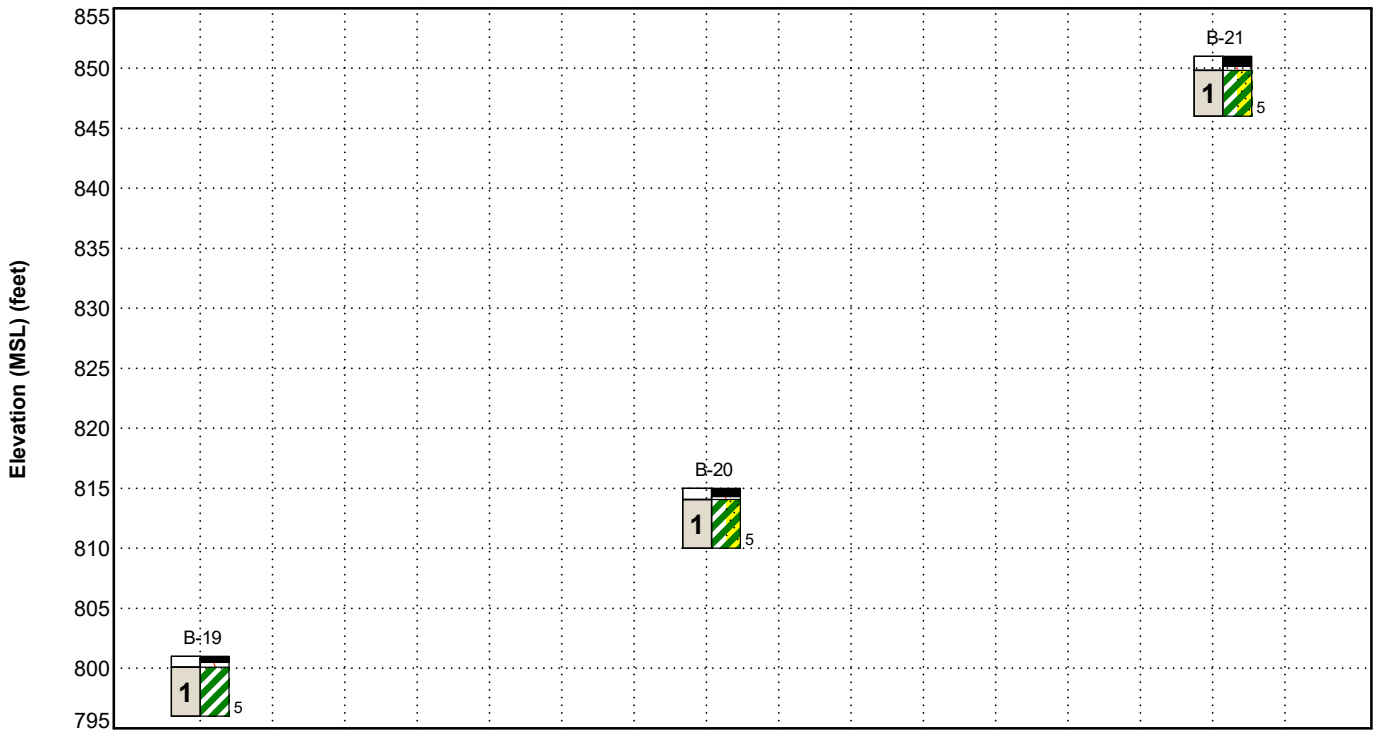
LEGEND

- Asphalt
- Aggregate Base Course
- Lean Clay with Sand
- Sandy Lean Clay
- Lean Clay

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.

15620 W 113th St
Lenexa, KS

GeoModel



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	**Residual Soils**	Lean to fat, brown and gray, with sand to sandy, medium stiff to hard
2	**Bedrock**	Limestone

LEGEND

Asphalt

Aggregate Base Course

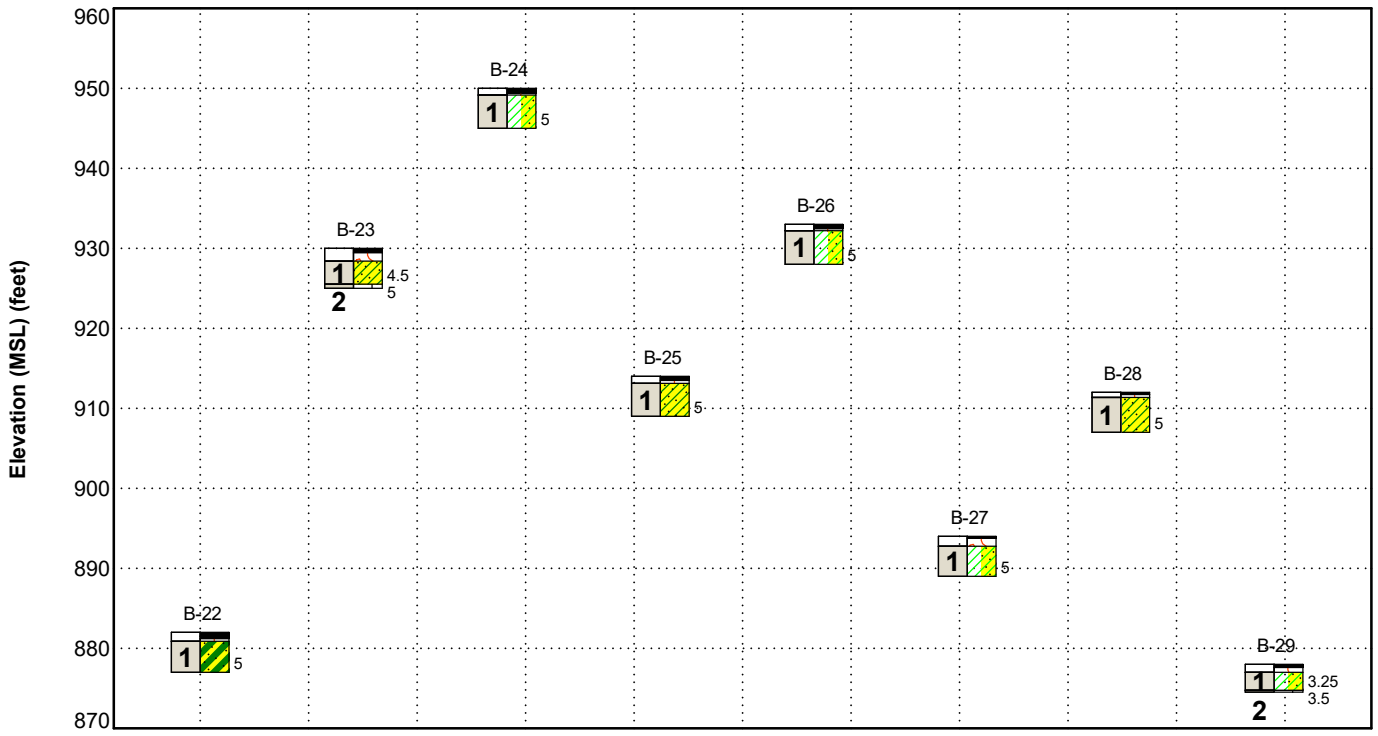
Fat Clay

Fat Clay with Sand

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.

15620 W 113th St
Lenexa, KS

GeoModel



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	**Residual Soils**	Lean to fat, brown and gray, with sand to sandy, medium stiff to hard
2	**Bedrock**	Limestone

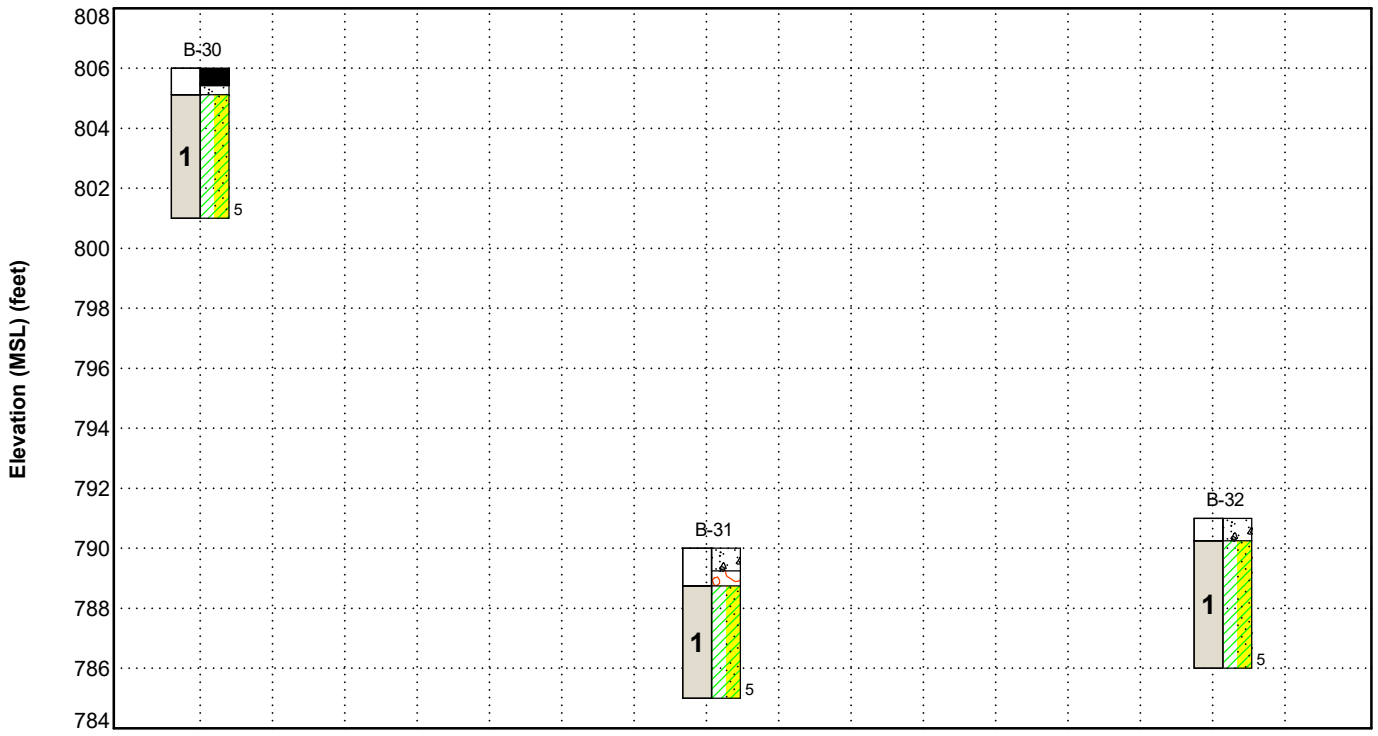
LEGEND

- Asphalt
- Aggregate Base Course
- Sandy Fat Clay
- Sandy Lean Clay
- Limestone
- Lean Clay with Sand

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.

15620 W 113th St
Lenexa, KS

GeoModel



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	**Residual Soils**	Lean to fat, brown and gray, with sand to sandy, medium stiff to hard
2	**Bedrock**	Limestone

LEGEND

Asphalt
Aggregate Base Course
Concrete
Lean Clay with Sand

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.

Attachments

Exploration and Testing Procedures

Field Exploration

Number of Borings	Approximate Boring Depth (feet)	Location
18	5	Route 1 (Golden Road)
14	5	Route 2 (N 158th Street & Loring Road)
2	5	161st Street

Boring Layout and Elevations: Terracon personnel provided the boring layout using handheld GPS equipment (estimated horizontal precision of about ±10 feet) and referencing existing site features. Approximate ground surface elevations were estimated using an online mapping application.

Subsurface Exploration Procedures: We advanced the borings with an ATV-mounted rotary drill rig using continuous flight augers. Samples were obtained from the borings using thin-walled tube and split-barrel sampling procedures. In the thin-walled tube sampling procedure, a thin-walled, seamless steel tube with a sharp cutting edge was pushed hydraulically into the soil to obtain a relatively undisturbed sample. In the split-barrel sampling procedure, a standard 2-inch outer diameter split-barrel sampling spoon was driven into the ground by a 140-pound automatic hammer falling a distance of 30 inches. The number of blows required to advance the sampling spoon the last 12 inches of a normal 18-inch penetration is recorded as the Standard Penetration Test (SPT) resistance value. The SPT resistance values, also referred to as N-values, are indicated on the boring logs at the test depths. The borings were backfilled with auger cuttings after their completion. The upper few inches of borehole penetrations through pavements were surface patched with cold-mix asphalt and/or pre-mixed concrete.

We also observed the boreholes while drilling and at the completion of drilling for the presence of groundwater. Groundwater was not observed in the boreholes at these times.

Our exploration team prepared field boring logs to record the sampling depths, penetration distances, other sampling information, visual classifications of the materials observed during drilling, and our interpretation of the subsurface conditions between samples. The samples were placed in appropriate containers and taken to our laboratory for testing and classification. The final boring logs provided with this report include modifications based on the results of the laboratory tests and observations of the recovered samples.

Laboratory Testing

The project engineer reviewed the field data and assigned laboratory tests. The laboratory testing program included the following tests on selected samples:

- Moisture Content
- Dry Unit Weight
- Grain Size Analysis
- Atterberg Limits

The laboratory testing program included examination of soil samples by an engineer. Based on the results of our field and laboratory programs, we described and classified the soil samples in general accordance with the Unified Soil Classification System.

Rock classification was conducted using locally accepted practices for engineering purposes; core samples and petrographic analysis may indicate other rock types. The rock classifications on the boring logs were determined using the attached Rock Classification Notes.

Photography Log



B-1, Asphalt: 7 inches



B-2, Asphalt: 6 inches



B-3, Asphalt: 3 inches



B-4, Asphalt: 5½ inches



B-5, Asphalt: 4½ inches



B-6, Asphalt: 5 inches



B-7, Asphalt: 4½ inches



B-8, Asphalt: 6 inches



B-9, Asphalt: 6½ inches



B-10, Asphalt: 6½ inches



B-11, Asphalt: 2½ inches



B-12, Asphalt: 4 inches



B-13, Asphalt: 7 inches



B-14, Asphalt: 4 inches



B-15, Asphalt: 5 inches



B-16, Asphalt: 7 inches



B-17, Asphalt: 6½ inches



B-18, Asphalt: 7 inches



B-19, Asphalt: 6 inches



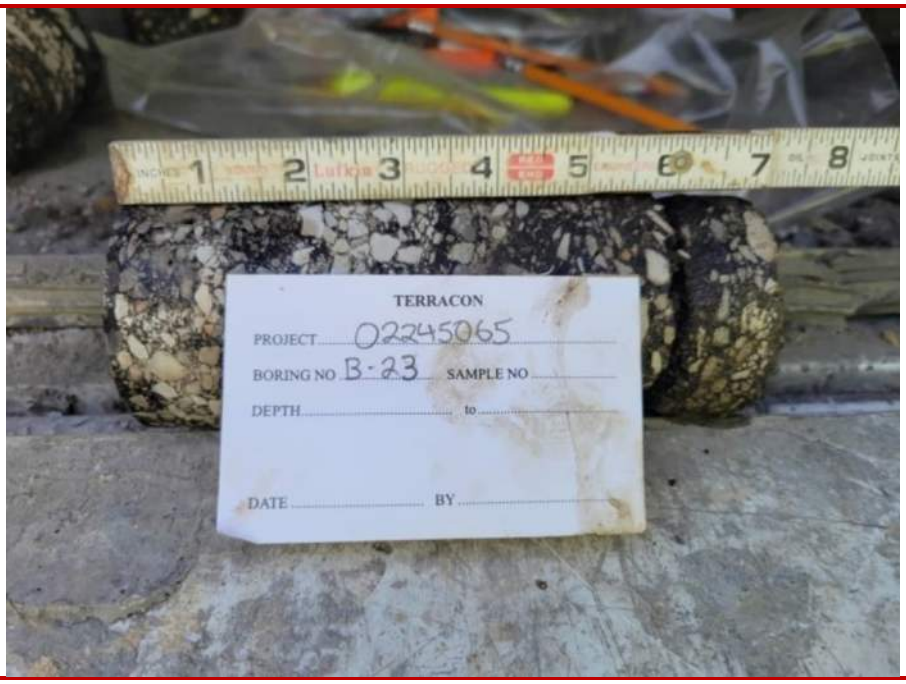
B-20, Asphalt: 8¼ inches



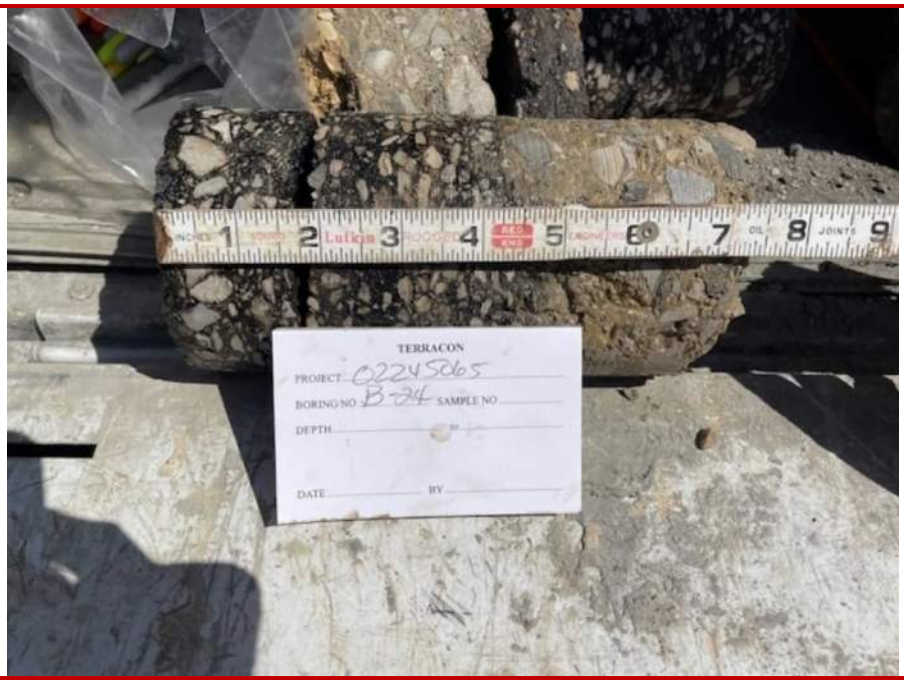
B-21, Asphalt: 10 inches



B-22, Asphalt: 9½ inches



B-23, Asphalt: 7 inches



B-24, Asphalt: 7 inches



B-25, Asphalt: 6½ inches



B-26, Asphalt: 6½ inches



B-27, Asphalt: 3 inches



B-28, Asphalt: 3½ inches



B-29, Asphalt: 5 inches



B-30, Asphalt: 7 inches, Concrete: 3½ inches



B-31, Concrete: 9 inches



B-32, Concrete: 9 inches

Site Location and Exploration Plans

Contents:

Site Location Plan
Exploration Plan (7 pages)

Note: All attachments are one page unless noted above.

Site Location

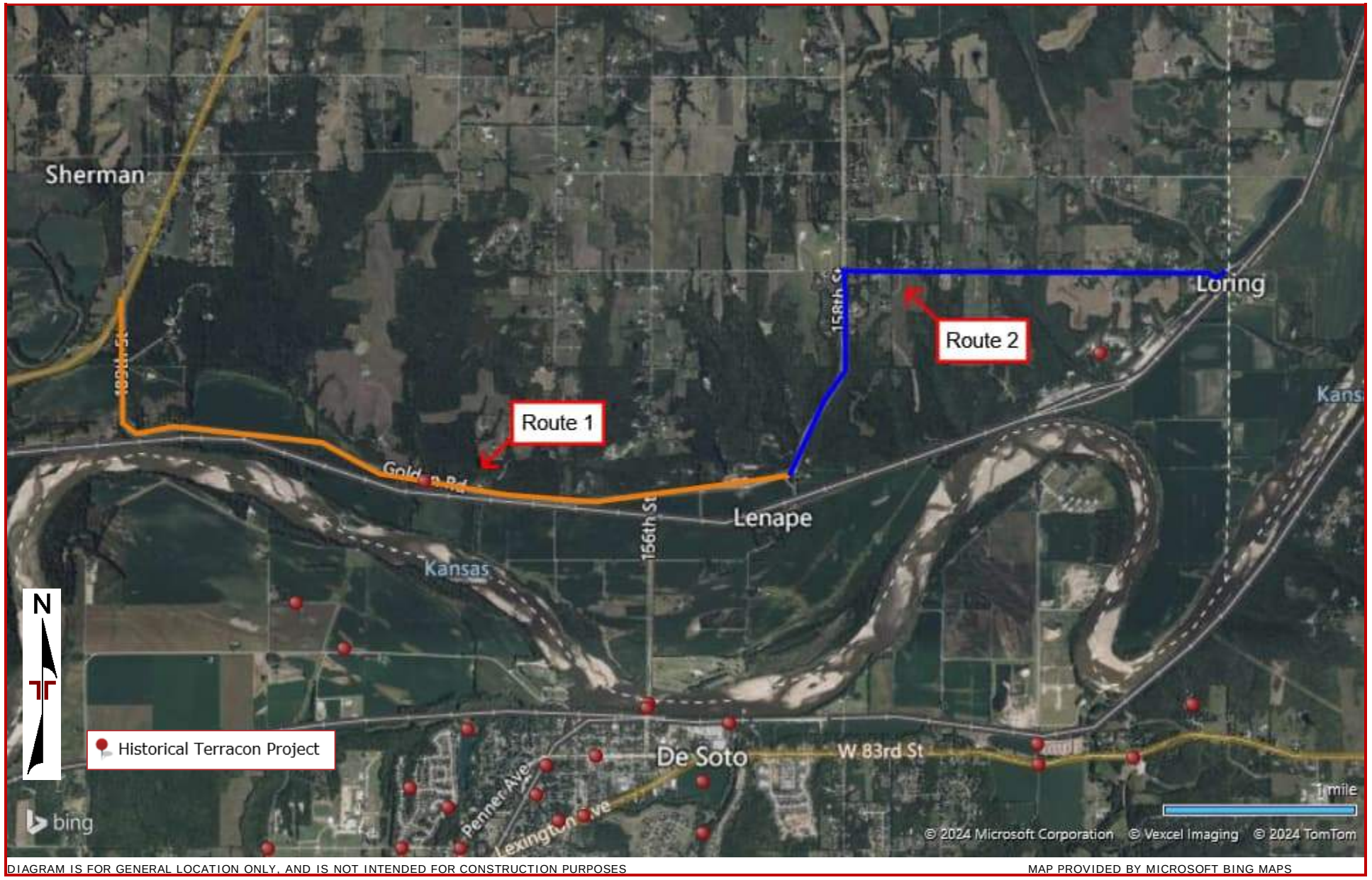


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration Plan



DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration Plan



DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration Plan



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MAP PROVIDED BY MICROSOFT BING MAPS

Exploration Plan



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MAP PROVIDED BY MICROSOFT BING MAPS

Exploration Plan

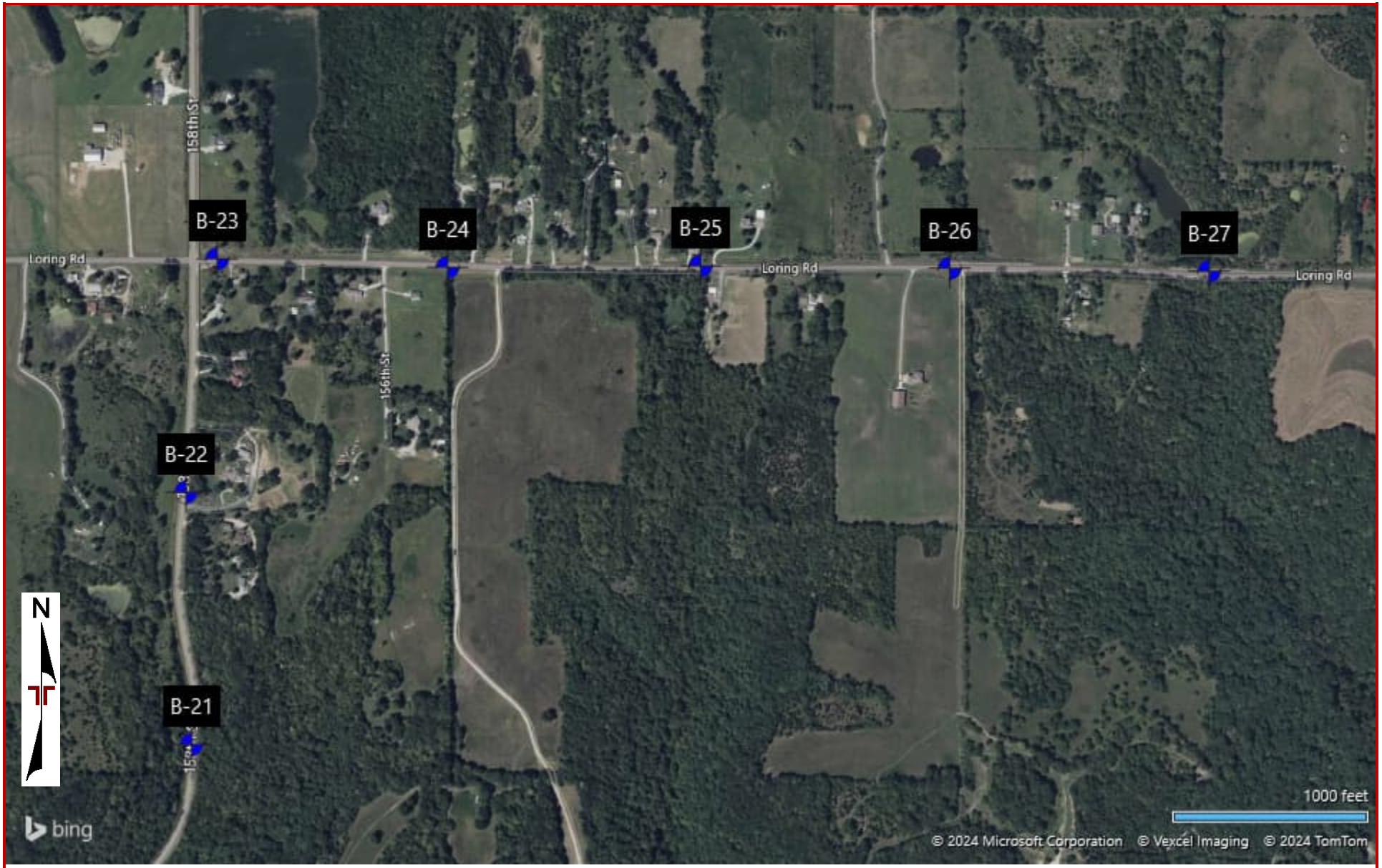


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration Plan



DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration Plan (Additional Borings)



DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration and Laboratory Results

Contents:

Boring Logs (B-1 to B-32; B-101 and B-102)

Note: All attachments are one page unless noted above.

Golden Road Pavement Evaluation
Golden Road from Linwood Road to N 158th Street | Leavenworth County, KS
Terracon Project No. 02245065

15620 W 113th St
Lenexa, KS

Boring Log No. B-1

Location: See Exploration Plan

Latitude: 39.0119° Longitude: -95.0156°

Depth (Ft.) Elevation: 826 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (7 inches) 0.6 / 825.42								
		AGGREGATE BASE COURSE (2 inches) 0.8 / 825.25								
1		**LEAN CLAY WITH SAND (CL)**, dark gray and light brown, very stiff			19		13.7	115	39-16-23	81
					13	4-7-10 N=17	19.5			
		5.0 / 821								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
04-30-2024

Boring Completed
04-30-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-2

Location: See Exploration Plan

Latitude: 39.0085° Longitude: -95.0157°

Depth (Ft.) Elevation: 809 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (6 inches) 0.5 / 808.5								
		AGGREGATE BASE COURSE (3 inches) 0.8 / 808.25								
1		**LEAN CLAY WITH SAND (CL)**, dark gray and light brown, very stiff to medium stiff								
		1								
		2			11	6-8-8 N=16	17.2			
		3								
		4			14	3-4-3 N=7	22.7			
		5.0 / 804								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
04-30-2024

Boring Completed
04-30-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-3

Location: See Exploration Plan

Latitude: 39.0048° Longitude: -95.0157°

Depth (Ft.) Elevation: 819 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (3 inches) 0.3 / 818.75								
		AGGREGATE BASE COURSE (2 inches) 0.4 / 818.58								
1		**LEAN CLAY WITH SAND (CL)**, light brown and dark gray, very stiff			12	3-7-8 N=15	14.5			
					13	5-7-10 N=17	16.6			
		5.0 / 814								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
04-30-2024

Boring Completed
04-30-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-4

Location: See Exploration Plan

Latitude: 39.0023° Longitude: -95.0136°

Depth (Ft.) Elevation: 815 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (5.5 inches) 0.5 (814.54)								
		AGGREGATE BASE COURSE (2 inches) 0.6 (814.37)								
1		**LEAN CLAY WITH SAND (CL)**, red brown, stiff								
		1								
		2			11		11.5		32-16-16	72
		3								
		4			14	3-4-7 N=11	19.5			
		5.0 (810)								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
04-30-2024

Boring Completed
04-30-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-5

Location: See Exploration Plan

Latitude: 39.0029° Longitude: -95.0092°

Depth (Ft.) Elevation: 801 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (4.5 inches) 0.4 / 800.62								
		AGGREGATE BASE COURSE (2 inches) 0.6 / 800.45								
1		**SANDY LEAN CLAY (CL)**, light brown and dark gray, hard								
		1								
		2			14	6-12-22 N=34	17.2			
		3								
		4			12	18-18-14 N=32	9.8			
		5.0 / 796								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
05-01-2024

Boring Completed
05-01-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-6

Location: See Exploration Plan

Latitude: 39.0024° Longitude: -95.0045°

Depth (Ft.) Elevation: 798 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (5 inches) 0.4 797.58								
		AGGREGATE BASE COURSE (1 inch) 0.5 797.5								
1		**SANDY LEAN CLAY (CL)**, brown and dark gray, very stiff								
		1								
		2			10	9-10-10 N=20	17.8			
		3								
		4			14	8-10-11 N=21	15.4			
		5.0 793								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
04-30-2024

Boring Completed
04-30-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-7

Location: See Exploration Plan

Latitude: 39.0020° Longitude: -94.9999°

Depth (Ft.) Elevation: 797 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (")	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (4.5 inches) 0.4 / 796.62								
		AGGREGATE BASE COURSE (2 inches) 0.6 / 796.45								
1		**LEAN CLAY WITH SAND (CL)**, brown and dark gray, medium stiff								
		1								
		2			13		21.0	100	33-20-13	78
		3								
		4			17	2-2-3 N=5	26.2			
		5.0 / 792								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
05-01-2024

Boring Completed
05-01-2024

Golden Road Pavement Evaluation
Golden Road from Linwood Road to N 158th Street | Leavenworth County, KS
Terracon Project No. 02245065

15620 W 113th St
Lenexa, KS

Boring Log No. B-8

Location: See Exploration Plan

Latitude: 39.0014° Longitude: -94.9958°

Depth (Ft.) Elevation: 795 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (")	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (6 inches) 0.5 / 794.5								
		AGGREGATE BASE COURSE (2 inches) 0.7 / 794.33								
1		**LEAN CLAY WITH SAND (CL)**, dark gray and light brown, very stiff to medium stiff								
					9	4-7-10 N=17	19.3			
					12	4-3-4 N=7	27.9			
		5.0 / 790								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes
Elevation Reference: Elevations estimated using an online mapping application

Water Level Observations
Groundwater not encountered

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
04-30-2024

Boring Completed
04-30-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-9

Location: See Exploration Plan

Latitude: 38.9998° Longitude: -94.9919°

Depth (Ft.) Elevation: 795 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (6.5 inches) 0.5 (794.46)								
		AGGREGATE BASE COURSE (2 inches) 0.7 (794.29)								
1		**SANDY LEAN CLAY (CL)**, dark gray and light brown, very stiff								
		1								
		2			12	6-9-12 N=21	18.1			
		3								
		4			12	4-8-8 N=16	17.0			
		5.0 (790)								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
05-01-2024

Boring Completed
05-01-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-10

Location: See Exploration Plan

Latitude: 38.9989° Longitude: -94.9875°

Depth (Ft.) Elevation: 796 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (6.5 inches) 0.5 795.46								
		AGGREGATE BASE COURSE (2 inches) 0.7 795.29								
1		**LEAN CLAY (CL)**, dark gray and light brown, medium stiff			13		21.3	104	47-18-29	89
					11	1-2-2 N=4	24.1			
		5.0 791 ***Boring Terminated at 5 Feet***								

1
2
3
4
5

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
04-30-2024

Boring Completed
04-30-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-11

Location: See Exploration Plan

Latitude: 38.9982° Longitude: -94.9829°

Model Layer	Graphic Log	Depth (Ft.)	Elevation: 796 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		0.2	**ASPHALT (2.5 inches)** 795.8									
		0.5	**AGGREGATE BASE COURSE (4 inches)** 795.46									
1			**SANDY LEAN CLAY (CL)**, light brown and dark gray, very stiff	1								
				2			14	7-10-12 N=22	14.1			
				3								
				4			12	5-8-12 N=20	11.9			
		5.0	791	5								
			Boring Terminated at 5 Feet									

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
05-01-2024

Boring Completed
05-01-2024

Golden Road Pavement Evaluation
Golden Road from Linwood Road to N 158th Street | Leavenworth County, KS
Terracon Project No. 02245065

15620 W 113th St
Lenexa, KS

Boring Log No. B-12

Location: See Exploration Plan

Latitude: 38.9975° Longitude: -94.9785°

Depth (Ft.) Elevation: 790 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (4 inches) 0.3 / 789.67								
		AGGREGATE BASE COURSE (2 inches) 0.5 / 789.5								
1		**SANDY LEAN CLAY (CL)**, light brown and dark gray, very stiff			23		12.3	118	33-17-16	60
					8	8-9-11 N=20	14.6			
		5.0 / 785								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes
Elevation Reference: Elevations estimated using an online mapping application

Water Level Observations
Groundwater not encountered

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
04-30-2024

Boring Completed
04-30-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-13

Location: See Exploration Plan

Latitude: 38.9972° Longitude: -94.9738°

Depth (Ft.) Elevation: 795 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (7 inches) 0.6 / 794.42								
		AGGREGATE BASE COURSE (2 inches) 0.8 / 794.25								
1		**SANDY LEAN CLAY (CL)**, dark gray and brown, very stiff								
		1								
		2			15	5-10-13 N=23	11.4			
		3								
		4			16	5-8-8 N=16	15.0			
		5.0 / 790								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
05-01-2024

Boring Completed
05-01-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-14

Location: See Exploration Plan

Latitude: 38.9973° Longitude: -94.9692°

Depth (Ft.) Elevation: 790 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (4 inches) 0.3 / 789.67								
		AGGREGATE BASE COURSE (3 inches) 0.6 / 789.42								
1		**LEAN CLAY WITH SAND (CL)**, dark gray and brown, very stiff								
					9	5-7-8 N=15	15.2			
					12	5-9-10 N=19	14.8			
		5.0 / 785								
		Boring Terminated at 5 Feet								

1 2 3 4 5

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
04-30-2024

Boring Completed
04-30-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-15

Location: See Exploration Plan

Latitude: 38.9978° Longitude: -94.9651°

Depth (Ft.) Elevation: 789 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (5 inches) 0.4 / 788.58								
		AGGREGATE BASE COURSE (2 inches) 0.6 / 788.42								
1		**LEAN CLAY WITH SAND (CL)**, dark gray and brown, very stiff								
					13	7-10-10 N=20	13.5			
					16	4-7-12 N=19	14.3			
		5.0 / 784								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
05-01-2024

Boring Completed
05-01-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-16

Location: See Exploration Plan

Latitude: 38.9982° Longitude: -94.9604°

Depth (Ft.) Elevation: 790 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (")	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (7 inches) 0.6 / 789.42								
		AGGREGATE BASE COURSE (2 inches) 0.8 / 789.25								
1		**LEAN CLAY WITH SAND (CL)**, dark gray and brown, very stiff								
					13	9-10-10 N=20	16.1			
					12	4-6-9 N=15	17.3			
		5.0 / 785								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
04-30-2024

Boring Completed
04-30-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-17

Location: See Exploration Plan

Latitude: 38.9984° Longitude: -94.9559°

Depth (Ft.) Elevation: 792 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (")	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (6.5 inches) 0.5 / 791.46								
		AGGREGATE BASE COURSE (2 inches) 0.7 / 791.29								
1		**LEAN CLAY WITH SAND (CL)**, dark gray and brown, medium stiff to stiff								
		1								
		2			15	4-3-4 N=7	24.2			
		3								
		4			14	2-5-5 N=10	20.0			
		5.0 / 787								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
05-01-2024

Boring Completed
05-01-2024

Golden Road Pavement Evaluation
Golden Road from Linwood Road to N 158th Street | Leavenworth County, KS
Terracon Project No. 02245065

15620 W 113th St
Lenexa, KS

Boring Log No. B-18

Location: See Exploration Plan

Latitude: 38.9993° Longitude: -94.9513°

Depth (Ft.) Elevation: 794 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (7 inches) 0.6 / 793.42								
		AGGREGATE BASE COURSE (2 inches) 0.8 / 793.25								
1		**LEAN CLAY (CL)**, dark gray and light brown, stiff								
		1								
		2			14		20.7	108	47-19-28	90
		3								
		4			14	4-4-6 N=10	23.8			
		5.0 / 789								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
D-50

Hammer Type
Automatic

Driller
FG

Logged by
DB

Boring Started
04-30-2024

Boring Completed
04-30-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-19

Location: See Exploration Plan

Latitude: 39.0021° Longitude: -94.9498°

Depth (Ft.) Elevation: 801 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (6 inches) 0.5 / 800.5								
		AGGREGATE BASE COURSE (5 inches) 0.9 / 800.08								
1		**FAT CLAY (CH)**, dark gray and brown, very stiff								
		1								
		2			22		20.8	110	53-20-33	87
		3								
		4			12	9-10-8 N=18	14.6			
		5.0 / 796								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
CME 550X

Hammer Type
Automatic

Driller
CJ

Logged by
FG

Boring Started
08-19-2024

Boring Completed
08-19-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-20

Location: See Exploration Plan

Latitude: 39.0048° Longitude: -94.9478°

Depth (Ft.) Elevation: 815 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (")	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (8.25 inches) 0.7 / 814.31								
		AGGREGATE BASE COURSE (3 inches) 0.9 / 814.06								
1		**FAT CLAY WITH SAND (CH)**, dark gray and brown, stiff								
					12	4-4-5 N=9	19.7			
					10	2-4-8 N=12	24.5			
		5.0 / 810								
		Boring Terminated at 5 Feet								

1 2 3 4 5

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
CME 550X

Hammer Type
Automatic

Driller
CJ

Logged by
FG

Boring Started
08-16-2024

Boring Completed
08-16-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-21

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 39.0078° Longitude: -94.9461° Depth (Ft.) Elevation: 851 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (10 inches) 0.8 850.17									
		AGGREGATE BASE COURSE (4 inches) 1.2 849.83	1								
1		**FAT CLAY WITH SAND (CH)**, gray and brown, very stiff to stiff	2			10	5-9-9 N=18	14.0			
			3								
			4			13	10-5-6 N=11	22.1			
		5.0 846	5								
		Boring Terminated at 5 Feet									

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
CME 550X

Hammer Type
Automatic

Driller
CJ

Logged by
FG

Boring Started
08-19-2024

Boring Completed
08-19-2024

Golden Road Pavement Evaluation
Golden Road from Linwood Road to N 158th Street | Leavenworth County, KS
Terracon Project No. 02245065

15620 W 113th St
Lenexa, KS

Boring Log No. B-22

Location: See Exploration Plan

Latitude: 39.0113° Longitude: -94.9462°

Depth (Ft.) Elevation: 882 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (")	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (9.5 inches) 0.8 / 881.21								
		AGGREGATE BASE COURSE (4 inches) 1.1 / 880.87								
1		**SANDY FAT CLAY (CH)**, gray and brown, stiff			12		18.2	115	50-20-30	69
					15	2-4-5 N=9	24.3			
		5.0 / 877								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
CME 550X

Hammer Type
Automatic

Driller
CJ

Logged by
FG

Boring Started
08-16-2024

Boring Completed
08-16-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-23

Location: See Exploration Plan

Latitude: 39.0146° Longitude: -94.9456°

Depth (Ft.) Elevation: 930 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (")	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (7 inches) 0.6 / 929.42								
		AGGREGATE BASE COURSE (12 inches) 1.6 / 928.42								
1		**SANDY LEAN CLAY (CL)**, light brown, very stiff to hard			14	5-10-9 N=19	10.8			
		4.5 / 925.5			10	15-25-50/2"	4.7			
2		**LIMESTONE** 5.0 / 925								
		Boring Terminated at 5 Feet								

1 2 3 4 5

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
CME 550X

Hammer Type
Automatic

Driller
CJ

Logged by
FG

Boring Started
08-19-2024

Boring Completed
08-19-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-24

Location: See Exploration Plan

Latitude: 39.0145° Longitude: -94.9414°

Depth (Ft.) Elevation: 950 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (7 inches) 0.6 / 949.42								
		AGGREGATE BASE COURSE (3 inches) 0.8 / 949.17								
1		**LEAN CLAY WITH SAND (CL)**, light brown, medium stiff								
					18	3-2-4 N=6	20.1			
					18	2-3-2 N=5	19.0			
		5.0 / 945								
		Boring Terminated at 5 Feet								

1
2
3
4
5

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
CME 550X

Hammer Type
Automatic

Driller
CJ

Logged by
FG

Boring Started
08-16-2024

Boring Completed
08-16-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-25

Location: See Exploration Plan

Latitude: 39.0145° Longitude: -94.9368°

Depth (Ft.) Elevation: 914 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (6.5 inches) 0.5 / 913.46								
		AGGREGATE BASE COURSE (4 inches) 0.9 / 913.12								
1		**SANDY LEAN CLAY (CL)**, gray and light brown, stiff			13		15.9	117	44-17-27	70
					14	5-6-7 N=13	16.7			
		5.0 / 909								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
CME 550X

Hammer Type
Automatic

Driller
CJ

Logged by
FG

Boring Started
08-19-2024

Boring Completed
08-19-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-26

Location: See Exploration Plan

Latitude: 39.0145° Longitude: -94.9323°

Depth (Ft.) Elevation: 933 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (6.5 inches) 0.5 / 932.46								
		AGGREGATE BASE COURSE (3 inches) 0.8 / 932.21								
1		**LEAN CLAY WITH SAND (CL)**, gray and light brown, stiff to medium stiff								
					14	4-5-7 N=12	15.4			
					15	2-3-3 N=6	17.5			
		5.0 / 928								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
CME 550X

Hammer Type
Automatic

Driller
CJ

Logged by
FG

Boring Started
08-16-2024

Boring Completed
08-16-2024

1234

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-27

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 39.0144° Longitude: -94.9276° Depth (Ft.) / Elevation: 894 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (")	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (3 inches) 0.3 / 893.75									
		AGGREGATE BASE COURSE (12 inches) 1.3 / 892.75	1								
1		**LEAN CLAY WITH SAND (CL)**, gray and light brown, medium stiff to stiff	2			12	3-3-4 N=7	16.6			
			3								
			4			14	3-4-5 N=9	19.2			
		5.0 / 889	5								
		Boring Terminated at 5 Feet									

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
CME 550X

Hammer Type
Automatic

Driller
CJ

Logged by
FG

Boring Started
08-19-2024

Boring Completed
08-19-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-28

Location: See Exploration Plan

Latitude: 39.0144° Longitude: -94.9229°

Model Layer	Graphic Log	Depth (Ft.)	Elevation: 912 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		0.3	**ASPHALT (3.5 inches)** 911.71									
		0.6	**AGGREGATE BASE COURSE (4 inches)** 911.37									
1			**SANDY LEAN CLAY (CL)**, light brown, stiff	1								
				2			13		18.6	117	47-17-30	70
				3								
				4			12	3-5-7 N=12	17.5			
		5.0	907	5								
			Boring Terminated at 5 Feet									

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
CME 550X

Hammer Type
Automatic

Driller
CJ

Logged by
FG

Boring Started
08-16-2024

Boring Completed
08-16-2024

Golden Road Pavement Evaluation
Golden Road from Linwood Road to N 158th Street | Leavenworth County, KS
Terracon Project No. 02245065

15620 W 113th St
Lenexa, KS

Boring Log No. B-29

Location: See Exploration Plan

Latitude: 39.0144° Longitude: -94.9184°

Depth (Ft.) | Elevation: 878 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (")	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (5 inches) 0.4 / 877.58								
		AGGREGATE BASE COURSE (7 inches) 1.0 / 877								
1		**LEAN CLAY WITH SAND (CL)**, light brown, stiff 3.3 / 874.75			10	4-5-6 N=11	16.2			
2		**LIMESTONE** 3.5 / 874.5			0	50/0"				
		Auger Refusal at 3.5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
CME 550X

Hammer Type
Automatic

Driller
CJ

Logged by
FG

Boring Started
08-19-2024

Boring Completed
08-19-2024

Golden Road Pavement Evaluation
Golden Road from Linwood Road to N 158th Street | Leavenworth County, KS
Terracon Project No. 02245065

15620 W 113th St
Lenexa, KS

Boring Log No. B-30

Location: See Exploration Plan

Latitude: 39.0144° Longitude: -94.9139°

Depth (Ft.) Elevation: 806 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		ASPHALT (7 inches) 0.6 / 805.42								
		CONCRETE (3.5 inches) 0.9 / 805.12								
1		**LEAN CLAY WITH SAND (CL)**, dark gray to light brown, very stiff to stiff								
					10	6-9-11 N=20	12.6			
					12	6-6-7 N=13	10.1			
		5.0 / 801								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
CME 550X

Hammer Type
Automatic

Driller
CJ

Logged by
FG

Boring Started
08-16-2024

Boring Completed
08-16-2024

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-31

Location: See Exploration Plan

Latitude: 39.0141° Longitude: -94.9098°

Depth (Ft.) Elevation: 790 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		CONCRETE (9 inches) 0.8 / 789.25								
		AGGREGATE BASE COURSE (6 inches) 1.3 / 788.75								
1		**LEAN CLAY WITH SAND (CL)**, brown, medium stiff to stiff								
					5	5-2-3 N=5	13.9			
					10	5-6-4 N=10	51.4			
		5.0 / 785								
		Boring Terminated at 5 Feet								

1
2
3
4
5

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
CME 550X

Hammer Type
Automatic

Driller
CJ

Logged by
FG

Boring Started
08-19-2024

Boring Completed
08-19-2024

Golden Road Pavement Evaluation
Golden Road from Linwood Road to N 158th Street | Leavenworth County, KS
Terracon Project No. 02245065

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-32

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 39.0156° Longitude: -94.9070° Depth (Ft.) Elevation: 791 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		CONCRETE (9 inches) 0.8 790.25									
1		**LEAN CLAY WITH SAND (CL)**, dark gray to light brown, very stiff to stiff	1								
			2			16	6-9-12 N=21	22.6			
			3								
			4			16	8-8-5 N=13	20.6			
		5.0 786	5								
		Boring Terminated at 5 Feet									

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
CME 550X

Hammer Type
Automatic

Driller
CJ

Logged by
FG

Boring Started
08-16-2024

Boring Completed
08-16-2024

Golden Road Pavement Evaluation
Golden Road from Linwood Road to N 158th Street | Leavenworth County, KS
Terracon Project No. 02245065

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-101

Location: See Exploration Plan

Latitude: 38.9987° Longitude: -94.9507°

Depth (Ft.) Elevation: 792 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		AGGREGATE BASE COURSE (4 inches) 0.3 / 791.67								
1		**CLAYEY SAND WITH GRAVEL (SC)**, brown, medium dense			6		23.1			
					8	12-10-4 N=14	9.4			
		3.5 / 788.5								
		LEAN CLAY WITH SAND (CL), brown, stiff			15	3-3-9 N=12	13.3			
		5.0 / 787								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
CME 550X

Hammer Type
Automatic

Driller
CJ

Logged by
FG

Boring Started
06-10-2025

Boring Completed
06-10-2025

Golden Road Pavement Evaluation
Golden Road from Linwood Road to N 158th Street | Leavenworth County, KS
Terracon Project No. 02245065

Terracon
15620 W 113th St
Lenexa, KS

Boring Log No. B-102

Location: See Exploration Plan

Latitude: 38.9969° Longitude: -94.9507°

Depth (Ft.) Elevation: 784 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery ()	Field Test Results	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
		AGGREGATE BASE COURSE (12 inches)								
		1.0 783								
1		**LEAN CLAY WITH SAND (CL)**, brown			15		21.1	97		
		3.0 781								
		FAT CLAY (CH), brown, medium stiff			18	2-2-3 N=5	31.5			
		5.0 779								
		Boring Terminated at 5 Feet								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Water Level Observations
Groundwater not encountered

Notes
Elevation Reference: Elevations estimated using an online mapping application

Advancement Method
CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite
Surface Capped with Asphalt

Drill Rig
CME 550X

Hammer Type
Automatic

Driller
CJ

Logged by
FG

Boring Started
06-10-2025

Boring Completed
06-10-2025

Supporting Information

Contents:

General Notes
Unified Soil Classification System
Rock Classification Notes

Note: All attachments are one page unless noted above.

15620 W 113th St
Lenexa, KS

General Notes

Sampling	Water Level	Field Tests
Shelby Tube Split Spoon	Water Initially Encountered Water Level After a Specified Period of Time Water Level After a Specified Period of Time Cave In Encountered Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.	N Standard Penetration Test Resistance (Blows/Ft.) (HP) Hand Penetrometer (T) Torvane (DCP) Dynamic Cone Penetrometer UC Unconfined Compressive Strength (PID) Photo-Ionization Detector (OVA) Organic Vapor Analyzer

Descriptive Soil Classification

Soil classification as noted on the soil boring logs is based Unified Soil Classification System. Where sufficient laboratory data exist to classify the soils consistent with ASTM D2487 "Classification of Soils for Engineering Purposes" this procedure is used. ASTM D2488 "Description and Identification of Soils (Visual-Manual Procedure)" is also used to classify the soils, particularly where insufficient laboratory data exist to classify the soils in accordance with ASTM D2487. In addition to USCS classification, coarse grained soils are classified on the basis of their in-place relative density, and fine-grained soils are classified on the basis of their consistency. See "Strength Terms" table below for details. The ASTM standards noted above are for reference to methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgment.

Location And Elevation Notes

Exploration point locations as shown on the Exploration Plan and as noted on the soil boring logs in the form of Latitude and Longitude are approximate. See Exploration and Testing Procedures in the report for the methods used to locate the exploration points for this project. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

Strength Terms

Relative Density of Coarse-Grained Soils
(More than 50% retained on No. 200 sieve.)
Density determined by Standard Penetration Resistance

Relative Density	Standard Penetration or N-Value (Blows/Ft.)
Very Loose	0 - 3
Loose	4 - 9
Medium Dense	10 - 29
Dense	30 - 50
Very Dense	> 50

Consistency of Fine-Grained Soils
(50% or more passing the No. 200 sieve.)
Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance

Consistency	Unconfined Compressive Strength Qu (tsf)	Standard Penetration or N-Value (Blows/Ft.)
Very Soft	less than 0.25	0 - 1
Soft	0.25 to 0.50	2 - 4
Medium Stiff	0.50 to 1.00	4 - 8
Stiff	1.00 to 2.00	8 - 15
Very Stiff	2.00 to 4.00	15 - 30
Hard	> 4.00	> 30

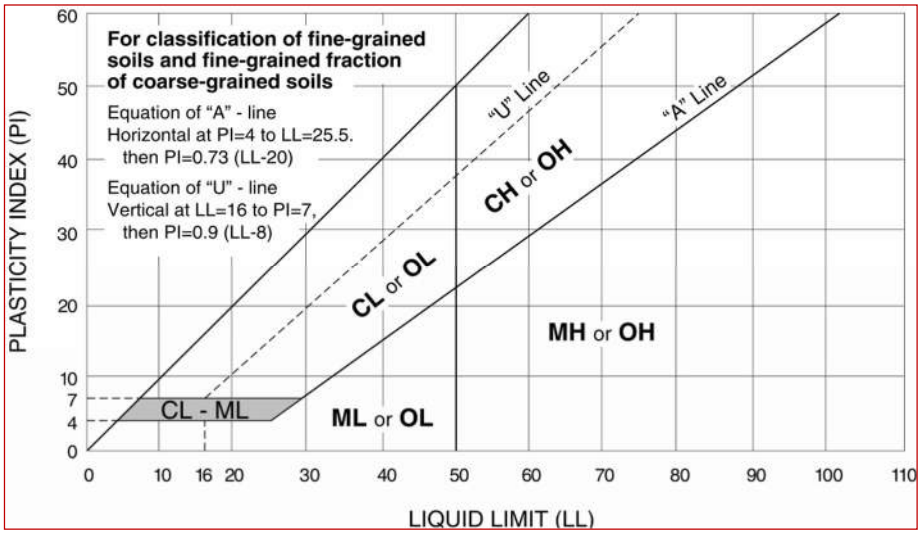
Relevance of Exploration and Laboratory Test Results

Exploration/field results and/or laboratory test data contained within this document are intended for application to the project as described in this document. Use of such exploration/field results and/or laboratory test data should not be used independently of this document.

Unified Soil Classification System

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]				Soil Classification	
				Group Symbol	Group Name [B]
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	Gravels: More than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels: Less than 5% fines [C]	Cu≥4 and 1≤Cc≤3 [E]	GW	Well-graded gravel [F]
			Cu<4 and/or [Cc<1 or Cc>3.0] [E]	GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH	GM	Silty gravel [F, G, H]
			Fines classify as CL or CH	GC	Clayey gravel [F, G, H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	Clean Sands: Less than 5% fines [D]	Cu≥6 and 1≤Cc≤3 [E]	SW	Well-graded sand [I]
			Cu<6 and/or [Cc<1 or Cc>3.0] [E]	SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH	SM	Silty sand [G, H, I]
			Fines classify as CL or CH	SC	Clayey sand [G, H, I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	Silts and Clays: Liquid limit less than 50	Inorganic:	PI > 7 and plots above "A" line [J]	CL	Lean clay [K, L, M]
			PI < 4 or plots below "A" line [J]	ML	Silt [K, L, M]
		Organic:	$\frac{LL\ oven\ dried}{LL\ not\ dried}$ < 0.75	OL	Organic clay [K, L, M, N]
					Organic silt [K, L, M, O]
	Silts and Clays: Liquid limit 50 or more	Inorganic:	PI plots on or above "A" line	CH	Fat clay [K, L, M]
			PI plots below "A" line	MH	Elastic silt [K, L, M]
		Organic:	$\frac{LL\ oven\ dried}{LL\ not\ dried}$ < 0.75	OH	Organic clay [K, L, M, P]
					Organic silt [K, L, M, Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor			PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve.
[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.
[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.
[E] $Cu = D_{60}/D_{10}$ $Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$
[F] If soil contains ≥ 15% sand, add "with sand" to group name.
[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.
[H] If fines are organic, add "with organic fines" to group name.
[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.
[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.
[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.
[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.
[N] PI ≥ 4 and plots on or above "A" line.
[O] PI < 4 or plots below "A" line.
[P] PI plots on or above "A" line.
[Q] PI plots below "A" line.



Rock Classification Notes

WEATHERING	
Term	Description
Fresh	Mineral crystals appear bright; show no discoloration. Features show little or no staining on surfaces. Discoloration does not extend into intact rock.
Slightly weathered	Rock generally fresh except along fractures. Some fractures stained and discoloration may extend <0.5 inches into rock.
Moderately weathered	Significant portions of rock are dull and discolored. Rock may be significantly weaker than in fresh state near fractures. Soil zones of limited extent may occur along some fractures.
Highly weathered	Rock dull and discolored throughout. Majority of rock mass is significantly weaker and has decomposed and/or disintegrated; isolated zones of stronger rock and/or soil may occur throughout.
Completely weathered	All rock material is decomposed and/or disintegrated to soil. The rock mass or fabric is still evident and largely intact. Isolated zones of stronger rock may occur locally.

STRENGTH OR HARDNESS		
Description	Field Identification	Uniaxial Compressive Strength, psi
Extremely strong	Can only be chipped with geological hammer. Rock rings on hammer blows. Cannot be scratched with a sharp pick. Hand specimens require several hard hammer blows to break.	>36,000
Very strong	Several blows of a geological hammer to fracture. Cannot be scratched with a 20d common steel nail. Can be scratched with a geologist's pick only with difficulty.	15,000-36,000
Strong	More than one blow of a geological hammer needed to fracture. Can be scratched with a 20d nail or geologist's pick. Gouges or grooves to ¼ inch deep can be excavated by a hard blow of a geologist's pick. Hand specimens can be detached by a moderate blow.	7,500-15,000
Medium strong	One blow of geological hammer needed to fracture. Can be distinctly scratched with 20d nail. Can be grooved or gouged 1/16 in. deep by firm pressure with a geologist's pick point. Can be fractured with single firm blow of geological hammer. Can be excavated in small chips (about 1-in. maximum size) by hard blows of the point of a geologist's pick;	3,500-7,500
Weak	Shallow indent by firm blow with geological hammer point. Can be gouged or grooved readily with geologist's pick point. Can be excavated in pieces several inches in size by moderate blows of a pick point. Small thin pieces can be broken by finger pressure.	700-3,500
Very weak	Crumbles under firm blow with geological hammer point. Can be excavated readily with the point of a geologist's pick. Pieces 1-in. or more in thickness can be broken with finger pressure. Can be scratched readily by fingernail.	150-700

DISCONTINUITY DESCRIPTION			
Fracture Spacing (Joints, Faults, Other Fractures)		Bedding Spacing (May Include Foliation or Banding)	
Description	Spacing	Description	Spacing
Intensely fractured	< 2.5 inches	Laminated	< ½-inch
Highly fractured	2.5 – 8 inches	Very thin	½ – 2 inches
Moderately fractured	8 inches to 2 feet	Thin	2 inches – 1 foot
Slightly fractured	2 to 6.5 feet	Medium	1 – 3 feet
Very slightly fractured	> 6.5 feet	Thick	3 – 10 feet
		Massive	> 10 feet

ROCK QUALITY DESIGNATION (RQD) [1]	
Description	RQD Value (%)
Very Poor	0 - 25
Poor	25 – 50
Fair	50 – 75
Good	75 – 90
Excellent	90 - 100

1. The combined length of all sound and intact core segments equal to or greater than 4 inches in length, expressed as a percentage of the total core run length.

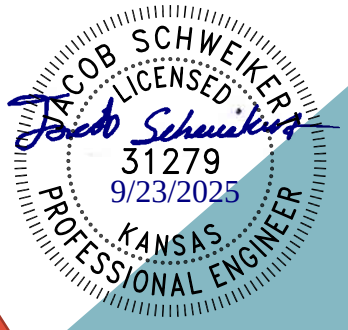
15. Lenape Sand Operation Traffic Study prepared by GBA (not included; replaced in its entirety by the Route Study, Item 13):

STORMWATER DRAINAGE STUDY

LENAPE SAND QUARRY

SOUTHEAST CORNER OF 166TH ST & LENAPE ROAD
LEAVENWORTH COUNTY, KANSAS
GBA NO. 16477
MAY 22, 2025
REV SEP 23, 2025

Prepared for:
Evan Horowitz
Chief Financial Officer
Kaw Valley Companies, Inc.
5600 Kansas Avenue
Kansas City, Kansas 66106
913.634.8816



GBA
9801 Renner Boulevard, Ste. 300
Lenexa, KS 66219-9745
913.492.0400 | www.gbateam.com

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Exhibit 2 – FEMA Flood Insurance Rate Map
Exhibit 3 – USDA Soil Resource Report
Plan Sheet 4 - Overall Grading Plan

General Information:

A site of approximately 424+/- acres is to be developed in Leavenworth County, Kansas. The project is bound by the Union Pacific Railroad to the north, Kansas River to the south and east, and 166th Street to the west. The site is currently undeveloped and mainly consists of open vegetated area, used as farmland. The site is nearly flat, consisting mainly of slopes less than 1%. Stormwater runoff drains generally to roadside ditches and ultimately to the Kansas river to the south. The site is intended to be used for a sand dredging operation. The project site lies inside FEMA Zone AE, regulatory floodway per FEMA map number 20103C0425G revised July 16, 2015. The FEMA map can be found in Appendix A. Areas of jurisdictional wetlands are shown on plan sheet C4 which is attached to this report. According to the NRCS web soil survey, the site is predominately made up of type B and type C fine sandy loam. The web soil survey can be found in Appendix A. Per the 1990 edition of APWA Section 5600, a curve number of 75, which corresponds to a runoff coefficient of 0.3, was selected for this site due to the undeveloped nature. This document will provide analysis of the site as it relates to stormwater runoff and floodplain management.

Existing Conditions Analysis:

Plan sheet C4, overall grading plan, is attached to this report. This sheet demonstrates the flat nature of the site, as wetlands located throughout the site low points do not have outfall locations. There are no major conveyances of stormwater into, out of, or internal to the project site due to the flat topography of the floodplain.

Proposed Conditions Analysis:

The proposed site will be used for a sand excavation operation. Site improvements include a dredging pond, sand dryer and processors, sand stockpiles, gravel road, and amenities. At no point before, during, or after excavation operations will stormwater runoff patterns be altered to cause additional discharge to neighboring properties. All areas outside of the delineated disturbed area will drain according to existing drainage patterns. See attached Plan Sheet 4 – Grading Plan.

The dredging area (approximately 280.4 acres x 50 feet deep) will serve as a pond after dredging is complete. Due to the addition of a large pond to the site, additional stormwater runoff control structures & detention are not anticipated to be required.

Conclusions and Recommendations:

The proposed dredging pond will add approximately 11,103 ac-ft of water storage to the site. Since earthwork operations are limited to sand dredging, no additional runoff to adjacent properties or rights-of-way is possible.

APPENDIX A

Exhibit 1 – Location Map
Exhibit 2 – FEMA Flood Insurance Rate Map
Exhibit 3 – USDA Soil Resource Report
Plan Sheet 4 – Overall Grading Plan

Exhibit 1

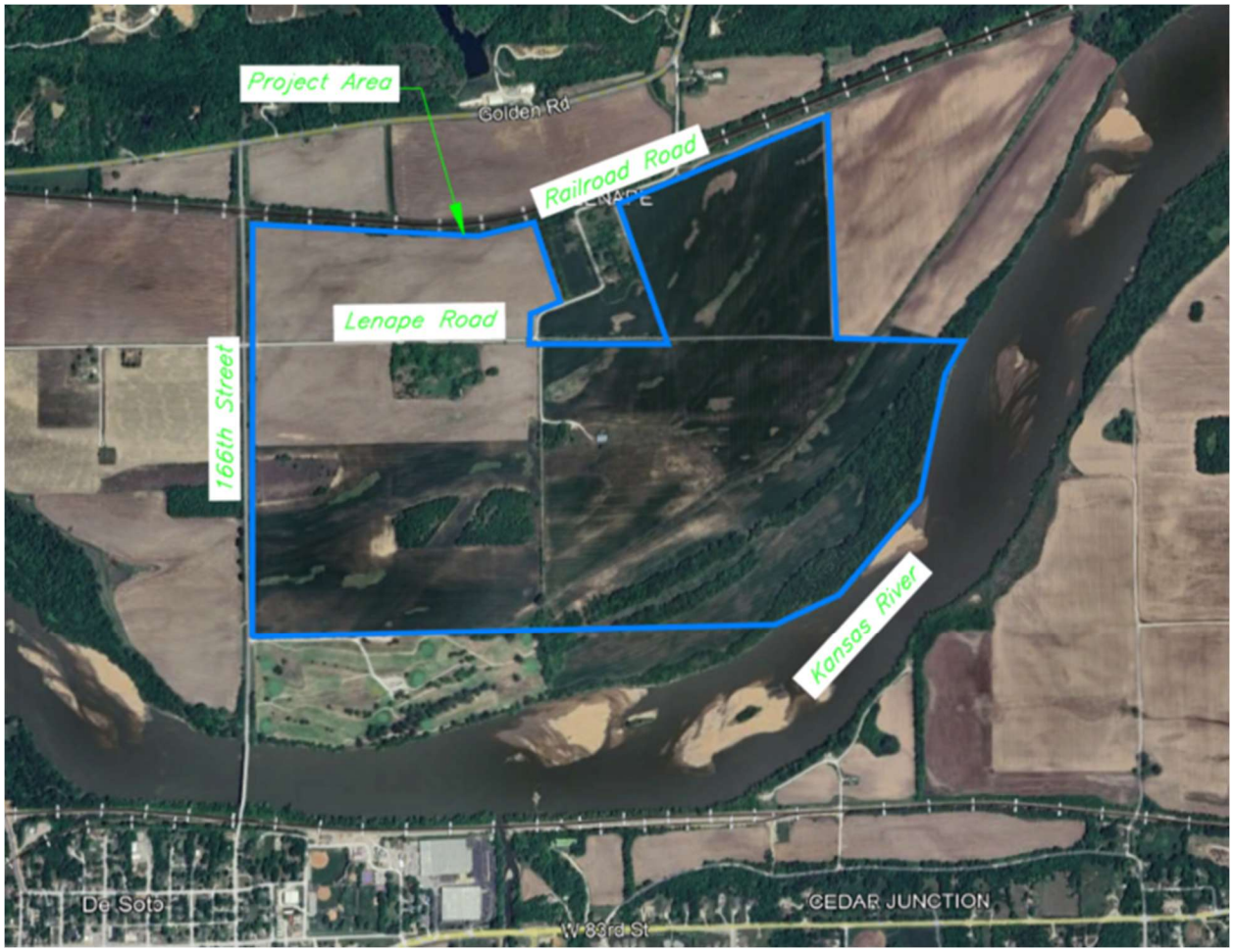

Project Area
Golden Rd
Railroad Road
Lenape Road
166th Street
Kansas River
De Soto
CEDAR JUNCTION
W 83rd St

Exhibit 2

NOTES TO USERS

o is for use in administering the National Flood Insurance Program. It does essarily identify all areas subject to flooding, particularly from local sources of small size. The **community map repository** should be d for possible updated or additional flood hazard information.

n more detailed information in areas where **Base Flood Elevations** and/or **floodways** have been determined, users are encouraged to consult d Profiles and Floodway Data and/or Summary of Stillwater Elevations ontained within the Flood Insurance Study (FIS) report that accompanies M. Users should be aware that BFEs shown on the FIRM represent whole-foot elevations. These BFEs are intended for flood insurance rating s only and should not be used as the sole source of flood elevation on. Accordingly, flood elevation data presented in the FIS report should be n conjunction with the FIRM for purposes of construction and/or floodplain nent.

ies of the **floodways** were computed at cross sections and interpolated cross sections. The floodways were based on hydraulic considerations ard to requirements of the National Flood Insurance Program. Floodway nd other pertinent floodway data are provided in the Flood Insurance port for this jurisdiction.

areas not in Special Flood Hazard Areas may be protected by **flood structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood e Study report for information on flood control structures for this on.

jection used in the preparation of this map was NAD 1983 State Plane North, zone 1501. The **Horizontal datum** was NAD 83, GRS80 spheroid. es in datum, spheroid, projection or UTM zones used in the production of or adjacent jurisdictions may result in slight positional differences in map across jurisdiction boundaries. These differences do not affect the of this FIRM.

vations on this map are referenced to the North American Vertical Datum These flood elevations must be compared to structure and ground s referenced to the same **vertical datum**. For information regarding on between the National Geodetic Vertical Datum of 1929 and the North n Vertical Datum of 1988, visit the National Geodetic Survey website at w.ngs.noaa.gov/ or contact the National Geodetic Survey at the following

ormation Services
I/NGS12
Geodetic Survey
, #9202
st-West Highway
ring, Maryland 20910-3282
3-3242

n current elevation, description, and/or location information for **bench** hown on this map, please contact the Information Services Branch of the Geodetic Survey at **(301) 713-3242**, or visit its website at w.ngs.noaa.gov/.

ap information shown on this FIRM was provided in digital format by orth County GIS Department. This information was photogrammetrically d at a scale of 1:1,200 from aerial photography dated 2012.

n updated topographic information, this map reflects more detailed and e **stream channel configurations and floodplain delineations** than own on the previous FIRM for this jurisdiction. As a result, the Flood and Floodway Data tables may reflect stream channel distances that differ at is shown on the map. Also, the road to floodplain relationships for d streams may differ from what is shown on previous maps.

ofile baselines' represent the hydraulic modeling baselines that match the ofiles in the FIS report. As a result of improved topographic data, the baseline", in some cases, may deviate significantly from the channel e or appear outside the SFHA.

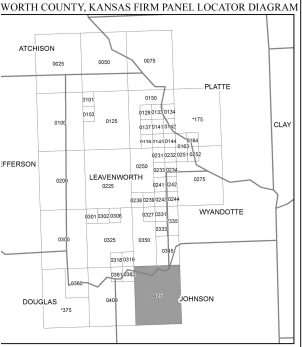
te limits shown on this map are based on the best data available at the ublication. Because changes due to annexations or de-annexations may urred after this map was published, map users should contact appropriate ity officials to verify current corporate limit locations.

efer to the separately printed **Map Index** for an overview map of the howing the layout of map panels; community map repository addresses; sting of Communities table containing National Flood Insurance Program r each community as well as a listing of the panels on which each ity is located.

the **FEMA Map Service Center** (MSC) via the FEMA Map Information ge (FMIX) at 1-877-336-2627 for information on available products ed with this FIRM. Available products may include previously issued f Map Change, a Flood Insurance Study Report, and/or digital versions of o. The MSC may also be reached by Fax at 1-800-358-9620 and its at http://msc.fema.gov/.

ve **questions about this map** or questions concerning the National Flood e Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or FEMA website at http://www.fema.gov/business/nfip/.

WORTH COUNTY, KANSAS FIRM PANEL LOCATOR DIAGRAM





LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUN
BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the f has a 1% chance of being equaled or exceeded in any given year. The Special Floo Area is the area subject to flooding by the 1% annual chance flood. Areas of Spe Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevati water-surface elevation of the 1% annual chance flood.

- **ZONE A** No Base Flood Elevations determined.
- **ZONE AE** Base Flood Elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); avera determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chanc a flood control system that was subsequently decertified. Zone AR indi the former flood control system is being restored to provide protection 1% annual chance or greater flood.
- **ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood system under construction; no Base Flood Elevations determined.
- **ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that mus free of encroachment so that the 1% annual chance flood can be carried without s increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood wit depths of less than 1 foot or with drainage areas less than 1 square areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAS)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Area

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- Boundary dividing Special Flood Hazard Areas of different E Elevations, flood depths, or flood velocities.
- CBRS and OPA boundary
- International, State, or County boundary
- Corporate, Extraterritorial Jurisdiction, or Urban Growth bou
- Area Not Included boundary
- Military Reservation, Native American Lands boundary
- 513 Base Flood Elevation line and value; elevation in feet*
- (EL. 987) Base Flood Elevation value where uniform within zone; eleva

* Referenced to the North American Vertical Datum of 1988

- A—A Cross section line
- 23—23 Transect line
- 87°07'45", 32°22'30" Geographic coordinates referenced to the North American 1983 (NAD 83)
- 4276 0000mE 1000-meter Universal Transverse Mercator grid values, zone
- 600000 FT 5000-foot grid ticks: Kansas State Plane coordinate syst 1501), Lambert Conformal Conic projection
- DX5510 × Bench mark (see explanation in Notes to Users section of panel)
- M1.5 River Mile
- Culvert, Flume, Penstock, or Aqueduct
- Road or Railroad Bridge

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
AUGUST 18, 2009

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
July 16, 2015 - to reflect updated topographic information

For community map revision history prior to countywide mapping, refer to the Comm History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance ag the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
600 0 600 1200 METER

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0425G

FIRM
FLOOD INSURANCE RATE M

LEAVENWORTH CO
KANSAS
AND INCORPORATED AR

PANEL 425 OF 425
(SEE LOCATOR DIAGRAM OR MA
FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL
LEAVENWORTH COUNTY	200186	0425

Notice to User: The **Map Number** shown below sh when placing map orders; the **Community Number** should be used on insurance applications for the subject

MAP NU
20103C
MAP RE
JULY 16

Federal Emergency Management

United States Department of Agriculture

NRCS

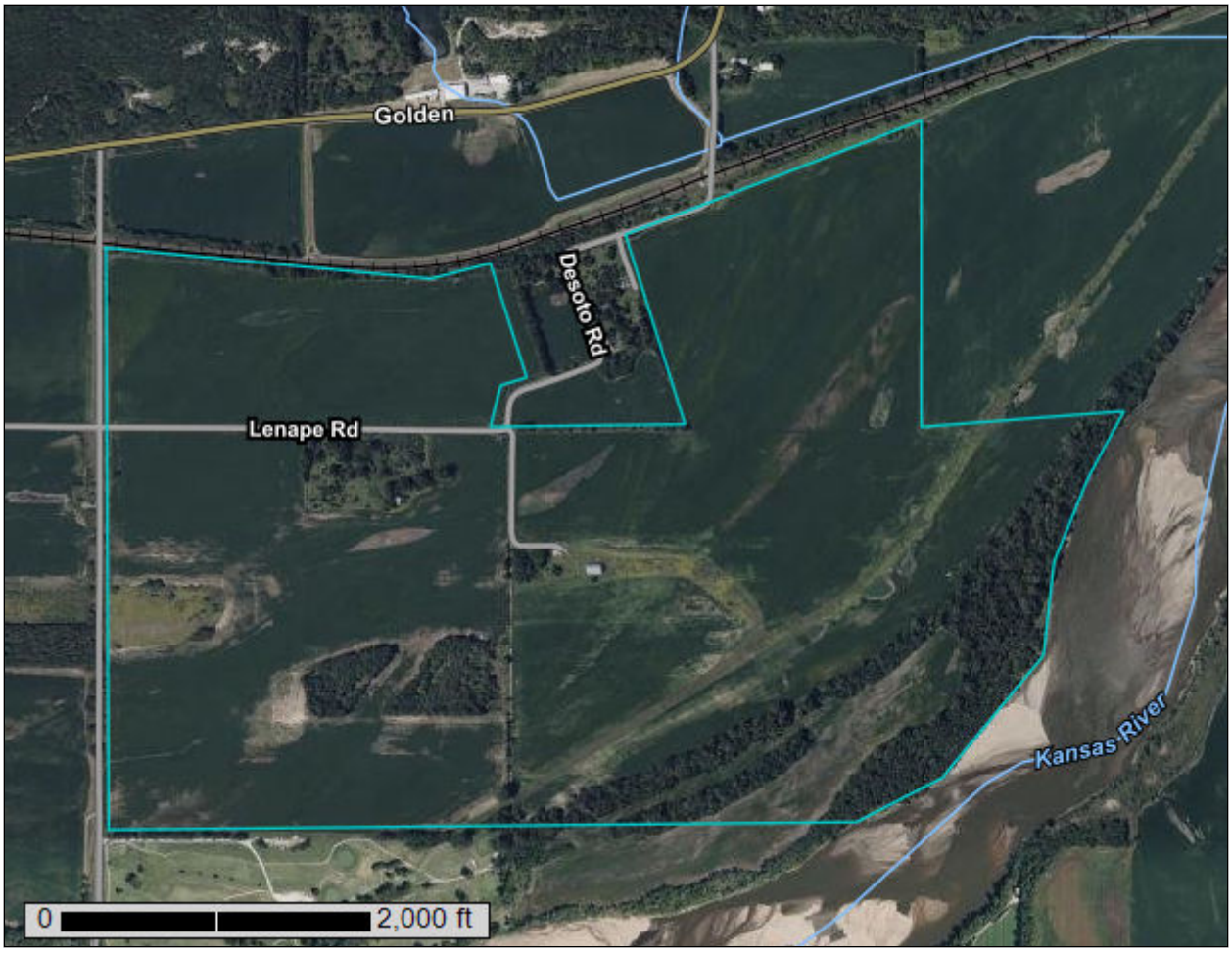
Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Leavenworth County, Kansas

Kaw Valley

Exhibit 3



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

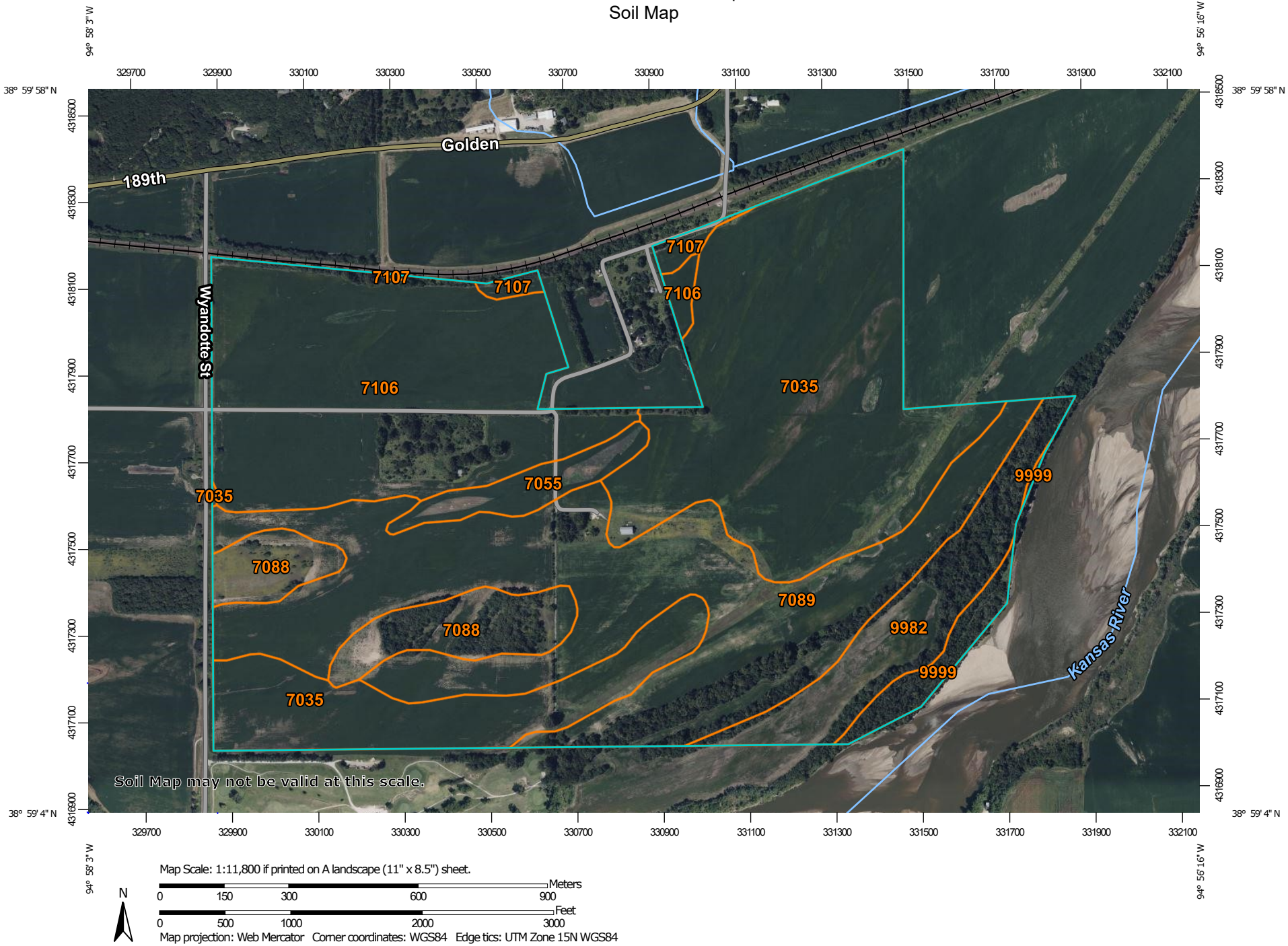
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map


94° 58' 3" W
94° 56' 16" W
38° 59' 58" N
38° 59' 4" N
329700
329900
330100
330300
330500
330700
330900
331100
331300
331500
331700
331900
332100
4318500
4318300
4318100
4317900
4317700
4317500
4317300
4317100
4316900
Golden
189th
Wyandotte St
Kansas River
7107
7106
7035
7055
9999
7088
7089
9982
Soil Map may not be valid at this scale.
Map Scale: 1:11,800 if printed on A landscape (11" x 8.5") sheet.
N
0 150 300 600 900 Meters
0 500 1000 2000 3000 Feet
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Leavenworth County, Kansas
Survey Area Data: Version 18, Sep 12, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 30, 2022—Sep 16, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
7035	Eudora-Bismarckgrove fine sandy loams, overwash, occasionally flooded	158.9	33.3%
7055	Kimo silty clay loam, occasionally flooded	10.9	2.3%
7088	Stonehouse sand, occasionally flooded	27.0	5.7%
7089	Stonehouse-Eudora fine sandy loams, overwash, occasionally flooded	130.4	27.3%
7106	Eudora-Bismarckgrove silt loams, rarely flooded	105.8	22.2%
7107	Bismarckgrove-Kimo complex, rarely flooded	3.9	0.8%
9982	Fluvents, frequently flooded	32.2	6.7%
9999	Water	8.5	1.8%
Totals for Area of Interest		**477.6**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas

are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Leavenworth County, Kansas

7035—Eudora-Bismarckgrove fine sandy loams, overwash, occasionally flooded

Map Unit Setting

National map unit symbol: 2xlgf
Elevation: 730 to 1,700 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 158 to 203 days
Farmland classification: Not prime farmland

Map Unit Composition

Eudora, occasionally flooded, and similar soils: 55 percent
Bismarckgrove, occasionally flooded, and similar soils: 25 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Eudora, Occasionally Flooded

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

Ap - 0 to 7 inches: fine sandy loam
A - 7 to 16 inches: silt loam
AC - 16 to 23 inches: silt loam
C1 - 23 to 36 inches: silt loam
C2 - 36 to 79 inches: very fine sandy loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 11.0 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: R106XY068NE - Loamy Floodplain
Hydric soil rating: No

Description of Bismarckgrove, Occasionally Flooded

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty alluvium over sandy alluvium

Typical profile

Ap - 0 to 7 inches: fine sandy loam
A1 - 7 to 13 inches: silty clay loam
A2 - 13 to 23 inches: silty clay loam
Bw - 23 to 30 inches: silty clay loam
C1 - 30 to 36 inches: stratified silt loam
2C2 - 36 to 79 inches: stratified loamy fine sand to fine sandy loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: R106XY068NE - Loamy Floodplain
Hydric soil rating: No

Minor Components

Bourbonais, occasionally flooded

Percent of map unit: 10 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R106XY068NE - Loamy Floodplain
Hydric soil rating: No

Kimo, occasionally flooded

Percent of map unit: 5 percent
Landform: Meander scars on terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Ecological site: R106XY032NE - Subirrigated

Hydric soil rating: No

Stonehouse, occasionally flooded

Percent of map unit: 4 percent
Landform: Flood-plain steps
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R106XY069NE - Sandy Lowland
Hydric soil rating: No

Aquolls, occasionally ponded

Percent of map unit: 1 percent
Landform: Depressions on flood plains
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Ecological site: R106XY032NE - Subirrigated
Hydric soil rating: Yes

7055—Kimo silty clay loam, occasionally flooded

Map Unit Setting

National map unit symbol: 30x00
Elevation: 720 to 1,710 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 160 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Kimo and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kimo

Setting

Landform: Meander scars on terraces
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Clayey alluvium over loamy alluvium

Typical profile

Ap - 0 to 7 inches: silty clay loam
A1 - 7 to 15 inches: silty clay
A2 - 15 to 23 inches: silty clay loam
AC - 23 to 27 inches: silty clay loam
2C1 - 27 to 43 inches: silt loam
2C2 - 43 to 79 inches: silt loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 22 to 26 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 11.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D
Ecological site: R106XY032NE - Subirrigated
Hydric soil rating: No

Minor Components

Eudora

Percent of map unit: 5 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R106XY068NE - Loamy Floodplain
Hydric soil rating: No

Bismarckgrove, occasionally flooded

Percent of map unit: 5 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R076XY113KS - Loamy Lowland
Hydric soil rating: No

Kiro

Percent of map unit: 4 percent
Landform: Depressions on terraces
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Ecological site: R106XY065NE - Wet Subirrigated
Hydric soil rating: Yes

Aquolls, occasionally flooded

Percent of map unit: 1 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R106XY032NE - Subirrigated
Hydric soil rating: Yes

7088—Stonehouse sand, occasionally flooded

Map Unit Setting

National map unit symbol: 20hx6
Elevation: 750 to 980 feet
Mean annual precipitation: 31 to 47 inches
Mean annual air temperature: 52 to 55 degrees F
Frost-free period: 175 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition

Stonehouse and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Stonehouse

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium

Typical profile

Ap - 0 to 9 inches: sand
C1 - 9 to 23 inches: loamy fine sand
C2 - 23 to 31 inches: stratified loamy sand
C3 - 31 to 45 inches: stratified fine sand
C4 - 45 to 71 inches: stratified sandy loam
C5 - 71 to 80 inches: stratified loamy fine sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: R106XY069NE - Sandy Lowland

Hydric soil rating: No

Minor Components

Belvue

Percent of map unit: 5 percent
Landform: Flood-plain steps
Ecological site: R106XY068NE - Loamy Floodplain
Hydric soil rating: No

Bourbonais

Percent of map unit: 5 percent
Landform: Flood-plain steps
Ecological site: R106XY068NE - Loamy Floodplain
Other vegetative classification: CLAY LOWLAND (PE30-37) (106XY004KS_1)
Hydric soil rating: No

Eudora

Percent of map unit: 4 percent
Landform: Flood-plain steps
Ecological site: R106XY070NE - Loamy Terrace
Hydric soil rating: No

Aquolls

Percent of map unit: 1 percent
Landform: Drainageways, hillslopes, depressions
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R106XY032NE - Subirrigated
Hydric soil rating: Yes

7089—Stonehouse-Eudora fine sandy loams, overwash, occasionally flooded

Map Unit Setting

National map unit symbol: 20hx7
Elevation: 750 to 980 feet
Mean annual precipitation: 31 to 47 inches
Mean annual air temperature: 52 to 55 degrees F
Frost-free period: 175 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition

Stonehouse and similar soils: 50 percent
Eudora and similar soils: 30 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Stonehouse

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium

Typical profile

Ap - 0 to 9 inches: fine sandy loam
C1 - 9 to 23 inches: loamy fine sand
C2 - 23 to 31 inches: stratified loamy sand
C3 - 31 to 45 inches: stratified fine sand
C4 - 45 to 71 inches: stratified sandy loam
C5 - 71 to 80 inches: stratified loamy fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water supply, 0 to 60 inches: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: R106XY069NE - Sandy Lowland
Hydric soil rating: No

Description of Eudora

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-silty alluvium

Typical profile

Ap - 0 to 7 inches: fine sandy loam
A - 7 to 14 inches: silt loam
C1 - 14 to 40 inches: silt loam
C2 - 40 to 48 inches: silt loam
C3 - 48 to 80 inches: very fine sandy loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained

Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water supply, 0 to 60 inches: High (about 11.1 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: R106XY068NE - Loamy Floodplain
Hydric soil rating: No

Minor Components

Kimo
Percent of map unit: 10 percent
Landform: Meander scars on flood-plain steps
Ecological site: R106XY068NE - Loamy Floodplain
Other vegetative classification: CLAY LOWLAND (PE30-37) (106XY004KS_1)
Hydric soil rating: No

Bismarckgrove
Percent of map unit: 5 percent
Landform: Flood-plain steps
Ecological site: R106XY070NE - Loamy Terrace
Hydric soil rating: No

Bourbonais
Percent of map unit: 4 percent
Landform: Flood-plain steps
Ecological site: R106XY068NE - Loamy Floodplain
Other vegetative classification: CLAY LOWLAND (PE30-37) (106XY004KS_1)
Hydric soil rating: No

Aquolls
Percent of map unit: 1 percent
Landform: Drainageways, depressions
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R106XY065NE - Wet Subirrigated
Hydric soil rating: Yes

7106—Eudora-Bismarckgrove silt loams, rarely flooded

Map Unit Setting
National map unit symbol: 2xlgh

Elevation: 980 to 1,660 feet
Mean annual precipitation: 32 to 42 inches
Mean annual air temperature: 54 to 57 degrees F
Frost-free period: 160 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Eudora, rarely flooded, and similar soils: 55 percent
Bismarckgrove, rarely flooded, and similar soils: 30 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Eudora, Rarely Flooded

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

Ap - 0 to 7 inches: silt loam
A - 7 to 16 inches: silt loam
AC - 16 to 23 inches: silt loam
C1 - 23 to 36 inches: silt loam
C2 - 36 to 79 inches: very fine sandy loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 11.0 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: R076XY113KS - Loamy Lowland
Hydric soil rating: No

Description of Bismarckgrove, Rarely Flooded

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty alluvium over sandy alluvium

Typical profile

Ap - 0 to 7 inches: silt loam
A1 - 7 to 13 inches: silty clay loam
A2 - 13 to 23 inches: silty clay loam
Bw - 23 to 30 inches: silty clay loam
C1 - 30 to 36 inches: stratified silt loam
2C2 - 36 to 79 inches: stratified loamy fine sand to fine sandy loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: R076XY113KS - Loamy Lowland
Hydric soil rating: No

Minor Components

Kimo, rarely flooded

Percent of map unit: 5 percent
Landform: Meander scars on terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Ecological site: R106XY032NE - Subirrigated
Hydric soil rating: No

Bourbonais, rarely flooded

Percent of map unit: 5 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R076XY113KS - Loamy Lowland
Hydric soil rating: No

Stonehouse, rarely flooded

Percent of map unit: 4 percent
Landform: Flood-plain steps
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R106XY069NE - Sandy Lowland

Hydric soil rating: No

Aquolls, occasionally ponded

Percent of map unit: 1 percent
Landform: Depressions on flood plains
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Ecological site: R074XY132KS - Subirrigated
Hydric soil rating: Yes

7107—Bismarckgrove-Kimo complex, rarely flooded

Map Unit Setting

National map unit symbol: 2ww29
Elevation: 730 to 1,700 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 158 to 203 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Bismarckgrove, rarely flooded, and similar soils: 55 percent
Kimo, rarely flooded, and similar soils: 25 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bismarckgrove, Rarely Flooded

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

Ap - 0 to 7 inches: silt loam
A1 - 7 to 13 inches: silty clay loam
A2 - 13 to 23 inches: silty clay loam
Bw - 23 to 30 inches: silty clay loam
C1 - 30 to 36 inches: stratified silt loam
2C2 - 36 to 79 inches: stratified loamy fine sand to fine sandy loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)

Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: R106XY068NE - Loamy Floodplain
Hydric soil rating: No

Description of Kimo, Rarely Flooded

Setting

Landform: Meander scars on terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Parent material: Clayey alluvium over loamy alluvium

Typical profile

Ap - 0 to 7 inches: silty clay loam
A1 - 7 to 15 inches: silty clay
A2 - 15 to 23 inches: silty clay loam
AC - 23 to 27 inches: silty clay loam
2C1 - 27 to 60 inches: silt loam
2C2 - 60 to 79 inches: silt loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 17 to 33 inches
Frequency of flooding: Rare
Frequency of ponding: Occasional
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 11.4 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: R106XY032NE - Subirrigated
Hydric soil rating: No

Minor Components

Eudora, rarely flooded

Percent of map unit: 10 percent
Landform: Flood plains

Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R106XY070NE - Loamy Terrace
Hydric soil rating: No

Bourbonais, rarely flooded
Percent of map unit: 5 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R106XY068NE - Loamy Floodplain
Hydric soil rating: No

Stonehouse, rarely flooded
Percent of map unit: 4 percent
Landform: Flood-plain steps
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R106XY069NE - Sandy Lowland
Hydric soil rating: No

Aquolls, occasionally ponded
Percent of map unit: 1 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R106XY032NE - Subirrigated
Hydric soil rating: Yes

9982—Fluvents, frequently flooded

Map Unit Setting
National map unit symbol: 20j07
Elevation: 730 to 1,700 feet
Mean annual precipitation: 31 to 47 inches
Mean annual air temperature: 52 to 55 degrees F
Frost-free period: 175 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition
Fluvents and similar soils: 99 percent
Minor components: 1 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fluvents

Setting
Landform: Flood plains

Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine-silty alluvium

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Depth to water table: About 33 to 38 inches
Frequency of flooding: Frequent
Frequency of ponding: None

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Ecological site: R106XY032NE - Subirrigated
Hydric soil rating: Unranked

Minor Components

Aquolls

Percent of map unit: 1 percent
Landform: Drainageways, depressions
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R106XY032NE - Subirrigated
Hydric soil rating: Yes

9999—Water

Map Unit Setting

National map unit symbol: 20j0f
Elevation: 600 to 1,300 feet
Mean annual precipitation: 24 to 31 inches
Mean annual air temperature: 50 to 54 degrees F
Frost-free period: 190 to 210 days
Farmland classification: Not prime farmland

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

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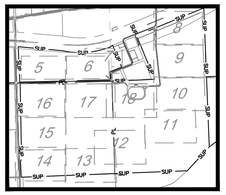
G:\16477\Civil 3D\Production Drawings\Special Use Permit\16477C0700.dwg Layout: 4 Overall Grading Plan -- Friday May 16, 2025, 3:10pm -- Copyright 2025, George Butler Associates, Inc.

CAUTION!

Numerous Utilities on Site. Contractor shall verify location and elevation of all utilities prior to commencing construction.



KEY MAP
Not to Scale

General Notes

1. Collapsible Plastic Fence will only be used where dredging activities take place and will expand as activity expands.
2. Septic tank system with minimum 5 day holding capacity and not less than 2,000 gallons is to be designed by an engineer. Septic tank requires floodplain permits and must be anchored to meet state guidelines. A contract with a Leavenworth County septic hauler to regularly pump the septic tank must be provided to Leavenworth County Planning & Zoning prior to use of the system.
3. Septic tank is to be designed in accordance with Leavenworth County Sanitary Code Chapter 2 Article 8.
4. There will be no pedestrian conveyance within the site.

Grading Legend

- 1010 — Proposed Contours
- 900 — Existing Contour Major
- 902 — Existing Contour Minor
- Existing Wetland (Non Jurisdictional)
- Existing Wetland (Jurisdictional)
- Limits of Flood Zone AE
- Limits of FEMA Regulatory Floodway
- Ex Location of (Non Jurisdictional Levee)
- Limits of Disturbed Area 328 Acres
- 26' Gravel Road
- 6' Collapsible Plastic Fence
- 8' Chain Link Fence with Lockable Gate
- SUP — SUP Permit Boundary
- Property Limits
- Drainage Flow Arrow

300' 0' 300' 600'
SCALE : 1 INCH = 300 FEET

GBA
9801 Renner Blvd., Ste. 300
Lenexa, KS 66219
913.492.0400
gbateam.com

LENAPE SAND OPERATION
Kaw Valley Companies, Inc.
166th St. & Lenape Rd.
Leavenworth County, Kansas

REVISION

PROJECT NUMBER
16477.00

DATE
10/11/2024

DESIGNED

DRAWN

REVIEWED

SHEET TITLE
Overall Grading Plan

SHEET NUMBER
4

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909019

Division of Taxation
120 SE 10th Avenue
PO Box 3506
Topeka KS 66625-3506
Mark A. Burghart, Secretary

Kansas
Department of Revenue

Phone: 785-368-8222
Fax: 785-296-2073
www.ksrevenue.gov
Laura Kelly, Governor

April 29, 2025

KAW VALLEY SAND & GRAVEL INC
5600 KANSAS AVE
KANSAS CITY, KS 66106-1147

Attached is your Kansas Retailers' Sales tax registration certificate. Refer to page 3 to see how to use your certificate. If you close or sell your business, please return this certificate along with a Discontinuation of Business form (CR-108), which can be found on our web site.

You are required by Kansas law to file returns electronically. To do so or make payments electronically, visit our web site at http://www.ksrevenue.gov/eservices.html.
See page 3 for more details.

KANSAS DEPARTMENT OF REVENUE **www.ksrevenue.gov**
Division of Taxation

RETAILERS' SALES TAX REGISTRATION CERTIFICATE

Kaw Valley Sand & Gravel Inc
5600 Kansas Ave
Kansas City, KS 66106-1147

Tax Account Number: 004-XXXXX1835F-01
Inception Date: 06/01/1984
Filing Frequency: Monthly

This Registration Certificate is valid until canceled and is not transferable.

SACERT

110123

P|Z LEAVENWORTH COUNTY

Planning & Zoning
300 Walnut St, Suite 212
Leavenworth, KS 66048
Ph 913-684-0465
PZ@Leavenworthcounty.gov

PROPERTY TAX VERIFICATION

DEV-_____

I/WE, Carolyn E. Knutson ~~Evan~~, as trustee owners of the following real property, Lenape Rd, acknowledge that I/we have read and understand the following statement:

> Any property owner wishing to apply for a Special Use Permit, Home Occupation License or to rezone their property must be current on property taxes for the property in question and have no delinquent tax payments in Leavenworth County.

Carolyn E. Knutson, Trustee
Owner – Trustee Carolyn Spring Trust

10/16/2025
Date

_____
Owner

_____
Date

Treasurer's Office Approval

Property Owner Name: Carolyn Spring Trust
Address of Property: Lenape Rd
PID: 1-20767
Property Taxes Paid In Full? ☒ Yes ☐ No

Tammy Tavano
Treasurer's Office Representative Name

Tammy Tavano
Signature

10-10-25
Date

P|Z LEAVENWORTH COUNTY

Planning & Zoning
300 Walnut St, Suite 212
Leavenworth, KS 66048
Ph 913-684-0465
PZ@Leavenworthcounty.gov

PROPERTY TAX VERIFICATION

DEV-25-021

I/WE, Kaw Valley Companies, INC., as owners of the following real property, 16201 Lenape Rd, acknowledge that I/we have read and understand the following statement:

> Any property owner wishing to apply for a Special Use Permit, Home Occupation License or to rezone their property must be current on property taxes for the property in question and have no delinquent tax payments in Leavenworth County.

Owner Vice President

Owner

10/16/2025

Date

Date

Treasurer's Office Approval

Property Owner Name: Kaw Valley Companies
Address of Property: Lenape Rd
PID: 1-20835
Property Taxes Paid In Full? ☒ Yes ☐ No

Tammy Tavano

Treasurer's Office Representative Name

Tammy Tavano

Signature

10.10.25

Date

P|Z LEAVENWORTH COUNTY

Planning & Zoning
300 Walnut St, Suite 212
Leavenworth, KS 66048
Ph 913-684-0465
PZ@Leavenworthcounty.gov

PROPERTY TAX VERIFICATION

DEV- 25-021

I/WE, Kaw Valley Companies, Inc., as owners of the following real property, Lenape Road, acknowledge that I/we have read and understand the following statement:

> Any property owner wishing to apply for a Special Use Permit, Home Occupation License or to rezone their property must be current on property taxes for the property in question and have no delinquent tax payments in Leavenworth County.

Owner VP

Owner

10/16/2025
Date

Date

Treasurer's Office Approval

Property Owner Name: Kaw Valley Companies
Address of Property: 16201 Lenape Rd
PID: 1-20776
Property Taxes Paid In Full? ☒ Yes ☐ No

Tammy Tavano
Treasurer's Office Representative Name

Tammy Tavano
Signature

10-10-25
Date

ROUSE FRETS WHITE GOSS GENTILE RHODES, P.C.

Aaron G. March
amarch@rousepc.com
816.502.4701

August 11, 2025

Ms. Amy Allison
Deputy Director
Planning & Zoning Department
Leavenworth County, Kansas
Public Works, Planning & Zoning
300 Walnut Street, Suite 212
Leavenworth, KS 66048

Re: SUP DEV-25-021 Kaw Valley Sand Operation Review Comments - Reply

Dear Ms. Allison:

We have received and reviewed the Planning and Zoning Department's comments dated March 27, updated April 16, 2025 and further updated July 30, 2025 and the comments from the Emergency Services Department dated July 31, 2025 ("Staff's Comments"), to the above referenced project. (We understand that some comments from the Department of Public Works may be forthcoming.) We have responded to the most recent Staff's Comments as set out in blue italics following each comment.

Planning Department Comments:

Narrative:

1. Please provide an updated narrative with the answers provided in the Letter dated April 8, 2025.
   Response: *An updated narrative containing all of the answers provided in Staff's letter dated April 8, 2025 was included with our resubmittal dated July 16, 2025. Another copy of the July 16, 2025 updated Narrative is attached for your convenience.*

Additional Information:

27. Notice of Intent Approval. Please provide the State approval of the required Notice of Intent as part of the SWPP process since more than one acres is being disturbed.
   Response: *GBA informs us that the SWPP application process is not typically commenced until after the approval of the SUP. Upon approval of the SUP, we will initiate the process to obtain the SWPP and the State Notice of Intent prior to commencement of construction.*

28. Notification and requirement for improvements to the Union Pacific crossing for the proposed route from Union Pacific.
Response: *We have been in contact with representatives of Union Pacific Railroad ("UPRR"). UPRR's initial review found the project potentially agreeable. On August 5, 2025, a representative of UPRR sent the following by email:*

Aaron,

I have reviewed your inquiry. This crossing is associated with the road authority, Leavenworth County. Please review your proposed use of the roadway with the road authority and have them submit an inquiry to propose any updates at the crossing. Per MUTCD, it is the roadway authority's responsibility to determine the traffic warning devices at the crossing and any agreement with UPRR involving the crossing would be required to be with the roadway authority or the state.

Thank you,

Ryan Wright
Senior Public Project Manager
Mobile: 479-222-5279

29. Part of the area being proposed for this development is located within a platted area. Staff will recommend a condition of approval be placed on the Special Use Permit that that section of plat must be vacated at the applicants expense.
Response: *We accept the condition of approval.*

30. Review of application by the local fire district. Staff has forwarded the application on to the fire district but has not received comments back. We will need confirmation that the fire district has reviewed the submittal. We recommend someone from Kaw Valley reach out to the First District to insure that they have reviewed the application and that all comments have been addressed.
Response: *We have contacted the fire district. Any comments that it has will be addressed.*

Emergency Services Comments dated July 31, 2025:

In response to the Emergency Services comments, we offer the following reply:

- A dredging operation should be responsible for returning the ground to the condition they found it in when they arrived which is stated in the application.
Response: *When operations are complete, rather than returning the ground to*

the original condition, we will be implementing the reclamation plan detailed in our SUP Application.

- Include a barricade be placed around the site to keep persons away from the area when not in operation.
  Response: *A movable, collapsable fence will surround the area of operation. The 6' collapsible fence is plastic. There will also be an 8' chain link fence limiting access to the more fixed operations. The locations and heights of each fence are included on the Site Plan legend (Sheet 3). Additional details on the chain link fence is shown on Sheet 23. An 8 ft. chain link fence with a lockable gate is proposed and is shown on Sheet 3. Specifications and details are set out on Sheet 23.*

- The company should provide an emergency action plan and a site plan to the local fire department and with the Emergency Management office.
  Response: *We agree and will provide.*

- The company needs to include contact persons after hours and emergency actions in the event of an accident such as a possible drowning or engulfment of material to a person.
  Response: *We agree and will provide.*

- Any Hazardous Material spill of any kind will need to be reported back to the Emergency Management Office for proper clean up and exposure to the ground water.
  Response: *We agree and will comply.*

- Heavy rain traffic is relevant in this area so caution needs to be warranted along 166th Street with drivers so signage might be a need.
  Response: *Based upon specific direction from Staff, we will provide additional signage if necessary.*

We look forward to reviewing these responses and any additional comments or questions staff may have. If you have any additional questions or concerns, please feel free to contact us.

Very truly yours,



Aaron G. March

AGM:jw
Attachment
cc: Mr. Evan Horowitz (via e-mail, evanh@kvco.net)
Mr. Brian Boyd (via e-mail, bboyd@gbateam.com)
Greg L. Musil, Esq. (via e-mail, gmusil@rousepc.com)

ROUSE FRETS WHITE GOSS GENTILE RHODES, P.C.

Aaron G. March
amarch@rousepc.com
816.502.4701

September 30, 2025

VIA ELECTRONIC MAIL (aallison@leavenworthcounty.gov)

Ms. Amy Allison
Deputy Director
Planning & Zoning Department
Leavenworth County, Kansas
Public Works, Planning & Zoning
300 Walnut Street, Suite 212
Leavenworth, KS 66048

Re: SUP DEV-25-021 Kaw Valley Sand Operation Review Comments - Reply

Dear Ms. Allison:

We have received and reviewed the Public Works comments dated August 14, 2025 ("Staff's Comments"), to the above referenced project. We have responded to the most recent Staff's Comments as set out in blue italics following each comment. Based upon conversations with Staff, a new report entitled Route Study Report, September 26, 2025 has been provided. The Route Study Report incorporates Appendices updates to the Pavement Evaluation Report, the Drainage Report and the Noise Study. Additionally, the Stormwater Drainage Study and the Site Plan have been updated as discussed below.

Planning Department Comments:

Site Plan:

1. Olsson Comment (4.17.25): Site plan review is attached. Applicant Response (7.16.25): See below responses to site plan markup comments.

   a. Olsson Comment (4.17.25): Application includes a 2nd site plan with the file name: 5 2024.10.11 16477 Lenape Sand Site Plan(1033788xA006D) - 4905-6033-0526.pdf. Is it the applicant's intention for both site plans in the application to be the same? This site plan has an additional sheet compared to the site plan named 5 2024.10.11..... Revise both so they are the same, if this is the intent

   Applicant Response (7.16.25): There is a single set of site plan documents (the "Site Plan"), included with this response. The Site Plan incorporates the comments from Staff.

   Olsson Response (8.12.25): Acknowledged.
   Response: No response

b. Olsson Comment (4.17.25): Site plan to be signed and sealed by a licensed professional according to Article 27 Section 4.

Applicant Response (7.16.25): The Site Plan is signed and sealed by Jacob Schweikert, a licensed professional engineer.

Olsson Response (8.12.25): Document is submitted with a date and no signature on the seal. Engineer to provide a signature over the seal
Response: Seal has been signed.

c. Olsson Comment (4.17.25): Provide a statement on the current zoning of the site. Provide labels and depict the zoning adjacent to the site.

Applicant Response (7.16.25): Project site and all adjacent properties are zoned I-3. Zoning labels have been added to Sheet 3.

Olsson Response (8.12.25): Sheet 3, missing adjacent property information and details. See attached site plan review.
Response: Adjacent property zoning labels have been added to the Site Plan.

d. Olsson Comment (4.17.25): Remove 'Draft' from sheet title.

Applicant Response (7.16.25): Draft has been removed from the title block.

Olsson Response (8.12.25): No further comment.
Response: No response

e. Olsson Comment (4.17.25): Provide actual legal description.

Applicant Response (7.16.25): A Boundary legal description has been added to Sheet 1.

Olsson Response (8.12.25): No further comment.
Response: No response

f. Olsson Comment (4.17.25): Revise sheet index.

Applicant Response (7.16.25): Sheet index has been revised.

Olsson Response (8.12.25): No further comment
Response: No response

g. Olsson Comment (4.17.25): Confirm site is within the City of De Soto, KS sewer district. If different, revise.

Applicant Response (7.16.25): We have confirmed that the site is within City of DeSoto, Kansas sewer district.

Olsson Response (8.12.25): Add sewer utility contact information to the cover sheet, if applicable.
Response: Site is not within any sewer district per Leavenworth County GIS utility map.

h. Olsson Comment (4.17.25): Confirm site is within the City of De Soto, KS water district. If different, revise.

Applicant Response (7.16.25): We have confirmed that the site is within City of DeSoto, Kansas water district.

Olsson Response (8.12.25): Add water utility contact information to the cover sheet, if applicable.
Response: Site is not within any water district per Leavenworth County GIS utility map.

i. Olsson Comment (4.17.25): Remove signature block.

Applicant Response (7.16.25): The city engineer signature block has been removed. The project engineer signature block has remained.

Olsson Response (8.12.25): No further comment.
Response: No response

j. Olsson Comment (4.17.25): Provide a statement, septic system to be permitted through a separate application.

Response (7.16.25): General Notes regarding the permitting of the septic system have been added to sheet 3. Specifically, Notes 2 and 3. Note 2. Septic tank system with minimum 5 day holding capacity and not less than 2,000 gallons will be designed by a licensed engineer. Septic tank requires Floodplain permits and will be obtained for the septic tank prior to construction. The septic tank will be anchored to meet state guidelines. A contract with a Leavenworth County septic hauler to regularly pump the septic tank will be obtained and provided to Leavenworth County Planning & Zoning prior to use of the system. Note 3. Septic tank is to be designed in accordance with Leavenworth County Sanitary Code Chapter 2 Article 8.

Olsson Response (8.12.25): In the General Notes, provide a statement regarding the septic system to be permitted through a separate application.
Response: A general note has been added to sheet 3.

k. Olsson Comment (4.17.25): Provide turning templates for within the site depicting traffic circulations for truck traffic.

Applicant Response (7.16.25): Sheet 22, Truck Turning Circulation, is included with the Site Plan.

Olsson Response (8.12.25): No further comment.
Response: No response

l. Olsson Comment (4.17.25): Per Article 27 Section 5, storm drainage must provide for attaining a zero-net gain in storm water runoff between the tract in its natural state and the proposed developed state. Provide a storm drainage report signed and sealed by a Kansas licensed professional engineer.

Applicant Response (7.16.25): A storm drainage report is included with the application and this resubmittal. "At no point before, during, or after excavation operations will stormwater runoff patterns be altered to cause additional discharge to neighboring properties."

(Stormwater Drainage Study, p.2., p.3.) See also Sheet 4 – Grading Plan.

Olsson Response (8.12.25): Stormwater drainage study review:

Revise report to include the requirements from the County's Minimum Storm Water Report Requirements.

Report states no changes in drainage patterns causing additional discharge to neighboring properties. Revise grading plan in this document to demonstrate drainage patterns will not be impacted.

Provide a conclusion and recommendations section in the report.

Document is submitted with a date and no signature on the seal. Engineer to provide a signature over the seal.
Response: Storm Drainage Report has been revised as requested.

m. Olsson Comment (4.17.25): Depict and label flood zones within the site.

Applicant Response (7.16.25): The FEMA regulatory floodway and the flood zone AE are depicted and labeled on the Site Plan.

Olsson Response (8.12.25): No further comment.
Response: No response

n. Olsson Comment (4.17.25): Revise legend to indicate what is existing vs proposed.

Applicant Response (7.16.25): The legend is revised and indicates existing and proposed.

Olsson Response (8.12.25): See attached site plan review.
Response: Site plan comment responses are set out below.

o. Olsson Comment (4.17.25): Label sand & aggregate stockpile
Applicant Response (7.16.25): The sand and aggregate stockpiles are labeled on the Site Plan included with this resubmittal.

Olsson Response (8.12.25): No further comment.
Response: No response

p. Olsson Comment (4.17.25): Coordinate with jurisdiction over the existing levee to obtain an approval for the site plan. Provide documentation of approval. Provide actual location of the existing levee instead of approximate.

Applicant Response (7.16.25): There is no jurisdictional levee on the property. The location of the private levees is shown on the Site Plan.

Olsson Response (8.12.25): No further comment.
Response: No response

q. Olsson Comment (4.17.25): Label line at SE corner of property.

Applicant Response (7.16.25): The extra line on the SE corner of the property has been removed.

Olsson Response (8.12.25): No further comment.
Response: No response

r. Olsson Comment (4.17.25): Remove “Draft” (typ)

Applicant Response (7.16.25): The word “Draft” has been removed from the

border.

Olsson Response (8.12.25): No further comment.
Response: No response

s. Olsson Comment (4.17.25): Provide detail of the enclosure for the trash dumpster according Article 27.

Applicant Response (7.16.25): Sheet 23, Construction Details, includes trash dumpster detail.

Olsson Response (8.12.25): No further comment.
Response: No response

t. Olsson Comment (4.17.25): Are the proposed parking stalls open for public use? Public use requires ADA accommodations.

Applicant Response (7.16.25): Parking stalls are not open for public use.

Olsson Response (8.12.25): No further comment.
Response: No response

u. Olsson Comment (4.17.25): Provide existing contour lines with labels.

Applicant Response (7.16.25): Existing contour lines with labels are provided on the Site Plan.

Olsson Response (8.12.25): See attached site plan review.
Response: Site plan comment responses are set out below.

v. Olsson Comment (4.17.25): Grading shall have sheets 1"=50' or more detailed.

Applicant Response (7.16.25): Sheets 5 through 18 depict grading at 1”=50’.

Olsson Response (8.12.25): No further comment.
Response: No response

w. Olsson Comment (4.17.25): Grading plan to provide additional information including offsite areas draining onto the site and how runoff effects adjacent areas.

Applicant Response (7.16.25): No offsite areas drain on to the site. All onsite areas will drain to the dredging area.

Olsson Response (8.12.25): See attached site plan review.
Response: Site plan comment responses are set out below.

x. Olsson Comment (4.17.25): How is water being supplied to the site?

operations. Potable water will be privately supplied by the applicant.

Olsson Response (8.12.25): Provide a note in the site plan from the response that non potable water will be supplied internal to the site via operations. Potable water will be privately supplied by the applicant.
Response: Note has been added to the Site Plan as requested.

y. Olsson Comment (4.17.25): For proposed structures indicate the number of stories (height), gross floor area and label entrances to the structure.

Applicant Response (7.16.25): Structure heights, gross floor area, and entrances for each structure are noted on Sheet 3 of the Site Plan.

Olsson Response (8.12.25): Provide gross floor area for each structure.
Response: Gross floor area for each structure has been added to the Site Plan as requested.

z. Olsson Comment (4.17.25): Label and depict the location and dimension of existing and proposed access points to County roads.

Applicant Response (7.16.25): Existing County roads have been labeled and dimensioned. Access points to County roads are labeled.

Olsson Response (8.12.25): See attached site plan review.
Response: Site Plan comment responses are set out below.

aa. Olsson Comment (4.17.25): Depict the route from the NW dredging area to the primary/alternate route to the site.

Applicant Response (7.16.25): Sand from the NW dredging area will not be loaded for transport from the NW dredging area. The NW dredging area will utilize underground piping to send material under Lenape Road where it will be processed and loaded. Only Kaw Valley operation vehicles will access the NW dredging area for ongoing operations. The access points for the NW dredging area are shown and labeled on Sheet 3 of the Site Plan.

Olsson Response (8.12.25): See traffic study review for comments on proposed

access along Lenape Road and Green Street. Depict underground pipe within the right-of-way. Provide details of pipe material, construction detail, and encasement pipe.
Response: Location of the pipe has been shown on the Site Plan. Construction detail will be provided at time of right-of-way permit application as noted on the Site Plan.

bb. Olsson Comment (4.17.25): Provide the height and materials of the fences.

Applicant Response (7.16.25): The 6' collapsible fence is plastic. The chain link fence is 8'. The locations and heights of each fence are included on the Site Plan legend (Sheet 3). Additional details on the chain link fence is shown on Sheet 23.

Olsson Response (8.12.25): No further comment.
Response: No response

cc. Olsson Comment (4.17.25): Will there be pedestrian conveyance within the site? Site plan to provide for the safe movement of pedestrians within the site.

Applicant Response (7.16.25): There will be no pedestrian conveyance within the site.

Olsson Response (8.12.25): No further comment.
Response: No response

dd. Olsson Comment (4.17.25): Describe the proposed use of the site and list the number of required off-street parking spaces.

Applicant Response (7.16.25): The proposed use of the site is set out in the Site Plan, specifically Sheet 3 states that Kaw Valley Companies, Inc. ("Kaw Valley") requests approval of a Special Use Permit to utilize the approximately 435-acre site located at 166th and Lenape Road in rural Leavenworth County, Kansas (the "Property") for a sand excavation and stockpiling operation (the "Sand Operation"). The proposed use does not require off-street parking. There will be five (5) regular full-time employees, 2-3 employees per shift.

Olsson Response (8.12.25): No further comment.
Response: No response

ee. Olsson Comment (4.17.25): Will there be a site entrance sign proposed for the facility?

Applicant Response (7.16.25): No signage is proposed for the facility.

Olsson Response (8.12.25): Provide a note in the site plan from the response that no site entrance sign is proposed.
Response: Note has been added to the Site Plan as requested.

ff. Olsson Comment (4.17.25): Site plan indicates the existing levee will be modified. Coordinate with jurisdiction over the existing levee to obtain an approval for the site plan near the levee and modification of the levee. Provide documentation of approval.

Applicant Response (7.16.25): The existing non-jurisdictional, private levee, will not be modified.

Olsson Response (8.12.25): No further comment.
Response: No response

gg. Olsson Comment (4.17.25): Erosion Control Plan doesn't depict any erosion control devices. Title of the sheet indicates this sheet is Phase 1. Is there other phases? Applicant to revise and complete the erosion control plan. Is erosion control sheet for initial construction of the site?

Applicant Response (7.16.25): Phase 1 terminology has been removed. Erosion control notes have been added to the Erosion Control Plan (Sheet 19).

Olsson Response (8.12.25): Erosion Control Plan is not a required document for the site plan application. Erosion Control Plan and SWPP not reviewed. Applicant to provide the County a copy of the permit authorization (NOI) from KDHE for County records prior to disturbance.
Response: Acknowledged

hh. Olsson Comment (4.17.25): Confirm collector street is used in the site plan.

Applicant Response (7.16.25): The collector road section has been removed from plans.

Olsson Response (8.12.25): No further comment.
Response: No response

ii. Olsson Comment (4.17.25): Confirm and label this driveway is limited to within the site.

Applicant Response (7.16.25): The driveway sections on Sheet 2 will only be used within the SUP boundary. General Note 1 for each driveway section

indicates the "driveway is limited within site boundary."

Olsson Response (8.12.25): No further comment.
Response: No response

jj. Olsson Comment (4.17.25): What type of gravel fill and rock size is being proposed?

Applicant Response (7.16.25): 8" minimum aggregate per county standards will be used on the driveways.

Olsson Response (8.12.25): No further comment.
Response: No response

kk. Olsson Comment (4.17.25): Is sheet 8 a duplicate of sheet 5? If so, remove.

Applicant Response (7.16.25): The index of sheets has been revised and duplicate sheets removed.

Olsson Response (8.12.25): No further comment.
Response: No response

Site Plan Revisions and Updates:

1. Cover Sheet – Sheet 1
   a. Provide signature to seal.
      Response: Seal has been signed.
   b. Add Water and Sewer Utility Contact Info
      Response: Site is not within any water or sewer district per Leavenworth County GIS utility map.
2. Typical Sections – Sheet 2
   a. Revise labels to include "Private Drive"
      Response: Note has been revised.
3. Site Plan – Sheet 3
   a. Provide a statement regarding the septic system to be permitted through a separate application
      Response: Note has been added.

b. Depict underground pipe within the right-of-way. Provide details of pipe material, construction detail, and encasement pipe.
Response: Location of pipe has been shown on the Site Plan. Construction detail will be provided at time of right-of-way permit application as noted on the Site Plan.

c. Provide statements regarding water being supplied per the response letter dated July 16th, 2025.
Response: Note has been added.

d. Provide statement regarding no site entrance sign is being proposed for the facility.
Response: Note has been added.

e. Per GIS, this is in the city of Desoto. Confirm city of Desoto limits. If DeSoto's limits exist, depict and label said limits. Provide zoning of property. Revise throughout the document.
Response: City limits have been added and labeled on all applicable sheets.

f. Label ownership of tract and zoning. Revise throughout the document.
Response: Label has been added throughout the document.

g. Lenape Road is a local roadway. The minimum distance from an intersection to a driveway per the access management policy is 100 ft from the intersection.
Response: We acknowledge the reference to the access management policy requiring a minimum 100 feet separation between intersections and driveways. In this case, the Kaw Valley site driveway does not fall within 100 feet of any true intersection. The roadway feature in question is a horizontal bend where Lenape Road transitions and ties into the access road. This bend does not create a defined intersection condition per the access management policy. Therefore, the site driveway connection is compliant with the policy intent, as it does not conflict with an intersecting roadway approach.

h. Label as proposed access.
Response: Label has been added.

i. Text masks existing roadway.
Response: Text has been relocated.

j. Green Road is a local roadway. The minimum distance from an intersection to a driveway per the access management policy is 100 ft from the intersection.
Response: We acknowledge the reference to the access management policy requiring a minimum 100 feet separation between intersections and driveways.

In this case, the Kaw Valley site driveway does not fall within 100 feet of any true intersection. The roadway feature in question is a horizontal bend where Lenape Road transitions and ties into the access road. This bend does not create a defined intersection condition per the access management policy. Therefore, the site driveway connection is compliant with the policy intent, as it does not conflict with an intersecting roadway approach.

k. Site plan indicates new entrance is within the rail company right-of-way. Applicant to provide coordination and approval documentation from the rail company regarding the new entrance.
Response: Coordination with the railroad company will be undertaken as part of the design review and permitting phase associated with the final design and construction documents. This process is consistent with typical practice for any proposed improvements that extend into non-jurisdictional rights-of-way, including railroad property. Documentation of coordination and approvals from the rail company will be provided at the appropriate stage of design and permitting. Furthermore, the railroad has indicated that the request for review and approval must come from the County. Copies of our correspondence with the railroad and contact information has previously been provided to Staff.

l. Apply R/W line type to the plan views within the plan set.
Response: Right-of-way linetype has been added to plan views. Portions of SUP boundary (denoted by SUP linetype) which run along public roads are also right-of-way lines.

m. Water Line, proposed or existing.
Response: Note has been updated.

n. Plan view indicates SUP linetype overlays the property limits. Revise to depict the SUP permit Boundary and all property limits.
Response: SUP linetype legend has been revised to include property limits designation.

o. Provide gross floor area of the structures.
Response: Scale House gross floor area added.

4. Overall Grading Plan – Sheet 4

a. Provide additional existing contour labels.
Response: Additional contour labels added.

b. Depict pipe that will convey material from the NW dredging area.
Response: Pipe has been depicted.

c. Does this area drain per existing drainage patterns.
Response: Yes, generally south to north.

d. Provide statement regarding the septic system to be permitted through a separate application.
Response: Note has been added.

5. Grading Plan – Sheet 5

a. Proposed grading doesn't tie out to existing contours in the site plan. Tie out grading and update. Provide additional information depicting off-site areas draining onto the site and how runoff effects adjacent areas. Confirm drainage patterns are to remain adjacent properties. (typ).
Response: Proposed grading has been revised to properly tie out. Additional flow arrows have been added to demonstrate flow patterns external to the disturbed area. No additional runoff will be directed towards adjacent properties compared to existing conditions. Site is nearly completely bordered by berms, roadways, and railroad tracks which further demonstrate adjacent properties will not be affected.

b. Provide existing and proposed drainage arrows to and from the site. (typ)
Response: Additional flow arrows have been added. Site and surrounding areas are nearly flat. Little to no stormwater runoff will flow to and from site.

c. Grading in the public roadway?
Response: No grading within public right of way is proposed, sheets have been updated.

d. Match-line doesn't coordinate. Example Sheet 5 and 16. Revise throughout set.
Response: These are intended to be enlargements instead of match lines, terminology has been updated throughout set.

e. Existing contours do not tie into the proposed grading (typ).
Response: Contours have been updated.

6. Grading Plan – Sheet 6

a. Existing contour label.
Response: Additional labels have been added.

b. Grading in the public roadway?

Response: No grading within public right of way is proposed, sheets have been updated.

c. Proposed contour label? Tie out.
Response: Contour has been removed.

7. Grading Plan – Sheet 7
   a. Doesn't tie out.
   Response: Contours have been revised.

   b. Does this area drain? Provide additional information on how area drains.
   Response: Areas external to disturbed areas will drain as they do in existing conditions. Additional flow arrows have been added.

8. Grading Plan – Sheet 8

   a. Will a culvert pipe be needed to convey existing drainage?
   Response: Culvert has been depicted.

   b. Provide existing contour labels.
   Response: Additional labels have been added.

   c. Does this area drain per existing drainage patterns. Provide additional information on how area drains.
   Response: Areas external to disturbed areas will drain as they do in existing conditions. Additional flow arrows have been added.

9. Grading Plan – Sheet 9

   a. Does this area drain per existing drainage patterns. Provide additional information on how area drains.
   Response: Areas external to disturbed areas will drain as they do in existing conditions. Additional flow arrows have been added.

10. Grading Plan – Sheet 13

    a. Does this area drain per existing drainage patterns. Provide additional information on how area drains.
    Response: Areas external to disturbed areas will drain as they do in existing conditions. Additional flow arrows have been added.

    b. Existing contours do not tie into the proposed grading (typ).
    Response: Contours have been revised.

11. Grading Plan – Sheet 16

    a. Grading in the public roadway?
    Response: No grading within public right of way is proposed, sheets have been updated.

12. Grading Plan – Sheet 17

    a. Existing contour label.
    Response: Additional labels have been added.

13. Grading Plan – Sheet 18

    a. Proposed contour label?
    Response: Contours have been removed.

    b. Does this area drain? Provide additional information on how area drains.
    Response: Additional flow arrow has been added.

14. Erosion Control Plan – Sheet 19

    a. Erosion control plans are not required for the site plan application. Erosion control plan and SWPPP not reviewed. Applicant to provide the County with a copy of the permit authorization (NOI) from KDHE for County records prior to disturbance.
    Response: Acknowledged.

Traffic Study, Drainage Structures Report, and Pavement Evaluation Report: Olsson Comment (4.17.25): Traffic study, drainage structures report, and pavement evaluation report documents are incomplete and have inconsistencies between documents throughout the application. Initial comments are included below and should be addressed before an inclusive review can be completed. Once revised documents are submitted, review of the application documents will resume.

1. Olsson Comment (4.17.25): Page 31 of the Traffic Study states: This geometry has been compared to the required minimum criteria found in Chapter IV of the Leavenworth County Department of Public Works Road Construction and Strom Water Drainage Standards, dated January 1, 2003, as shown in Table 9. Page 34 states: The existing roadway geometry of both the Primary and Alternate Routes do not match the Collector Street Typical Section adopted in Chapter V of the Chater IV of the Leavenworth County Department of Public Works Road Construction and Storm Water Drainage Standards.

In accordance Leavenworth County Public Works Department, the Leavenworth County Department of Public Works Road Construction and Storm Water Drainage Standards for new subdivisions, dated January 1, 2003, are not applicable to the proposed routes within the County's jurisdiction. Furthermore, the County does not have an adopted roadway standard for roadways within said proposed routes.

For routes within Leavenworth County, the applicant shall develop a typical roadway section in accordance AASHTO and the Roadside Design Guide criteria for the purposes of assessing the existing roadways within said routes. The assessment shall identify necessary improvements to said routes to meet the referenced criteria, provide function for the SUP operations, and provide a safe corridor to the general welfare of the traveling public. The typical section should include lane and shoulder widths, shoulder material type, pavement width and thickness, pavement slope, roadway foreslope and backslopes, and ditch widths. The assessment shall be based on the existing posted speed limits, geotechnical information, pavement evaluation report, 25 year pavement design life, volume of traffic per day including size and types of trucks, growth factors, and include the SUP's proposed traffic generation. Said assessment shall also include, but not be limited to, the review of vertical and horizontal curves, traveled way widening on horizontal curves, stopping sight distance, truck turning movements at intersections, superelevation, right of way impacts, edge drop off, pavement markings, signage, and impacts to physical features along the routes (i.e. driveways, guardrail, culverts, and other physical features found).

A route study shall be generated to be included with the above assessment. The updated traffic study, drainage structures report, and pavement evaluation report shall be included in the route study. Said study shall be signed and sealed by a Kansas Professional Engineer.

Applicant Response (7.16.25): A revised typical roadway section (Figure 17, PDF Page 33, Appendix F, Pages 277-281) has been developed using AASHTO Green Book and Roadside Design Guide criteria. The Route Study assesses improvements for safe and functional operation and is signed/sealed by a Kansas Professional Engineer.

Olsson Response (8.12.25): A route study has not been provided; the route study should consolidate and present recommendations from the traffic, drainage structures and pavement evaluation reports. The traffic impact study states that there are several existing deficiencies identified but that improvements are not triggered by the proposed development. Of the existing conditions noted, the impact of truck traffic associated with the development is not presented. For example, the previous study presented potential benefits of shoulder or guardrail, but that text has been removed from the report. The study does not present if the existing road width and curvature is adequate to support the planned truck traffic (ie – trucks over tracking the lane on curves).
Response: A Route Study Report which consolidates the findings from the updated

Traffic, Drainage Structure, and Pavement Evaluation reports is being provided.

2. Olsson Comment (4.17.25): Page 30 of the Traffic Study states: Notably, there is a railroad crossing just north of the 161st Street and Railroad Road intersection, but evaluation of the crossing and coordination with the railroad or KDOT was not considered in this study. While not considered as part of this study, the crossing has signage warning vehicles about low ground clearance. As the 161st Street crossing is to serve as primary access to the sand operation, it is recommended that the railway crossing be evaluated to reduce grades and improve safety. Page 77 Summary of Proposed Conditions: Evaluate the 161st Street railroad crossing for necessary improvements to increase clearance based on operation vehicles.

   Evaluate railway crossing as recommended in the traffic study. Queueing should be reviewed to determine if there is potential to back and block adjacent intersections/railroad. Include documentation of coordination with the rail company.

   Applicant Response (7.16.25): Evaluation for safety, clearance, and queuing is completed and included in the revised study with documentation of outreach. No additional evaluation of the crossing is needed.

   "Notably, there is a railroad crossing just north of the 161st Street and Railroad Road intersection. Based on conversations with the owner of the quarry, it was determined that quarry vehicles would have adequate clearance for the crossing, and therefore, a detailed evaluation of the crossing was not completed as part of this study. Vehicles have adequate clearance or may self-lift to clear the crossing. Additionally, given the low volume of vehicles on 161st Street, it is expected that queuing will not block adjacent intersections during crossing events." (Traffic Study, PDF Page 32. Existing Route Geometric Analysis.)

   Olsson Response (8.12.25): A review of the rail crossing was not conducted; the traffic impact study references a conversation with a quarry owner who states the crossing is adequate. The recommendation for crossing improvements was removed from the resubmittal. Due to the primary vehicle type associated with the project being heavy trucks, coordination with the rail company and/or KDOT to be conducted to ensure the current crossing is acceptable for truck use. Provide coordination and approval documentation from the rail company and/or KDOT as part of the application.

   Additionally, information is not presented regarding the number of trains per day, length of typical crossing train, etc. The study states that queuing is not expected to be an operational or safety concern, which may be acceptable for the segment of 161st Street north of the rail crossing. Access to the site is planned south of the rail line; dependent upon departure rates of traffic from the site, queuing could extend along Railroad Road/Green Street or internal to the site.

Site plan: A gate is noted on the site plan (lockable). It appears the gate is approximately 60 feet south of Railroad Road/Green Street. How will the gate be operated? If the gate is closed/locked could the situation arise where trucks would be queued waiting for access, which could approach/pass the rail line?

Site plan: Site plan indicates new entrance is within the rail company right-of-way. Applicant to provide coordination and approval documentation from the rail company regarding new entrance
Response: The railroad has indicated that the request for review and approval must come from the County. Copies of our correspondence with the railroad and contact information has previously been provided to Staff.

3. Olsson Comment (4.17.25): The traffic study is labeled draft. The traffic study shall be signed and sealed by a Kansas Professional Engineer.

   Applicant Response (7.16.25): The traffic study is "final" and is signed and sealed by Kendra Miller, a Kansas Professional Engineer.

   Olsson Response (8.12.25): No further comment.
   Response: Acknowledged

4. Olsson Comment (4.17.25): Traffic trips are inconsistent throughout the application documents. Revise documents to be consistent.

   Example: The SUP Application indicates a maximum of 120 round trips for truck versus the 220 trucks (110 round trips) listed in the report. The narrative write-up indicates 120 round trips, which would represent 240 total trips.

   Applicant Response (7.16.25): Trips have been revised to 240 daily trips throughout the study document.

   Olsson Response (8.12.25): See original comment.

   The traffic study presents 250 total trips (240 haul route/trucks, 10 operations).

   SUP application matches operations trips but daily trips are 10-120. Referencing the TIS the daily trips for trucks should be 240.

   The narrative document presents a range of trips for trucks but does not present operations trips. Trips presented should match the study and application – for example: 10 total operations trips and 240 total truck trips.

The 'Applicant's Response to Staff Comments' - #6 – The response indicates that many drivers will be employees of the applicant traveling to 9501 Woodend, but that "many other drivers" will be taking product elsewhere. Are the "many other drivers" in addition to the trips to/from the processing facility that are employees of the applicant? The narrative indicates that traffic volumes are based on applicant historical volumes, confirm that the historical volumes include all trips (applicant employees and other drivers).
Response: Non-applicant trips are included in the 240 total trips. The Narrative has been clarified to reflect that the average expected number of round trips from operations will be approximately 50 round trips per day. In an abundance of caution and to be overly conservative, the Route Study assumed 120 round trips, 120 in and 120 out, would be generated. The total trips includes all trips, both Applicant and non-applicant trips.

5. Olsson Comment (4.17.25): For the primary and alternate routes, depict and describe the Leavenworth County and KDOT jurisdiction limits within the application documents. Leavenworth County's review is limited to Leavenworth County jurisdiction only. Applicant shall acquire all appropriate approvals from KDOT for any intersection or roadway within KDOT jurisdiction

   Applicant Response (7.16.25): A map with jurisdictional limits has been created and included in the study. Improvements within KDOT right-of-way will be coordinated with KDOT directly. (Figure 3, PDF Page 9.)

   Olsson Response (8.12.25): Applicant to provide coordination and approval documentation in the application from KDOT for any intersection or roadway within Leavenworth County jurisdiction.
   Response: GBA has initiated coordination with the KDOT Metro Engineer (Bonner Springs), Ryan Barrett, and will provide KDOT with a copy of the Route Study Report for their review and input. Until a time when design plans are provided to KDOT for concurrence regarding recommendations at K-32 intersections, their engagement will be informational only. Formal buy-in would occur during the design phase, as KDOT does not typically approve of proposed improvements without design plans.

6. Olsson Comment (4.17.25): Confirm all trucks will haul from the site to the Kaw Valley Companies processing facility at 9501 Woodend Road in Edwardsville, Kansas. Will there be onsite sales causing destinations different than the processing facility? What practice will be used to ensure all drivers take the Primary vs Alternative vs Other routing between the two facilities?

   Applicant Response (7.16.25): While many drivers will be employees of the Application and haul from the site to 9501 Woodend in Edwardsville, KS, many other drivers will be taking product to locations throughout the metro area. All drivers when stopped at the weigh station will be given printed directions and instructed to use the primary route as they prepare to leave the site.

Olsson Response (8.12.25): How will drivers that are not employees of the applicant know which route to use? The study only presents trips between 9501 Woodend and the site, are additional trips along other routes expected? Confirm that the trip distribution and expected operations presented in the traffic impact study reflect expected vehicular routing.
Response: Non-Employee traffic, i.e., traffic not going to 9501 Woodend is included within the provided studies.

7. Olsson Comment (4.17.25): Revise drainage structures report to include the assessment of structures along the alternate route, 161st Street along the primary route, and structures along the route from the northwest dredging to the proposed routes.

Applicant Response (7.16.25): The report has been updated to include all drainage structures along the primary, alternate, and northwest dredging area routes. The limits of the drainage structures study area includes:

- 189th St/Golden Rd from K-32/Linwood Rd to 158th/161st
- 158th St from Golden Rd to Loring Rd
- Loring Rd from 158th St to 142nd St (County Line)
- 166th St from Golden Rd to Lenape Rd
- Lenape Rd/Desoto Rd/Amnesty Rd/161st St from 166th St to Golden Rd

The report assessed 20 additional structures, beginning with culvert ID 12 (page 65 of the report) and ending with Culvert ID 31.

Olsson Response (8.12.25): See attached drainage structure review.
Response: An updated Drainage Structures Report dated 9/26/2025 is being submitted. Revised maintenance recommendations in this updated study are based on Olsson's comments. A disclaimer has been added to the title page that this report evaluated conditions through a visual inspection only. Structural capacity was not evaluated and would be assessed during the design phase to determine if, and which, structures may need replacement or other modifications to meet current criteria.

8. Olsson Comment (4.17.25): Revise pavement assessment to include 161st Street as it is part of the primary route and the route to the northwest dredging area proposed.

Applicant Response (7.16.25): The pavement assessment has been revised to include 161st Street and related access segments.

Olsson Response (8.12.25): See review of the Pavement Evaluation Report.
Response: Revised report includes clarification of the analysis and recommendations for

161st street.

9. Olsson Comment (4.17.25): The traffic impact study provides a narrative of crashes, provide a figure depicting the crash locations on a map along with additional narrative from crash reports. The appendix should include additional information for crashes, specifically including the crash year, type, location, and level of severity

Applicant Response (7.16.25): The crash map is unchanged from the previous submittal. Crash year, type, location, severity, and other relevant information is now provided in a new appendix (Appendix C, page 219).

Olsson Response (8.12.25): Adequate information is not provided in the report or on the figure to determine conditions surrounding reported crashes. Specifically, are there any existing conditions or crash trends that should be further considered with the use of the route as a haul road with heavy trucks? The report presents that some crashes are related to navigating the curve from Golden Road to 189th Street. Further evaluation should be presented to determine if trucks can navigate this curve while maintaining the lane. Crash occurrences at the intersection of Golden Road and 166th Street are also noted; will the increase of truck traffic increase crash potential? Are there improvements recommended to address the conditions with the proposed increase of truck traffic?
Response: The design team has reviewed the SS4A study for crashes and has provided additional narrative as part of the Route Study Report.

10. Olsson Comment (4.17.25): Page 26 of the traffic study narrative describes that the intersection of 161st Street with Golden Road / 158th Street is at a skew, and it is preferrable to have the intersection reconfigured. Is this a recommendation? If so, provide sketch and sight distance review of proposed reconfiguration geometry.

Applicant Response (7.16.25): Reconfiguration of the intersection is not recommended. Narrative has been removed from study. (PDF Page 28).

Olsson Response (8.12.25): What is the justification for removing the recommendation? Did conditions change?
Response: It was originally a consideration not a formal recommendation and was not a recommendation in the SS4A study. Given the lack of crash history at the intersections, skew correction is not required to meet current design criteria unless reconstruction is recommended, and then implementation of that modification should be considered.

11. Olsson Comment (4.17.25): Page 27 of the traffic study notes that the sight distance for K-32 & Golden Road / 158th Street is 1,004 in the appendix and 1,099 in the report, confirm 1,099 is the correct value.

Applicant Response (7.16.25): The reference to K-32 & Golden Road / 189th Street and

the appendix value has been updated to 1,099 (PDF Page 234).

Olsson Response (8.12.25): No further comment.
Response: Acknowledged

12. Olsson Comment (4.17.25): Page 28 of the traffic study does not show improvements at 158th Street and Loring Road, page 310 of the appendix indicates additional pavement at the intersection, a northbound deceleration taper along 158th Street is shown. Is this a recommendation?

Applicant Response (7.16.25): Existing conditions (PDF Page 30 of revised Traffic Study) do not warrant any additional improvements. Ultimate development does warrant improvement and is recommended in both proposed conditions and recommendations sections. (PDF Pages 64 & 80).

Olsson Response (8.12.25): A northbound right-turn taper is recommended. The study should provide detail on length of taper.
Response: The length of the taper has been provided in the Route Study Report; however, the layout of the recommendation will be provided as part of any proposed design improvements.

13. Olsson Comment (4.17.25): Page 28 of the traffic study presents sight distance for the intersection of Loring Road / Loring Lane & 142nd Street pertaining to the northbound right-turns and southbound left-turns. Images in appendix appear to be for 142nd Street, not the intersection of Loring Road / Loring Lane. Was sight distance reviewed for the approach of Loring Road to Loring Lane?

Applicant Response (7.16.25): Existing conditions (PDF Page 30 of revised Traffic Study) do not warrant any additional improvements. Ultimate development does warrant improvement and is recommended in both proposed conditions and recommendations sections. (PDF Pages 64 & 80).

Page 30 now includes:

“Loring Road & Loring Lane is a minor-road stop-controlled intersection, with the north-south portion of Loring Road serving as the major roadway. Eastbound Loring Road serves as the stop- controlled minor roadway.

Sight distance at the Loring Road & Loring Lane intersection was reviewed to meet the minimum requirements as outlined in the AASHTO Green Book. Based on calculations for tractor-trailer trucks, a minimum of 761 ft. of sight distance is required to the north, and a minimum of 592 ft. is required to the south for stop-controlled vehicles on eastbound Loring Road. For both right-turns and left-turns, sight distance requirements

were met. Full sight distance calculations and photos may be seen in Appendix D.

At the intersection, sand operation trucks utilizing the Alternate Route headed to and from the facility will complete eastbound left-turn and southbound right-turn movements. Additional pavement is not required to accommodate truck turning movements for either existing or proposed geometries at the intersection. Full turning envelopes for the intersection may be seen in Appendix E. The Primary Route does not utilize the intersection."

Olsson Response (8.12.25): The traffic impact study recommends clearing of vegetation within right-of-way. No further comment.
Response: Acknowledged.

14. Olsson Comment (4.17.25): Page 63 of the traffic study describes capacity analysis, reviewing appendix results a single heavy vehicle percentage factor was applied to all movements. Provide justification for the application of the heavy vehicle percentage adjustment used universally or adjust for calculations based on a per-movement basis.

Applicant Response (7.16.25): Heavy vehicle percentages were adjusted to match per-movement values from collected traffic counts in existing operational scenarios, or calculated for all proposed operational scenarios.

Olsson Response (8.12.25): No further comment.
Response: Acknowledged.

15. Olsson Comment (4.17.25): The site plan depicts an access along Lenape Road, confirm/describe how this drive interacts with the proposed site and how vehicles will be limited/restricted from using Lenape Road to 166th Street.

Applicant Response (7.16.25): The accesses along Lenape Road will be limited to service vehicles. No hauling will be permitted on Lenape Road. Written instructions will be given to drivers to exit North to Golden Rd. The existing turning geometrics do not allow for left turns out of our site onto Lenape Rd.

Olsson Response (8.12.25): See comment 28 under this section for comments regarding the drive location.
Response: We acknowledge the reference to the access management policy requiring a minimum 100 feet separation between intersections and driveways. In this case, the Kaw Valley site driveway does not fall within 100 feet of any true intersection. The roadway feature in question is a horizontal bend where Lenape Road transitions and ties into the access road. This bend does not create a defined intersection condition per the access management policy. Therefore, the site driveway connection is compliant with the policy

intent, as it does not conflict with an intersecting roadway approach.

16. Olsson Comment (8.12.25): Leavenworth County classifies Golden Road east of 166th Street as an arterial but the study presents the road as a collector. What is the justification/reasoning for this change in classification for the county road?
Response: This error has been corrected in the Route Study Report.

17. Olsson Comment (8.12.25): The study does not present existing conditions of 161st Street or if the gravel surface and existing road width is adequate for proposed traffic.
Response: Our latest report includes boring findings, analysis, and recommendations for the segment of 161st street. Existing gravel road width adequacy will be addressed in roadway design phase.

18. Olsson Comment (8.12.25): Study notes horizontal and vertical curves that do not meet minimum requirements. Provide a proposed solution to address these deficiencies. What is the impact of additional truck traffic on the conditions?
Response: Existing geometrics for some horizontal and vertical curves do not meet current design criteria. Additional narrative has been added in the Route Study offering recommendations for options to bring existing curvatures to meet current criteria. With regard to the impact of trucks versus automobiles, vertical curves are designed based on speed taking into account the height of eye to meet stopping sight distance requirements, therefore accounting for both automobiles and trucks. The same is true for horizontal curves, in combination with superelevation, that the design vehicle will not alter the selection of an appropriate radius and superelevation based on design speed. Modifications to both horizontal and vertical curves would be developed as part of preliminary design in coordination with the county.

19. Olsson Comment (8.12.25): Study notes in the Horizontal and Vertical Geometry section that the minimum pavement width and cross section of the road was based on the Golden Road Pavement Evaluation Report. The width of road driving lanes and whether a road needs shoulders should be based on AASHTO Green Book. Whether a shoulder should be paved, dirt or gravel needs to be established in the study. Please provide a recommended shoulder type and cite the source.
Response: Depending on what pavement recommendation is selected in coordination with the county, there are a variety of combinations of typical sections that may be used to modify the existing roadway to meet current criteria. One size will not fit all based on varying existing conditions along the primary and alternate routes (e.g. a fill versus cut section and existing right of way widths will drive typical section choices that may not be one consistent typical section). The Route Study is intended to identify existing conditions, and through the development of preliminary design plans and coordination with county officials, a preferred typical section will be selected for one or more station ranges along the primary and secondary routes. At this time, a single recommendation is not provided, however, the impacts of choices regarding paving action, shoulder type and

width, foreslope selection, and drainage and right of way impacts is contemplated in the report.

20. Olsson Comment (8.12.25): Please label the slope of the 6' shoulder on the Figure 17 Typical Cross Section. Please show the proposed typical section geometry beyond the traveled way. The referenced Roadside Design Guide tables are not specific enough. Please confirm that this typical section is what is recommended for the Primary and Secondary route.
Response: Clear zone considerations have been accounted for with a revised typical section, and are included within the report. Recommended typical sections will be provided at the preliminary design plan stage after various design criteria choices, as previously discussed in comment 19 response, are concurred with by county officials.

21. Olsson Comment (8.12.25): The clear zone table referenced in Table 10 shows 4:1 is the maximum foreslope in the clear zone assuming there is no traversable area below a steeper slope. Is this the foreslope you are recommending off the new shoulder?
Response: Foreslope will vary along the route depending on cut versus fill section and available right of way, along with ditch capacity based on drainage flows (not part of this report, but would be included in the preliminary design phase). The design team is recommending the use of foreslopes and backslopes that meet clear zone requirements, which would be any slope flatter than a 4:1 within the clear zone.

22. Olsson Comment (8.12.25): The pavement evaluation report borings indicate varying pavement thicknesses and recommends an overlay with a minimum thickness for each route. How will consistent pavement structure be maintained when the recommended overlay thickness differs along each route?
Response: The design team has provided clarity around the recommended paving action based on a range of treatments – see Route Study Report. A variety of paving actions will be considered given that the existing pavement thickness is not uniform. Typical design practice is to show proposed treatments in the preliminary design plans, providing station ranges with a proposed paving action that will be used to meet a minimum thickness. This is needed to not only address a minimum thickness across the roadway, but may also require increased thickness where existing superelevation correction is needed to meet current geometric design criteria.

23. Olsson Comment (8.12.25): In the 'Roadway Drive Lane and Shoulder Dimensions' section, language regarding HSM guidance on road widening and shoulders has been removed. What is the justification for the removal of this language? Is road widening or shoulder needed to support the proposed vehicle type?
Response: Language regarding HSM was removed because the appropriate design guidance are the AASHTO Greenbook, and Roadside Design Guide. Road widening

needs are addressed later in comment response 25.

24. Olsson Comment (8.12.25): The report presents that guardrail 'could be considered'. Previous report language has been removed that indicated that if shoulder/grading work was conducted guardrail recommendations may change. The report needs to clearly state if an improvement is recommended. Does the proposed vehicle type or proposed shoulders impact the need for guardrail at specific locations? Were any segments of steep embankment cross referenced to crash reports to determine if providing guardrail would improve conditions for proposed haul route traffic?
Response: Guardrail, and potentially other appropriate safety treatments such as Type 4 end sections on cross road pipes are recommended if the clear zone conditions cannot be met with a traversable and recoverable slope. Regardless of vehicle type or proposed shoulder width, the clear zone requirement will be the same. Typical practice, and what the design team proposes, will be to provide roadside safety treatments at the preliminary plan stage where clear zone conditions cannot be met due to right of way or other constraints. Regardless of crash reports, improvements to the roadway should address providing a clear zone that meets current criteria. Guardrail is one potential option to improve steep embankments; others include flattening of sideslopes or end section treatments to existing structures to meet the clear zone.

25. Olsson Comment (8.12.25): 'Superelevation and Advisory Speed Review' section of the report presents a review of advisory speed within curves. Were the curves reviewed to determine if trucks can maintain lane with the 11' lanes while navigating the curve?

The report recommends changing the advisory speed along the Golden to 158th curve from 35 mph to 30 mph but this recommendation is not noted in the final section of the report.

Why weren't ball bank measurements taken along the reverse curve on 158th Street between Golden Road and Loring Road? The study recommends to remove advisory speed plaques based on speeds that were determined acceptable; recommendation for removal of signage should be based on measurement.
Response: There is an inability for trucks to maintain their lane position with 11' lanes and tight radius curves as they exist today. Based on field observations, no vehicle is able to consistently maintain their lane position due to very tight radius horizontal curves. A swept path analysis will be performed during design when assessing existing horizontal curves to determine off-tracking impacts and whether flattening of the curve radius or lane widening is the better solution.

The design team has collected additional cross slope data at all horizontal curves, that is included in the appendices of the Route Study Report. Ball bank readings can provide some insight into advisory speeds that could be used for existing curves, however, to meet current design criteria, best practice is to evaluate the existing cross slope against

recommended superelevation based on speed and radii. A summary of those findings indicates that in general, the high side of the super does not meet current criteria for any horizontal curve.

The reverse curves on 158th between Golden Road and Loring Road did not register a reading on the ball bank indicator, therefore a reduction in advisory speed was not necessary. The report section has been modified to indicate this finding.

26. Olsson Comment (8.12.25): Several signing recommendations are noted, specifically along curves along the haul route. Given the proposed vehicle type associated with the application, are any of the signs recommended to be installed to support the project?
Response: The Applicant's consultant team recommends the removal of the "Commercial Vehicles Excluded" signs to allow for a haul route.

27. Olsson Comment (8.12.25): If pavement modifications are made (overlay), adjustments to signing should be made as needed to support the improvement. Pavement markings along overlay sections should be installed per recommendations provided in the report.
Response: Pavement marking modifications will be provided at the design phase of the project after proposed paving actions are selected.

28. Olsson Comment (8.12.25): The study doesn't present review/discussion of the proposed drive locations. Proposed access to the site along Railroad Road/Green Street and Lenape Road should be provided. Consider relocation of the drives so that they are not located along a curve or provide justification for the proposed location. Confirm adequate sight distance is provided. See site plan review.
Response: We acknowledge the reference to the access management policy requiring a minimum 100 feet separation between intersections and driveways. In this case, the Kaw Valley site driveway does not fall within 100 feet of any true intersection. The roadway feature in question is a horizontal bend where Lenape Road transitions and ties into the access road. This bend does not create a defined intersection condition per the access management policy. Therefore, the site driveway connection is compliant with the policy intent, as it does not conflict with an intersecting roadway approach.

29. Olsson Comment (8.12.25): The turning templates in the traffic study are different than the templates provided on the site plan. During design of proposed intersection improvements at Golden and 161st, the truck turning templates should be reviewed and truck movements maintained within the appropriate lane.
Response: Truck swept path diagrams have been updated; where improvements are not recommended these diagrams demonstrate lane-keeping. If off-tracking illustrates lane-keeping cannot be achieved, proposed pavement widening has been identified with an illustration in the Route Study Report. Design of this widening will be included in the preliminary plan stage of the project.

30. Olsson Comment (8.12.25): The conclusion section recommends the addition of a thick overlay on both routes but does not identify how the edge drop off that would be created is mitigated. The traffic impact study describes the typical section in Figure 17 as the minimum requirements for the traveled way and shoulders. Per the typical section the edge of the travel lane is flush with the shoulder. Would the overlay affect existing guardrails, culverts, driveways, mailboxes, and intersecting roadways abutting the overlay? Provide how the edge drop off will be mitigated to meet the typical section.

    The pavement evaluation report borings indicate varying pavement thicknesses and recommends an overlay with a minimum thickness for each route. How will this be mitigated along the edge of pavement when the recommended overlay thickness differs along each route?
    Response: Various methodologies can be used to address edge drop offs; the change in elevation of the drop off and existing typical section often dictates the proposed solution. Since the existing pavement thickness varies along the primary and alternate routes, various treatments may be required to balance impacts to right-of-way, maintaining ditch capacity, accommodating existing drainage structures, avoidance of utilities, etc. Several solutions include: the addition of shoulder with flattened sideslopes, pavement edge wedge to tie pavement to existing ground where foreslopes are flatter, the use of FHWA recommended safety edge slope, the use of roadside safety appurtenances such as guardrail, etc. A combination of these features can be chosen to address varying existing roadway typical sections in coordination with the paving action, which would be selected as part of the decision making process with the county during preliminary design

31. Olsson Comment (8.12.25): The conclusion section states that improvements to meet road standards identified as part of this study are not the responsibility of the developer. The application increases the volume of vehicles and trucks on the proposed routes. Analysis shall be included to determine if the increased traffic will exasperate reported existing deficiencies.
    Response: Operationally, the increased traffic will not exasperate existing conditions. Geometric features that do not meet current criteria have been summarized and proposed improvements tied to the increased truck traffic are discussed in the response to comment 36 below.

32. Olsson Comment (8.12.25): Appendix F does not provide a typical section. Please provide slope labels on cross sections. Do the cross sections include the proposed overlay thickness?
    Response: Cross sections are illustrative of potential impacts, demonstrating what a proposed section would look like when implemented in an existing cut or fill section along the route. Updated cross sections, that include the proposed paving action, with labeling and other standard details will be provided at the preliminary plan stage, after preferred pavement actions have been selected in coordination with the county.

33. Olsson Comment (8.12.25): Appendix F does not provide an assessment of right of way impacts. Please provide.
Response: In general, the existing right of way along the corridor is 80' wide and is illustrated on the cross sections provided in the appendices of the Route Study Report. As part of the design survey, exact right of way linework will be collected and added to the proposed plan sheets during the preliminary design phase.

34. Olsson Comment (8.12.25): Appendix F does not provide an assessment of impacts to physical features along the routes. Please provide.
Response: A comprehensive assessment of physical feature impacts will be provided during the preliminary design phase, along with mitigation recommendations.

35. Olsson Comment (8.12.25): Application proposes an overlay raising the road along and in a flood zone. What are the impacts of raising the road and permitting requirements?
Response: A large portion of the existing roadway falls within a floodplain based on effective FEMA maps. Proposed improvements would need to be modeled within HEC RAS software to verify that a No Rise could be obtained and a CLOMR/LOMR would not be needed.

Once proposed pavement sections have been selected as part of the preliminary design phase, an assessment of impacts to the increase in road elevation can be performed. It is not anticipated that a CLOMR/LOMR would be necessary, however a No Rise Certification and Floodplain Development Permit would be required and would be addressed during the preliminary design phase.

36. Olsson Comment (8.12.25): Page 79 states: While such deficiencies were identified within this study, these geometric elements are considered existing conditions. Additionally, the proposed sand operation traffic does fulfill any threshold requirements that would trigger potential roadway geometric improvements.

Clarify statement. Does sand operation traffic fulfill or do not fulfill any threshold requirements?

Provide the threshold requirements for the deficiencies to require improvements.
Response: The items impacted by the additional truck traffic are as follows: potential roadway widening for off-tracking at tight radii curves and intersections with turning movements and insufficient roadway width, existing drainage structures that may not have sufficient structural capacity due to their maintenance condition, and elevation differences in the increased pavement elevation due to paving action and existing ground. Other geometric features do not meet current criteria independent of design vehicle and the proposed sand operation.

Impacts from off-tracking have been identified at intersections with turning movements in the Route Study Report. The impacts from off-tracking on horizontal curves would be addressed during the design phase as the selection of the proposed improvement will change what amount of widening may be necessary. Additionally, the drainage structure analysis for structural capacity would occur during the design phase, as replacements that are discussed and selected during that phase of the project would negate the need for certain structures to be assessed. Lastly, the elevation change resulting from the selected paving action(s) will be addressed during preliminary design.

Pavement Evaluation Report: Additional review comments are below:

1. Olsson Comment (4.17.25): Report doesn't provide a vehicle class breakdown for the existing pavement design or existing truck traffic along routes. Provide in report.

   Applicant Response (7.16.25): A detailed vehicle classification breakdown and axle load distribution, based on GBA data, has been added to the revised report. Specifically, PDF Page 2 of the report now states:

   "The existing traffic consists of less than 1% articulated trucks and, amongst all routes, an average of 2% buses/single-unit trucks. Truck traffic of 110 round trips of tandem axle dump trucks is expected to be added to the existing traffic."

   Olsson Response (8.12.25): No further comment.
   Response: No response

2. Olsson Comment (4.17.25): Page 1 states: Truck traffic of 110 round trips of tandem axle dump trucks is expected to be added to the existing traffic.

   Confirm the type of tandem axle dump truck and the equivalent single angle loading that each truck or the total of the trucks will be comprised of.

   Applicant Response (7.16.25): The haul trucks are FHWA Class 8 tandem axle dump trucks. Each round trip equates to approximately 2.6 ESALs, as confirmed with GBA.

   Olsson Response (8.12.25): The report references 110 round trips per day for the maximum number of trucks anticipated at the site. However, the application states 120 round trips per day for truck traffic. The report and calculated pavement sections should be updated to reflect the number referenced in the application.
   Response: Report revised to match 240 total truck count (120 round trips).

3. Olsson Comment (4.17.25): According to the traffic study, the primary and alternate route utilizes 161st Street. No route has been identified from the northwest dredging area. 161st Street is a gravel roadway.

Pavement evaluation report to include the 161st Street segment and analysis due to it being part of the route. Pavement evaluation report to include the route from the northwest dredging area and analysis.

Applicant Response (7.16.25): 161st Street and the northwest dredging route have been evaluated. Exploration results and analysis are included in the revised report. (PDF Pages 18, 44, 78, 79). Olsson Response (8.12.25): Terracon's pavement evaluation report covers Golden Road, N. 158th Street, and Loring Road in Leavenworth County, but does not include the short gravel section of 161st Street. Two additional borings (B-101 and B-102) on 161st Street show a gravel layer (4–12 inches thick) over clayey gravel and lean clay with sand. As 161st Street connects to the proposed sand plant's main entrance and is part of the main route being considered, recommendations for supporting the new truck traffic in combination with new pavement sections are needed along this section of roadway.
Response: Pavement thickness recommendations added specifically for 161st street in latest revised report.

4. Olsson Comment (4.17.25): Applicant: How was the Level of Reliability for the new total pavement design determined to be 85% when there is old pavement below new pavement?

   Applicant Response (7.16.25): 85% reliability is standard for regional flexible pavements. The revised report uses a more conservative 90% to address underlying pavement conditions.

   Olsson Response (8.12.25): No further comment.
   Response: No response

5. Olsson Comment (4.17.25): For the Flexible Overall Standard Deviation, a factor of 0.45 was used. Would 0.49 be more consistent with AASHTO?

   Applicant Response (7.16.25): For the Flexible Overall Standard Deviation, we revised to 0.49 in line with the upper end of the AASHTO-recommended range (0.40–0.50) for flexible pavement design.

   Olsson Response (8.12.25): No further comment.
   Response: No response

6. Olsson Comment (4.17.25): The Flexible Initial PSI serviceability number is 4.2. As mentioned in number 4, there is older pavement below the planned new overlay, therefore, how was this determined?

Applicant Response (7.16.25): A PSI of 4.2 is consistent with a new surface course. Existing pavement conditions are accounted for in the structural recommendations.

Olsson Response (8.12.25): It does not appear that the new pavement sections were designed as overlays in accordance with AASHTO 93 Design Guide. The new pavement sections should be designed as an overlay so that the old pavement does not have the same parameters, such as Flexible Initial PSI of 4.2, that new pavements would. Additionally, the existing pavement Structural Number should reflect the lack of flexibility and brittleness that is associated with older asphaltic pavements.
Response: Parameters for existing and new pavements are each provided in latest revised report

7. Olsson Comment (4.17.25): No growth rate was mentioned in the design. Provide growth rate. Growth rate of 2% is typical for County roadways, however one should be submitted for use by the applicant with review of historical data from the surrounding roadway network. Confirm with applicant on growth for operations.

   Applicant Response (7.16.25): Traffic projections include 2% annual growth for existing traffic and 5% for new truck traffic, per GBA input and County standards.

   Olsson Response (8.12.25): No further comment.
   Response: No response

8. Olsson Comment (4.17.25):Page 4 states: A traffic study was conducted at this site, and an Average Daily Traffic (ADT) of approximately 2,400 vehicles was determined. We have made the assumption that approximately 5% of the existing traffic consists of trucks, and a truck equivalency factor of 0.47 was used in our calculations.

   The traffic study has existing traffic counts. Confirm 5% trucks with existing counts from the traffic study.

   Applicant Response (7.16.25): While the "Traffic Study" shows 2% truck volume, we utilized 5% in our analysis to provide a conservative design margin.

   Olsson Response (8.12.25): No further comment.
   Response: No response

9. Olsson Comment (4.17.25): Page 4 states: With the information provided and the assumptions stated above, we estimate that the existing needs of the roadways studied to be 400,000 18-kip equivalent single axle loads (ESALs) over a 20-year design period. With the new truck traffic, we anticipate approximately 5,000,000 ESALs for a 20-year design period.

anticipate approximately 5,000,000 ESALs for a 20-year design period.

Draft narrative is proposing a SUP operation for 25 years.

Revise report utilizing the generated trips for a 25-year SUP term as proposed in the application. Applicant Response (7.16.25): The report has been updated to reflect a 25-year SUP term as proposed in the application. See PDF Pages 7, 8, 9.

Olsson Response (8.12.25): No further comment.
Response: No response

10. Olsson Comment (4.17.25): Page 6 states: Due to the variable thickness of the existing aggregate base in the sections observed, we have developed new minimum pavement section thicknesses to utilize a value of 2 inches of aggregate base at existing route 1 locations and 4 inches of aggregate base at existing route 2 locations.

    Why does the report assuming 4 inches for route 2 where there are several locations where there is only 3 inches of aggregate along that route according to table on page 5.

    Applicant Response (7.16.25): Our pavement analysis and recommendation are based on all the data captured and designed to accommodate the worst-case scenarios

    Olsson Response (8.12.25): No further comment
    Response: No response

11. Olsson Comment (4.17.25): Page 7 states: Paved areas should be sloped to provide rapid drainage of surface water and to drain water away from the pavement edges. Pavement should be designed so water does not accumulate on or adjacent to the pavement, since this could saturate and soften the subgrade soils and subsequently accelerate pavement deterioration.

    Describe how this will be accomplished. How will loss of edge support be mitigated?

    Applicant Response (7.16.25): Surface water will drain to existing ditches in a sheet flow pattern. This will reduce any edge deterioration and erosion from channelized flows discharging off of the pavements edge down into the roadside ditches.

    Olsson Response (8.12.25): The new asphalt pavement sections will have around 6+ inches of asphalt added to the existing pavement surface. The Traffic Impact Study does not recommend shoulder improvements or raising the pavement edge grade to the new overlay edge grade as part of the application submittal. The pavement design should include recommendations to prevent edge cracking, a common issue on narrow pavements caused by asphalt shrinkage and lack of lateral support. Edge cracking can

shorten the new pavement lifespan and cause premature failures. In addition, how will consistent pavement structure be maintained if portions of the routes only need a few inches of additional asphalt and other portions of the routes will need 6 or 7 inches of additional asphalt. How will this be constructed and still meet all the elevations that are currently set along the alignments.
Response: Comments addressing edge cracking added to latest revised report included in the Route Study Report.

12. Olsson Comment (4.17.25): Page 6 states: Construction traffic on the pavements was not considered in developing their opinions of minimum pavement thickness. If the pavements will be subject to construction equipment/vehicles, the pavement sections should be revised to consider the additional loading.

Will the pavement be subject to construction traffic for the SUP? If so, update the report to include in analysis and recommendations. Include estimated vehicle types and trips of construction traffic in the report.

Applicant Response (7.16.25): GBA confirmed no construction traffic on the haul route. No additional ESALs included.

Olsson Response (8.12.25): Please add this statement to the pavement evaluation report regarding no construction traffic on the haul route and no additional ESALs included.
Response: Statement added to latest revised report included in the Route Study Report.

13. Olsson Comment (4.17.25): The report includes variation of existing pavement thicknesses in both routes. Page 6 states Route 1 asphalt section be thickened to 10 total inches. For Route 2 asphalt section, be thickened to 9 total inches.

The total thickness for the new sections of roadway are 9 and 10 inches respectively, this includes the existing asphalt section. The existing asphalt section varies significantly over short distance. How will it be determined the total new thicknesses of 9 and 10 inches are achieved when the thickness of the existing pavements vary?

Applicant Response (7.16.25): All recommended section thicknesses include the analysis of the existing pavements. Field verification and inspections during construction is highly recommended to ensure total thickness is achieved per the pavement recommendations set forth in this report.

Olsson Response (8.12.25): Please specify how these quality assurance measures will be supported, i.e. by comprehensive construction oversight, including core sampling or non-destructive testing at representative intervals, to confirm that reconstructed sections achieve the intended structural depth. Coordination among field inspectors, contractors, and project engineers will be essential to document any discrepancies in existing

pavement depth and to adjust placement of new materials accordingly. By proactively addressing variability in the pavement structure, the project minimizes the risk of thin sections and premature failures.
Response: This will be addressed in roadway design phase.

14. Olsson Comment (4.17.25): Page 34 of the Traffic Study states: The Primary Route and alternate Route are striped with 11 ft. wide lanes, which is a typical width for streets. The Collector Street Typical Section adopted by Leavenworth County shows the travel lanes as 12 ft. wide. There is no threshold requiring the 11 ft. lane to be widened to 12 ft. based on additional traffic or truck-specific traffic. The Highway Safety Manual (HSM), 2010, states that widening the roadway from 11 ft. to 12 ft. could decrease crashes by 5% considering the characteristics of the Primary and Alternate Routes.

The Primary Route and Alternate Route do not have shoulders that match the adopted typical section. For much of the roadway, the Primary Route and Alternate Route have a shoulder of 0 ft. While shoulders may be paved, gravel, composite, or turf according to engineering manuals, a shoulder exists if a side slope outside of the travel lane is present with a similar slope compared to the travel lanes. If there is a steep drop off past the edge of the travel lane, then a shoulder is note present. The adopted typical section shows 4 ft. wide shoulders consisting of gravel. The HSM states that widening of a shoulder from 0 ft. to 4 ft. could decrease crashes by 35% considering the characteristics of the Primary and Alternate Routes. The HSM also states that a shoulder made of gravel could decrease crashes by 4% compared to turf

According to the traffic study, the existing roadways along the proposed routes have 11 ft wide lanes with 0 ft shoulders. Traffic study and the pavement evaluation do not recommend any widening improvements, shoulder improvements, or mitigation to edge drop off after the overlay is constructed. Does the pavement evaluation and pavement design account for 11 ft lanes, 0 ft shoulders, and edge drop off from the proposed ovelay?

Applicant Response (7.16.25): Geometric and safety upgrades, including lane width and shoulder improvements, fall outside the pavement analysis scope. Any recommendations tied to geometric improvements would be reflected within the traffic analysis sections of the report.

Olsson Response (8.12.25): No further comment.
Response: No response

15. Olsson Comment (8.12.25): The report states on page 5:
Typically, when existing asphalt sections are modified, one to two inches of surface asphalt is milled prior to placement of new asphalt overlay. At the time of our study, it appears that the existing asphalt surface is in fair to good condition, and milling

procedures may not be necessary. If milling procedures are not utilized at this site, the existing surface would need to be thoroughly cleaned prior to placement of the tack coat and new surface course overlay to ensure that new overlay materials properly adhere to the existing pavements. If a new asphalt overlay is placed on dirty/dusty existing pavements, the owner must accept the risk that debonding could occur between the older and newer sections, which could lead to rapid deterioration of the asphalt surface.

Since the asphalt surface is exposed, the pavement evaluation report should clearly state whether milling is needed. The statements "may not be necessary" and "could lead to rapid deterioration of the asphalt surface" are contradictory and lack a specific recommendation.
Response: Addressed in latest revised report.

We look forward to reviewing these responses and any additional comments or questions staff may have. If you have any additional questions or concerns, please feel free to contact us.

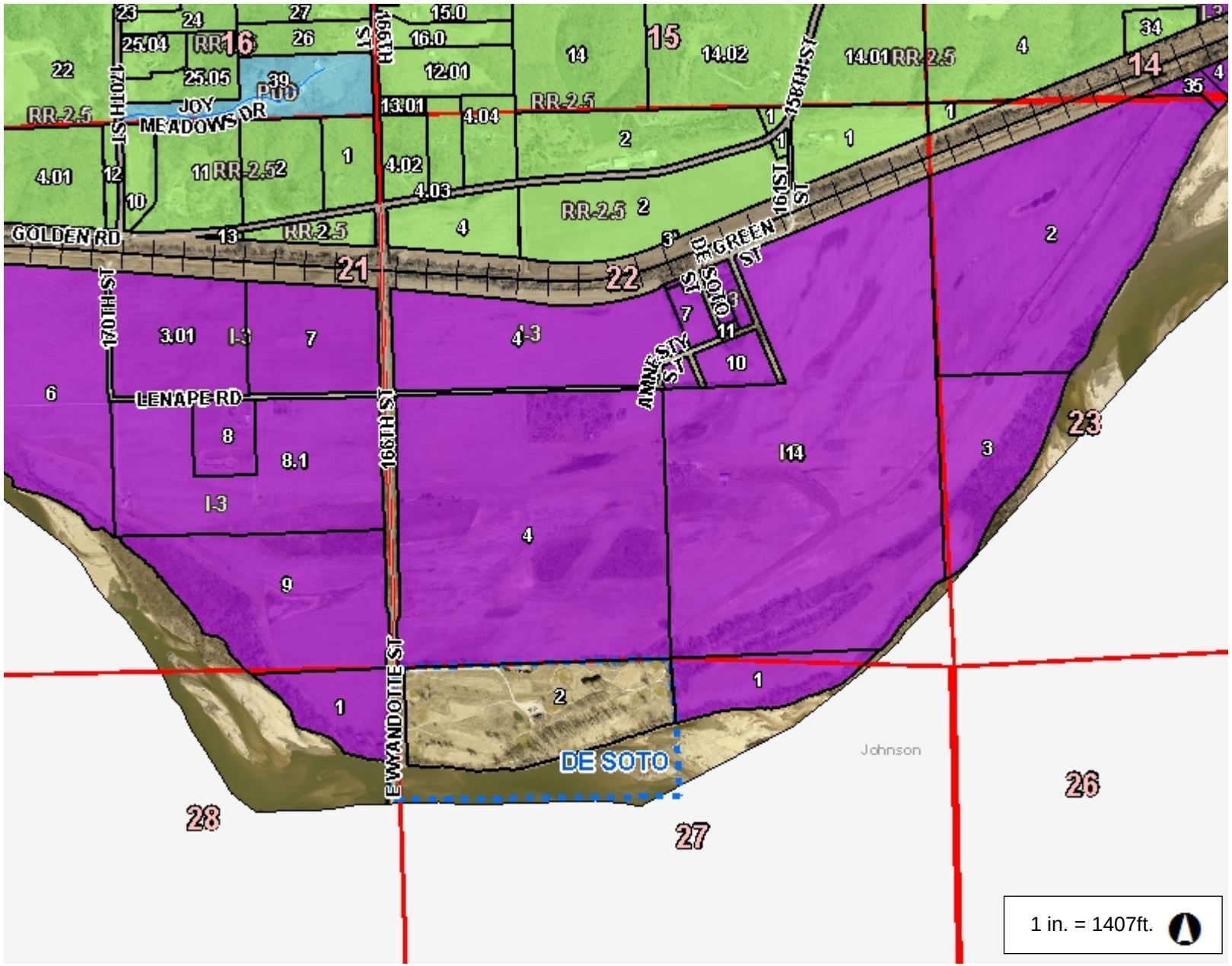
Very truly yours,



Aaron G. March

AGM:jw
cc: Ms. Misty Brown (via e-mail, MBrown@leavenworthcounty.gov)
Mr. Evan Horowitz (via e-mail, evanh@kvco.net)
Mr. Brian Boyd (via e-mail, bboyd@gbateam.com)
Greg L. Musil, Esq. (via e-mail, gmusil@rousepc.com)

Zoning Map





Legend

- Parcel Number
- Parcel
- City Limit Line
- Major Road
  - <all other values>
  - 70
- Road
  - <all other values>
  - PRIVATE
- Railroad
- Section
- Section Boundaries
- County Boundary
- Zoning
  - B-1
  - B-2
  - B-3
  - I-1
  - I-2
  - I-3
  - MXD
  - PC
  - PI
  - PR-1
  - PR-2
  - PR-3

Notes

1327

2,814.2 0 1,407.08 2,814.2 Feet

This Cadastral Map is for informational purposes only. It does not purport to represent a property boundary survey of the parcels shown and shall not be used for conveyances or the establishment of property boundaries.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

Allison, Amy

From: PLN-Planner on Duty <Planner@jocogov.org>
Sent: Tuesday, March 11, 2025 12:00 PM
To: Allison, Amy
Subject: RE: DEV-25-021 Special Use Permit – Kaw Valley

Notice: This email originated from outside this organization. Do not click on links or open attachments unless you trust the sender and know the content is safe.

Thank you Amy for the email . Johnson County Planning department (our jurisdiction is only the unincorporated part of JOCO) – does not have any comments on this application. Thank you for notifying us and allowing us to review and comment.

Diane Wicklund, AICP
Senior Planner
111 South Cherry, Suite 2000 Olathe, KS 66061
Direct (913) 715-2212 | Office (913) 715-2200
JOHNSON COUNTY KANSAS
Planning, Housing & Community Development
jocogov.org | @jocogov | F/jocogov

From: Allison, Amy <AAllison@leavenworthcounty.gov>
Sent: Tuesday, March 11, 2025 8:55 AM
To: Magaha, Chuck <cmagaha@lvsheriff.org>; Anderson, Kyle <KAnderson@leavenworthcounty.gov>; Miller, Jamie <JMiller@leavenworthcounty.gov>; Dedeke, Andrew <adedeke@lvsheriff.org>; Brown, Misty <MBrown@leavenworthcounty.gov>; 'kritter@lvcofd2.com' <kritter@lvcofd2.com>; 'dritter@lvcofd2.com' <dritter@lvcofd2.com>; 'designgroupshawnee@evergy.com' <designgroupshawnee@evergy.com>; Bradley C. Weisenburger <bweisenburger@desotoks.us>; PLN-Planner on Duty <PLN-PlannerOnDuty@jocogov.org>
Cc: PZ <PZ@leavenworthcounty.gov>
Subject: RE: DEV-25-021 Special Use Permit – Kaw Valley

You don't often get email from aallison@leavenworthcounty.gov. Learn why this is important

***** This email originated from outside the organization. Use caution when opening attachments, clicking links, or performing any actions requested in this message. *****

Good Morning,

The Department of Planning and Zoning has received a request to operate a sand excavation and stockpiling operation at 16201 & 00000 Lenape Road (235-22-0-00-00-014.00 & 235-22-0-00-00-004.00).

The Planning Staff would appreciate your written input in consideration of the above request. Please review the attached information and forward any comments to us by Monday, March 24, 2025.

If you have any questions or need additional information, please contact me at (913) 684-0465 or at pz@leavenworthcounty.gov

Thank you,

Amy Allison, AICP
Deputy Director
Planning & Zoning
Leavenworth County
913.364.5757

Disclaimer

This message and any attachments are intended only for the use of the recipient or their authorized representative. The information provided in this email is limited in scope and response detail by available information, current zoning and subdivision regulations. Depending on the level of development, the applicable regulations can change. Final approval cannot be granted until a complete application has been submitted, reviewed and approved by the governing body. Nothing in this message or its contents should be interpreted to authorize or conclude approval by Leavenworth County.

Allison, Amy

From: Matt Roecker <Matt.Roecker@evergy.com>
Sent: Wednesday, March 12, 2025 1:29 PM
To: PZ
Cc: Travis Shockey
Subject: DEV-25-021 Special Use Permit – Kaw Valley

Notice: This email originated from outside this organization. Do not click on links or open attachments unless you trust the sender and know the content is safe.

Internal Use Only

Hello,

Evergy has no conflicts with the operation on Lenape Rd.

Thanks

Matt Roecker
Evergy
TD Designer IV
matt.roecker@evergy.com
913-667-5116

Allison, Amy

From: Anderson, Kyle
Sent: Friday, March 28, 2025 1:53 PM
To: Allison, Amy
Subject: Holding Tank Requirements

A holding tank will need to be used to store all septic waste. The holding tank will require floodplain permits and must be anchored to meet state guidelines. An engineer will need to design the system and it shall have a minimum 5-day holding capacity, but not less than 2,000 gallons. A contract with a Leavenworth County Septic Hauler to regularly pump the holding tank must be provided to our office prior to use of the system. Holding tank regulations can be found in the Leavenworth County Sanitary Code Chapter 2 Article 8.

Kyle Anderson
Environmental Technician/Code Enforcement
Leavenworth County Planning & Zoning
300 Walnut St. Ste. 212
Leavenworth, KS 66048
913-684-1084

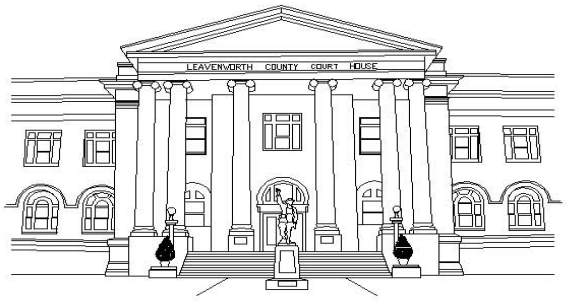
Disclaimer: This message and any attachments are intended only for the use of the recipient or their authorized representative. The information provided in this email is limited in scope and response detail by available information, current zoning and subdivision regulations. Depending on the level of development, the applicable regulations can change. Final approval cannot be granted until a complete application has been submitted, reviewed and approved by the governing body. Nothing in this message or its contents should be interpreted to authorize or conclude approval by Leavenworth County.

MEMO

To: John Jacobson
From: Chuck Magaha
Subject: Sand Dredging
Date: July 31, 2025

John, thank you for the opportunity to review the special use permit for the sand dredging operation submitted by Kaw Valley Sand and Gravel. We had a special use permit issue to a party unknown to myself for the same type of operation by the Kansas River on 222nd street on the North side of the River that was abandoned for years. This was finally reclaimed about a year ago. A dredging operation should be responsible for returning the ground to the condition they found it in when they arrived which is stated in the application. Recommendations from this office would be to include a barricade be placed around the site to keep persons away from the area when not in operation. The company should provide an emergency action plan and a site plan to the local fire department and with the Emergency Management office. The company needs to include contact persons after hours and emergency actions in the event of an accident such as a possible drowning or engulfment of material to a person. Any Hazardous Material spill of any kind will need to be reported back to the Emergency Management Office for proper clean up and exposure to the ground water. Heavy train traffic is relevant in this area so caution needs to be warranted along 166th Street with drivers so signage might be a need. If you have any questions please contact me at 684-0455.

Note: This is my report on the Plant in 2020 my comments remain the same.



COUNTY OF LEAVENWORTH

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October 15, 2025

Kaw Valley SUP DEV-25-021 – Leavenworth County

The comments provided are intended for a preliminary review to assist the applicant in understanding the necessary improvements to make the roadway suitable for use as a haul route. County policy mandates that applicants seeking a special use permit for a proposed haul road enter into a roadway improvement agreement for the enhancement and maintenance of the road. A copy of the County's Roadway Improvement Agreement template has been shared with counsel previously.

Kaw Valley SUP DEV-25-021 – Public Works Review

The Public Works Department's consultant (Olsson) has reviewed the revised application documents for the proposed Lenape Sand Operation received September 30th, 2025; review comments are provided herein. Olsson's review does not alleviate the responsibility of the engineer of record. Based on the review, revised documents received may generate additional and/or new comments. Please direct any questions to Amy Allison at aallison@leavenworthcounty.gov.

Application Review Summary:

The Public Works Department's consultant (Olsson) has reviewed the revised application documents received on September 30th, 2025. Olsson's review is limited to the Route Study (Pavement Evaluation Report and Drainage Structure Report for roads within Leavenworth County jurisdiction), Site Plan, and Drainage Study and are included in the following section. The Noise Study within the route study was not reviewed by Olsson.

The route study evaluated the existing routes according to AASHTO Green Book, AASHTO Roadside Design Guide, and KDOT Criteria. Traffic analysis evaluated routes according to the Manual on Uniform Traffic Control Devices (MUTCD). Pavement evaluation report evaluated the existing pavements according to AASHTO Guide for Design of Pavement Structures (1993). Drainage structures evaluated existing structures according to Recording and Coding Guide for the Structure Inventory and Appraisal of Nation's Bridges – Report No. FHWA-PD-96-001. The site plan review is according to Article 27 Section 4 of the Zoning and Subdivision Regulations. Storm drainage study review is according to Leavenworth County Minimum Storm Water Report Requirements.

It is Olsson's opinion that the pavement evaluation report and drainage structures report are in general conformance; however, the site plan and storm drainage study require further revision. Documents to be revised as part of the site design documents.

The route study does not present specific recommendations regarding improvements to the road network. The applicant has indicated that recommendations will be determined during the preliminary design phase. Final decisions regarding improvements to the road network should be made under the design phase. Items that should be reviewed under the preliminary design phase include, but are not limited to, clear zone improvements, typical sections, pavement design, curve improvements, signing and marking improvements, vegetation clearing, Kansas Department of Transportation approval, rail company approval, and other aspects identified within the route study and to be conducted under preliminary design.

Site Plan:

Detailed review below:

1. Olsson Comment (4.17.25): Site plan review is attached.

   Applicant Response (7.16.25): See below responses to site plan markup comments.

   a. Olsson Comment (4.17.25): Application includes a 2nd site plan with the file name: 5 2024.10.11 16477 Lenape Sand Site Plan(1033788xA006D) - 4905-6033-0526.pdf. Is it the applicant's intention for both site plans in the application to be the same? This site plan has an additional sheet compared to the site plan named 5 2024.10.11..... Revise both so they are the same, if this is the intent.

      Applicant Response (7.16.25): There is a single set of site plan documents (the “Site Plan”), included with this response. The Site Plan incorporates the comments from Staff.

      Olsson Response (8.12.25): Acknowledged.

      Applicant Response (9.30.25): No response.

   b. Olsson Comment (4.17.25): Site plan to be signed and sealed by a licensed professional according to Article 27 Section 4.

      Applicant Response (7.16.25): The Site Plan is signed and sealed by Jacob Schweikert, a licensed professional engineer.

      Olsson Response (8.12.25): Document is submitted with a date and no signature on the seal. Engineer to provide a signature over the seal.

      Applicant Response (9.30.25): Seal has been signed.

      Olsson Response (10.15.25): Engineer to provide signature over the seal.

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c. Olsson Comment (4.17.25): Provide a statement on the current zoning of the site. Provide labels and depict the zoning adjacent to the site.

Applicant Response (7.16.25): Project site and all adjacent properties are zoned I-3. Zoning labels have been added to Sheet 3.

Olsson Response (8.12.25): Sheet 3, missing adjacent property information and details. See attached site plan review.

Applicant Response (9.30.25): Adjacent property zoning labels have been added to the Site Plan.

Olsson Response (10.15.25): No further comment.

d. Olsson Comment (4.17.25): Remove 'Draft' from sheet title.

Applicant Response (7.16.25): Draft has been removed from the title block.

Olsson Response (8.12.25): No further comment.

Applicant Response (9.30.25): No response.

e. Olsson Comment (4.17.25): Provide actual legal description.

Applicant Response (7.16.25): A Boundary legal description has been added to Sheet 1.

Olsson Response (8.12.25): No further comment.

Applicant Response (9.30.25): No response.

f. Olsson Comment (4.17.25): Revise sheet index.

Applicant Response (7.16.25): Sheet index has been revised.

Olsson Response (8.12.25): No further comment.

Applicant Response (9.30.25): No response.

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g. Olsson Comment (4.17.25): Confirm site is within the City of De Soto, KS sewer district. If different, revise.

Applicant Response (7.16.25): We have confirmed that the site is within City of DeSoto, Kansas sewer district.

Olsson Response (8.12.25): Add sewer utility contact information to the cover sheet, if applicable.

Applicant Response (9.30.25): Site is not within any sewer district per Leavenworth County GIS utility map.

Olsson Response (10.15.25): No further comment.

h. Olsson Comment (4.17.25): Confirm site is within the City of De Soto, KS water district. If different, revise.

Applicant Response (7.16.25): We have confirmed that the site is within City of DeSoto, Kansas water district.

Olsson Response (8.12.25): Add water utility contact information to the cover sheet, if applicable.

Applicant Response (9.30.25): Site is not within any water district per Leavenworth County GIS utility map.

Olsson Response (10.15.25): No further comment.

i. Olsson Comment (4.17.25): Remove signature block

Applicant Response (7.16.25): The city engineer signature block has been removed. The project engineer signature block has remained.

Olsson Response (8.12.25): No further comment.

Applicant Response (9.30.25): No response.

j. Olsson Comment (4.17.25): Provide a statement, septic system to be permitted through a separate application.

Response (7.16.25): General Notes regarding the permitting of the septic system have been added to sheet 3. Specifically, Notes 2 and 3.

> Note 2. Septic tank system with minimum 5 day holding capacity and not less than 2,000 gallons will be designed by a licensed engineer. Septic tank requires Floodplain permits and will be obtained for the septic tank prior to construction. The septic tank will be anchored to meet state guidelines. A contract with a Leavenworth County septic hauler to regularly pump the septic tank will be obtained and provided to Leavenworth County Planning & Zoning prior to use of the system.
>
> Note 3. Septic tank is to be designed in accordance with Leavenworth County Sanitary Code Chapter 2 Article 8.

Olsson Response (8.12.25): In the General Notes, provide a statement regarding the septic system to be permitted through a separate application.

Applicant Response (9.30.25): A general note has been added to sheet 3.

Olsson Response (10.15.25): No further comment.

k. Olsson Comment (4.17.25): Provide turning templates for within the site depicting traffic circulations for truck traffic.

Applicant Response (7.16.25): Sheet 22, Truck Turning Circulation, is included with the Site Plan.

Olsson Response (8.12.25): No further comment.

Applicant Response (9.30.25): No response.

l. Olsson Comment (4.17.25): Per Article 27 Section 5, storm drainage must provide for attaining a zero-net gain in storm water runoff between the tract in its natural state and the proposed developed state. Provide a storm drainage report signed and sealed by a Kansas licensed professional engineer.

Applicant Response (7.16.25): A storm drainage report is included with the application and this resubmittal. “At no point before, during, or after excavation operations will stormwater runoff patterns be altered to cause additional discharge to neighboring properties.” (Stormwater Drainage Study, p.2., p.3.) See also Sheet 4 – Grading Plan.

Olsson Response (8.12.25): Stormwater drainage study review:

Revise report to include the requirements from the County's Minimum Storm Water Report Requirements.

Report states no changes in drainage patterns causing additional discharge to neighboring properties. Revise grading plan in this document to demonstrate drainage patterns will not be impacted.

Provide a conclusion and recommendations section in the report.

Document is submitted with a date and no signature on the seal. Engineer to provide a signature over the seal.

Applicant Response (9.30.25): Storm Drainage Report has been revised as requested.

Olsson Response (10.15.25): Engineer to provide signature over the seal.

Page 2 of the report references curve numbers from APWA Section 5600. Provide table of the runoff coefficients used in the analysis from the source and add it to the Appendix of the report.

Per Leavenworth County Minimum Storm Water Report Requirements, provide analysis of the 10 and 100 year storm in the pre construction vs post construction. Demonstrate the ponds have sufficient volume above normal pool to manage 10 and 100 year storm events according to the increase in stormwater runoff in the post construction condition.

Exhibit 2, FIRM map is cut off along the border. Revise document presentation.

m. Olsson Comment (4.17.25): Depict and label flood zones within the site.

Applicant Response (7.16.25): The FEMA regulatory floodway and the flood zone AE are depicted and labeled on the Site Plan.

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Olsson Response (8.12.25): No further comment.

Applicant Response (9.30.25): No response.

n. Olsson Comment (4.17.25): Revise legend to indicate what is existing vs proposed.

Applicant Response (7.16.25): The legend is revised and indicates existing and proposed.

Olsson Response (8.12.25): See attached site plan review.

Applicant Response (9.30.25): Site plan comment responses are set out below.

Olsson Response (10.15.25): Acknowledged.

o. Olsson Comment (4.17.25): Label sand & aggregate stockpile

Applicant Response (7.16.25): The sand and aggregate stockpiles are labeled on the Site Plan included with this resubmittal.

Olsson Response (8.12.25): No further comment.

Applicant Response (9.30.25): No response.

p. Olsson Comment (4.17.25): Coordinate with jurisdiction over the existing levee to obtain an approval for the site plan. Provide documentation of approval. Provide actual location of the existing levee instead of approximate.

Applicant Response (7.16.25): There is no jurisdictional levee on the property. The location of the private levees is shown on the Site Plan.

Olsson Response (8.12.25): No further comment.

Applicant Response (9.30.25): No response.

q. Olsson Comment (4.17.25): Label line at SE corner of property

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Applicant Response (7.16.25): The extra line on the SE corner of the property has been removed.

Olsson Response (8.12.25): No further comment.

Applicant Response (9.30.25): No response.

r. Olsson Comment (4.17.25): Remove “Draft” (typ)

Applicant Response (7.16.25): The word “Draft” has been removed from the border.

Olsson Response (8.12.25): No further comment.

Applicant Response (9.30.25): No response.

s. Olsson Comment (4.17.25): Provide detail of the enclosure for the trash dumpster according Article 27.

Applicant Response (7.16.25): Sheet 23, Construction Details, includes trash dumpster detail.

Olsson Response (8.12.25): No further comment.

Applicant Response (9.30.25): No response.

t. Olsson Comment (4.17.25): Are the proposed parking stalls open for public use? Public use requires ADA accommodations.

Applicant Response (7.16.25): Parking stalls are not open for public use.

Olsson Response (8.12.25): No further comment.

Applicant Response (9.30.25): No response.

u. Olsson Comment (4.17.25): Provide existing contour lines with labels.

Applicant Response (7.16.25): Existing contour lines with labels are provided on the Site Plan.

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Olsson Response (8.12.25): See attached site plan review.

Applicant Response (9.30.25): Site plan comment responses are set out below.

Olsson Response (10.15.25): Acknowledged.

v. Olsson Comment (4.17.25): Grading shall have sheets 1"=50' or more detailed.

Applicant Response (7.16.25): Sheets 5 through 18 depict grading at 1”=50’.

Olsson Response (8.12.25): No further comment.

Applicant Response (9.30.25): No response.

w. Olsson Comment (4.17.25): Grading plan to provide additional information including offsite areas draining onto the site and how runoff effects adjacent areas.

Applicant Response (7.16.25): No offsite areas drain on to the site. All onsite areas will drain to the dredging area.

Olsson Response (8.12.25): See attached site plan review.

Applicant Response (9.30.25): Site plan comment responses are set out below.

Olsson Response (10.15.25): Acknowledged.

x. Olsson Comment (4.17.25): How is water being supplied to the site?

Applicant Response (7.16.25): Non potable water will be supplied internal to the site via the operations. Potable water will be privately supplied by the applicant.

Olsson Response (8.12.25): Provide a note in the site plan from the response that non potable water will be supplied internal to the site via operations. Potable water will be privately supplied by the applicant.

Applicant Response (9.30.25): Note has been added to the Site Plan as requested.

Olsson Response (10.15.25): No further comment.

y. Olsson Comment (4.17.25): For proposed structures indicate the number of stories (height), gross floor area and label entrances to the structure.

Applicant Response (7.16.25): Structure heights, gross floor area, and entrances for each structure are noted on Sheet 3 of the Site Plan.

Olsson Response (8.12.25): Provide gross floor area for each structure.

Applicant Response (9.30.25): Gross floor area for each structure has been added to the Site Plan as requested.

Olsson Response (10.15.25): No further comment.

z. Olsson Comment (4.17.25): Label and depict the location and dimension of existing and proposed access points to County roads.

Applicant Response (7.16.25): Existing County roads have been labeled and dimensioned. Access points to County roads are labeled.

Olsson Response (8.12.25): See attached site plan review.

Applicant Response (9.30.25): Site Plan comment responses are set out below.

Olsson Response (10.15.25): Acknowledged.

aa. Olsson Comment (4.17.25): Depict the route from the NW dredging area to the primary/alternate route to the site.

Applicant Response (7.16.25): Sand from the NW dredging area will not be loaded for transport from the NW dredging area. The NW dredging area will utilize underground piping to send material under Lenape Road where it will be processed and loaded. Only Kaw Valley operation vehicles will access the NW dredging area for ongoing operations. The access points for the NW dredging area are shown and labeled on Sheet 3 of the Site Plan.

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Olsson Response (8.12.25): See traffic study review for comments on proposed access along Lenape Road and Green Street. Depict underground pipe within the right-of-way. Provide details of pipe material, construction detail, and encasement pipe.

Applicant Response (9.30.25): Location of the pipe has been shown on the Site Plan. Construction detail will be provided at time of right-of-way permit application as noted on the Site Plan.

Olsson Response (10.15.25): Acknowledged.

bb. Olsson Comment (4.17.25): Provide the height and materials of the fences.

Applicant Response (7.16.25): The 6' collapsible fence is plastic. The chain link fence is 8'. The locations and heights of each fence are included on the Site Plan legend (Sheet 3). Additional details on the chain link fence is shown on Sheet 23.

Olsson Response (8.12.25): No further comment.

Applicant Response (9.30.25): No response.

cc. Olsson Comment (4.17.25): Will there be pedestrian conveyance within the site? Site plan to provide for the safe movement of pedestrians within the site.

Applicant Response (7.16.25): There will be no pedestrian conveyance within the site.

Olsson Response (8.12.25): No further comment.

Applicant Response (9.30.25): No response.

dd. Olsson Comment (4.17.25): Describe the proposed use of the site and list the number of required off-street parking spaces.

Applicant Response (7.16.25): The proposed use of the site is set out in the Site Plan, specifically Sheet 3 states that Kaw Valley Companies, Inc. ("Kaw Valley") requests approval of a Special Use Permit to utilize the approximately 435-acre site located at 166th and Lenape Road in rural Leavenworth County, Kansas (the "Property") for a sand excavation and stockpiling operation (the "Sand Operation"). The proposed use does not

require off-street parking. There will be five (5) regular full-time employees, 2-3 employees per shift.

Olsson Response (8.12.25): No further comment.

Applicant Response (9.30.25): No response.

ee. Olsson Comment (4.17.25): Will there be a site entrance sign proposed for the facility?

Applicant Response (7.16.25): No signage is proposed for the facility.

Olsson Response (8.12.25): Provide a note in the site plan from the response that no site entrance sign is proposed.

Applicant Response (9.30.25): Note has been added to the Site Plan as requested.

Olsson Response (10.15.25): No further comment.

ff. Olsson Comment (4.17.25): Site plan indicates the existing levee will be modified. Coordinate with jurisdiction over the existing levee to obtain an approval for the site plan near the levee and modification of the levee. Provide documentation of approval.

Applicant Response (7.16.25): The existing non-jurisdictional, private levee, will not be modified.

Olsson Response (8.12.25): No further comment.

Applicant Response (9.30.25): No response.

gg. Olsson Comment (4.17.25): Erosion Control Plan doesn't depict any erosion control devices. Title of the sheet indicates this sheet is Phase 1. Is there other phases? Applicant to revise and complete the erosion control plan. Is erosion control sheet for initial construction of the site?

Applicant Response (7.16.25): Phase 1 terminology has been removed. Erosion control notes have been added to the Erosion Control Plan (Sheet 19).

Olsson Response (8.12.25): Erosion Control Plan is not a required document for the site plan application. Erosion Control Plan and SWPP not reviewed. Applicant to provide the County a copy of the permit authorization (NOI) from KDHE for County records prior to disturbance.

Applicant Response (9.30.25): Acknowledged.

hh. Olsson Comment (4.17.25): Confirm collector street is used in the site plan.

Applicant Response (7.16.25): The collector road section has been removed from plans.

Olsson Response (8.12.25): No further comment.

Applicant Response (9.30.25): No response.

ii. Olsson Comment (4.17.25): Confirm and label this driveway is limited to within the site.

Applicant Response (7.16.25): The driveway sections on Sheet 2 will only be used within the SUP boundary. General Note 1 for each driveway section indicates the “driveway is limited within site boundary.”

Olsson Response (8.12.25): No further comment.

Applicant Response (9.30.25): No response.

jj. Olsson Comment (4.17.25): What type of gravel fill and rock size is being proposed?

Applicant Response (7.16.25): 8” minimum aggregate per county standards will be used on the driveways.

Olsson Response (8.12.25): No further comment.

Applicant Response (9.30.25): No response.

kk. Olsson Comment (4.17.25): Is sheet 8 a duplicate of sheet 5? If so, remove.

Applicant Response (7.16.25): The index of sheets has been revised and duplicate sheets removed.

Olsson Response (8.12.25): No further comment.

Applicant Response (9.30.25): No response.

Site Plan Revisions and Updates:

Detailed review below:

1. Cover Sheet – Sheet 1.
   a. Olsson Comment (8.12.25): Provide signature to Seal.

      Applicant Response (9.30.25): Seal has been signed.

      Olsson Response (10.15.25): Engineer to provide signature over the seal.

   b. Olsson Comment (8.12.25): Add Water and Sewer Utility Contact Info.

      Applicant Response (9.30.25): Site is not within any water or sewer district per Leavenworth County GIS utility map.

      Olsson Response (10.15.25): No further comment.

2. Typical Section – Sheet 2.
   a. Olsson Comment (8.12.25): Revise labels to include “Private Drive”

      Applicant Response (9.30.25): Note has been revised.

      Olsson Response (10.15.25): No further comment.

3. Site Plan – Sheet 3.
   a. Olsson Comment (8.12.25): Provide a statement regarding the septic system to be permitted through a separate application.

      Applicant Response (9.30.25): Note has been added.

      Olsson Response (10.15.25): No further comment.

   b. Olsson Comment (8.12.25): Depict underground pipe within the right-of-way. Provide details of pipe material, construction detail, and encasement pipe.

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Applicant Response (9.30.25): Location of pipe has been shown on the Site Plan. Construction detail will be provided at time of right-of-way permit application as noted on the Site Plan.

Olsson Response (10.15.25): Acknowledged.

c. Olsson Comment (8.12.25): Provide statements regarding water being supplied per the response letter dated July 16th, 2025.

Applicant Response (9.30.25): Note has been added.

Olsson Response (10.15.25): No further comment.

d. Olsson Comment (8.12.25): Provide statement regarding no site entrance sign is being proposed for the facility.

Applicant Response (9.30.25): Note has been added.

Olsson Response (10.15.25): No further comment.

e. Olsson Comment (8.12.25): Per GIS, this is in the city of Desoto. Confirm city of Desoto limits. If DeSoto's limits exist, depict and label said limits. Provide zoning of property. Revise throughout the document.

Applicant Response (9.30.25): City limits have been added and labeled on all applicable sheets.

Olsson Response (10.15.25): No further comment.

f. Olsson Comment (8.12.25): Label ownership of tract and zoning. Revise throughout the document.

Applicant Response (9.30.25): Label has been added throughout the document.

Olsson Response (10.15.25): Reconfirm ownership of tract labeled "Thomas & Donna Kelly". Leavenworth County GIS indicates the tract to be owned by Schmitt Living Trust.

g. Olsson Comment (8.12.25): Lenape Road is a local roadway. The minimum distance from an intersection to a driveway per the access management policy is 100 ft from the intersection.

Applicant Response (9.30.25): We acknowledge the reference to the access management policy requiring a minimum 100 feet separation between intersections and driveways. In this case, the Kaw Valley site driveway does not fall within 100 feet of any true intersection. The roadway feature in question is a horizontal bend where Lenape Road transitions and ties into the access road. This bend does not create a defined intersection condition per the access management policy. Therefore, the site driveway connection is compliant with the policy intent, as it does not conflict with an intersecting roadway approach.

Olsson Response (10.15.25): The concern with the location of the drives is the intersection of the proposed drive locations along a curved segment of roadway. Further review and evaluation of the proposed drive access should be conducted during the preliminary design phase.

h. Olsson Comment (8.12.25): Label as proposed access.

Applicant Response (9.30.25): Label has been added.

Olsson Response (10.15.25): Per applicant's response the driveway to the NW dredge area will be limited to operation vehicles only. Add callout to this driveway referencing General Note 6 for access information.

i. Olsson Comment (8.12.25): Text masks existing roadway.

Applicant Response (9.30.25): Text has been relocated.

Olsson Response (10.15.25): No further comment.

j. Olsson Comment (8.12.25): Green Road is a local roadway. The minimum distance from an intersection to a driveway per the access management policy is 100 ft from the intersection.

Applicant Response (9.30.25): We acknowledge the reference to the access management policy requiring a minimum 100 feet separation between intersections and driveways.
In this case, the Kaw Valley site driveway does not fall within 100 feet of any true intersection. The roadway feature in question is a horizontal bend where Lenape Road transitions and ties into the access road. This bend does not create a defined intersection condition per the access management policy. Therefore, the site driveway connection is compliant with the policy intent, as it does not conflict with an intersecting roadway approach.

Olsson Response (10.15.25): The concern with the location of the drives is the intersection of the proposed drive locations along a curved segment of roadway. Further review and evaluation of the proposed drive access should be conducted during the preliminary design phase.

k. Olsson Comment (8.12.25): Site plan indicates new entrance is within the rail company right-of-way. Applicant to provide coordination and approval documentation from the rail company regarding the new entrance.

Applicant Response (9.30.25): Coordination with the railroad company will be undertaken as part of the design review and permitting phase associated with the final design and construction documents. This process is consistent with typical practice for any proposed improvements that extend into non-jurisdictional rights-of-way, including railroad property. Documentation of coordination and approvals from the rail company will be provided at the appropriate stage of design and permitting. Furthermore, the railroad has indicated that the request for review and approval must come from the County. Copies of our correspondence with the railroad and contact information has previously been provided to Staff.

Olsson Response (10.15.25): Acknowledged.

l. Olsson Comment (8.12.25): Apply R/W line type to the plan views within the plan set.

Applicant Response (9.30.25): Right-of-way linetype has been added to plan views. Portions of SUP boundary (denoted by SUP linetype) which run along public roads are also right-of-way lines.

Olsson Response (10.15.25): No further comment.

m. Olsson Comment (8.12.25): Water Line, proposed or existing.

Applicant Response (9.30.25): Note has been updated.

Olsson Response (10.15.25): No further comment.

n. Olsson Comment (8.12.25): Plan view indicates SUP linetype overlays the property limits. Revise to depict the SUP permit Boundary and all property limits.

Applicant Response (9.30.25): SUP linetype legend has been revised to include property limits designation.

Olsson Response (10.15.25): No further comment.

o. Olsson Comment (8.12.25): Provide gross floor area of the structures.

Applicant Response (9.30.25): Scale House gross floor area added.

Olsson Response (10.15.25): No further comment.

4. Overall Grading Plan – Sheet 4.
   a. Olsson Comment (8.12.25): Provide additional existing contour labels.

   Applicant Response (9.30.25): Additional contour labels added.

   Olsson Response (10.15.25): No further comment.

   b. Olsson Comment (8.12.25): Depict pipe that will convey material from the NW dredging area

   Applicant Response (9.30.25): Pipe has been depicted.

   Olsson Response (10.15.25): No further comment.

   c. Olsson Comment (8.12.25): Does this area drain per existing drainage patterns.

   Applicant Response (9.30.25): Yes, generally south to north.

   Olsson Response (10.15.25): No further comment.

   d. Olsson Comment (8.12.25): Provide statement regarding the septic system to be permitted through a separate application.

   Applicant Response (9.30.25): Note has been added.

   Olsson Response (10.15.25): No further comment.

5. Grading Plan – Sheet 5.
   a. Olsson Comment (8.12.25): Proposed grading doesn't tie out to existing contours in the site plan. Tie out grading and update. Provide additional information depicting off-site areas draining

onto the site and how runoff effects adjacent areas. Confirm drainage patterns are to remain adjacent properties. (typ).

Applicant Response (9.30.25): Proposed grading has been revised to properly tie out. Additional flow arrows have been added to demonstrate flow patterns external to the disturbed area. No additional runoff will be directed towards adjacent properties compared to existing conditions. Site is nearly completely bordered by berms, roadways, and railroad tracks which further demonstrate adjacent properties will not be affected.

Olsson Response (10.15.25): No further comment.

b. Olsson Comment (8.12.25): Provide existing and proposed drainage arrows to and from the site. (typ)

Applicant Response (9.30.25): Additional flow arrows have been added. Site and surrounding areas are nearly flat. Little to no stormwater runoff will flow to and from site.

Olsson Response (10.15.25): No further comment.

c. Olsson Comment (8.12.25): Grading in the public roadway?

Applicant Response (9.30.25): No grading within public right of way is proposed, sheets have been updated.

Olsson Response (10.15.25): No further comment.

d. Olsson Comment (8.12.25): Match-line doesn't coordinate. Example Sheet 5 and 16. Revise throughout set.

Applicant Response (9.30.25): These are intended to be enlargements instead of match lines, terminology has been updated throughout set.

Olsson Response (10.15.25): No further comment.

e. Olsson Comment (8.12.25): Existing contours do not tie into the proposed grading (typ).

Applicant Response (9.30.25): Contours have been updated.

Olsson Response (10.15.25): No further comment.

6. Grading Plan – Sheet 6.
   a. Olsson Comment (8.12.25): Existing contour label.

      Applicant Response (9.30.25): Additional labels have been added.

      Olsson Response (10.15.25): No further comment.

   b. Olsson Comment (8.12.25): Grading in the public roadway?

      Applicant Response (9.30.25): No grading within public right of way is proposed, sheets have been updated.

      Olsson Response (10.15.25): No further comment.

   c. Olsson Comment (8.12.25): Proposed contour label? Tie out.

      Applicant Response (9.30.25): Contour has been removed.

      Olsson Response (10.15.25): No further comment.

7. Grading Plan – Sheet 7.
   a. Olsson Comment (8.12.25): Doesn't tie out.

      Applicant Response (9.30.25): Contours have been revised.

      Olsson Response (10.15.25): No further comment.

   b. Olsson Comment (8.12.25): Does this area drain? Provide additional information on how area drains.

      Applicant Response (9.30.25): Areas external to disturbed areas will drain as they do in existing conditions. Additional flow arrows have been added.

      Olsson Response (10.15.25): No further comment.

8. Grading Plan – Sheet 8.

a. Olsson Comment (8.12.25): Will a culvert pipe be needed to convey existing drainage?

   Applicant Response (9.30.25): Culvert has been depicted.

   Olsson Response (10.15.25): Culvert is inside the right-of-way. Culvert design is to be submitted as part of the right-of-way permit application. Provide note on site plan.

b. Olsson Comment (8.12.25): Provide existing contour labels.

   Applicant Response (9.30.25): Additional labels have been added.

   Olsson Response (10.15.25): No further comment.

c. Olsson Comment (8.12.25): Does this area drain per existing drainage patterns. Provide additional information on how area drains.

   Applicant Response (9.30.25): Areas external to disturbed areas will drain as they do in existing conditions. Additional flow arrows have been added.

   Olsson Response (10.15.25): No further comment.

9. Grading Plan – Sheet 9.
   a. Olsson Comment (8.12.25): Does this area drain per existing drainage patterns. Provide additional information on how area drains.

      Applicant Response (9.30.25): Areas external to disturbed areas will drain as they do in existing conditions. Additional flow arrows have been added.

      Olsson Response (10.15.25): No further comment.

10. Grading Plan – Sheet 13.
    a. Olsson Comment (8.12.25): Does this area drain per existing drainage patterns. Provide additional information on how area drains.

       Applicant Response (9.30.25): Areas external to disturbed areas will drain as they do in existing conditions. Additional flow arrows have been added.

Olsson Response (10.15.25): Provide additional grading information along the south side of the berm. South side of the berm depicts a proposed 786 contour. Sheet is not clear how drainage is conveyed from the 786 contour. Provide additional information to demonstrate stormwater conveyance to not impact abutting property.

b. Olsson Comment (8.12.25): Existing contours do not tie into the proposed grading (typ).

Applicant Response (9.30.25): Contours have been revised.

Olsson Response (10.15.25): Proposed 786 contour along south side of the berm ties into the proposed 788 contour within the dredge area at the bottom right corner of the sheet. Revise grading.

11. Grading Plan – Sheet 16.
    a. Olsson Comment (8.12.25): Grading in the public roadway?

    Applicant Response (9.30.25): No grading within public right of way is proposed, sheets have been updated.

    Olsson Response (10.15.25): No further comment.

12. Grading Plan – Sheet 17.
    a. Olsson Comment (8.12.25): Existing contour label.

    Applicant Response (9.30.25): Additional labels have been added.

    Olsson Response (10.15.25): No further comment.

13. Grading Plan – Sheet 18.
    a. Olsson Comment (8.12.25): Proposed contour label?

    Applicant Response (9.30.25): Contours have been removed.

    Olsson Response (10.15.25): No further comment.

    b. Olsson Comment (8.12.25): Does this area drain? Provide additional information on how area drains.

Applicant Response (9.30.25): Additional flow arrow has been added.

Olsson Response (10.15.25): Top right of sheet, depicts a proposed contour. Provide proposed contour label elevation on sheet 18. Proposed contour carries to sheet 9 and doesn't tie out. Depict tie out of contour and add contour label elevation.

14. Erosion Control Plan – Sheet 19.
    a. Olsson Comment (8.12.25): Erosion control plans are not required for the site plan application. Erosion control plan and SWPPP not reviewed. Applicant to provide the County with a copy of the permit authorization (NOI) from KDHE for County records prior to disturbance.

       Applicant Response (9.30.25): Acknowledged.

15. Grading Plan – Sheet 14.
    Olsson Comment (10.15.25): Proposed 786 contour ties out to the existing 788 contour. Revise grading. Provide additional information to demonstrate stormwater conveyance to not impact abutting property.

Route Study (Traffic Study, Drainage Structures Report, and Pavement Evaluation Report):

Detailed review below:

1. Olsson Comment (4.17.25): Page 31 of the Traffic Study states: This geometry has been compared to the required minimum criteria found in Chapter IV of the Leavenworth County Department of Public Works Road Construction and Strom Water Drainage Standards, dated January 1, 2003, as shown in Table 9. Page 34 states: The existing roadway geometry of both the Primary and Alternate Routes do not match the Collector Street Typical Section adopted in Chapter V of the Chater IV of the Leavenworth County Department of Public Works Road Construction and Storm Water Drainage Standards.

   In accordance Leavenworth County Public Works Department, the Leavenworth County Department of Public Works Road Construction and Storm Water Drainage Standards for new subdivisions, dated January 1, 2003, are not applicable to the proposed routes within the County's jurisdiction. Furthermore, the County does not have an adopted roadway standard for roadways within said proposed routes.

   For routes within Leavenworth County, the applicant shall develop a typical roadway section in accordance AASHTO and the Roadside Design Guide criteria for the purposes of assessing the existing roadways within said routes. The assessment shall identify necessary improvements to said routes to meet the referenced criteria, provide function for the SUP operations, and provide a

safe corridor to the general welfare of the traveling public. The typical section should include lane and shoulder widths, shoulder material type, pavement width and thickness, pavement slope, roadway foreslope and backslopes, and ditch widths. The assessment shall be based on the existing posted speed limits, geotechnical information, pavement evaluation report, 25 year pavement design life, volume of traffic per day including size and types of trucks, growth factors, and include the SUP's proposed traffic generation. Said assessment shall also include, but not be limited to, the review of vertical and horizontal curves, traveled way widening on horizontal curves, stopping sight distance, truck turning movements at intersections, superelevation, right of way impacts, edge drop off, pavement markings, signage, and impacts to physical features along the routes (i.e. driveways, guardrail, culverts, and other physical features found).

A route study shall be generated to be included with the above assessment. The updated traffic study, drainage structures report, and pavement evaluation report shall be included in the route study. Said study shall be signed and sealed by a Kansas Professional Engineer.

Applicant Response (7.16.25): A revised typical roadway section (Figure 17, PDF Page 33, Appendix F, Pages 277-281) has been developed using AASHTO Green Book and Roadside Design Guide criteria. The Route Study assesses improvements for safe and functional operation and is signed/sealed by a Kansas Professional Engineer.

Olsson Response (8.12.25): A route study has not been provided; the route study should consolidate and present recommendations from the traffic, drainage structures and pavement evaluation reports. The traffic impact study states that there are several existing deficiencies identified but that improvements are not triggered by the proposed development. Of the existing conditions noted, the impact of truck traffic associated with the development is not presented. For example, the previous study presented potential benefits of shoulder or guardrail, but that text has been removed from the report. The study does not present if the existing road width and curvature is adequate to support the planned truck traffic (ie – trucks over tracking the lane on curves).

Applicant Response (9.30.25): A Route Study Report which consolidates the findings from the updated Traffic, Drainage Structure, and Pavement Evaluation reports is being provided.

Olsson Response (10.15.25): The route study does not present specific recommendations regarding improvements to the road network. The applicant has indicated that recommendations will be determined during the preliminary design phase.

2. Olsson Comment (4.17.25): Page 30 of the Traffic Study states: Notably, there is a railroad crossing just north of the 161st Street and Railroad Road intersection, but evaluation of the crossing and

coordination with the railroad or KDOT was not considered in this study. While not considered as part of this study, the crossing has signage warning vehicles about low ground clearance. As the 161st Street crossing is to serve as primary access to the sand operation, it is recommended that the railway crossing be evaluated to reduce grades and improve safety. Page 77 Summary of Proposed Conditions: Evaluate the 161st Street railroad crossing for necessary improvements to increase clearance based on operation vehicles.

Evaluate railway crossing as recommended in the traffic study. Queueing should be reviewed to determine if there is potential to back and block adjacent intersections/railroad. Include documentation of coordination with the rail company.

Applicant Response (7.16.25): Evaluation for safety, clearance, and queuing is completed and included in the revised study with documentation of outreach. No additional evaluation of the crossing is needed.

“Notably, there is a railroad crossing just north of the 161st Street and Railroad Road intersection. Based on conversations with the owner of the quarry, it was determined that quarry vehicles would have adequate clearance for the crossing, and therefore, a detailed evaluation of the crossing was not completed as part of this study. Vehicles have adequate clearance or may self-lift to clear the crossing. Additionally, given the low volume of vehicles on 161st Street, it is expected that queuing will not block adjacent intersections during crossing events.” (Traffic Study, PDF Page 32. Existing Route Geometric Analysis.)

Olsson Response (8.12.25): A review of the rail crossing was not conducted; the traffic impact study references a conversation with a quarry owner who states the crossing is adequate. The recommendation for crossing improvements was removed from the resubmittal. Due to the primary vehicle type associated with the project being heavy trucks, coordination with the rail company and/or KDOT to be conducted to ensure the current crossing is acceptable for truck use. Provide coordination and approval documentation from the rail company and/or KDOT as part of the application.

Additionally, information is not presented regarding the number of trains per day, length of typical crossing train, etc. The study states that queuing is not expected to be an operational or safety concern, which may be acceptable for the segment of 161st Street north of the rail crossing. Access to the site is planned south of the rail line; dependent upon departure rates of traffic from the site, queuing could extend along Railroad Road/Green Street or internal to the site.

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Site plan: A gate is noted on the site plan (lockable). It appears the gate is approximately 60 feet south of Railroad Road/Green Street. How will the gate be operated? If the gate is closed/locked could the situation arise where trucks would be queued waiting for access, which could approach/pass the rail line?

Site plan: Site plan indicates new entrance is within the rail company right-of-way. Applicant to provide coordination and approval documentation from the rail company regarding new entrance.

Applicant Response (9.30.25): The railroad has indicated that the request for review and approval must come from the County. Copies of our correspondence with the railroad and contact information has previously been provided to Staff.

Olsson Response (10.15.25): The route study should be provided to the rail company by the county and any required improvements coordinated with the applicant under the preliminary design phase.

3. Olsson Comment (4.17.25): The traffic study is labeled draft. The traffic study shall be signed and sealed by a Kansas Professional Engineer.

   Applicant Response (7.16.25): The traffic study is “final” and is signed and sealed by Kendra Miller, a Kansas Professional Engineer.

   Olsson Response (8.12.25): No further comment.

   Applicant Response (9.30.25): Acknowledged

4. Olsson Comment (4.17.25): Traffic trips are inconsistent throughout the application documents. Revise documents to be consistent.

   Example: The SUP Application indicates a maximum of 120 round trips for truck versus the 220 trucks (110 round trips) listed in the report. The narrative write-up indicates 120 round trips, which would represent 240 total trips.

   Applicant Response (7.16.25): Trips have been revised to 240 daily trips throughout the study document.

   Olsson Response (8.12.25): See original comment.

   The traffic study presents 250 total trips (240 haul route/trucks, 10 operations).

SUP application matches operations trips but daily trips are 10-120. Referencing the TIS the daily trips for trucks should be 240.

The narrative document presents a range of trips for trucks but does not present operations trips. Trips presented should match the study and application – for example: 10 total operations trips and 240 total truck trips.

The 'Applicant's Response to Staff Comments' - #6 – The response indicates that many drivers will be employees of the applicant traveling to 9501 Woodend, but that "many other drivers" will be taking product elsewhere. Are the "many other drivers" in addition to the trips to/from the processing facility that are employees of the applicant? The narrative indicates that traffic volumes are based on applicant historical volumes, confirm that the historical volumes include all trips (applicant employees and other drivers).

Applicant Response (9.30.25): Non-applicant trips are included in the 240 total trips. The Narrative has been clarified to reflect that the average expected number of round trips from operations will be approximately 50 round trips per day. In an abundance of caution and to be overly conservative, the Route Study assumed 120 round trips, 120 in and 120 out, would be generated. The total trips includes all trips, both Applicant and non-applicant trips.

Olsson Response (10.15.25): The trips presented in the special use permit application do not appear to match the route study.

5. Olsson Comment (4.17.25): For the primary and alternate routes, depict and describe the Leavenworth County and KDOT jurisdiction limits within the application documents. Leavenworth County's review is limited to Leavenworth County jurisdiction only. Applicant shall acquire all appropriate approvals from KDOT for any intersection or roadway within KDOT jurisdiction

   Applicant Response (7.16.25): A map with jurisdictional limits has been created and included in the study. Improvements within KDOT right-of-way will be coordinated with KDOT directly. (Figure 3, PDF Page 9.)

   Olsson Response (8.12.25): Applicant to provide coordination and approval documentation in the application from KDOT for any intersection or roadway within Leavenworth County jurisdiction.

   Applicant Response (9.30.25): GBA has initiated coordination with the KDOT Metro Engineer (Bonner Springs), Ryan Barrett, and will provide KDOT with a copy of the Route Study Report for

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their review and input. Until a time when design plans are provided to KDOT for concurrence regarding recommendations at K-32 intersections, their engagement will be informational only. Formal buy-in would occur during the design phase, as KDOT does not typically approve of proposed improvements without design plans.

Olsson Response (10.15.25): The route study should be presented to KDOT for their review and determination regarding any required improvements.

6. Olsson Comment (4.17.25): Confirm all trucks will haul from the site to the Kaw Valley Companies processing facility at 9501 Woodend Road in Edwardsville, Kansas. Will there be onsite sales causing destinations different than the processing facility? What practice will be used to ensure all drivers take the Primary vs Alternative vs Other routing between the two facilities?

   Applicant Response (7.16.25): While many drivers will be employees of the Application and haul from the site to 9501 Woodend in Edwardsville, KS, many other drivers will be taking product to locations throughout the metro area. All drivers when stopped at the weigh station will be given printed directions and instructed to use the primary route as they prepare to leave the site.

   Olsson Response (8.12.25): How will drivers that are not employees of the applicant know which route to use? The study only presents trips between 9501 Woodend and the site, are additional trips along other routes expected? Confirm that the trip distribution and expected operations presented in the traffic impact study reflect expected vehicular routing.

   Applicant Response (9.30.25): Non-Employee traffic, i.e., traffic not going to 9501 Woodend is included within the provided studies.

   Olsson Response (10.15.25): Based on the information presented, non-employee traffic may not be aware of the designated haul route and could use alternate routes.

7. Olsson Comment (4.17.25): Revise drainage structures report to include the assessment of structures along the alternate route, 161st Street along the primary route, and structures along the route from the northwest dredging to the proposed routes.

   Applicant Response (7.16.25): The report has been updated to include all drainage structures along the primary, alternate, and northwest dredging area routes. The limits of the drainage structures study area includes:
   - 189th St/Golden Rd from K-32/Linwood Rd to 158th/161st
   - 158th St from Golden Rd to Loring Rd

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- Loring Rd from 158th St to 142nd St (County Line)
- 166th St from Golden Rd to Lenape Rd
- Lenape Rd/Desoto Rd/Amnesty Rd/161st St from 166th St to Golden Rd

The report assessed 20 additional structures, beginning with culvert ID 12 (page 65 of the report) and ending with Culvert ID 31.

Olsson Response (8.12.25): See attached drainage structure review.

Applicant Response (9.30.25): An updated Drainage Structures Report dated 9/26/2025 is being submitted. Revised maintenance recommendations in this updated study are based on Olsson's comments. A disclaimer has been added to the title page that this report evaluated conditions through a visual inspection only. Structural capacity was not evaluated and would be assessed during the design phase to determine if, and which, structures may need replacement or other modifications to meet current criteria.

Olsson Response (10.15.25): No further comment.

8. Olsson Comment (4.17.25): Revise pavement assessment to include 161st Street as it is part of the primary route and the route to the northwest dredging area proposed.

   Applicant Response (7.16.25): The pavement assessment has been revised to include 161st Street and related access segments.

   Olsson Response (8.12.25): See review of the Pavement Evaluation Report.

   Applicant Response (9.30.25): Revised report includes clarification of the analysis and recommendations for 161st street.

   Olsson Response (10.15.25): Limited information is provided in the route study regarding 161st Street. The pavement report presents pavement design. Recommendations regarding roadway improvements to 161st Street should include, but not be limited to, roadway width and typical section. Per the applicant, final recommendations will be determined during the preliminary design phase.

9. Olsson Comment (4.17.25): The traffic impact study provides a narrative of crashes, provide a figure depicting the crash locations on a map along with additional narrative from crash reports. The

appendix should include additional information for crashes, specifically including the crash year, type, location, and level of severity.

Applicant Response (7.16.25): The crash map is unchanged from the previous submittal. Crash year, type, location, severity, and other relevant information is now provided in a new appendix (Appendix C, page 219).

Olsson Response (8.12.25): Adequate information is not provided in the report or on the figure to determine conditions surrounding reported crashes. Specifically, are there any existing conditions or crash trends that should be further considered with the use of the route as a haul road with heavy trucks? The report presents that some crashes are related to navigating the curve from Golden Road to 189th Street. Further evaluation should be presented to determine if trucks can navigate this curve while maintaining the lane. Crash occurrences at the intersection of Golden Road and 166th Street are also noted; will the increase of truck traffic increase crash potential? Are there improvements recommended to address the conditions with the proposed increase of truck traffic?

Applicant Response (9.30.25): The design team has reviewed the SS4A study for crashes and has provided additional narrative as part of the Route Study Report.

Olsson Response (10.15.25): Acknowledged.

10. Olsson Comment (4.17.25): Page 26 of the traffic study narrative describes that the intersection of 161st Street with Golden Road / 158th Street is at a skew, and it is preferrable to have the intersection reconfigured. Is this a recommendation? If so, provide sketch and sight distance review of proposed reconfiguration geometry.

    Applicant Response (7.16.25): Reconfiguration of the intersection is not recommended. Narrative has been removed from study. (PDF Page 28).

    Olsson Response (8.12.25): What is the justification for removing the recommendation? Did conditions change?

    Applicant Response (9.30.25): It was originally a consideration not a formal recommendation and was not a recommendation in the SS4A study. Given the lack of crash history at the intersections, skew correction is not required to meet current design criteria unless reconstruction is recommended, and then implementation of that modification should be considered.

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Olsson Response (10.15.25): Acknowledged. KDOT will need to review the route report to confirm the current configuration is adequate for the proposed truck traffic.

11. Olsson Comment (4.17.25): Page 27 of the traffic study notes that the sight distance for K-32 & Golden Road / 158th Street is 1,004 in the appendix and 1,099 in the report, confirm 1,099 is the correct value.

    Applicant Response (7.16.25): The reference to K-32 & Golden Road / 189th Street and the appendix value has been updated to 1,099 (PDF Page 234).

    Olsson Response (8.12.25): No further comment.

    Applicant Response (9.30.25): Acknowledged.

12. Olsson Comment (4.17.25): Page 28 of the traffic study does not show improvements at 158th Street and Loring Road, page 310 of the appendix indicates additional pavement at the intersection, a northbound deceleration taper along 158th Street is shown. Is this a recommendation?

    Applicant Response (7.16.25): Existing conditions (PDF Page 30 of revised Traffic Study) do not warrant any additional improvements. Ultimate development does warrant improvement and is recommended in both proposed conditions and recommendations sections. (PDF Pages 64 & 80).

    Olsson Response (8.12.25): A northbound right-turn taper is recommended. The study should provide detail on length of taper.

    Applicant Response (9.30.25): The length of the taper has been provided in the Route Study Report; however, the layout of the recommendation will be provided as part of any proposed design improvements.

    Olsson Response (10.15.25): The route study does not present specific recommendations regarding improvements to the road network. The applicant has indicated that recommendations will be determined during the preliminary design phase.

13. Olsson Comment (4.17.25): Page 28 of the traffic study presents sight distance for the intersection of Loring Road / Loring Lane & 142nd Street pertaining to the northbound right-turns and southbound left-turns. Images in appendix appear to be for 142nd Street, not the intersection of Loring Road / Loring Lane. Was sight distance reviewed for the approach of Loring Road to Loring Lane?

Applicant Response (7.16.25): Existing conditions (PDF Page 30 of revised Traffic Study) do not warrant any additional improvements. Ultimate development does warrant improvement and is recommended in both proposed conditions and recommendations sections. (PDF Pages 64 & 80).

Page 30 now includes:

“Loring Road & Loring Lane is a minor-road stop-controlled intersection, with the north-south portion of Loring Road serving as the major roadway. Eastbound Loring Road serves as the stop-controlled minor roadway.

Sight distance at the Loring Road & Loring Lane intersection was reviewed to meet the minimum requirements as outlined in the AASHTO Green Book. Based on calculations for tractor-trailer trucks, a minimum of 761 ft. of sight distance is required to the north, and a minimum of 592 ft. is required to the south for stop-controlled vehicles on eastbound Loring Road. For both right-turns and left-turns, sight distance requirements were met. Full sight distance calculations and photos may be seen in Appendix D.

At the intersection, sand operation trucks utilizing the Alternate Route headed to and from the facility will complete eastbound left-turn and southbound right-turn movements. Additional pavement is not required to accommodate truck turning movements for either existing or proposed geometries at the intersection. Full turning envelopes for the intersection may be seen in Appendix E. The Primary Route does not utilize the intersection.”

Olsson Response (8.12.25): The traffic impact study recommends clearing of vegetation within right-of-way. No further comment.

Applicant Response (9.30.25): Acknowledged.

14. Olsson Comment (4.17.25): Page 63 of the traffic study describes capacity analysis, reviewing appendix results a single heavy vehicle percentage factor was applied to all movements. Provide justification for the application of the heavy vehicle percentage adjustment used universally or adjust for calculations based on a per-movement basis.

    Applicant Response (7.16.25): Heavy vehicle percentages were adjusted to match per-movement values from collected traffic counts in existing operational scenarios, or calculated for all proposed operational scenarios.

Olsson Response (8.12.25): No further comment.

Applicant Response (9.30.25): Acknowledged.

15. Olsson Comment (4.17.25): The site plan depicts an access along Lenape Road, confirm/describe how this drive interacts with the proposed site and how vehicles will be limited/restricted from using Lenape Road to 166th Street.

    Applicant Response (7.16.25): The accesses along Lenape Road will be limited to service vehicles. No hauling will be permitted on Lenape Road. Written instructions will be given to drivers to exit North to Golden Rd. The existing turning geometrics do not allow for left turns out of our site onto Lenape Rd.

    Olsson Response (8.12.25): See comment 28 under this section for comments regarding the drive location.

    Applicant Response (9.30.25): We acknowledge the reference to the access management policy requiring a minimum 100 feet separation between intersections and driveways. In this case, the Kaw Valley site driveway does not fall within 100 feet of any true intersection. The roadway feature in question is a horizontal bend where Lenape Road transitions and ties into the access road. This bend does not create a defined intersection condition per the access management policy. Therefore, the site driveway connection is compliant with the policy intent, as it does not conflict with an intersecting roadway approach.

    Olsson Response (10.15.25): The concern with the location of the drive is the intersection of the proposed drive location along a curved segment of roadway. Further review and evaluation of the proposed drive access should be conducted during the preliminary design phase.

16. Olsson Comment (8.12.25): Leavenworth County classifies Golden Road east of 166th Street as an arterial but the study presents the road as a collector. What is the justification/reasoning for this change in classification for the county road?

    Applicant Response (9.30.25): This error has been corrected in the Route Study Report.

    Olsson Response (10.15.25): Acknowledged.

17. Olsson Comment (8.12.25): The study does not present existing conditions of 161st Street or if the gravel surface and existing road width is adequate for proposed traffic.

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Applicant Response (9.30.25): Our latest report includes boring findings, analysis, and recommendations for the segment of 161st street. Existing gravel road width adequacy will be addressed in roadway design phase.

Olsson Response (10.15.25): The route study does not present specific recommendations regarding improvements to the road network. The applicant has indicated that recommendations will be determined during the preliminary design phase.

18. Olsson Comment (8.12.25): Study notes horizontal and vertical curves that do not meet minimum requirements. Provide a proposed solution to address these deficiencies. What is the impact of additional truck traffic on the conditions?

    Applicant Response (9.30.25): Existing geometrics for some horizontal and vertical curves do not meet current design criteria. Additional narrative has been added in the Route Study offering recommendations for options to bring existing curvatures to meet current criteria. With regard to the impact of trucks versus automobiles, vertical curves are designed based on speed taking into account the height of eye to meet stopping sight distance requirements, therefore accounting for both automobiles and trucks. The same is true for horizontal curves, in combination with superelevation, that the design vehicle will not alter the selection of an appropriate radius and superelevation based on design speed.

    Modifications to both horizontal and vertical curves would be developed as part of preliminary design in coordination with the county.

    Olsson Response (10.15.25): The route study does not present specific recommendations regarding improvements to the road network. The applicant has indicated that recommendations will be determined during the preliminary design phase.

19. Olsson Comment (8.12.25): Study notes in the Horizontal and Vertical Geometry section that the minimum pavement width and cross section of the road was based on the Golden Road Pavement Evaluation Report. The width of road driving lanes and whether a road needs shoulders should be based on AASHTO Green Book. Whether a shoulder should be paved, dirt or gravel needs to be established in the study. Please provide a recommended shoulder type and cite the source.

    Applicant Response (9.30.25): Depending on what pavement recommendation is selected in coordination with the county, there are a variety of combinations of typical sections that may be used to modify the existing roadway to meet current criteria. One size will not fit all based on

varying existing conditions along the primary and alternate routes (e.g. a fill versus cut section and existing right of way widths will drive typical section choices that may not be one consistent typical section). The Route Study is intended to identify existing conditions, and through the development of preliminary design plans and coordination with county officials, a preferred typical section will be selected for one or more station ranges along the primary and secondary routes. At this time, a single recommendation is not provided, however, the impacts of choices regarding paving action, shoulder type and width, foreslope selection, and drainage and right of way impacts is contemplated in the report.

Olsson Response (10.15.25): The route study does not present specific recommendations regarding improvements to the road network. The applicant has indicated that recommendations will be determined during the preliminary design phase.

20. Olsson Comment (8.12.25): Please label the slope of the 6' shoulder on the Figure 17 Typical Cross Section. Please show the proposed typical section geometry beyond the traveled way. The referenced Roadside Design Guide tables are not specific enough. Please confirm that this typical section is what is recommended for the Primary and Secondary route.

    Applicant Response (9.30.25): Clear zone considerations have been accounted for with a revised typical section, and are included within the report. Recommended typical sections will be provided at the preliminary design plan stage after various design criteria choices, as previously discussed in comment 19 response, are concurred with by county officials

    Olsson Response (10.15.25): The route study does not present specific recommendations regarding improvements to the road network. The applicant has indicated that recommendations will be determined during the preliminary design phase.

21. Olsson Comment (8.12.25): The clear zone table referenced in Table 10 shows 4:1 is the maximum foreslope in the clear zone assuming there is no traversable area below a steeper slope. Is this the foreslope you are recommending off the new shoulder?

    Applicant Response (9.30.25): Foreslope will vary along the route depending on cut versus fill section and available right of way, along with ditch capacity based on drainage flows (not part of this report, but would be included in the preliminary design phase). The design team is recommending the use of foreslopes and backslopes that meet clear zone requirements, which would be any slope flatter than a 4:1 within the clear zone.

Olsson Response (10.15.25): The route study does not present specific recommendations regarding improvements to the road network. The applicant has indicated that recommendations will be determined during the preliminary design phase.

22. Olsson Comment (8.12.25): The pavement evaluation report borings indicate varying pavement thicknesses and recommends an overlay with a minimum thickness for each route. How will consistent pavement structure be maintained when the recommended overlay thickness differs along each route?

    Applicant Response (9.30.25): The design team has provided clarity around the recommended paving action based on a range of treatments – see Route Study Report. A variety of paving actions will be considered given that the existing pavement thickness is not uniform. Typical design practice is to show proposed treatments in the preliminary design plans, providing station ranges with a proposed paving action that will be used to meet a minimum thickness. This is needed to not only address a minimum thickness across the roadway, but may also require increased thickness where existing superelevation correction is needed to meet current geometric design criteria.

    Olsson Response (10.15.25): The route study does not present specific recommendations regarding improvements to the road network. The applicant has indicated that recommendations will be determined during the preliminary design phase.

23. Olsson Comment (8.12.25): In the 'Roadway Drive Lane and Shoulder Dimensions' section, language regarding HSM guidance on road widening and shoulders has been removed. What is the justification for the removal of this language? Is road widening or shoulder needed to support the proposed vehicle type?

    Applicant Response (9.30.25): Language regarding HSM was removed because the appropriate design guidance are the AASHTO Greenbook, and Roadside Design Guide. Road widening needs are addressed later in comment response 25.

    Olsson Response (10.15.25): The route study does not present specific recommendations regarding improvements to the road network including shoulder recommendation. The applicant has indicated that recommendations will be determined during the preliminary design phase.

24. Olsson Comment (8.12.25): The report presents that guardrail 'could be considered'. Previous report language has been removed that indicated that if shoulder/grading work was conducted guardrail recommendations may change. The report needs to clearly state if an improvement is recommended. Does the proposed vehicle type or proposed shoulders impact the need for

guardrail at specific locations? Were any segments of steep embankment cross referenced to crash reports to determine if providing guardrail would improve conditions for proposed haul route traffic?

Applicant Response (9.30.25): Guardrail, and potentially other appropriate safety treatments such as Type 4 end sections on cross road pipes are recommended if the clear zone conditions cannot be met with a traversable and recoverable slope. Regardless of vehicle type or proposed shoulder width, the clear zone requirement will be the same. Typical practice, and what the design team proposes, will be to provide roadside safety treatments at the preliminary plan stage where clear zone conditions cannot be met due to right of way or other constraints. Regardless of crash reports, improvements to the roadway should address providing a clear zone that meets current criteria. Guardrail is one potential option to improve steep embankments; others include flattening of sideslopes or end section treatments to existing structures to meet the clear zone.

Olsson Response (10.15.25): The route study does not present specific recommendations regarding improvements to the road network. The applicant has indicated that recommendations will be determined during the preliminary design phase.

25. Olsson Comment (8.12.25): 'Superelevation and Advisory Speed Review' section of the report presents a review of advisory speed within curves. Were the curves reviewed to determine if trucks can maintain lane with the 11' lanes while navigating the curve?

    The report recommends changing the advisory speed along the Golden to 158th curve from 35 mph to 30 mph but this recommendation is not noted in the final section of the report.

    Why weren't ball bank measurements taken along the reverse curve on 158th Street between Golden Road and Loring Road? The study recommends to remove advisory speed plaques based on speeds that were determined acceptable; recommendation for removal of signage should be based on measurement.

    Applicant Response (9.30.25): There is an inability for trucks to maintain their lane position with 11' lanes and tight radius curves as they exist today. Based on field observations, no vehicle is able to consistently maintain their lane position due to very tight radius horizontal curves. A swept path analysis will be performed during design when assessing existing horizontal curves to determine off-tracking impacts and whether flattening of the curve radius or lane widening is the better solution.

    The design team has collected additional cross slope data at all horizontal curves, that is included in the appendices of the Route Study Report. Ball bank readings can provide some insight into

advisory speeds that could be used for existing curves, however, to meet current design criteria, best practice is to evaluate the existing cross slope against recommended superelevation based on speed and radii. A summary of those findings indicates that in general, the high side of the super does not meet current criteria for any horizontal curve.

The reverse curves on 158th between Golden Road and Loring Road did not register a reading on the ball bank indicator, therefore a reduction in advisory speed was not necessary. The report section has been modified to indicate this finding.

Olsson Response (10.15.25): The route study does not present specific recommendations regarding improvements to the road network. The applicant has indicated that recommendations will be determined during the preliminary design phase.

26. Olsson Comment (8.12.25): Several signing recommendations are noted, specifically along curves along the haul route. Given the proposed vehicle type associated with the application, are any of the signs recommended to be installed to support the project?

    Applicant Response (9.30.25): The Applicant's consultant team recommends the removal of the "Commercial Vehicles Excluded" signs to allow for a haul route.

    Olsson Response (10.15.25): The route is currently signed per County Resolution 2009-50. County Resolution will need to be revised to remove the 'Commercial Vehicles Excluded' signage. Specific improvements to support heavy vehicle traffic on the roadway should be identified during the preliminary design phase.

27. Olsson Comment (8.12.25): If pavement modifications are made (overlay), adjustments to signing should be made as needed to support the improvement. Pavement markings along overlay sections should be installed per recommendations provided in the report.

    Applicant Response (9.30.25): Pavement marking modifications will be provided at the design phase of the project after proposed paving actions are selected.

    Olsson Response (10.15.25): The route study does not present specific recommendations regarding improvements to the road network. The applicant has indicated that recommendations will be determined during the preliminary design phase.

28. Olsson Comment (8.12.25): The study doesn't present review/discussion of the proposed drive locations. Proposed access to the site along Railroad Road/Green Street and Lenape Road should

be provided. Consider relocation of the drives so that they are not located along a curve or provide justification for the proposed location. Confirm adequate sight distance is provided. See site plan review.

Applicant Response (9.30.25): We acknowledge the reference to the access management policy requiring a minimum 100 feet separation between intersections and driveways. In this case, the Kaw Valley site driveway does not fall within 100 feet of any true intersection. The roadway feature in question is a horizontal bend where Lenape Road transitions and ties into the access road. This bend does not create a defined intersection condition per the access management policy. Therefore, the site driveway connection is compliant with the policy intent, as it does not conflict with an intersecting roadway approach.

Olsson Response (10.15.25): The concern with the locations of the drives is the intersection of the proposed drive location along a curved segment of roadway. Further review and evaluation of the proposed drive access should be conducted during the preliminary design phase.

29. Olsson Comment (8.12.25): The turning templates in the traffic study are different than the templates provided on the site plan. During design of proposed intersection improvements at Golden and 161st, the truck turning templates should be reviewed and truck movements maintained within the appropriate lane.

    Applicant Response (9.30.25): Truck swept path diagrams have been updated; where improvements are not recommended these diagrams demonstrate lane-keeping. If off-tracking illustrates lane- keeping cannot be achieved, proposed pavement widening has been identified with an illustration in the Route Study Report. Design of this widening will be included in the preliminary plan stage of the project.

    Olsson Response (10.15.25): The route study does not present specific recommendations regarding improvements to the road network. The applicant has indicated that recommendations will be determined during the preliminary design phase.

30. Olsson Comment (8.12.25): The conclusion section recommends the addition of a thick overlay on both routes but does not identify how the edge drop off that would be created is mitigated. The traffic impact study describes the typical section in Figure 17 as the minimum requirements for the traveled way and shoulders. Per the typical section the edge of the travel lane is flush with the shoulder. Would the overlay affect existing guardrails, culverts, driveways, mailboxes, and intersecting roadways abutting the overlay? Provide how the edge drop off will be mitigated to meet the typical section.

The pavement evaluation report borings indicate varying pavement thicknesses and recommends an overlay with a minimum thickness for each route. How will this be mitigated along the edge of pavement when the recommended overlay thickness differs along each route?

Applicant Response (9.30.25): Various methodologies can be used to address edge drop offs; the change in elevation of the drop off and existing typical section often dictates the proposed solution. Since the existing pavement thickness varies along the primary and alternate routes, various treatments may be required to balance impacts to right-of-way, maintaining ditch capacity, accommodating existing drainage structures, avoidance of utilities, etc. Several solutions include: the addition of shoulder with flattened sideslopes, pavement edge wedge to tie pavement to existing ground where foreslopes are flatter, the use of FHWA recommended safety edge slope, the use of roadside safety appurtenances such as guardrail, etc. A combination of these features can be chosen to address varying existing roadway typical sections in coordination with the paving action, which would be selected as part of the decision making process with the county during preliminary design

Olsson Response (10.15.25): The route study does not present specific recommendations regarding improvements to the road network. The applicant has indicated that recommendations will be determined during the preliminary design phase.

31. Olsson Comment (8.12.25): The conclusion section states that improvements to meet road standards identified as part of this study are not the responsibility of the developer. The application increases the volume of vehicles and trucks on the proposed routes. Analysis shall be included to determine if the increased traffic will exasperate reported existing deficiencies.

    Applicant Response (9.30.25): Operationally, the increased traffic will not exasperate existing conditions. Geometric features that do not meet current criteria have been summarized and proposed improvements tied to the increased truck traffic are discussed in the response to comment 36 below.

    Olsson Response (10.13.25): The route study does not present specific recommendations regarding improvements to the road network. The applicant has indicated that recommendations will be determined during the preliminary design phase.

32. Olsson Comment (8.12.25): Appendix F does not provide a typical section. Please provide slope labels on cross sections. Do the cross sections include the proposed overlay thickness?

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Applicant Response (9.30.25): Cross sections are illustrative of potential impacts, demonstrating what a proposed section would look like when implemented in an existing cut or fill section along the route. Updated cross sections, that include the proposed paving action, with labeling and other standard details will be provided at the preliminary plan stage, after preferred pavement actions have been selected in coordination with the county.

Olsson Response (10.15.25): The route study does not present specific recommendations regarding improvements to the road network. The applicant has indicated that recommendations will be determined during the preliminary design phase.

33. Olsson Comment (8.12.25): Appendix F does not provide an assessment of right of way impacts. Please provide.

    Applicant Response (9.30.25): In general, the existing right of way along the corridor is 80’ wide and is illustrated on the cross sections provided in the appendices of the Route Study Report. As part of the design survey, exact right of way linework will be collected and added to the proposed plan sheets during the preliminary design phase.

    Olsson Response (10.15.25): The route study does not present right-of-way impacts. The applicant has indicated that the impacts will be determined during the preliminary design phase.

34. Olsson Comment (8.12.25): Appendix F does not provide an assessment of impacts to physical features along the routes. Please provide.

    Applicant Response (9.30.25): A comprehensive assessment of physical feature impacts will be provided during the preliminary design phase, along with mitigation recommendations.

    Olsson Response (10.15.25): The route study does not present specific recommendations regarding improvements to the road network. The applicant has indicated that recommendations will be determined during the preliminary design phase.

35. Olsson Comment (8.12.25): Application proposes an overlay raising the road along and in a flood zone. What are the impacts of raising the road and permitting requirements?

    Applicant Response (9.30.25): A large portion of the existing roadway falls within a floodplain based on effective FEMA maps. Proposed improvements would need to be modeled within HEC RAS software to verify that a No Rise could be obtained and a CLOMR/LOMR would not be needed.

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Once proposed pavement sections have been selected as part of the preliminary design phase, an assessment of impacts to the increase in road elevation can be performed. It is not anticipated that a CLOMR/LOMR would be necessary, however a No Rise Certification and Floodplain Development Permit would be required and would be addressed during the preliminary design phase.

Olsson Response (10.15.25): The route study does not present specific recommendations regarding improvements to the road network. The applicant has indicated that recommendations will be determined during the preliminary design phase.

36. Olsson Comment (8.12.25): Page 79 states: While such deficiencies were identified within this study, these geometric elements are considered existing conditions. Additionally, the proposed sand operation traffic does fulfill any threshold requirements that would trigger potential roadway geometric improvements.

    Clarify statement. Does sand operation traffic fulfill or do not fulfill any threshold requirements?

    Provide the threshold requirements for the deficiencies to require improvements.

    Applicant Response (9.30.25): The items impacted by the additional truck traffic are as follows: potential roadway widening for off-tracking at tight radii curves and intersections with turning movements and insufficient roadway width, existing drainage structures that may not have sufficient structural capacity due to their maintenance condition, and elevation differences in the increased pavement elevation due to paving action and existing ground. Other geometric features do not meet current criteria independent of design vehicle and the proposed sand operation.

    Impacts from off-tracking have been identified at intersections with turning movements in the Route Study Report. The impacts from off-tracking on horizontal curves would be addressed during the design phase as the selection of the proposed improvement will change what amount of widening may be necessary. Additionally, the drainage structure analysis for structural capacity would occur during the design phase, as replacements that are discussed and selected during that phase of the project would negate the need for certain structures to be assessed. Lastly, the elevation change resulting from the selected paving action(s) will be addressed during preliminary design.

    Olsson Response (10.15.25): The route study does not present specific recommendations regarding improvements to the road network. The applicant has indicated that recommendations will be determined during the preliminary design phase. Items described in the applicant's response to be identified with recommendations during the preliminary design phase.

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Pavement Evaluation Report:

Detailed review below:

1. Olsson Comment (4.17.25): Report doesn't provide a vehicle class breakdown for the existing pavement design or existing truck traffic along routes. Provide in report.

   Applicant Response (7.16.25): A detailed vehicle classification breakdown and axle load distribution, based on GBA data, has been added to the revised report. Specifically, PDF Page 2 of the report now states:

   "The existing traffic consists of less than 1% articulated trucks and, amongst all routes, an average of 2% buses/single-unit trucks. Truck traffic of 110 round trips of tandem axle dump trucks is expected to be added to the existing traffic."

   Olsson Response (8.12.25): No further comment.

   Applicant Response (9.30.25): No response.

2. Olsson Comment (4.17.25): Page 1 states: Truck traffic of 110 round trips of tandem axle dump trucks is expected to be added to the existing traffic.

   Confirm the type of tandem axle dump truck and the equivalent single angle loading that each truck or the total of the trucks will be comprised of.

   Applicant Response (7.16.25): The haul trucks are FHWA Class 8 tandem axle dump trucks. Each round trip equates to approximately 2.6 ESALs, as confirmed with GBA.

   Olsson Response (8.12.25): The report references 110 round trips per day for the maximum number of trucks anticipated at the site. However, the application states 120 round trips per day for truck traffic. The report and calculated pavement sections should be updated to reflect the number referenced in the application.

   Applicant Response (9.30.25): Report revised to match 240 total truck count (120 round trips).

   Olsson Response (10.15.25): No further comment.

3. Olsson Comment (4.17.25): According to the traffic study, the primary and alternate route utilizes 161st Street. No route has been identified from the northwest dredging area. 161st Street is a gravel roadway.

Pavement evaluation report to include the 161st Street segment and analysis due to it being part of the route. Pavement evaluation report to include the route from the northwest dredging area and analysis.

Applicant Response (7.16.25): 161st Street and the northwest dredging route have been evaluated. Exploration results and analysis are included in the revised report. (PDF Pages 18, 44, 78, 79).

Olsson Response (8.12.25): Terracon's pavement evaluation report covers Golden Road, N. 158th Street, and Loring Road in Leavenworth County, but does not include the short gravel section of 161st Street. Two additional borings (B-101 and B-102) on 161st Street show a gravel layer (4–12 inches thick) over clayey gravel and lean clay with sand. As 161st Street connects to the proposed sand plant's main entrance and is part of the main route being considered, recommendations for supporting the new truck traffic in combination with new pavement sections are needed along this section of roadway.

Applicant Response (9.30.25): Pavement thickness recommendations added specifically for 161st street in latest revised report.

Olsson Response (10.15.25): No further comment.

4. Olsson Comment (4.17.25): How was the Level of Reliability for the new total pavement design determined to be 85% when there is old pavement below new pavement?

   Applicant Response (7.16.25): 85% reliability is standard for regional flexible pavements. The revised report uses a more conservative 90% to address underlying pavement conditions.

   Olsson Response (8.12.25): No further comment.

   Applicant Response (9.30.25): No response.

5. Olsson Comment (4.17.25): For the Flexible Overall Standard Deviation, a factor of 0.45 was used. Would 0.49 be more consistent with AASHTO?

   Applicant Response (7.16.25): For the Flexible Overall Standard Deviation, we revised to 0.49 in line with the upper end of the AASHTO-recommended range (0.40–0.50) for flexible pavement design.

   Olsson Response (8.12.25): No further comment.

   Applicant Response (9.30.25): No response.

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6. Olsson Comment (4.17.25): The Flexible Initial PSI serviceability number is 4.2. As mentioned in number 4, there is older pavement below the planned new overlay, therefore, how was this determined?

   Applicant Response (7.16.25): A PSI of 4.2 is consistent with a new surface course. Existing pavement conditions are accounted for in the structural recommendations.

   Olsson Response (8.12.25): It does not appear that the new pavement sections were designed as overlays in accordance with AASHTO 93 Design Guide. The new pavement sections should be designed as an overlay so that the old pavement does not have the same parameters, such as Flexible Initial PSI of 4.2, that new pavements would. Additionally, the existing pavement Structural Number should reflect the lack of flexibility and brittleness that is associated with older asphaltic pavements.

   Applicant Response (9.30.25): Parameters for existing and new pavements are each provided in latest revised report

   Olsson Response (10.15.25): No further comment.

7. Olsson Comment (4.17.25): No growth rate was mentioned in the design. Provide growth rate. Growth rate of 2% is typical for County roadways, however one should be submitted for use by the applicant with review of historical data from the surrounding roadway network. Confirm with applicant on growth for operations.

   Applicant Response (7.16.25): Traffic projections include 2% annual growth for existing traffic and 5% for new truck traffic, per GBA input and County standards.

   Olsson Response (8.12.25): No further comment.

   Applicant Response (9.30.25): No response.

8. Olsson Comment (4.17.25): Page 4 states: A traffic study was conducted at this site, and an Average Daily Traffic (ADT) of approximately 2,400 vehicles was determined. We have made the assumption that approximately 5% of the existing traffic consists of trucks, and a truck equivalency factor of 0.47 was used in our calculations.

   The traffic study has existing traffic counts. Confirm 5% trucks with existing counts from the traffic study.

Applicant Response (7.16.25): While the "Traffic Study" shows 2% truck volume, we utilized 5% in our analysis to provide a conservative design margin.

Olsson Response (8.12.25): No further comment.

Applicant Response (9.30.25): No response.

9. Olsson Comment (4.17.25): Page 4 states: With the information provided and the assumptions stated above, we estimate that the existing needs of the roadways studied to be 400,000 18-kip equivalent single axle loads (ESALs) over a 20-year design period. With the new truck traffic, we anticipate approximately 5,000,000 ESALs for a 20-year design period.

   Draft narrative is proposing a SUP operation for 25 years.

   Revise report utilizing the generated trips for a 25-year SUP term as proposed in the application.

   Applicant Response (7.16.25): The report has been updated to reflect a 25-year SUP term as proposed in the application. See PDF Pages 7, 8, 9.

   Olsson Response (8.12.25): No further comment.

   Applicant Response (9.30.25): No response.

10. Olsson Comment (4.17.25): Page 6 states: Due to the variable thickness of the existing aggregate base in the sections observed, we have developed new minimum pavement section thicknesses to utilize a value of 2 inches of aggregate base at existing route 1 locations and 4 inches of aggregate base at existing route 2 locations.

    Why does the report assuming 4 inches for route 2 where there are several locations where there is only 3 inches of aggregate along that route according to table on page 5.

    Applicant Response (7.16.25): Our pavement analysis and recommendation are based on all the data captured and designed to accommodate the worst-case scenarios

    Olsson Response (8.12.25): No further comment.

    Applicant Response (9.30.25): No response.

11. Olsson Comment (4.17.25): Page 7 states: Paved areas should be sloped to provide rapid drainage of surface water and to drain water away from the pavement edges. Pavement should be designed

so water does not accumulate on or adjacent to the pavement, since this could saturate and soften the subgrade soils and subsequently accelerate pavement deterioration.

Describe how this will be accomplished. How will loss of edge support be mitigated?

Applicant Response (7.16.25): Surface water will drain to existing ditches in a sheet flow pattern. This will reduce any edge deterioration and erosion from channelized flows discharging off of the pavements edge down into the roadside ditches.

Olsson Response (8.12.25): The new asphalt pavement sections will have around 6+ inches of asphalt added to the existing pavement surface. The Traffic Impact Study does not recommend shoulder improvements or raising the pavement edge grade to the new overlay edge grade as part of the application submittal. The pavement design should include recommendations to prevent edge cracking, a common issue on narrow pavements caused by asphalt shrinkage and lack of lateral support. Edge cracking can shorten the new pavement lifespan and cause premature failures. In addition, how will consistent pavement structure be maintained if portions of the routes only need a few inches of additional asphalt and other portions of the routes will need 6 or 7 inches of additional asphalt. How will this be constructed and still meet all the elevations that are currently set along the alignments.

Applicant Response (9.30.25): Comments addressing edge cracking added to latest revised report included in the Route Study Report.

Olsson Response (10.15.25): The report states: Modifications to the existing pavement thickness increase the risk of loss edge support. To prevent this, consideration should be given to improving drainage infrastructure, installing a curb, or widening shoulders. The decision on how to best address this risk should be made by the roadway design team in the design phase of the project.

Acknowledged.

12. Olsson Comment (4.17.25): Page 6 states: Construction traffic on the pavements was not considered in developing their opinions of minimum pavement thickness. If the pavements will be subject to construction equipment/vehicles, the pavement sections should be revised to consider the additional loading.

    Will the pavement be subject to construction traffic for the SUP? If so, update the report to include in analysis and recommendations. Include estimated vehicle types and trips of construction traffic in the report.

Applicant Response (7.16.25): GBA confirmed no construction traffic on the haul route. No additional ESALs included.

Olsson Response (8.12.25): Please add this statement to the pavement evaluation report regarding no construction traffic on the haul route and no additional ESALs included.

Applicant Response (9.30.25): Statement added to latest revised report included in the Route Study Report.

Olsson Response (10.15.25): No further comment.

13. Olsson Comment (4.17.25): The report includes variation of existing pavement thicknesses in both routes. Page 6 states Route 1 asphalt section be thickened to 10 total inches. For Route 2 asphalt section, be thickened to 9 total inches.

    The total thickness for the new sections of roadway are 9 and 10 inches respectively, this includes the existing asphalt section. The existing asphalt section varies significantly over short distance. How will it be determined the total new thicknesses of 9 and 10 inches are achieved when the thickness of the existing pavements vary?

    Applicant Response (7.16.25): All recommended section thicknesses include the analysis of the existing pavements. Field verification and inspections during construction is highly recommended to ensure total thickness is achieved per the pavement recommendations set forth in this report.

    Olsson Response (8.12.25): Please specify how these quality assurance measures will be supported, i.e. by comprehensive construction oversight, including core sampling or non-destructive testing at representative intervals, to confirm that reconstructed sections achieve the intended structural depth. Coordination among field inspectors, contractors, and project engineers will be essential to document any discrepancies in existing pavement depth and to adjust placement of new materials accordingly. By proactively addressing variability in the pavement structure, the project minimizes the risk of thin sections and premature failures.

    Applicant Response (9.30.25): This will be addressed in roadway design phase.

    Olsson Response (10.15.25): Acknowledged

14. Olsson Comment (4.17.25): Page 34 of the Traffic Study states: The Primary Route and alternate Route are striped with 11 ft. wide lanes, which is a typical width for streets. The Collector Street Typical Section adopted by Leavenworth County shows the travel lanes as 12 ft. wide. There is no

threshold requiring the 11 ft. lane to be widened to 12 ft. based on additional traffic or truck-specific traffic. The Highway Safety Manual (HSM), 2010, states that widening the roadway from 11 ft. to 12 ft. could decrease crashes by 5% considering the characteristics of the Primary and Alternate Routes.

The Primary Route and Alternate Route do not have shoulders that match the adopted typical section. For much of the roadway, the Primary Route and Alternate Route have a shoulder of 0 ft. While shoulders may be paved, gravel, composite, or turf according to engineering manuals, a shoulder exists if a side slope outside of the travel lane is present with a similar slope compared to the travel lanes. If there is a steep drop off past the edge of the travel lane, then a shoulder is note present. The adopted typical section shows 4 ft. wide shoulders consisting of gravel. The HSM states that widening of a shoulder from 0 ft. to 4 ft. could decrease crashes by 35% considering the characteristics of the Primary and Alternate Routes. The HSM also states that a shoulder made of gravel could decrease crashes by 4% compared to turf when considering the characteristics of the Primary and Alternate Routes.

According to the traffic study, the existing roadways along the proposed routes have 11 ft wide lanes with 0 ft shoulders. Traffic study and the pavement evaluation do not recommend any widening improvements, shoulder improvements, or mitigation to edge drop off after the overlay is constructed. Does the pavement evaluation and pavement design account for 11 ft lanes, 0 ft shoulders, and edge drop off from the proposed overlay?

Applicant Response (7.16.25): Geometric and safety upgrades, including lane width and shoulder improvements, fall outside the pavement analysis scope. Any recommendations tied to geometric improvements would be reflected within the traffic analysis sections of the report.

Olsson Response (8.12.25): No further comment.

Applicant Response (9.30.25): No response.

15. Olsson Comment (8.12.25): The report states on page 5:
Typically, when existing asphalt sections are modified, one to two inches of surface asphalt is milled prior to placement of new asphalt overlay. At the time of our study, it appears that the existing asphalt surface is in fair to good condition, and milling procedures may not be necessary. If milling procedures are not utilized at this site, the existing surface would need to be thoroughly cleaned prior to placement of the tack coat and new surface course overlay to ensure that new overlay materials properly adhere to the existing pavements. If a new asphalt overlay is placed on dirty/dusty existing pavements, the owner must accept the risk that debonding could occur between the older and newer sections, which could lead to rapid deterioration of the asphalt surface.

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Since the asphalt surface is exposed, the pavement evaluation report should clearly state whether milling is needed. The statements “may not be necessary” and “could lead to rapid deterioration of the asphalt surface” are contradictory and lack a specific recommendation.

Applicant Response (9.30.25): Addressed in latest revised report.

Olsson Response (10.15.25): Report states: The decision on the method used to achieve the recommended thickness (removal and replacement, mill and overlay, or direct overlay) should be made in the roadway design phase of the project.

Acknowledged.

Allison, Amy

From: Bradley C. Weisenburger <BWeisenburger@desotoks.us>
Sent: Monday, October 27, 2025 2:17 PM
To: Allison, Amy
Subject: RE: RE: DEV-25-021 Special Use Permit – Kaw Valley

Hello Amy – De Soto's stance regarding the sand plant has not changed. We do not object the sand plant as long as trucks are prohibited from going south over the bridge into and through De Soto.

Bradley C. Weisenburger
Community Development Director
32905 W 84th St.
De Soto, KS 66018
913.586.5286 (Direct line)
913-221-6846 (Mobile)

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Please remember that all correspondence sent to and from this account is subject to public record and legal discovery activities.

Allison, Amy

From: Tyler Dowdall <[redacted]
Sent: Tuesday, December 2, 2025 1:20 PM
To: PZ
Subject: Thank You for Your 9–0 Recommendation — Please Stand Firm

Planning & Zoning Staff,

Thank you for your unanimous 9–0 recommendation to deny the Kaw Valley SUP.
Your analysis reflects the reality that southern Leavenworth County roads, homes, and families would be placed at serious risk by this project.

As this proceeds to the BOCC, residents ask that you restate your professional concerns clearly and firmly — especially regarding:

- Road failure projections
- Lack of KDOT study
- Safety risks of heavy trucks
- Mismatch between public cost and private benefit

Your voice matters.

Thank you for defending the long-term safety and integrity of our community.

Re: DEV-25-021 – Kaw Valley Companies Special Use Permit – Formal Opposition & Demand for Denial

Dear Commissioners:

After attending the November 2025 Planning Commission meeting, I came away with a clearer understanding of the scale and intensity of the proposed Kaw Valley sand mining operation.

During the hearing, the applicant indicated that mining could occur at approximately 15 acres per year at depths approaching 50 feet. Using typical sand densities, mining at that rate could produce approximately two million tons of sand per year. At approximately 25 tons per truckload (Kansas Bridge-Law max), transporting that volume would require roughly 310 loaded trucks per day, plus approximately 310 empty return trips, resulting in more than 620 truck movements per day. This equates to one truck passing nearby homes roughly every 45 seconds during operating hours.

This level of industrial activity is fundamentally inconsistent with the surrounding rural residential environment. Given the scale of activity described, it is difficult to see how an operation of this intensity could be compatible with surrounding land uses.

During the Planning Commission hearing, the applicant also stated that the operation would utilize their trucks as well as trucks belonging to their customers, and the application proposes a scale house for point-of-sale sales, suggesting that outside haulers may access the site. As a result, the truck volumes evaluated in the application may significantly underestimate the actual traffic that would occur.

The Planning Commission unanimously recommended denial (9-0). Based on the issues outlined below, including traffic impacts, floodplain concerns, environmental impacts, and unresolved technical issues, I respectfully request that the Board of County Commissioners uphold that recommendation and deny the proposed Special Use Permit.

Because several of these issues involve unresolved technical and regulatory questions, it is important that the administrative record fully address them before any approval is considered.

The proposed 435-acre sand mining operation would produce roughly 2 million tons of material per year, generating potentially 620 or more truck movements per day along rural county roads. The roads identified in the Route Study were not designed for this level of heavy industrial traffic.

If truck volumes approach the production levels discussed during the hearing, long-term pavement damage and road deterioration could occur. When heavy truck traffic causes roadway failure, the cost of reconstruction and repair is typically borne by the public road authority. This raises an important question for the County: who will be responsible for rebuilding or repairing these rural roads if the traffic generated by this operation causes pavement or structural failure?

Noise impacts are also a significant concern. Heavy trucks approaching intersections or slowing for turns frequently use engine braking systems (Jake brakes), which can produce noise levels of 80–100 decibels at distances of 50–100 feet. With trucks potentially passing homes every 45 seconds, residents could experience repeated braking, acceleration, and gear-shift noise events throughout the day.

Sand mining operations can also generate respirable crystalline silica dust, which OSHA and the National Institute for Occupational Safety and Health recognize as a serious health hazard associated with diseases such as silicosis and lung cancer. Because homes are located within approximately ¼ mile of the proposed site, including my residence, a site-specific analysis of dust generation and silica is needed.

Scale of the Mining Operation (Golden Factors 2, 3, 4) During the Planning Commission hearing, the applicant indicated that mining could occur at approximately 15 acres per year at depths approaching 50 feet. Using typical sand densities, mining at that rate could produce approximately two million tons of sand per year. At approximately 25 tons per truckload, hauling this volume would require roughly 310 loaded trucks per day, plus approximately 310 empty return trips, resulting in more than 620 truck movements per day. This equates to approximately one truck passing nearby homes every 45 seconds during operating hours. This level of industrial activity is fundamentally inconsistent with the surrounding rural residential environment (compatibility – Factor 2), unsuitable for the property (Factor 3), and will have detrimental effects on traffic, safety, and welfare (Factor 4).

Applicant Admission of Additional Trucks (Golden Factors 4, 6) During the Planning Commission hearing, the applicant's attorney stated that the operation would use 50 trips using their trucks as well as trucks belonging to their customers. This statement is important because the application also proposes installing a scale house at the site, which suggests that material may be sold directly from the pit to outside haulers. If outside trucking companies or contractors are hauling material from the site, the number of trucks could be significantly higher than the 120 loads per day referenced in portions of the application. Additionally, the Route Study indicates that the truck trip numbers used in the analysis were provided by the developer, and the Public Works review notes that truck trip counts are inconsistent across the application documents. This raises concerns that the traffic impacts may be underestimated (detrimental effects on roads/safety – Factor 4; public welfare – Factor 6).

Rural Roads Not Designed for Heavy Truck Traffic (Golden Factors 4, 6) The Route Study and Public Works review identify several deficiencies in the existing road network, including horizontal curves that do not meet current highway design standards, roadway geometry that makes it difficult for trucks to maintain lane position, and roadway sections that may require significant reconstruction or widening. Public Works specifically noted concerns regarding trucks being unable to maintain their lane position on existing curves. Allowing hundreds of heavy truck trips per day on narrow rural roads that do not meet modern design standards raises serious public safety concerns (detrimental effects – Factor 4; public welfare/safety – Factor 6).

Noise Impacts From Heavy Truck Traffic (Golden Factors 2, 6) Heavy truck traffic of this magnitude would also create significant noise impacts for residents along the haul route. When

trucks approach intersections or slow for turns, drivers frequently use engine braking systems (Jake brakes). These braking systems produce extremely loud noise events (80–100 dB at 50–100 ft) that can carry long distances in rural environments. With trucks potentially passing homes every 45 seconds, residents could experience repeated noise events throughout the day from engine braking, truck acceleration from stop signs or intersections, and gear shifting. These repetitive noise events would significantly alter the quiet rural character of the area (compatibility with surrounding uses – Factor 2; public welfare – Factor 6).

Silica Dust and Public Health (Golden Factors 2, 6) Sand mining operations can generate respirable crystalline silica dust, which is recognized by OSHA and the National Institute for Occupational Safety and Health as a serious health hazard. Respirable silica exposure has been linked to diseases including silicosis and lung cancer. Scientific studies of sand mining operations show that airborne particles can travel significant distances depending on wind conditions. Because nearby homes are located within approximately ¼ mile of the proposed operation, including my residence, a site-specific dust and respirable silica analysis should be required addressing excavation, stockpiling, truck loading, and haul routes (compatibility – Factor 2; public welfare/health – Factor 6).

Property Value Impacts (Golden Factors 1, 2, 6) Studies examining the effects of aggregate mining operations have found that residential property values often decline near active mining sites. These impacts are commonly associated with heavy truck traffic, increased noise levels, dust and air quality concerns, and loss of rural character. Homes located close to the proposed mining operation and haul routes could reasonably experience these impacts (neighborhood character – Factor 1; compatibility – Factor 2; public welfare – Factor 6).

Groundwater and Regional Water Demand (Golden Factors 4, 6) Since earlier sand mining proposals were considered in this area, the region now includes the Panasonic battery manufacturing facility in De Soto, a $4-billion industrial project that withdraws water from the same regional aquifer system. Because sand mining operations often excavate below the water table and create large open groundwater pits, it would be appropriate to evaluate potential cumulative groundwater impacts. A comprehensive groundwater analysis would help ensure long-term protection of regional water resources (detrimental effects – Factor 4; public welfare – Factor 6).

Floodplain Modeling Conflict – Stockpiles Not Modeled (Golden Factors 4, 6) The floodplain permit documentation references a temporary stockpile limited to a height of 20 feet. However, the permit language does not define the length, width, total volume, location, or duration of this stockpile. Limiting only the height still allows for very large accumulations of material. A stockpile that is 20 feet high, but several hundred feet long could represent tens of thousands of cubic yards of material located within the floodplain. At the same time, the engineer's certification states that the project will result in no rise in flood elevations. However, the engineering plans and hydraulic analysis do not appear to identify or model any stockpile footprint or obstruction within the floodplain. Because stockpiling is described as part of normal site operations, the absence of defined dimensions or hydraulic modeling raises questions as to whether the floodplain analysis fully reflects the project as it will actually operate (detrimental effects – Factor 4; public welfare – Factor 6).

Misleading "Temporary Stockpile" Label Hides Permanent Floodway Fill (Golden Factors 4, 6) The application and DWR permit repeatedly refer to a **"stockpile"** for ongoing sales. The Site Plan Sheet 4 only shows a "temporary stockpile" — with **no duration, no volume modeling, and no depiction** of the permanent sand stockpile that will exist for 25+ years. In the construction and mining industry, stockpiles for active production **stay there for the life of the operation**. This deception hides millions of tons of fill in the floodway from county review, making the Stormwater Study's "no-rise" claim false on its face. Staff's October 10 comments confirm the floodplain permit is still incomplete. This alone requires denial (detrimental effects – Factor 4; public welfare – Factor 6).

Federal Jurisdictional Determination Based on Smaller Site (Golden Factors 4, 6) Application materials include a U.S. Army Corps of Engineers jurisdictional determination referencing an approximately 222-acre project area. However, the current Special Use Permit application proposes a mining operation covering approximately 435 acres, nearly double the area referenced in the federal determination. Because jurisdictional determinations are issued based on the specific area evaluated, it is not clear whether the existing determination applies to the entire 435-acre project now proposed. If the project footprint has expanded significantly since the original federal review, it would be appropriate to confirm whether additional federal review or updated jurisdictional evaluation is required (detrimental effects – Factor 4; public welfare – Factor 6).

Unresolved Public Works Concerns (Golden Factors 4, 6) The October 2025 Public Works review indicates that several departmental comments were not adequately addressed by the applicant. Public Works raised concerns regarding roadway safety, infrastructure impacts, and haul route issues. These unresolved issues suggest that important technical questions remain regarding the project's impact on county infrastructure and public safety (detrimental effects – Factor 4; public welfare – Factor 6).

Conclusion This proposal raises serious concerns related to the scale and intensity of mining operations, heavy truck traffic on rural roads, roadway safety along the proposed haul route, noise impacts to nearby homes, silica dust and air quality concerns, potential groundwater impacts, floodplain modeling inconsistencies, and unresolved Public Works issues. For these reasons, and in light of the Planning Commission's unanimous 9-0 recommendation, I respectfully request that the Board of County Commissioners deny the proposed Special Use Permit.

Thank you for your time and consideration.

Respectfully,

Todd Donaldson

16440 Golden Rd

Leavenworth County, KS

JEFF & JILL BROWN

15455 161st St., Bonner Springs, KS 66012 | [redacted]

November 16, 2025

Leavenworth County Commissioners
c/o John Jacobson
300 Walnut St., Suite 212
Leavenworth, KS 66048

Dear Leavenworth County Commissioners:

We are writing to express our **opposition to the special use permit known as "Lenape Sand Operation DEV-25-021" submitted by Kaw Valley** ("DEV-25-021 permit").

We understand that a similar request for special use permit was denied in November 2022, in part because roads north on 158th street to Loring Road were deemed unsafe for heavy trucks fully loaded with sand. The current request for special use permit would route heavy trucks fully loaded with sand west on Golden Road to the K-32 intersection at 189th Street, then east on K-32 to Bonner Springs. Given the minimal shoulders and difficult sightlines along this stretch of K-32, the DEV-25-021 permit (if approved) would **create a significant safety concern for residents** in my neighborhood (Bear Lake) and other neighborhoods – especially for high school drivers traveling between home and Bonner Springs High School. It makes no sense to us that the earlier request for special use permit would be denied due to safety concerns for trucks, in favor of the current request which would create significant safety concerns for area residents.

In addition to these safety concerns, this permit provides little to no financial or related benefits to Leavenworth County and its residents.

Please keep our community safe and **vote against DEV-25-021**!

Sincerely,

Jeff & Jill Brown

STATE OF KANSAS

JEFFREY KLEMP
STATE SENATOR. 5TH DISTRICT
1314 EISENHOWER RD. #161
LEAVENWORTH, KANSAS 66048



SENATE CHAMBER

STATE CAPITOL
300 S.W. 10TH AVENUE
TOPEKA, KANSAS 66612
(785) 296-7522

March 25, 2026

Leavenworth County Board of County Commissioners
300 Walnut Street
Leavenworth, KS 66048

Dear Commissioners,

I want to begin by expressing my appreciation for the thoughtful and deliberate process you have undertaken regarding the Special Use Permit request from Kaw Valley Companies. Land use decisions of this scale are complex, and I commend the Board for ensuring a thorough and transparent review.

I also want to recognize the citizens of Leavenworth County who have engaged in this process—both those in support and those with concerns. The willingness of residents to participate and share their perspectives is a strength and an essential part of sound public policy.

Leavenworth County, like many across Kansas, continues to face ongoing tax pressures. I appreciate the County's approach to remaining open to responsible business development that strengthens the tax base, supports infrastructure, and creates long-term economic opportunity. Projects like this, when done responsibly, are part of the solution—not the problem—when addressing those pressures. Kaw Valley Companies is the type of partner that can align with these goals.

Throughout this process, it appears Kaw Valley has demonstrated a willingness to engage, adapt, and work alongside county staff and leadership to address concerns—particularly around road maintenance, operational safeguards, and compliance requirements. Their responsiveness reflects the level of accountability we should expect in projects of this nature. Additionally, operations such as this can serve as a catalyst for complementary businesses that further strengthen the local economy.

Also, during my time in the Senate, I have developed a strong working relationship with the rail industry and have become a firm believer in utilizing the most efficient modes of moving goods across our state and country. I have been consistently impressed with rail partners' willingness to

collaborate with the State of Kansas and identify creative, value-driven opportunities for growth. I have been engaged with the Rail Association and Union Pacific leadership regarding opportunities in South Leavenworth County, and this area is viewed as a clear “opportunity zone.” Rail integration presents a meaningful advantage—offering the potential to improve efficiency, reduce truck traffic and road wear, and support broader economic development. I am also providing a letter from Union Pacific reflecting their support and interest in this region.

If there are remaining concerns or barriers to approval, I would encourage the Board to formalize those items into a clear, actionable “punch list.” Establishing defined expectations ensures transparency, maintains accountability, and provides the applicant with a clear path forward. Based on their engagement to date, I am confident Kaw Valley will continue to work in good faith to meet the standards set by the County.

With that in mind, I support this effort and encourage approval with appropriate conditions. I believe Kaw Valley Companies has the potential to be a strong, responsible, and long-term asset to the Leavenworth County community.

Thank you for your continued leadership and for the care you bring to decisions that impact both current residents and future growth.

Respectfully,

Jeff Klemp Kansas State Senator, District 5

Respectfully,



Jeffrey Klemp

LENAPE DRAINAGE DISTRICT

EST. 1908

The Lenape Drainage District
Board: Tom Kelly, Stacey Schmitt, and Mark Tinberg
Linwood, KS 66052

March 23, 2026

Board of County Commissioners
Leavenworth County, Kansas
300 Walnut Street, Suite 212
Leavenworth, KS 66048

Attn: John Jacobson, Director of Planning & Zoning
Amy Allison, Deputy Director
Leavenworth County Staff

Re: Case DEV-25-021 – Special Use Permit for Sand Excavation and Stockpiling
Property: 16201 & 00000 Lenape Road
Lenape Drainage District Jurisdiction

Dear Chairman and Commissioners,

On behalf of the Lenape Drainage District (District), I am writing in my capacity as the District's Engineer of Record regarding the above-referenced Special Use Permit (SUP) currently scheduled for consideration by the Board of County Commissioners on March 25, 2026.

The District became aware of Case DEV-25-021 through the County meeting packet. At this time, the District has not received the SUP application, supporting technical studies, or related materials for review or comment, nor has the District been formally requested to provide concurrence or approval related to this proposal. This is similar to the process gap that occurred during a prior SUP submission for this site in 2020.

The subject property lies within the boundaries of the Lenape Drainage District. For reference, the District has attached a map depicting the approximate limits of the Lenape Drainage District, along with drainage channels and berms that are maintained by the District. This map is provided to illustrate the District's jurisdiction and the proximity of the proposed SUP area to District-maintained drainage infrastructure.

As a drainage district organized under K.S.A. Chapter 24, Article 4, the District has statutory authority and responsibility related to natural watercourses, drainage channels, levees, and associated facilities within its boundaries, including activities that may affect their stability, function, or long-term maintenance.

District Concerns Within Its Jurisdiction

Based on the limited information available in the County packet and public materials, the District has several areas of concern that would typically warrant formal District review:

1. Excavation Proximity to Levees and Drainage Features

The District has concerns regarding proposed excavation activities occurring adjacent to or within the zone of influence of existing levees and drainage facilities. Excavation depth, setback distances, side slopes, and sequencing are critical to maintaining levee stability and long-term performance.

2. Geotechnical Stability

The District has not reviewed any geotechnical evaluations addressing slope stability, bearing capacity, global stability near levees, or potential impacts to levee foundations and adjacent drainage features. Such analyses are necessary when excavation occurs at significant depths near flood control infrastructure.

3. Hydrologic and Hydraulic Impacts

The District has not reviewed hydraulic modeling or analyses demonstrating that the proposed excavation, stockpiling, or related grading will not adversely affect conveyance, flood elevations, velocities, or floodplain storage within District-controlled watercourses. This includes potential impacts from temporary or operational stockpiles located within floodplain or floodway areas.

4. Maintenance and Access

The District has not reviewed plans identifying how existing or future District access to levees, channels, and drainage facilities will be preserved during construction and throughout ongoing operations. Unrestricted access is essential for inspection, maintenance, and emergency response.

5. Channel Modifications, Obstructions, and Long-Term Operations

Ongoing dredging, sediment handling, and material movement within or adjacent to natural watercourses may constitute obstructions or channel modifications subject to District oversight. The District has not reviewed operational plans describing how these activities will be managed to avoid long-term impacts to drainage function.

6. Coordination with State Permits

While the packet references state floodplain and water resource permits, the District has not reviewed permit applications, conditions, or modeling submitted to state agencies to confirm consistency with District infrastructure, boundaries, and maintenance needs.

Request for Process Coordination

In addition to concerns specific to this SUP, the District respectfully requests guidance from the County regarding how drainage districts are to be consistently included in the development and permitting review process for projects located within their jurisdiction.

Specifically, the District would appreciate coordination with County staff and the Board to clarify:

- When and how drainage districts should receive SUP applications, plats, and development plans for review;
- Whether County approvals can be conditioned on drainage district concurrence when projects affect district facilities or natural watercourses; and
- How the County and District can work together to ensure statutory responsibilities are met without duplicating review efforts.

The District's intent is not to delay County processes, but to ensure that projects within the District are reviewed in a manner that protects public drainage infrastructure, downstream properties, and the long-term effectiveness of flood control systems.

The Lenape Drainage District appreciates the County's consideration of these concerns and looks forward to working collaboratively with the Board and Staff. The District remains available to review project materials and provide technical input if requested.

Please feel free to contact me if additional information or clarification would be helpful.

Regards,

Angela Morgan

Angela Morgan, P.E.
Engineer of Record
Lenape Drainage District

Attachments: Lenape Drainage District Jurisdiction Map (approximate limits, District-maintained channels and berms)

Outlook

Fw: Sandpit proposal concern

From Jacobson, John <JJacobson@leavenworthcounty.gov>
Date Mon 5/4/2026 5:16 PM
To Allison, Amy <AAllison@leavenworthcounty.gov>

Please include in the PC packet

Get Outlook for iOS

From: Brenna Woodruff [redacted]
Sent: Monday, May 4, 2026 5:13:15 PM
To: Jacobson, John <JJacobson@leavenworthcounty.gov>
Subject: Sandpit proposal concern

Hello,

I am writing to formally express my deep concern regarding the proposed sandpit project near my residence and several neighboring properties. We live right near the border of district 3 and district 5.

I am particularly concerned about the significant environmental and health impacts this project would have on our community. The potential for increased dust and air pollution poses a direct threat to the health of local residents, especially the children who attend Linwood Elementary School. Furthermore, the proximity of the sandpit and proposed routes to the school raises serious concerns regarding increased heavy machinery traffic and its impact on student safety and health. This would turn our area into an industrial environment and would have a negative impact on me and my family.

It is of utmost importance that we reject any proposals regarding the Kaw Valley sandpit. We must prioritize the future health and well-being of our children, who will be most affected by the long-term consequences of this project.

Thank you for your hard work and attention to this urgent matter.

Thank you,

Brenna and Chris Woodruff
[redacted]

Outlook

RE: DEV-25-021 Mining of sand

From Jacobson, John <JJacobson@leavenworthcounty.gov>
Date Tue 5/5/2026 10:59 AM
To 'anthony schmitt' <freakyschmitt@gmail.com>
Cc Allison, Amy <AAllison@leavenworthcounty.gov>

Mr. Schmitt- Your email will be included in the planning commission packet for their review.

Respectfully,
John Jacobson

From: anthony schmitt [redacted]>
Sent: Tuesday, May 5, 2026 10:54 AM
To: Jacobson, John <JJacobson@leavenworthcounty.gov>
Subject: DEV-25-021 Mining of sand

Good morning. We are once again writing about the sand pit. We are disappointed the BOCC didn't logically vote no to this issue at the March meeting. There were 2 letters read at that meeting. First from a Kansas state senator about development in the area where the proposed sand pit is located. This area is still a FLOODWAY and is extremely limited on what is acceptable in it. The second letter was from the railroad about a rail spur. Nothing was ever mentioned about who pays for said spur. Both letters were dated the day before the meeting. In our opinion it seems Kaw Valley is grasping at straws and trying anything to get approval for this SUP. To our knowledge they still have not offered any economic incentives. WHY? If this is financially beneficial to Leavenworth County, shouldn't it be willingly provided? Why are delays and postponements being given to KV when there are no new developments? We are not aware of KV's newest proposal; it should be included in the packet for next week's meeting. If there are not some drastic changes, the vote should still be to deny. If it is the same proposal, time is simply being wasted. The only exceptions KV has requested are no fencing, extending the SUP from 3 years to 25 years and dredging 24 hours 7 days a week. These are not conditions the county should be considering. The county MUST be considering the health, safety and welfare of its residents. We would like this to be included with the packet presented to the Planning and Zoning Board. Thank You, Tony & Stacey Schmitt 17322 Golden Road Linwood

Dear Leavenworth County Planning Commission and Staff,

At the November planning commission meeting, Kaw Valley's attorney stated they plan to mine approximately 15 acres per year at an average depth of 50 feet. He also said their customers will be hauling the material out using their own trucks.

That volume equals roughly 4,840 cubic yards per day.

The Terracon Pavement Report they submitted only analyzed 120 loaded truck trips per day, which moves just 1,560 cubic yards per day — less than one-third of what they told the public.

In their March 2026 presentation to the County Commissioners, they changed their story to only 10 acres per year and just 50 daily round trips.
This appears to be an attempt to lowball the truck volume after being called out on the higher number.

Here's the comparison:

Scenario,	Daily Volume	Loaded Trips/Day	Total Truck Passes/Day
November meeting statement.	4,840 cy/day	372	745
Terracon Report used.	1,560 cy/day	120	240
What they told Commissioners	3,200 cy/day	50 round trips	100

The U.S. Army Corps of Engineers Approved Jurisdictional Determinations from June 24, 2024 were issued for an approximate 218–223 acre site. The current SUP site plan shows 328 acres.

Additionally, the Kansas Division of Water Resources issued Floodway Permit LLV-0151 based on GBA's certification of "no rise." Yet that same permit was issued specifically for the placement of fill for a 6-foot tall safety berm and a 20-foot temporary stockpile in the floodway. The current site plans also show large ongoing sand stockpiles. These features contradict the no-rise certification.

We respectfully request a new traffic study based on the 15 acres per year and customer-haul statements they made in the November meeting, and a revised floodplain analysis that accurately reflects all the fill and stockpiling they are proposing.

Thank you for your attention to this matter.

Sincerely,
Todd Donaldson
16440 Golden Rd
[redacted]

Outlook

Re: Sandpit proposal concern

From Brenna Woodruff [redacted]
Date Tue 5/5/2026 2:35 PM
To Jacobson, John <JJacobson@leavenworthcounty.gov>
Cc Allison, Amy <AAllison@leavenworthcounty.gov>

Thank you!

I also just consulted with a professional in environmental remediation to learn more about the negative impacts.

A major source of concern that should be investigated further is how close one of district 7 well sight is to the proposed site. There have been numerous accounts of these excavation sights causing water turbidity which can cause problems with pumps in the wells and make it difficult to treat. I'm sure there are people looking into this already but it sounds like a serious headache and issue to deal with the potential problems and financial impact it will have on the public.

So sorry for this additional concern- I wanted to be more informed aside from the significant dust increase and wear and tear on our roads but didn't want this point to go unrecognized.

Thank you again!

Brenna Woodruff

On Tue, May 5, 2026 at 11:00 AM Jacobson, John <JJacobson@leavenworthcounty.gov> wrote:

> Mrs. Woodruff- Your email will be included in the planning commission packet for their review.
>
> Respectfully,
>
> John Jacobson

From: Brenna Woodruff <[redacted]
Sent: Monday, May 4, 2026 5:13 PM
To: Jacobson, John <JJacobson@leavenworthcounty.gov>
Subject: Sandpit proposal concern

Hello,

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I am particularly concerned about the significant environmental and health impacts this project would have on our community. The potential for increased dust and air pollution poses a direct threat to the health of local residents, especially the children who attend Linwood Elementary School. Furthermore, the proximity of the sandpit and proposed routes to the school raises serious concerns regarding increased heavy machinery traffic and its impact on student safety and health. This would turn our area into an industrial environment and would have a negative impact on me and my family.

It is of utmost importance that we reject any proposals regarding the Kaw Valley sandpit. We must prioritize the future health and well-being of our children, who will be most affected by the long-term consequences of this project.

Thank you for your hard work and attention to this urgent matter.

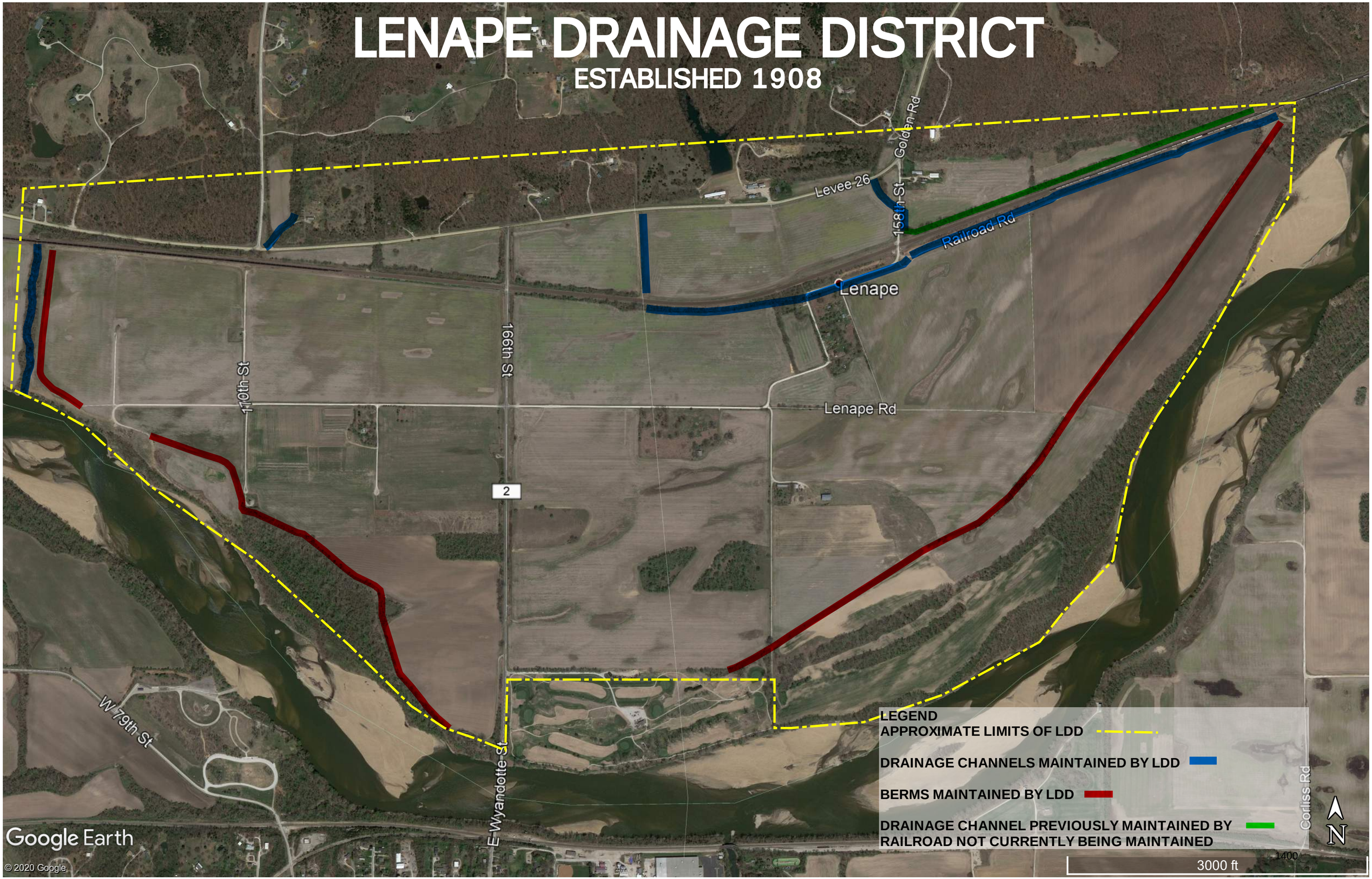
Thank you,

Brenna and Chris Woodruff

785-425-8091

LENAPE DRAINAGE DISTRICT

ESTABLISHED 1908



May 13, 2026

14439 Woodend Rd
Bonner Springs, KS 66012 (INSIDE Leavenworth County)

Planning Commission DEV-25-021

I am Mike McDonald, 14439 Woodend Rd, Bonner Springs inside Leavenworth, County. I come this evening to urge the Planning Commission to again reject the planned "Sand Mine" proposed by Kaw Valley Materials. The Planning Commission determines if the proposal will adversely impact the quality of life of county residents. An exhaustive discussion of water quality, air quality, noise, road safety, school bus safety and more occurred at previous public hearings and the Planning Commission voted to not recommend approval of the SUP.

My concerns are from the most recent application., The applicant has REJECTED many of the conditions placed on the previous application by the Planning Commission, most notably the three below:

- Proposing a partial fence rather than fencing the entire site
- Proposing almost complete elimination of operating hours restrictions
- Proposing a 25-year SUP rather than the 3-Year recommended previously



They added:

- A rather nebulous suggestion of "retail sales" on-site,
- Expanding the designated haul route west on K32 to County Road 1 and then I-70.

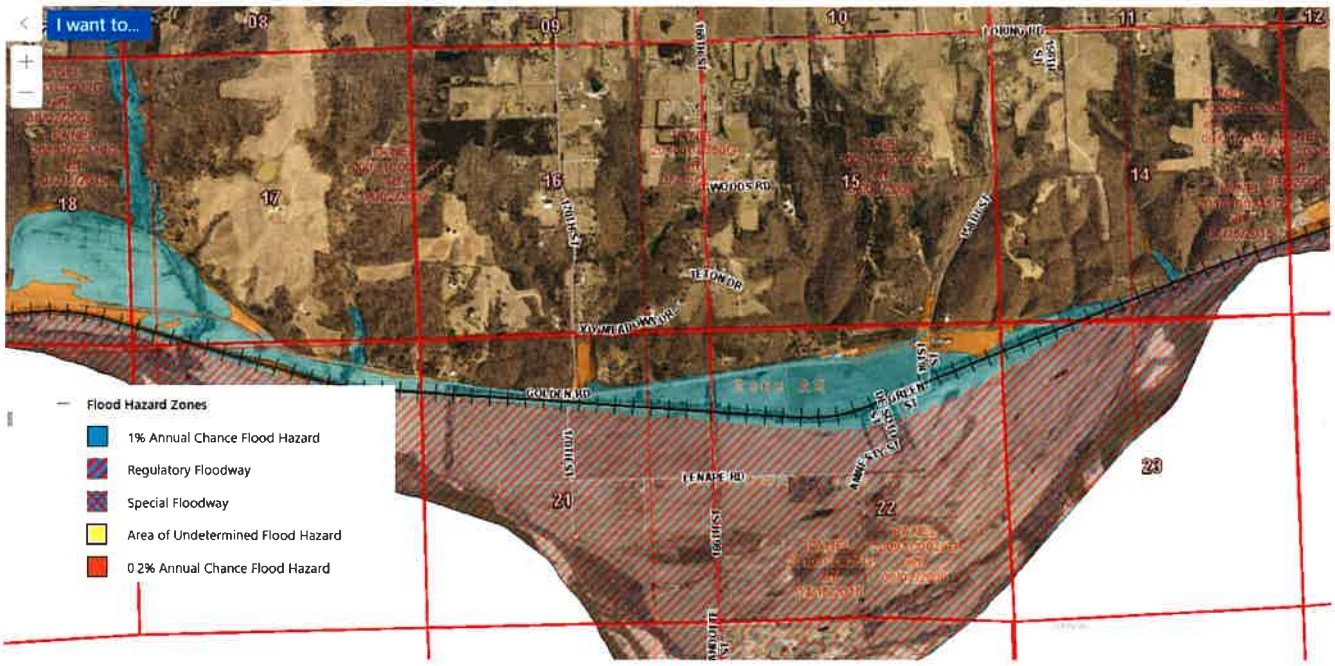
<u>What is actually being proposed needs to be clarified!</u>

Future Industrial Development is a Red Herring at best!
Future development of almost anything remotely industrial south of Golden Road is unlikely due to two reasons

- **FEMA Floodway Restrictions.** This SUP takes place in a federally regulated "Floodway". Key requirements are that nothing can be constructed that will cause the water level to increase during major flood events. This SUP obtained Federal and State permits primarily because it <u>removes material</u> from the floodway! What other industrial development can occur and offer the same circumstances?

- **Levee Construction.** The current levee system is operated by the Lenape Drainage District. They have voiced their concerns elsewhere in these documents. This levee system is not "Certified" by the Corps of Engineers to withstand flooding or provide reliable flood protection to any structures behind them. They cannot be used to support flood prevention for insurance purposes.

Rail Spur Construction is a Red Herring as well!
For the reasons noted above – it is unlikely that a Rail Spur would ever be constructed as there is rationally no other users that could generate sufficient volume and/or value over a long time period to justify investment of millions of dollars. And – it would likely have the same issues with the FEMA Floodway!



Other comments in no particular order. These all need a serious amount of discussion and clarification!

Noise Berm – properly designed vegetative barriers take several years to grow sufficiently large enough to become effective. Who inspects or enforces this?

Silica Dust and Blowing Sand – The proposal talks a good game, however lack of good house keeping to keep the dust down is a common problem. Silica Dust is a real health issue! Some photos shown below.

Various Haul Routes – Trucks on 189th entering K32 is difficult on a good day. The proposed widening looks good on paper, but is still a HEAVY SLOW truck entering a high speed roadway in an awkward corner. It gets worse if they are allowed to head west! The long term solution looks better – but

- When?
- Who Pays for it?
- Has KDOT commented on these trucks using that intersection?

And – Desoto is no longer the quiet quaint bedroom community it was seven years ago. They are a massive boomtown with an endless stream of trucks! There are plans to improve 83rd Street east to connect to the improved section west of K7 beginning in 2027. There is no reason to prevent trucks from going south on 166th, and a **good case can be made to REQUIRE them to go south and then east on 83rd St. as the longer trains often block both 166th and 158th street crossing for considerable length of time.**

Railroad Crossing at 158th St. – The railroad informed the Applicant that the County will be responsible for maintaining the crossing, paying for any signalization upgrades and such. Does Leavenworth County have this in their budget or in an agreement with the Applicant?

Property Values – The southern part of the county has a large number of nice expensive homes and there will be many more. I am sure property tax from these homes far exceeds any tax or fee revenue from this Sand Mine proposal. The impact of this proposal goes far beyond Golden Road. The trucks, dust, noise and more will influence new building and property values for miles north into the county

In the End – Please Reject this proposal. If you must add something – add something to benefit and protect the citizens of the county. Thank-you






Monitored
24 Hours
Surveillance
Camera



Estimated Haul Volume Comparison - 10 Acre Scenario

The following calculations compare the stated excavation acreage with the truck haul assumptions discussed during public meetings. These calculations illustrate the scale of material movement required to sustain the proposed mining operation.

Assumption	Value
Annual excavation area	10 acres/year
Approximate excavation depth	50 feet
Applicant stated haul trucks	50 loads/day
Approximate truck capacity	13 CY/load
Working days used in calculations	240 days/year
Hauling day length used for traffic frequency	8 hours/day

Applicant Stated Haul Capacity

50 loads/day x 13 CY/load = **650 CY/day**

650 CY/day x 240 working days = **156,000 CY/year hauled**

At 50 feet deep, this equals approximately **1.9 acres/year** excavated and hauled by the applicant's stated 50 daily loads.

Estimated Excavation Volume

1 acre = 43,560 square feet

43,560 SF x 50 ft depth = 2,178,000 cubic feet

2,178,000 CF / 27 = **80,667 CY per acre**

80,667 CY x 10 acres = **806,667 CY/year excavated**

Approximate Material Difference

Item	Volume	Equivalent Acres at 50 ft Deep
Estimated excavation volume	806,667 CY/year	10.0 acres
Applicant stated haul volume	156,000 CY/year	1.9 acres
Approximate remaining material volume	**650,667 CY/year**	**8.1 acres**

Estimated Additional Client Truck Traffic Needed

To account for the remaining excavation volume, approximately **209 additional client truck loads per day** would still be required beyond the applicant's stated 50 daily loads.

This would result in approximately **259 total one-way loaded truck loads per day** when including both company trucks and client trucks.

Because each loaded truck also returns empty, that equals approximately **517 total truck movements per day** past the road/driveway area.

Planning Commission
May 13, 2026

Kaw Valley Companies, Inc.

KAW VALLEY COMPANIES, INC.

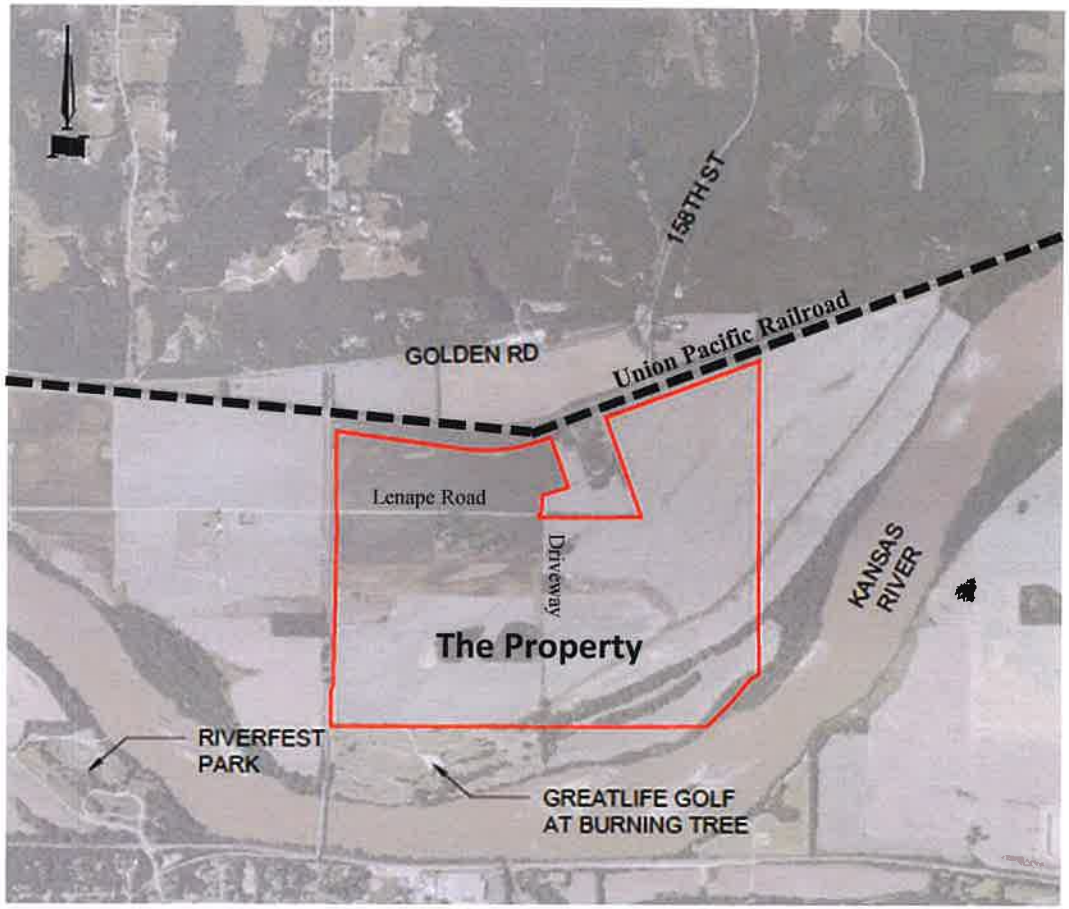
CASE NO. DEV-25-021

4919-1154-0648

Application has NOT changed

LOCATION AND REQUEST

- 435 acres located at 166th Street and Lenape Road
- Zoned I-3 Heavy Industrial
- Based upon **new facts**, recommend approval of a special use permit to operate a sand excavation and stockpiling operation with modified conditions



COMPREHENSIVE PLAN – FUTURE LAND USE

Existing industrial zoning will be maintained



Plan Boundary
Incorporated Area
100-Year Floodplain*
Floodway

Future Land Use Categories

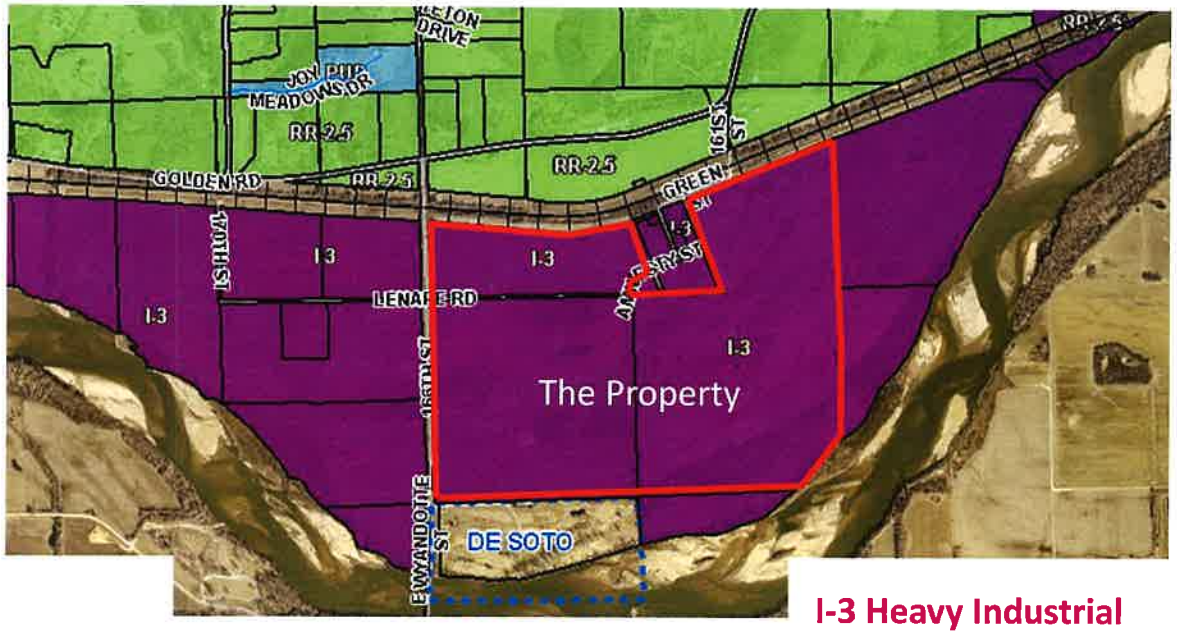
Mixed Use
Mixed Residential
Residential (3 Units / Acre)
Residential (2.5-Acre Minimum)**
Residential Estate (5-Acre Minimum)
Leavenworth County Road 1 Planning Area

Data Sources: Leavenworth County and Ochsner Hare & Hare, the Olsson Studio

Note: The existing industrial zoning along each river bottom will be maintained.

CURRENT ZONING AND PERMITTED USES

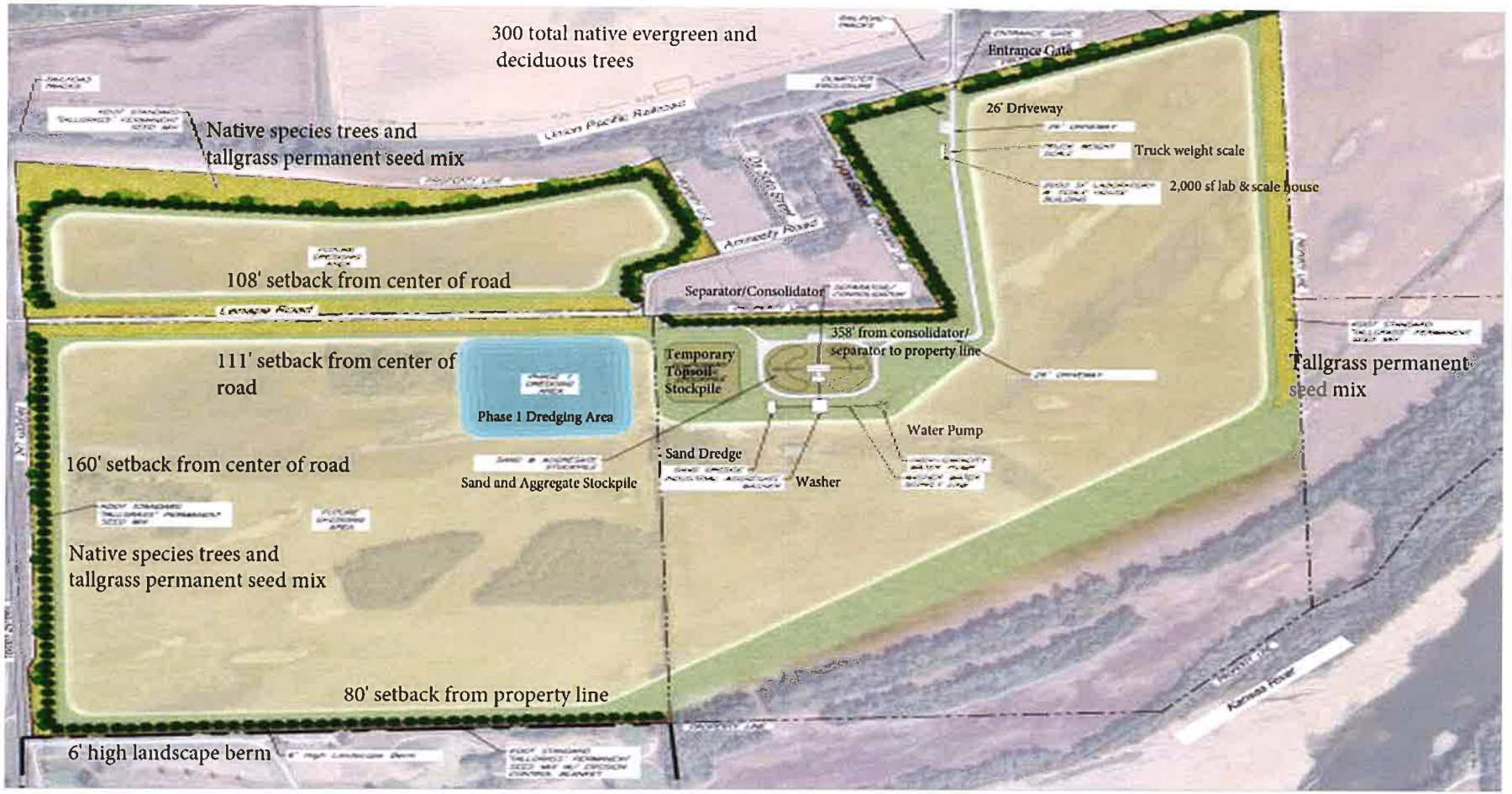
- Property zoned I-3, Heavy Industrial
  - Allowed uses include:
    - Blast furnaces and smelting operation
    - Storage facilities
    - Warehouse distribution center
    - Auto repair
    - Chemical processing and manufacturing
    - Material storage with retail
- Sand excavation permitted subject to obtaining an SUP



I-3 Heavy Industrial

Rural Residential 2.5

SITE PLAN


300 total native evergreen and deciduous trees
Entrance Gate
26' Driveway
Native species trees and tallgrass permanent seed mix
Truck weight scale
2,000 sf lab & scale house
108' setback from center of road
Separator/Consolidator
358' from consolidator/ separator to property line
111' setback from center of road
Temporary Topsoil Stockpile
Tallgrass permanent seed mix
Phase 1 Dredging Area
Water Pump
Sand Dredge
160' setback from center of road
Sand and Aggregate Stockpile
Washer
Native species trees and tallgrass permanent seed mix
80' setback from property line
6' high landscape berm

REGULATION OF OPERATIONS

- Leavenworth County SUP Conditions of Approval
  - Department of Public Works
  - Department of Planning and Zoning
- State of Kansas
  - Kansas Department of Agriculture
  - Kansas Department of Health and Environment
  - Kansas Department of Transportation
  - Kansas Division of Water Resources
- Federal
  - Mine Safety and Health Administration
  - U.S. Army Corps of Engineers
  - FEMA

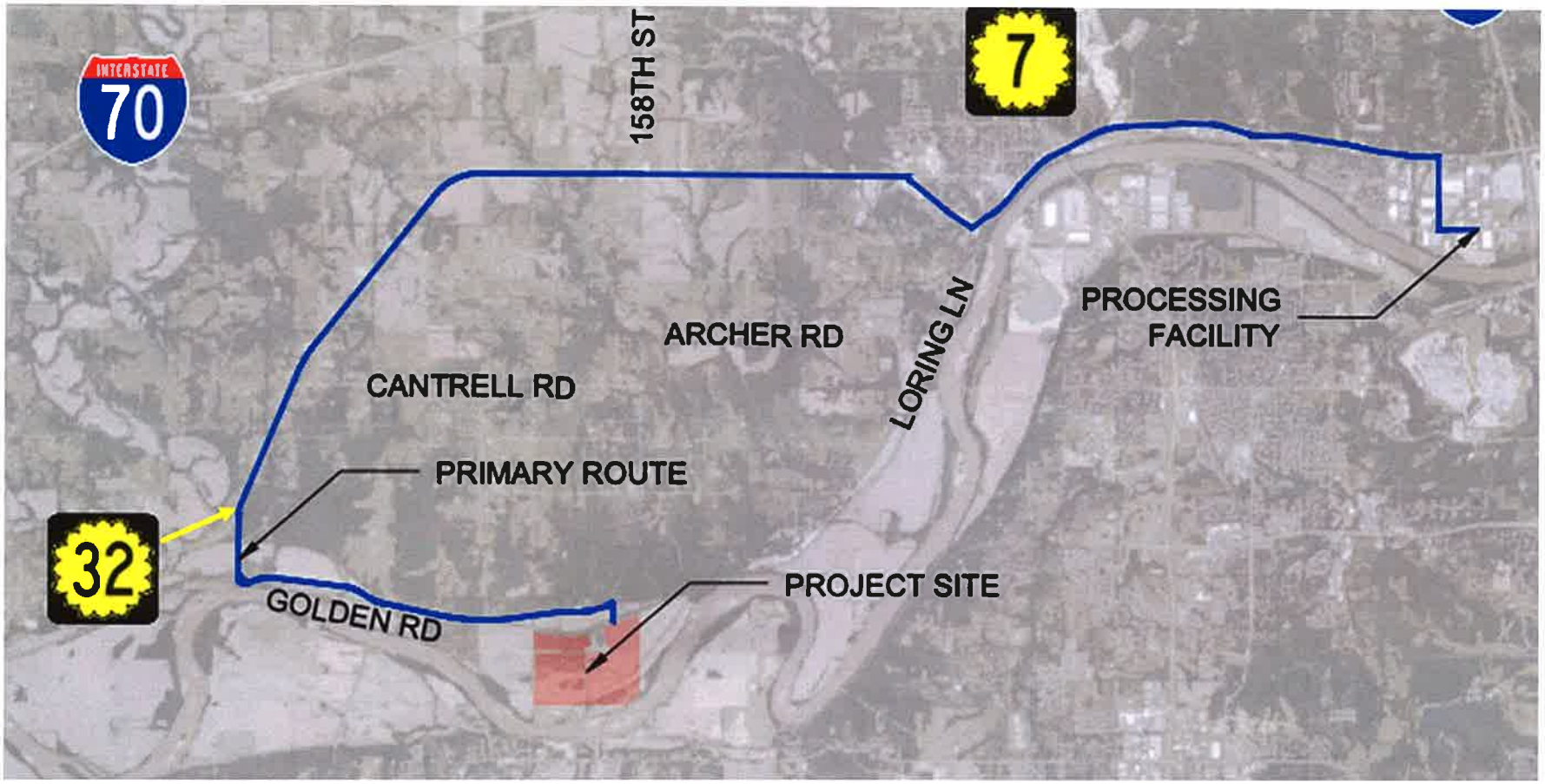
OPERATIONS

- Excavation and hauling limited to Monday–Friday, 7:00 a.m.–3:00 p.m.

- Dredging and stockpiling need to occur without restrictions to maintain inventory
  - Water pump, dredge line, washer and separator/consolidator are electric not diesel

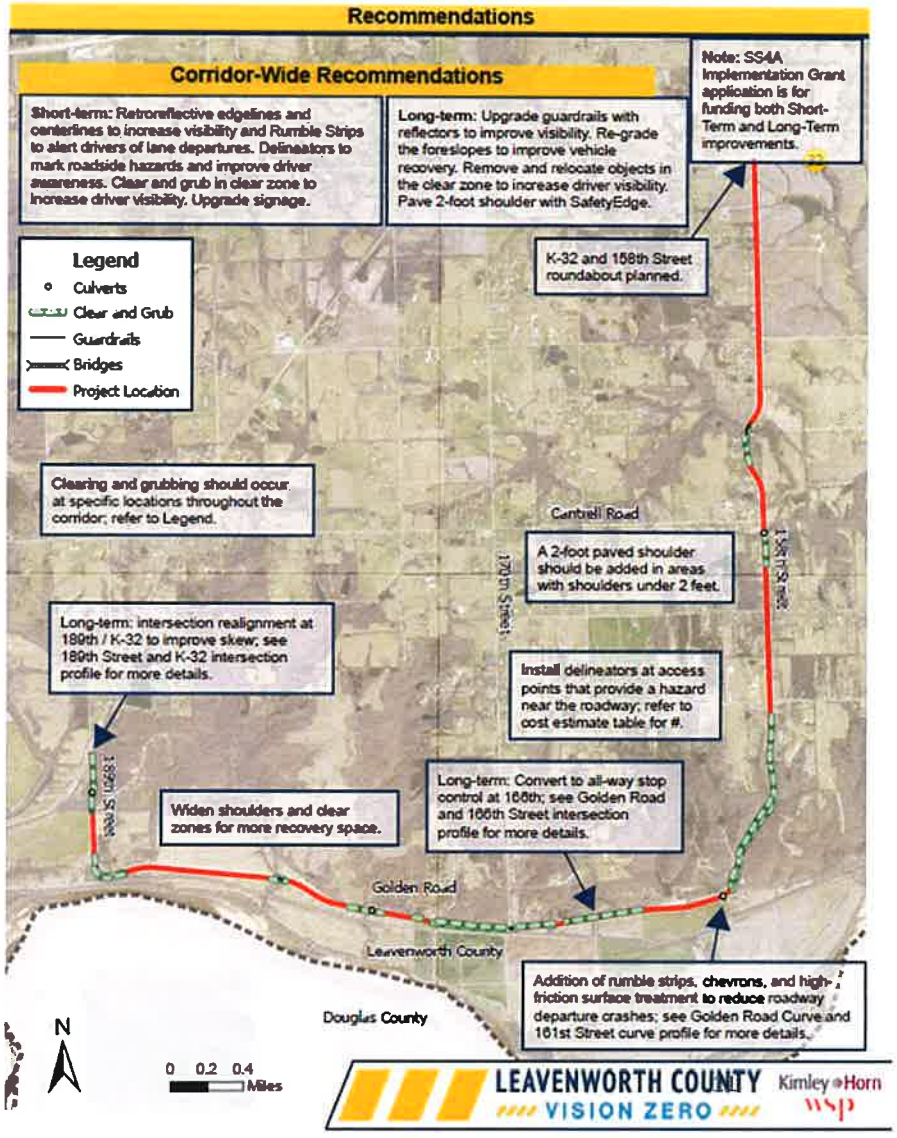
- **50 trips average/day** (studied 120 trips average/day)

PRIMARY ROUTE



While Application has NOT changed, other facts have become known which support approval of SUP.

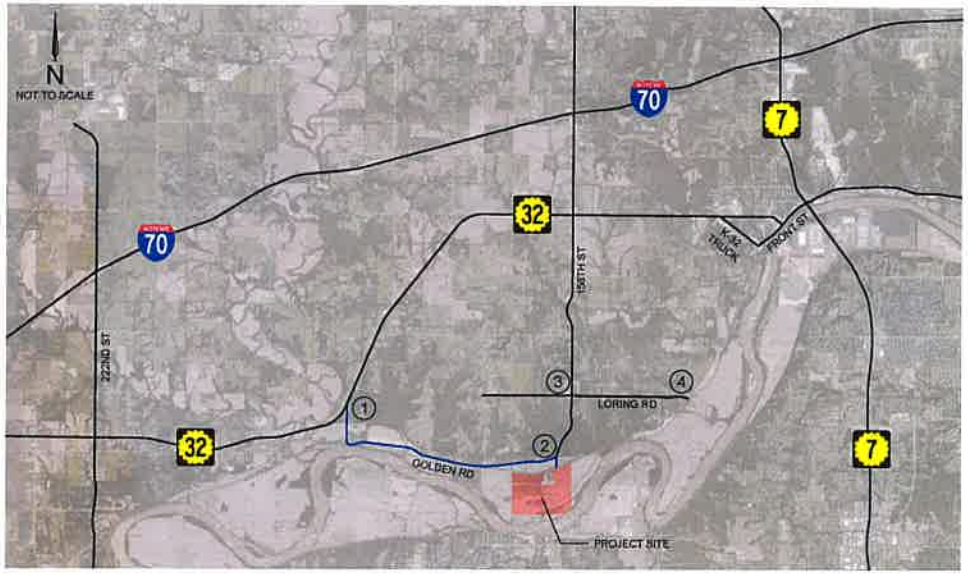
SS4A Grant Awarded: Safety Driven Improvements on Golden Road to be made by County



Development Agreement in Negotiation

DEVELOPMENT AGREEMENT ROAD IMPROVEMENT PROVISIONS

- Kaw Valley funds repaving of Golden Road to:
  - Fix existing pavement deficiency
  - Add additional pavement with 20-year pavement design life to handle Kaw Valley traffic
  - Approximately 5 inches of new asphalt
- Estimated Cost: $3 Million
  - Final amount established by County
  - Final amount paid by Kaw Valley



PAVEMENT, SIGNING, AND PAVEMENT MARKING IMPROVEMENTS, ROADSIDE GRADING DUE TO PAVEMENT ELEVATION CHANGE

① K-32 & 186TH ST / GOLDEN RD - PAVEMENT WIDENING BASED ON TRUCK TURNING ENVELOPES (TO BE COMPLETED BY OTHERS WITH 8S4A GRANT)

② GOLDEN RD / 15TH ST & 161ST ST - PAVEMENT WIDENING BASED ON TRUCK TURNING ENVELOPES

③ 158TH ST & GOLDEN RD - NORTHBOUND RIGHT-TURN TAPER

④ LORING RD & LORING DR - PAVEMENT WIDENING BASED ON TRUCK TURNING ENVELOPES

DEVELOPMENT AGREEMENT – ADDITIONAL PROVISIONS

- Kaw Valley's assistance in securing the extension of rail service to promote further economic development in the area
  - Strong support for rail with State leadership
  - Meetings with UPR, the State are scheduled
- The payment of a per ton royalty to the County by Kaw Valley

GOLDEN FACTORS SATISFIED

1. Applicant DOES match character of the neighborhood specifically Master Planned for Industrial

2. Applicant DOES match the zoning of nearby uses – industrial

4. Application is NOT detrimental to nearby property, more so with grant funded improvements to Golden Road and additional improvements funded by the Applicant

6. Economic benefit and gain to the public health, safety and welfare advanced
    - Fund major road paving needed today
    - Royalty payment
    - Economic Development "First Mover"

FIRST MOVER APPROVAL

Kaw Valley can be the "first mover" and open the corridor for development contemplated by Existing Zoning and Comprehensive Plan

Conditions of Approval

Condition No. 1 – Revised

- **"The SUP shall be limited to a period of ~~3~~ 25 years. ~~with annual staff evaluations.~~"**
  - Operations will not commence for approximately two years
  - Substantial investment is required to begin operations:
    - $6 million in direct on-site construction costs
    - Road improvements of at least $3 million funded by Kaw Valley required before operations begin

Condition No. 3 – Revised

- **"The applicants shall develop the property in compliance with the site plan submitted on September 30, 2025.~~, except they shall erect an 8 ft perimeter fence.~~"**

  - Operational safety is of paramount importance
  - An eight-foot-tall chain link fence with a lockable gate will be located along the property's northeast frontage
    - Gate will be located on the entrance to the property from 161st Street
  - A six-foot-tall movable fence will surround the harvest pit as it grows in size
    - Expected to harvest approximately ten acres per year
    - The harvest pit will be approximately 281 acres at the termination of the SUP
  - Property will continue to be farmed as sand excavation occurs
  - Fencing the entire perimeter is simply not practical or beneficial

Condition No. 16 – Delete

- "~~Dredging operations shall be limited to the hours of 6:30am until 6:30pm Monday–Saturday.~~"

- Dredging and stockpiling may occur without restrictions to maintain inventory
  - Takes two hours to begin operations and two hours to shut down operations
  - Dredging and stockpiling generate little noise – electric equipment
    - Not excavating gravel
    - Rocks are ejected before reaching the separator/consolidator

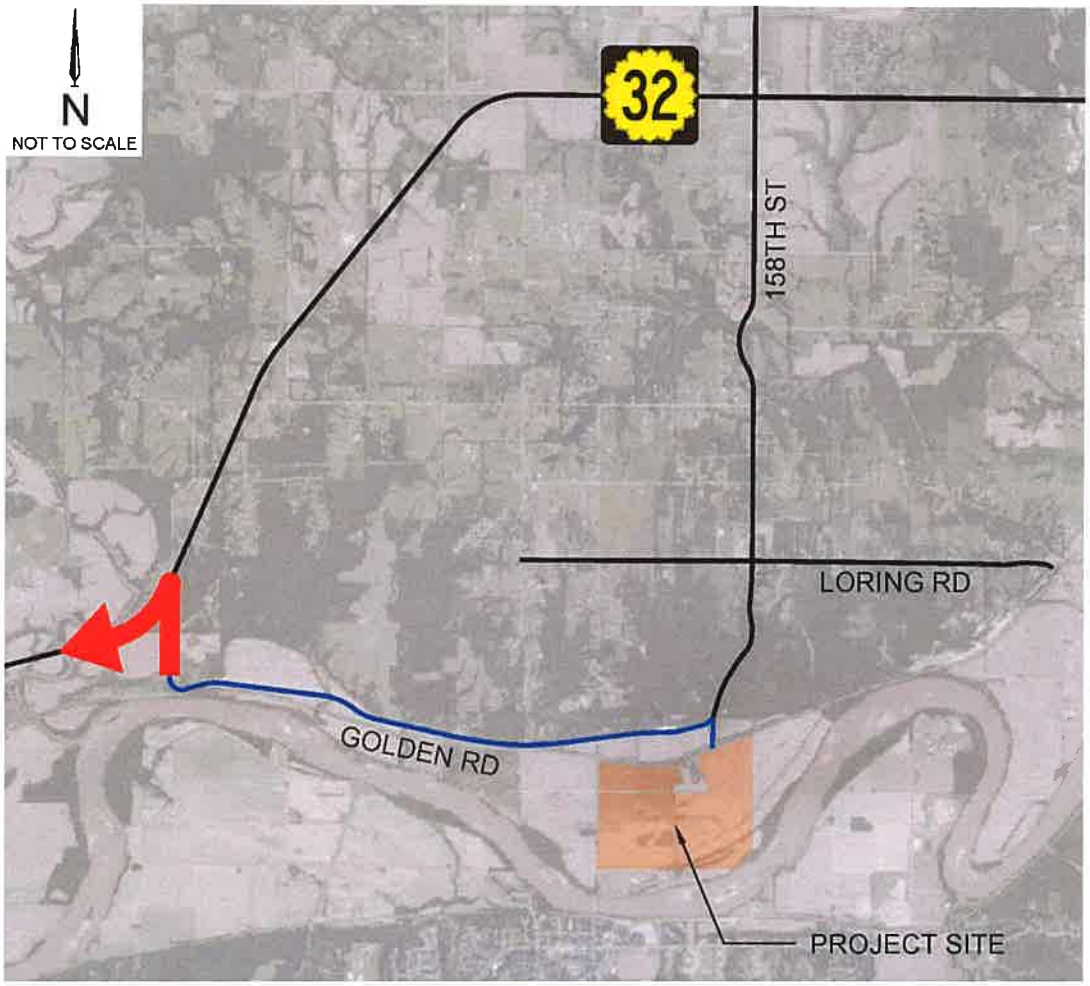
- **Excavation and hauling will be limited to 7:00 a.m. to 3:00 p.m. Monday–Friday.**

Additional – New Conditions to Consider

PRIMARY ROUTE MODIFICATION

- Condition to modify Primary Route to go south, left at K-32

ALTERNATE K-32 ROUTE



ALTERNATE K-32 ROUTE



RETAIL SALES

- Condition to allow Retail Sales

RETAIL SALES

- Not part of our business model
- Will add retail sales if made a condition of approval

More than Kaw Valley SUP
Bigger than Kaw Valley SUP
The Approval of the Kaw Valley SUP
is about County-wide
economic development

REQUEST

Approval of a special use permit to operate a sand excavation and stockpiling operation.

- Modify conditions 1, 3, and 16

(Willing to accept new conditions regarding alternate K-32 route and retail sales)

THANK YOU


Golden Road
Union Pacific Railroad
161st Street
Lenape Road
166th Street
Kansas River
Great Lawn
Park Shelter(s)
Fishing Dock(s)
Community Trail

GOLDEN FACTOR 6 SATISFIED

- Economic development and public gain promoted by:
  - Economic impact from construction:
    - 38 jobs - $2.37 million labor income; $7.47 million capital output
  - Economic impact from annual operations:
    - 36 jobs - $2.6 million labor income; $14.4 million capital output
  - Leveraging grant funds – Golden Road improvements
  - Funding the paving of Golden Road and pavement widening **($3 million estimate)**
  - Potential extension of rail service
  - Royalty payment

DREDGING

- Excavation Pit: Harvest Sand
  - Early stages
    - Water pump floods dredging pool
  - Later stages
    - Groundwater fills excavation pit
- Dredge line vacuums material
  - Feeds into washer
- Washer separates sand and sediment
- Sediment is returned to dredging pool



PRODUCTION

- Sand transferred to separator/consolidator
  - Sand from north pond transferred via underground pipeline
- Separator/consolidator grades the sand and transfers to stockpiles



ELECTRIC EQUIPMENT USED

- Water Pump
- Dredge line
- Washer
- Separator/consolidator







RECLAMATION PLAN



GOLDEN FACTOR 4

The only objective evidence is that there is NO negative impact from traffic, the road system has adequate capacity to handle over 120 trips a day. **We will generate 50 on average**.

GOLDEN FACTOR 4

- Capacity of 10,000 vehicles per day
- Current daily traffic is 2,300 – 2,670 vehicles
- Staff Report supports determination (subject to development agreement)

Estimated Haul Volume Comparison - 10 Acre Scenario

The following calculations compare the stated excavation acreage with the truck haul assumptions discussed during public meetings. These calculations illustrate the scale of material movement required to sustain the proposed mining operation.

Assumption	Value
Annual excavation area	10 acres/year
Approximate excavation depth	50 feet
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80,667 CY x 10 acres = **806,667 CY/year excavated**

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Estimated Additional Client Truck Traffic Needed

To account for the remaining excavation volume, approximately **209 additional client truck loads per day** would still be required beyond the applicant's stated 50 daily loads.

This would result in approximately **259 total one-way loaded truck loads per day** when including both company trucks and client trucks.

Because each loaded truck also returns empty, that equals approximately **517 total truck movements per day** past the road/driveway area.

Item	Description
Project Description	The project includes a pavement evaluation of an approximately 4¼ mile stretch of Golden Road in Leavenworth County. As well as a 3-mile alternate route along N 158th Street and Loring Road. The client is seeking information on current state of the roadway, and recommendations for the roadway to support additional truck traffic.
Pavements	GBA completed a traffic study at the site. An approximate vehicles per day (VPD) of 2,100 was provided to use in our analysis. The existing traffic consists of less than 1% articulated trucks and, amongst all routes, an average of 2% buses/single-unit trucks. Truck traffic of 120 round trips of tandem axle dump trucks is expected to be added to the existing traffic.

Terracon should be notified if any of the above information is inconsistent with the planned construction, as modifications to our recommendations may be necessary.

Site Conditions

The following description of site conditions is derived from our site visit in association with the field exploration and our review of publicly available geologic and topographic maps.

Item	Description
Project Location	The project is located along Golden Road, N 158th Street, and Loring Road in Leavenworth County, Kansas. Approximate Latitude/Longitude: 38.9985, -94.9843 (See Exhibit D)
Existing Improvements	Asphalt paved roadway
Existing Topography	Elevations at the site range from 780 feet to 840 feet. In general, the site slopes downward to the east.
Geology	The subsurface at the site consists of alluvial soils overlying the bedrock strata of the Lansing Group.

We also collected photographs at the time of our field exploration program. Representative photos are provided in our .

May 17, 2026

VIA EMAIL

RE: SUP DEV-25-021 - Unresolved Trip Generation and Review Concerns

Dear Leavenworth County Board of County Commissioners and Planning & Zoning Staff,

I am writing regarding Special Use Permit DEV-25-021 for the proposed Kaw Valley sand excavation and stockpiling operation.

My concern is not simply whether I agree or disagree with the applicant's traffic estimates. My concern is that the County's own third-party engineering consultant, Olsson Engineering, formally identified unresolved inconsistencies in the truck-trip generation numbers before the November 12, 2025 Planning Commission hearing, yet the application was still allowed to continue forward without requiring those inconsistencies to be fully reconciled.

In the September 30, 2025 Consolidated Response Letter, Olsson Engineering specifically stated that the traffic trips were inconsistent throughout the application documents and required the documents to be revised so they were consistent. Olsson further questioned whether all employee, non-employee, and third-party truck traffic had been incorporated into the studies and noted that different truck counts were being referenced throughout the application materials.

Despite these concerns being identified prior to the November Planning Commission vote, the same application and substantially the same trip-generation assumptions continued forward through the review process.

Following the March 25, 2026 remand, the applicant's attorney stated that "no changes are proposed" to the application materials. As a result, it remains unclear why the application was returned to the Planning Commission and continued forward without first resolving the inconsistencies previously identified by the County's own consultant.

This issue is important because the traffic assumptions are foundational to the entire roadway impact analysis. The Route Study, Traffic Study, Pavement Evaluation, and related engineering conclusions all depend upon reasonably accurate truck-trip generation and operational assumptions.

The County's Special Use Permit procedures require supporting studies and complete application materials. The County's own adopted policies further state that governmental decision makers should receive "timely, adequate, clear, and accurate information." In this case, unresolved inconsistencies in the trip-generation data were formally identified in writing before the public hearings proceeded.

I respectfully believe those discrepancies should have been fully reconciled before Public Works, Planning & Zoning staff, and the applicant continued advancing the application through the review process.

This letter is not intended as a personal criticism of any individual involved in the review. However, because these unresolved inconsistencies directly affect the reliability of the supporting engineering analyses and the factual basis relied upon for decision-making, I respectfully request that this correspondence be preserved as part of the official administrative record for SUP DEV-25-021.

Thank you for your time and consideration.

Sincerely,

Todd Donaldson
16440 Golden Rd
Leavenworth County, KS

Column

See Proof on Next Page

AFFIDAVIT OF PUBLICATION

Leavenworth Times
832-A N. Main Street, Lansing, KS 66043
(913) 682-0305

State of Florida, County of Orange, ss:

I, Anjana Bhadoriya, of lawful age, being duly sworn upon oath depose and say that I am an agent of Column Software, PBC, duly appointed and authorized agent of the Publisher of Leavenworth Times,a publication that is a "legal newspaper" as that phrase is defined for the city of Leavenworth, for the County of Leavenworth, in the state of Kansas, that this affidavit is Page 1 of 2 with the full text of the sworn-to notice set forth on the pages that follow, and that the attachment hereto contains the correct copy of what was published in said legal newspaper in consecutive issues on the following dates.

Publication Dates:

- Apr 18, 2026

Notice ID: 1EhqmF5EC6PARW8Nb4G8

Notice Name: land use extraction materials

Publication Fee: $21.51

Anjana Bhadoriya

_____

Agent

VERIFICATION

State of Florida
County of Orange

JESSICA GORDON-THOMPSON
Notary Public - State of Florida
Commission # HH301656
Expires on August 17, 2026

Signed or attested before me on this: 04/21/2026

_____

Notary Public

Notarized remotely online using communication technology via Proof.

NOTICE OF PUBLIC HEARING

Notice is hereby given for the Leavenworth County Planning Commission to hold a public hearing regarding an application (DEV-25-021) for a Special Use Permit for a Land Use of Extraction of raw materials (sand) to operate a sand excavation and stockpiling business; such use being listed in Article 19, Table of Uses, in the Leavenworth County Zoning and Subdivision Regulations.

The Special Use Permit (DEV-25-021) request is for the following described property:

A tract of land over a portion of the Northwest, Northeast, Southwest and Southeast Section 22, Township 12 South, Range 22 East, of Leavenworth County, Kansas, more particularly described as follows: BEGINNING at the North westerly corner of this SUP PERMIT BOUNDARY thence S84°49'09"E a distance of 1245.06 feet, said point also being a point on a non-tangent curve; thence Easterly, along a curve to the left, having a radius of 2348.16 feet, a central angle of 32°43'54", a distance of 1341.45 feet, thence N55°26'49"E a distance of 94.09 feet, thence S22°28'51"E, a distance of 661.46 feet, thence S68°30'32W, a distance of 343.39 feet, thence S02°38'11"E a distance of 268.68 feet, thence N87°29'03"E, a distance of 1226.92 feet, thence N22°20'46"W, a distance of 1318.47 feet, thence N67°34'56"E a distance of 2031.74 feet, thence S02°15'53"E a distance of 3885.72 feet, thence S42°36'55"W a distance of 906.97 feet, thence S87°45'55"W a distance of 4644.77 feet, thence N02°42'34"W a distance of 437.46 feet, thence N21°33'21"E a distance of 79.21 feet, thence N01°03'15"W a distance of 2148.27 feet, thence S88°25'46"E a distance of 10.29 feet, thence N02°26'46"W a distance of 990.90 feet, to the POINT OF BEGINNING.

Request submitted by Kaw Valley Companies, Inc.

Address: 16201 & 00000 Lenape Road

Parcel ID number: 235-22-0-00-00-004.00 & 235-22-0-00-00-014.00

The hearing will be held on Wednesday the 13th day of May, 2026 at 5:30 p.m., in the Meeting Room, located on the second floor of the Leavenworth County Courthouse, 300 Walnut Street, Leavenworth, Kansas.

Further information is available, including the full legal description, for inspection during regular business hours in the Leavenworth County Planning & Zoning Department.

We encourage public input. If you wish to provide comments in writing instead of in person, written comments must be received no later than noon Tuesday, May 12, 2026.

John Jacobson, Secretary

Leavenworth County Planning Commission

Published in the Leavenworth Times, Apr 18, 2026

4485100

RESOLUTION 2026-07

A resolution of the Leavenworth County Kansas Board of County Commission, conditionally issuing a Special Use Permit for a sand excavation and stockpiling operation – Kaw Valley Companies, Inc. on the following described property:

> A tract of land over a portion of the Northwest, Northeast, Southwest and Southeast Section 22, Township 12 South, Range 22 East, of Leavenworth County, Kansas, more particularly described as follows: BEGINNING at the North westerly corner of this SUP PERMIT BOUNDARY thence S84˚49'09"E a distance of 1245.06 feet, said point also being a point on a non-tangent curve; thence Easterly, along a curve to the left, having a radius of 2348.16 feet, a central angle of 32˚43'54", a distance of 1341.45 feet, thence N55˚26'49"E a distance of 94.09 feet, thence S22˚28'51"E, a distance of 661.46 feet, thence S68˚30'32W, a distance of 343.39 feet, thence S02˚38'11"E a distance of 268.68 feet, thence N87˚29'03"E, a distance of 1226.92 feet, thence N22˚20'46"W, a distance of 1318.47 feet, thence N67˚34'56"E a distance of 2031.74 feet, thence S02˚15'53"E a distance of 3885.72 feet, thence S42˚36'55"W a distance of 906.97 feet, thence S87˚45'55"W a distance of 4644.77 feet, thence N02˚42'34"W a distance of 437.46 feet, thence N21˚33'21"E a distance of 79.21 feet, thence N01˚03'15"W a distance of 2148.27 feet, thence S88˚25'46"E a distance of 10.29 feet, thence N02˚26'46"W a distance of 990.90 feet, to the POINT OF BEGINNING, more commonly known as 16201 & 00000 Lenape Road.

WHEREAS, it is hereby found and determined that a request for a Special Use Permit as described above was filed with the Secretary of the Leavenworth County Planning Commission, on the 13th day of May, 2025, and

WHEREAS, it is hereby found that the Leavenworth County Planning Commission, after notice as required by law, did conduct a public hearing upon the granting of such request for a Special Use Permit on the 12th day of November, 2025; and

WHEREAS, it is hereby found that the Leavenworth County Planning Commission, based upon specific findings of fact incorporated by reference herein, did recommend that the Special Use Permit be denied; and

WHEREAS, the Board of County Commission considered, in session on the 25th day of March, 2026, the recommendation of the Leavenworth County Planning Commission and remained the case back to the Planning Commission to hold a second public hearing to consider a modified application, including the Golden Factors and to develop an updated record and recommendation for consideration by the Board of County Commissioners.

WHEREAS, it is hereby found and determined that an email from the applicant was submitted on the 25th day of March 2026 that stated that no changes are proposed to the application on file, however, that two alternatives are proposed should the Planning Commission or Board of County Commissioners wish to consider amending the application. The alternatives included modifying the traffic route and allowing retail sales on site., and

WHEREAS, it is hereby found that the Leavenworth County Planning Commission, after notice as required by law, did conduct a second public hearing upon the granting of such request for a Special Use Permit on the 13th day of May, 2026; and

WHEREAS, it is hereby found that the Leavenworth County Planning Commission, based upon specific findings of fact incorporated by reference herein, did recommend that the Special Use Permit be denied; and

WHEREAS, the Board of County Commission considered, in session on the 3rd day of June, 2026, the recommendation of the Leavenworth County Planning Commission.

NOW, THEREFORE, BE IT RESOLVED by the Board of County Commission of Leavenworth County, Kansas, that:

I. Based upon the findings as set forth in the staff report and the findings of fact adopted by the Board of County Commission in regular session on the 3rd day of June, 2026, and incorporated herein by reference, **Case No. DEV-25-021, Special Use Permit for a sand excavation and stockpiling operation – Kaw Valley Companies, Inc is conditionally approved subject to the performance and observation of the conditions and stipulations set forth herein.**

II. The Special Use Permit conditionally granted in Section I. is hereby contingent upon the performance and observations of the following additional and supplementary regulations, stipulations, conditions and restrictions, of which any violations shall constitute an additional basis for revocation:

1. The SUP shall be limited to a period of 3 years with annual staff evaluations.

2. The applicants shall enter into and fully execute a Development Agreement incorporating the provisions of the County's Roadway Improvement Agreement to ensure that the roads are evaluated, and improved to a standard that will accommodate the proposed use.

3. The applicants shall develop the property in compliance with the site plan submitted on September 30, 2025, except they shall erect an 8ft parameter fence.

4. An emergency plan shall be prepared and submitted to Fire District #2 and the Emergency Management Department for approval prior to operations commencing.

5. All operations shall not take place within 105' from the center of any public roadway. All activities shall be a minimum of 40' from the property line. All activity along the southern parcel boundary shall be a minimum of 80' from the property line.

6. Machinery shall be well-maintained and lubricated to reduce noise.

7. There shall be no truck traffic associated with the development traveling south on 166th Street into De Soto.

8. Jake braking shall be prohibited.

9. Trucks shall use only the designated haul route as approved with this Special Use Permit.

10. All trucks exiting the site shall be weighed and must meet legal load limits prior to exiting the site.

11. Trucks shall not enter the site prior to 7:00am and shall exit the site no later than 3:00pm, Monday-Friday.

12. Noise shall be limited to 65 dBs along property lines adjacent to Residentially Zoned Parcels.

13. Lighting generated from the development shall be limited to 0.00 foot-candles net gain, as measured at the property line.

14. A permit for the private sanitation system shall be submitted to the County and must be maintained in compliance with the Leavenworth County Sanitary Code per the email from Kyle Anderson dated March 28, 2025.

15. A right-of-way obstruction permit shall be required for any improvement within the County right-of-way.

16. Dredging operations shall be limited to the hours of 6:30am until 6:30pm Monday-Saturday.

17. The applicants shall file a Surface Mining Permit with the Kansas Department of Agriculture. This shall be submitted to Leavenworth County upon completion, including confirmation of the reclamation bond and a copy of the approved reclamation plan.

18. The applicant shall update and maintain the Section 401 Water Quality Certification with the Kansas Department of Health and Environment and shall comply with all conditions set forth within the Certification.

19. All Notices of Intents and Stormwater Pollution Prevention Plans shall be obtained from the State of Kansas and a copy provided to the County.

20. The applicant shall obtain and comply with all State, Federal and local floodplain permits.

21. The SUP shall be limited to five (5) full-time employees not including truck operators.

22. No on-site retail sales shall be permitted from the site.

23. The applicant shall adhere to the following memorandums:
    a. Email – Kyle Anderson, Code Enforcement, dated March 28, 2025
    b. Memo – Chuck Magaha, Emergency Management, dated July 31, 2025
    c. Memo – Public Works, dated October 15, 2025

24. No signage is allowed in the right-of-way. No signage is requested with the SUP. All signage shall comply with Article 25, Sign Regulations of the Leavenworth County Zoning and Subdivision Regulations.

25. No on-street parking or stacking shall be allowed.

26. The applicant shall provide a certificate of general liability insurance in the amount of $1,000,000 and shall indicate Leavenworth County as the certificate holder prior to commencement of activities on the site.

27. This SUP shall be limited to the application submitted on September 30, 2025 and narrative submitted on October 16, 2025.

28. That no public nuisance be allowed or created upon the subject real property.

29. This SUP shall comply with all local, state, and federal rules and regulations that may be applicable.

30. That the conditional Special Use Permit granted herein is subject to revocation upon the breaching of the conditions set forth herein, or any substantial change in the use of the subject property. Kaw Valley Companies, Inc., and its assigns or successors in interest, hereby consent to, and authorize, entry onto the

subject property by employees or agents of the County for the purpose of inspecting the subject property for compliance with the conditions set forth herein.

located in Section 22, Township 12 South, Range 22, in Leavenworth County, Kansas more commonly known as 16201 & 00000 Lenape Road.

Adopted this 3rd day of June, 2026
Board of County Commission
Leavenworth, County, Kansas

_____
Mike Stieben, Chairman

ATTEST

_____
Jeff Culbertson, Member

_____
Janet Klasinski

_____
Vanessa Reid, Member

_____
Willie Dove, Member

_____
Mike Smith, Member

Leavenworth County
Request for Board Action

Date: May 28, 2026

To: Board of County Commissioners

Cc: Mark Loughry; Bill Noll; John Jacobson

From: Misty Brown, County Counselor

Department Head Approval: N/A

Additional Reviews as needed:

Budget Review ☐ Administrator Review ☐ Legal Review ☒

Action Requested: Review the proposed Development and Road Improvement Agreement between Kaw Valley, Inc. and the County and take action as desired.

Analysis: The attached Development and Road Improvement Agreement was prepared in accordance with the County's Roadway Improvement Policy in the event that the Board of County Commissioners issues a Special Use Permit in Case No. SUPDEV-25-021, to allow for the utilization of an approximately 435 acre site located at 166th and Lenape Road for a sand excavation, stockpiling and sales operation, both wholesale and retail.

A condition of the Special Use Permit required the Applicant to enter into a Development Agreement incorporating the provisions of the County's Roadway Improvement Agreement to ensure that the roads are evaluated and improved to a standard that will accommodate the proposed use. The attached agreement incorporates the County Roadway Improvement Policy and addresses other factors associated with the impact of the proposed use.

Alternatives: 1) Approve the Agreement; 2.) Decline to Approve the Agreement and provide direction to staff; or 3) Table the matter for further study.

Budgetary Impact:

☒ Not Applicable
☐ Budgeted item with available funds
☐ Non-Budgeted item with available funds through prioritization
☐ Non-Budgeted item with additional funds requested

Total Amount Requested: N/A

Additional Attachments: (1) Copy of Development and Road Improvement Agreement

DEVELOPMENT AND ROAD IMPROVEMENT AGREEMENT

This Development and Road Improvement Agreement (the "Agreement") is made and entered into on this ___ day of _____, 2026, by and between the Board of County Commissioners of Leavenworth, Kansas, a body politic organized and existing pursuant to the laws of the State of Kansas (hereinafter "County") and Kaw Valley Companies, Inc., a Kansas corporation (hereinafter "Applicant"). The County and Applicant are collectively referred to herein as the "Parties."

I. RECITALS

WHEREAS, the Applicant applied to the County for the issuance of a Special Use Permit ("SUP"), in Case No. SUPDEV-25-021, to allow for the utilization of an approximately 435 acre site located at 166th and Lenape Road for a sand excavation, stockpiling and sales operation, both wholesale and retail (the "Project"). The Project is proposed to be located upon the land legally described on **Exhibit A** attached hereto and incorporated herein by reference and depicted on the site plan attached hereto as **Exhibit B** and incorporated herein by reference (the "Property" and the "Site Plan" respectively); and

WHEREAS, on or about_____, 2026 the County adopted Resolution No. _____, attached hereto and incorporated herein by reference as **Exhibit C** (the "SUP Resolution") which approved the issuance of the SUP for the Project subject to a number of conditions which were placed upon the SUP; and

WHEREAS, the SUP Resolution requires the Applicant to enter into this Agreement with the County regarding *inter alia*: (1) the design and construction of certain necessary road improvements uniquely and specifically required for the operation of the Project (the "Road Improvements"); (2) for the reduction of dust and dirt from the operation of the Project on the Property; and (3) the satisfaction of other conditions of approval as set out in the SUP Resolution; and

NOW THEREFORE, in satisfaction of Condition _____ of the SUP Resolution and for good and valuable consideration, the County and Applicant hereby enter into this Agreement on behalf of themselves and their respective successor and legal representatives, upon the following terms and conditions and in consideration of the mutual covenants and agreements contained herein.

II. EFFECTIVE DATE AND TERM

1. **EFFECTIVE DATE AND TERM.** The effective date of this Agreement shall be _____, notwithstanding that the parties have executed this Agreement on an earlier date or later date. This Agreement shall be for the same term as the term of the SUP and shall automatically expire when such permit expires or is revoked.

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III. ROAD IMPROVEMENTS

1. **ROAD IMPROVEMENTS.** The Applicant acknowledges that the operation of the Project will add heavy commercial traffic to the County road system. As part of the SUP application review process, the County required the Applicant to submit a proposed haul route, and the Applicant elected to conduct a comprehensive Road Study (the "Road Study"). The Road Study identified certain road improvements to be made by the Applicant which are specifically and uniquely attributable to the traffic that is anticipated to be created by the operation of the Project which are set out on **Exhibit D** (the "Preliminary Road Improvements"). The Preliminary Road Improvements are preliminary and will be validated and possibly modified by the process set out in Section 2 below.

2. **REVIEW AND EVALUATION OF PRELIMINARY ROAD IMPROVEMENTS.** Pursuant to the terms of this Agreement, with the approval of the SUP, the parties will take the following steps to review, evaluate, confirm and possibly modify the scope of the Preliminary Road Improvements and determine, with the input of the Applicant and the County, the scope, timing and sequencing of the final road improvements to be built or funded by the Applicant to mitigate the unique and specific impacts of traffic generated by the operation of the Project (the "Final Road Improvements"):

(a) The County shall issue a request for proposals from qualified engineering firms to provide engineering consultant services in regard to the Primary and Secondary Routes, as defined in the SUP and the impact of the Project on the Primary and Secondary Routes. The County shall, in its sole discretion, select the engineering firm (the "Consulting Engineer") to perform the work described below at the sole cost of the Applicant.

(b) Engineering services to be provided by the Consulting Engineer (the "Engineering Services") may be provided in up to six phases with the goal being to provide the County Engineer and the Director of Public Works with recommendations on how best to improve the Primary Route, as defined in the Road Study to ensure that the Primary Route complies with the applicable road design standard and to further ensure the public health, welfare and safety is being protected. Additionally, the objective of the Engineering Services is to determine and/or confirm the road improvements that are not otherwise being funded by other sources, which need to be built to resolve and mitigate the direct impacts on the Primary Route resulting from the operation of the Project. The six phases of the Engineering Services could but need not include the following:

(i) **Planning/study phase** includes, but is not limited to, development of a project schedule, design criteria documents, consultants to identify the best route for the Road Improvements, and a traffic study.

(ii) **Field work/ discovery phase** includes, but is not limited to, analysis of existing roadway geometrics and drainage structure condition, corridor topographic and boundary survey, preparation and submittal to governmental agencies a certified land corner record for each section corner recovered and used for the project, geotechnical investigation of existing pavement and corridor soils, said geotechnical investigation information to be utilized by the consultant for

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pavement typical section design, obtaining title work, analysis of utility encumbrances and required relocations, development of geometric concept plan, and analysis of horizontal and vertical curve modifications and required right-of-way easement acquisition.

(iii) **Preliminary design phase** includes, but is not limited to, development of roadway and storm improvements plan documents for preliminary plans with right-of-way and easement strip map, preparation of cost estimate for preliminary plans and a field check meeting.

(iv) **Final plans phase** includes, but is not limited to, preparation of construction sequence and traffic control plan, erosion control plans, property acquisition documents and exhibits, being available to meet with some property owners during the acquisition process, providing right of way and easement staking for some properties to aid in acquisition, submittal of final plans for County comment, coordination of utility relocations prior to construction, preparation of cost estimate for final plans, obtaining all necessary permits for construction and environmental assessment.

(v) **Bidding and construction phase** includes, but is not limited to, preparation of specifications and special provisions for construction bid package, providing bid letting assistance, construction period services and resetting any property corners disturbed during construction.

(vi) **Project acceptance/ long term maintenance requirement phase** includes, but is not limited to, a punch list walk through the County.

(c) The Consulting Engineer's opinions shall be reduced to writing (the "Report"). The Report shall indicate whether or not traffic generated by Applicant's proposed use will have a detrimental impact on the safety of the public or will require the County to subsidize the business as a result of the degradation of the roadway created from the additional traffic and what improvements, if any, need to be made to the Primary Route as a direct result of the Project to comply with the applicable County standard as defined by the County Engineer. The Report shall be subject to the review and approval of the County Engineer (the "Approved Report"). The Approved Report shall contain the Final Road Improvements to be built or funded by the Applicant to mitigate the direct traffic impacts of the Project on the Primary Route. The Applicant agrees to accept and shall be bound by the opinions and conclusions set forth in the Approved Report.

(i) The Approved Report, as it relates to the Final Road Improvements, shall identify the typical section and pavement requirements for a standard 20-year pavement design life based on existing traffic on the Primary Route and the anticipated residential traffic growth and additional ESAL loading associated with the Project.

(ii) If the Applicant improves or funds improvements to portions of the Primary Route based on the Approved Report and other entities are approved to

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utilize the Primary and Secondary Routes and required to pay the County a traffic impact or road use and maintenance fee as a condition of their special use permit within ten (10) years of the date of this Agreement, the Applicant may be entitled to receive a pro-rata share of the traffic impact or road use and maintenance fees paid to the County during the initial ten (10) years period from the date of this Agreement. Similar to the original pro-rata share formula, all recalculations shall be based on anticipated ESAL loading for each roadway user. Regardless of the amount of traffic impact or road and maintenance fees collected by County, Applicant shall only receive up to 50% of the actual amount paid by Applicant to improve the Road.

(d) The County shall provide the Applicant with the cost information prior to initiating phase (i), the planning/study phase, and after completion of each subsequent phase thereafter and after the bid opening in phase (v). The Applicant retains authority to, in its sole discretion, elect to move forward with each phase and any work recommended by the Consulting Engineer or withdraw its application for the SUP. If the Applicant wishes to proceed with a phase, the Applicant shall notify the County of its wish to proceed and remit payment in full to the County for the cost of the Consulting Engineer and/or general contractor services as they apply to the phase prior to the commencement of that phase of work. Upon notice of the Applicant's wish to proceed and receipt of payment in full, the County shall engage the Consulting Engineer to begin the next phase.

3. **PAYMENT IN LIEU OF ROAD IMPROVEMENT CONSTRUCTION**. As an alternative to the Applicant constructing the Final Road Improvements, the parties agree that it may be best for the Applicant to make a payment in an amount equal to the estimated cost to construct the Final Road Improvements directly to the County (the "Payment in Lieu of Construction") in order to maximize the road improvements that may be made to the Primary Route. The Payment in Lieu of Construction will be based upon the Consulting Engineer's estimate of the Final Road Improvements and shall be made by the Applicant upon receiving ninety (90) days written notice from the County that it has issued a notice to proceed to the contractor selected to construct the Final Road Improvements. The Applicant's payment of the Payment in Lieu of Construction shall satisfy the Applicant's obligations under Sections 2 and 3 of this Agreement.

4. **CREDITS.** Pursuant to the County's Traffic Impact Policy, the Applicant shall receive a credit against any and all other costs or fees, including any Traffic Impact Fee, which might be due and owing under the County's Traffic Impact Policy on a dollar-for-dollar basis based upon all the costs and fees related to the Final Road Improvements actually constructed or funded by the Applicant. (The Traffic Impact Fee is distinct and not the same as the Royalty Fee set out in Section IV below.)

5. **DUST CONTROL/ROAD MAINTENANCE.** The parties understand and agree that dirt, loose rock and the like may be deposited on the Primary and Secondary Routes as a result of Applicant's operation on the Property. In the event Applicant or Applicant's customers deposit dirt, loose rock and the like that are in such quantities or of such size that their presence upon the surface of Golden Road may cause hazardous driving conditions for traffic, the Applicant shall be responsible for removing the same within three (3) days upon receipt of notice or upon Applicant's

observation of such conditions. Further, all loose rock and the like caused by Applicant or Applicant's customers or agents, regardless of size or quantity, shall be swept from the surface of Golden Road on an as-needed basis. All safety precautions shall be observed by Applicant during the sweeping process.

IV. ROYALTY FEE

Upon commencement of sand dredging operations at the Project, the Applicant shall pay to the County on a weekly basis an impact fee based upon the following schedule for each ton of sand sold from the operations of the Project: Years 1 – 5 of operations: Twenty-Five Cents ($0.25); Years 6 – 10 of operations: Fifty Cents ($0.50); and Years 11 – 20 of operations: Seventy-Five Cents ($0.75) (the "Royalty Fee"). In recognition that circumstances may materially change over time, the Parties agree to meet and confer in good faith to re-evaluate the impact fee and its continued appropriateness no later than the twentieth (20th) anniversary of the Effective Date of this Agreement.

The Royalty Fee shall be paid by the Applicant to the County within thirty (30) days after the end of the previous week. Kaw Valley shall submit to the County reasonable documentation as to the amount of sand removed from the Project for each week the Project is in operation an provide the County with a copy of Kaw Valley's annual Mine Safety and Health Administration ("MSHA") report. No Royalty Fee shall be due and owing if no sand is sold from the operations of the Project in any given week. The County may use the Royalty Fee as it sees fit, including for future maintenance and repair work on the Primary Route.

By way of information only, the Applicant intends to use JWS software to track trucks that will cross the scales that will be located on the Property to weigh the sand excavated from the Property. It is anticipated that a weekly spreadsheet will be prepared which includes the date, the aggregate material, quantity in tons sold and ticket numbers for each transaction. Similar tracking software will be utilized throughout the term of the SUP and this Agreement.

V. FUTURE EXPANSION

The County and the Applicant have had preliminary conversations regarding the possible future growth and expansion of the Applicant's other operations within the County. It is the desire of the Parties that these conversations continue and that they result in additional capital investment, jobs and taxes being generated by the Applicant within the County. It is not anticipated that any such relocation and/or expansion shall occur until after the Project is fully operating and stabilized.

VI. RAILROAD

1. **RAILROAD CROSSING AND OTHER RAIL CONSIDERATIONS.** As it relates to the railroad crossing just north of 161st Street and the Railroad Road intersection, Union Pacific Railroad ("UPR") has indicated that it has conceptually approved the crossing. To complete its review, UPR will require that the County, as the "road authority," make a formal request for review of the crossing by the UPR. Any fee associated with this review request will be provided by the Applicant.

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2. **FUTURE RAILROAD.** The Applicant acknowledges and agrees with the County that the extension of rail service to and beyond the Property would not only benefit the Property and the operations of the Project but would also be beneficial to future development in the County. The Applicant agrees in good faith to use commercially reasonable efforts to convert Applicant's transportation of sand from the Project to rail service within three (3) years after commencement of operation. Such efforts include, but are not limited to, evaluating feasibility, engaging with rail providers, pursuing necessary permits and approvals, and undertaking reasonable infrastructure planning consistent with industry standards. Further, the Applicant agrees to fully cooperate with the County in the exploration of federal, state or other funds which might be available to facilitate this extension.

VII. VIOLATION OF THIS AGREEMENT

1. **VIOLATION OF THIS AGREEMENT**. It is understood and agreed upon by the Parties that:

(a) If it is determined by the County that Applicant has failed to perform or breaches any material term, condition, provision or obligation of this Agreement, then the County shall provide Applicant with written notice of the failure of performance or breach, and Applicant shall be given a reasonable opportunity, but not less than ten (10) days, to cure such failure or breach. If Applicant fails to timely cure the failure of performance or breach then:

(i) The County may terminate or revoke the SUP; and

(b) Notwithstanding the notice and opportunity to cure afforded to Applicant above:

(i) If the Public Works Director determines that there is a reasonable probability that Applicant's failure to perform or breach may cause hazardous driving conditions for traffic, then the County Engineer may close Golden Road to through traffic until such time as the failure to perform, the breach and hazardous conditions are remedied to the satisfaction of the County Engineer; and

(ii) In the event the Public Works Director closes Golden Road to through traffic as set forth above in subparagraph 5(b)(i), then Applicant shall not haul from the Property while Golden Road is closed.

(iii) If Golden Road is closed, time is of the essence to get Golden Road cleared of any hazardous driving conditions so Golden Road can be reopened without further delay.

VIII. DISPUTE RESOLUTION

1. **DISPUTE RESOLUTION.** In the event that Applicant believes it is aggrieved and wishes to contest the determinations of the Consulting Engineer regarding either the scope or cost estimates of the Final Road Improvements, the Applicant may submit its contest in writing to

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the County. The contest shall set out in detail the basis for the contest to include information on any outside engineering consultants advising Applicant. Within ten (10) business days of the serving of the notice of contest, the parties shall confer to discuss the contested issues. In the event that the contested issues remain unresolved, Applicant may request that the Leavenworth County Board of County Commissioners conduct a hearing on the unresolved contested issues. At that hearing, Applicant shall fully state in detail the basis of the contest and provide a suggested resolution to the contested issues. The Board of County Commissioners shall consider and rule upon the contested issues within two (2) calendar weeks of the closure of the hearing on the matter.

While the parties acknowledge that it is the duty and prerogative of the Board of County Commissioners to act in the best interests of the public health, welfare and safety of the citizens of Leavenworth County, as it relates to the scope of the Final Improvements, decisions by the Board of County Commissioners on the contested issues shall be final, subject to judicial review as provided by K.S.A. 19-223.

VIX. GENERAL PROVISIONS

1. **COOPERATION OF APPLICANT**. Applicant shall fully and timely cooperate with the County in its efforts to comply with the terms and conditions of this Agreement. The Applicant shall take such actions, including timely participating in meetings with the County as reasonably requested and the execution and delivery of such documents and instruments to the Consulting Engineer, as may be reasonably necessary to carry out the terms, provisions and intent of this Agreement.

2. **NOTICES**. Any notices, demands or requests required by this Agreement shall be deemed sufficient if sent by the parties hereto by hand delivery (including courier services providing a receipt) or by U.S. mail, postage prepaid, addressed to:

If to the County:	Mark Loughry Leavenworth County Administrator 300 Walnut Street Leavenworth, KS 66048
With a copy to:	Misty S. Brown County Counselor Leavenworth County, Kansas 300 Walnut Street Leavenworth, KS 66048
If Applicant:	Tim Kates Kaw Valley Companies, Inc. 5600 Kansas Avenue Kansas City, KS 66106

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With a copy to: Aaron G. March
Rouse Frets White Goss
801 W. 47th St., Suite 500
Kansas City, MO 64112

A party's address may be changed by written notice to the other party; provided, however, that no notice of a change of address shall be effective until actual receipt of such notice.

Furthermore, in the event of a successor to Applicant's interest, Applicant shall give the County written notice of the same and shall provide the County with the name and address of Applicant's successor(s). The failure of Applicant to notify the County of Applicant's successor(s) shall relieve the County from any notice requirements it would otherwise be obligated to give Applicant's successor.

3. **SALE OF PROPERTY/ TRANSFER OF INTEREST.** Applicant agrees that the sale of any portion of the Property, or the sale or assignment in fact or at law, or such other transfer of Applicant's interest in the Property, shall in no way effect or change Applicant's obligation to continue to comply with the terms of this Agreement unless and until Applicant first receives the written permission of the County to substitute its successor(s) or assignee(s), and any such successor(s) or assignee(s) enter into a separate written agreement with the County to assume the same terms, covenants and obligations regarding the mattes referred to herein. However, if Applicant ceases operations at the Property and notifies the County of its intention to no longer utilize the SUP, then Applicant shall immediately be relieved of any obligations and duties required by the terms of this Agreement.

4. **INDEMNITY.** Applicant further agrees to protect, defend, indemnify and hold the County and its officers, employees and agents free and harmless from and against any and all losses, penalties, damages, settlements, costs, charges, professional fees or other expenses or liabilities, whether false, fraudulent, meritless, or meritorious, of every kind and character arising out of or relating to any and all claims, liens, demands, obligations, actions, proceedings or causes of action of every kind and character (the "Claims") in connection with, relating to or arising directly or indirectly out of the error, omission, or negligence of Applicant and its employees, contractors, subcontractors, independent contractors, or other similar entity's performance of the term and conditions of this Agreement. Applicant further agrees to investigate, handle, respond to, provide defenses for and defend any such Claims at its sole expense and agrees to bear all other costs and expenses related thereto, even if said Claims are groundless, false or fraudulent. Applicant shall have the exclusive and sole right to use an attorney of its choice to handle, investigate and/or defend such claims.

5. **RECORDING OF THIS AGREEMENT.** Applicant further agrees that this Agreement shall be filed by Applicant with the Register of Deeds, Leavenworth County, Kansas, as soon as reasonably practical after it has been signed by both parties hereto, such costs as may be incurred by the recording to be paid by Applicant. Applicant shall provide the County Counselor with file stamped copies of the recording Agreement immediately after it has been recorded.

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6. **COVENANTS RUNNING WITH THE LAND**. Unless terminated in accordance with this Agreement, all of the terms, provisions and requirements of this Agreement shall be deemed to be covenants running with the land and shall, therefore, be binding upon Applicant and its respective successors, except as otherwise state herein.

7. **GOVERNING LAW**. This Agreement shall be governed by the laws of the State of Kansas. In any proceeding that may be brought arising out of, in connection with, or by reason of this Agreement, the laws of the State of Kansas shall be applicable, controlling and govern to the exclusion of the law of any other forum, without regard to the jurisdiction in which any such proceeding may be instituted.

8. **STATUS OF PARTIES.** It is understood and agreed between the Parties that this Agreement does not and shall not be construed, interpreted or argued by either of them in a court of law or otherwise, to create any principal/agent, master/servant, employer/employee or partnership relationship of any kind between County and Applicant.

9. **NO JOINT VENTURE**. This Agreement does not create any joint venture, partnership, undertaking, or business arrangement between or among the Parties hereto nor any rights or benefits to third parties, except as expressly provided herein. Neither Party shall be authorized to enter any into binding agreement on the other Party without the express written consent of the other Party to any such agreement.

10. **MATTERS DISREGARDED**. The titles and headings of the various sections hereof are intended solely for convenience of reference and are not intended for any purpose whatsoever to modify, explain or place any construction on any of the provisions of this Agreement and shall be disregarded in construing or interpreting any of the provisions of this Agreement.

11. **SEVERANCE**. If any of the clauses or provisions of this Agreement is held to be illegal, invalid or unenforceable by a court of competent jurisdiction, then in that event, it is the intention of the parties hereto that the remainder of this Agreement shall not be affected thereby, and every other provision of this Agreement shall be valid and enforceable to the fullest extent permitted by law.

12. **WAIVER**. No waiver of any breach of any covenant or agreement herein contained shall operate as a waiver of any subsequent breach of the same covenant or agreement or as a waiver of any breach of any other covenant or agreement.

13. **TIME**. Time is of the essence of this Agreement, provided that if any date upon which some action, notice or response is required of any party hereunder occurs on a weekend or national holiday, such action, notice or response shall not be required until the next succeeding business day.

14. **ASSIGNMENT.** This agreement may not be assigned by Applicant, in whole or in part, to any person for any reason without the prior, express written consent of the County.

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15. **SUCCESSORS AND ASSIGNEES.** The terms, provisions, conditions, covenants and obligations contained in this Agreement shall be binding upon the successors and assignees of the County and Applicant.

16. **ENTIRE AGREEMENT.** This Agreement, together with the exhibits attached hereto, supersedes all prior agreements between the Parties as to the Property, if any, and constitutes the entire agreement between the Parties with respect to the subject matter hereof.

17. **MODIFICATION.** It is understood and agreed between the Parties that there shall be no waiver or modification of this Agreement unless such waiver or modification is first reduced to writing and signed by both Parties herein.

18. **CONSTRUCTION.** The Parties acknowledge that the Parties and their counsel have reviewed and revised this Agreement and agree that the normal rule of construction – to the effect that any ambiguities are to be resolved against the drafting party – shall not be employed in the interpretation of this Agreement or any exhibits or amendments hereto.

19. **EXHIBITS.** All exhibits attached hereto are incorporated herein by reference to the same extent as though such exhibits were included in the body of this Agreement verbatim.

20. **COUNTERPARTS, FURTHER INSTRUMENTS, ETC.** This Agreement may be executed in counterparts, and when so executed shall be deemed executed as one agreement. County and Applicant shall execute any and all documents and perform any and all acts reasonably necessary to fully implement this Agreement.

21. **SIGNATURE AUTHORITY**. Applicant herby agrees and promises that the individuals whose name sand signatures appear below for and on behalf of Applicant have in fact the authority to so bind the Applicant to the terms and conditions of this Agreement.

22. **NO OBLIGATION TO CONSTRUCT.** It is expressly agreed that, in the event the Applicant does not proceed with the Project, then this Agreement shall be null and void and of no further force or effect and nothing contained in this Agreement shall be construed to contain a covenant, either express or implied, to deposit funds and/or to construct the Final Road Improvements or any other development.

23. **TERM.** The Parties acknowledge that this Development Agreement is intended to mirror the term and duration of the associated Special Use Permit. Accordingly, unless earlier terminated pursuant to the terms herein, this Agreement shall remain in effect for so long as the Special Use Permit remains valid and in effect, including any lawful extensions, renewals, or modifications thereto.

(Remainder of page intentionally left blank. Signature pages to follow.)

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FOR THE BOARD OF LEAVENWORTH COUNTY COMMISSIONERS:

_____
JEFF CULBERTSON, 1ST DISTRICT

_____
VANESSA REID, 2ND DISTRICT

_____
WILLIE DOVE, 3RD DISTRICT

_____
MIKE SMITH, 4TH DISTRICT

_____
MIKE STIEBEN, 5TH DISTRICT

ATTEST:

_____
FRAN KEPPLER, COUNTY CLERK

APPROVED AS TO FORM:

_____
Misty Brown, County Counselor

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APPLICANT:

By: _____
Tim Kates, President

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EXHIBIT A
Project Legal Description

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EXHIBIT B
Project Site Plan

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EXHIBIT C
SUP Resolution

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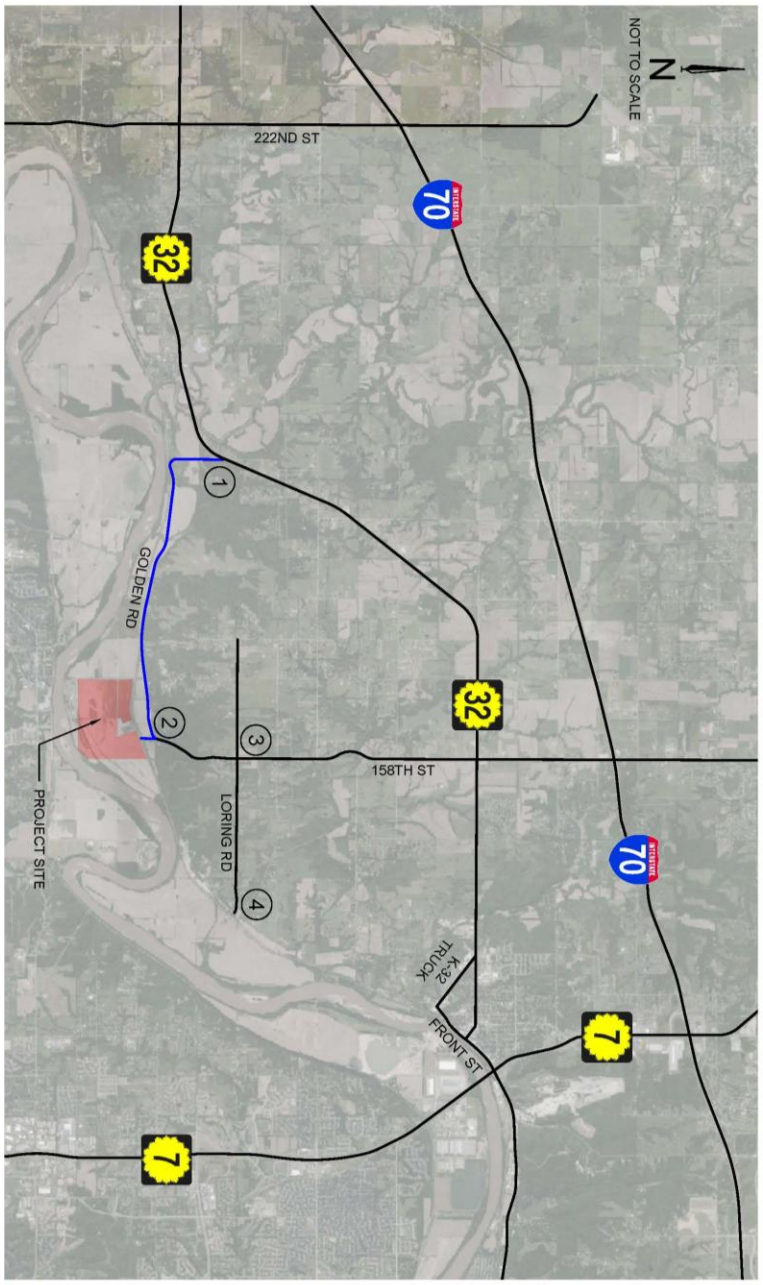
EXHIBIT D

Preliminary Road Improvements



PAVEMENT, SIGNING, AND PAVEMENT MARKING IMPROVEMENTS, ROADSIDE GRADING DUE TO PAVEMENT ELEVATION CHANGE

1. K-32 & 189TH ST / GOLDEN RD - PAVEMENT WIDENING BASED ON TRUCK TURNING ENVELOPES
2. GOLDEN RD / 158TH ST & 161ST ST - PAVEMENT WIDENING BASED ON TRUCK TURNING ENVELOPES
3. 158TH ST & GOLDEN RD - NORTHBOUND RIGHT-TURN TAPER
4. LORING RD & LORING DR - PAVEMENT WIDENING BASED ON TRUCK TURNING ENVELOPES

GBA

KAW VALLEY SAND
PROJECT RECOMMENDATIONS

PROJECT NUMBER	DATE	FIGURE
16477	05/28/2026	1

1468

Leavenworth County
Request for Board Action
Resolution 2026-10
Case No. DEV-26-048 Proposed Amendment to the Leavenworth County Comprehensive Plan

Date: June 3, 2026
To: Board of County Commissioners
From: Planning & Zoning Staff

Department Head Review: John Jacobson, Reviewed

Additional Reviews as needed:

Budget Review ☐ Administrator Review ☒ Legal Review ☒

Action Requested:

Chairman, I move that we approve the recommendation of the Planning Commission on Case DEV-26-048 and that we adopt Resolution 2026-10, amendment to the Leavenworth County Comprehensive Plan as outlined in Case DEV-26-048.

Analysis: This is a request to consider a proposed amendment to the Leavenworth County Comprehensive Plan. The proposed amendment is for the Action Plan, as outlined below:

Strategy 4: Review the Plan periodically and strategically; Prepare an Annual Progress Report

Conduct an internal update of the Plan every ~~three to five~~ five to ten years; dovetail this review with the preparation of the county budget

Staff's recommendation is based on the current development patterns of Leavenworth County that have not grown at a rate to support the level of plan oversight every three to five years. A five to ten year range better matches the growth that is currently occurring in the County and budgetary constraints that would limit the scale of review necessary.

Recommendation: The Planning Commission voted 8-0 (1 absence) to recommend approval of Case No. DEV-26-048 Amendment to the Leavenworth County Comprehensive Plan.

Alternatives:

1. Approve Case No. DEV-26-048 Amendment to the Leavenworth County Comprehensive Plan: Strategic Plan in whole or in part with findings of fact.

   Motion: Chairman, I move that we approve the recommendation of the Planning Commission on Case DEV-26-048 and that we adopt Resolution 2026-10, amendment to the Leavenworth County Comprehensive Plan as outlined in Case DEV-26-048.

2. Disapprove Case No. DEV-26-048 Amendment to the Leavenworth County Comprehensive Plan: Strategic Plan in whole or in part and return Case No. DEV-26-048 to the Planning Commission for further consideration with a written statement of reasons for disapproving Case No. DEV-26-048 or with suggested modifications.

   Motion: Chairman, I move that we disapprove the recommendation of the Planning Commission in Case No. DEV-26-048 Amendment to the Leavenworth County Comprehensive Plan: Strategic Plan and that we remand Case No. DEV-26-048 to the Planning Commission for further consideration based on (LIST REASONS FOR DISAPPROVING) [or] (LIST SUGGESTED MODIFICATIONS)

3. Take no further action on Case No. DEV-26-048 with findings of fact.

Budgetary Impact:

☒ Not Applicable
☐ Budgeted item with available funds
☐ Non-Budgeted item with available funds through prioritization
☐ Non-Budgeted item with additional funds requested

Total Amount Requested:
$0.00

Additional Attachments: Staff Report, Planning Commission Minutes, Proposed Resolution

Case No. DEV-26-048
Annual Comprehensive Plan Review

Staff Report – Planning Commission **May 13, 2026**

GENERAL INFORMATION:

Applicant: Leavenworth County Planning and Zoning Department

Planner: Amy Allison, Deputy Director

REQUEST:

The Leavenworth County Comprehensive Plan was adopted in 2020. According to KSA-12-747 the Planning Commission shall review the Comprehensive Plan on a yearly basis. This review, upon completion, will fulfill the requirement for the year 2026. During the review process, Staff reached out to affected County Departments requesting amendments, corrections or clarification. No additional amendments, corrections or clarifications were provided.

PLANNING & ZONING

Planning Staff has identified one amendment to the Action Plan, which is as outlined below:

Strategy 4: Review the Plan periodically and strategically; Prepare an Annual Progress Report

Conduct an internal update of the Plan every ~~three to five~~ five to ten years; dovetail this review with the preparation of the county budget

Staff's recommendation is based on the current development patterns of Leavenworth County that have not grown at a rate to support the level of plan oversight every three to five years. A five to ten year range better matches the growth that is currently occurring in the County and budgetary constraints that would limit the scale of review necessary.

The Annual Progress Report is attached for the Commission to review. Updated timelines and completion dates for action items have been provided.

WORK SESSION

On February 11, 2026, the Planning Commission held a work session to review the proposed amendment and Annual Progress Report. No changes were proposed.

STAFF RECOMMENDATION:

Staff recommends approving the amendment suggested in DEV-26-048 Annual Comprehensive Plan Review.

ACTION OPTIONS:

1. Recommend approval of Case No. DEV-26-048 Annual Comprehensive Plan Review, to the Board of County Commission, with Findings of Fact; or

2. Recommend denial of Case No. DEV-26-048 Annual Comprehensive Plan Review, to the Board of County Commission, with Findings of Fact; or

3. Continue the Public hearing to another date, time, and place.

ATTACHMENTS:

2026 Annual Progress Report

Leavenworth County Comprehensive Plan
Strategic Plan Matrix
Holistic Implementation Measures

	Tasks	Category	Task Owner and Participants	Time Frame	Cost Impact	Status	Completion Date
Strategy 1:	Adopt the Updated Comprehensive Plan						
	Post final draft Plan to the county website prior to Planning Commission and County Commission adoption hearings	Process	Planning & Zoning Dept., Commissioners	Immediately	Low	Complete	11/9/2020
	Determine when and how the Leavenworth County Planning and Zoning Department will utilize the Plan during the development review process and communicate to Planning Commission and County Commission	Process	Planning & Zoning Dept., Commissioners	Immediately	Low	Ongoing	
	Present the Plan to the Planning Commission for recommendation of adoption and to the County Commission for Adoption	Policy	Planning & Zoning Dept., Commissioners	Immediately	Low	Complete	11/9/2020
Strategy 2:	Amend Relevant Regulations and Plans						
	Conduct a thorough review of the existing zoning and subdivision regulations and compile a comprehensive list of changes (with exact policy text) necessary to align county zoning and subdivision regulations with the intent of the Plan	Process	Planning & Zoning Dept., Commissioners	Immediately	Low	~~Proposed for 2024~~ Ongoing	
	Conduct a thorough review of the existing plans, such as the U.S. 24/40 Corridor Study, and compile a comprehensive list of changes (with exact policy text) necessary to align the plans with the intent of the Plan	Process	Planning & Zoning Dept., Public Works, Commissioners	Immediately	Low	Proposed for ~~2025~~ late 2026-2027	
	Communicate changes with county residents through the Planning & Zoning Department's webpage on the county website	Process	Planning & Zoning Dept., Commissioners	Immediately	Low	Ongoing	
	Present proposed plan amendments to the Planning Commission for recommendation of approval and to the County Commission for approval	Policy	Planning & Zoning Dept., Commissioners	Immediately	Low	Ongoing	
Strategy 3:	Use the Plan on a Day-to-Day Basis						
	Evaluate all improvement and development proposals within the county by the Plan's targets and strategies to assess whether the proposal aligns completely, partially aligns, or does not align with the Plan	Process	Planning & Zoning Dept., Commissioners	Continuous	Low	Ongoing	
	Assist the Planning Commission and County Commission in the day-to-day administration, interpretation, and application of the Plan	Process	Planning & Zoning Dept., Commissioners	Continuous	Low	Ongoing	
Strategy 4:	Review the Plan periodically and strategically; Prepare an Annual Progress Report						
	Maintain a list of current possible amendments, issues, or needs that may be a subject of change, addition or deletion from the Plan	Process	Planning & Zoning Dept.	Continuous	Low	~~Proposed for 2024~~ Ongoing	

	Monitor demographic and market data as it becomes available to alter land use-specific demand projections	Process	Planning & Zoning Dept., Economic Development	Continuous	Low	Complete	2025
	Prepare an annual progress report and presentation to present to the Planning Commission and County Commission that describes the list of successes and possible amendments, issues or needs that may be subjects of change, addition or deletion from the Plan	Process	Planning & Zoning Dept., Commissioners	Continuous	Low	~~Proposed for 2024~~ Ongoing	
	Conduct an internal update of the Plan every five to ten~~three to five~~ years; dovetail this review with the preparation of the county budget.	Process	Planning & Zoning Dept, Public Works, Commissioners	Continuous	Low	Proposed for ~~2025~~ 2029	
Strategy 5:	Educate Elected Officials, County Departments, Local Municipalities and the Public						
	Conduct a work session with the Planning Commission and County Commission to educate them on the findings and recommendations of the Plan as leadership changes; prepare a key takeaways document for easy reference after the presentation	Process	Planning & Zoning Dept., County Administrator, Commissioners	Continuous	Low	Complete	2024
	Meet with relevant department heads and local municipal leaders to explain the findings and recommendations of the Plan; prepare a succinct presentation and provide a copy of it to the department heads and local municipal leaders	Process	Planning & Zoning Dept., Public Works, County Administrator, Municipalities, Commissioners	Immediately (and as leadership changes)	Low	Complete	2024
	Make copies of the Plan available online for free and provide hard copies at the County Courthouse for purchase	Process	Planning & Zoning Dept.	Immediately	Low	Complete	11/9/2020
	Aid the public in explaining the Plan and its relationship to private and public development projects and other proposals, as appropriate	Process	Planning & Zoning Dept., Commissioners	Continuous	Low	Ongoing	
	Draft a summary document at that includes key recommendations from the Plan that can be distributed to residents, developers, businesses and other interested parties	Process	Planning & Zoning Dept.	Immediately	Low	2024	pending
Strategy 6:	Widely Communicate and Market the Plan to celebrate the Plan's successes						
	Post the final Plan on the City's and county's website	Process	Planning & Zoning Dept.	Immediately	Low	Complete	11/9/2020
	Provide a copy of the Plan to each county department	Process	Planning & Zoning Dept.	Immediately	Low	Complete	11/9/2020
	Post updates related to the Plan on the county's social media accounts	Program	Planning & Zoning Dept.	Continuous	Low	Ongoing	
Strategy 7:	Develop strong relationships with implementation partner organizations						

Ensure open communication lines between the county and vital implementation partner organizations, such as the Leavenworth County Development Corporation, Leavenworth County Port Authority and Leavenworth County Council on Aging	Process	Planning & Zoning Dept., County Administrator, Economic Development, Leavenworth County Development Corporation, Leavenworth County Port Authority, Leavenworth County Council on Aging, Commissioners	Continuous	Low	Ongoing	
Gather demographic and market insight and research from implementation partner organizations to avoid duplicative efforts as the Plan is updated to reflect changing conditions	Program	Planning & Zoning Dept., County Administrator, Economic Development, Leavenworth County Development Corporation, Leavenworth County Port Authority, Leavenworth County Council on Aging, Commissioners	Continuous	Low	Complete	2025 - additional resources are sought when available

Leavenworth County Comprehensive Plan
Strategic Plan Matrix
Land Use and Economic Development Implementation Measures

	Tasks	Category	Task Owner and Participants	Time Frame	Cost Impact	Status	Completion Date
Strategy 1:	Create Commercial and Mixed Use Development and Redevelopment Plans with Incentives along identified key corridors and at specific intersections						
	Prepare incentive plans and assistance packages to spur the development of the U.S. 24/40 corridor between Basehor and Tonganoxie; the intersection of U.S. 24/40 and CR-1; and 155th Street between Basehor and Lansing; the package should detail the proposed uses on the site, as well as the site's advantages	Process	Economic Development, Planning & Zoning, Public Works	Short-term	Medium	Complete	2023
	Consider preparing a Request for Proposal for the abov mentioned corridors and intersections to send to interested developers; the RFP should detail the available incentive and assistance package; high standards for site and building design should be required	Process	Economic Development, Planning & Zoning, Public Works	Short-term	Low	Complete - Used on an As Needed Basis	2023
	Use the County's existing online mapping software to show the spatial location of available properties and incentives	Process	Economic Development, Planning & Zoning, Public Works	Short-term	Medium	Complete - Used on an As Needed Basis	2023
Strategy 2:	Update the Special Use Permit Categories and Review and Monitoring Process						
	Create a tiered review and approval system for special uses within the county with different categories of special uses, dependent on their scale, use and potential impact on the health, safety, welfare and property values of surrouding properties, using page 81 of this Plan as a guide	Policy	Planning & Zoning, County Administrator, County Attorney, Commissioners	Immediately	Low	Complete	2024
	Consider longer approval terms for lower special uses within the County	Policy	Planning & Zoning, Commissioners	Immediately	Low	Complete	2022; amended 2024
	Integrate the Land Evaluation component of the Land Evaluation and Site Assessment (LESA) system into the special use permit review process, as spelled out in the county's zoning and subdivision regulations, to identify areas of and protect the most productive farmland	Policy	Planning & Zoning	Immediately	Low	BOCC determined no further action	Conversations from 2024 indicated no interest in pursueing
Strategy 3:	Integrate a "Land First" approach into the development review process, and a clear analysis of such an approach into County Planning Staff Reports						
	Update the County's zoning and subdivision reuglations to include graphic examples and descriptive text that illustrates conservation design principles, as described on page 82	Process	Planning & Zoning, Commissioners	Short-term	Low	2025	Draft Completed
	Work with and educate development review applicants on ways to incorporate conservation design principles into their development proposals	Process	Planning & Zoning, Commissioners	Continuous	Low	BOCC determined no further action	Conversations from 2024 indicated no interest in pursueing

	Consider the use of incentives to encourage applicants to incorporate conservation design principles into their development proposals	Policy	Planning & Zoning, Commissioners	Continous	Low	BOCC determined no further action	Conversations from 2024 indicated no interest in pursueing
Strategy 4:	Develop and adopt an economic development strategic plan						
	Idenitfy funding for an economic development strategic plan	Process	Economic Development, Planning & Zoning, County Administrator	Short-term	Medium	Complete	2024
	Prepare a scope of services for an economic development strategic plan that includes a regional market assessment, opportunity and barrier assessment, target industry sector analysis, regional and target industry positioning , economic development goals and policies, and stakeholder input	Process	Economic Development, Planning & Zoning, County Administrator	Short-term	Low	Complete	2024
	Develop a county economic development strategic plan with robust stakeholder input	Plan	Economic Development, Planning & Zoning, County Administrator	Short-term	Medium	Complete	2024
	Consider regional and municipal economic development activities in the economic development strategic plan	Process	Economic Development, Planning & Zoning, County Administrator	Short-term	Low	Complete	2024
	Develop a comprehensive economic development incentive policy demonstrating the availability, applicability and utilization of various incentives to enhance the local economy through business attraction, business retention and entrepreneurship	Policy	Economic Development, County Administrator, Commissioners	On-Going	Low	Complete	2023
Strategy 5:	Create an economic development roundtable						
	Identify critical participants, including public, private, and nonprofit partners, in the economic development roundtable to be part of the first line of communication between businesses and local government and subsequent recommendations to the PlanningCommission and County Commission	Process	Economic Development, County Administrator, LCDC, Commissioners	Short-term	Low	Proposed for ~~2025~~ 2026	

Standardize the economic development roundtable's meeting schedule, member responsibilities, and goals, as they relate to business recruitment and retention;workforce development and training; marketing; regional collaboration; and strategiceconomic development planning.	Program	Economic Development, County Administrator, LCDC	Short-term	Low	Proposed for ~~2025~~ 2026
Invest in online mapping sofware that can be integrated into the county's website in order to show the spatial location of available properties and incentives	Process	Economic Development, County Administrator, LCDC	Short-term	Medium	Proposed for ~~2025~~ 2027

Leavenworth County Comprehensive Plan
Strategic Plan Matrix
Transportation and Mobility Implementation

	Tasks	Category	Task Owner and Participants	Time Frame	Cost Impact	Status	Completion Date
Strategy 1:	Develop and adopt a Transportation Master Plan						
	Allocate funding for a transportation master plan in the county's upcoming budget cycle	Plan	Planning & Zoning, Public Works, Commissioners	Immediately	Medium	Determined by the BOCC	
	Prepare a scope of services for a transportation master plan that covers all modes of transportation, including maintenance of roads (including paving guidelines), roadconstruction or upgrades, trails, pedestrian and bicycle facilities, transit, freight, railroads,and aviation; atention should be placed on funding	Process	Planning & Zoning, County Administrator, Public Works, Commissioners	Immediately	Low	Determined by the BOCC	
	The transportation master plan should take into consideration regional and municipal planning activites, including but not limited to the Kansas City Regional Bike Plan, MetroGreen Regional Greenway System, KDOT planned improvements, MARC's Regional Transportation Plan 2050, KCATA transit plans, and Leavenworth County's Council on Aging	Process	Planning & Zoning, Public Works, KDOT, KCATA, MARC, Council on Aging, Commissioners	Short-term	Low	Determined by the BOCC	
	Use the recommendations illustrated onFigure 5.1Transportation Plan as a starting point for the transportation master plan	Process	Planning & Zoning, Public Works, Commissioners	Short-term	Low	Determined by the BOCC	
	Following existing conditions analysis, public engagement, and formulation of transportation recommendations, present the master plan to the Planning Commission for recommendation of adoption and to the County Commission for adoption	Process	Planning & Zoning, Public Works, Commissioners	Short-term	Low	Determined by the BOCC	
Strategy 2:	Improve connectivity in the County's transportation network						
	Align transportation improvements with development and redevelopment projects to link activity centers with appropriate roadway infrastructure	Policy	Public Works, Planning & Zoning, Commissioners	Continuous	Medium	Determined by the BOCC	
	Regularly coordinate with the Leavenworth County Port Authority to address barge and rail operations and determine their role in the regional transportation network	Process	Planning & Zoning, Public Works, Leavenworth County Port Authority	Continuous	Low	Determined by the BOCC	
Strategy 3:	Update the County's road standards						
	Review and potentially update the county road standards, based on best management practices, peer county practices, and FHWA guidance	Process	Public Works, Commissioners	Immediately	Low	In Process	Summer ~~2025~~2027

	Regularly (every one to three years) review the updated county road standards and revise them to follow national best practices	Process	Public Works, Commissioners	Continuous	Low	Determined by the BOCC	
Strategy 4:	Actively coordinate with other municipalities on the County roadway system						
	Host quarterly transportation meetings with representatives from each municipality's public works department, as well as KDOT, to ensure a coordinated strategy for theincorporated and unincorporated roadways	Process	Public Works, KDOT, Municipalities	Continuous	Low		
	Proactively communicate with municipalities about the updated county road standards	Process	Public Works, Municipalities	Continuous	Low	Upon Completion	
Strategy 5:	Monitor transit needs countywide						
	Meet annually with KCATA to evaluate how well the current transit system is meeting demand	Process	County on Aging, Planning & Zoning, KCATA	Continuous	Low	Ongoing	
	Continue allocating appropriate funds to operate the Leavenworth County's Council onAging on-demand meals and transportation service to seniors	Program	Commissioners, Council on Aging, Planning & Zoning	Continuous	Low	On-going	

Leavenworth County Comprehensive Plan
Strategic Plan Matrix
Community Services and Infrastructure Implementation

	Tasks	Category	Task Owner and Participants	Time Frame	Cost Impact	Status	Completion Date
Strategy 1:	Develop and adopt a Utility Master Plan						
	Allocate funding for a utility master plan in the county's upcoming budget cycle	Process	Public Works, Planning & Zoning, County Administrator, Commissioners	Short-term	Medium	Ongoing; Will be determined at a later date	
	Prepare a scope of services for a utility master plan that covers all utilities, including water, wastewater, stormwater, and energy	Process	Public Works, Planning & Zoning, County Administrator, Commissioners	Short-term	Low	Ongoing; Will be determined at a later date	
	Consider hiring a consultant to draft the utility master plan or dedicate staff time to perform the study in-house	Process	Public Works, Planning & Zoning, County Administrator, Commissioners	Short-term	Low/Medium	Ongoing; Will be determined at a later date	
	Following existing conditions analysis, public engagement, and formulation of utility master plan recommendations, present the Plan to the Planning Commission forrecommendation of adoption and to the County Commission for adoption	Process	Public Works, Planning & Zoning, Commissioners	Short-term	Low	Ongoing; Will be determined at a later date	
	Perform a Cost of Services study to understand the cost associated with the provision of utility infrastructure based on development type	Plan	Public Works, Planning & Zoning, Commissioners	Short-term	Medium	Ongoing; Will be determined at a later date	
	Host regular coordination meetings between the county, municipalities, and utility providers to ensure utility infrastructure is properly maintained and residents receivequality service	Process	Public Works, Planning & Zoning, County Administrator, Utility Providers, Municipalities, Commissioners	Continuous	Low	In process	Utility Commission 2026

RESOLUTION 2026-10

A RESOLUTION OF THE LEAVENWORTH COUNTY, KANSAS BOARD OF COUNTY COMMISSIONERS AMENDING THE ACTION PLAN OF THE LEAVENWORTH COUNTY COMPREHENSIVE PLAN

WHEREAS, K.S.A. 19-2958, *et seq.*, and any amendments thereto, provides for the adoption and amendment of a Comprehensive Plan for the enactment of planning and zoning laws and regulations by Counties for the coordinated development of the county and protection of the public health, safety and welfare; and

WHEREAS, on October 28, 2020, a Comprehensive Plan was created and established for Leavenworth County; and

WHEREAS, the Leavenworth County Planning Commission, after notice as required by law, did conduct a public hearing upon the amendment of the Leavenworth County Comprehensive Plan on the 13th day of May, 2026; and

WHEREAS, the Leavenworth County Planning Commission, with the approval of the majority of members, recommended for approval an amendment as set forth in Exhibit A to the Leavenworth County Comprehensive Plan based upon specific findings of fact incorporated by reference herein; and

WHEREAS, the Board of County Commissioners considered, in session on the 3rd day of June, 2026, the recommendation of the Leavenworth County Planning Commission.

NOW, THEREFORE, BE IT RESOLVED by the Board of County Commissioners of Leavenworth County, Kansas, that:

1. The amendment as set forth in Exhibit A to the Leavenworth County Comprehensive Plan be approved based upon the recommendation and findings of fact of the Leavenworth County Planning Commission incorporated herein by reference and the findings of fact as adopted by the Board of County Commissioners in regular session on the 3rd day of June; and incorporated herein by reference

This Resolution shall be in full force and effect from and after its adoption.

Adopted this 3rd day of June, 2026
Board of County Commissioners
Leavenworth County, Kansas

_____
Mike Stieben, Chairman

ATTEST

_____
Jeff Culbertson, Member

Fran Keppler, County Clerk

Vanessa Reid, Member

Willie Dove, Member

Mike Smith, Member

Exhibit A

Strategy 4: Review the Plan periodically and strategically; Prepare an Annual Progress Report

Conduct an internal update of the Plan every ~~three to five~~ five to ten years; dovetail this review with the preparation of the county budget

Leavenworth County
Request for Board Action

Date: May 28th, 2026

To: Board of County Commissioners

From: Public Works

Department Head Approval: WLN

Additional Reviews as needed:

Budget Review ☒ Administrator Review ☒ Legal Review ☒

Action Requested: Approval of the 1302 Project Programming Request form for the CDS project on 235th Street with KDOT.

Analysis: This is the first of many forms that will be presented to the board to follow KDOT protocol for funding the Congressionally Directed Spending Funds on 235th Street. This form will allow KDOT to prepare an agreement and for the county to submit our preliminary plans for environmental review. We have yet to hear a firm no on our request for Build Kansas Funds.

Alternatives: Deny

Budgetary Impact: $6,000,000

☐ Not Applicable
☒ Budgeted item with available funds
☐ Non-Budgeted item with available funds through prioritization
☐ Non-Budgeted item with additional funds requested

Additional Attachments: 1302 Form

KANSAS DEPARTMENT OF TRANSPORTATION - BUREAU OF LOCAL PROJECTS

PROJECT PROGRAMMING REQUEST

☑ New Project	☐ Amend Existing Project	Date:	
Program Year:	**Funding Program:**		

KDOT District	MPO	MPO TIP #
1	MARC	

County	City	Route / Corridor	Functional Classification
Leavenworth	Tonganoxie	235th Street	5 = Major Collector

Project Sponsor / Lead Agency		
Leavenworth County		
Project Mgr / Contact	**Phone**	**E-mail Address**
Bill Noll	(913) 684-0463	bnoll@leavenworthcounty.gov

Project Title

235th Street Road Improvements, Dempsey Road to K-92 Highway

Project Length:	4.060	miles	Desired Letting Date:	March 2027

Letting Type: ☑ KDOT ☐ LPA ☐ Force Account

Location, Project Limits, Description, Scope of Work

235th Street between Dempsey Road and K-92 Highway. 4.5 miles northwest of Tonganoxie, KS. Gravel road improvement project.

Purpose and Need

This gravel roadway is the major connecting link between K-16 and K-92 Highways. It has the highest accident rate of any county roadway per vehicle miles traveled. The improved roadway will have better vertical curve stopping distance, clear zones that are adequate for the posted speed, and a better storm drainage system that complies with the road classification.

Project Benefits

This project represents the final phase of a 3-Phase project. The roadway will create a north-south connecting roadway on the west side of Leavenworth County that has been needed for decades.

RR within 1/2 mile?	RR Company Name	No. of Tracks	Existing Crossing Protection
No			

In accordance with the Bureau of Local Projects (BLP) Memo 99-11, dated December 16, 1999, we are required, under the Comprehensive Transportation Program (CTP), to collect and record total costs of all work phases of projects. This includes local agency federal-aid and state-aid projects that include any non-participating, pre-construction local agency costs for preliminary engineering (plan design), rights of way and utility adjustments. Please show your estimate of the cost for all work phases below:

Project Cost Estimate	*Participating*	*Non-Participating*	*Total*
PE (Design)	$ -	$ 730,895.00	$ 730,895.00
Utilities	$ -	$ 443,830.00	$ 443,830.00
ROW	$ -	$ 389,290.00	$ 389,290.00
CE (Inspection)	$ -	$ 1,508,990.00	$ 1,508,990.00
Construction Total	$ 9,982,450.00	$ 77,500.00	$ 10,059,950.00
Grading	$ 4,284,515.00	$ 33,265.00	$ 4,317,780.00
Culvert	$ 1,178,200.00	$ 9,145.00	$ 1,187,345.00
Surfacing (Asphalt)	$ 4,188,330.00	$ 32,520.00	$ 4,220,850.00
Signing and Pavement Marking	$ 53,270.00	$ 415.00	$ 53,685.00
Seeding	$ 114,140.00	$ 885.00	$ 115,025.00
Other	$ 163,995.00	$ 1,270.00	$ 165,265.00
			$ -
Project Totals	***$ 9,982,450.00***	***$ 3,150,505.00***	**$ 13,132,955.00**

KANSAS DEPARTMENT OF TRANSPORTATION - BUREAU OF LOCAL PROJECTS

PROJECT PROGRAMMING REQUEST

BE IT RESOLVED: That sufficient funds from Leavenworth County

are now, or will be available and are hereby pledged to the Secretary in the amount and at the time required for the supplementing of federal funds available for the completion of this project. Prior to Federal Authorization, any project expenditures made by the LPA are ineligible for federal funding and remain the responsibility of the LPA. Upon cancellation of the project by the LPA, the LPA shall reimburse the Secretary within thirty (30) days after receipt of statement of cost incurred by the Secretary prior to cancellation.

Please sign below in accordance with your local policy.

Recommended for Approval:

Appropriate Local Officials

Title

Title

ATTEST:

Title

Title

Title

Leavenworth County
Request for Board Action

Date: May 28th, 2026

To: Board of County Commissioners

From: Public Works

Department Head Approval: WLN

Additional Reviews as needed:

Budget Review ☒ Administrator Review ☒ Legal Review ☒

Action Requested: Approval of the agreement for the relocation of the waterline north of Dempsey Road on 235th Street with RWD#9.

Analysis: Public Works would strongly prefer to bid this work as an add alternate item with the construction of 235th Street between Dempsey Road and K-92 Highway. However, state law does not allow us to require that this work be bid by the water district. The water district declined to allow us to bid the work. This work is required to be completed as part of the project and, while the line will be new, it is not a betterment of size. We do not pay for betterment. The water district could decide to increase the size of the line at their cost and discretion.

Alternatives: Deny

Budgetary Impact: $350,200

☐ Not Applicable
☒ Budgeted item with available funds
☐ Non-Budgeted item with available funds through prioritization
☐ Non-Budgeted item with additional funds requested

Additional Attachments: Agreement with exhibits

WATER MAIN RELOCATION AGREEMENT

THIS WATER MAIN RELOCATION AGREEMENT, made and entered into by and between **LEAVENWORTH COUNTY RURAL WATER DISTRICT NO. 9**, hereinafter referred to as "the District" and the **BOARD OF COUNTY COMMISSIONERS OF LEAVENWORTH COUNTY, KANSAS** hereinafter referred to as "the County".

WITNESSETH:

WHEREAS, the County has determined that it appropriate and proposes a public road improvement project described as "235th Street Road Reconstruction Dempsey Road to 4H Road, Leavenworth County, Kansas" located in Sections 25 & 36, Township 9S, Range20E; Sections 30 & 31, Township 9S, Range21E; Section 1, Township 10S, Range20E; and Sections 6 and 10, Township 10S, Ranges 21E; and

WHEREAS, as part of the said road improvement project, it is necessary to reconstruct and otherwise relocate and replace water facilities which are presently either located in private right-of-way or partly within public right of way and/or utility easements, (the "Relocations"); and

WHEREAS, the District is the owner of certain water distribution pipelines and facilities located wholly or in part on private easements as shown in Tracts 1 - 8, & 10 and further identified in recordings in the Leavenworth County Register of Deeds, and said pipelines or facilities are not located entirely upon existing road right-of-way; and

WHEREAS, the District certifies that its facilities located in or about the area to be traversed by said road improvement are on location where it has right of occupancy either by holding the fee, an easement or other property interest; and

WHEREAS, the District as agreed to the relocation subject to the cost of said relocation being allocated to the County as set forth herein; and

WHEREAS, the County is willing to advance fund and make payment to the District for the Relocations as a part of the public improvement subject to the terms and conditions of this Agreement; and

WHEREAS, the County and District have determined to enter into this Agreement for the aforesaid public improvement as authorized and provided by K.S.A. 68-169 and K.S.A. 12-2908.

NOW, THEREFORE, IT IS AGREED:

1. That the District will relocate the water pipeline and facilities in accordance with Paragraph 8 of this Agreement, and the digital file Exhibit "A", "Full Strip Map with Aerial" provided by Bartlett & West, the district's Engineer and Exhibit "B" (Leavenworth Co RWD No. 9 Preliminary Cost Estimate, 235th ST Relocation, Dempsey RD to 4H RD May, 2026) attached hereto as part of the public road improvement project.

2 The County will pay to the District the District's actual cost of engineering, easement/legal, construction, & inspection of the relocation of those parts of the water pipeline located within private easement in accordance with the Exhibit "A" in an amount not to exceed $350,200.00, said payment to be made within fourteen (14) days of the execution of this agreement. It is understood that the estimated total cost to design, construct, relocate and/or inspect the pipeline is $350,200.00 as shown on Exhibit "B". If the actual cost of design, construction, relocation and/or inspection as established within the scope of work exceeds the amount of $350,200.00, the District will bear such additional costs. If the District utilizes a contractor to perform the construction and relocation of the facilities described herein, the District will ensure that the contract with the contractor requires the contractor to secure sufficient insurance coverage and names the County as an additional insured.

3. The District is solely responsible for the construction, engineering and inspection of the relocation and may, in its sole discretion, expand, change, upsize or otherwise alter the relocation work to serve the requirements of the District's water system, as long as these changes do not impair the work of the County in reconstruction of 235th Dempsey to 4H Roads. The County shall have reasonable access to the construction area as may be necessary to ensure compliance with the plans and specifications of the road improvement. The County, or any other authorized agent of the County, shall have access at all reasonable times to such District records for this purpose. It is understood that these District records are kept at the District's divisional office located in Tonganoxie, Kansas and all costs incurred by the County related to the inspection of the project records shall be borne by the County.

4. That the construction involved with the relocation of the District's facilities shall be completed within a reasonable length of time after the County notifies the District, in writing, that the alterations may proceed.

5. The District will maintain its facilities in a manner which will not endanger the vehicular traffic.

6. (a) To the extent permitted by law, without waiving any of its right or immunities, and subject to the maximum liability provisions of the Kansas Tort Claims Act as applicable, the District agrees to indemnify and hold harmless the County against and from any and all liability, loss and expense and shall defend all claims resulting from loss of life or damage or injury to persons or property where causation is directly or indirectly resulting from the work performed by the District in connection with this project, except those claims resulting from the negligent acts of agents or employees of said County. If the District utilizes a contractor to perform the construction and relocation of the facilities described herein, the District agrees to require the contractor to indemnify, hold harmless, and save the County from personal injury and property damage claims arising out of the act or omission of the contractor, the contractor's agent, subcontractors (at any tier), or suppliers (at any tier). If the County defends a third party's claim, the contractor shall indemnify the County for damages paid to the third party and all related expenses the County may incur in defending the claim.

(b) To the extent permitted by law, without waiving any of its right or immunities, and subject to the maximum liability provisions of the Kansas Tort Claims Act as applicable, the

County agrees to indemnify and hold harmless the District against and from any and all liability, loss and expense and shall defend all claims resulting from loss of life or damage or injury to persons or property where causation is directly or indirectly resulting from the work performed by the County in connection with this project, except those claims resulting from the negligent acts of agents or employees of the District or its contractors. If the County utilizes a contractor to perform the construction services, the County agrees to require the contractor to indemnify, hold harmless, and save the District from personal injury and property damage claims arising out of the act or omission of the contractor, the contractor's agent, subcontractors (at any tier), or suppliers (at any tier). If the District defends a third party's claim, the contractor shall indemnify the District for damages paid to the third party and all related expenses the District may incur in defending the claim.

7. Description of relocation work to be performed:

   Water main and appurtenances located in the project plans from Sta 199+00 to 287+50, on the left side of the project corridor; and four service lines to meters located at Sta 205+40, 224+60, 249+28, 254+20; and two crossings of 235th Street at Sta 199+20 and 286+40. With all of the associated costs shown for Items 1-20 on the cost estimate form. Deadline November 1, 2026. Water main and appurtenances are located on Tracts 1 - 8, & 10 of the roadway improvement plan drawings applicably described in registered private easement documents at the Leavenworth County, KS Register of Deeds. Estimated total cost of work to be performed on mains is $350,200.00 with the percentage of total actual costs of completed work to be borne by the County is 100% ($350,200.00).

8. For purposes of this Agreement, any required notices shall be deemed sufficiently given the third day following deposit in the U.S. mail, certified, return receipt requested, postage prepaid, and addressed as follows:

If to the County:	Mark Loughry County Administrator 300 Walnut Leavenworth, KS 66048 mloughry@leavenworthcounty.gov
With a copy to:	Misty Brown County Counselor 300 Walnut Leavenworth, KS 66048 mbrown@leavenworthcounty.gov
If to the District:	Karen Armstrong, District Manager PO Box 295 Tonganoxie, KS 66086 lvrwd9@gmail.com

Notice shall also be deemed sufficiently given upon actual delivery by reliable courier service or other method.

9. In the event that any provision contained in this Water Main Relocation Agreement is in conflict with a provision in the District's right of way permit from the County, then the provision contained in this Water Main Relocation Agreement shall apply as to the area covered by this Water Main Relocation Agreement.

10. This Agreement may only be terminated by mutual written consent of the parties.

11. This Agreement is subject to, governed by, and construed according to the laws of the State of Kansas.

12. This Agreement may be modified or amended only in writing executed by both parties and will be subject to renegotiation in the event of changes to applicable law, rules, or regulations affecting the subject matter of this Agreement.

13. This Agreement and its attachments set forth the parties' entire agreement. Neither party has made any oral or side agreements or representations not contained in this Agreement. This is a legal document and not a mere recital and is binding upon the parties, their representatives, and successors in interest.

IN WITNESS WHEREOF, the parties hereto have duly executed this Agreement by the authority of their respective governing bodies the day and year first written below.

EXECUTED BY THE COUNTY THIS

____ day of _____, 2026
BOARD OF LEAVENWORTH COUNTY COMMISSIOENRS

BY: _____
MIKE STIEBEN, Chairman

ATTEST: _____
Fran Keppler, County Clerk

EXECUTED BY THE DISTRICT THIS

19th day of May, 2026
LEAVENWORTH COUNTY RURAL WATER DISTRICT NO. 9

BY: _____
CRAIG LOHMAN, Chairman

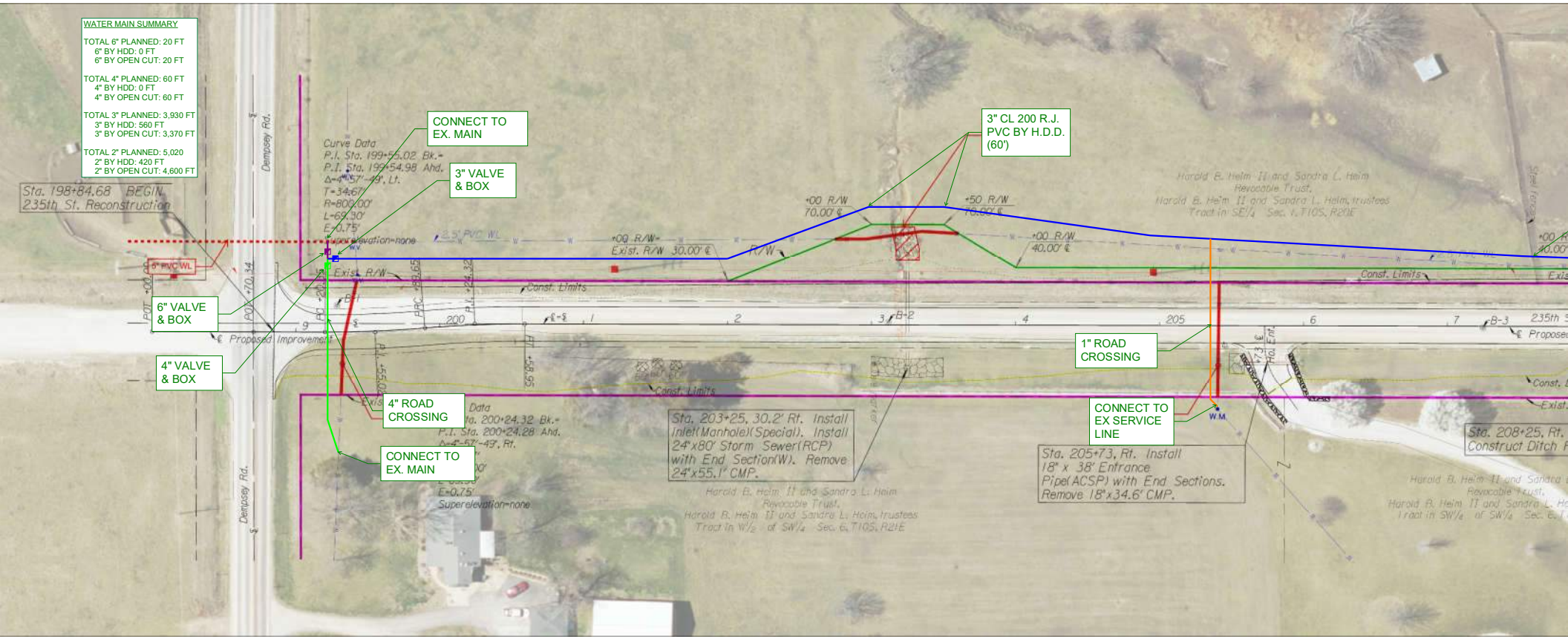
ATTEST: _____
Kim Buchanon, Secretary

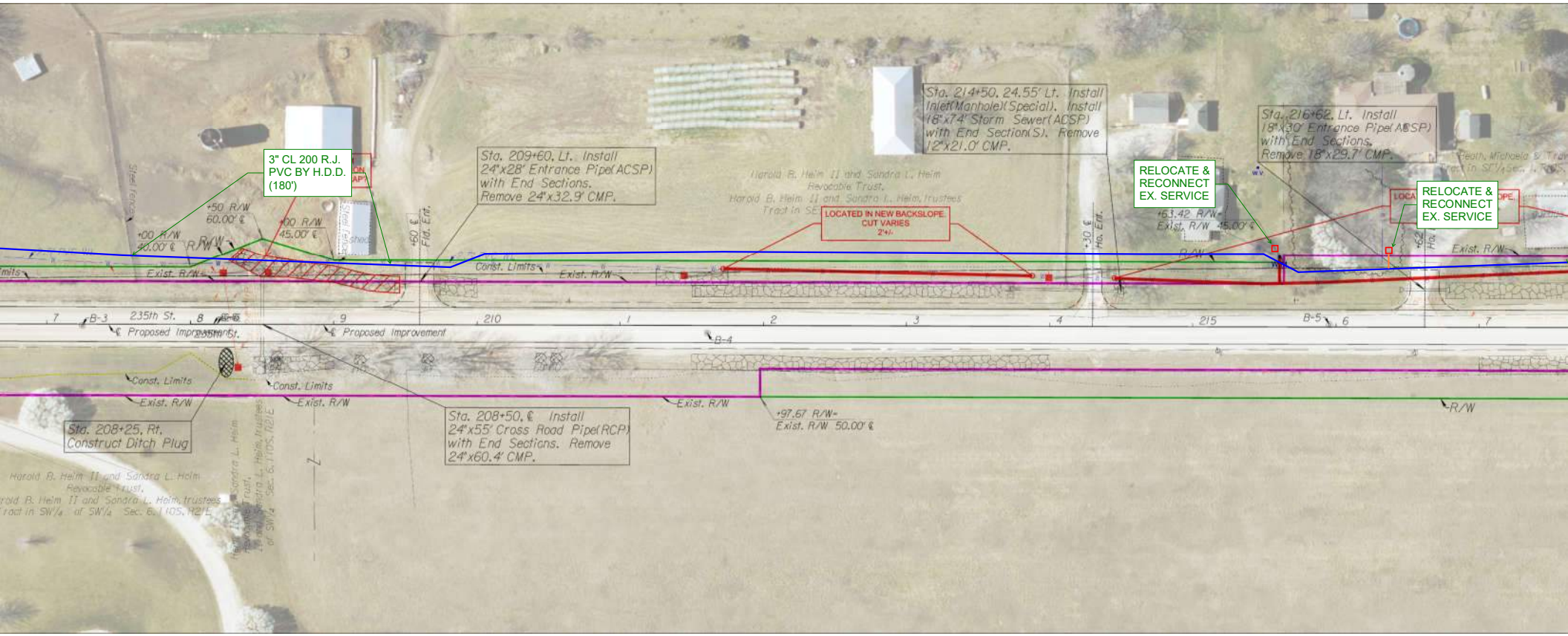
Exhibit B

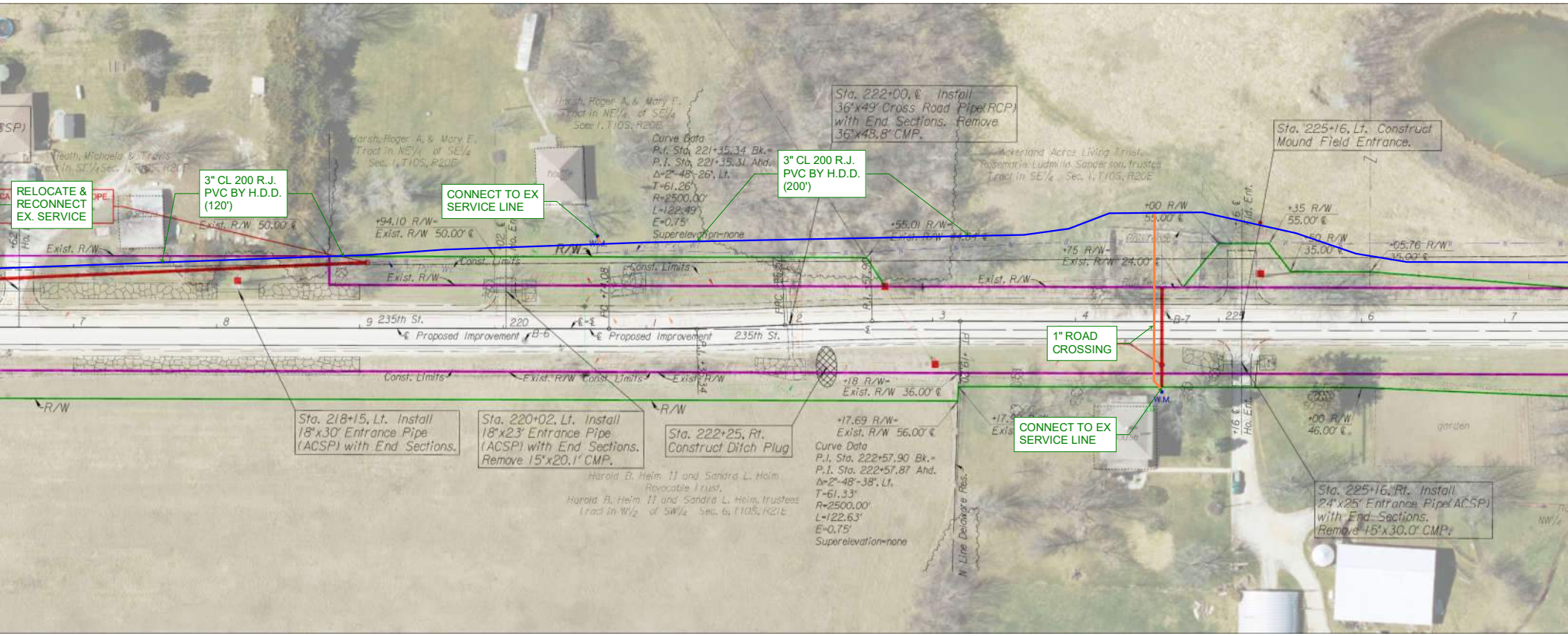
LEAVENWORTH CO RWD NO. 9
235th ST RELOCATION -- DEMPSEY RD. TO 4H RD.
MAY, 2026

Item	Description	Unit	Quantity	Unit Price	Extension
1	Mobilization, Insurance, Overhead		LUMP SUM		$ 7,000
2	6" Cl 200 PVC Pipe, Open Cut	L.F.	20	45.00	900
3	4" Cl. 200 PVC Pipe, Open Cut	L.F.	60	20.00	1,200
5	3" Cl 200 PVC Pipe, Open Cut	L.F.	3,370	20.00	67,400
6	3" Cl 200 PVC Pipe, H.D.D.	L.F.	560	55.00	30,800
7	2" Cl 200 PVC Pipe, Open Cut	L.F.	4,600	18.00	82,800
8	2" Cl 200 PVC Pipe, H.D.D.	L.F.	420	35.00	14,700
9	6" Valve & Box	EA.	1	2,300	2,300
10	4" Valve & Box	EA.	1	2,000	2,000
11	3" Valve & Box	EA.	1	1,800	1,800
12	2" Valve & Box	EA.	2	1,400	2,800
13	4" Road Crossing	EA.	1	4,000	4,000
14	2" Road Crossing	EA.	1	3,000	3,000
15	1" Road Crossing	EA.	4	2,750	11,000
16	Connect to Existing Main Line	EA.	4	4,500	18,000
17	Connect to Existing Service Line	EA.	5	1,000	5,000
18	Relocate and Reconnect Existing Service	EA.	3	2,500	7,500
19	2" Flush Hydrant	EA.	1	3,000	3,000
20	Contingencies		LUMP SUM		27,000
	Total Construction Cost				**$ 292,200**
	Engineering				$ 38,000
	Easement/Legal				$ 10,000
	Inspection				$ 10,000
	Total Project Cost				**$ 350,200**

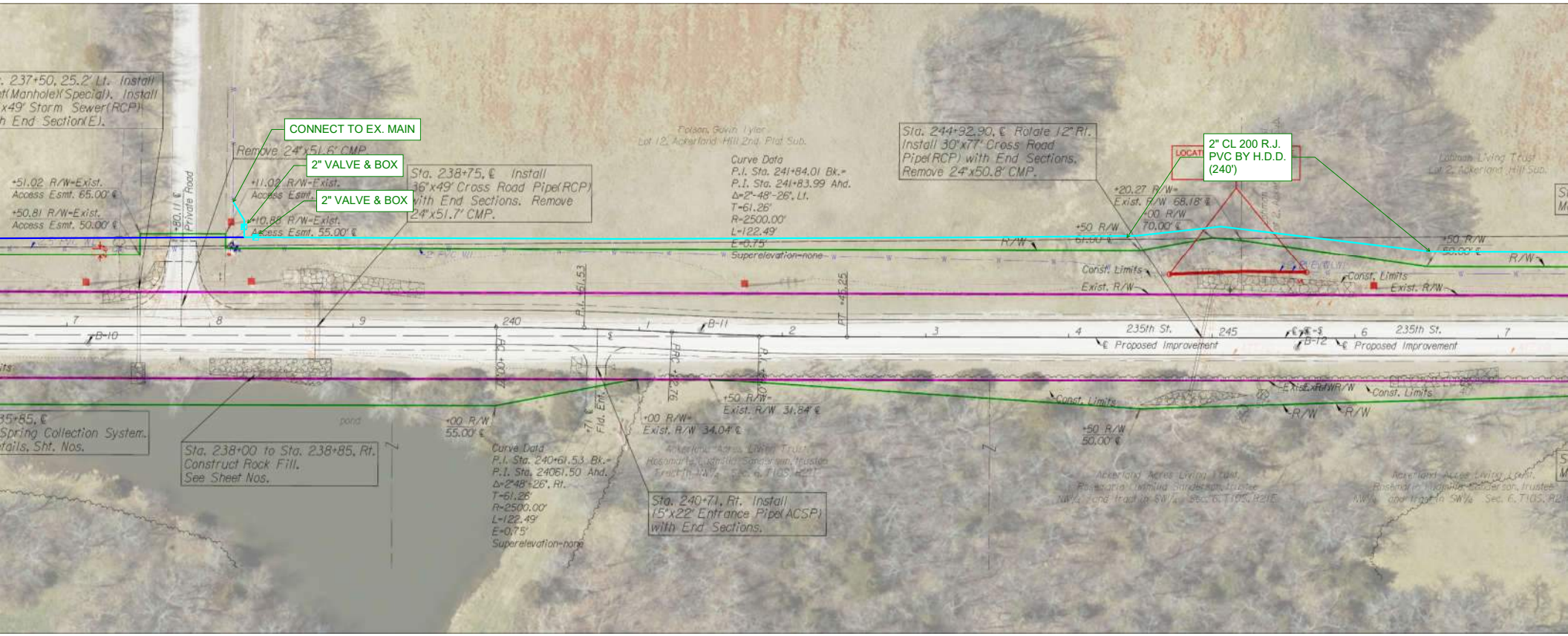
Exhibit A

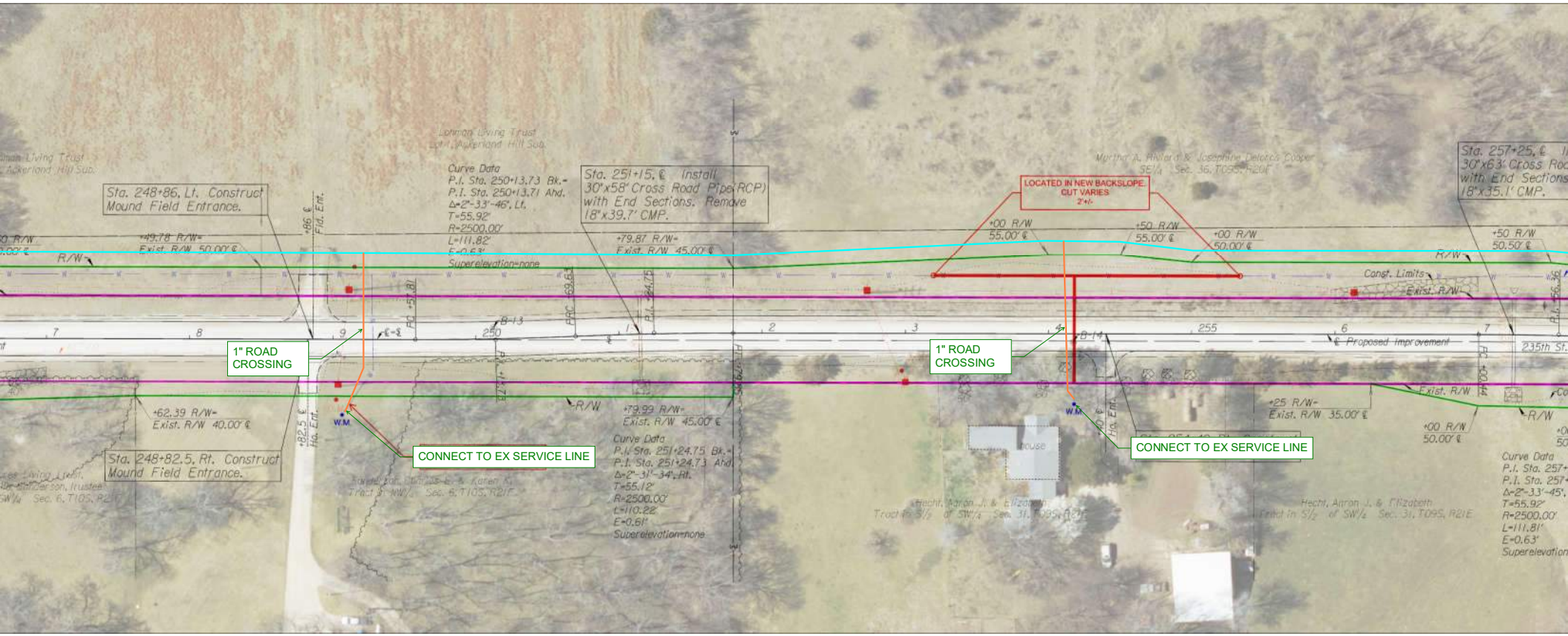

WATER MAIN SUMMARY
TOTAL 6" PLANNED: 20 FT
6" BY HDD: 0 FT
6" BY OPEN CUT: 20 FT
TOTAL 4" PLANNED: 60 FT
4" BY HDD: 0 FT
4" BY OPEN CUT: 60 FT
TOTAL 3" PLANNED: 3,930 FT
3" BY HDD: 560 FT
3" BY OPEN CUT: 3,370 FT
TOTAL 2" PLANNED: 5,020
2" BY HDD: 420 FT
2" BY OPEN CUT: 4,600 FT
Sta. 198+84.68 BEGIN 235th St. Reconstruction
Dempsey Rd.
CONNECT TO EX. MAIN
3" VALVE & BOX
6" VALVE & BOX
4" VALVE & BOX
4" ROAD CROSSING
CONNECT TO EX. MAIN
3" CL 200 R.J. PVC BY H.D.D. (60')
1" ROAD CROSSING
CONNECT TO EX SERVICE LINE
Sta. 203+25, 30.2' Rt. Install Inlet(Manhole)(Special). Install 24"x80' Storm Sewer(RCP) with End Section(W). Remove 24"x55.1' CMP.
Sta. 205+73, Rt. Install 18" x 38' Entrance Pipe(ACSP) with End Sections. Remove 18"x34.6' CMP.
Sta. 208+25, Rt. Construct Ditch
Curve Data
P.I. Sta. 199+55.02 Bk.=
P.I. Sta. 199+54.98 Ahd.
Δ=4°57'-49", Lt.
T=34.67'
R=800.00'
L=69.30'
E=0.75'
Superelevation=none
Exist. R/W
Const. Limits
Proposed Improvement
Harold B. Helm II and Sandra L. Helm Revocable Trust, Harold B. Helm II and Sandra L. Helm, trustees Tract in SE1/4 Sec. 6, T10S, R21E
Harold B. Helm II and Sandra L. Helm Revocable Trust, Harold B. Helm II and Sandra L. Helm, trustees Tract in W1/2 of SW1/4 Sec. 6, T10S, R21E

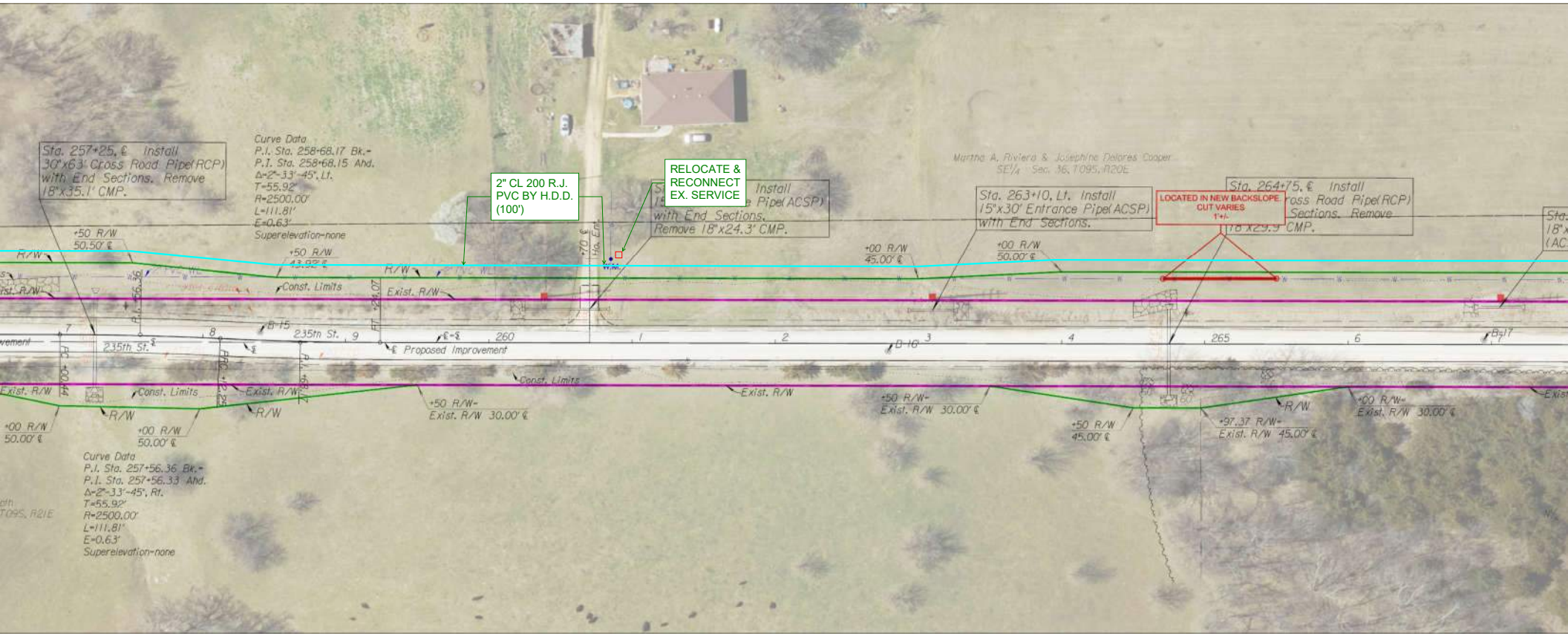

3" CL 200 R.J. PVC BY H.D.D. (180')
Sta. 209+60, Lt. Install 24"x28' Entrance Pipe(ACSP) with End Sections. Remove 24"x32.9' CMP.
Sta. 214+50, 24.55' Lt. Install Inlet(Manhole)(Special). Install 18"x74' Storm Sewer(ACSP) with End Section(S). Remove 12"x21.0' CMP.
Sta. 216+62, Lt. Install 18"x30' Entrance Pipe(ACSP) with End Sections. Remove 18"x29.7' CMP.
RELOCATE & RECONNECT EX. SERVICE
RELOCATE & RECONNECT EX. SERVICE
LOCATED IN NEW BACKSLOPE. CUT VARIES 2'+/-
Sta. 208+25, Rt. Construct Ditch Plug
Sta. 208+50, ℄ Install 24"x55' Cross Road Pipe(RCP) with End Sections. Remove 24"x60.4' CMP.
235th St.
Proposed Improvement
Const. Limits
Exist. R/W
Harold B. Heim II and Sandra L. Heim Revocable Trust, Harold B. Heim II and Sandra L. Heim, trustees Tract in SE1/4 of SW1/4 Sec. 6, T105, R21E
Harold B. Heim II and Sandra L. Heim Revocable Trust, Harold B. Heim II and Sandra L. Heim, trustees Tract in SW1/4 of SW1/4 Sec. 6, T105, R21E

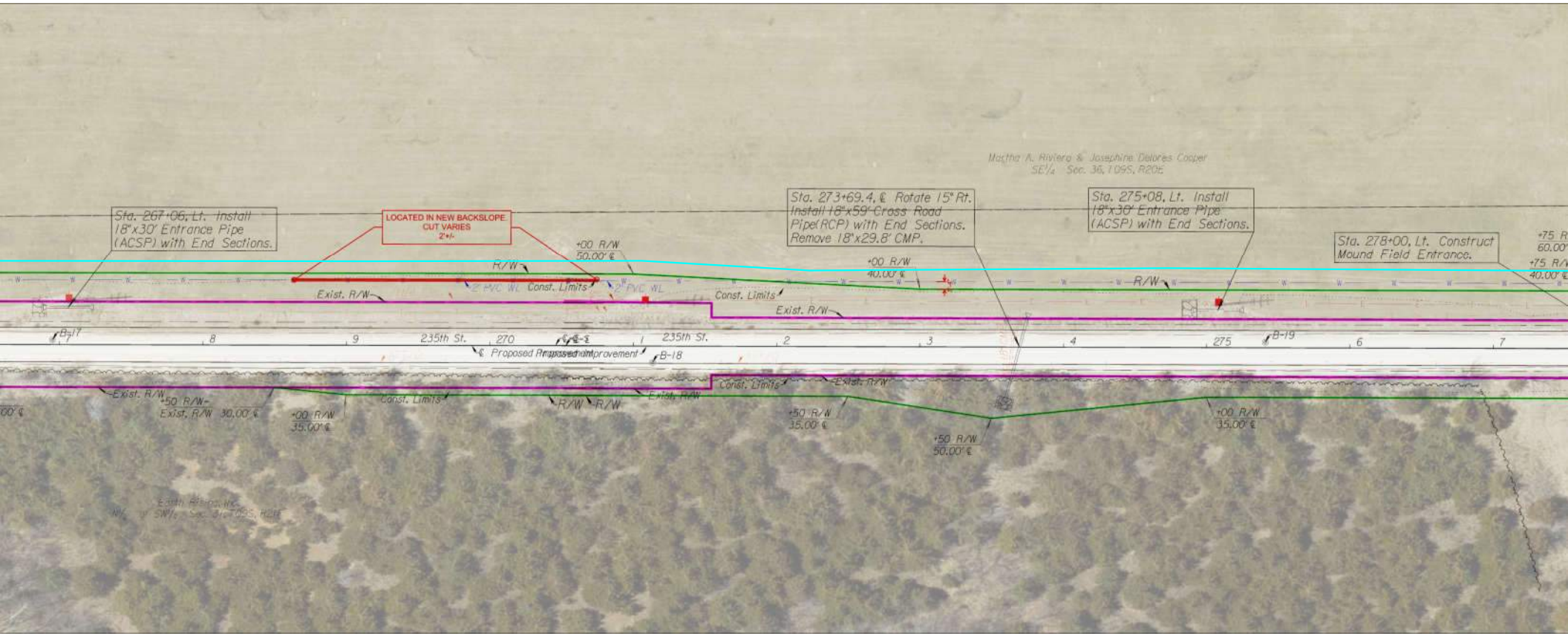

RELOCATE & RECONNECT EX. SERVICE
3" CL 200 R.J. PVC BY H.D.D. (120')
CONNECT TO EX SERVICE LINE
3" CL 200 R.J. PVC BY H.D.D. (200')
Sta. 222+00, ℄ Install 36"x49" Cross Road Pipe(RCP) with End Sections. Remove 36"x48.8" CMP.
Sta. 225+16, Lt. Construct Mound Field Entrance.
1" ROAD CROSSING
CONNECT TO EX SERVICE LINE
Sta. 218+15, Lt. Install 18"x30" Entrance Pipe (ACSP) with End Sections.
Sta. 220+02, Lt. Install 18"x23" Entrance Pipe (ACSP) with End Sections. Remove 15"x20.1" CMP.
Sta. 222+25, Rt. Construct Ditch Plug
Sta. 225+16, Rt. Install 24"x25" Entrance Pipe(ACSP) with End Sections. Remove 15"x30.0' CMP.
Curve Data
P.I. Sta. 221+35.34 Bk.=
P.I. Sta. 221+35.31 Ahd.
Δ=2°-48'-26", Lt.
T=61.26'
R=2500.00'
L=122.49'
E=0.75'
Superelevation=none
Curve Data
P.I. Sta. 222+57.90 Bk.=
P.I. Sta. 222+57.87 Ahd.
Δ=2°-48'-38", Lt.
T=61.33'
R=2500.00'
L=122.63'
E=0.75'
Superelevation=none
Exist. R/W
Const. Limits
℄ Proposed Improvement
235th St.
garden

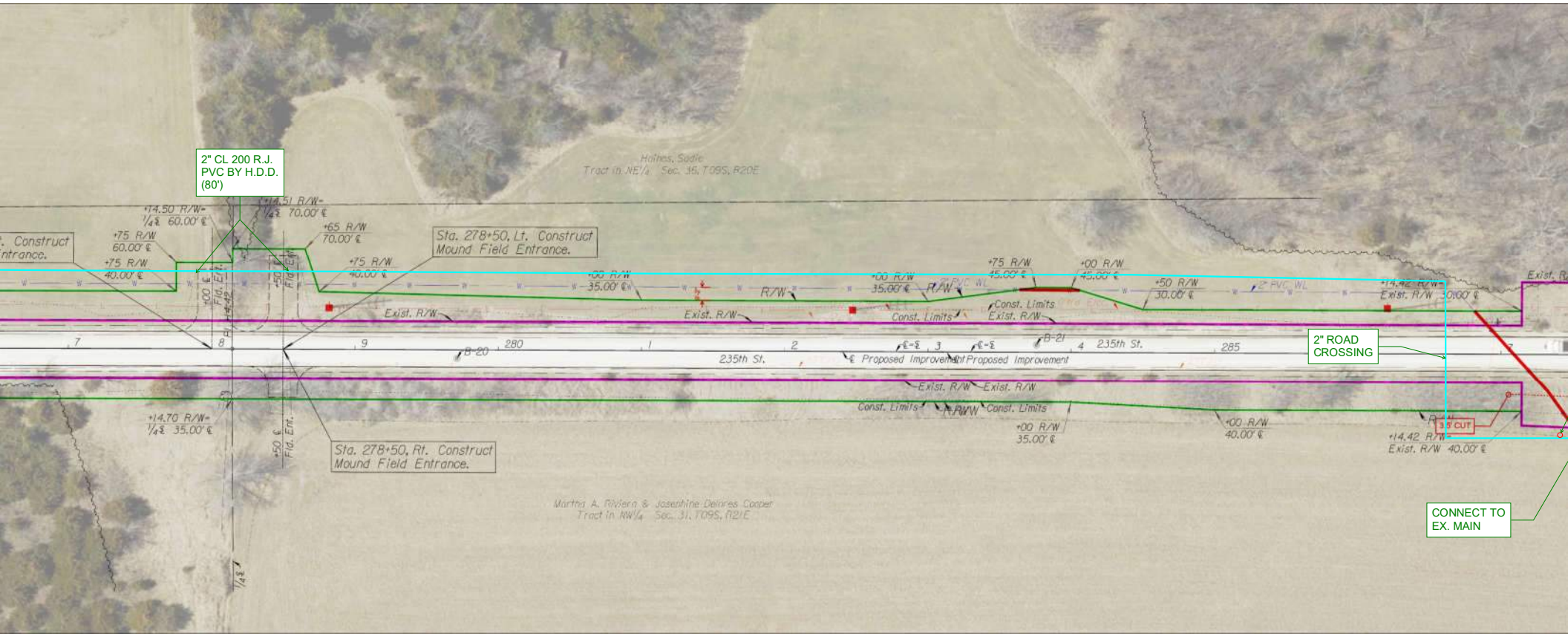

Sta. 237+50, 25.2' Lt. Install Inlet(Manhole)(Special). Install 24"x49' Storm Sewer(RCP) with End Section(E).
Ackerland Acres Living Trust, Rosemarie Ludmilla Sanderson, trustee S1/2 of NE1/4 Sec. 1, T10S, R20E
Remove 36"x54.7' CMP. Remove 15"x30' CMP
+50 R/W 35.00' ℄
+51.02 R/W-Exist. Access Esmt. 65.00' ℄
+50.81 R/W-Exist. Access Esmt. 50.00' ℄
+50 R/W- Exist. R/W 24.00' ℄
Exist. R/W
+00 R/W 35.00' ℄
+60 R/W 35.00' ℄
R/W
Const. Limits
235th St.
Proposed Improvement
Sta. 235+61.75, ℄ Rotate 20° Lt. Install 2-36"x60' Cross Road Pipe(RCP) with End Sections.
Sta. 235+85, ℄ Install Spring Collection System. See Details, Sht. Nos.
+50 R/W 60.00' ℄
+75 R/W 55.00' ℄
Ackerland Acres Living Trust, Rosemarie Ludmilla Sanderson, trustee NW1/4 and tract in SW1/4 Sec. 6, T10S, R21E


CONNECT TO EX. MAIN
2" VALVE & BOX
2" VALVE & BOX
2" CL 200 R.J. PVC BY H.D.D. (240')
Sta. 238+75, ℄ Install 36"x49' Cross Road Pipe(RCP) with End Sections. Remove 24"x51.7' CMP.
Sta. 244+92.90, ℄ Rotate 12" Rt. Install 30"x77' Cross Road Pipe(RCP) with End Sections. Remove 24"x50.8' CMP.
Sta. 238+00 to Sta. 238+85, Rt. Construct Rock Fill. See Sheet Nos.
Sta. 240+71, Rt. Install 15"x22' Entrance Pipe(ACSP) with End Sections.
Curve Data
P.I. Sta. 241+84.01 Bk.=
P.I. Sta. 241+83.99 Ahd.
Δ=2°-48'-26", Lt.
T=61.26'
R=2500.00'
L=122.49'
E=0.75'
Superelevation=none
Curve Data
P.I. Sta. 240+61.53 Bk.=
P.I. Sta. 240+61.50 Ahd.
Δ=2°48'-26", Rt.
T=61.26'
R=2500.00'
L=122.49'
E=0.75'
Superelevation=none
235th St.
℄ Proposed Improvement
Const. Limits
Exist. R/W
R/W
Private Road
Polson, Gavin Tyler
Lot 12, Ackerland Hill 2nd Plat Sub.
Lohman Living Trust
Lot 2, Ackerland Hill Sub.
Ackerland Acres Living Trust
Rosemarie Lindmilla Sanderson, trustee
NW¼ and tract in SW¼ Sec. 6, T10S, R21E
Ackerland Acres Living Trust
Rosemarie Lindmilla Sanderson, trustee
NW¼ and tract in SW¼ Sec. 6, T10S, R21E
Spring Collection System.
Details, Sht. Nos.
Remove 24"x51.6' CMP
+51.02 R/W=Exist. Access Esmt. 65.00' ℄
+50.81 R/W=Exist. Access Esmt. 50.00' ℄
+11.02 R/W=Exist. Access Esmt.
+10.88 R/W=Exist. Access Esmt. 55.00' ℄
+20.27 R/W=Exist. R/W 68.18' ℄
+00 R/W 70.00' ℄
+50 R/W 61.00' ℄
+50 R/W 50.00' ℄
+50 R/W=Exist. R/W 31.84' ℄
+00 R/W=Exist. R/W 34.04' ℄
+00 R/W 55.00' ℄
+50 R/W 50.00' ℄
B-10
B-11
B-12
240
245
Fld. Ent.
PRC +00.77
PRC +12.76
PT +45.25
P.I. +61.53
Pond


Sta. 248+86, Lt. Construct Mound Field Entrance.
Sta. 248+82.5, Rt. Construct Mound Field Entrance.
Sta. 251+15, ℄ Install 30"x58' Cross Road Pipe (RCP) with End Sections. Remove 18"x39.7' CMP.
Curve Data
P.I. Sta. 250+13.73 Bk.=
P.I. Sta. 250+13.71 Ahd.
Δ=2°-33'-46", Lt.
T=55.92'
R=2500.00'
L=111.82'
E=0.63'
Superelevation=none
Curve Data
P.I. Sta. 251+24.75 Bk.=
P.I. Sta. 251+24.73 Ahd.
Δ=2°-31'-34", Rt.
T=55.12'
R=2500.00'
L=110.22'
E=0.61'
Superelevation=none
LOCATED IN NEW BACKSLOPE. CUT VARIES 2'+/-
Sta. 257+25, ℄ 30"x63' Cross Road with End Sections 18"x35.1' CMP.
1" ROAD CROSSING
1" ROAD CROSSING
CONNECT TO EX SERVICE LINE
CONNECT TO EX SERVICE LINE
W.M.
W.M.
+49.78 R/W= Exist. R/W 50.00' ℄
+62.39 R/W= Exist. R/W 40.00' ℄
+79.87 R/W= Exist. R/W 45.00' ℄
+79.99 R/W= Exist. R/W 45.00' ℄
+00 R/W 55.00' ℄
+50 R/W 55.00' ℄
+00 R/W 50.00' ℄
+50 R/W 50.50' ℄
+25 R/W= Exist. R/W 35.00' ℄
Const. Limits
Exist. R/W
℄ Proposed Improvement
235th St.
House


Sta. 257+25, ℄ Install 30"x63' Cross Road Pipe(RCP) with End Sections. Remove 18"x35.1' CMP.
Curve Data
P.I. Sta. 258+68.17 Bk.=
P.I. Sta. 258+68.15 Ahd.
Δ=2°-33'-45", Lt.
T=55.92'
R=2500.00'
L=111.81'
E=0.63'
Superelevation-none
2" CL 200 R.J. PVC BY H.D.D. (100')
RELOCATE & RECONNECT EX. SERVICE
Sta. 263+10, Lt. Install 15"x30' Entrance Pipe(ACSP) with End Sections.
LOCATED IN NEW BACKSLOPE CUT VARIES 1'+/-
Sta. 264+75, ℄ Install
Cross Road Pipe(RCP)
Sections. Remove
18"x29.9' CMP.
Martha A. Riviera & Josephine Delores Cooper
SE¼ Sec. 36, T09S, R20E
+50 R/W 50.50' ℄
+00 R/W 50.00' ℄
+50 R/W 45.00' ℄
+97.37 R/W- Exist. R/W 45.00' ℄
+50 R/W- Exist. R/W 30.00' ℄
Const. Limits
Exist. R/W
R/W
235th St.
℄ Proposed Improvement
Curve Data
P.I. Sta. 257+56.36 Bk.=
P.I. Sta. 257+56.33 Ahd.
Δ=2°-33'-45", Rt.
T=55.92'
R=2500.00'
L=111.81'
E=0.63'
Superelevation-none


Sta. 267+06, Lt. Install 18"x30' Entrance Pipe (ACSP) with End Sections.
LOCATED IN NEW BACKSLOPE CUT VARIES 2'+/-
Sta. 273+69.4, ℄ Rotate 15° Rt. Install 18"x59' Cross Road Pipe(RCP) with End Sections. Remove 18"x29.8' CMP.
Sta. 275+08, Lt. Install 18"x30' Entrance Pipe (ACSP) with End Sections.
Sta. 278+00, Lt. Construct Mound Field Entrance.
Martha A. Riviera & Josephine Delores Cooper
SE¼ Sec. 36, T09S, R20E
+00 R/W 50.00' ℄
+00 R/W 40.00' ℄
R/W
Exist. R/W
2" PVC WL
Const. Limits
235th St.
℄ Proposed Improvement
B-18
B-19
+50 R/W 30.00' ℄
+00 R/W 35.00' ℄
+50 R/W 35.00' ℄
+50 R/W 50.00' ℄
+75 R/W 60.00'
+75 R/W 40.00' ℄


2" CL 200 R.J. PVC BY H.D.D. (80')
Sta. 278+50, Lt. Construct Mound Field Entrance.
Sta. 278+50, Rt. Construct Mound Field Entrance.
2" ROAD CROSSING
CONNECT TO EX. MAIN
Exist. R/W
Const. Limits
Proposed Improvement
235th St.
Mathes, Sadie
Tract in NE1/4 Sec. 35, T09S, R20E
Martha A. Riviera & Josephine Delores Cooper
Tract in NW1/4 Sec. 31, T09S, R21E


N
0 30 60 120 Feet
Exist. R/W
Const. Limits
Proposed Improvement
235th St.
2" CLEANOUT
3.5' CUT
3.5' CUT
CONNECT TO EX. MAIN
Martha A. Riviera & Josephine Delores Cooper
Tract in NW1/4 Sec. 31, T09S, R21E

Exhibit B

LEAVENWORTH CO RWD NO. 9
235th ST RELOCATION -- DEMPSEY RD. TO 4H RD.
MAY, 2026

Item	Description	Unit	Quantity	Unit Price	Extension
1	Mobilization, Insurance, Overhead		L U M P S U M		$ 7,000
2	6" Cl 200 PVC Pipe, Open Cut	L.F.	20	45.00	900
3	4" Cl. 200 PVC Pipe, Open Cut	L.F.	60	20.00	1,200
5	3" Cl 200 PVC Pipe, Open Cut	L.F.	3,370	20.00	67,400
6	3" Cl 200 PVC Pipe, H.D.D.	L.F.	560	55.00	30,800
7	2" Cl 200 PVC Pipe, Open Cut	L.F.	4,600	18.00	82,800
8	2" Cl 200 PVC Pipe, H.D.D.	L.F.	420	35.00	14,700
9	6" Valve & Box	EA.	1	2,300	2,300
10	4" Valve & Box	EA.	1	2,000	2,000
11	3" Valve & Box	EA.	1	1,800	1,800
12	2" Valve & Box	EA.	2	1,400	2,800
13	4" Road Crossing	EA.	1	4,000	4,000
14	2" Road Crossing	EA.	1	3,000	3,000
15	1" Road Crossing	EA.	4	2,750	11,000
16	Connect to Existing Main Line	EA.	4	4,500	18,000
17	Connect to Existing Service Line	EA.	5	1,000	5,000
18	Relocate and Reconnect Existing Service	EA.	3	2,500	7,500
19	2" Flush Hydrant	EA.	1	3,000	3,000
20	Contingencies		L U M P S U M		27,000
	Total Construction Cost				**$ 292,200**
	Engineering				$ 38,000
	Easement/Legal				$ 10,000
	Inspection				$ 10,000
	Total Project Cost				**$ 350,200**

Leavenworth County
Request for Board Action

Date: To Be Determined, 2026

To: Board of County Commissioners

From: Public Works

Department Head Approval: WLN

Additional Reviews as needed:

Budget Review ☒ Administrator Review ☒ Legal Review ☒

Action Requested: Approval of the construction contract with Norfolk Contracting for the replacement of Bridge HP-51 on Jamison Road and Bridge T-31 on Fairmount Road.

Analysis: Public Works solicited for bids for the replacement of HP-51 and T-31 bridge structures. Both bridge substructures utilize a simple steel beam support system attached to H-Pile bent abutments. The bridge deck for HP-51 will be a cast-in-place PCC concrete deck. The bridge deck for T-31 will utilize a PCC concrete prefabricated slat deck system. Three bids were received for the construction and the low bid was accepted. The combined bridge projects will start in mid-May, 2026 and be completed by November 15, 2026. The bid includes the removal of the existing structure and the construction of the new bridges. The county Road Department will be responsible for the backfill of the structure and the gravel surfacing. The 10% contingency is due to the fact no geotechnical borings were completed for the project which may or may not result in an overrun in the cost of the headwall piles.

Alternatives: Deny

Budgetary Impact: $593,000 + 10% contingency ($652,300.00 Total)

- ☐ Not Applicable
- ☒ Budgeted item with available funds
- ☐ Non-Budgeted item with available funds through prioritization
- ☐ Non-Budgeted item with additional funds requested

Additional Attachments: Contract and Notice of Award

COUNTY OF LEAVENWORTH

Bridge HP-51 Replacement BID OPENING ON 03.17.2026

BID TABULATION - FINAL

Item No.	Item Description	Unit	Quantity	Reece Construction Salina, KS	Total	Ebert Construction Wamego, KS	Total	Norfolk Contracting Norfolk, NE	Total
				Price	Total Price	Price	Total Price	Price	Total Price
	ROAD ITEMS								
1	Mobilization	L.S.	1	$ 24,305.99	$ 24,305.99	$ 44,148.02	$ 44,148.02	$ 6,500.00	$ 6,500.00
2	Removal of Existing Bridge	L.S.	1	$ 19,200.00	$ 19,200.00	$ 42,242.30	$ 42,242.30	$ 11,000.00	$ 11,000.00
3	Abutment Steel H-Pile (HP10x42)	600 Lin-Ft	1	$ 67.85	$ 40,710.00	$ 67.00	$ 40,200.00	$ 65.00	$ 39,000.00
4	Wing Steel H-Pile (HP8x36)	240 Lin-Ft	1	$ 64.27	$ 15,424.80	$ 60.09	$ 14,421.60	$ 60.00	$ 14,400.00
5	Steel Sheet pile (80-7 gauge sheets & 4 Type "F" corner sheets @26'-0)	3,276 S.F.	1	$ 17.39	$ 56,969.64	$ 25.40	$ 83,210.40	$ 17.00	$ 55,692.00
6	Structure steel-A709 Gr. 50 (11,234 lbs.)	L.S.	1	$ 22,681.12	$ 22,681.12	$ 34,634.49	$ 34,634.49	$ 25,839.00	$ 25,839.00
7	Structure steel-A709 Gr. 50W (55,331 lbs.)	L.S.	1	$ 142,699.75	$ 142,699.75	$ 169,682.74	$ 169,682.74	$ 165,993.00	$ 165,993.00
8	Reinforcing Steel-Gr. 60 (11,235 lbs.)	L.S.	1	$ 11,352.63	$ 11,352.63	$ 13,725.09	$ 13,725.09	$ 14,831.00	$ 14,831.00
9	Bridge Concrete Deck (4.0-(AE)-(SW))	41 C.Y.	1	$ 793.38	$ 32,528.58	$ 977.11	$ 40,061.51	$ 590.00	$ 24,190.00
10	Guardrail W-Beam	117 Lin-Ft	129	$ 129.43	$ 15,143.31	$ 136.76	$ 16,000.92	$ 90.00	$ 10,530.00
	BID PRICE				**$381,015.82**		**$498,327.07**		**$367,975.00**

COUNTY OF LEAVENWORTH

Bridge T-31 Replacement BID OPENING ON 03.17.2026

BID TABULATION - FINAL

Item No.	Item Description	Unit	Quantity	Reece Construction Salina, KS	Total	Ebert Construction	Total	Norfolk Contracting Norfolk, NE	Total
				Price	Total Price	Price	Total Price	Price	Total Price
	ROAD ITEMS								
1	Mobilization	L.S.	1	$ 24,305.99	$ 24,305.99	$ 17,987.47	$ 17,987.47	$ 10,000.00	$ 10,000.00
2	Removal of Existing Bridge	L.S.	1	$ 19,200.00	$ 19,200.00	$ 35,238.81	$ 35,238.81	$ 13,000.00	$ 13,000.00
3	Abutment Steel H-Pile (HP10x42)	480 Lin-Ft	1	$ 67.27	$ 32,289.60	$ 67.48	$ 32,390.40	$ 60.00	$ 28,800.00
4	Wing Steel H-Pile (HP8x36)	240 Lin-Ft	1	$ 63.83	$ 15,319.20	$ 59.72	$ 14,332.80	$ 56.00	$ 13,440.00
5	Steel Sheet pile (74-7 gauge sheets & 4 Type "F" corner sheets @ 22'-0)	2,574 S.F.	1	$ 17.39	$ 44,761.86	$ 25.40	$ 65,379.60	$ 19.00	$ 48,906.00
6	Sub-Structure (7,910 lbs.)	L.S.	1	$ 24,071.69	$ 24,071.69	$ 29,889.43	$ 29,889.43	$ 35,595.00	$ 35,595.00
7	Nine (9) Precast Concrete Slab Units	L.S.	1	$ 76,896.22	$ 76,896.22	$ 91,270.82	$ 91,270.82	$ 69,600.00	$ 69,600.00
8	Bridge Guardrail W-Beam	58 Lin-Ft	1	$ 139.77	$ 8,106.66	$ 136.76	$ 7,932.08	$ 98.00	$ 5,684.00
	BID PRICE				**$244,951.22**		**$294,421.41**		**$225,025.00**

COMBINED TOTAL PRICE	**$625,967.04**	**$792,748.48**	**$593,000.00**

CONTRACT AGREEMENT

THIS AGREEEMENT, made and entered in to this _____ day of _____, 20____, by and between **Leavenworth County, Kansas** acting through their **County Commissioners,** thereunto duly authorized to do so, party of the first part and hereinafter called the Owner, and Norfolk Construction, Inc. _____, party of the second part hereinafter called the Contractor.

WITNESSETH:

THAT WHEREAS, the Owner has caused to be prepared in accordance with the law, specifications, plans, and other contract documents for the work herein described and has approved and adopted said documents and has caused to be published in the manner and for the time required by law, an advertisement for and in connection with:

Jamison Road over Little Stranger Creek Bridge Replacement
Leavenworth Bridge Number HP-51
and
Fairmont Road over an Unnamed Tributary of Jarbalo Creek Bridge Replacement
Leavenworth Bridge Number T-31

In accordance with the drawings, specifications, and other contract documents prepared by MRJ Engineering. and

WHEREAS, the said Contractor in response to such advertisement has submitted to the Owner in the manner and at the time specified as sealed proposal in accordance with the terms of said advertisement; and

WHEREAS the Owner in the manner prescribed by law has publicly opened, examined, and canvassed the proposals submitted in response to the published invitation therefore, and as result of such canvass has determined and declared the aforesaid Contractor to be the best bidder for the said work and has duly awarded to the said Contractor a contract therefore, for the sum or sums maned in the Contractor's proposal, a copy thereof being attached to and made a part of this contract.

NOW, THEREFORE, in consideration of the compensation to be paid to the Contractor and of the mutual agreements herein contained, the parties to these presents have agreed and hereby agree, the Owner for itself and successors and the Contractor for itself, him/herself or themselves or its, his/her or their successors and assigns or its, his/her or their executors and administrators as follows:

ARTICLE I. The Contractor shall furnish all necessary labor, materials, equipment, tools, and services necessary to perform and complete in a workmanlike manner all work required for the construction of the project in strict compliance with the plans, specifications, and other contract documents herein mentioned which are hereby made part of the contract.

ARTICLE II. The contract comprises the contract documents listed as follows. In the event that any provision of one contract document conflicts with the provision or another contract document, the provision in that contract document list listed below shall govern except as otherwise specifically stated:

A. Agreement (this instrument), including Contractual Provisions attachment and Exhibits to the Agreement.

B. Addenda to Contract Documents as follows

ADDENDUM NO.	DATED
#1	February 16, 2026

C. Legal and Procedural Documents
1. Proposal
2. Instructions to Bidders
3. Invite to Bidders

D. Detailed Specification Requirements
1. Special Provisions
2. Supplemental Specifications
3. Standard Specifications for State Public Works Construction of the Kansas Department of Transportation, 2015 Edition.

E. Plan Drawings and Special Conditions

F. General Provisions of the Specifications
1. Special Provisions
2. Standard Specifications for State Public Works Construction of the Kansas Department of Transportation, 2015 Edition, Division 100, the General Clauses and Covenants.

G. Bonds
1. Performance Bond
2. Statutory Bond
3. Bid Bond

And Maintenance Bond per Addendum #1

H. Owner's "Contractual Provisions Attachment"

ARTICLE III. The Contractor shall start work on, or within thirty (30) calendar days from the "Proposed Start Date" provided by the Contractor in the Bid Proposal. The Contractor shall complete said work within the "Proposed Number of Working Days" as stated in his/her Bid Proposal.

ARTICLE IV. The Contractor shall at all time observe and comply with all Federal and State laws, local by-laws, ordinances, and regulations in any manner affecting the conduct of the work and all such order or decrees as exist at present and those which may be enacted late by bodies, or tribunals having jurisdiction or authorize over the work and shall indemnify and save harmless the Owner and all its officers, agents, and representatives against any claim or liability from or base on the violation of any such law, by-law, ordinance, regulation, order, or decree whether by him/herself, his/her employees, or his/her subcontractors.

The Contractor shall comply with all applicable laws governing safety, health, and sanitation and shall provide all safeguard, safety devices, and protective equipment and take any other needed actions on his/her own responsibility necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

ARTICLE V. For the performance of work under this contract, the Owner has designated Leavenworth Public Works Director as a duly authorized agent to perform duties of the Engineer authorized representative of the Owner. The Superintendent shall decide any and all questions which may arise as to the quality and acceptability of material furnished and the work performed and as to the manner of the performance and rate of progress of the work. The Superintendent shall decide all questions which may arise as to the interpretation of the plans and specifications and all questions as to the acceptable fulfillment of the terms of the contract.

ARTICLE VI. The Owner shall have the right to terminate the employment of the Contactor after giving ten days written notice of termination to the Contractor and his surety in the event of any default by the Contractor and upon receiving written notice from the P.W. Director/Engineer certifying cause for such action. In the event of such termination, the Owner may take possession of the work and of all material and may finish the work by whatever method and means he/she may select. The Owner may demand the Contractor's surety that the surety proceed in place of the Contractor to complete that contract in accordance with the terms and provisions thereof. It shall be considered a default by the Contractor whenever he/she shall:

A. Declare bankruptcy, become insolvent, or assign his/her assets for the benefit of his/her creditors.
B. Disregard or violate important provisions of the contract documents or the Superintendents instruction or fail to prosecute the work according to the agreed schedule of completion including the extensions thereof.
C. Fail to provide a qualified project manager, competent workmen or subcontractors, or proper materials, or fail to make prompt payment therefore.

ARTICLE VII. The Contractor may suspend work or terminate the contract upon ten days written notice to the Owner for any of the following reasons:

A. If an order of any court or other public authority causes the work to be stopped or suspended for a period of ninety (90) days through no fault of the Contractor or his employees.
B. If the Owner should fail to act upon any request for payment within thirty (30) days after it is presented in accordance with the contract documents.
C. If the Owner should fail to pay the Contractor any sum within thirty (30) days after its award by arbitrators.

ARTICLE VIII. The Owner shall pay to the Contractor the performance of the work embraced in this contract and the Contractor will accept as compensation therefore, the percent of the work completed stipulated in the Proposal attached hereto for the various items of work in accordance with the provisions of the performed and the materials furnished as authorized and determined in accordance with the provisions of the contract document. The total bid price, determined on the basis of approximate quantities listed in the above mentioned is in the amount of $593,000.00.

ARTICLE IX. The Contractor agrees to bond every subcontractor by the terms of the contract documents but in no way shall this be considered as creating any contractual relationship between any subcontractor and the Owner.

ARTICLE X. The Contactor shall purchase and maintain insurance in the following minimum amounts or the minimum amount required by law, whichever is greater throughout this Agreement:

A. Workers' Compensation and employer's liability insurance as required by the State of Kansas.
B. Comprehensive automobile and vehicle liability insurance covering claims for injuries to members of the public and/or damage to property of others arising from use of motor vehicles, including on site and off site operations, and owned, non-owned, or hired vehicles, with $1,000,000 combined single limits.
C. Commercial general liability insurance covering claims for injuries to members of the public or damage to property of others arising out of any covered negligent act or omission of the Contractor or any of its employees, agents, or subcontractors, with $1,000,000 per occurrence and in the aggregate.
D. Owner will be named as an additional insured with respect to Contractor's liability hereunder in insurance coverage in items "B" and "C", and Contractor waiver subrogation against Owner as to said polices.
E. Contractor shall file three (3) copies of certificates of aforementioned insurances with the Owner.

ARTICLE XI. This Agreement and all of the covenants hereof shall insure to the benefit of and be binding upon the Owner and Contractor respectively and to his partners, successors, assigns, and legal representatives. Neither the Owner nor the Contractor shall have the right to assign, transfer, or sublet his interests or obligations hereunder without written consent of the other party.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the day and year first written.

BOARD OF COUNTY COMMISSIONERS
LEAVENWORTH COUNTY, KANSAS

Leavenworth County Chairman

CONTRACTOR

Randy Matter
By

PRESIDENT
Title

P.O. Box 1893
Address NORFOLK, NE 68702

ATTEST: Leavenworth County Clerk

The contract and bond are in due form according to law and are hereby approved.

BRIDGE HP-51 BID PROPOSAL

To the Chairman and County Commissioners
Leavenworth County, Kansas

I, We, the undersigned have carefully examined the plans and specifications and also having examined the site, hereby propose to do the bridge constructions, together with all appurtenances and accessories, and complete in a workmanlike manner, furnishing all necessary materials, equipment, and labor therefore, all in accordance with the plans and specifications on file with the Leavenworth County Commissioners, for **Jamison Road over Little Stranger Creek Bridge Replacement, Bridge No. HP-51.** Said work to be done in strict conformity to the plans and specifications subject to acceptance of the Leavenworth County Commissioners at the following prices:

ITEM	QUANTITY	UNIT PRICE	TOTAL PRICE
Mobilization	1 Lump Sum		$ 6500.00
Removal of Existing Bridge	1 Lump Sum		$ 11,000.00
Abutment Steel H-Pile (HP10x42)	600 Lin-Ft.	$ 65.00 /Lin-Ft.	$ 39,000.00
Wing Steel H-Pile (HP8x36)	240 Lin-Ft.	$ 60.00 /Lin-Ft.	$ 14,400.00
Steel Sheet Pile (80 - 7 Gauge Sheets & 4 Type "F" Corner Sheets @ 26'-0)	3,276 S.F.	$ 17.00 /S.F.	$ 55,692.00
Structure Steel-A709 Gr. 50 (11,234 lbs.)	1 Lump Sum		$ 25,839.00
Structure Steel-A709 Gr. 50W (55,331 lbs.)	1 Lump Sum		$ 165,993.00
Reinforcing Steel-Gr. 60 (11,235 lbs.)	1 Lump Sum		$ 14,831.00
Bridge Concrete Deck (4.0-(AE)-(SW))	41 C.Y.	$ 590.00 /C.Y.	$ 24,190.00
Guardrail W-Beam	117 Lin-Ft.	$ 90.00 /Lin-Ft.	$ 10,530.00

BRIDGE No. HP-51 TOTAL PRICE: $ 367,975.00

BRIDGE No. HP-51 Estimated Start Date: SEPT. 7TH 2026

BRIDGE T-31 BID PROPOSAL

To the Chairman and County Commissioners
Leavenworth County, Kansas

I, We, the undersigned have carefully examined the plans and specifications and also having examined the site, hereby propose to do the bridge constructions, together with all appurtenances and accessories, and complete in a workmanlike manner, furnishing all necessary materials, equipment, and labor therefore, all in accordance with the plans and specifications on file with the Leavenworth County Commissioners, for **Fairmont Road over an Unnamed Tributary of Jarbalo Creek Bridge Replacement, Bridge No. T-31.** Said work to be done in strict conformity to the plans and specifications subject to acceptance of the Leavenworth County Commissioners at the following prices:

ITEM	QUANTITY	UNIT PRICE	TOTAL PRICE
Mobilization	1 Lump Sum		$ 10,000.00
Removal of Existing Bridge	1 Lump Sum		$ 13,000.00
Abutment Steel H-Pile (HP10x42)	480 Lin-Ft.	$ 60.00 /Lin-Ft.	$ 28,800.00
Wing Steel H-Pile (HP8x36)	240 Lin-Ft.	$ 56.00 /Lin-Ft.	$ 13,440.00
Steel Sheet Pile (74 - 7 Gauge Sheets & 4 Type "F" Corner Sheets @ 22'-0)	2,574 S.F.	$ 19.00 /S.F.	$ 48,906.00
Sub-Structure Steel (7,910 lbs.)	1 Lump Sum		$ 35,595.00
Nine (9) Precast Concrete Slab Units	1 Lump Sum		$ 69,600.00
Bridge Guardrail W-Beam	58 Lin-Ft.	$ 98.00 /Lin-Ft.	$ 5684.00

BRIDGE No. T-31 TOTAL PRICE: $ 225,025.00

BRIDGE No. T-31 Estimated Start Date: AUG. 10th 2026

Bridge No. HP-51 & No. T-31 COMBINED TOTAL PRICE: $ 593,000.00

Respectfully Submitted,

NORFOLK CONTRACTING, INC.
Name of Firm

By: RANDY MATTEO (Name) PRES. (Title) Date: 3-10-2026

Address: P.O. Box 1893 NORFOLK NE 68702 Telephone: 402-371-7934

BID BOND (PENAL SUM FORM)

Bidder	**Surety**
Name: Norfolk Contracting, Inc.	**Name:** Merchants Bonding Company (Mutual)
Address *(principal place of business)*: PO Box 1893 Norfolk, NE 68702	**Address** *(principal place of business)*: P.O. Box 14498 Des Moines, IA 50306-3498
Owner	**Bid**
Name: Leavenworth County	**Project** *(name and location)*: Bridge No. HP-51 and Bridge No. T-31 Replacement
Address *(principal place of business)*: 300 Walnut St. Suite 106, Leavenworth, KS 66048	**Bid Due Date:** March 17, 2026

Bond

Penal Sum: Five Percent of the Amount Bid 5%

Date of Bond: March 17, 2026

Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth in this Bid Bond, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

Bidder	**Surety**
Norfolk Contracting, Inc. *(Full formal name of Bidder)*	Merchants Bonding Company (Mutual) *(Full formal name of Surety) (corporate seal)*
By: Randy Matteo *(Signature)*	By: *(Signature) (Attach Power of Attorney)*
Name: RANDY MATTEO *(Printed or typed)*	Name: James M. King *(Printed or typed)*
Title: PRES.	Title: Attorney-in-Fact
Attest: Holly S. Anderson *(Signature)*	Attest: Tammy Hurlbut *(Signature)*
Name: Holly S. Anderson *(Printed or typed)*	Name: Tammy Hurlbut *(Printed or typed)*
Title: Witness	Title: Witness

Notes: (1) Note: Addresses are to be used for giving any required notice. (2) Provide execution by any additional parties, such as joint venturers, if necessary.

EJCDC® C-430, Bid Bond (Penal Sum Form).
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1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond will be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder occurs upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation will be null and void if:
   3.1. Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
   3.2. All Bids are rejected by Owner, or
   3.3. Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions does not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.
6. No suit or action will be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety, and in no case later than one year after the Bid due date.
7. Any suit or action under this Bond will be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder must be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Postal Service registered or certified mail, return receipt requested, postage pre-paid, and will be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond will be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute governs and the remainder of this Bond that is not in conflict therewith continues in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

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MERCHANTS
BONDING COMPANY™

POWER OF ATTORNEY

Know All Persons By These Presents, that MERCHANTS BONDING COMPANY (MUTUAL) and MERCHANTS NATIONAL BONDING, INC., both being corporations of the State of Iowa, and MERCHANTS NATIONAL INDEMNITY COMPANY , an assumed name of Merchants National Bonding, Inc., (herein collectively called the "Companies") do hereby make, constitute and appoint, individually,

Jacob J Buss; James M King; Robert T Cirone; Seth Weedin; Tamala J Hurlbut; Thomas L King

their true and lawful Attorney(s)-In-Fact, to sign its name as surety(ies) and to execute, seal and acknowledge any and all bonds, undertakings, contracts and other written instruments in the nature thereof, on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

This Power-of-Attorney is granted and is signed and sealed by facsimile under and by authority of the By-Laws adopted by the Board of Directors of the Companies.

"The President, Secretary, Treasurer, or any Assistant Treasurer or any Assistant Secretary or any Vice President shall have power and authority to appoint Attorneys-In-Fact, and to authorize them to execute on behalf of the Company, and attach the seal of the Company thereto, bonds and undertakings, recognizances, contracts of indemnity and other writings obligatory in the nature thereof."

"The signature of any authorized officer and the seal of the Company may be affixed by facsimile or electronic transmission to any Power of Attorney or Certification thereof authorizing the execution and delivery of any bond, undertaking, recognizance, or other suretyship o obligations of the Company, and such signature and seal when so used shall have the same force and effect as though manually fixed."

In connection with obligations in favor of the Florida Department of Transportation only, it is agreed that the power and authority hereby given to the Attorney-In-Fact includes any and all consents for the release of retained percentages and/or final estimates on engineering and construction contracts required by the State of Florida Department of Transportation. It is fully understood that consenting to the State of Florida Department of Transportation making payment of the final estimate to the Contractor and/or its assignee, shall not relieve this surety company of any of its obligations under its bond.

In connection with obligations in favor of the Kentucky Department of Highways only, it is agreed that the power and authority hereby given to the Attorney-In-Fact cannot be modified or revoked unless prior written personal notice of such intent has been given to the Commissioner - Department of Highways of the Commonwealth of Kentucky at least thirty (30) days prior to the modification or revocation.

In Witness Whereof, the Companies have caused this instrument to be signed and sealed this 2nd day of June , 2025 .

MERCHANTS BONDING COMPANY (MUTUAL) INCORPORATED -o- 1933

MERCHANTS NATIONAL BONDING, INC. INCORPORATED -o- 2003

MERCHANTS NATIONAL INDEMNITY COMPANY CALIFORNIA

MERCHANTS BONDING COMPANY (MUTUAL)
MERCHANTS NATIONAL BONDING, INC.
MERCHANTS NATIONAL INDEMNITY COMPANY

By Larry Taylor

President

STATE OF IOWA
COUNTY OF DALLAS ss.

On this 2nd day of June 2025 , before me appeared Larry Taylor, to me personally known, who being by me duly sworn did say that he is President of MERCHANTS BONDING COMPANY (MUTUAL), MERCHANTS NATIONAL BONDING, INC., and MERCHANTS NATIONAL INDEMNITY COMPANY; and that the seals affixed to the foregoing instrument are the Corporate Seals of the Companies; and that the said instrument was signed and sealed in behalf of the Companies by authority of their respective Boards of Directors.

NOTARIAL SEAL IOWA

Penni Miller
Commission Number 787952
My Commission Expires
January 20, 2027

Notary Public

(Expiration of notary's commission does not invalidate this instrument)

I, Elisabeth Sandersfeld, Secretary of MERCHANTS BONDING COMPANY (MUTUAL), MERCHANTS NATIONAL BONDING, INC., and MERCHANTS NATIONAL INDEMNITY COMPANY do hereby certify that the above and foregoing is a true and correct copy of the POWER-OF-ATTORNEY executed by said Companies, which is still in full force and effect and has not been amended or revoked.

In Witness Whereof, I have hereunto set my hand and affixed the seal of the Companies on this 17th day of March , 2026 .

MERCHANTS BONDING COMPANY (MUTUAL) INCORPORATED -o- 1933

MERCHANTS NATIONAL BONDING, INC. INCORPORATED -o- 2003

MERCHANTS NATIONAL INDEMNITY COMPANY CALIFORNIA

Secretary

POA 0018 (5/25)

ORIGINAL BOND 1 OF 3 Bond No. 101708489

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: That Norfolk Contracting, Inc.

PO Box 1893, Norfolk, NE 68702

(Address of Contractor)

a Corporation, hereinafter called
(Corporation, Partnership, or Individual)

Principle; and Merchants Bonding Company (Mutual)

PO Box 14498 Des Moines, IA 50306

(Address of Surety)

Hereinafter called Surety, are held and firmly bound unto Leavenworth County, Kansas

Hereinafter called Owner, in the penal sum of

Five Hundred Ninty Three Thousand and no/100 Dollars, ($ 593,000.00)

in lawful money of the United States, for the payment which sum well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITIONS OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the Owner, date the 7th day of April, 20 26, a copy of which is hereto attached and made a part hereof for the construction of

Jamison Road over Little Stranger Creek Bridge Replacement
Leavenworth Bridge Number HP-51
and
Fairmont Road over an Unnamed Tributary of Jarbalo Creek Bridge Replacement
Leavenworth Bridge Number T-31

NOW, THEREOF: If the Principal shall well, truly, and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of said Contract Documents during the original term thereof, and any extensions thereof which may be granted by the Owner, with or without notice to the Surety and during the one year guaranty period, and if he shall fully indemnify and save harmless the Owner from all cost and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the Owner all outlay and expense which the Owner may incur in making good any default, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDE FURTHER, that the said Surety, for value received, hereby stipulated and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the Work to be performed thereunder or the Specifications accompanying the same shall in any way affect its

obligation on the Bond, and it does hereby waive notice of any such change, extension of time, alterations or addition to the terms of the contract or to the Work or to the Specifications.
PROVIDE, FURTHER, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in 3 counterparts, each one of which shall be deemed an original this the 9th day of April, 20 26.

Holly L. Anderson
(Witness)

Holly S. Anderson
(Please Type)

Norfolk Contracting, Inc.
By (Principal) (Seal)

Randy Matteo
(Please Type)

RANDY MATTEO PRES.
(Title)

Kara Stege
(Witness)

Kara Stege
(Please Type)

Merchants Bonding Company (Mutual)
By (Surety) (Seal)

(Please Type)

James M. King Attorney-in-Fact
(Title)

NOTE: Date of Bond must not be prior to date of Contract. If Contractor is a Partnership, all partners should execute Bond.

Bond No. 101708489

STATUTORY BOND

KNOW ALL MEN BY THESE PRESENTS: That Norfolk Contracting, Inc., As Contractor, and ~~Offices in the City of~~ Merchants Bonding Company (Mutual), a Corporation organized under the laws of the State of Iowa, and authorized to transact business in the State of Kansas, as Surety, are held and firmly bound unto the State of Kansas, in the penal sum of Five Hundred Ninety Three Thousand and 00/100 Dollars ($ 593,000.00) lawful money of the United State of America, for payment of which sum well and truly to be made we bind ourselves, and our heirs, executors, administrators, successors, and assigns, jointly, and severally, firm by these presents: THE CONDITIONS OF THE FOREGOING OBLIGATION IS SUCH THAT:

WHEREAS, the said Contractor has on the 7th day of April, 2026, entered into a written contract with Leavenworth County, Kansas, for furnishing all tools, equipment, materials, and supplies, performing all labor, and constructing public improvements consisting of

Jamison Road over Little Stranger Creek Bridge Replacement
Leavenworth Bridge Number HP-51
and
Fairmont Road over an Unnamed Tributary of Jarbalo Creek Bridge Replacement
Leavenworth Bridge Number T-31

in accordance with Specifications and other Contract Documents on file in the office of the Leavenworth County Public Works Department, in the said City of Leavenworth, Kansas.

NOW, THEREFORE, if the Contractor shall pay all indebtedness incurred for supplies, materials, or labor furnished, used or consumed in connection with or in or about the construction of making of, the above described improvement, including gasoline, lubricating oils, greases, coal, and similar items used or consumed directly or furtherance of such public improvement, this obligation shall be void; otherwise it shall remain in full force and effect.

The said Surety, for value received, hereby stipulates and agrees that change, extension of time, alteration or addition to the terms of the contract or work to be performed thereunder, or the specifications accompanying the same, shall in any ways affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition of the terms of the Contract or to the Specifications.

The said Surety further agrees that any person to whom there is due any sum for labor or materials furnished, as hereinbefore stated, or said persons and assigns, may bring an action on this Bond for the recovery of said indebtedness; Provided, that no action shall be brought on said bond after six (6) months from the completion of said public improvement.

IN TESTIMONY WHEREOF, the said Contractor has hereunto set his hand, and the said Surety has caused these presents to be executed in its name, and its corporate seal to be hereunto affixed, by it attorney-in-fact duly authorized, hereunto so to do, at Lincoln, on this the 9th day of April, 2026.

Norfolk Contracting, Inc.

CONTRACTOR

Randy Matteo

RANDY MATTEO PRES.

NORFOLK CONTRACTING, INC. CORPORATE SEAL 68701 10789

Merchants Bonding Company (Mutual)

SURETY COMPANY

By

Attorney-in-Fact James M. King

James M. King License No.649398 Kansas Agent

(Accompanying this Bond with Attorney-in-Fact's authority from the Surety Company certified to include the date of the Bond.)

File this Bond with the Clerk of the District Court, in the district hat the work is performed.

Bond No. 101708489

MAINTENANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS:
That we, **(Contractor)** Principal Norfolk Contracting, Inc. and Merchants Bonding Company (Mutual), as Surety, are held and firmly bound unto Leavenworth County, Kansas, in the full and just sum of Five Hundred Ninty Three Thousand and no/100 Dollars ($ 593,000.00) for the payment of which, well and truly to be made, we, and each of us, bind ourselves, our heirs, executors and assigns, themselves, and its successors and assigns, jointly and severally, firmly by these present. Dated this 7th day of April, 2026.

The conditions of this obligation are such, that whereas upon completion of a Contract for the description of improvements, (and has been accepted by Leavenworth County, Kansas, as having been built in accordance with approved plans and specifications with no unacceptable deviations thereof), has agreed to guarantee the construction and installation, including all materials and workmanship, for the period of one (1) year beginning on the date the County so accepts said work, said date being the formal acceptance date.

NOW, THEREFORE, if said **(Contractor)** Principal shall guarantee the above work for a period of One (1) year from the date of formal acceptance, then this obligation shall be null and void, otherwise to remain in full force and effect.

Signed, sealed and delivered the day and year first above written.

ATTEST:

Holly J. Anderson
(Secretary)

By _____
(Attorney-in-fact) James M. King

By _____
(Kansas Agent) James M. King
License No. 649398

Norfolk Contracting, Inc.
(Contractor/Principal)

By Randy Matteo
(Name and Title) RANDY MATTEO PRES.

Merchants Bonding Company (Mutual)
(Surety Company)

PO Box 14498 Des Moines, IA 50306
(Address)

NOTE:
1. (Accompany this bond with attorney-in-fact's authority from the Surety Company certified to include the date of the bond.)
2. IMPORTANT: Surety companies executing Bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the Project is located.

MERCHANTS BONDING COMPANY™

POWER OF ATTORNEY

Know All Persons By These Presents, that MERCHANTS BONDING COMPANY (MUTUAL) and MERCHANTS NATIONAL BONDING, INC., both being corporations of the State of Iowa, and MERCHANTS NATIONAL INDEMNITY COMPANY , an assumed name of Merchants National Bonding, Inc., (herein collectively called the "Companies") do hereby make, constitute and appoint, individually,

Jacob J Buss; James M King; Robert T Clrone; Seth Weedin; Tamala J Hurlbut; Thomas L King

their true and lawful Attorney(s)-In-Fact, to sign its name as surety(ies) and to execute, seal and acknowledge any and all bonds, undertakings, contracts and other written instruments in the nature thereof, on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

This Power-of-Attorney is granted and is signed and sealed by facsimile under and by authority of the By-Laws adopted by the Board of Directors of the Companies.

"The President, Secretary, Treasurer, or any Assistant Treasurer or any Assistant Secretary or any Vice President shall have power and authority to appoint Attorneys-In-Fact, and to authorize them to execute on behalf of the Company, and attach the seal of the Company thereto, bonds and undertakings, recognizances, contracts of indemnity and other writings obligatory in the nature thereof."

"The signature of any authorized officer and the seal of the Company may be affixed by facsimile or electronic transmission to any Power of Attorney or Certification thereof authorizing the execution and delivery of any bond, undertaking, recognizance, or other suretyship o obligations of the Company, and such signature and seal when so used shall have the same force and effect as though manually fixed."

In connection with obligations in favor of the Florida Department of Transportation only, it is agreed that the power and authority hereby given to the Attorney-In-Fact includes any and all consents for the release of retained percentages and/or final estimates on engineering and construction contracts required by the State of Florida Department of Transportation. It is fully understood that consenting to the State of Florida Department of Transportation making payment of the final estimate to the Contractor and/or its assignee, shall not relieve this surety company of any of its obligations under its bond.

In connection with obligations in favor of the Kentucky Department of Highways only, it is agreed that the power and authority hereby given to the Attorney-In-Fact cannot be modified or revoked unless prior written personal notice of such intent has been given to the Commissioner - Department of Highways of the Commonwealth of Kentucky at least thirty (30) days prior to the modification or revocation.

In Witness Whereof, the Companies have caused this instrument to be signed and sealed this 2nd day of June , 2025 .

MERCHANTS BONDING COMPANY (MUTUAL) INCORPORATED -o- 1933

MERCHANTS NATIONAL BONDING, INC. INCORPORATED -o- 2003

MERCHANTS NATIONAL INDEMNITY COMPANY CALIFORNIA

MERCHANTS BONDING COMPANY (MUTUAL)
MERCHANTS NATIONAL BONDING, INC.
MERCHANTS NATIONAL INDEMNITY COMPANY

By Larry Taylor

President

STATE OF IOWA
COUNTY OF DALLAS ss.
On this 2nd day of June 2025 , before me appeared Larry Taylor, to me personally known, who being by me duly sworn did say that he is President of MERCHANTS BONDING COMPANY (MUTUAL), MERCHANTS NATIONAL BONDING, INC., and MERCHANTS NATIONAL INDEMNITY COMPANY; and that the seals affixed to the foregoing instrument are the Corporate Seals of the Companies; and that the said instrument was signed and sealed in behalf of the Companies by authority of their respective Boards of Directors.

NOTARIAL SEAL IOWA
Penni Miller
Commission Number 787952
My Commission Expires
January 20, 2027

Notary Public

(Expiration of notary's commission does not invalidate this instrument)

I, Elisabeth Sandersfeld, Secretary of MERCHANTS BONDING COMPANY (MUTUAL), MERCHANTS NATIONAL BONDING, INC., and MERCHANTS NATIONAL INDEMNITY COMPANY do hereby certify that the above and foregoing is a true and correct copy of the POWER-OF-ATTORNEY executed by said Companies, which is still in full force and effect and has not been amended or revoked.

In Witness Whereof, I have hereunto set my hand and affixed the seal of the Companies on this 9th day of April , 2026 .

MERCHANTS BONDING COMPANY (MUTUAL) INCORPORATED -o- 1933

MERCHANTS NATIONAL BONDING, INC. INCORPORATED -o- 2003

MERCHANTS NATIONAL INDEMNITY COMPANY CALIFORNIA

Secretary

POA 0018 (5/25)

NOTICE OF AWARD

TO: Norfolk Contracting, Inc.
PO Box 1893
Norfolk, NE 68702

Project Description:

Jamison Road over Little Stranger Creek Bridge Replacement
Leavenworth Bridge Number HP-51
and
Fairmont Road over an Unnamed Tributary of Jarbalo Creek Bridge Replacement
Leavenworth Bridge Number T-31

The Owner has considered the Bid submitted by you for the above described Work in response to its Advertisement for Bid dated March 17, 20 26 and Information for Bidders

You are hereby notified that your Bid has been accepted for items in the amount of

$ 593,000.00.

You are required to execute the Agreement and furnish the required Contractor's Performance Bond and Payment Bond within 14 calendar days from the date of the Notice to you.

If you fail to execute the Agreement and furnish said Bonds within 10 days from the date of this Notice, said Owner will be entitled to consider all your rights arising out of the Owner's acceptance of your bid as abandoned and as a forfeiture of you bid security. The Owner will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this Notice of Award to the Owner.

Dated this 2nd day of April, 20 26

Owner: Leavenworth County, Kansas
Leavenworth County Commissioners

By Bill Nash
Public Works Director

ACCEPTANCE OF NOTICE

Receipt of the above Notice of Award is hereby acknowledged by

RANDY MATTEO this the 7th day of

APRIL, 20 26.

By Randy Matteo Title PRES.

ARTICLE IX. The Contractor agrees to bond every subcontractor by the terms of the contract documents but in no way shall this be considered as creating any contractual relationship between any subcontractor and the Owner.

ARTICLE X. The Contactor shall purchase and maintain insurance in the following minimum amounts or the minimum amount required by law, whichever is greater throughout this Agreement:

A. Workers' Compensation and employer's liability insurance as required by the State of Kansas.
B. Comprehensive automobile and vehicle liability insurance covering claims for injuries to members of the public and/or damage to property of others arising from use of motor vehicles, including on site and off site operations, and owned, non-owned, or hired vehicles, with $1,000,000 combined single limits.
C. Commercial general liability insurance covering claims for injuries to members of the public or damage to property of others arising out of any covered negligent act or omission of the Contractor or any of its employees, agents, or subcontractors, with $1,000,000 per occurrence and in the aggregate.
D. Owner will be named as an additional insured with respect to Contractor's liability hereunder in insurance coverage in items "B" and "C", and Contractor waiver subrogation against Owner as to said polices.
E. Contractor shall file three (3) copies of certificates of aforementioned insurances with the Owner.

ARTICLE XI. This Agreement and all of the covenants hereof shall insure to the benefit of and be binding upon the Owner and Contractor respectively and to his partners, successors, assigns, and legal representatives. Neither the Owner nor the Contractor shall have the right to assign, transfer, or sublet his interests or obligations hereunder without written consent of the other party.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the day and year first written.

BOARD OF COUNTY COMMISSIONERS
LEAVENWORTH COUNTY, KANSAS

Leavenworth County Chairman

CONTRACTOR

Randy Matter
By

PRESIDENT
Title

P.O. Box 1893
Address NORFOLK, NE 68702

ATTEST: Leavenworth County Clerk

The contract and bond are in due form according to law and are hereby approved.

Leavenworth County
Request for Board Action

Date: May 28th, 2026

To: Board of County Commissioners

From: Public Works

Department Head Approval: WLN

Additional Reviews as needed:

Budget Review ☒ Administrator Review ☒ Legal Review ☒

Action Requested: Acceptance of the low bid for the purchase of a trench roller from Foley Equipment.

Analysis: Bids were solicited for the purchase of a new trench compact. This equipment will be used to achieve proper compaction under the culverts so that trenches will not need to be left open to settle as long prior to paving over the top of the culvert. This should also keep the culvert from needing patched after the first year of placement. This has been an ongoing issue in the county and needs to be addressed.

Alternatives: Deny

Budgetary Impact: $37,000

☐ Not Applicable
☒ Budgeted item with available funds
☐ Non-Budgeted item with available funds through prioritization
☐ Non-Budgeted item with additional funds requested

Additional Attachments: Bid Tab and Bids

COUNTY OF LEAVENWORTH
Trench Roller Quotes

Item Description	Quantity	Foley Equipment		Murphy Tractor		Road Builders	
		Bid Price	Model	Bid Price	Model	Bid Price	Model
Trench Roller	1	$37,000.00	**RTDSC4**	$40,338.88	**HTC 15**	$38,645.00	**Bomag BMP 8500**
TOTAL BID PRICE		**$37,000.00**		**$40,338.88**		**$38,645.00**	
Leavenworth County Contractor (local preference, percentage difference from lowest bid)							

Quote 234413-01

May 15, 2026

LEAVENWORTH COUNTY ROAD & BRIDGE
23690 187TH
LEAVENWORTH
Kansas
66048

Attention: ZACH EVANS

Dear Sir,
We would like to thank you for your interest in our company and our products, and are pleased to quote the following for your consideration.

Wacker Model: RTDSC4 MISCELLANEOUS

STOCK NUMBER: 6AR1542 **SERIAL NUMBER:** WNMR0301KM0002408 **YEAR:** 2026 **SMU:** 0

We wish to thank you for the opportunity of quoting on your equipment needs. This quote is contingent upon Customer's acceptance of Foley's standard terms and conditions. This quotation is valid for 30 days, after which time we reserve the right to re-quote. If there are any questions, please do not hesitate to contact me.

Sincerely,
Matt Schuster
Regional Sales Representative

MACHINE SPECIFICATIONS

Description	Reference No
***	WA-CKER
WACKER RTLX-SC4 TRENCH ROLLER,	RTLX-SC4
KOHLER ENGINE	
OPERATING WEIGHT 3295LBS	
6.3 GAL TANK. 1.2 GAL/HR CONSUM	

SELL PRICE	$37,000.00
NET BALANCE DUE	**$37,000.00**
PLUS APPLICABLE TAXES CALCULATED AT DELIVERY	**$37,000.00**

F.O.B/TERMS
Wichita, KS

Accepted by_____ **on** _____

_____
Signature

MURPHY TRACTOR & EQUIPMENT CO.

WIRTGEN GROUP

Leavenworth County



The configured machine may differ from the machine shown and the description below.

New in stock unit 257874 HTC 15 (H951)

HTC 15 Trench roller with two vibration padfoot drums

- IR remote control
- Low center of gravity to reduce the risk of tipping
- Engine tipping protection to protect the engine
- High level of versatility - drum width extension as standard
- Easy to transport and service

Maximum working width	32,3 in
Axle load, front/rear	1.649/1.561 lbs
Drum width, front/rear	32,3/32,3 in
Power ISO 14396, kW/PS/rpm	[UNKNOWN]

MURPHY TRACTOR & EQUIPMENT CO.

WIRTGEN GROUP

2026 US Source-Well Quote, Contract-No. 060122-WAI

Quotation price	$ 40,338.88

Quote Valid until June 15th 2026 — Price subject to change without notice

2026 Source-Well List Price:	$49,054.00
Includes 20% Source-Well Discount:	$39,243.20
Freight & PDI:	$1,095.68

Road Builders Machinery and Supplies Co.
Kansas City KS
Presented by:
Jeremy Manning

816-898-9728
jmanning@rbmsco.com

Billing Address:
LEAVENWORTH COUNTY LEAVE002
300 WALNUT
LEAVENWORTH KS 66048
Main Phone# 9136840422

Shipping Address:
23690 187th Street
Leavenworth KS 66048-8321

Qty: 1 2026 Bomag BMP 8500
S/N Factory Order, STOCK # N.I.S.
$38,645.00

Equipped as follows:
Drum extensions 24" or 33.5" widths usage
Operating weight--3,263 lb and add 253 lb with the drum extension to 33.5" width
Kubota engine, 3 cylinder, 19 HP, diesel
Vibrating drum front and rear
See attachment for complete standard specs

Standard Options

Warranty Details:
2 Years/2,000 Hours Full Machine 24 Months / 2000 Hours whichever occurs first

** Subject to all applicable taxes. This proposal is good for 30 days and subject to availability. Pricing is subject to change without notice.*

Sub Total:	**$38,645.00**
Total Selling Price:	**$38,645.00**

**Compactor is new from the factory with lead time July 2026
**Price includes freight from the factory and delivery to Leavenworth, KS
**Sourcewell discount was figured in the pricing; see below for details:

Quote has been prepared for bid and/or budgetary review for Government/Municipal organization
Pricing, general unit availability, and estimated lead times are subject to change per conditions from Road Builders Machinery and Supplies Co., BOMAG Americas, Inc., and other 3rd-party manufacturing

SOURCEWELL CONTRACT
BOMAG (#060122-BAI)
Soil and Asphalt Rollers, Pavers, Landfill and Refuse Compactors

MEMBER ID
Leavenworth County (ID# 140335)
Leavenworth, KS

On behalf of RoadBuilders Machinery & Supplies Co., thank you for the opportunity to quote this Bomag MODEL BMP 8500 Compactor Serial Number Factory Order Stock Number N.I.S..

Sincerely,

Jeremy ManningDistrict Sales Rep 

** Subject to all applicable taxes. This proposal is good for 30 days and subject to availability. Pricing is subject to change without notice.*

816-898-9728
jmanning@rbmsco.com

Terms and Provisions

Customer Acceptance By: _____ Printed Name: _____

Date Signed: _____ PO #: _____

Requested delivery date: _____ Ship Via: _____

Terms: _____

Subject to Management approval

Management Approval: _____

Credit Approval: _____

CA #: _____

Due to the current tariff environment, all quotes are subject to change with a potential tariff surcharge that may be added to the quote. The total surcharge, will be based on tariff surcharges received at the time of the manufacture invoice Please Initial here _____

** Subject to all applicable taxes. This proposal is good for 30 days and subject to availability. Pricing is subject to change without notice.*

BOMAG Technologies

ECONOMIZER:

The ECONOMIZER shows the operator the increase of compaction on a display, helping to achieve the best compaction results. Operation is very simple because no set-up or calibration is required. The ECONOMIZER automatically determines the compaction progress. A light strip indicates the end of compaction to the driver to avoid over compaction. A warning lamp also lets you know when there is a risk of over compaction.

BOMAP:

BOMAP as a free app with maximum compatibility. The app is available free of charge in the Google Play Store. BOMAP runs on all regular Android tablets and smartphones, so no special hardware is required.
The app is immediately ready for use after installation. Once all parameters have been set, the app runs throughout the entire construction process. When the app is started, BOMAP automatically documents compaction output without the driver having to make any further settings. It is immediately apparent where optimum compaction has been achieved or whether further passes are necessary.

TELEMATICS:

Call up the status of your vehicles from your computer or tablet. Full transparency at all times for your machine fleet with the new BOMAG TELEMATIC app for PC, iOS and Android devices.

- Effective monitoring: Monitor your fleet fuel consumption
- Real time reports: Monitor the current operating hours of your machines as well as pending and completed maintenance and service
- Location: Know where your machines are and how they are used

** Subject to all applicable taxes. This proposal is good for 30 days and subject to availability. Pricing is subject to change without notice.*

- Anti-theft alarm: Alarm function activated when motion is detected or the machine leaves a geographically defined zone for individual machines.

ROADBUILDERS FINANCING OPTIONS

RoadBuilders offers solutions to your unique financial needs. We have a dedicated financial specialist who will find the financial options that are right for you - comprehensive, flexible, and cost-effective financing. On the other hand, if you prefer to finance through your bank, we're happy to assist. We can always offer a financing comparison, which sometimes saves you money.

THERE ARE MANY PLANS TO CHOOSE FROM:

- Leasing Options
    - Lease with Fixed Residual
    - Lease with Fair Market Value Option
- Installment Sales Plan

** Subject to all applicable taxes. This proposal is good for 30 days and subject to availability. Pricing is subject to change without notice.*

2027



Proposed Budget

GENERAL OPERATING FUND

EMS

DEPARTMENT / DIVISION SPENDING SUMMARY

EXPENDITURES	2023 ACTUAL	2024 ACTUAL	2025 ACTUAL	2026 BUDGET	2026 Projection	2027 Request
SALARIES	$3,480,921	$3,602,563	$4,060,929	$4,054,515	$4,054,515	$3,988,314
CONTRACTUAL	$164,768	$213,495	$215,900	$233,330	$236,930	$234,857
TRAVEL & TRAINING	$5,545	$10,374	$8,163	$10,500	$10,500	$10,500
MAINTENANCE & SUPPLIES	106,065	93,193	95,499	111,100	$116,307	$118,100
SUPPLIES & POSTAGE	276,276	218,210	210,377	274,750	$275,250	$275,500
PUBLIC RELATION	-	22	176	500	$500	$500
RADIO EQUIPMENT	-	6,557	8,391	10,000	$10,000	$20,000
TRANSFER TO CAPITAL IMPROV.	360,000	320,000	320,000	390,000	$390,000	$410,000
TRANSFER TO EMPLOYEE BENEFITS	1,598,269	1,744,178	2,110,702	2,139,500	$2,129,500	$2,103,226
Total	$ 5,991,647	$ 6,208,593	$ 7,030,137	$ 7,224,195	$7,223,502	$7,160,997

2027 Budget Proposal Detail
EMS Detail

				2025 Breakdown Total			Difference (2026-2027)	2027 Budget Request
Salaries							-66,201	$3,988,314
4-001-5-05-1	2023 Actual	2024 Actual	2025 Actual		2026 Budget	2026 Projection		
	3,480,921	3,602,563	4,060,929		4,054,515	4,054,515	-66,201	$3,988,314
Contractual							1,527	$234,857
	2023 Actual	2024 Actual	2025 Actual		2026 Budget	2026 Projection		
	164,768	213,495	215,900		233,330	$236,930		
001-5-05-201	Medical Director			15,874	15,000	18,000	3,000	18,000
001-5-05-203	Licenses, Dues & Membership			1,241	2,000	2,000	0	2,000
001-5-05-209	Subscription			4,069	4,300	4,900	600	4,900
001-50-5-210	Telephone			4,316	4,000	4,000	400	4,400
001-5-05-212	Miscellaneous			315	500	500	0	500
001-5-05-214	Insurance			51,408	51,408	51,408	0	51,408
001-5-05-215	Utilities			42,586	50,000	50,000	0	50,000
001-5-05-216	Cable			4,695	5,000	5,000	(1,500)	3,500
001-5-05-217	Rent			27,500	27,500	27,500	0	27,500
001-5-05-271	Vehicles Lease Payments			56,895	58,622	58,622	(973)	57,649
001-5-05-282	Red Waste			4,279	5,000	5,000	0	5,000
001-5-05-285	Immunization			70	500	500	0	500
001-5-05-287	Printing			0	1,000	1,000	0	1,000
001-5-05-290	Patient Reim. To Patients			2,652	8,500	8,500	0	8,500
Travel & Training							0	$10,500
	2023 Actual	2024 Actual	2025 Actual		2026 Budget	2026 Projection		
	5,545	10,374	8,163		10,500	$10,500		
001-5-05-202	Training & Education			8,148	10,000	10,000	0	$10,000
001-5-05-205	Mileage & Travel			16	500	500	0	$500
Maintenance & Supplies							7,000	$118,100
	2023 Actual	2024 Actual	2025 Actual		2026 Budget	2026 Projection		
	106,065	93,193	95,499		111,100	$116,307		
001-5-05-213	Vehicle Maintenance			43,798	50,000	50,000	0	50,000
001-5-05-220	Computer Software Maintenance			27,445	29,000	29,400	2,000	31,000
001-5-05-280	Radio Maintenance			5,675	8,000	8,000	0	8,000
001-5-05-281	Monitor Maintenance			13,967	17,000	21,807	5,000	22,000
001-5-05-283	Copy Machine Maintenance			714	1,000	1,000	0	1,000

001-5-05-284	Bldgs. Maintenance Expenses	465	2,000	2,000	0	2,000
001-5-05-286	Medical Equipment Maintenance	3,435	4,100	4,100	0	4,100
Supplies & Postage					750	$275,500
	2023 Actual	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
	276,276	218,210	210,377	274,750	$275,250		
001-5-05-301	Office Supplies	3,470	8,000	8,000	8,000	8,000
001-5-05-302	Postage	6,799	7,000	7,500	7,000	7,750
001-5-05-312	Miscellaneous	0	250	250	250	250
001-5-05-351	Personal Protective Equip.	0	12,000	12,000	12,000	12,000
001-5-05-381	Field Supplies	137,907	160,000	160,000	160,000	160,000
001-5-05-384	Living Quarters Supplies	1,976	2,000	2,000	2,000	2,000
001-5-05-380	Training Equipment	141	1,000	1,000	1,000	1,000
001-5-05-350	Uniforms	7,641	13,000	13,000	13,000	13,000
001-5-05-306	Vehicle Maintenance Supplies	46,551	65,000	65,000	65,000	65,000
001-5-05-383	Bldgs. Maintenance Supplies	5,892	6,500	6,500	6,500	6,500
Public Relations					0	$500
0015-05-385	2023 Actual	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
		21.98	175.99	500	$500	$500	$500
Radio Equipment						10,000	$20,000
001-5-05-4	2023 Actual	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
		6557.28	8390.73	10000	$10,000	$10,000	$20,000
Transfer to Capital Improvement						20,000	$410,000
001-5-05-403	2023 Actual	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
	360000	320000	320000	390000	390000	390000	$410,000
Transfer to Employee Benefits						-36,274	$2,103,226
001-5-05-503	2023 Actual	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
	1598269	1744178	2110702	2139500	2129500		$2,103,226
	5,991,844	6,208,593	7,030,137	7,224,195	**Department Total**	-63,198	$7,160,997

2027 EMS Line Item Budget

PERSONNEL SERVICES:

Approved 2025	Approved 2026	Proposed 2027
$4,006,909	$4,054,515	$3,988,314

Expenditures	Expenditures
$4,054,515	$932,187 (1st quarter)

The budgeted amount is based on the current pay scale and personnel for the EMS Department.

CONTRACTUAL:

MEDICAL DIRECTOR (201):

Approved 2025	Approved 2026	Proposed 2027
$15,000	$15,000	$18,000

Expenditures	Expenditures
$15,874	$4,500 (1st quarter)

This line-item expense is based on the contractual agreement between the Board of County Commissioners and the Medical Director. EMS is required by statute to have a Medical Director; certified technicians must work directly under the license of a Kansas physician. The amount listed is the EMS portion for the Medical Director.

TRAINING AND EDUCATION (202):

Approved 2025	Approved 2026	Proposed 2027
$8,000	$10,000	$10,000

Expenditures	Expenditures
$8,148	$3,246 (1st quarter)

This line item covers all educational costs we incur. Continuing education is essential to the quality of care provided by our service. EMS provides enough educational hours for all employees to continue recertification through the State Board of EMS. This also covers our paramedic sponsorship cost. (3) employees will be entering their 2nd year of school. Along with the CEU cost, billing and insurance training are also covered in this expense

DUES AND LICENSE FEES (203):

Approved 2025	Approved 2026	Proposed 2027
$2,500	$2,000	$2,000
Expenditures $1,241	Expenditures $420 (1st quarter)	

Included in this line item are fees and/or dues for KSBEMS, KS Pharm, KEMSA, LV Fire Mutual aid, Notary, Walmart Business membership, Ambulance registrations, Kahoot it.

MILEAGE AND TRAVEL (205):

Approved 2025	Approved 2026	Proposed 2027
$500	$500	$500
Expenditures $50	Expenditures $5 (1st quarter)	

This line item represents travel costs, including hotel, mileage, and tolls. Currently, the routine expenditures come from toll turnpike fees. This varies based on the call volume. We control travel as much as possible.

SUBSCRIPTIONS (209):

Approved 2025	Approved 2026	Proposed 2027
$3,500	$4,300	$4,900
Expenditures $4,069	Expenditures $4,896 (1st quarter)	

This line item is for subscriptions needed to electronically bill EMS runs. The current cost is $55/month or ($660) respectively. This is also paying for our SharePoint subscription ($2,960), which is utilized for schedules and other operational resources needed for the organization. Kahoot ($185) is our web-based training program used for continuing education. Orca ($120) is our inventory control software. This line also had to pay for the Office 365 subscriptions

TELEPHONE (210):

Approved 2025	Approved 2026	Proposed 2027
$4,000	$4,000	$4,400
Expenditures	Expenditures	
$4,316	$882 (1st quarter)	

This line item covers the cellular contracts ($1,173) for our cellphones and data communications in our ambulances. Cell phones and 800 MHz radios are utilized to contact the hospital for patient care guidance from online medical control. Wireless MiFi connections ($2,820) on all ambulances. Our patient care reporting is all web browser-driven and requires data in all ambulances to communicate. EMS maintains the minimal plan allowable that would still meet the needs of the operations.

MISCELLANEOUS (212):

Approved 2025	Approved 2026	Proposed 2027
$500	$500	$500
Expenditures	Expenditures	
$315	$159 (1st quarter)	

This line item is used to accommodate expenses that routinely do not fit within other line items. This line item also supports the expenses associated with hiring and pre-employment requirements.

VEHICLE MAINTENANCE (213):

Approved 2025	Approved 2026	Proposed 2027
$45,000	$50,000	$50,000
Expenditures	Expenditures	
$43,798	$10,659 (1st quarter)	

This line item is for all labor cost involved in maintaining our vehicle fleet. We utilize Advanced Auto for the predominant portion of our fleet maintenance. When Advanced is

unable to make the repair, we pay the prevailing shop's hourly rate of the vendor providing the services.
This line item, in conjunction with vehicle maintenance supplies and vehicle operating expense, makes up our vehicle maintenance budget. Maintaining our fleet is a crucial aspect of our department. With the additional call volume comes the additional maintenance of our fleet. Also, not being able to replace our vehicle as frequently places further maintenance needs to the department.

INSURANCE (214):

Approved 2025	Approved 2026	Proposed 2027
$51,408	$51,408	$51,408

Expenditures	Expenditures
$51,408	$51,408

The cost of this line item is generated through the County Clerk's office. This premium covers all areas of the EMS department. It covers liability, auto and medical malpractice insurance premiums as required.

UTILITIES (215):

Approved 2025	Approved 2026	Proposed 2027
$50,000	$50,000	$ 50,000

Expenditures	Expenditures
$42,586	$14,681 (1st quarter)

Utility costs, for EMS, are for three (3) stations, which are manned twenty-four (24) hours a day, year-round, and the EMS Admin portion of the Health Department Building.
Unfortunately, weather and utility prices comprise and drive this line item. We have seen increases over the last (2) year cycles.

TV SERVICE (216):

Approved 2025	Approved 2026	Proposed 2027
$5,000	$5,000	$3,500

Expenditures	Expenditures
$4,695	$776 (1st quarter)

This line item covers the cost of all television services provided at our stations. We provide only basic services to maintain the lowest expense possible. This covers all (3) stations. This equates to approximately $139/per month /station.

AMBULANCE STATION RENT (217):

Approved 2025	Approved 2026	Proposed 2027
$27,500	$27,500	$27.500
Expenditures $27,500	Expenditures $27,500	

This line item was added after a lease agreement was signed for EMS to occupy space at the Fairmount Township Fire Department, located in Basehor.

COMPUTER MAINTENANCE (220):

Approved 2025	Approved 2026	Proposed 2027
$27,000	$29,000	$31,000
Expenditures $27,445	Expenditures $23,466 (1st quarter)	

This line item is for the updates and technical support and hosting for Respond Billing software, which is our billing software program. This also covers our EPCR (Image Trend) annual premium and hosting costs.
2026 current costs were as follows:
Respond Billing software - $11,217
Image Trend hosting $12,861
Image trend Support Annual $6,208

LEASE PAYMENTS (272):

Approved 2025	Approved 2026	Proposed 2027
$64,741	$58,622	$57,649
Expenditures $56,895	Expenditures $14,229 (1st Quarter)	

This line covers the cost of the EMS response vehicles on the enterprise lease program. This does not cover the cost for ambulance replacement

RADIO MAINTENANCE (280):

Approved 2025	Approved 2026	Proposed 2027
$8,000	$8,000	$8,000

Expenditures	Expenditures
$5,675	$1,283 (1st quarter)

This line item is for all radio maintenance, which includes monthly service cost, repairs and replacement parts. EMS is responsible for a portion of the county's radio maintenance. Radios are one of our backbone pieces of communications equipment and must be in operational repair.

MONITOR MAINTENANCE (281):

Approved 2025	Approved 2026	Proposed 2027
$17,000	$17,000	$22,000

Expenditures	Expenditures
$13,967	$21,807 (1st quarter)

Our EKG monitor, known as a Life Pac, is made by Physio-Control/ Stryker. This is our highest liability and most costly piece of equipment and must be maintained annually. The approximate annual cost is $16,250.00. This line item also covers disposable and non-disposable items not covered under the maintenance contract for our monitors. We are able to purchase these items at a discounted price because of the contract. We also receive any updates and many enhancements at no charge because we have this contract. This is a piece of equipment utilized on almost every call.

RED WASTE (282):

Approved 2025	Approved 2026	Proposed 2027
$4,500	$5,000	$5,000

Expenditures	Expenditures
$4,279	$1,144 (1st quarter)

The red waste bio hazard industry has steadily increased its cost over last few years. We have adjusted our line expenditure to come in line with these increases. This is a required service that comes with an expense within our industry. This line item is directly related to call volume and types of calls. As the number of critical calls increases, usually so does our red waste production. Because of the nature of our business, by law, we are required to have bio waste services available.

COPY MACHINE MAINTENANCE (283):

Approved 2025	Approved 2026	Proposed 2027
$1,000	$1,000	$1,000
Expenditures $768	Expenditures $-0- (1st quarter)	

This covers the monthly contract, for the maintenance of our copier. Administration is doing everything within our power to keep copier expenses to a minimum. We have converted to as much as possible to electronic. The copy machine is also the central printer for our patient bills. These are printed daily. This copier is our central scanning, printing, and faxing point.

BUILDING MAINTENANCE EXPENSES (284):

Approved 2025	Approved 2026	Proposed 2027
$2,000	$2,000	$2,000
Expenditures $714	Expenditures $100 (1st quarter)	

This line item covers all contractual building maintenance expenditures associated with our (3) ambulance stations. EMS does not utilize janitorial services.

IMMUNIZATIONS (285):

Approved 2025	Approved 2026	Proposed 2027
$500	$500	$500
Expenditures $70	Expenditures $-0- (1st quarter)	

This line covers cost associated with immunizations needed by employees. We make every attempt to keep this line controlled; however, staffing needs dictate expenditures from this line item. Infectious control regulations require the employer to provide certain immunizations at no cost to the employee.

MEDICAL EQUIPMENT MAINTENANCE (286):

Approved 2025	Approved 2026	Proposed 2027
$4,100	$4,100	$4,100
Expenditures $3,435	Expenditures $-0- (1st quarter)	

This line covers all medical equipment maintenance, other than the EKG monitors. We have several pieces of equipment that require annual calibration or inspection. This line item covers this cost. We maintain the cots, ventilators, CPAP, and stair chairs. These are usually done in the fall.

PRINTING (287):

Approved 2025	Approved 2026	Proposed 2027
$1,000	$1,000	$1,000
Expenditures $0	Expenditures $-0- (1st quarter)	

This line item is used for the purchase of run reports, legal documents and operational forms. Several of our printing costs are directly related to our call volume. We have lowered this line considerably by switching to electronic patient care reports. Printing is done on an as needed basis. Expenditure for the first quarter is misleading if it is utilized to make a yearly prediction of total costs.

OVER PAYMENTS (290):

Approved 2025	Approved 2026	Proposed 2027
$8,500	$8,500	$8,500
Expenditures $7,652	Expenditures $618 (1st quarter)	

Patient reimbursements are actually payments made in error by insurance providers, healthcare facilities and/or private pays, due to either multiple secondary insurance and private payment prior to the insurance appeal process completion. This makes this a difficult line item to budget for. We were required by the auditors to have this line item budgeted.

COMMODITIES:

OFFICE SUPPLIES (301):

Approved 2025	Approved 2026	Proposed 2027
$8,000	$8,000	$8,000
Expenditures $5,043	Expenditures $1,318 (1st quarter)	

This line item is used for the purchase of all office supplies and equipment. EMS is very reserved and cautious when making expenditures for office supplies. These line items also cover meeting expenses.

POSTAGE (302):

Approved 2025	Approved 2026	Proposed 2027
$7,000	$7,500	$7,750
Expenditures $3,470	Expenditures $1,812 (1st quarter)	

Most of the costs in this line item are for mailing bills to patients and insurance providers and administrative correspondence. We do utilize delivery confirmation on legal matters, which adds to our costs. We are doing everything within our power to keep this cost controlled. We have seen an increase in medical records requests.

VEHICLE MAINTENANCE SUPPLIES (306):

Approved 2025	Approved 2026	Proposed 2027
$62,500	$65,000	$65,000
Expenditures $46,551	Expenditures $17,866 (1st quarter)	

This line item is used for vehicle maintenance supplies. As demonstrated with last year's expenses we experienced some large unexpected maintenance costs. If we maintain our current expenditures with the first quarter and we don't have any significant maintenance issues, we will make the anticipated approved budget. Part cost directly impacts this line. State regulations require us to maintain our vehicles very strictly.

MISCELLANEOUS (312):

Approved 2025	Approved 2026	Proposed 2027
$250	$250	$250
Expenditures	Expenditures	
$-0-	$ -0-(1st quarter)	

This line item is difficult to budget for, but its' purpose, within the accounting system is twofold: monetary donations, and unanticipated and/or unusual expenses, not necessarily reoccurring.

Donations for Technician Appreciation:

Patients and/or their families have donated money to the service, as a thank you for the care that was provided by EMS. This line item was created for this type of donation, as we need to deposit the money in order to spend it. For instance, the crew received a donation, in which the individual has asked they spend the money on a picnic for EMS. The donation is deposited and EMS is then able to make that expenditure.

Varied Expenses

In the accounting process we need a line item in which an unusual expense, which may be of a onetime occurrence, can be placed. We have had situations, in which we reimbursed a technician's for their loss of eyeglasses that occurred while on a call.

UNIFORMS (350):

Approved 2025	Approved 2026	Proposed 2027
$13,000	$13,000	$13,000
Expenditures	Expenditures	
$7,641	$2,557 (1st quarter)	

This line covers the initial issue of uniforms and maintenance on uniform items. Uniforms are issued on an as needed basis for replacement.

PERSONAL PROTECTIVE EQUIPMENT (351):

Approved 2025	Approved 2026	Proposed 2027
$12,000	$12,000	$12,000
Expenditures $1,451	Expenditures $-0- (1st quarter)	

Personal protective equipment is essential in meeting the safety requirements for our technicians in the field. This line item is utilized as needed and also for the routine replacement as the gear does become uncertified over time. Last year extrication gear was not ordered because funding was spent in other priority areas of operations. Extrication will be ordered this year expending this line item.

The gear is for special rescue/extrication and blood borne pathogen protection. The gear will protect our employees from blood, bodily fluids, battery acid, fuel, other hazardous fluids, cuts, abrasions and misc. debris. Our employees are placed in dangerous situations on a daily basis and we must protect them to the best of our ability.

TRAINING EQUIPMENT (380):

Approved 2025	Approved 2026	Proposed 2027
$1,000	$1,000	$1,000
Expenditures $141	Expenditures $150 (1st quarter)	

In the past, we have held the purchase of training equipment until the last quarter of the year. Many of our care skills are psychomotor, requiring appropriate training aids.

This line item allows us to purchase up-to-date training aids to continue our fundamental education skills as prehospital medical providers. Due to the technology era we are in, the training aids that are needed have increased in cost. Maintaining this amount in our budget will allow us to continue purchasing these needed training aids. We purchase on an as-needed basis.

FIELD SUPPLIES (381):

Approved 2025	Approved 2026	Proposed 2027
$160,000	$160,000	$160,000

Expenditures	Expenditures
$137,907	$32,590 (1st quarter)

This line item is for purchasing the field supplies that we use in caring for our patients. Last year, we were over in this line item slightly. This stems from type of call and equipment and product cost needed for standard of care. Next to vehicle operations. This is the most costly expense to operations. When volume increases, so does the overall cost of supplies. The standard of care in the pre-hospital arena has expanded over the last couple of years and has directly impacted the number, type, and necessity of various supplies utilized currently in the field. We are currently within line item for the first quarter.

To assist in the management of the expenses for field supplies, we are a member of MARC and utilize the MARCER field supplies contract, for the majority of the needed field supplies. This has proven to be a substantial savings to this line item.

Oxygen supply also comes from this line item. Along with the increase in field supply usage, we also see an increase in oxygen consumption. Unfortunately, like fuel, this is a very hard to budget for, as it is specific call-driven.

BUILDING MAINTENANCE SUPPLIES (383):

Approved 2025	Approved 2026	Proposed 2027
$6,500	$6,500	$6,500

Expenditures	Expenditures
$5,892	$775 (1st quarter)

This line item covers all cleaning materials and paper supplies for the three (3) buildings, which we maintain. EMS does not fall into the janitorial contract so the cost to clean and maintain the stations remains in the budget. As previously mentioned, yearly generalized maintenance will need to be conducted on all stations to maintain these stations and much of the supplies come from this line item. The upkeep and maintenance of the prox door system falls to this line item to include prox cards themselves.

LIVING QUARTERS (384):

Approved 2025	Approved 2026	Proposed 2027
$2,000	$2,000	$2,000
Expenditures $1,976	Expenditures $-0- (1st quarter)	

This line item is used for the replacement of necessary items for the living quarters for each station. Historically, this line is saved until the last quarter in case critical needs, (refrigerator, stove, etc.) are needed for replacement throughout the year. With the amount of items needed to run the operation, replacement items are usually needed sometime throughout the year. Items are purchased on an as needed basis.

PUBLIC EDUCATION AND RELATIONS (385):

Approved 2025	Approved 2026	Proposed 2027
$500	$500	$500
Expenditures $175.99	Expenditures $-0- (1st quarter)	

EMS is unique in the fact we educate the public about our services. This is a yearly, ongoing process. We do programs for all age groups, schools, civic organizations, and care facilities. This is an area that has an increasing demand every year. EMS attempts to meet the public's demand for community public relations activities. With Covid, our PR was all but absent over the last few years, however; we are seeing more and more requests as we have ion the past.

The majority of supplies for public relations are purchased at the end of year for the upcoming year. These items are distributed very conservatively throughout the public relations events. EMS's participation has increased in the past few years and there is a need to continue increasing funding to this important line item.

CAPITAL OUTLAY

RADIO EQUIPMENT (4):

Approved 2025	Approved 2026	Proposed 2027
$10,000	$10,000	$20,000

Expenditures	Expenditures
$8,391	$ 50 (1st quarter)

Radio equipment is the backbone to our communications and operations. We are have to replace batteries, voice pagers, cell phones, and other equipment in relation to communications, as technology inoperability drives these needs. We have learned this year a number of our handheld radios are now obsolete and cannot be maintained. We will start replacing these radios. Unfortunately, the cost is approximately $4,500 per radio.

TRANSFER TO EMS CAPITAL OUTLAY:

Approved 2025	Approved 2026	Proposed 2027
$320,000	$390,000	$410,000

Expenditures	Expenditures
$320,000	$390,000

All large capital expenditures or smaller items bought in quantity have been placed to a new replacement schedule. This amount budgeted represents the needed funding, on a more level basis, to replace the needed equipment moving forward. Funding this line item will allow for the equipment replacement plan to be followed. Unfortunately, the increase that was presented last year was removed for budgetary concerns. This impacts available funding for scheduled purchases in the future.

Costs in every area of the world have seen an extreme increase. From ambulances to medical equipment in our operations, the replacement cost will be significantly higher when it comes time to replace these items. In reviewing the master spreadsheet, if this line item is not increased steadily over time, the department and county will not have the appropriate funding to replace required equipment to operate in the future. The included spreadsheet outlines the anticipated purchases for the dept.

EMS Equipment Reserve
Purchasing Schedule

DEPT./ITEMS	ACTUAL COST	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Transfer in travelers		21959.75										
Current Depre move to ER												
Budgeted equipment reserve payment		320,000.00	320,000.00	390,000.00	410,000.00	430,000.00	450,000.00	470,000.00	490,000.00	510,000.00	530,000.00	530,000.00
Balance carried forward		907,292.97	238,613.55	212,088.55	156,033.55	116,586.90	112,834.15	161,195.90	255,899.61	313,801.59	419,649.75	21,602.36
Ambulances x8		-539,952.00	-332,000.00	-333,000.00	-333,000.00	-270,000.00	-278,100.00	-286,443.00	-295,036.29	-303,887.38	-313,004.00	-375,000.00
9112		replacement -2023							remount - old 9115			
9113							remount - old 9119					
9114		replace								remount - old 9112		
9115								remount - old 9113				
9116					replace							
9117			replace								remount - old 9114	
9118				replace								replace
9119						remount - old 9116						
cots / load system	412,742.00			-73,000.00	-75,190.00	-77,445.70	-79,769.07	-82,162.14	-84,627.01	-87,165.82	-89,780.79	-92,474.22
Lucas CPR Device	132,160.00			-23,000.00	-23,690.00	-24,400.70	-25,132.72	-25,886.70	-26,663.30	-27,463.20	-28,287.10	-29,135.71
life paks	470,000.00	-469,157.47	-14,525.00								-470,000.00	
vents	56,000.00								-6,000.00	-6,000.00	-6,000.00	6,000.00
Furniture for stations (recliners, beds,tables etc)	50,000.00											
High Fidelity Maniki	66,000.00					-80000						
Stairchairs	72,000.00			-17,055.00	-17,566.65	18,093.65	-18,636.46	19,195.55	-19,771.42	20,364.56	-20,975.50	21,604.76
Lease vehicle expenses		-1,529.70										
Year Balance Totals		238,613.55	212,088.55	156,033.55	116,586.90	112,834.15	161,195.90	255,899.61	313,801.59	419,649.75	21,602.36	82,597.19

PROPOSED RECEIPTS AND REIMBURSEMENTS

GENERAL FUND EMS	Budgeted 2025 Revenue	Actual 2025 Revenue	Budgeted 2026 Revenue	2027 Proposed Revenue
Ambulance Runs (05-405)	3,290,000.00	4,515,644.00	3,490,000.00	3,900,000.00
Bad Checks (05-737)				
Misc Income (05-739)	5,000.00	3,769.00	2,500.00	3,000.00
Reimbursed Income (05-740)				
Training Fees (05-741)		50.00		
TOTAL	3,295,000.00	4,519,463.00	3,492,500.00	3,903,000.00
Please list any Federal, State, or Pass Thru Grants for 2027 Below:				

James A Wilk

Department Head Signature

Date: 5.27.2025

Leavenworth County Health Department Proposed 2027 Budget

GENERAL OPERATING FUND

Health
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DEPARTMENT / DIVISION SPENDING SUMMARY

EXPENDITURES	2023 ACTUAL	2024 ACTUAL	2025 ACTUAL	2026 BUDGET	2026 Projection	2027 REQUEST
SALARIES	$868,980	$941,804	$865,086	$902,807	$890,000	$ 884,248
CONTRACTUALS	$124,089	$130,908	$140,386	$139,350	$138,975	140,800
EDUCATION & TRAINING	$2,756	$1,693	$1,345	$4,000	$4,000	4,000
SUPPLIES & POSTAGE	7,994	9,590	9,192	11,500	11,000	11,000
MEDICAL SUPPLIES & EDUCATION	42,915	36,892	38,455	50,000	52,500	53,500
GRANTS	41,657	44,246	122,398	64,000	30,500	36,000
CAPITAL OUTLAY	10,000			-		-
TRANSFER TO EMPLOYEE BENEFITS	289,567	336,478	360,409	371,292	355,000	367,785
TRANSFER TO EQUIP RESERVE	10,000	10,000	4,719	10,000	10,000	10,000
REIMB.	(750)		(3,791)			-
Total	$ 1,397,208	$ 1,511,611	$ 1,538,199	$ 1,552,949	$ 1,491,975	$ 1,507,333

Health (108)

Salaries

	2024 Actual	2025 Actual	2026 Budget	2026 Projection	Difference (2026-2027)	2027 Budget Request
					-18,559	$884,248
108-5-00-1	$941,804	$865,086	$902,807	$890,000		884,248

Contractual Services

	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
	130,908	140,386	139,350	138,975	1,450	$140,800
108-5-00-203	License , Dues & Membership	3,900	4,000			4,100
108-5-00-204	Maint. Office Equip. & Service Contract	3,500	3,500			3,500
108-5-00-209	Subscriptions	250	275			300
108-5-00-214	Insurance	13,000	13,000			13,000
108-5-00-216	Miscellaneous (Overpayments)	1,000	1,000			1,200
108-5-00-219	Utilities 500 Eisenhower	35,000	31,000			32,000
108-5-00-280	Contracted Services	80,000	83,500			84,000
108-5-00-217	Printing	500	500			500
108-5-00-213	Vehicle Maintenance	2,200	2,200			2,200

Education & Travel

	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
	1,693	1,345	4,000	4,000	0	$4,000
108-5-00-202	Education & Training	2,500	2,500			2,500
108-5-00-211	Travel & Airlines	1,500	1,500			1,500

Supplies & Postage

	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
	9,590	9,192	11,500	11,000	-500	$11,000
108-5-00-301	Office Supplies	8,000	8,000			8,000
108-5-00-302	Postage	2,500	2,000			2,000
108-5-00-304	Gasoline	1,000	1,000			1,000

Medical & Education

					3,500	53,500

	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
	36,892	38,455	50,000	52,500		
108-5-00-380	Medical Supplies		12,000	12,000		13,000
108-5-00-381	Client Education		500	500		500
108-5-00-384	Vaccine Private Stock		37,500	40,000		40,000

These line items are grant specific amounts awarded and needed to be spent for reimbursment per grant guidelines.

Grants					-28,000	$36,000

	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
	44,246	122,398	64,000	30,500		
108-5-00-603	Maternal Child Health		6,000	6,000		5,500
108-5-00-604	Family Planning		29,500	0		0
108-5-00-606	Women, Infant, Children		20,000	22,000		22,000
108-5-00-610	Teen Pregnancy		3,000	3,000		3,000
108-5-00-601	Public Health Emergency Preparation		5,500	5,500		5,500
108-5-00-613	CRI		0	20,360		20,360

Transfer to Capital Outlay					0	$0
108-5-00-403	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
				0		0

Transfer to Employee Benefits					-3,507	$367,785
	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
108-5-00-503	336,478	360,409	371,292	355,000		367,785

Transfer to Equip.Reserve					0	$10,000
108-5-00-505	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
	10,000	4,719	10,000	10,000		10,000

Department Total	-45,616	1,507,333

2026 Health Line Item Budget

The Health Department is a very complex budget. The Department seeks its revenue from several grants that follow different fiscal years. This makes establishing the County's fiscal budget very difficult. Several grants received require some sort of local agency funding match.

PERSONNEL SERVICES:

Approved 2025	Approved 2026	Proposed 2027
$933,928	$902,807	$884,247

Expenditures	Expenditures
$865,086	$183,232 1st Quarter

The budgeted amount is based on the county's current pay scale. The amount reflects zero cola but does allow for a step for all employees.

EMPLOYEE BENEFITS:

Approved 2025	Approved 2026	Proposed 2027
$382,348	$393,012	$367,784

Expenditures	Expenditures
$360,409	$85,251 1st Quarter

Employee benefits are fixed numbers based on current staffing. The formula utilized is from the current benefits calculations. Due to the complexity of the Health Department budget and how grants are reimbursed, employee benefits remain in the Health Department budget so they can be shown as monthly expenses for reimbursement from the grants.

CONTRACTUAL:

TRAINING AND EDUCATION (202):

Approved 2025	Approved 2026	Proposed 2027
$3,500	$2,500	$2,500

Expenditures	Expenditures
$1,144	$425 1st Quarter

This line item covers all educational and training costs mandated by grants and program requirements. We use grant funds first when attending training to cover expenses.

DUES AND LICENSE FEES (203):

Approved 2025	Approved 2026	Proposed 2027
$3,900	$3,900	$4,100

Expenditures	Expenditures
$4,331	$3,001 1st Quarter

This line item covers memberships to organizations that benefit the Health Department in the public health arena. These memberships may include, Kansas Association Local Health Departments, Kansas Public Health Association. We have reduced our affiliated memberships over the years to only those that best support us locally.

SERVICE MAINTENANCE CONTRACTS (204):

Approved 2025	Approved 2026	Proposed 2027
$5,000	$3,500	$3,500

Expenditures	Expenditures
$6,799	$1,027 1st Quarter

This covers the monthly contract costs associated with the maintenance of our copier. This line item also covers our copier, audiometer calibration and other medical equipment. This covers the cost of the respiratory protection certification machine utilized by both Health Department and EMS. These are usually completed in the last Qtr of the year.

SUBSCRIPTIONS (209):

Approved 2025	Approved 2026	Proposed 2027
$250	$250	$300
Expenditures	Expenditures	
$260	$44 1st Quarter	

This line item is for professional medical journals and administrative journals. Also included is a subscription to the local newspaper to obtain the obituaries and legal notices, utilized by the billing department.

Travel, Airline, Hotel (211):

Approved 2025	Approved 2026	Proposed 2027
$2,000	$1,500	$1,500
Expenditures	Expenditures	
$202	$27 (1st Quarter)	

This line item includes all Travel expenses to include hotel, airlines, and meals. We limit travel as much as we can while still maintaining grant requirements. Overnight travel has already happened this year to the governor's conference as well as immunization and billing conferences. Again, grant funding is utilized first when training and travel is required.

VEHICLE MAINTENANCE (213):

Approved 2025	Approved 2026	Proposed 2027
$2,000	$2,200	$2,200
Expenditures	Expenditures	
$2,626	$377 1st Quarter	

This line item is for all labor cost involved in maintaining our vehicle fleet. It is anticipated in this budget year some additional maintenance will be needed such as tires, brakes, etc.

This line does not cover fuel. The Health Department has (2) vehicles that are used on a daily basis. This also covers the Gao tab and fleet associated cost.

INSURANCE (214):

Approved 2025	Approved 2026	Proposed 2027
$13,000	$13,000	$13,000
Expenditures	Expenditures	
$13,000	$13,000 1st Quarter	

The cost of this line item is generated through the County Clerk's office. This premium covers the contents at 500 Eisenhower. It also covers liability, auto and medical malpractice insurance premiums.

MISCELLANEOUS (Overpayments) (216):

Approved 2025	Approved 2026	Proposed 2027
$250	$1,000	$1,200
Expenditures	Expenditures	
1,142	$-0- 1st Quarter	

This was a line item covers any miscellaneous purchases for the Health Department along with any client reimbursements of fees. With the health department getting into insurance billing, client reimbursements will be seen higher in the future similar to the EMS department. Again this is the patient reimbursement line item required by the Auditors for over payments or payment in error on patient accounts. This allows for the accounting processes to have a line item to show expenditure for revenue received in error.

PRINTING (217):

Approved 2025	Approved 2026	Proposed 2027
$500	$500	$500
Expenditures	Expenditures	
$0	$-0- 1st Quarter	

This line item covers the cost for printing brochures and placing ads in the paper to promote Health Department services from time to time as required for grants. This is also covers printing of billing envelopes and paper as needed.

UTILITIES, 500 EISENHOWER (219):

Approved 2025	Approved 2026	Proposed 2027
$32,000	$35,000	$32,000

Expenditures	Expenditures
$26,879	$3,966 1st Quarter

This line item is for contractual utilities at 500 Eisenhower Road. Red Waste, water, Evergy, phone, Central System Security, and Deffenbaugh are all included in this line item.

CONTRACTUAL PROFESSIONAL SERVICES (280):

Approved 2025	Approved 2026	Proposed 2027
$87,500	$80,000	$84,000

Expenditures	Expenditures
$83,717	$18,787 1st Quarter

This line item is for all contractual professional services. Contracts include; Medical Director, Well Child Clinic, KUMC contract for clinic services in Family Planning and Maternal and Infant; LabCorp; Pharmacist Renewal; Interpreter services for Client services.

COMMODITIES:

OFFICE SUPPLIES (301):

Approved 2025	Approved 2026	Proposed 2027
$8,000	$8,000	$8,000

Expenditures	Expenditures
$7,121	$1,501 1st Quarter

This line item is used for the purchase of all office supplies and equipment. Supplies are monitored continuously and kept to an as needed basis.

POSTAGE (302):

Approved 2025	Approved 2026	Proposed 2027
$3,500	$2,500	$2,000

Expenditures	Expenditures
$1,593	$213 1st Quarter

Most of the expenses in this line item are for mailing bills to patients and insurance providers and administrative correspondence. We are doing everything within our power to keep this cost down. This line item is being evaluated constantly for additional cost savings measures or procedures.

GASOLINE (304):

Approved 2025	Approved 2026	Proposed 2027
$500	$1,000	$1,000

Expenditures	Expenditures
$478	$81 1st Quarter

This line item is used for fuel. We charge fuel to grant funding when available to cover these costs which is why this line shows a lower expenditure.

NURSING/LAB SUPPLIES (380):

Approved 2025	Approved 2026	Proposed 2027
$13,000	$12,000	$13,000

Expenditures	Expenditures
$8,612	$2,489 1st Quarter

This line item is used for all supplies to be used by Lab, and Nursing staff to run clinics. These supplies include needles, alcohol preps, client gowns, bandages, syringes, hemocues, slides, etc. all items need to run the clinics we currently operate. These are

purchased on an as needed basis. Medical supplies, like everything else, has increased in cost.

CLIENT EDUCATION (381):

Approved 2025	Approved 2026	Proposed 2027
$500	$500	$500

Expenditures	Expenditures
$429	$-0- 1st Quarter

This line item is utilized to purchase client education materials that are needed to provide services. Many of the grants require client education be provided. We control this line item to as needed materials only. This amount is budgeted to meet grant match requirements.

VACCINE, PRIVATE STOCK (384):

Approved 2025	Approved 2026	Proposed 2027
$32,500	$37,500	$40,000

Expenditures	Expenditures
$29,843	$13,744 1st Quarter

This line item is used for all private stock vaccines, including the flu vaccine, which is purchased in the fall. This line item has direct user fee reimbursement back into our revenue amount. We will control this line item by the amount of Flu vaccine and other vaccines purchased. This is on a consumption and availability basis. Immunization cost have escalated in the past few years.

CAPITAL OUTLAY

EQUIPMENT RESERVE (505):

Approved 2025	Approved 2026	Proposed 2027
$10,000	$10,000	$10,000

Expenditures	Expenditures
$10,000	$10,000

Starting in 2019 the depreciation line has been dissolved into this line item. All large capital expenditures or smaller items bought in quantity have been placed to a new replacement schedule. This amount budgeted represents the needed funding, on a more level basis, to replace needed equipment. Funding this line item will allow for the equipment replacement plan to be followed. Attached is the spreadsheet for the replacement schedule.

GRANTS:

Below are the specific grant amounts allocated to contractual, commodity, and capital expenses that are direct reimbursements. Again, as mentioned before, a majority of the grant revenue has been allocated to personnel services, thus reducing most of these reimbursements in the contractual, commodity, and equipment line items. The county will now be able to maximize the grant revenue and control our matching expenses to these areas of the budget.

PUBLIC HEALTH EMERGENCY PREPAREDNESS (601):

Approved 2025	Approved 2026	Proposed 2027
$7,500	$5,500	$5,500
Expenditures $5,656	Expenditures $589 1st Quarter	

This line item covers all contractual, commodities, and equipment purchases covered by the Grant.

WOMEN, INFANT, CHILDREN (606):

Approved 2025	Approved 2026	Proposed 2027
$20,000	$20,000	$22,000
Expenditures $29.101	Expenditures $6,071 1st Quarter	

This line item covers all contractual, commodities, and equipment purchases covered by the WIC Grant.

TPTCM (610):

Approved 2025	Approved 2026	Proposed 2027
$10,370	$ 3,000	$3,000

Expenditures	Expenditures
$5,344	$170 1st Quarter

This line item covers all contractual, commodities, and equipment purchases covered by the Grant.

CRI (613):

Approved 2025	Approved 2026	Proposed 2027
$40,122	$ 20,360	$20,360

Expenditures	Expenditures
$40,122	$1,191 1st Quarter

This line item is the cities readiness grant. No local match funds are required. This funding is for emergency public health preparation.

PROPOSED RECEIPTS AND REIMBURSEMENTS

HEALTH DEPT FUND 108	Budgeted 2025 Revenue	Actual 2025 Revenue	Budgeted 2026 Revenue	2027 Proposed Revenue
Ad Valorem (101)	493,604	483,140	507,484.00	
Back Tax Collection (103)		7,442		
Rec Vehicle Tax (104)	844	950	737.00	777.00
Motor Vehicle (105)	48,589	57,024	46,644.00	48,166.00
Trucks 16-20 M (106)	450		396.00	
CMV Tax (110)	1,401	1,518	1,339.00	1,259.00
Watercraft Tax (111)	530		418.00	405.00
In Lieu of Tax (117)		547		
Donations (722)		36		
Misc Income (739)		1,071		1,000.00
Public Health Emergency (742)	54,572	45,772	54,472.00	51,699.00
User Fees (743)	110,000	118,788	110,000.00	115,000.00
GRANTS:				
Grant Income L1 (744)	44,000	43,773	44,000.00	45,000.00
Grant Income MC (745)	124,583	93,594	89,594.00	125,560.00
Grant Income FA (746)	81,616	109,725	87,981.00	-
Grant Income IA (752)	9,466	8,782	9,466.00	13,663.00
Grant Income WI (753)	293,601	288,740	307,388.00	302,860.00
Grant Income ST (754)	133,391	142,523	136,742.00	136,742.00
KS Assoc of Local (755)				
Ebola/Zika (758)				
Teen Pregnancy (759)	39,217	29,413	19,608.00	29,400.00
Pregnancy Maint Init (760)	35,545	34,200	35,545.00	36,136.00
BFPC (761)	15,615		15,615.00	15,615.00
CRI (762)		40,720		20,360.00
Reim Expenses (901)				
Transfer In (902)				
COVID ELC Personnel (903)				
Totals	1,487,024	1,507,758	1,467,429	943,642

Department Head Signature:

James A Wilk

County Counselor

GENERAL OPERATING FUND

COUNTY COUNSELOR

DEPARTMENT / DIVISION SPENDING SUMMARY

EXPENDITURES	2023 ACTUAL	2024 ACTUAL	2025 ACTUAL	2026 BUDGET	2026 PROJECTION	2027 REQUEST
SALARIES	$294,093	$372,058	$355,616	$423,224	$423,224	423,224.00
CONTRACTUAL SERVICES	$261,513	$362,569	$409,457	$395,865	$395,865	401,500
EDUCATION & TRAVEL	$1,399	$1,242	$963	$6,476	$6,476	6,000
TAX SALE & COLLECTION	9,195	7,441	10,373	11,000	11,000	12,500
OFFICE SUPPLIES & POSTAGE	2,148	1,668	79	2,724	2,724	2,724
CASA	70,000	70,000	70,000	70,000	70,000	70,000
REIMB.	(350)	-	(2,999)		-	-
Total	$ 637,998	$ 814,978	$ 843,489	$ 909,289	$ 909,289	$ 915,948

County Counselor

				2026 Breakdown Total		Difference (2026-2027)	2027 Budget Request
Salaries						0	$423,224
	2023 Actual	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
001-5-09-1	$294,093	$372,058	$355,616	$423,224	$423,224		
Contractual						5,635	$401,500
	2023 Actual	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
	261,513	362,569	409,457	395,865	395,865		
001-5-09-203	License & Dues			2,000	2,000		2,000
001-5-09-209	Subscription			3,000	3,000		7,500
001-5-09-212	Miscellaneous			1,365	1,365		1,000
001-5-09-230	Litigation			4,500	4,500		6,000
001-5-09-231	Court appointed Attorney's			385,000	385,000		385,000
Education & Travel						-476	$6,000
	2023 Actual	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
	1,399	1,242	963	6,476	6,476		
001-5-09-202	Education and Training			5,900	5,900		5,000
001-5-09-205	Mileage & Food			576	576		1,000
Tax Sale & Collection						1,500	$12,500
	2023 Actual	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
	9,195	7,441	10,373	11,000	11,000		
001-5-09-232	Tax Sale			1,500	1,500		1,500
001-5-09-233	Del Tax Collection Cost			9,500	9,500		11,000
Office Supplies & Postage						0	2,724
	2023 Actual	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
	2,148	1,668	79	2,724	2,724		
001-5-09-301	Office Supplies			1,074	1,074		1,224
001-5-09-302	Postage			650	650		1,000
001-5-09-307	Office Books			1,000	1,000		500
CASA						0	$70,000
	2023 Actual	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
	70,000	70,000	70,000	70,000	70,000		
					Department Total	6,659	$915,948

2027 County Counselor Budget Narrative

- **001-5-09-1 — Salaries**
  Salaries remain flat pending additional information. In 2025, an employee was reassigned to the County Counselor's Office, and a new Assistant County Counselor was hired to fill a vacancy created by a resignation.

- **001-5-09-203 — Licenses & Dues**
  This line item remains unchanged and accurately reflects current expenditures.

- **001-5-09-209 — Subscriptions**
  An increase is included to support an additional attorney's use of online legal research tools, as well as expanded AI-assisted services that improve efficiency in contract review, communications, and legal filings.

- **001-5-09-212 — Miscellaneous**
  A slight decrease is reflected due to reduced legal expenses and publication costs.

- **001-5-09-230 — Litigation**
  An increase is proposed to account for anticipated litigation-related expenses, including mediation services and court reporter fees.

- **001-5-09-231 — Court-Appointed Attorney Fees**
  Due to rising costs, the County entered into new agreements with panel attorneys to better manage the use of conflict counsel and associated fees. The current budgeted amount is expected to be sufficient for both the current year and 2027.

- **001-5-09-202 — Education & Training**
  A decrease is reflected for 2026 to allow reallocation of funds to other line items.

- **001-5-09-205 — Mileage & Meals**
  This line item has been increased within overall budget constraints to accommodate anticipated travel for training and meetings.

- **001-5-09-232 — Tax Sale Expenses (General)**
  Although overall tax sale expenses have increased, this line item remains flat, as most costs are associated with title work and postage.

- **001-5-09-233 — Tax Sale Expenses (Title Work)**
  An increase is included to address rising title work costs. Revenue generated from tax sales is expected to fully offset these expenses.

- **001-5-09-301 — Office Supplies & Equipment**
  This line item has been increased to reflect higher costs for office supplies, including files, paper, envelopes, and necessary equipment.

- **001-5-09-302 — Postage**
  Funds have been reallocated to address rising postage costs.

- **001-5-09-307 — Office Books**
  A decrease is noted due to the transition to subscription-based resources and to maintain overall budget balance.

PROPOSED RECEIPTS AND REIMBURSEMENTS

GENERAL FUND COUNTY COUNSELOR	Budgeted 2025 Revenue	Actual 2025 Revenue	Budgeted 2026 Revenue	2027 Proposed Revenue
Contract Atty Fees (09-510)	26,000.00	33,643.00	26,000.00	26,000.00
Counsel at Large (511)				
Reimb. Sheriff Sale Costs (09-901)	8,000.00			
TOTAL	34,000.00	33,643.00	26,000.00	26,000.00

_____

Department Head Signature

Date: _____

Coroner

GENERAL OPERATING FUND

Coroner

DEPARTMENT / DIVISION SPENDING SUMMARY

EXPENDITURES	2023 ACTUAL	2024 ACTUAL	2025 ACTUAL	2026 BUDGET	2026 Projection	2027 REQUEST
CONTRACTUAL SERVICES	$27,305	$21,000	$19,263	$25,000	$25,000	25,000
BURIAL FEES	$2,325	$0	$775	$5,000	$10,000	5,000
AUTOPSY	$217,618	$249,885	$191,025	$250,000	$250,000	250,000
Total	$ 247,248	$ 270,885	$ 211,063	$ 280,000	$ 285,000	$ 280,000

Coroner

						Difference (2026-2027)	2027 Budget Request
Contractual Services						0	$25,000
	2023 Actual	2024 Actual	2025 Budget	2026 Budget	2026 Projection		
001-5-13-211	$27,305	$21,000	$19,263	$25,000	$25,000		
Burial Fees						0	$5,000
	2023 Actual	2024 Actual	2025 Budget	2026 Budget	2026 Projection		The County was not billed since 2023 and then billed all at once
001-5-13-215	$2,325		$775	$5,000	$10,000		
Autopsy						0	250,000
	2023 Actual	2024 Actual	2025 Budget	2026 Budget	2026 Projection		
001-5-13-271	$217,618	$249,885	$191,025	$250,000	$250,000		
					Department Total	0	$280,000

County Commission

GENERAL OPERATING FUND

COUNTY COMMISSION

DEPARTMENT / DIVISION SPENDING SUMMARY

EXPENDITURES	2023 ACTUAL	2024 ACTUAL	2025 ACTUAL	2026 BUDGET	2026 PROJECTION	2027 REQUEST
SALARIES	$568,028	$620,604	$620,800	$597,484	$620,800	$ 620,800
OTHER CONTRACTUAL SERVICES	$9,436	$27,847	$87,374	$36,950	$36,950	37,950
TRAVEL & TRAINING	$11,689	$9,110	$12,314	$10,000	$12,000	12,000
GENERAL SUPPLIES & MATERIALS	$6,578	$4,941	$3,497	$4,400	$4,400	4,400
LITIGATION	$22,469	$13,374	$8,415	$30,000	$30,000	30,000
TRANSFER OUT EQUIPMENT RESERVE	$0	$0	$61,473	$0	$0	-
MENTAL HEALTH	$291,237	$291,237	$291,237	$291,237	$291,237	291,237
REIMB.	($151)	($9)	($204)			
Total	$ 909,286	$ 967,103	$1,084,906	$ 970,071	$ 995,387	$ 996,387

County Commission Detail

				2026 Breakdown Totals		Difference (2026-2027)	2027 Budget Request
Salaries						23,316	$620,800
	2023 Actual	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
001-5-01-1	$568,028	$620,604	$620,800	$597,484	$620,800		620,800
Contractual Services						1,000	$37,950
	2023 Actual	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
	$9,436	$27,847	$87,374	$36,950	$36,950		
001-5-01-2	Contractuals			5,000	5,000		5,000
001-5-01-201	Copies			4,000	4,000		4,000
001-5-01-203	License and Dues			19,000	19,000		20,000
001-5-01-204	Maint. Office equipment			750	750		750
001-5-01-209	Subscription			200	200		200
001-5-01-212	Miscellaneous			8,000	8,000		8,000
Travel and Training						2,000	$12,000
	2023 Actual	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
	11,689	9,110	12,314	10,000	12,000		
001-5-01-202	Education and Training			500	500		500
001-5-01-205	Mileage and Food			2,500	3,500		3,500
001-5-01-211	Travel			4,000	4,500		4,500
001-5-01-213	Lodging			3,000	3,500		3,500
Office Supplies and Postage						0	$4,400
	2023 Budget	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
	6,578	4,941	3,497	4,400	4,400		
001-5-01-301	Office Supplies			3,000	3,000		3,000
001-05-01-302	Postage			600	600		600
001-5-01-308	Printing			800	800		800
Litigation						0	$30,000
	2023 Actual	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
001-5-01-230	$22,469	$13,374	$8,415	$30,000	$30,000		30,000
Transfer Out Equipment						0	$0
	2023 Actual	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
	$0	$0	$61,473	$0			
Mental Health						0	$291,237
	2023 Actual	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
	$291,237	$291,237	$291,237	$291,237	$291,237		291,237
					$995,387	26,316	$996,387

Administration

GENERAL OPERATING FUND

Administration

DEPARTMENT / DIVISION SPENDING SUMMARY

EXPENDITURES	2023 ACTUAL	2024 ACTUAL	2025 ACTUAL	2026 BUDGET	2026 Projection	2027 REQUEST
SALARIES	$153,649	$190,200	$134,111	$100,000	$100,000	$ -
CONTRACTUAL SERVICES	$6,813	$3,941	$470	$3,750	$3,500	3,500
EDUCATION & TRAINING	$7,208	$6,851	$75	$3,250	$3,000	3,000
SUPPLIES AND POSTAGE	-	77	737	1,900	1,200	1,200
REIMBURSEMENT	(89)		-	-	-	-
Total	$ 167,581	$ 201,069	$ 135,394		$ 107,700	$ 7,700

Administration

						Difference (2026-2027	2027 Budget Request
Salaries						-100,000	
	2023 Actual	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
001-5-23-1	$153,649	$190,200	$134,111	$100,000	$100,000		
Contractual Services						-250	$3,500
	2023 Actual	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
	6,813	3,941	470	3,750	3,500		
001-5-23-2	Contractual			3,000	3,000		3,000
001-5-23-201	Copies			250	250		250
001-5-23-203	License & Dues			0			
001-5-23-209	Subscription						
001-5-23-212	Miscellaneous			500	250		250
Education & Travel						-250	$3,000
	2023 Actual	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
	7,208	6,851	75	3,250	3,000		
001-5-23-202	Meeting & Education			500	500		500
001-5-23-205	Mileage & Food			250	500		500
001-5-23-211	Travel			1,500	1,000		1,000
001-5-23-213	Lodging			1,000	1,000		1,000
Supplies & Postage						-700	$1,200
	2023 Actual	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
		77	737	1,900	1,200		
001-5-23-301	Office Supples			700	700		700
001-5-23-302	Postage			1,200	500		500
Reimbursements						0	
	2023 Actual	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
	(89)						
					Department Total	-101,200	$7,700

COURTHOUSE GENERAL

GENERAL OPERATING FUND

Courthouse General

DEPARTMENT / DIVISION SPENDING SUMMARY

EXPENDITURES	2023 ACTUAL	2024 ACTUAL	2025 ACTUAL	2026 BUDGET	2026 Projection	2027 REQUEST
CONTRACTUALS	$998,374	$355,365	$1,238,860	$1,529,400	$1,694,400	$ 1,694,400
LEGAL FEES	$85,541	$15,905	$12,097	$33,000	$28,000	28,000
MAINTENANCE & RENTALS	$8,072	$9,645	$9,844	$12,600	$12,250	12,250
AUDIT & ANALYSIS	100,343	94,229	103,870	105,000	108,000	108,000
FUEL	275,264	245,181	225,613	340,000	372,000	393,500
SUPPLIES	16,305	11,928	21,869	46,000	43,000	43,000
TRANSFER TO CAPITAL IMPROVEMENT	1,050,000	1,050,000	65,000	-	-	-
TRANSFER TO 911 FUND	-	75,045	-	-	-	-
REIMB.	(2,221)	(8,638)	(8,638)		-	-
Total	$ 2,531,678	$1,848,660	$ 1,668,515	$ 2,066,000	$ 2,257,650	$ 2,279,150

Courthouse General

						Difference (2026-2027)	2027 Budget Request
Contractraul						165,000	$1,694,400
	2023 Actual	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
	998,374	355,365	1,238,860	1,529,400	1,694,400		
001-5-14-2	Contractual Services			152,000	152,000		152,000
001-5-14-203	Dues, License, Membership			0			
001-5-14-210	Communication			50,000	55,000		55,000
001-5-14-212	Contractual Misc.			2,000	2,000		2,000
001-5-14-220	Utilities			175,000	185,000		185,000
001-5-14-224	Insurance			1,150,000	1,300,000		1,300,000
001-5-14-241	Real Estate Tax & Land Acquistion						
001-5-14-225	Lighting Strike Insurance Claim						
001-5-14-218	Legal Publication						
001-5-14-247	Shredding			400	400		400
Legal Fees						-5,000	$28,000
	2023 Actual	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
	85,541	15,905	12,097	33,000	28,000		
001-5-14-221	Witness			18,000	18,000		18,000
001-5-14-230	Legal Fees			15,000	10,000		10,000
001-5-14-257	Settlement						
Maintenance & Rentals						-350	$12,250
	2023 Actual	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
	8,072	9,645	9,844	12,600	12,250		
001-5-14-227	Underground Storage			100	250		250
001-5-14-229	Trash Pickup			6,000	5,000		5,000
001-5-14-234	Postage Meter Rental			5,000	5,000		5,000
001-5-14-235	Equip Maintenance			1,500	2,000		2,000
Audit & Analysis						3,000	$108,000
	2023 Actual	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
	100,343	94,229	103,870	105,000	108,000		
001-5-14-228	Audit/Budget			45,000	48,000		48,000
001-5-14-248	Commerce Analysis Charges			60,000	60,000		60,000

Fuel

	2023 Actual	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
	275,264	245,181	225,613	340,000	372,000	53,500	$393,500
001-5-14-331	EMS			160,000	175,000		185,000
001-5-14-332	Sheriff			160,000	175,000		185,000
001-5-14-333	Spec Bldg & Grounds			5,000	5,500		6,000
001-5-14-334	Appraisers			5,000	5,500		6,000
001-5-14-335	Planning & Zoning			2,000	2,200		2,500
001-5-14-336	Noxious Weed			8,000	8,800		9,000

Supplies & Postage

	2023 Actual	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
	16,305	11,928	21,869	46,000	43,000	-3,000	$43,000
001-5-14-301	Office Supplies			10,000	10,000		10,000
001-5-14-302	Postage			5,000	6,000		6,000
001-5-14-312	Miscellaneous			15,000	12,000		12,000
001-5-14-321	Rape Evidence Kits			15,000	15,000		15,000
001-5-14-340	Vehicle Tracking Cameras			1,000	0		

Transfer to Capital Improvement

	2023 Actual	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
001-5-14-403	1,050,000	1,050,000	65,000			0	-

Transfer to Equipment Reserve

	2023 Actual	2024 Actual	2025 Actual	2026 Budget	2026 Projection		
001-5-14-502	0	75,045	0			0	0

Department Total	213,150	$2,279,150