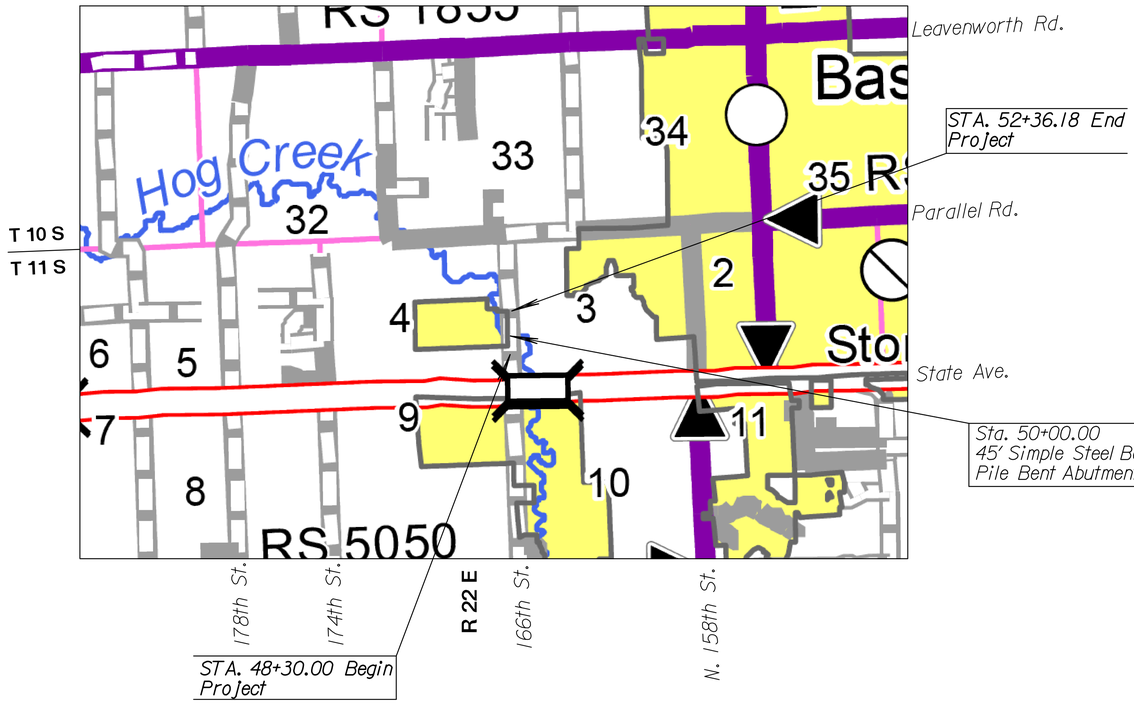
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	1	51

166TH STREET OVER HOG CREEK
LEAVENWORTH COUNTY, KANSAS
BRIDGE F-46

GRADING
SURFACING
SEEDING
BRIDGE

INDEX OF SHEETS



SCALE: 1" = 2,000'

DESIGN DESIGNATION

AADT (2017)	1,277
T	16%
V	35 mph
Clear Zone	14 FT

Note:
Bridge to be closed during construction.

CONVENTIONAL SIGNS

COUNTY LINE		CENTER LINE OF PROJECT	50 1
CITY LIMITS		TERRACE	
STATE OR NATIONAL LINE		CULVERTS	
TOWNSHIP, SECTION or GRANT LINE		DROP INLET & STORM SEWER	
PROPERTY LINE		ACCESS CONTROL	
HIGHWAY FENCE		POWER POLE	
EXISTING FENCE		TELEPHONE POLE	
GUARDRAIL		MARSH	
CONSTRUCTION LIMITS		HEDGE	
RIGHT OF WAY LINE		TREES	
TRAVELED WAY		PROFILE ELEVATION	172.18
RAILROADS		STREAM or CREEK	

GROSS LENGTH OF PROJECT	406.18 FT. (Includes Equations)	
EXCEPTIONS	None	
NET LENGTH OF PROJECT	406.18 FT.	0.077 MILES
NET LENGTH OF BRIDGES	45.00 FT.	0.009 MILES
NET LENGTH OF ROAD	361.18 FT.	0.068 MILES

MICHELE RAE NEAL LICENSED 16497 KANSAS PROFESSIONAL ENGINEER

JARROD M. RUSSELL LICENSED 27335 12-27-21 KANSAS PROFESSIONAL ENGINEER

Approved _____
Date

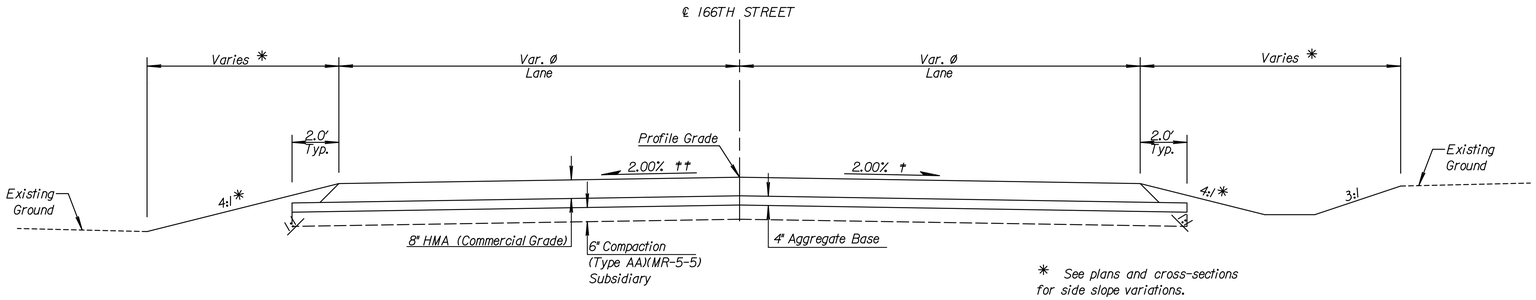
County Engineer

LEAVENWORTH COUNTY

DATE | BY
SURVEY
CADD TECHNICIAN
DESIGNERS
SQUAD

Plotted : 13-DEC-2021 10:54
Drawn By : mrockwell
File : F46_Title.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	2	51



PROPOSED TYPICAL SECTION - 166TH STREET

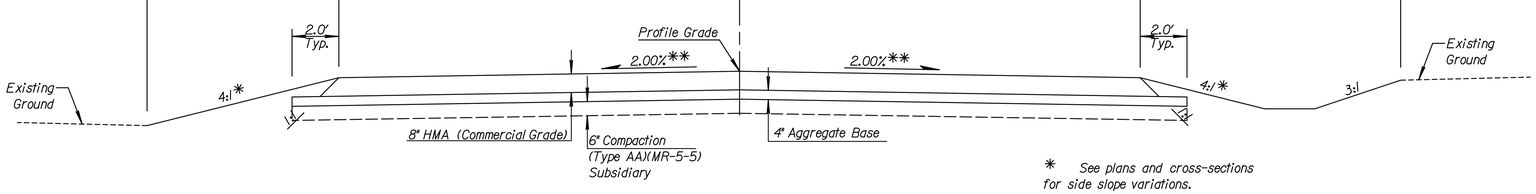
Sta. 48+30.00 to Sta. 49+64.50

* See plans and cross-sections for side slope variations.

† Sta. 48+30.00 - Sta. 49+10.00 transition cross slopes from existing to 2%

†† Sta. 48+30.00 - Sta. 48+65.00 transition cross slopes from existing to 2%

Ø Sta. 48+30.00 - Sta. 49+15.00 transition lane width from existing to 14.0'
Sta. 49+15.00 - Sta. 49+77.50 14' lanes



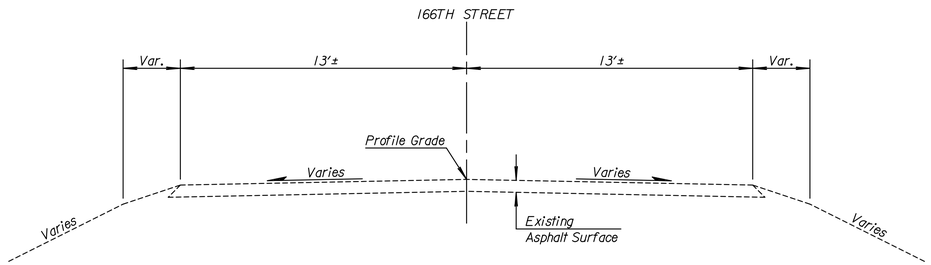
PROPOSED TYPICAL SECTION - 166TH STREET

Sta. 50+35.50 to Sta. 51+50.00

* See plans and cross-sections for side slope variations.

** Sta. 51+25.00 - Sta. 51+50.00 transition cross slopes from 2% to existing

ØØ Sta. 50+22.00 - Sta. 50+90.00 14' lanes
Sta. 50+90.00 - Sta. 51+50.00 transition lane width from 14.0' to existing



EXISTING TYPICAL SECTION - 166TH STREET

Note:
Intersection of all slope lines shall be softened and rounded for pleasing appearance. Match Existing Roadway at Sta. 48+30.00 and Sta. 51+50.00

TYPICAL SECTIONS
166TH STREET

Drawn By : mrockwell
File : F46_Typical Section.dgn
Plotted :13-DEC-2021 10:55

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	3	51

GENERAL NOTES

1. THE CONTRACTOR SHALL THOROUGHLY REVIEW AND BECOME FAMILIAR WITH SPECIFICATIONS AND SPECIAL CONDITIONS OF THE CONTRACT DOCUMENTS PRIOR TO BEGINNING CONSTRUCTION ON THIS PROJECT.

2. THE GEOLOGICAL INFORMATION SHOWN ON THESE PLANS IS FROM STUDIES IN THE FIELD AND REPRESENTS THE BEST INFORMATION AVAILABLE TO THE ENGINEER.

3. AT BORROW AREA LOCATIONS ADJACENT TO THE RIGHT OF WAY, UTILITY POLES MAY BE SET AT THE PERMANENT LOCATIONS PRIOR TO CONSTRUCTION AS APPROVED BY THE ENGINEER PROVIDED A MINIMUM VERTICAL CLEARANCE, IN ACCORDANCE WITH THE NATIONAL ELECTRICAL SAFETY CODE, IS OBTAINED. THE CONTRACTOR WILL BE REQUIRED TO WORK AROUND THESE POLES TO COMPLETE THE WORK.

4. ALL BORROW TO BE OBTAINED FROM AREAS PROVIDED BY THE CONTRACTOR SHALL BE APPROVED BY THE ENGINEER, BOTH AS TO SUITABILITY OF MATERIAL AND SITE LOCATION. LOCATIONS WHICH, IN THE OPINION OF THE ENGINEER, CONTAIN UNSUITABLE MATERIAL OR WILL LEAVE AN UNSIGHTLY APPEARANCE ON THE PROJECT WILL NOT BE APPROVED.

5. EMBANKMENT QUANTITIES FOR INITIAL CONSOLIDATION AND SETTLEMENT SHOWN IN THE EARTHWORK QUANTITIES ARE SUBSIDIARY TO OTHER EARTHWORK ITEMS. MATERIAL FOR THE EMBANKMENT IS INCLUDED IN THE EXCAVATION QUANTITIES.

6. EXCAVATION REQUIRED FOR PLACING SELECT SOIL IS INCLUDED IN THE COMMON EXCAVATION QUANTITIES.

7. EXCAVATION SHOWN TO BE WASTED SHALL BE WASTED ON SITES PROVIDED BY THE CONTRACTOR. THESE SITES SHALL BE APPROVED BY THE ENGINEER AS TO SUITABILITY, APPEARANCE, AND SITE LOCATION. LOCATIONS THAT, IN THE OPINION OF THE ENGINEER, WILL LEAVE AN UNSIGHTLY APPEARANCE WILL NOT BE APPROVED.

8. ALL TREES, HEDGE ROWS, SHELTER BELTS, AND WOODY SHRUBS NOT SHOWN TO BE REMOVED AND LOCATED BETWEEN THE CONSTRUCTION LIMITS AND THE RIGHT-OF-WAY LINE OR EASEMENT LINE SHALL BE SPARED UNLESS DIRECTED BY THE ENGINEER TO BE REMOVED. ALL TREES WITHIN THE APPROPRIATE CLEAR ZONE SHALL BE REMOVED.

9. ALL EXISTING SLOPES STEEPER THAN 5 HORIZONTAL TO 1 VERTICAL, 5(H):1(V), IN FILL AREAS SHOULD BE BENCHED PRIOR TO PLACEMENT OF FILL. BENCHING OF THE SLOPE PROVIDES INTERLOCKING BETWEEN THE FILL AND NATURAL SOILS AND FACILITATES COMPACTION OF THE FILL. BENCHES SHOULD BE CUT AS THE FILL PROGRESSES AND SHOULD HAVE A MAXIMUM BENCH HEIGHT OF 3 FEET.

10. THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL PROPERTY OWNERS LOCATED WITHIN THE WORK ZONE.

11. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING TEMPORARY TRAFFIC CONTROL IN ACCORDANCE WITH CURRENT MUTCD STANDARDS. THE CONTRACTOR SHALL PREPARE AND SUBMIT A TRAFFIC CONTROL PLAN TO THE COUNTY ENGINEER FOR REVIEW PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION ACTIVITY REQUIRING DIFFERENT TRAFFIC CONTROL THAN IS CURRENTLY SET UP.

12. POLICE, FIRE DEPARTMENTS, U.S. POSTAL SERVICE, AND SCHOOL BUS COMPANIES SHALL BE NOTIFIED PRIOR TO CLOSING ANY ROADS. ROAD CLOSURES REQUIRE THE APPROVAL OF THE COUNTY ENGINEER.

13. THE CONSTRUCTION COVERED BY THESE PLANS SHALL CONFORM TO THE 2015 EDITION OF THE KANSAS STANDARD SPECIFICATIONS FOR STATE ROAD AND BRIDGE CONSTRUCTION.

14. ALL WORKMANSHIP AND MATERIALS SHALL BE SUBJECT TO INSPECTION AND APPROVAL BY LEAVENWORTH COUNTY, KANSAS.

15. ALL EXISTING UTILITIES INDICATED ON THE PLANS ARE ACCORDING TO THE BEST INFORMATION AVAILABLE TO THE ENGINEER; HOWEVER, ALL UTILITIES ACTUALLY EXISTING MAY NOT BE SHOWN. UTILITIES DAMAGED THROUGH THE NEGLIGENCE OF THE CONTRACTOR TO OBTAIN THE EXACT LOCATION OF SAME SHALL BE COORDINATED AND EITHER REPAIRED OR REPLACED BY THE CONTRACTOR AT THEIR EXPENSE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING UTILITIES PRIOR TO CONSTRUCTION TO VERIFY EXISTING FACILITIES, LOCATIONS OF RECENT RELOCATIONS, AS WELL AS LIMITS FOR ABANDONED FACILITIES. KANSAS ONE CALL - 800-344-7233. IF A UTILITY IS FOUND THAT WAS NOT LOCATED, THE CONTRACTOR SHALL CONTACT LEAVENWORTH COUNTY.

16. THE CONTRACTOR SHALL GIVE 48 HOUR ADVANCE NOTICE TO UTILITY COMPANIES PRIOR TO EXCAVATING WITHIN ANY PUBLIC RIGHT-OF-WAY.

17. SILTATION AND EROSION CONTROL SYSTEMS SHALL BE INSTALLED AT THE LOCATIONS AS DIRECTED BY THE ENGINEER. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING EROSION CONTROL SYSTEMS; REPAIRING DAMAGED OR FAILED EROSION CONTROL DEVICES; AND INSPECTING THE SITE AND REPAIRING THE EROSION CONTROL SYSTEM AS NEEDED WITHIN 24 HOURS AFTER A SIGNIFICANT RAIN EVENT.

18. ALL DISTURBED AREAS SHALL BE SEEDED. REFER TO THE KANSAS STANDARD SPECIFICATION FOR PROJECT SEEDING REQUIREMENTS.

19. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PRESERVING PROPERTY CORNERS AND GOVERNMENT LAND CORNERS. THE CONTRACTOR SHALL BE REQUIRED TO REESTABLISH ANY CORNERS WHICH HAVE BEEN DAMAGED OR DESTROYED BY THEIR CONSTRUCTION OPERATIONS. SUCH CORNERS SHALL BE REESTABLISHED BY A LICENSED LAND SURVEYOR IN ACCORDANCE WITH STATE LAWS. NO SEPARATE MEASURE OF PAYMENT WILL BE MADE FOR THIS WORK AS IT SHALL BE CONSIDERED SUBSIDIARY TO OTHER CONTRACT ITEMS.

20. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE U.S. POSTAL SERVICE TO ENSURE MAIL DELIVERY IS MAINTAINED DURING ALL CONSTRUCTION ACTIVITIES. ALL MAILBOXES SHALL BE RELOCATED AND REINSTALLED BY CONTRACTOR AND SHALL BE SUBSIDIARY TO OTHER BID ITEMS.

21. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO EXISTING PAVEMENT, DRIVEWAYS, OTHER SURFACE, STRUCTURE, TREE OR SHRUB, IRRIGATION SYSTEM, ETC. ADJACENT TO THE PROJECT. ALL REPAIRS SHALL BE MADE BY THE CONTRACTOR AT THEIR EXPENSE.

22. SAWCUTS SHALL BE SUBSIDIARY TO THE REMOVAL OF EXISTING PAVEMENT (ROCK EXCAVATION).

Drawn By : mrockwell
File : F46_General Notes.dgn
Plotted :13-DEC-2021 10:55

GENERAL NOTES
166TH STREET

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	4	51

POT 46+00.00
N: 300655.31 E: 2173474.53
1. Nothing Set

CP #113 STA 49+92.62, 42.98' RT
N 301046.30 E 2173418.61
Set 1/2" Iron Bar
1. W end of SW Wing Wall 27.48' SE
2. W end of NW Wing Wall 40.17' NE
3. N end of W Guardrail 92.32' NE
4. S end of W Guardrail 77.08' SE

Sta. 48+93.83 to Sta. 49+77.50 Lt. Install Guardrail End Terminal (MGS) and 37.5' Guardrail Steel Plate (MGS)

MURPHY, DANIEL CHARLES; TR & MURPHY, BLANCHE TERESA; TR
SE 1/4
SEC. 4-11-22

Sta. 48+70.14 Install 24"x 52' EP 25'Lt. w/End Sections
Prop. ℄ Inlet=878.64
Prop. ℄ Outlet=876.54
Remove Exist. C.M.P.

CP #113

Sta. 48+30.00 Begin Project

POT +00.00

Exist. R/W

Power Line

Sewer Line

Gas Utility Line

Const. Limit

Retaining Wall

70'-14' Entrance Asphalt

6 ℄ 166th Street 7 8 9 50 1 2 3 4

N1°53' 35"W

3.5'

Telephone Line

Exist. R/W

Water Line

+68.45 R/W = Exist. R/W 36.5' ℄

Sta. 48+30 Begin Pavement Replacement

Sta. 48+70.14 Extend 24"x 5' C.M.P. w/End Section
Prop. ℄ Inlet=877.14 (Ex)
Prop. ℄ Outlet=876.83

+83.00 Field Entrance (Earth)

+15.00

Remove Tree

Fiber Optic

Const. Limit

R/W

+25.00 R/W = 80' ℄

Sta. 48+96.81 to Sta. 49+77.50 Rt. Install Type 2 Guardrail End Terminal and 93.75' Guardrail Steel Plate (CGS)

Sta. 50+00.00
Remove Exist. 28' Simple Beam Span
Install 45' Simple Steel Beam Span on Pile Bent Abutments, 28' Roadway

LANGLEY, NICHOLAS R
SE 1/4
SEC. 4-11-22

+50.00 R/W = Exist. R/W 43.5' ℄

+50.00 R/W = 50' ℄

+00.00 R/W = 50' ℄

+00.00 R/W = Exist. R/W 43.5' ℄

+90.00

R/W

Const. Limit

+50.00 R/W = Exist. R/W 36.5' ℄

Sta. 51+00 to Sta. 51+25 Const. Aggregate Ditch Lining (6") Rt.

+00.00 R/W = 80' ℄

REILLY DEVELOPMENT LLC
SW 1/4
SEC. 3-11-22

Sta. 50+22.50 to Sta. 51+06.17 Rt. Install 37.5' Guardrail Steel Plate (MGS) and (1) Guardrail End Terminal (MGS)

HIDDEN RIDGE HOA, INC
SE 1/4
SEC. 4-11-22

HIDDEN RIDGE

Sta. 50+22.50 to Sta. 51+18.69 Lt. Install 50.0' Guardrail Steel Plate (MGS) and (1) Guardrail End Terminal (MGS)

Gas Utility Line

Sewer Line

Exist. R/W

CORALBERRY CROSSING

Const. Limit

Gas Utility Line

BM #106

POT +00.00

Power Line

Underground Fiber Optic

Exist. R/W

Water Line

Sta. 52+36.18 End Project

Sta. 51+50 End Pavement Replacement

POT 54+00.00
N: 301454.87 E: 2173448.10
1. Nothing Set

FRIESE, ELISABETH & MICHAEL D
SW 1/4
SEC. 3-11-22

SW Cor. Sec. 3, T11S, R22E
Found 1/2" Iron Bar w/ Al Cap
Northing= 299601.94 Easting= 2173505.84
1. Mag Nail and Washer in Wood Sign Post 62.41' W/NW
2. Mag Nail and Washer in Wood Sign Post 71.15' SW
3. Mag Nail and Washer in Wood Sign Post 90.83' SE
4. Mag Nail and Washer in Woon Sign Post 41.52' E-NE

BM #106
Chisiled "□" on wing wall along E. side of 166th St., N. of Creek
STA 53+80.15, 17.88' LT Elev. 885.35

LEGEND

— Rip Rap

SCALE
50' 0 50' 100'
PLAN: Lat. & Long.

PROJECT SURVEY CONTROL

HORIZONTAL PROJECT DATUM
Proj. Coord. X 0.99991132 = Kansas North Zone
State Plane Coordinates NAD 83 (2011)

VERTICAL DATUM
Sea Level Datum NAVD 88
Datum Benchmark =
North American Vertical datum (1988)
3,(KE0640) Elev. = 1093.89

NGS Data Monument 3
Copper bolt in concrete mass at
barber wire fence corner Elev. = 1093.89

Utility Owners:

Power
Evergy
(913) 758-2727

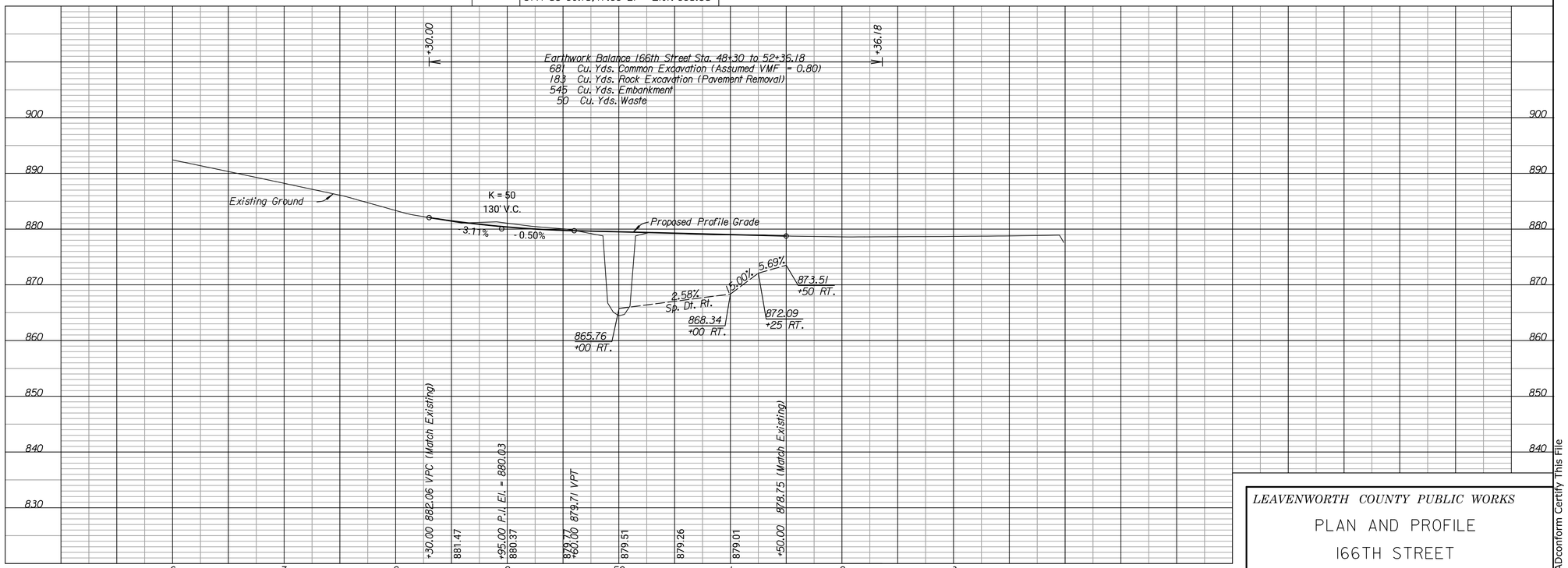
Gas
Atmos Energy
(866) 383-6948

Telephone
ATT Distribution
(913) 778-9140

Sewer
City of Basehor
(800) 778-9140

Water
Suburban Water
913-927-5580

Fiber
MIDCO
(785) 423-3411



LEAVENWORTH COUNTY PUBLIC WORKS

PLAN AND PROFILE

166TH STREET

DATE | BY | REFERENCES NOTED | REFERENCES CHECKED

Plotted : 13-DEC-2021 10:55

Drawn By : mrockwell
File : F46_PP.dgn

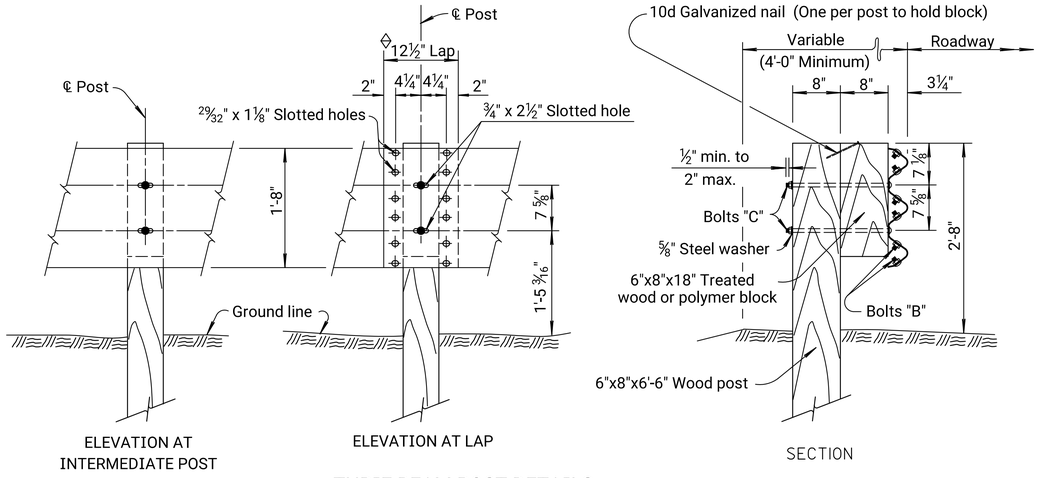
CADconform Certify This File

CADconform Certify This File

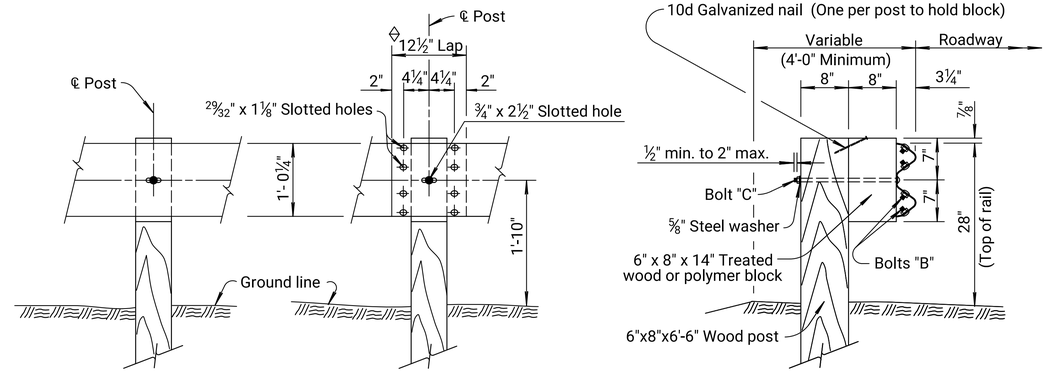
Sh. No. 4

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	5	51

Notes to Designer: For posts installed in pavement thicker than 8" or posts installed in rock formations refer to AASHTO's Roadside Design Guide for details then revise this drawing and all supporting drawings appropriately.



THRIE BEAM POST DETAILS



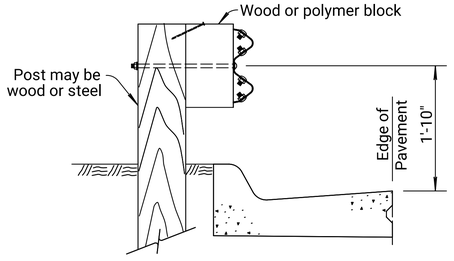
W-BEAM POST DETAILS

◊ Lap guardrail splices, including terminal connector, in the direction of traffic. Where traffic is temporarily carried in the opposite direction of final configuration, lap rail splices in the direction of permanent traffic.

WOOD POSTS

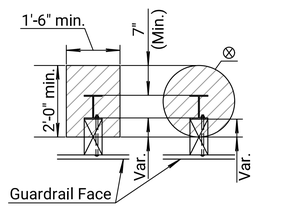
GENERAL NOTES (Wood Posts)

Give all wood posts and wood blocks a preservative treatment, see standard specifications. Thoroughly saturate all cuts, injuries and bolt holes on wood posts and blocks with preservative. Use only one type of preservative treatment on a project. Use S4S rectangular posts and wood blocks, see standard specifications. Use only one post/blockout type within guardrail run, this excludes the the guardrail end terminals. Set guardrail posts by digging or by driving. Use post caps to protect the post from crushing during driving operations. Contractor must notify Engineer at the earliest time when a non-removable manmade object (footing, pipe, etc.) is encountered and prevents installation of a full length post. Contractor must obtain Engineer approval prior to cutting post shorter than 6'-6". Approved polymer blockouts may be substituted for wood blockouts. Only one type of blockout is permitted on each guardrail installation. This excludes the guardrail end terminals unless certified by the manufacturer. All dimensions are nominal and are subject to manufacturing tolerances. Excavation including rock, shale, and other materials for erection of Guardrail is subsidiary to various bid items for which payment is made. Where guardrail posts are installed in pavement, form openings in the pavement for the guardrail posts.



DETAIL OF PLACEMENT AT CURB

Note: When face of guardrail is aligned with the face of a curb, measure the height of rail from the pavement surface at the curb/pavement joint as shown. Use a laydown type curb where the face of the guardrail is not located at the face of the curb.

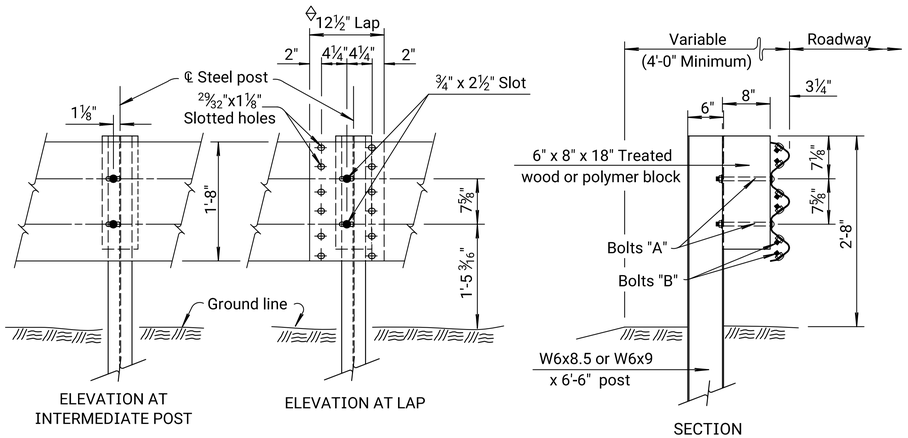


POSTS IN PAVEMENT PLAN
(ALTERNATE GEOMETRIES)
Applies to All Wood and All Steel Posts
(Steel Posts Shown)

▨ Slurry Grout (Low Strength). See KDOT's Standard Specifications

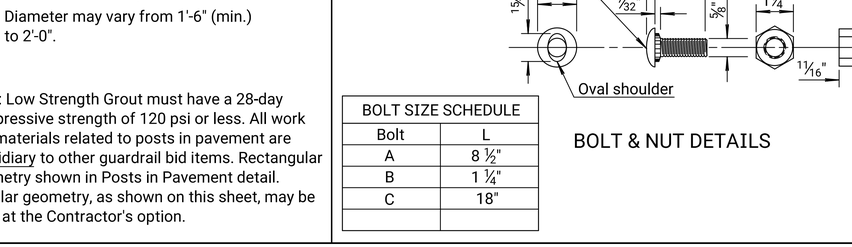
⊗ Diameter may vary from 1'-6" (min.) to 2'-0".

Note: Low Strength Grout must have a 28-day compressive strength of 120 psi or less. All work and materials related to posts in pavement are subsidiary to other guardrail bid items. Rectangular geometry shown in Posts in Pavement detail. Circular geometry, as shown on this sheet, may be used at the Contractor's option.



THRIE BEAM POST DETAILS

◊ Lap guardrail splices, including terminal connector, in the direction of traffic. Where traffic is temporarily carried in the opposite direction of final configuration, lap rail splices in the direction of permanent traffic.



W-BEAM POST DETAILS

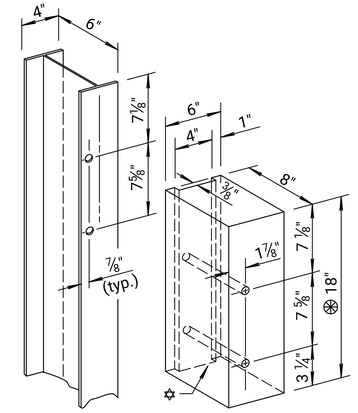
STEEL POSTS

GENERAL NOTES (Steel Posts)

Use grade of steel for steel posts that meets the requirements of the standard specifications. Hot dip galvanize the posts after fabrication, see standard specifications. Use only one post/blockout type within guardrail run, this excludes the guardrail end terminals. For wood/polymer blockout requriements see standard specifications. Approved polymer blockouts may be substituted for wood blockouts. Only one type of blockout is permitted on each guardrail installation. This excludes the guardrail end terminals. Set guardrail posts by digging or by driving. Use post caps to protect the post from crushing during driving operations. Contractor must notify Engineer at the earliest time when a non-removable manmade object (footing, pipe, etc.) is encountered and prevents installation of a full length post. Contractor must obtain Engineer approval prior to cutting post shorter than 6'-6" except as allowed on Standard Drawing RD617. All dimensions are nominal and are subject to manufacturing tolerances. Excavation including rock, shale, and other materials for erection of Guardrail is subsidiary to various bid items for which payment is made. Where guardrail posts are installed in pavement, form openings in the pavement for the guardrail posts.

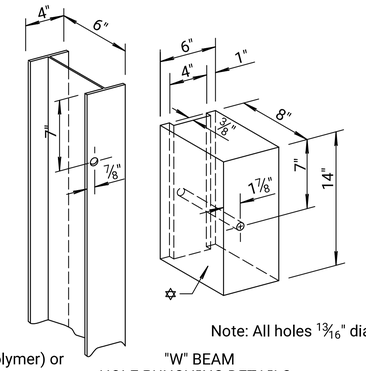
✡ Non-Metallic (Polymer) or Treated Wood Block

⊛ See Standard Drawing RD613 for Thrie-Beam Transition Section Details.



Note: All holes 13/16" dia.

THRIE BEAM
HOLE PUNCHING DETAILS



Note: All holes 13/16" dia.

"W" BEAM
HOLE PUNCHING DETAILS

BOLT & NUT DETAILS

BOLT SIZE SCHEDULE	
Bolt	L
A	8 ½"
B	1 ¼"
C	18"

Galvanize all bolts, nuts, and washers in accordance with the KDOT's Standard Specifications.

NO.	DATE	REVISIONS	BY	APP'D
13	9-5-18	Added Det., Posts In Pavement	A.L.R.	T.T.R.
12	12-14-10	Revised notes, 28" w-be	S.W.K.,	J.O.B.
11	6-30-04	Remove steel blockout and notes	S.W.K.,	J.O.B.
10	7-15-02	Add polymer block-out alternate	S.W.K.,	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL POST DETAILS

RD611

FHWA APPROVAL	9-25-18	APP'D.	SCOTT W. KING
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

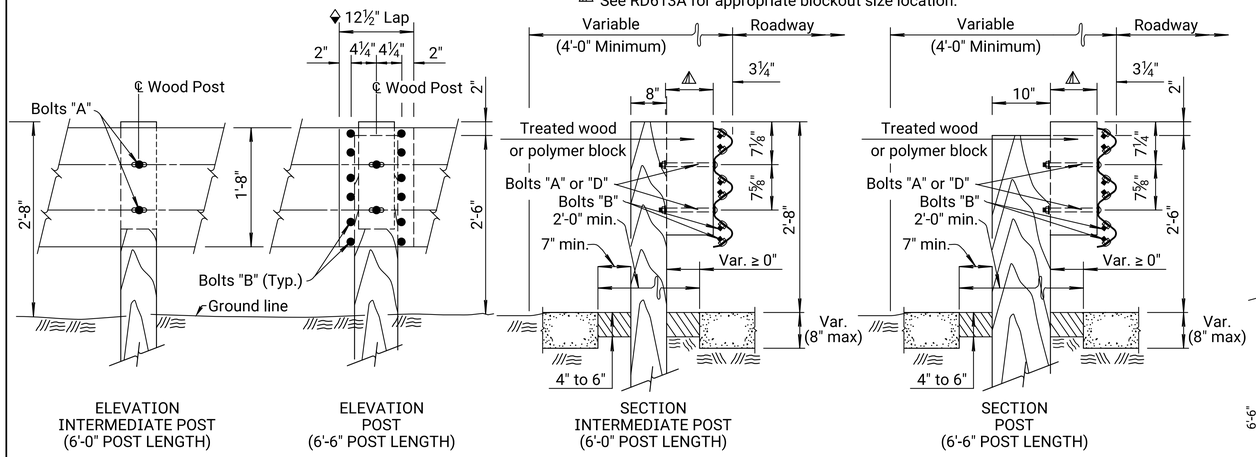
Plotted :13-DEC-2021 10:55

Drawn By : mrockwell
File : rd611.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	6	51

◆ Lap guardrail splices, including terminal connector, in the direction of traffic. Where traffic is temporarily carried in the opposite direction of final configuration, lap rail splices in the direction of permanent traffic.

⚠ See RD613A for appropriate blockout size location.



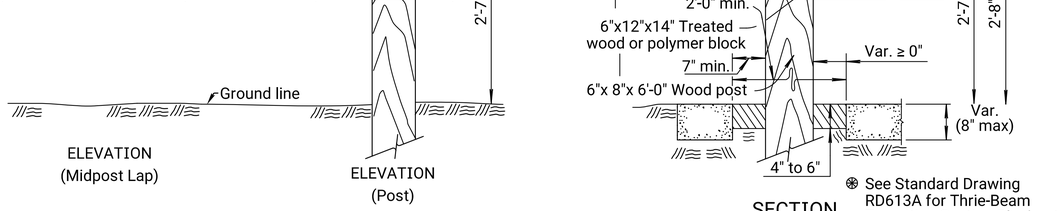
ELEVATION INTERMEDIATE POST (6'-0" POST LENGTH)

ELEVATION POST (6'-6" POST LENGTH)

SECTION INTERMEDIATE POST (6'-0" POST LENGTH)

SECTION POST (6'-6" POST LENGTH)

THRIE BEAM POST DETAILS/POSTS IN PAVEMENT



ELEVATION (Midpost Lap)

ELEVATION (Post)

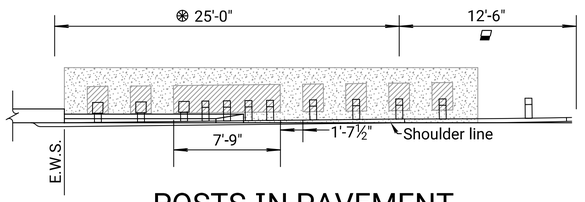
SECTION

⊛ See Standard Drawing RD613A for Thrie-Beam Transition Section Blockout hole pattern.

✡ Non-Metallic (Polymer) or Treated Wood Block

▤ See Guardrail Layout Sheets for Details.

W-BEAM (MGS) POST DETAILS/POSTS IN PAVEMENT



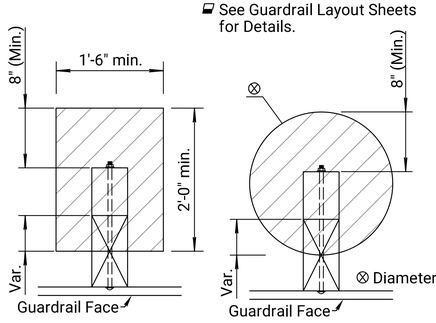
POSTS IN PAVEMENT

(Not to Scale)

▨ Slurry Grout (Low Strength)
See KDOT's Standard Specifications

▨ Pavement (Concrete or Asphalt)

Note: Low Strength Grout must have a 28-day compressive strength of 120 psi or less. All work and materials related to posts in pavement are subsidiary to other guardrail bid items. Rectangular geometry shown in Posts in Pavement detail. Circular geometry, as shown on this sheet, may be used at the Contractor's option.

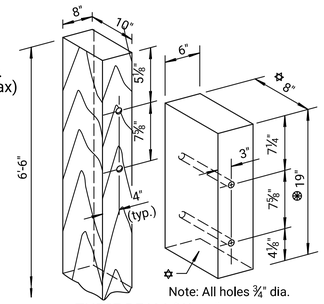


RECTANGULAR GEOMETRY

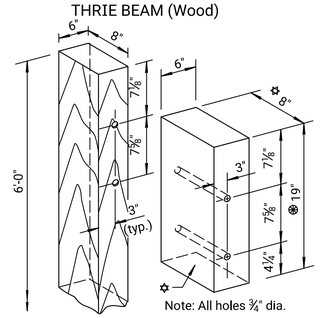
CIRCULAR GEOMETRY

⊗ Diameter may vary from 1'-6" (min.) to 2'-0".

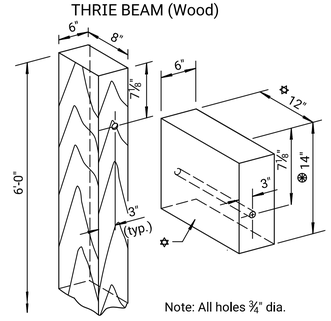
PLAN (ALTERNATE GEOMETRIES)



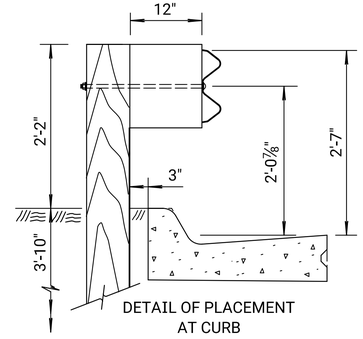
THRIE BEAM (Wood)



THRIE BEAM (Wood)

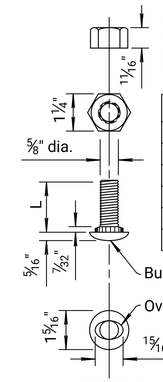


"W" BEAM (Wood)



DETAIL OF PLACEMENT AT CURB

Note: Measure height of rail from the pavement surface at the curb/pavement joint as shown. A special design is needed when guardrail is not located as detailed. A Type II (laydown) curb & gutter is preferred when guardrail is adjacent to curb.



All bolts,nuts, and washers shall be galvanized in accordance with the Standard Specifications.

BOLT SIZE SCHEDULE	
Bolt	L
A	10"
B	1¼"
C	18"
D	14"
E	22"

BOLT & NUT DETAILS

GENERAL NOTES (Wood Posts)

Give all wood posts and wood blocks a preservative treatment, see standard specifications. Thoroughly saturate all cuts, injuries and bolt holes on wood posts and blocks with preservative. Use only one type of preservative treatment on a project.

Set guardrail posts by digging or by driving. Use post caps to protect the post from crushing during driving operations.

Wood blockouts may be used through the 25'-0" thrie-beam section with wood or polymer blockouts used throughout the remainder of the w-beam installation. The blockout size and material used in the guardrail end terminal may be independent from the remainder of the installation. For wood/polymer blockout requirements see standard specifications.

Use S4S rectangular posts/blockouts for Thrie Beam/W-Beam installation. See standard specifications for additional information.

Contractor must notify Engineer at the earliest time when a non-removable man-made object (footing, pipe, etc.) is encountered and prevents installation of a full length post.

All dimensions are nominal and are subject to manufacturing tolerances.

Excavation including rock, shale, and other materials for erection of Guardrail is subsidiary to various bid items for which payment is made.

NO.	DATE	REVISIONS	BY	APP'D
4	9-24-15	Initial Release	T.T.R.	S.W.K.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL POST (WOOD) (MGS) DETAILS

RD611B

FHWA APPROVAL	1-29-16	APP'D. Scott W. King	
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. King

KDOT Graphics Certified 03-28-2018

Sh. No. 6

KDOT Graphics Certified

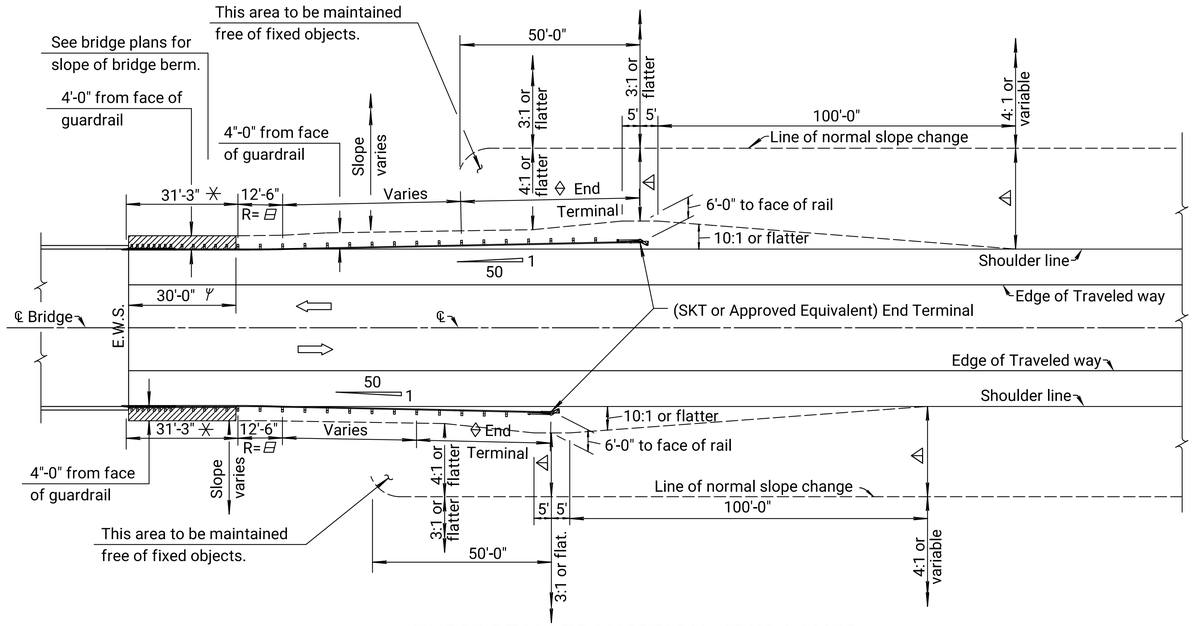
Notes to Designer: For posts installed in pavement thicker than 8" or posts installed in rock formations refer to AASHTO's Roadside Design Guide for details then revise this drawing and all supporting drawings appropriately.

Plotted :13-DEC-2021 10:55

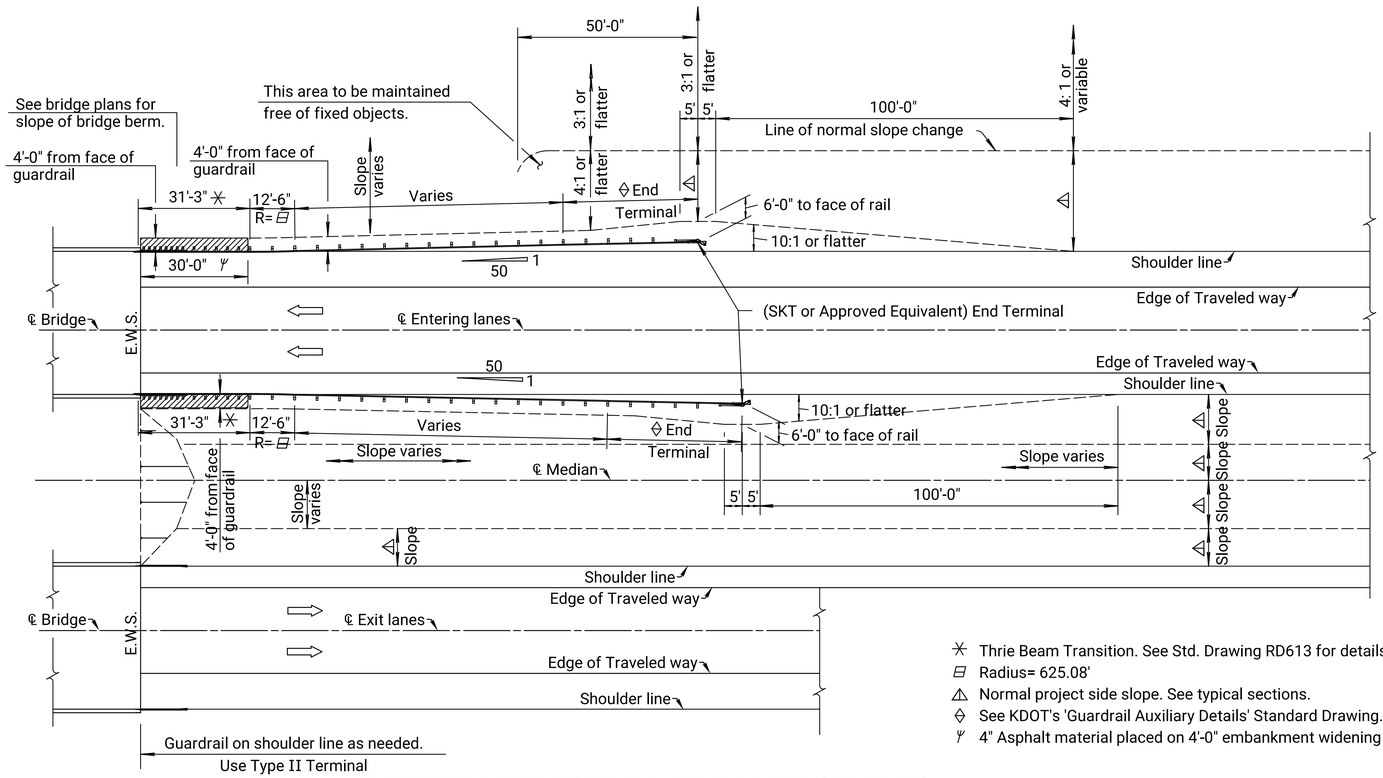
Drawn By : mrockwell
File : rd611b.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	7	51

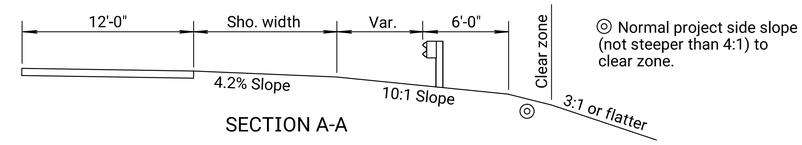
Note to Designer: Guardrail length of need shall be determined in accordance with the AASHTO Roadside Design Guide.
L_1 for length of need calculation on flared alignment shown is 37.5'.
Under certain conditions, the designer may elect to reduce the length of flare to include only the end terminal.
This sheet shall be used when the parallel guardrail design is selected.
Material for asphalt guardrail widening shall be included in the plan quantities.



THRIE BEAM TRANSITION - TWO LANES

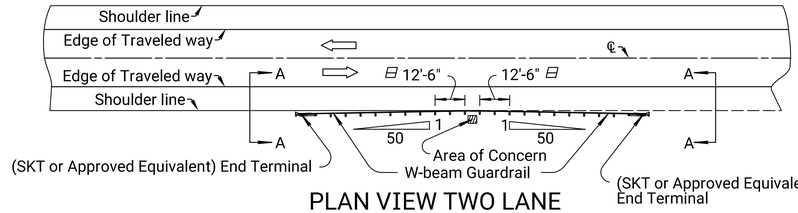


THRIE BEAM TRANSITION - FOUR LANES (DIVIDED)

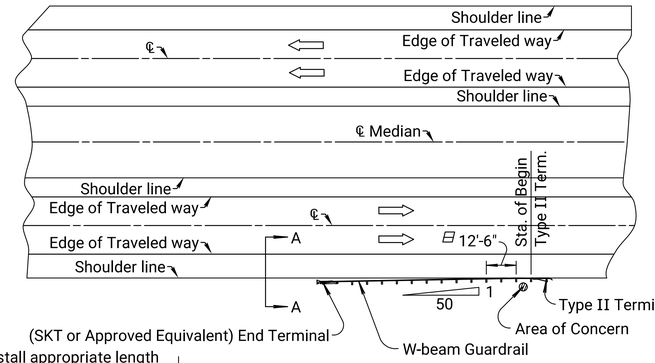


◎ Normal project side slope (not steeper than 4:1) to clear zone.

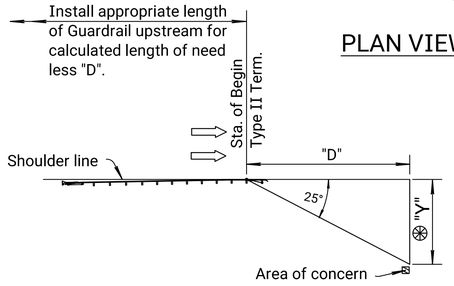
SECTION A-A



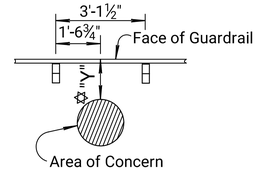
PLAN VIEW TWO LANE



PLAN VIEW FOUR LANE



⊛ On divided facility with adjacent traffic in one direction only, total length of need may be reduced by length "D".



ENLARGEMENT - AREA OF CONCERN

✡ Guardrail shall be nested and post spacing reduced to one half of normal spacing when "Y" is less than 5'. Rigid barrier shall be used when "Y" is less than 3'-3".

DETAILS OF GUARDRAIL PROTECTION AT ROADSIDE OBSTACLE

⚹ Thrie Beam Transition. See Std. Drawing RD613 for details and general note.
⊟ Radius= 625.08'
⚠ Normal project side slope. See typical sections.
⟠ See KDOT's 'Guardrail Auxiliary Details' Standard Drawing.
ᛘ 4" Asphalt material placed on 4'-0" embankment widening unless flume inlet and slope drain is constructed.

NO.	DATE	REVISIONS	BY	APP'D
13	5-15-17	Removed X-LITE	A.L.R.	S.W.K.
12	7-2-09	Added Roadside obstacle details	S.W.K.	J.O.B.
11	1-10-07	Changed Bituminous to Asphalt	S.W.K.	J.O.B.
10	1-20-04	Revised end terminal options	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

THRIE BEAM GUARDRAIL BRIDGE APPROACH TRANSITION TYPICAL ALIGNMENTS (PARALLEL)

RD612

FHWA APPROVAL 10-12-17		APP'D. SCOTT W. KING	
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

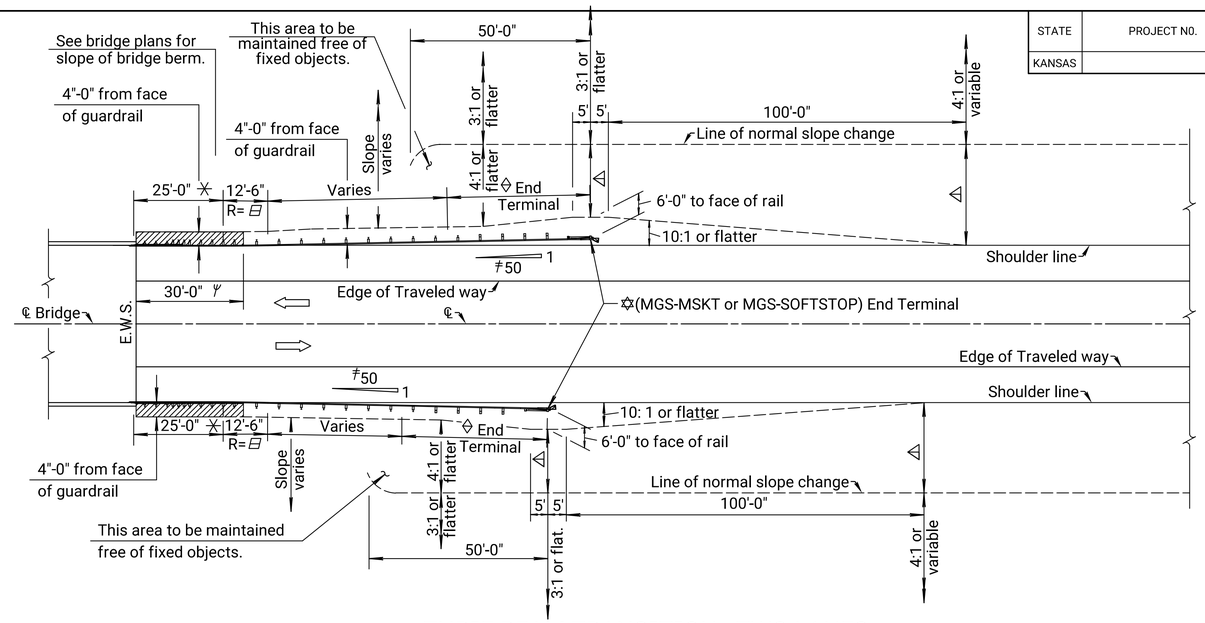
Plotted :13-DEC-2021 10:55
Drawn By : mrockwell
File : rd612.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	8	51

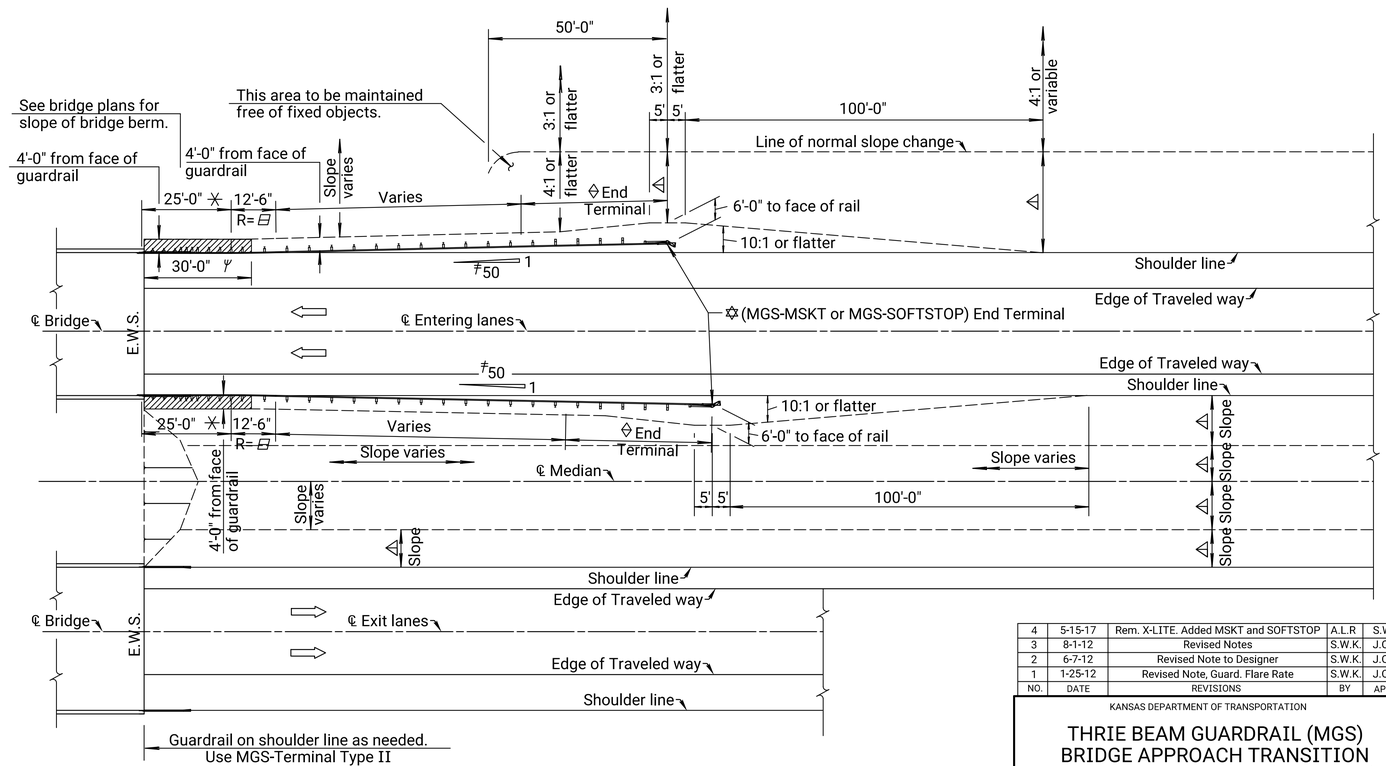
Notes to Designer: Determine the guardrail length of need using either KDOT's Length of Need Equation or a graphic design approach with an L_t distance measured from the edge of the area of concern to the P.I. of the curved guardrail section. Combine the edge of the area of concern to the P.I. of the curved guardrail section. Combine material for asphalt widening in the plan quantities.

"Parallel" installations are flared at a rate of 50:1. "Zero Flare' installations follow the edge of shoulder.

- Thrie Beam Transition. See Std. Drawing RD613A for details and general note.
- Radius= 625.08'
- Normal project side slope. See typical sections.
- See KDOT's 'Guardrail Auxiliary Details' Standard Drawing.
- 4" Asphalt material placed on 4'-0" embankment widening unless flume inlet and slope drain is constructed. See RD611A for "Post in Pavement" details.
- Terminate zero flare rate installations with a parallel guardrail end terminal. Typically parallel end terminals are flared at 50:1 over the length of the end terminal, but may be flared up to 26:1 or flatter.
- The minimum length of w-beam guardrail required between the thrie-beam transition and the guardrail end terminal is 12'-6" for all installations.



THRIE BEAM TRANSITION - TWO LANES



THRIE BEAM TRANSITION - FOUR LANES (DIVIDED)

NO.	DATE	REVISIONS	BY	APP'D
4	5-15-17	Rem. X-LITE. Added MSKT and SOFTSTOP	A.L.R	S.W.K.
3	8-1-12	Revised Notes	S.W.K.	J.O.B.
2	6-7-12	Revised Note to Designer	S.W.K.	J.O.B.
1	1-25-12	Revised Note, Guard. Flare Rate	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

THRIE BEAM GUARDRAIL (MGS) BRIDGE APPROACH TRANSITION TYPICAL ALIGNMENTS (PARALLEL)

RD612B

FHWA APPROVAL	10-12-17	APP'D. SCOTT W. KING	
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

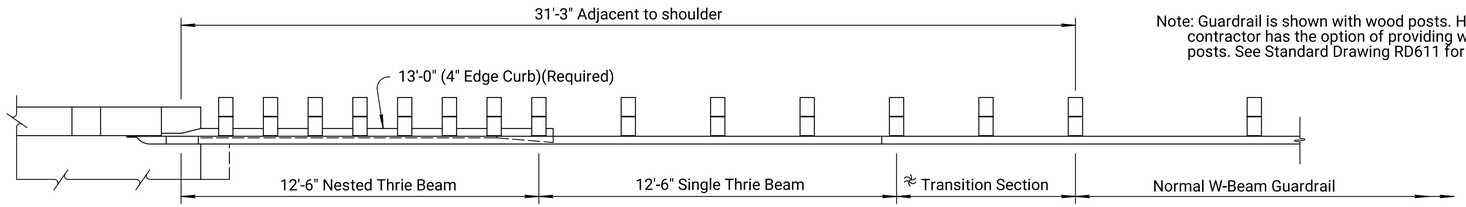
KDOT Graphics Certified 05-29-2018 Sh. No. 8

KDOT Graphics Certified

Drawn By : mrockwell
File : rd612b.dgn

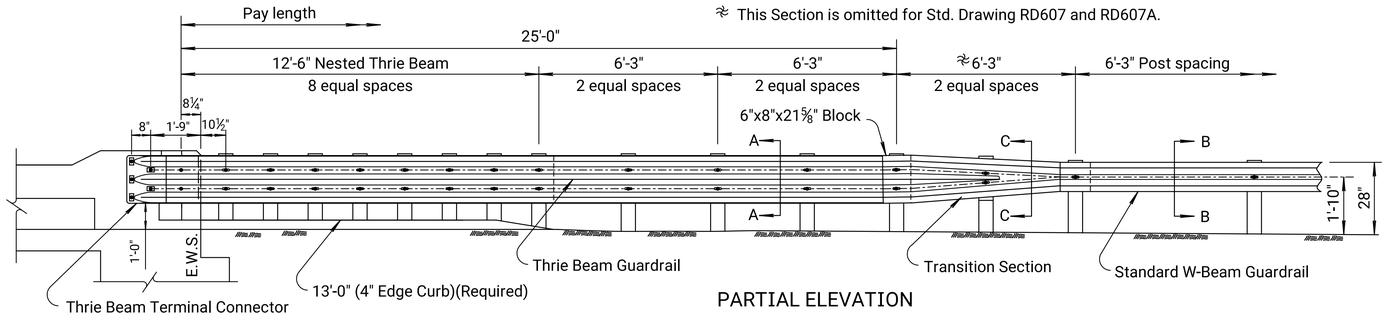
Plotted :13-DEC-2021 10:55

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	9	51



PARTIAL PLAN

Note: Guardrail is shown with wood posts. However the contractor has the option of providing wood or steel posts. See Standard Drawing RD611 for details.



PARTIAL ELEVATION

GENERAL NOTE

Use galvanized 12 gauge steel rail elements unless otherwise noted. Use galvanized anchor bolts and post rail fittings, see Standard Specifications. Supply guard rail parts that are interchangeable with similar parts regardless of source or manufacturer.

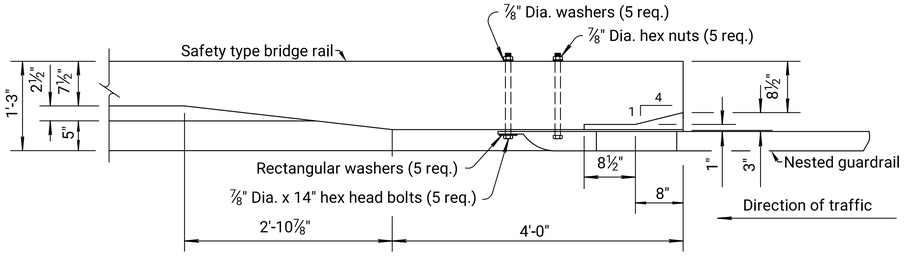
Fabricate Terminal Connector from 10 gauge steel, see standard specification. The connector has the same section as thrie beam guardrail Terminal connector is subsidiary to the bid item "Steel Plate Guardrail".

Shop curve rails when radius is less than 150'.

Lap guardrail splices, including terminal connector, in the direction of traffic. Where traffic is temporarily carried in the opposite direction of final configuration, lap rail splices in the direction of permanent traffic.

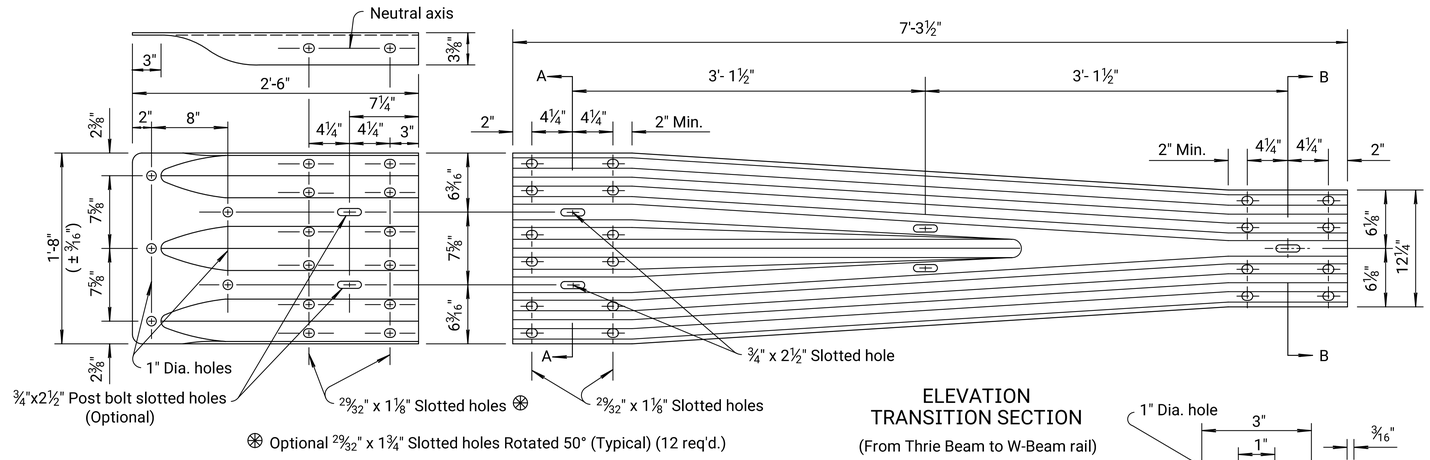
Bridge to guardrail transition consists of 1- 25'-0" Thrie beam with 1- 12'-6" Thrie beam section nested in back of 25'-0" section (see layout), & 1- Thrie beam to W-beam Asymmetrical transition section. Use associated hardware with post spacing shown. Use w-beam guardrail with 6'-3" post spacing with rail furnished in 12'-6" or 25'-0" sections.

All material and work required for this installation are paid under the bid item "Steel Plate Guardrail".



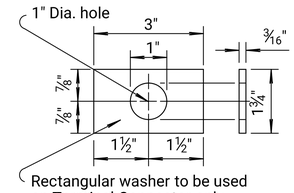
PLAN VIEW

GUARDRAIL ATTACHMENT
TO SAFETY SHAPE BRIDGE RAIL

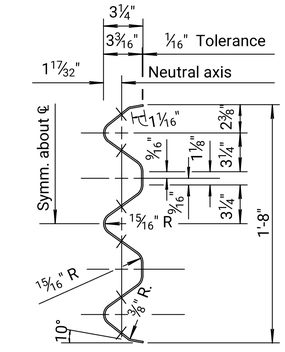


TERMINAL CONNECTOR

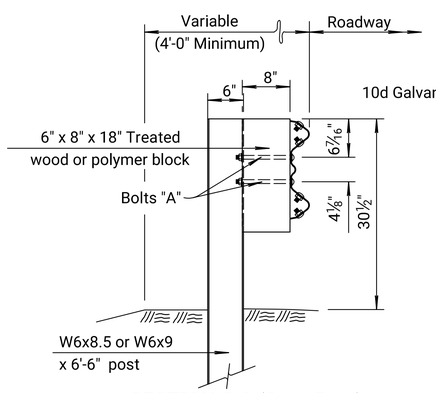
ELEVATION
TRANSITION SECTION
(From Thrie Beam to W-Beam rail)



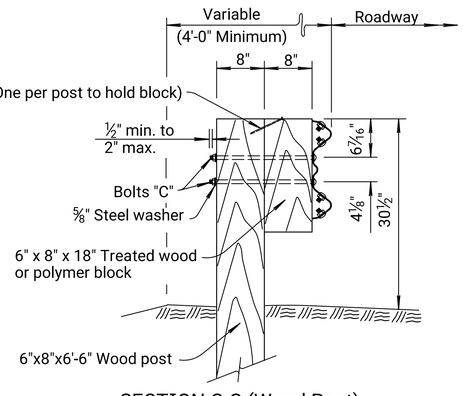
RECTANGULAR WASHER
(Other approved washer may be used.)



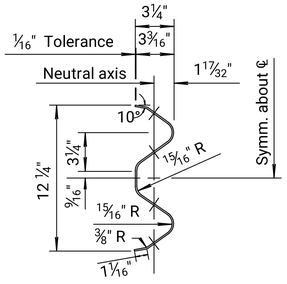
SECTION A-A THRU RAIL ELEMENT
TYPICAL THRIE BEAM



SECTION C-C (Steel Post)



SECTION C-C (Wood Post)



SECTION B-B THRU RAIL ELEMENT
TYPICAL W-BEAM

NO.	DATE	REVISIONS	BY	APP'D
13	12-06-10	Rev. Sec. C-C, notes & 28" rail height	S.W.K.	J.O.B.
12	07-02-09	Rev.Safety Shape Br. Rail detail	S.W.K.	J.O.B.
11	01-05-04	Added 4" Edge Curb, revised note	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

DETAILS OF THRIE BEAM
GUARDRAIL TRANSITION

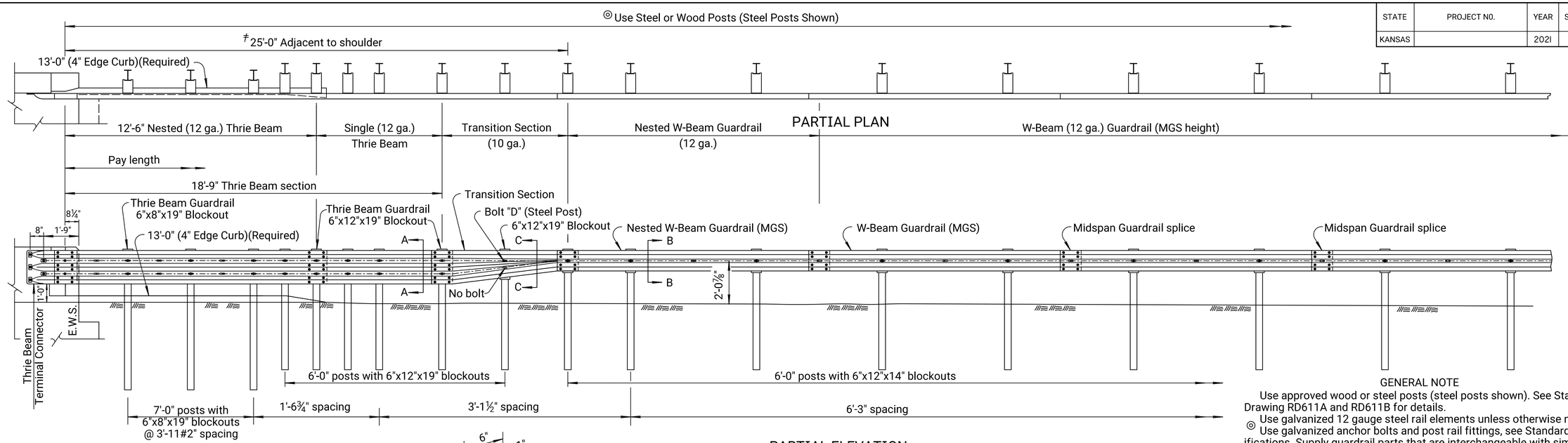
RD613

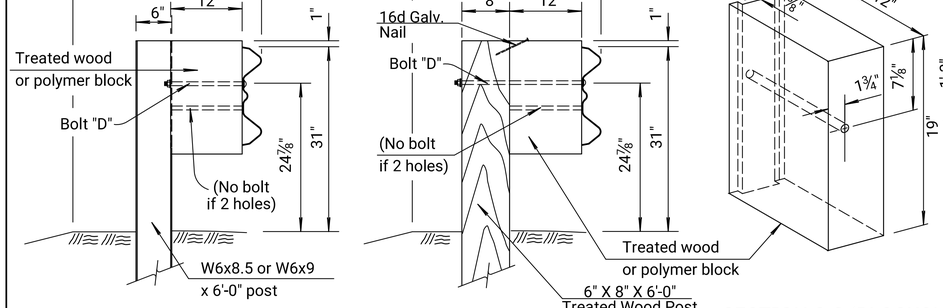
FHWA APPROVAL 1-11-11		APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. King

Sh. No. 9

Plotted :13-DEC-2021 10:55
Drawn By : mrockwell
File : rd613.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	10	51

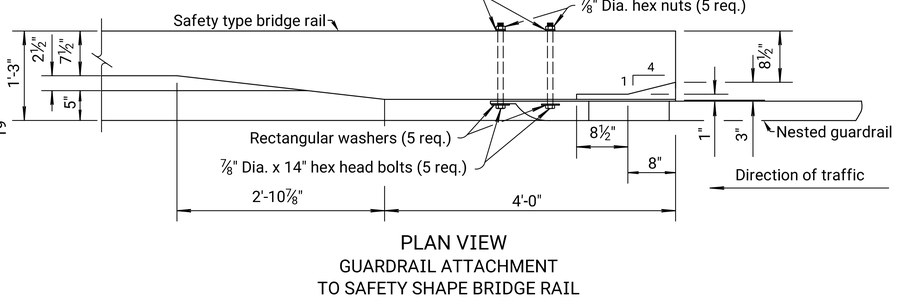




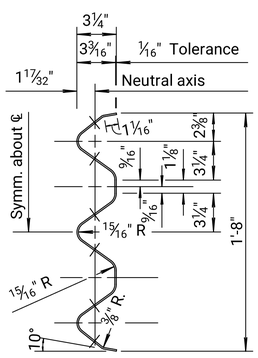
◎ SECTION C-C (STEEL POST)

◎ SECTION C-C (WOOD POST)

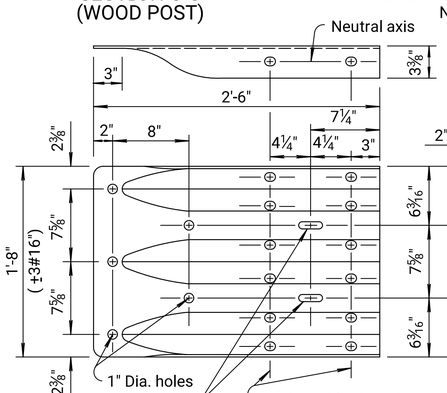
SECTION C-C (BLOCKOUTS)
Note: All holes ¾" dia.



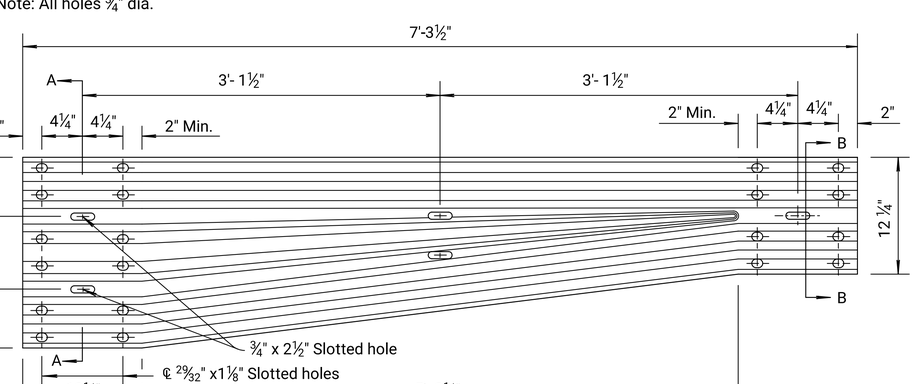
PLAN VIEW
GUARDRAIL ATTACHMENT
TO SAFETY SHAPE BRIDGE RAIL



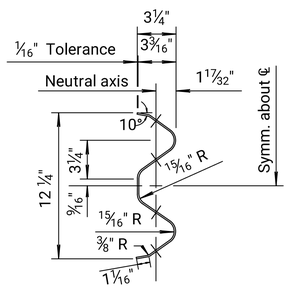
SECTION A-A
THRU RAIL ELEMENT
TYPICAL THRIE BEAM



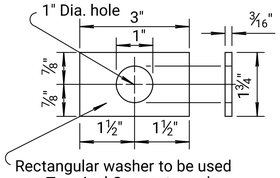
TERMINAL CONNECTOR
⊛ Optional 29⁄32" x 1¾" Slotted holes Rotated 50° (Typical) (12 req'd.)



ELEVATION
ASYMMETRICAL TRANSITION SECTION
(From Thrie Beam to W-Beam rail)



SECTION B-B
THRU RAIL ELEMENT
TYPICAL W-BEAM



RECTANGULAR WASHER
(Other approved washer may be used.)

GENERAL NOTE

Use approved wood or steel posts (steel posts shown). See Standard Drawing RD611A and RD611B for details.

◎ Use galvanized 12 gauge steel rail elements unless otherwise noted. Use galvanized anchor bolts and post rail fittings, see Standard Specifications. Supply guardrail parts that are interchangeable with similar parts regardless of source or manufacturer.

Wood blockouts may be used through the 25'-0" thrie-beam section with wood or composite blockouts used throughout the remainder of the w-beam installation. The blockout size and material used in the guardrail end terminal may be independent from the remainder of the installation.

Fabricate Terminal Connector from 10 gauge steel, see Standard Specification. The connector has the same section as thrie beam guardrail. Terminal connector is Subsidiary to the bid item "Guardrail, Steel Plate (MGS)".

Shop bend curve rails when radius is less than 150'.

Lap guardrail splices, including terminal connector, in the direction of traffic. Where traffic is temporarily carried in the opposite direction of final configuration, lap rail splices in the direction of permanent traffic.

Bridge to guardrail transition consists of 1- 18'-9" thrie-beam with 1- 12'-6" thrie-beam section nested in back of 18'-9" section (See Layout), 1- Thrie beam to W-beam Asymmetrical transition section, use associated hardware with post sizes and location shown. For the remainder of installation use (MGS) W-beam guardrail with only one post type used within (MGS) guardrail run.

All material and work required for this construction is Subsidiary to the bid item "Guardrail, Steel Plate (MGS)".

NO.	DATE	REVISIONS	BY	APP'D
2	2-10-16	Added Detail, Wood Post	T.T.R.	S.W.K.
1	1-25-12	Revised Details, Thrie-Beam	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

DETAILS OF THRIE BEAM to (MGS) GUARDRAIL TRANSITION

RD613A

FHWA APPROVAL	4-21-16	APP'D.	SCOTT W. KING
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 03-28-2018 Sh. No. 10

KDOT Graphics Certified

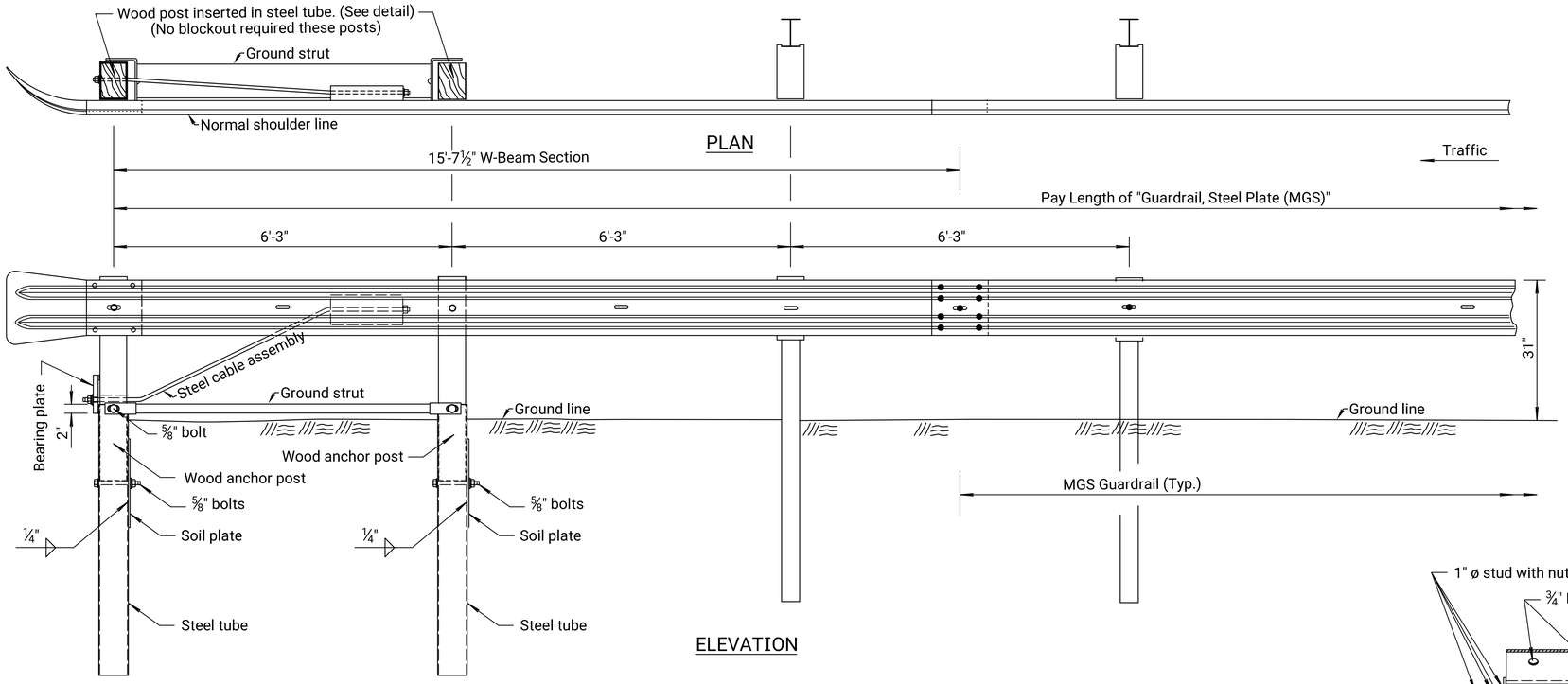
Drawn By : mrockwell
File : rd613a.dgn
Plotted :13-DEC-2021 10:55

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	11	51

Notes to Designer: Use Guardrail End Terminal, MGS Type II on the traffic departing end of barriers where end on impacts are not a consideration and at the end of entrance return.

Plotted :13-DEC-2021 10:55

Drawn By : mrockwell
File : rd618a.dgn



GENERAL NOTE

Terminal end posts consist of a wood post inserted into a steel tube see details on this sheet.

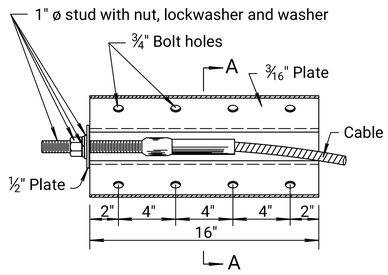
Steel soil tubes may be driven with an approved driving head. Set steel tube and soil plate before installing wood anchor post assembly. Do not drive steel soil tubes with wood post in the tube. Backfill and satisfactorily compact around steel soil tubes placed in drilled holes to prevent tube settlement.

Galvanize all steel parts after fabrication.

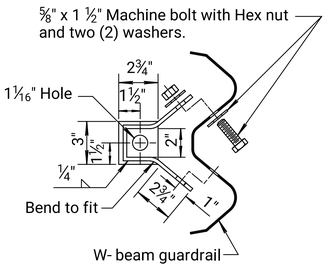
Lap guardrail splices, including terminal connector, in the direction of traffic. Where traffic is temporarily carried in the opposite direction of final configuration, lap rail splices in the direction of the permanent traffic.

All work and materials required for the installation of MGS Terminal Type II are considered subsidiary to the bid item "Guardrail, Steel Plate (MGS)".

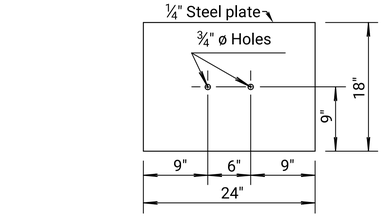
Include MGS Type II end terminal in pay length of "Guardrail, Steel Plate (MGS)".



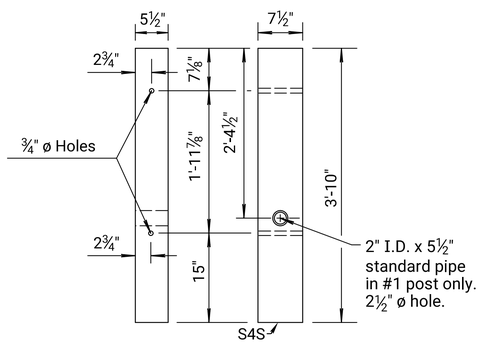
ANCHOR PLATE



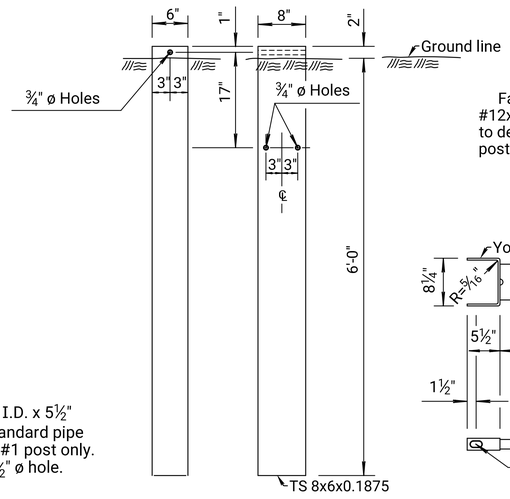
MODIFIED SECTION A-A



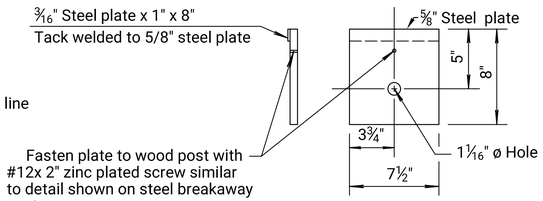
SOIL PLATE



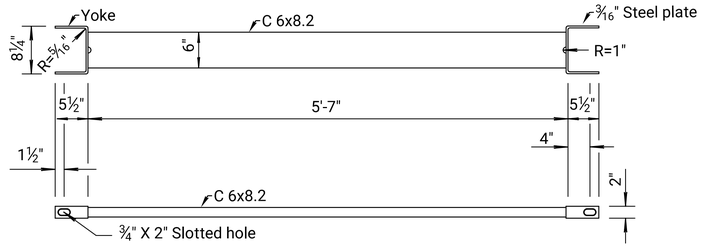
BCT (MGS) WOOD POST



STEEL TUBE

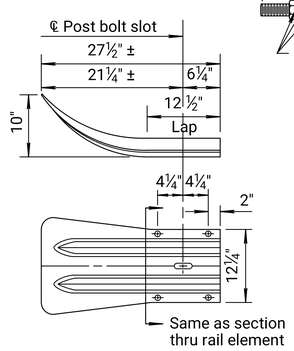


BEARING PLATE



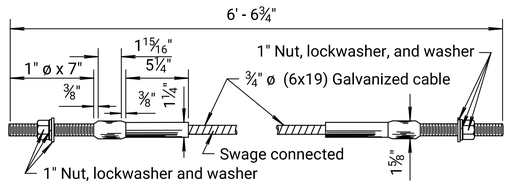
GROUND STRUT

(Strut dimensions shown are typical)



STANDARD END SECTION

(1 each)
(Subsidiary to Steel Plate Guardrail)



CABLE ASSEMBLY (1 each)

(40,000 lbs. min. breaking strength)
Tighten cable to taut tension.

NO.	DATE	REVISIONS	BY	APP'D
2	1-5-16	Revised Layout, End Terminal	T.T.R.	S.W.K.
1	1-25-12	Revised Dimension, End Terminal	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL END TERMINAL (MGS) TYPE II

RD618A

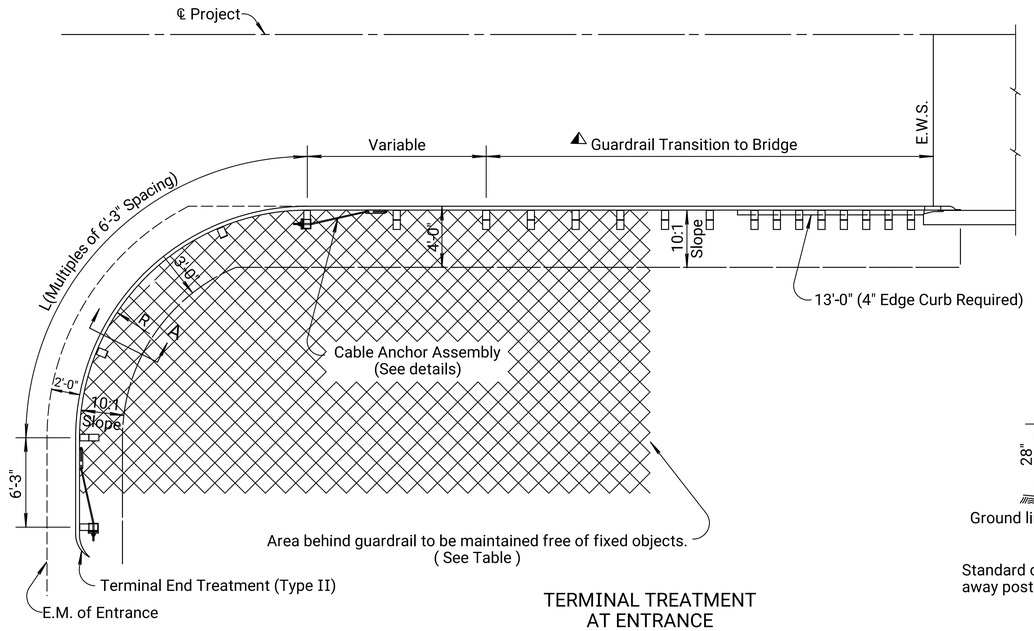
FHWA APPROVAL		APP'D.	Scott W. King
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified

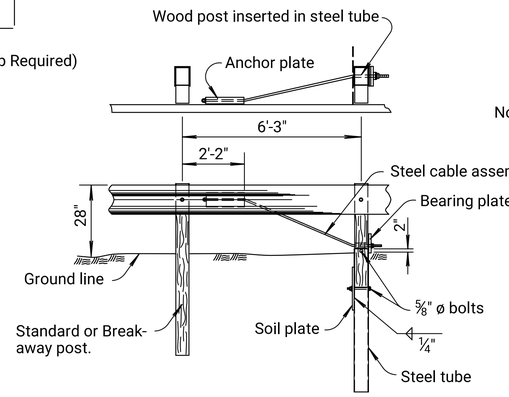
KDOT Graphics Certified 03-28-2018

Sh. No. 11

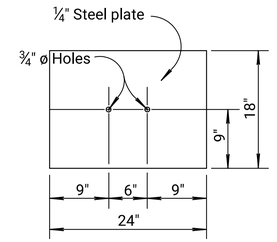
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	12	51



TERMINAL TREATMENT AT ENTRANCE

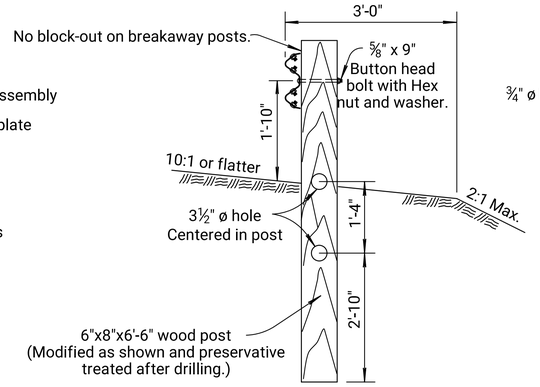


ANCHOR ASSEMBLY



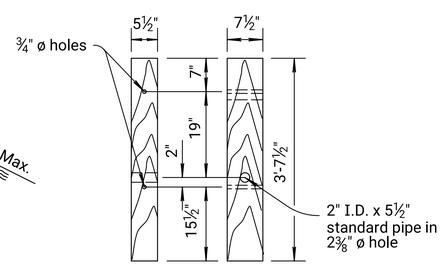
SOIL PLATE

General notes:
The curved rail element is 12 ga, and shop bent.
See Standard Drawing RD611 for notes applying to guardrail posts.
See Standard Drawing RD618 for details of Type II End Terminal.
Use wood Breakaway Posts through curved section of guardrail, all other posts may be either wood or steel with no mixing of types.
Set steel tube and soil plate in place prior to the installation of the wood anchor assembly post.
Use Type II Terminal at entrances or locations where end-on impacts with the terminal are not considered likely to occur.
Use a crashworthy end terminal at sideroad locations and appropriate length of guardrail to satisfy length of need requirements.

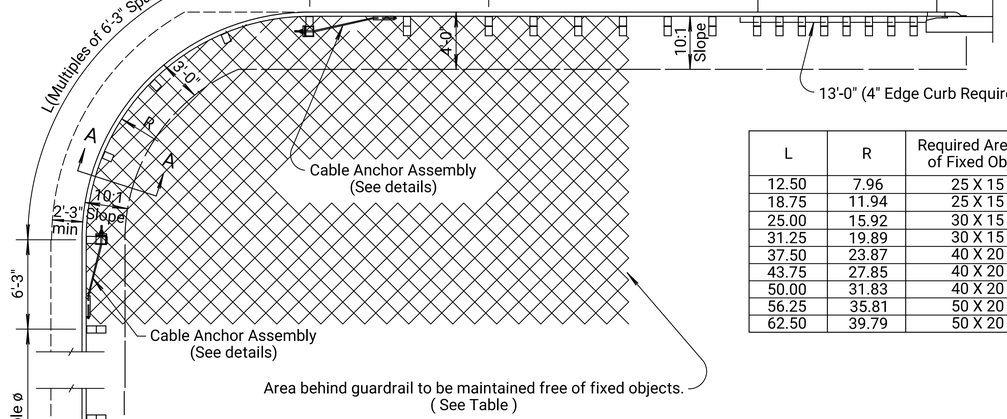


SECTION A-A

(Typical through curved portion of guardrail.)



ANCHOR ASSEMBLY POST



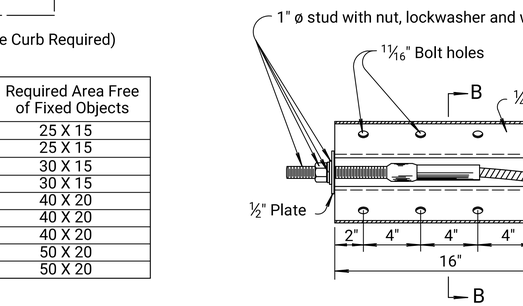
L	R	Required Area Free of Fixed Objects
12.50	7.96	25 X 15
18.75	11.94	25 X 15
25.00	15.92	30 X 15
31.25	19.89	30 X 15
37.50	23.87	40 X 20
43.75	27.85	40 X 20
50.00	31.83	40 X 20
56.25	35.81	50 X 20
62.50	39.79	50 X 20

TERMINAL TREATMENT AT SIDEROAD

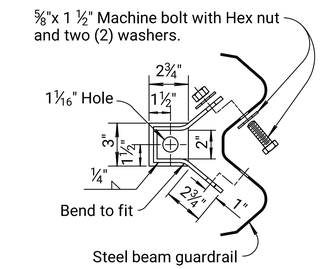
⊛ SRT shown. Other crashworthy terminals may be utilized. See the guardrail layout sheets for additional details.

ø Variable length must be in multiple of 6'-3". Length required is based on length of need for approach sideroad traffic.

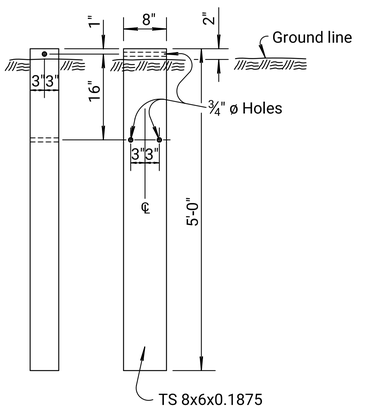
See guardrail layout details for length.



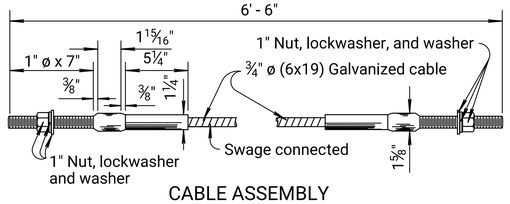
ANCHOR PLATE



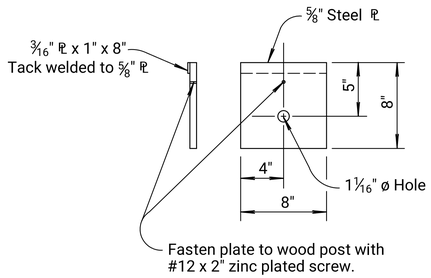
MODIFIED SECTION B-B



STEEL TUBE



CABLE ASSEMBLY
(40,000 lbs. min. breaking strength)
Tighten cable to taut tension.



BEARING PLATE

▲ 31'-3" Minimum length for thrie beam transition. See Standard Drawings RD612 & RD613.
25'-0" Minimum length for W-beam with rubrail transition. See Standard Drawing RD615.

NO.	DATE	REVISIONS	BY	APP'D
7	12-14-10	Rev. notes, details & 28" rail height	S.W.K.	J.O.B.
6	7-20-04	Rev. layout, notes, gd.fc. to guardrail	R.J.S.	J.O.B.
5	3-05-01	Add sideroad detial	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

DETAILS FOR GUARDRAIL INSTALLATION AT INTERSECTING ROADWAY

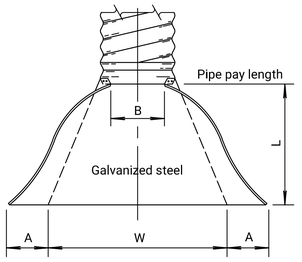
RD619

FHWA APPROVAL 1-1 1-1 1		APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. King

Sh. No. 12

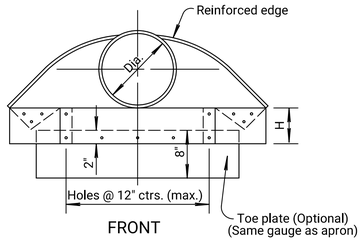
Plotted :13-DEC-2021 10:55
Drawn By : mrockwell
File : rd619.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	13	51

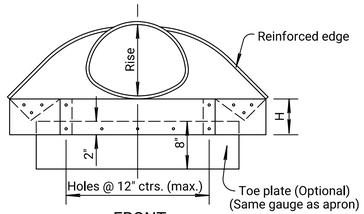


PLAN

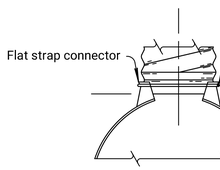
(Illustrated with Type #3 Connection)



FRONT

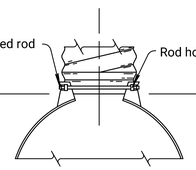


FRONT



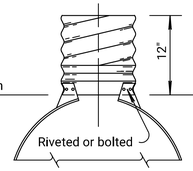
TYPE 1

Available in sizes 12" through 24" only.



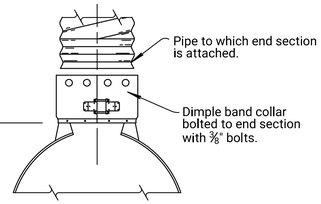
TYPE 2

Available in sizes 30" and 36" Round and 17"x13" through 57"x38" Pipe-Arches.



TYPE 3

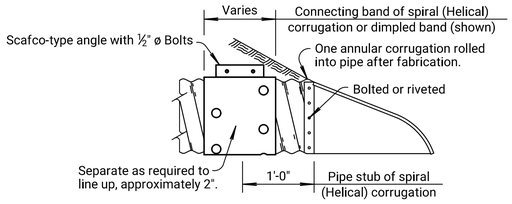
Available in sizes 42" through 96" Round and 60"x46" through 81"x59" Pipe-Arches.



TYPE 5

Available for all Round and equivalent Pipe-Arch sizes, (Type 1 and Type 2 connections are recommended for the smaller sizes with annular ends).

Note: Type 3 connection may be furnished instead of Type 1 or Type 2 for smaller round or arch pipe.



SPIRAL (HELICAL) CORRUGATION

For all sizes of round and arch culvert pipes having Spiral (Helical) corrugations, the end sections and connecting bands shall be as shown above.

Thickness CSP/ACSP	Thickness CAP	Gauge
0.064"	0.060"	16 ga.
0.079"	0.075"	14 ga.
0.109"	0.105"	12 ga.
0.138"	0.135"	10 ga.
0.168"	0.164"	8 ga.

Pipe Dia. (In.)	CS, ACS or CA Gauge	Dimensions in Inches A (min.)	B (max.)	H (min.)	L (±2")	W (min.)	Approx. Slope
12"	16	5	7	6	21	22	2½: 1
15"	16	6	8	6	26	28	2½: 1
18"	16	7	10	6	31	34	2½: 1
21"	16	8	12	6	36	40	2½: 1
24"	16	9	13	6	41	46	2½: 1
30"	14	11	16	8	51	55	2½: 1
36"	14	13	19	9	60	70	2½: 1
42"	12	15	25	10	69	82	2½: 1
48"	12	17	29	12	78	88	2¼: 1
54"	12	17	33	12	84	100	2¼: 1
60"	12/10	17	36	12	87	112	2: 1
66"	12/10	17	39	12	87	118	2: 1
72"	12/10	17	44	12	87	120	2: 1
78"	12/10	17	48	12	87	130	1½: 1
84"	12/10	17	52	12	87	136	1½: 1
90"	12/10	17	58	12	87	142	1½: 1
96"	12/10	17	58	12	87	144	1½: 1

Bid Designation Sq. Ft.	Nom. W.W. Area Sq. Ft.	Pipe Arch Span & Rise	Dimensions in Inches 2⅔" x ½" Corrugations CS, ACS or CA Gauge	A (min.)	B (max.)	H (min.)	L (±2")	W (min.)	Dimensions in Inches 3" x 1" or 5" x 1" Corr. CS, ACS or CA Gauge	A (min.)	B (max.)	H (min.)	L (±2")	W (min.)	Approx. Slope
1.0	1.1	17" x 13"	16	5	9	6	20	28							2½: 1
1.5	1.6	21" x 15"	16	6	11	6	24	34							2½: 1
2.0	2.2	24" x 18"	16	7	12	6	28	40							2½: 1
2.5	2.9	28" x 20"	16	7	16	6	32	46							2½: 1
3.0 or 4.0	4.5	35" x 24"	14	9	16	6	39	58							2½: 1
5.0 or 6.0	6.5	42" x 29"	14	11	18	7	46	73							2½: 1
7.0 or 8.5	8.9	49" x 33"	12	12	21	9	53	82							2½: 1
10.0 or 11.0	11.7	53" x 41"							12	17	26	12	63	88	2: 1
10.0 or 11.0	11.6	57" x 38"	12	16	26	12	62	88							2: 1
12.5 or 14.0	15.6	60" x 46"							12	17	36	12	70	100	2: 1
12.5 or 14.0	14.7	64" x 43"	12	17	30	12	69	100							2: 1
16.5	19.3	66" x 51"							12/10	17	36	12	70	112	1½: 1
16.5	18.1	71" x 47"	12/10	17	36	12	77	112							1½: 1
21.0	23.2	73" x 55"							12/10	17	36	12	77	124	1½: 1
21.0	21.9	77" x 52"	12/10	17	36	12	77	124							1½: 1
25.0	27.4	81" x 59"							12/10	17	44	12	77	136	1½: 1
25.0	26.0	83" x 57"	12/10	17	44	12	77	130							1½: 1
32.0	32.1	87" x 63"							12/10	17	44	12	77	136	1½: 1
36.0	37.0	95" x 67"							12/10	17	44	12	87	160	1½: 1
42.0	42.4	103" x 71"							12/10	17	44	12	87	172	1½: 1
47.0	48.0	112" x 75"							12/10	17	44	12	87	172	1½: 1

(Information listed in these tables are nominal and may vary by manufacturer.)

GENERAL NOTE for END SECTIONS

End section material shall follow KDOT Pipe Policy for geographic location. Location shall govern use of CS (Galvanized), ACS (Aluminized) or CA (Aluminum) (Type I) End Section. Pipe material and End Section material shall be the same with no mixing of types per location.

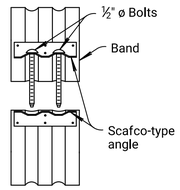
Toe plate extension, when specified, is an accessory and shall be the same gauge and metal as end section. Toe plate shall be punched to match holes in apron lip and attached with furnished 3#8" diameter nuts & bolts.

W + 10" for 12" to 30" diameter pipes inclusive.
W + 20" for 36" to 84" diameter pipes inclusive.
W + 10" for pipe-arches with a rise of 13" to 29" inclusive.
W + 20" for pipe-arches with a rise of 33" to 59" inclusive.

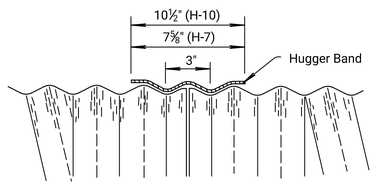
Multiple panel end sections may contain dual gauges of like metal and shall have lap seams which are tightly joined with rivets or bolts. For 60" and larger diameter round pipe end sections and 77"x52" arch pipe end sections, the reinforced edges are supplemented with stiffener angles. The angles are attached with nuts and bolts. Angle reinforcement may be required uder the center panel seams of 73"x55" and larger arch pipe end sections depending on manufacturer.

Other approved designs may be used in lieu of type shown.

Connection of end sections by welding will not be permitted.

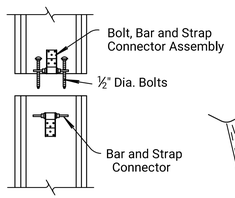


CONNECTION DETAIL
H-7 or H-10 BAND

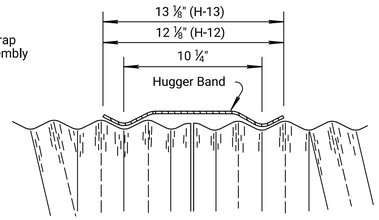


UNIVERSAL REFORMED END with
H-7 or H-10 HUGGER BAND

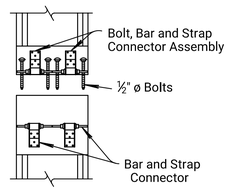
DETAILS FOR H-7 HUGGER BAND (12" thru 36")
or H-10 HUGGER BAND (12" thru 120")



CONNECTION DETAIL
SINGLE HARNESS



UNIVERSAL REFORMED END with
HUGGER BAND



CONNECTION DETAIL
DOUBLE HARNESS

DETAILS FOR H-12 or H-13 HUGGER BAND

Pipe Dia. Inches	Minimum Gauge of Round Pipe 2⅔" x ½" Corr. CSP or ACSP	3" x 1" Corr. CSP or ACSP	5" x 1" Corr. CSP or ACSP	2⅔"x ½" Corr. CAP	3" x 1" Corr. CAP
12"	14			16	
15"	14			16	
18"	14			16	
21"	14			16	
24"	14			16	
30"	14			14	
36"	14			14	16
42"	14			12	16
48"	12	14 16	14 16	12	16
54"	12	14 16	14 16	12	16
60"	10	14 16	14 16	10	16
66"	10	14 16	14 16	8	16
72"	10	14 16	14 16	8	16
78"	8	14 14	14 14		14
84"	8	14 14	14 14		12
90"		14 14	14 14		12
96"		12 12	12 12		12
102"		12 12	12 12		10
108"		12 12	12 12		10
114"		12 12	12 12		8
120"		10 10	10 10		8

Bid Designation Sq. Ft.	Pipe Dimension Span & Rise	Sq. Ft.	Equiv. Round Pipe Diameter	Minimum Gauge of Arch Pipe 2⅔"x ½" Corr. CSP or ACSP	3" x 1" Corr. CSP or ACSP	5" x 1" Corr. CSP or ACSP	2⅔"x ½" Corr. CAP	3" x 1" Corr. CAP
1.0	17" x 13"	1.1	15"	14			16	
1.5	21" x 15"	1.6	18"	14			16	
2.0	24" x 18"	2.2	21"	14			16	
2.5	28" x 20"	2.9	24"	14			14	
3.0 or 4.0	35" x 24"	4.5	30"	14			14	
5.0 or 6.0	42" x 29"	6.5	36"	14			12	
7.0 or 8.5	49" x 33"	8.9	42"	14			12	
10.0 or 11.0	53" x 41"	11.7	48"		14			
10.0 or 11.0	57" x 38"	11.6	48"	12			10	
12.5 or 14.0	60" x 46"	15.6	54"		14			14
12.5 or 14.0	64" x 43"	14.7	54"	12			10	
16.5	66" x 51"	19.3	60"		14			14
16.5	71" x 47"	18.1	60"	10			8	
21.0	73" x 55"	23.2	66"		14			14
21.0	77" x 52"	21.9	66"	8				
25.0	81" x 59"	27.4	72"		14	12		12
25.0	83" x 57"	26.0	72"	8				
32.0	87" x 63"	32.1	78"		12	12		12
36.0	95" x 67"	37.0	84"		12	12		12
42.0	103" x 71"	42.4	90"		12	12		10
47.0	112" x 75"	48.0	96"		12	12		8
54.0	117" x 79"	54.2	102"		10	10		
60.0	128" x 83"	60.5	108"		10	10		
67.0	137" x 87"	67.4	114"		10	10		
74.0	142" x 91"	74.5	120"		8	8		

GENERAL NOTE for METAL PIPE

Culvert "Type" listed may be CSP, ACSP, CAP, RCP, PVCP & PEP within guidelines of KDOT Pipe Policy for geographic location. More than one pipe "Type" may be acceptable for a design location with allowable types listed for each site.

There shall be no payment for gain in pipe length due to fit of pipe at connecting band.

When Hugger Bands are used, the H-7 Hugger Band may be used on circular pipes 36" diameter and smaller or pipe arches 42"x 29" and smaller. The H-10 Hugger Band may be used on 12" thru 120" pipe. The H-12 or H-13 Hugger Band are for pipe sizes larger than 36" diameter or 42"x29" arch pipe.

⊛ Pipe gauge listed in the tables on this sheet are minimum for E'=750 p.s.i. soil. Pipe gauge will be determined for each site based on the Design Manual Volume I- Part C Fill Height Tables and shall shall be listed in the Pipe Culvert Summary. Gauges shown on this Standard Drawing are KDOT minimum and may not be industry minimum gauge.

In geographic areas that allow CSP (24" or smaller arched or round pipe) for entrance and side road installation with less than 3,000 AADT, 16 gauge ACSP may be substituted for 14 gauge CSP.

Aluminum or aluminized pipes or end sections shall be coated with an asphaltic paint when in contact with fresh concrete in accordance with the Standard Specifications.

Note to Designer: KDOT Pipe Policy provides guidance in identifying the prohibited and/or restricted uses of CSP, ACSP, PEP, PVCP, CAP & RCP. Provide end sections of the same type and coating as the pipe. Exceptions to this are noted in the Standard Specifications. Refer to the KDOT Design Manual, Volume I (Part C), Road Section "Elements of Drainage & Culvert Design" for structural pipe design information which includes: corrugations, sizes, gauges, maximum/minimum fill heights and classes of pipe.

Plotted :13-DEC-2021 10:55

Drawn By : mrockwell
File : rd660.dgn

NO.	DATE	REVISIONS	BY	APP'D
4	9-10-09	Rev. Round and Arch tables, add. Alum.	S.W.K.	J.O.B.
3	1-20-09	Rev. Round Pipe Gauges	S.W.K.	J.O.B.
2	4-1 8-08	Rev. layout, details, tables and notes	S.W.K.	J.O.B.
1	4-27-98	Added pipe corrugation option note	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

METAL END SECTION FOR ROUND & ARCH METAL CULVERTS (TYPE I) & PIPE GAUGE TABLES

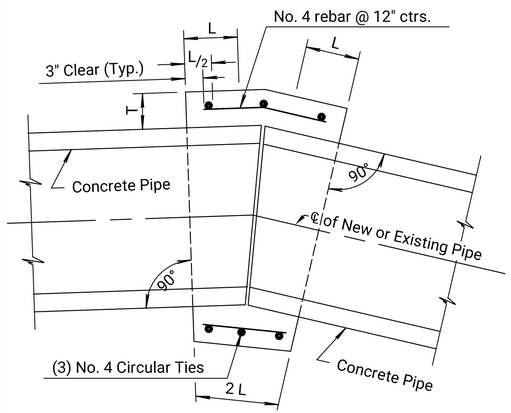
RD660

FHWA APPROVAL 12-16-09		APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. King

KDOT Graphics Certified 03-29-2018

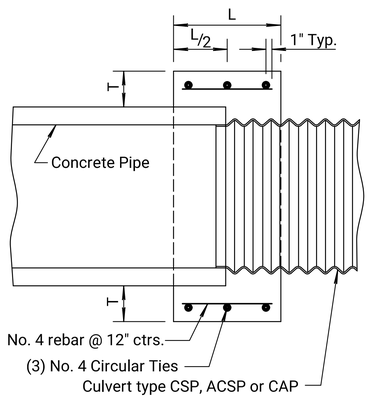
Sh. No. 13

KDOT Graphics Certified



PIPE COLLAR AT CHANGE IN ALIGNMENT

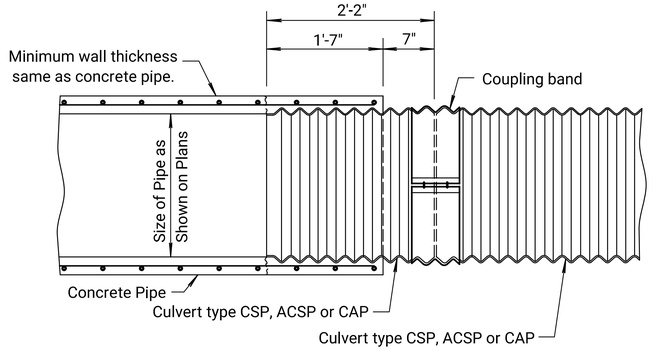
TYPE A COLLAR



PIPE COLLAR AT CHANGE IN PIPE MATERIAL

TYPE B COLLAR

CONCRETE PIPE COLLAR		
Pipe Dia.	L	T
18"	1'-0"	6"
24"	1'-0"	6"
36"	1'-6"	8"
48"	1'-6"	10"
60"	1'-9"	11"

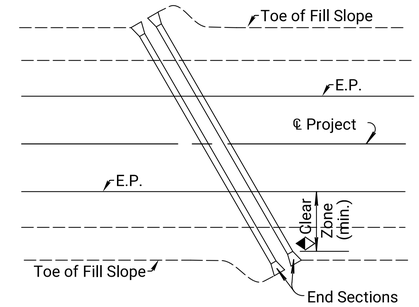


(CONCRETE PIPE CONNECTED TO CORRUGATED METAL PIPE)

TYPE C COLLAR ⚠

⚠ A section of concrete pipe (6'-0" min.) is cast 1'-7" short with the re-steel protruding. Tack weld the re-steel to the 2'-2" section of CMP and finish casting the remaining 1'-7" of RCP around the CMP. This is an approved connection provided it is fabricated as an integral part of a section of concrete pipe.

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	14	51



PLACEMENT OF ROTATED PIPES

RELATIVE TO FILL SLOPE

AND CLEAR ZONE

♦ Pipe culverts 2'-0" or less in height may terminate within the clear zone with Type I or Type III End Section. Any size pipe may terminate within the clear zone with a Type IV End Section.

General Notes:

Pipe collar shall be used to join pipes of different diameters or materials or where change in alignment or grade exceeds that allowed for ordinary joints.

All concrete shall be Concrete Grade 3.0. All reinforcing steel shall be Grade 60 and shall have a minimum of 2" of cover.

The diameter of the circular ties shall be the outside diameter of the larger pipe plus "T".

The maximum allowable distance between the ends of the pipes at any point is 2".

All labor, materials and incidentals required to construct the pipe collar Type A, B or C shall not be paid for directly but shall be subsidiary to the individual pipe bid items.

Aluminum or aluminized pipes or end sections shall be coated with an asphaltic paint when in contact with fresh concrete in accordance with the Standard Specifications.

Pipe ends shall be trimmed such that the maximum distance between pipes at any point is 2".

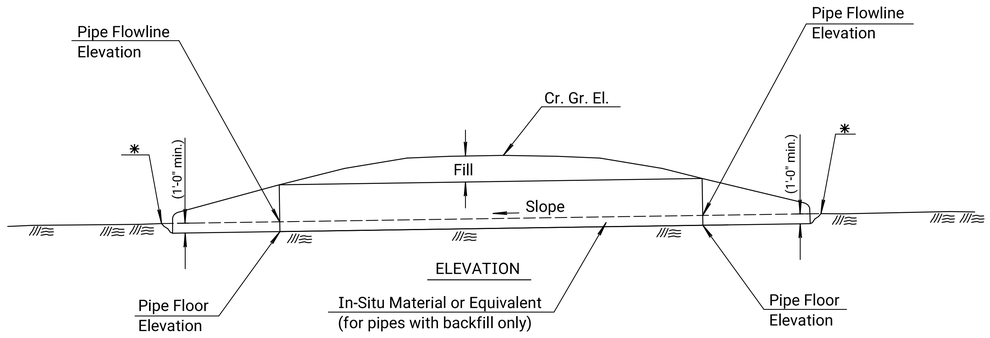
PIPE COLLARS

GENERAL NOTE

For pipes where the height or rise is greater than 4'-0" place uncompacted backfill through the pipe, including the end sections, 1'-0" (Min.). Backfill material will be reasonably free of organic material. In-situ material may be used for backfill as approved by the Engineer.

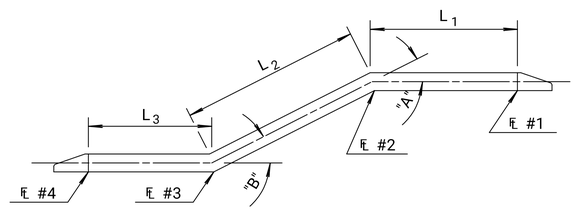
For pipes where the height or rise is less than or equal to 4'-0" install the pipe such that embedment will occur through natural sedimentation. See Pipe Embedment detail shown on this sheet.

Work and material for embedding pipes will not be paid for directly, but will be Subsidiary to the other pipe bid items in the contract.



PIPE EMBEDMENT

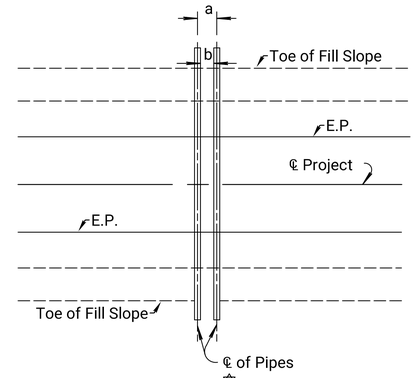
✳Natural channel or ditch flowline elevation. See profile sheets and cross sections for details.



Sketch Along ℄ CRP (CMP)

Broken-Back

SUMMARY OF BROKEN BACK PIPES											
STATION	SIZE	FLOW LINES				LENGTH			ANGLES		REMARKS
		#1	#2	#3	#4	L_1	L_2	L_3	A	B	



a = Face width of end section ✡ + 1'.

✡ Face width is equal to the following dimension shown on the end section std. drawing.

Type I Concrete = D

Type III Concrete = I

Type I CM = W+ 2A

Type III CM = G

Type IV = W+ 2A

b = Pipe diameter or span (3' min.)

Spacing shall be equal to the larger of dimensions a or b.

Spacing for three or more pipes shall be determined using a similar method.

MULTIPLE PIPE SPACING

NO.	DATE	REVISIONS	BY	APP'D
6	1-21-16	Added Details, Pipe Embedment	T.T.R.	S.W.K.
5	5-17-13	Rev. Dimension, Type B Collar	S.W.K.	J.O.B.
4	4-18-08	Added asphaltic paint note	S.W.K.	J.O.B.
3	1-28-05	Changed Class to Grade concrete	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

MISCELLANEOUS
PIPE CULVERT DETAILS

RD668

FHWA APPROVAL	3-16-16	APP'D. SCOTT W. KING	
DESIGNED	DETAILED KAHLE	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK. RHOADS	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 03-12-2018 Sh. No. 14

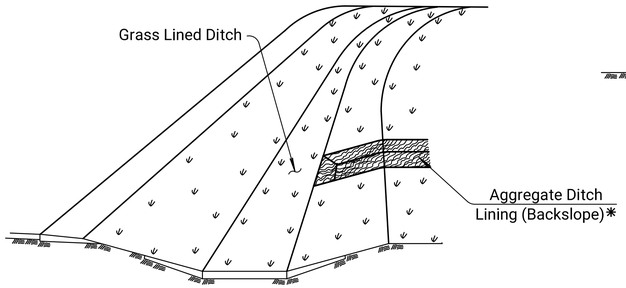
KDOT Graphics Certified

Plotted :13-DEC-2021 10:55

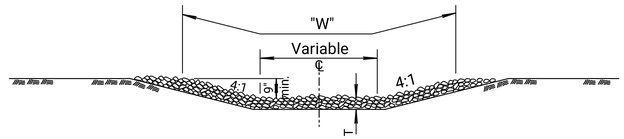
Drawn By : mrockwell

File : rd668.dgn

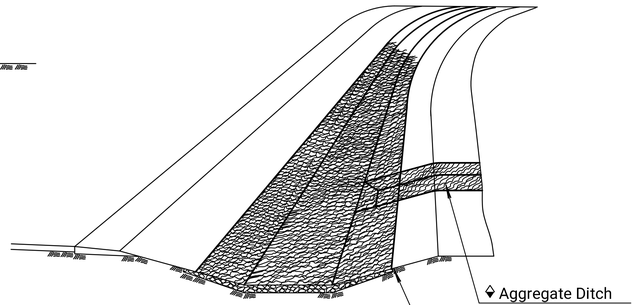
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	15	51



PERSPECTIVE VIEW
(Backslope Dt. Lining without Highway Dt. Lining)



CROSS SECTION (Backslope)



Where select soil is specified adjust slopes to match edge of aggregate lining.

PERSPECTIVE VIEW

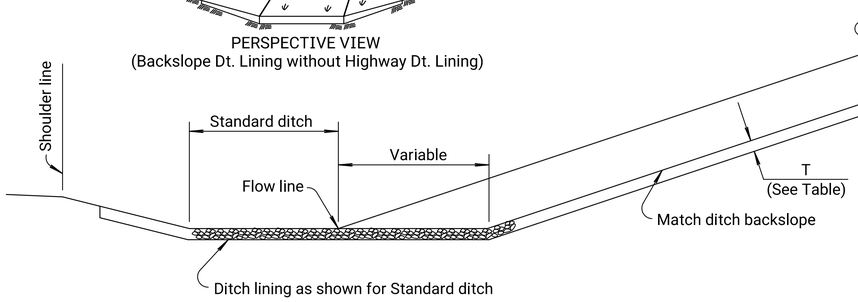
GENERAL NOTE

All work and materials required for this construction shall be paid for by the ton of "Aggregate Ditch Lining (D_{50})".

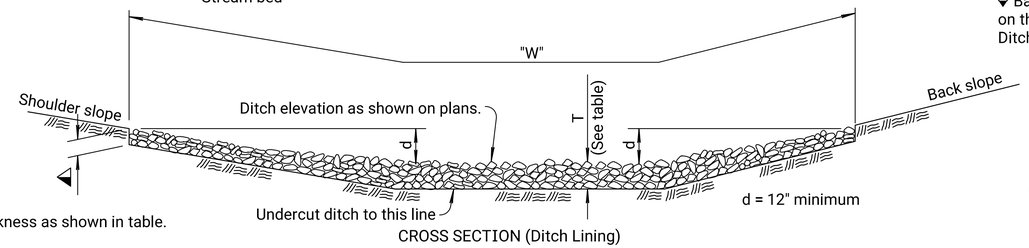
Dumped aggregate shall be spread in reasonable conformity with the ditch section as shown and as directed by the Engineer.

Aggregate Ditch Lining shall be measured and paid for by the ton in the vehicle at the location designated by the Engineer and shall be full compensation for excavation for undercutting, furnishing, hauling, placing and maintaining the material as specified to complete the work.

The weight of the aggregate is based on a standard density of 120 PCF. When the standard density of the material is more or less than 120 PCF, the thickness may vary correspondingly.



LONGITUDINAL SECTION (Backslope)



Feather edges to nominal thickness as shown in table.

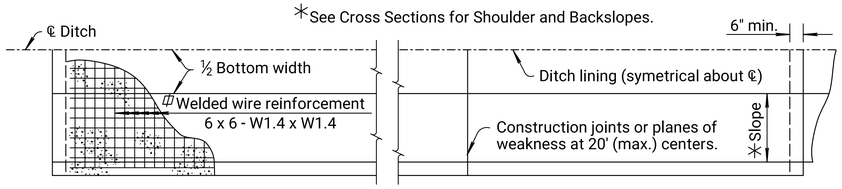
CROSS SECTION (Ditch Lining)

◆ Backslope aggregate ditch lining, constructed as indicated on this sheet, shall be paid for by the ton of "Aggregate Ditch Lining (D_{50})."

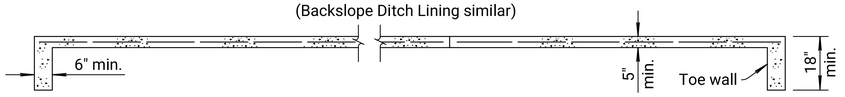
			QUANTITIES FOR TYPICAL 10' DITCH with 6:1 shoulder slope & 4:1 backslope			
D_{50}	T	◭	Approx. Excavation per Station (cu.yd.)			
			d = 1.0	d = 2.0	d = 3.0	d = 4.0
◔ 4"	12"	8"	68	99	130	161
6"	18"	12"	102	148	195	241

Note: Quantities provided for information only.
◔ Aggregate larger than 4 inches (D_{50}) should not be used within the clear zone.

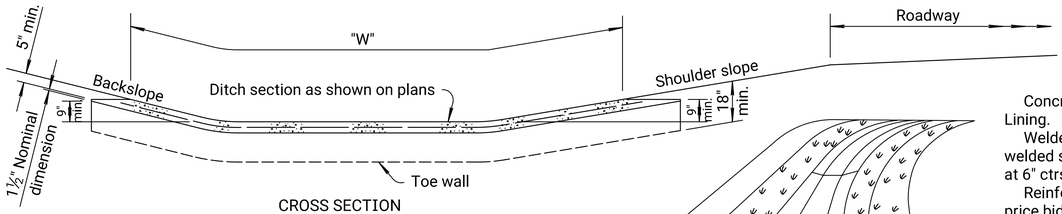
AGGREGATE DITCH LINING (D_{50})



HALF PLAN
(Backslope Ditch Lining similar)



LONGITUDINAL SECTION



CROSS SECTION

GENERAL NOTE

Concrete Grade 3.0 shall be used in Concrete Ditch Lining.

Welded wire reinforcement shall be of the electrically welded square mesh type with No. W1.4 wires spaced at 6" ctrs. each way.

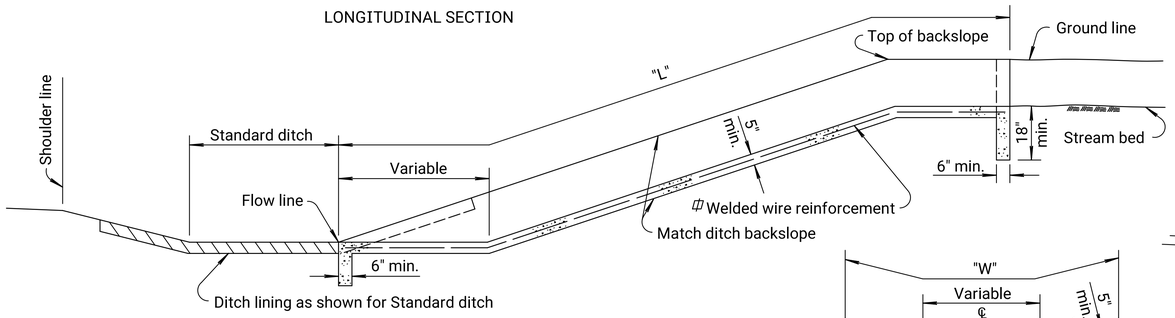
Reinforcement as shown is included in the unit price bid for "Concrete Ditch Lining".

Measurements of Concrete Ditch Lining shall be in sq. yds. of outside surface area. Add 1'-6" times "W" for each toewall.

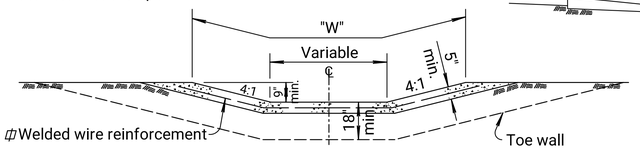
The exact location and dimensions may be adjusted, if required, by the Engineer at the time of construction.

Longitudinal construction joints may be constructed at the Contractor's option.

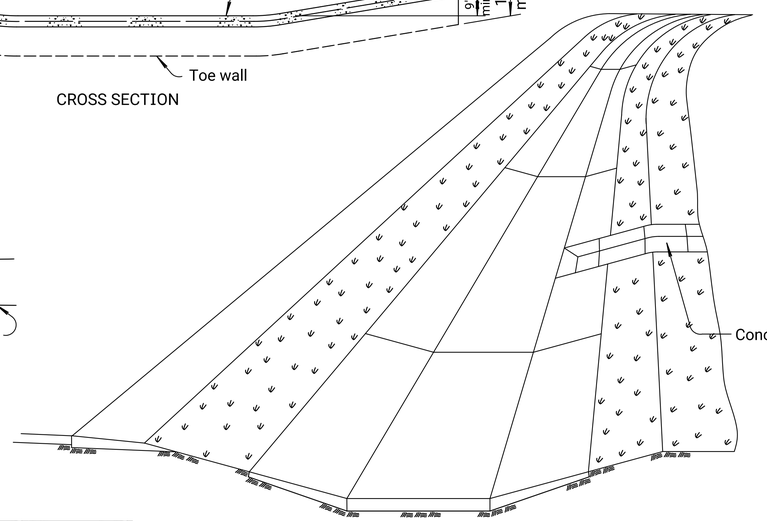
◬ Welded wire can be substituted with macro fiber reinforcement. See Standard Specifications for macro fiber and application rate requirements



LONGITUDINAL SECTION (Backslope)



CROSS SECTION (Backslope)



PERSPECTIVE VIEW

CONCRETE DITCH LINING

NO.	DATE	REVISIONS	BY	APP'D
10	3-27-18	Added Aggregate Size in Clear Zone Guidance	A.L.R.	T.T.R.
9	8-1-12	Revised General Note	S.W.K.	J.O.B.
8	3-20-08	Rev. agg. edge thickness and quant.	S.W.K.	J.O.B.
7	11-07-07	Revised aggregate to 120 PCF	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

DITCH LINING

RD502

FHWA APPROVAL	6-19-18	APP'D. SCOTT W. KING	
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

Sh. No. 15

Plotted :13-DEC-2021 10:55
Drawn By : mrockwell
File : rd502.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	130563.00	2021	16	51

SUMMARY OF QUANTITIES

ITEM / LOCATION	Excavation Class 1	Concrete (Grade 4.0) (AE)(SA)	Reinforcing Steel (Grade 60) (Epoxy Coated)	Reinforcing Steel (Grade 60)	Structural Steel AASHTO M270 (Gr.50WT3)	Structural Steel ASTM A709 (Gr.50W)	Structural Steel ASTM A709 (Gr.36) (Galv.)	Galvanized Corrugated Metal Sheet Piling	Concrete Pavement (10" Unif.) (AE)(BR APP)	Bridge Approach Slab Footing	Piles (Steel) (HP10x42)	Cast Steel Pile Points	Abutment Aggregate Drain	Slope Protection (Riprap Stone)	Pre-Drilled Pile Holes
	Cu. Yds.	Cu. Yds.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lin. Ft.	Sq. Yds.	Cu. Yds.	Lin. Ft.	Each	Cu. Yds.	Cu. Yds.	Lin. Ft.
Abutment No. 1	63.50							1,436.10			320.80	15	34.70	119.40	49.00
Abutment No. 2	64.00							1,400.70			313.10	15	34.10	112.30	49.00
Substructure	127.50						1,440		83.80	26.70		30	68.80		
Superstructure		41.70	12,310		22,730	2,730									
Total	127.50	41.70	12,310		22,730	2,730	1,440	2,836.80	83.80	26.70	633.90 †	30	68.80	231.70	98.00

† Summary of Piling
Abutment No. 1 - 1 @ 37.0' (Pile Cap)
5 @ 22.2' (Piles)*
Wing (Southwest) - 1 @ 14.3' (At End)
1 @ 15.1'
1 @ 15.9'
1 @ 16.7'
1 @ 24.4' (At Abutment No. 1)*
Wing (Southeast) - 1 @ 14.3' (At End)
1 @ 15.1'
1 @ 15.9'
1 @ 16.7'
1 @ 24.4' (At Abutment No. 1)*
Abutment No. 2 - 1 @ 37.0' (Pile Cap)
5 @ 21.9' (Piles)*
Wing (Northwest) - 1 @ 13.3' (At End)
1 @ 14.3'
1 @ 15.2'
1 @ 16.2'
1 @ 24.1' (At Abutment No. 2)*
Wing (Northeast) - 1 @ 13.3' (At End)
1 @ 14.3'
1 @ 15.2'
1 @ 16.2'
1 @ 24.1' (At Abutment No. 2)*

* Pre-drill piles to Elev. 854.00

LRFR RATING FACTORS

Truck / Rating Level	Inventory	Operating
HL-93 Loading	1.19	1.54
NRL	1.22	1.58
2008 Manual for Bridge Evaluation		

LFD RATING FACTORS

Truck / Rating Level	Inventory	Operating
H20 (20T)	1.77	2.96
Type 3 (25T)	1.70	2.85
HS20 (36T)	1.31	2.20
Type 3S2 (36T)	1.86	3.10
Type 3-3 (40T)	2.06	3.44
NRL (40T)	1.09	1.83
2002 LFD Rating. 17th Edition AASHTO		

GENERAL NOTES

TEMPERATURE: The design temperature for all dimensions is 60° F.

CONCRETE: Concrete Grade 4.0 (AE)(SA) shall be used throughout. Bevel all exposed edges with a 3/4" triangular molding unless otherwise noted.

SLAB CURING: No traffic shall be permitted on the deck surface until the wet curing period is complete. operations necessary to complete placement of the deck may be permitted for a minimum practical time as noted in the Standard Specifications.

CONSTRUCTION LOADS: Limited traffic is permitted on the new deck during the curing period, keep any exposed deck wet during the curing period. See KDOT Specifications Section 710 Tables 710-1 & 710-2 for additional information. Construction loads on the 8 1/2" deck will be limited to loads approved by the Engineer.

REINFORCING: All dimensions in Bending Diagrams are out to out of bar. All other dimensions relative to reinforcing steel are to ℄ of bar unless otherwise noted. All reinforcing steel shall be Grade 60 (Epoxy Coated).

STRUCTURAL STEEL: Beams shall meet the requirements for AASHTO M270 Grade 50WT3. Stiffeners and diaphragms shall meet the requirements for ASTM A709 Grade 50W.

PAINTING TOP FLANGES: Apply a 3 mil primer coat of an approved inorganic zinc primer to the tops of the top flanges after all welding is complete.

BOLTS: All bolts, nuts and hardened flat washers shall conform to the heavy hex structural requirements of ASTM A325, Type 3, and KDOT Specifications unless otherwise noted. Direct Tension Indicators (DTIs) are to comply with the requirements of the latest edition of ASTM F959. This work is subsidiary to the bid item, "Structural Steel".

In lieu of using DTI's, the Contractor may, at his option, use the turn of the nut method for tightening bolts.

BOLTED CONNECTIONS: Girder Connections: Use 3/4" diameter heavy hex structural bolts for the member connections. Use 13/16" diameter bolt holes. Do not ream during field erection. Accurately align all connections by driving 13/16" diameter drift pins in all corners. See KDOT Specifications.

WELDING: Material and construction shall conform to KDOT Specifications. Welding requires approved procedures and welders.

OPTIONAL CONNECTIONS: Connect beam diaphragm connections with high strength bolted connections or welded connections at the option of the Contractor. Include details of the proposed connections in the shop drawings. If welded connections are used, all welds shall be 5/16" fillet welds. The structural steel quantities shown on the plans are based on the bolted connections. The structural steel pay quantity will be the quantity shown on the plans regardless of the type of connection used or of any approved modifications to the connection details.

DIMENSIONS: All dimensions shown on the design plans are horizontal dimensions unless otherwise noted. Make necessary allowances for roadway grade and cross slope.

SLOPE PROTECTION: Place Slope Protection (Riprap Stone) to the limits and thicknesses shown on the plans or as directed by the Engineer. Use "Light 24" Stone for Riprap" as described in KDOT Specifications Section 1114 placed to the limits shown on the plans. Place geotextile fabric under full extent of slope protection at both abutment embankments. See the "Bridge Berm and Slope Protection" Sheet (BR132B) for details.

REMOVAL OF EXISTING STRUCTURE: Removal of existing structure is included in the bid item, "Removal of Existing Structure", Lump Sum. All materials removed from the existing structure shall become the property of the Contractor except for guardrail, signs or object markers. Place the salvaged material in the R/W area to be picked up by the County. Remove all other materials from the site.

BACKFILL COMPACTION: Compact backfill at the abutments.

PILING: Driving shall stop when, in the opinion of the Engineer, additional driving may damage the piling. Drive all piling to the Pile Driving Formula Load of:
Abutment No. 1: 49.6 Tons
Abutment No. 2: 49.6 Tons
As a minimum drive each pile to the load and penetration, but in no case shall the pile be driven to more than 110% of Pile Driving Formula Driving Load. At any location where problems are experienced, pile damage is suspected, or the Pile Driving Formula Load occurs significantly above the design pile tip elevation, the Engineer may request that the Pile Driving Analyzer (PDA) equipment be used. Piles shall extend a minimum of 10' below the streambed. If refusal is encountered before 10', pile locations shall be pre-drilled to the minimum depth according to KDOT Specifications. Payment for any necessary pre-drilling will be negotiated between Contractor and the County. Length of pile is estimated from subsurface investigation performed at the project site.

PILING SPLICE LOCATION: Integral pile splice locations and weld testing criteria for Abutments No. 1 & 2 will follow the "Standard Pile Details" Sheet (BR110).

PAINTING: Blast clean all surfaces of all weathering steel, including all contact surfaces of bolted connections, to meet SSPC-SP6 Specifications (latest Revision). Blast clean to meet SSPC-SP10 Specifications and prime coat the ends of the beams within 5' of the bearings, including the abutment diaphragms, in accordance with KDOT Specifications.

STEEL PROTECTIVE COATINGS: Steel at the abutments and wings, including piling, pile cap, and miscellaneous steel, shall be galvanized. Areas to be welded shall have galvanizing removed or may be left ungalvanized, and then galvanized in the field after welding using the zinc alloy stick method. Any galvanizing damaged in the field shall be repaired using the same method.

QUANTITIES: Items not listed separately in the Summary of Quantities are subsidiary to other items in the proposal.

DESIGN DATA

DESIGN LOADING: HL-93 A.A.S.H.T.O. Specifications, 2014 Edition and latest Interim Specifications, Load and Resistance Factor Design.

LOADING:
Live Load - HL-93

UNIT STRESSES:

Concrete Grade 4.0(AE)	f'c = 4.0 ksi
Concrete Grade 4.0(AE)(SA)	f'c = 4.0 ksi
Reinforcing Steel (Grade 60)	fy = 60,000 psi
Reinforcing Steel (Grade 60)(Epoxy Coated)	fy = 60,000 psi
Structural Steel ASTM A709M Gr. 36 (Galvanized)	fy = 36 ksi
Structural Steel ASTM A709 Gr. 50W	fy = 50 ksi
Structural Steel AASHTO M270 Gr. 50WT3	fy = 50 ksi

ABUTMENT TOTAL LOAD:
The total reactions from the combined superstructure dead and live loading are as follows:
Strength I = 495.8 kips or 247.9 tons per abutment

NUT ROTATION FROM THE SNUG FIT CONDITION

Bolt Length ◔	Rotation
Up to and including 4 bolt diameters	1/3
Over 4 bolt diameters to 8 bolt diameters	1/2
Over 8 bolt diameters to 12 bolt diameters	2/3

◔ Length from the underside of the bolt head to end of the bolt.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. F-46 Sta. 50+00.00
GENERAL NOTES & QUANTITIES
BRIDGE F-46 REPLACEMENT
166th STREET OVER HOG CREEK
Proj. No. 130563.00 Leavenworth Co.

SHEET NO. 16 OF 51	SCALE	APP'D	
DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN. CK.	CADD CK.

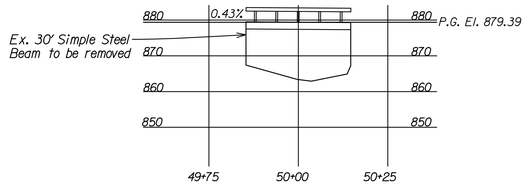
Plotted By: mrockwell | Plot Location:
File: 01-Gen Notes.dgn
Plot Date: 13-DEC-2021 10:55

CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	130563.00	2021	17	51

P.T. CL Sta. 46+00.00
N 300,655.311, E 2,173,474.528

P.T. CL Sta. 54+00.00
N 301,454.875, E 2,173,448.100



EXISTING WATERWAY OPENING
346 S.F. OPENING AREA

Utility Owners:

Power
Evergy
(800) 778-9140

Gas
Atmos Energy
(866) 322-8667

Telephone
ATT Distribution
(800) 778-9140

Sewer
City of Basehor
(800) 778-9140

Water
Suburban Water
913-724-1800

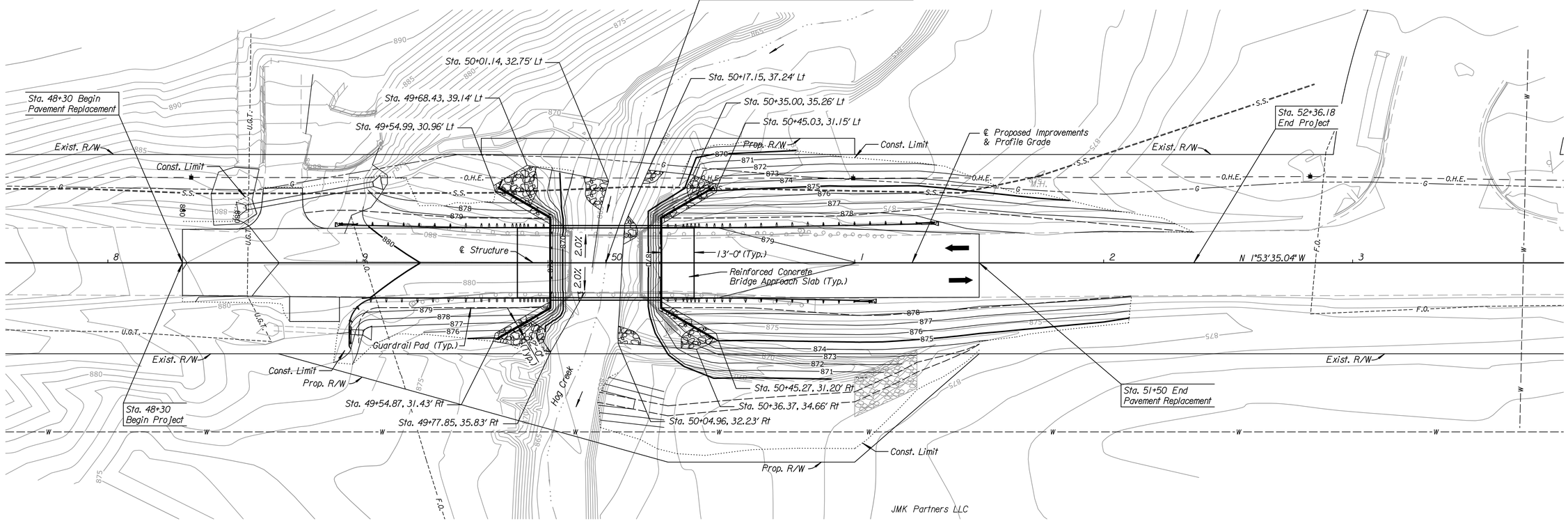
Fiber
MIDCO
(785) 423-3411

Nicholas R Langley

SE 1/4, SEC 4, T11S, R22E

Mid America Investments

Sta. 50+00.00
Remove Exist. 28' Simple Beam Span
Install 45' Simple Steel Beam Span (SBMS) on Pile Bent Abutments, 28' Roadway, No Skew



SW 1/4, SEC 3, T11S, R22E

JMK Partners LLC

PLAN

SCALE
20' 0 20' 40'

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. F-46 Sta. 50+00.00
CONTOUR MAP
BRIDGE F-46 REPLACEMENT
166th STREET OVER HOG CREEK
Proj. No. 130563.00 Leavenworth Co.

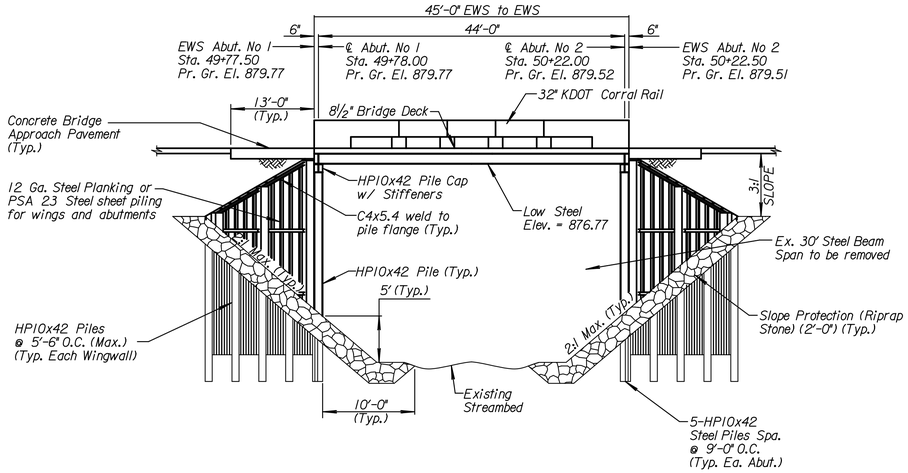
SHEET NO. 17 OF 51	SCALE	APP'D	
DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN. CK.	CADD CK.

CADconform Certify This File
Sh. No. 17

Plotted By: mrockwell | Plot Location:
File: 02-Contour Map.dgn
Plot Date: 13-DEC-2021 10:55

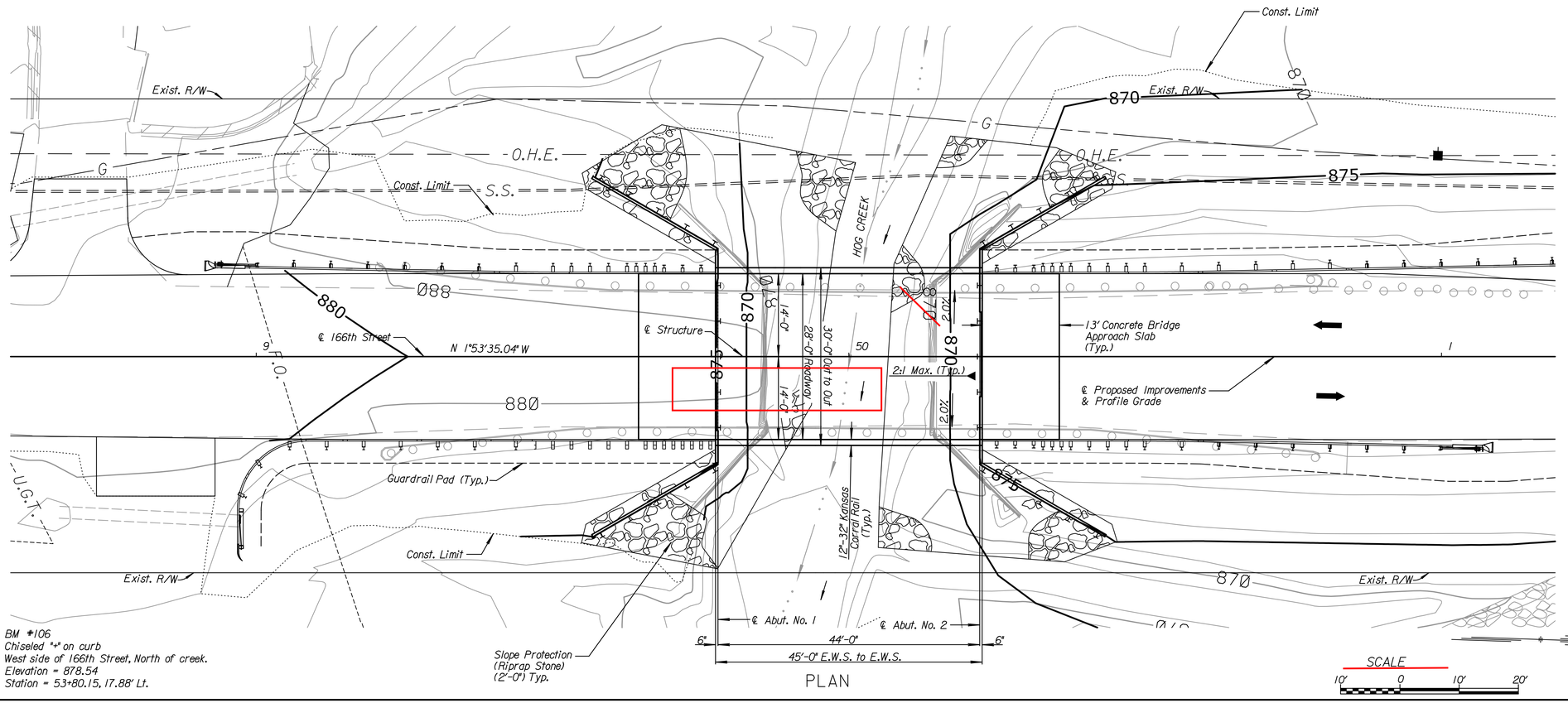
CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	130563.00	2021	18	51



ELEVATION

45' Simple Span Steel Beam (SBMS)
Pile Bent Abutments
28' Roadway, No Skew



PLAN

SCALE
10' 0 10' 20'

DRAINAGE DATA

Local Drainage Area	3.74	Sq.Mi.
Design Frequency	25	Yr.
Design Discharge (Q_{25})	3,560	cfs
Design Highwater Elevation	876.6	Ft.
Design Backwater	0.92	Ft.
Change in Backwater	-1.27	Ft.
Design Backwater Elevation	876.6	Ft.
Overtopping Elevation (Sta.47+92.56)-	881.0	Ft.
Overtopping Discharge	8,040	cfs
Overtopping Frequency	500	Yr.
Discharge at Q_{100}	5,370	cfs
Backwater at Q_{100}	1.65	Ft.
Change in Backwater at Q_{100}	-1.36	Ft.
Backwater Elevation at Q_{100}	879.3	Ft.
Ordinary Highwater Elevation	878.0	Ft.
Total Waterway Provided	460.9	Sq.Ft.
Design Waterway Provided (Q_{25})	405.8	Sq.Ft.
Average Velocity at Q_{25}	9.4	fps
Average Velocity at Q_{100}	12.8	fps
Overflow Q_{25} (3% of Q_{total})	106.8	cfs

Historic Highwater Elevation is reported to be no higher than the banks adjacent to the structure. This was reported to the surveyor by a local resident with knowledge of the area.

FEMA Flood Insur. Rate Map Leavenworth County, 7/16/2015 Zone A at Bridge Site. Community Panel 200186 0103 G Map No. 20103C0103G

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. F-46 Sta. 50+00.00

CONSTRUCTION LAYOUT
BRIDGE F-46 REPLACEMENT
166th STREET OVER HOG CREEK

Proj. No. 130563.00 Leavenworth Co.

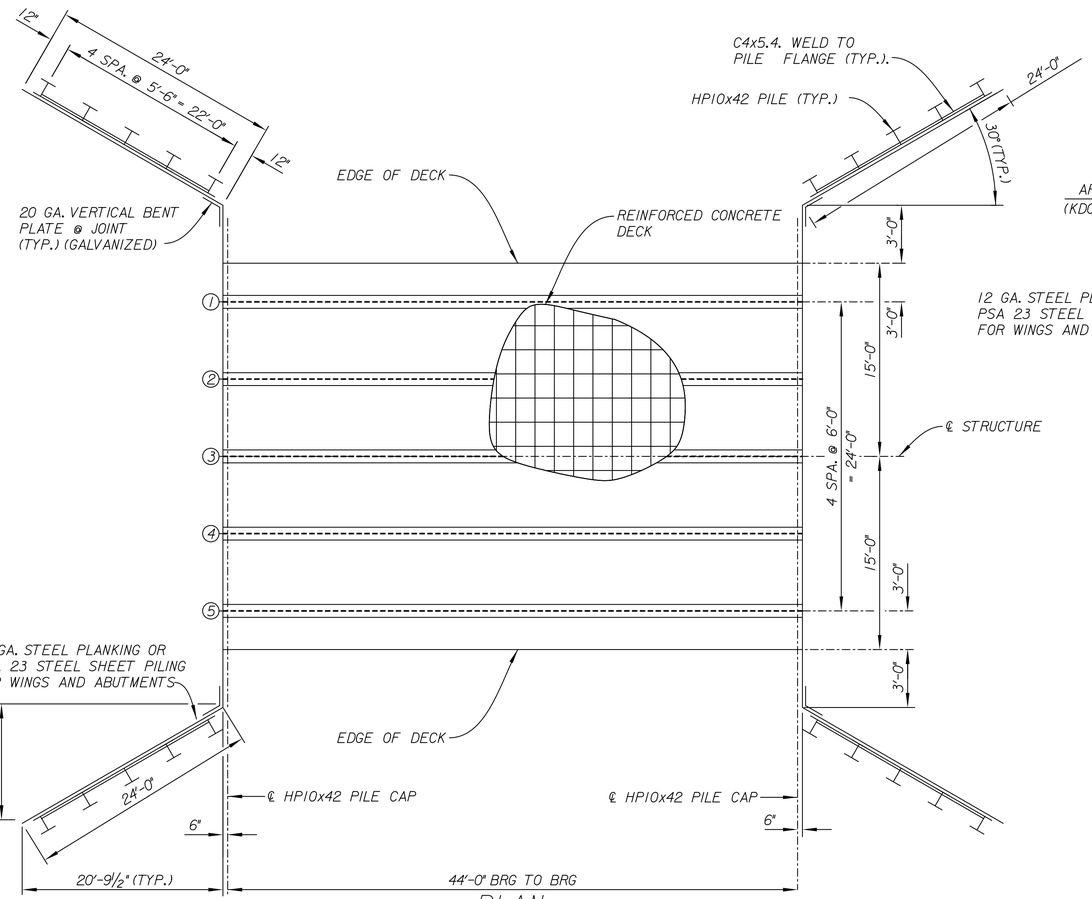
SHEET NO. 18 OF 51	SCALE	APP'D	
DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN. CK.	CADD CK.

Sh. No. 18

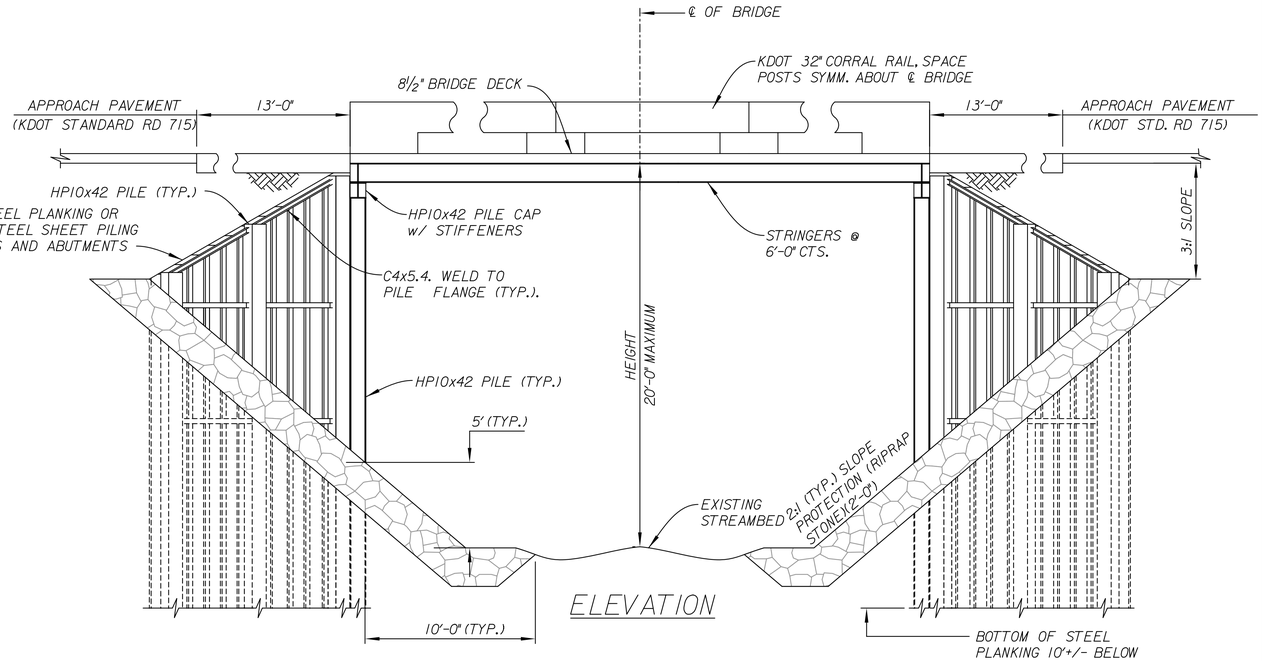
Plot Location:
Plotted By: mrockwell
File: 03-Construction Layout.dgn
Plot Date: 13-DEC-2021 10:55

CADconform Certify This File

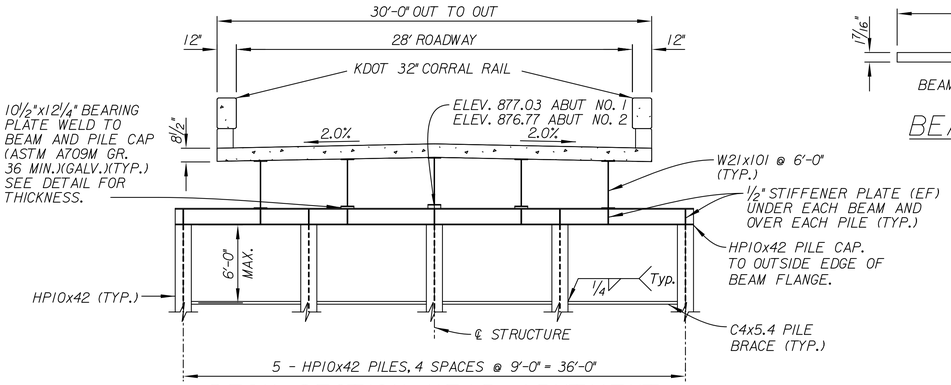
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	130563.00	2021	19	51



PLAN

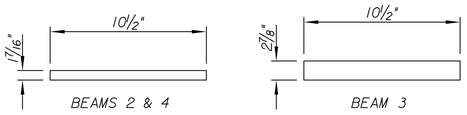


ELEVATION

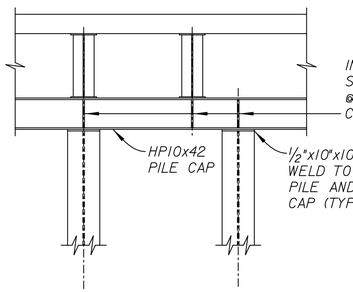


DECK SECTION NEAR ABUTMENT

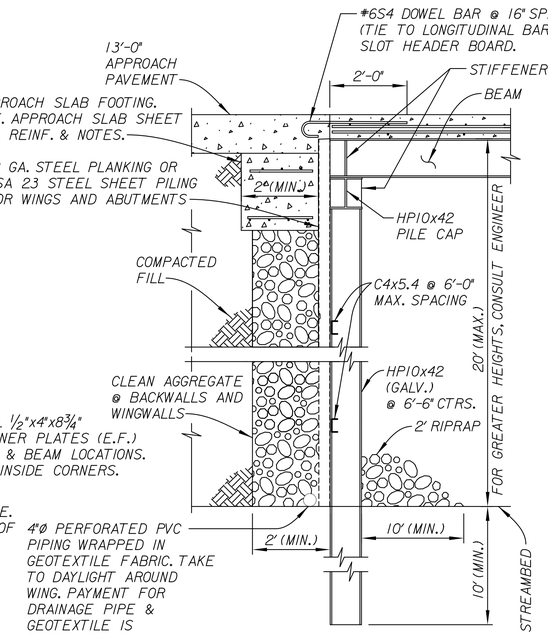
ABUTMENT SHEET PILING NOT SHOWN FOR CLARITY



BEARING PLATE DETAIL



STIFFENER DETAIL



NOTE:
DRIVE PILES TO REFUSAL.

ABUTMENT DETAIL

GENERAL NOTES:

ALL ABUTMENT AND WING STEEL USED SHALL BE ASTM A709M GR. 36 (MINIMUM)(GALVANIZED).

STEEL STIFFENERS SHALL USE A 1/4" FILLET WELD (ALL AROUND).

STEEL ABUTMENT PILING SHALL BE DRIVEN TO REFUSAL OR TO TWICE THE REQUIRED BEARING VALUE, BUT NOT LESS THAN 10'-0" BELOW STREAMBED. DRIVE WING PILES TO 10' BELOW FLOWLINE.

STEEL WINGWALL PILES SHALL BE HP10x42 AT 5'-6" CENTERS AS SHOWN. FOR HEIGHTS GREATER THAN 20'-0", CONSULT ENGINEER.

CONCRETE DECK AS SHOWN. 4,000 PSI MIN. (AE)(SA).

ALL REINFORCING STEEL TO BE GRADE 60 (EPOXY COATED).

PAINT AND GALVANIZING: PRIME END OF BEAMS AND ABUTMENT DIAPHRAGMS. GALVANIZE ALL STEEL AT THE ABUTMENTS AND WINGS. SEE GENERAL NOTES SHEET.

NOTE:

E.F. = EACH FACE.
STEEL PILES SHALL BE FIELD SPLICED AS REQUIRED PER KDOT STANDARDS.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. F-46 Sta. 50+00.00

SITE DETAILS
BRIDGE F-46 REPLACEMENT
166th STREET OVER HOG CREEK

Proj. No. 130563.00 Leavenworth Co.

SHEET NO. 19 OF 51	SCALE	APP'D	
DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN. CK.	CADD CK.

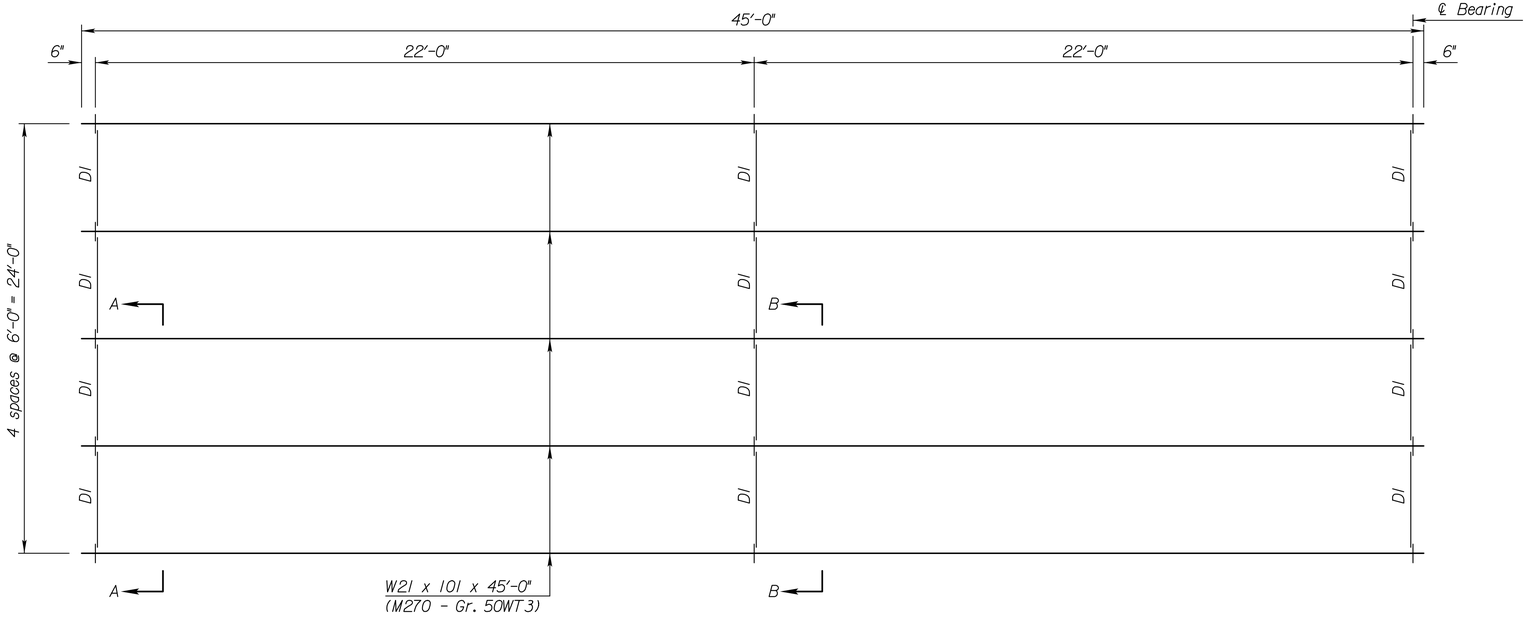
CADconform Certify This File

Sh. No. 19

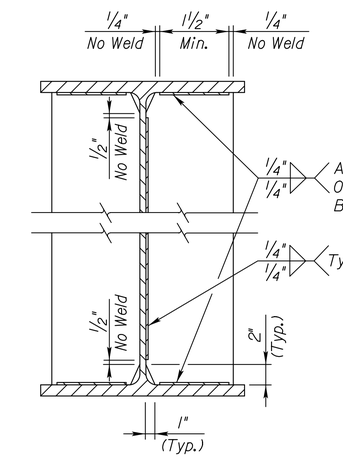
Plotted By: mrockwell | Plot Location:
File: 04-Site Details.dgn
Plot Date: 13-DEC-2021 10:55

CADconform Certify This File

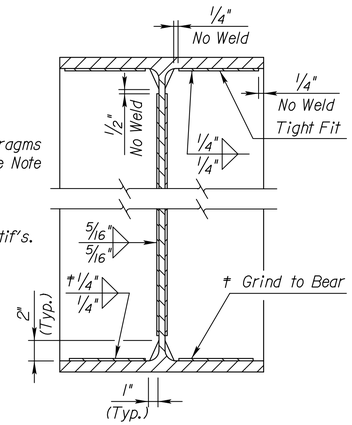
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	130563.00	2021	20	51



FRAMING PLAN



INTERMEDIATE STIFFENER DETAIL



BEARING STIFFENER WELD DETAILS

GENERAL NOTES

DESIGN: HL-93, AASHTO Specifications, 2014 Edition, and latest Interim Specifications, Load and Resistance Factor Design.

STRUCTURAL STEEL: Beams shall meet the requirements for AASHTO M270 Grade 50WT3. Stiffeners and diaphragms shall meet the requirements for ASTM A709 Grade 50W.

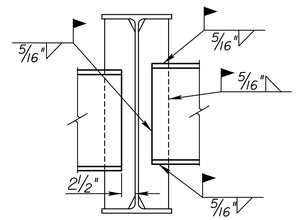
PAINTING TOP FLANGES: Apply a 3 mil primer coat of an approved inorganic zinc primer to the tops of the top flanges.

PAINT: Prime coat steel within 5' of bearing including abutment diaphragm.

WELDS: All welds shall be 1/4" fillet welds unless otherwise noted.

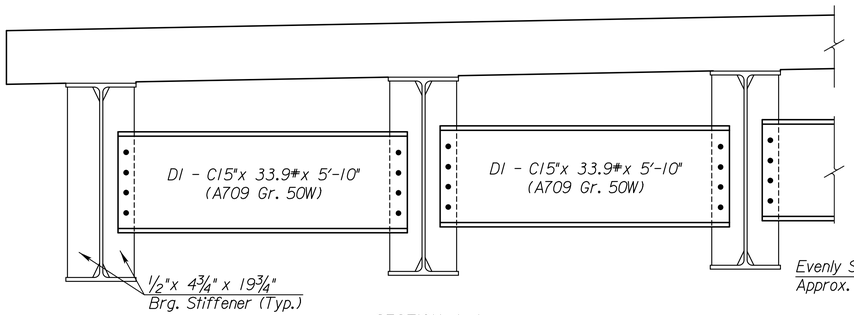
TIGHT FIT: Tight fit is defined as at least 75% of the stiffener shall be in direct contact with the flange for bearing stiffeners. Tight fit is defined as a maximum permissible gap of no more than 1/16" between the stiffener and the flange for an intermediate stiffener.

NOTE: See "Summary of Quantities and General Notes" sheet for additional notes.

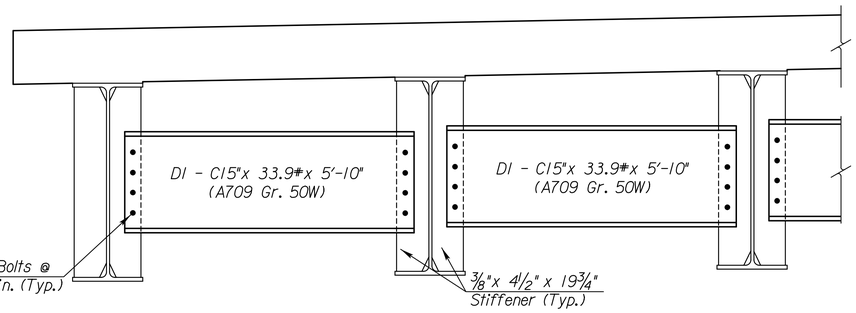


OPTIONAL WELDED CONNECTION

SUMMARY OF QUANTITIES		
	Structural Steel	
	A709 Gr. 50W Lbs.	M270 Gr. 50WT3 Lbs.
Beams		22,730
Diaphragms	2,380	
Stiffeners	100	
Bearing Stiffeners	270	
Totals	2,750	22,730



SECTION A-A



SECTION B-B

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. F-46 Sta. 50+00.00

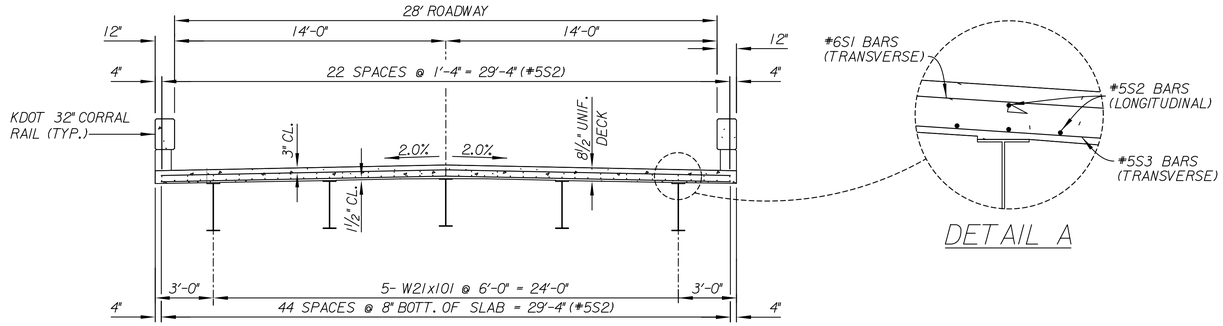
STEEL DETAILS
BRIDGE F-46 REPLACEMENT
166th STREET OVER HOG CREEK

Proj. No. 130563.00 Leavenworth Co.

SHEET NO. 20 OF 51	SCALE	APP'D	
DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN. CK.	CADD CK.

Plotted By: mrockwell | Plot Location:
File: 05-Steel Details.dgn
Plot Date: 13-DEC-2021 10:55

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	130563.00	2021	21	51



SLAB SECTION

DETAIL A

GENERAL NOTES:

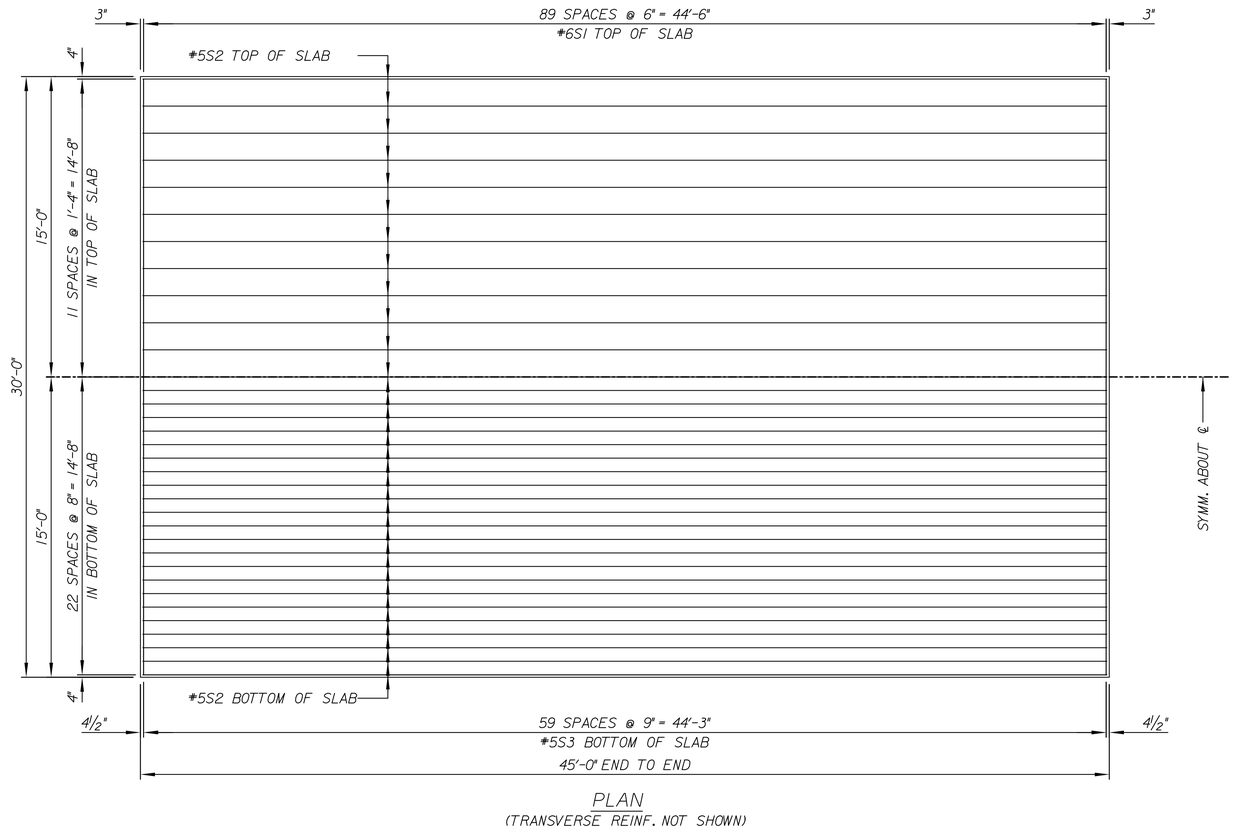
DESIGN: HL-93, AASHTO SPECIFICATIONS, 2014 EDITION AND LATEST INTERIM SPECIFICATIONS, LOAD AND RESISTANCE FACTOR DESIGN.

UNIT STRESSES: CONCRETE 4.0 (AE)(SA) f'c = 4,000 PSI, REINFORCING STEEL fy = 60,000 PSI.

CONCRETE: CONCRETE 4.0 (AE)(SA) SHALL BE USED THROUGHOUT. BEVEL ALL EXPOSED EDGES WITH 3/4" TRIANGULAR MOLDING UNLESS OTHERWISE NOTED.

REINFORCING: ALL DIMENSIONS IN BENDING DIAGRAMS ARE OUT TO OUT OF BAR. ALL OTHER DIMENSIONS RELATIVE TO REINFORCING STEEL ARE TO ℄ OF BARS UNLESS OTHERWISE NOTED. ALL REINFORCING STEEL GRADE 60 (EPOXY COATED).

CONSTRUCTION LOADS: LIMITED TRAFFIC IS PERMITTED ON THE NEW DECK DURING THE CURING PERIOD. KEEP ANY EXPOSED DECK WET DURING THE CURING PERIOD. SEE KDOT SPECIFICATIONS SECTION 710, TABLES 710-1 & 710-2 FOR ADDITIONAL INFORMATION. CONSTRUCTION LOADS ON THE 8½" DECK WILL BE LIMITED TO LOADS APPROVED BY ENGINEER.



PLAN
(TRANSVERSE REINF. NOT SHOWN)

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. F-46 Sta. 50+00.00

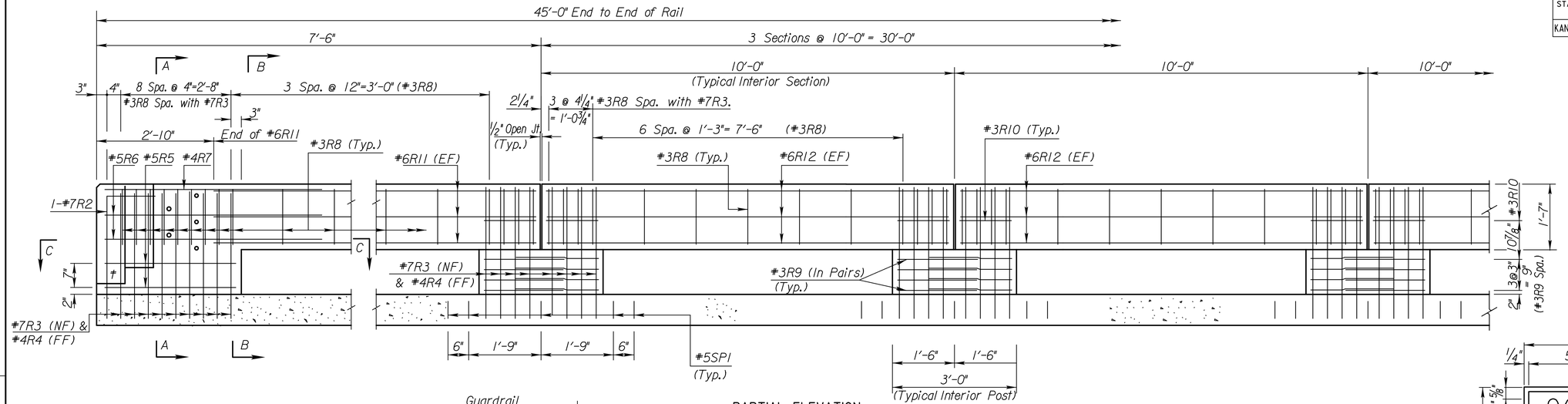
SLAB DETAILS
BRIDGE F-46 REPLACEMENT
166th STREET OVER HOG CREEK

Proj. No. 130563.00 Leavenworth Co.

SHEET NO. 21 OF 51	SCALE	APP'D	
DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN. CK.	CADD CK.

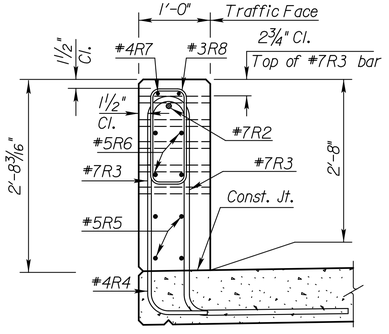
Plotted By: mrockwell | Plot Location:
File: 06-Slab Plan.dgn
Plot Date: 13-DEC-2021 10:55

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	130563.00	2021	22	51

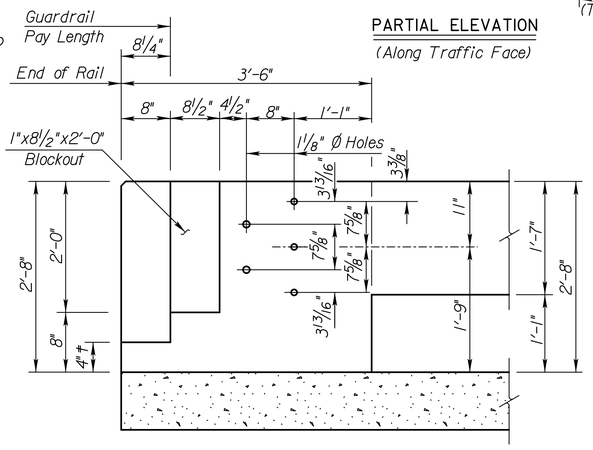


† Extend the 12:3 taper to the top of the approach slab curb.

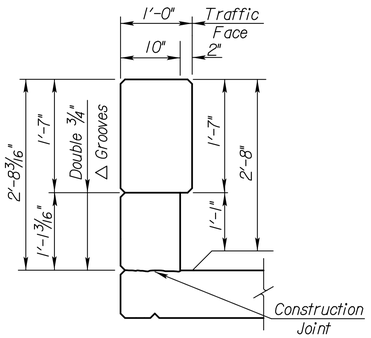
PARTIAL ELEVATION
(Along Traffic Face)



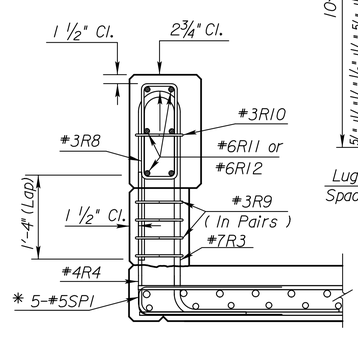
SECTION A-A



ELEVATION
(Dimensions at traffic face of rail.)

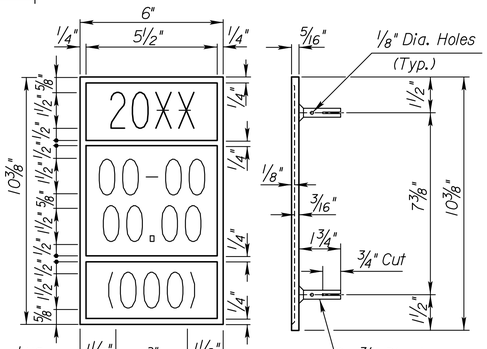


TYPICAL INTERIOR POST



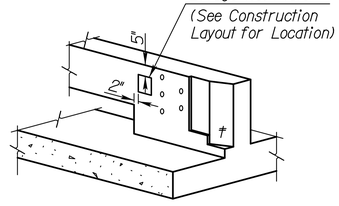
SECTION THRU POST

* Note:
The hook may be canted to provide clearance and/or fit between reinforcing.

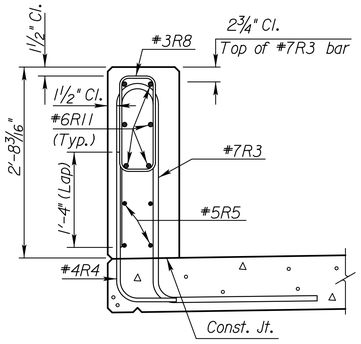


** Year Bridge is Completed.

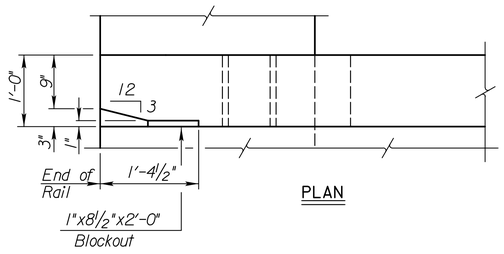
BRIDGE NUMBER PLATE
(1 Required)
(See Construction Layout for Location)



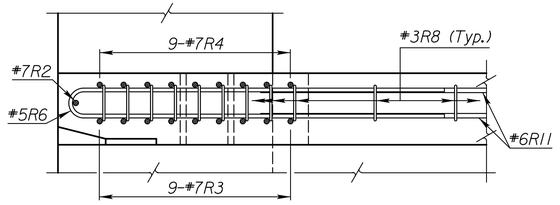
BRIDGE NUMBER PLATE PLACEMENT DETAIL



SECTION B-B



PLAN



SECTION C-C

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

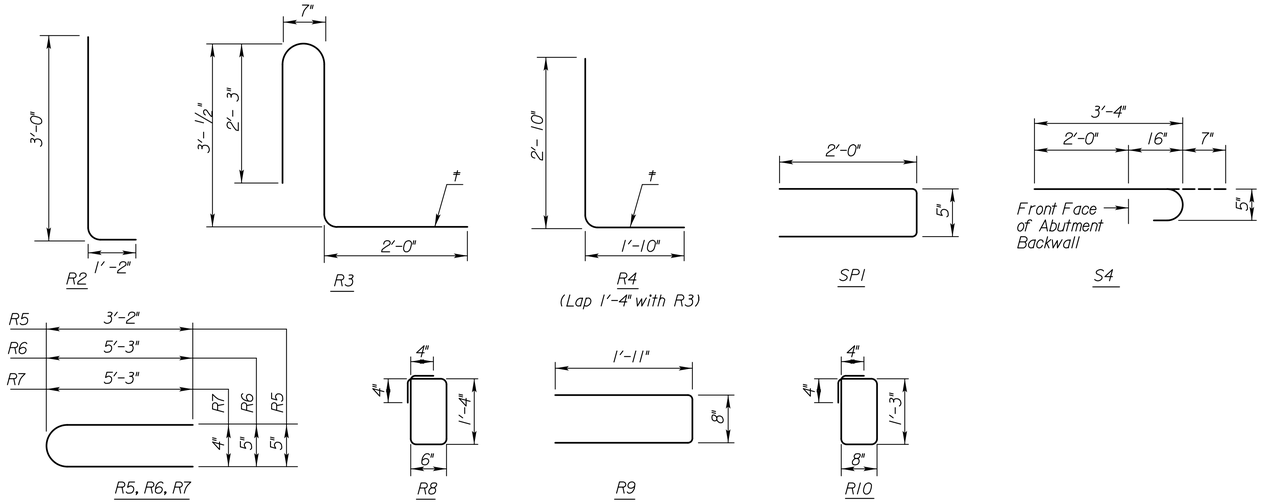
KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. F-46 Sta. 50+00.00
32' KDOT CORRAL RAIL (Without Curb)
BRIDGE F-46 REPLACEMENT
166th STREET OVER HOG CREEK
Proj. No. 130563.00 Leavenworth Co.

SHEET NO. 22 OF 51	SCALE	APP'D	
DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN. CK.	CADD CK.

Sh. No. 22

Plotted By: mrockwell | Plot Location:
File: 07-Corral Rail.dgn
Plot Date: 13-DEC-2021 10:55

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	130563.00	2020	23	51



BENDING DIAGRAMS

All dimensions are out to out of bars.

† *Bend this leg to match the slope of the roadway.*

⊗ *These dimensions vary due to slope of deck or thickness of slab.*

BILL OF REINFORCING STEEL
Epoxy Coated (Gr. 60)

Straight Bars				Bent Bars			
Mark	Size	Number	Length	Mark	Size	Number	Length
R11	#6	24	4'-7"	R2	#7	4	4'-2"
R12	#6	36	9'-8"	R3	#7	100	7'-7"
S1	#6	90	29'-8"				
				S4	#6	42	3'-11"
S2	#5	68	44'-9"				
S3	#5	60	29'-8"	R5	#5	8	6'-6"
				R6	#5	8	10'-8"
				SP1	#5	40	4'-4"
				R4	#4	100	4'-3"
				R7	#4	4	10'-8"
				R8	#3	138	4'-4"
				R9	#3	64	4'-6"
				R10	#3	16	4'-6"

*See Bending Diagrams

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1	4-12-93	Current Release		

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. F-46 Sta. 50+00.00

BILL OF REINFORCING STEEL
& BENDING DIAGRAMS
166th STREET OVER HOG CREEK

Proj. No. 130563.00 Leavenworth Co.

SHEET NO. 23 OF 51	SCALE	APP'D	
DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN. CK.	CADD CK.

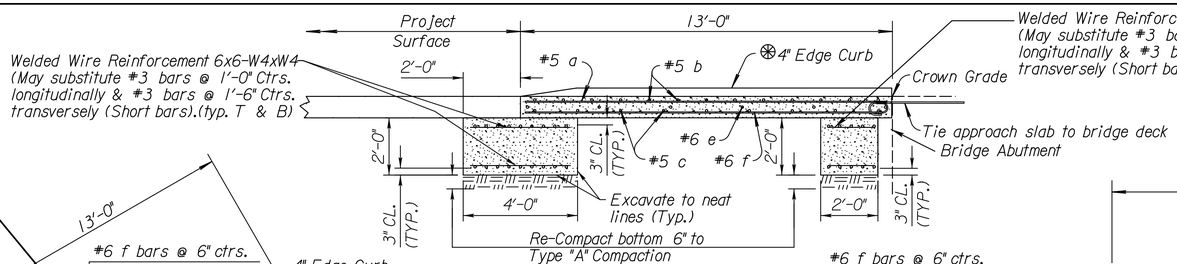
CADconform Certify This File

Sheet No. 23

CADconform Certify This File

Std. Base File: br182a.dgn
Plotted By: mrockwell Plot Location:
File: 08-Bill of Reinforcing Steel.dgn
Plot Date: 13-DEC-2021 10:56

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	130563.00	2020	24	51



LONGITUDINAL SECTION ON CENTER LINE

⊛ Details for 4" Edge Curb, See Standard Drawing RD711.

GENERAL NOTES

Special Concrete Bridge Approach shall be paid for as Sq. Yds. of Concrete Pavement (10" Unif.)(AE)(Br App) and includes all work and materials required to construct the approach slab as shown on this sheet.

All work and materials required for installation of joint material shall be subsidiary to this bid item.

At the Contractor's options #4x3'-0" tie bars @ 15" centers may be substituted for the #6 e bars at 2'-6" centers.

All reinforcing steel shall be epoxy coated.

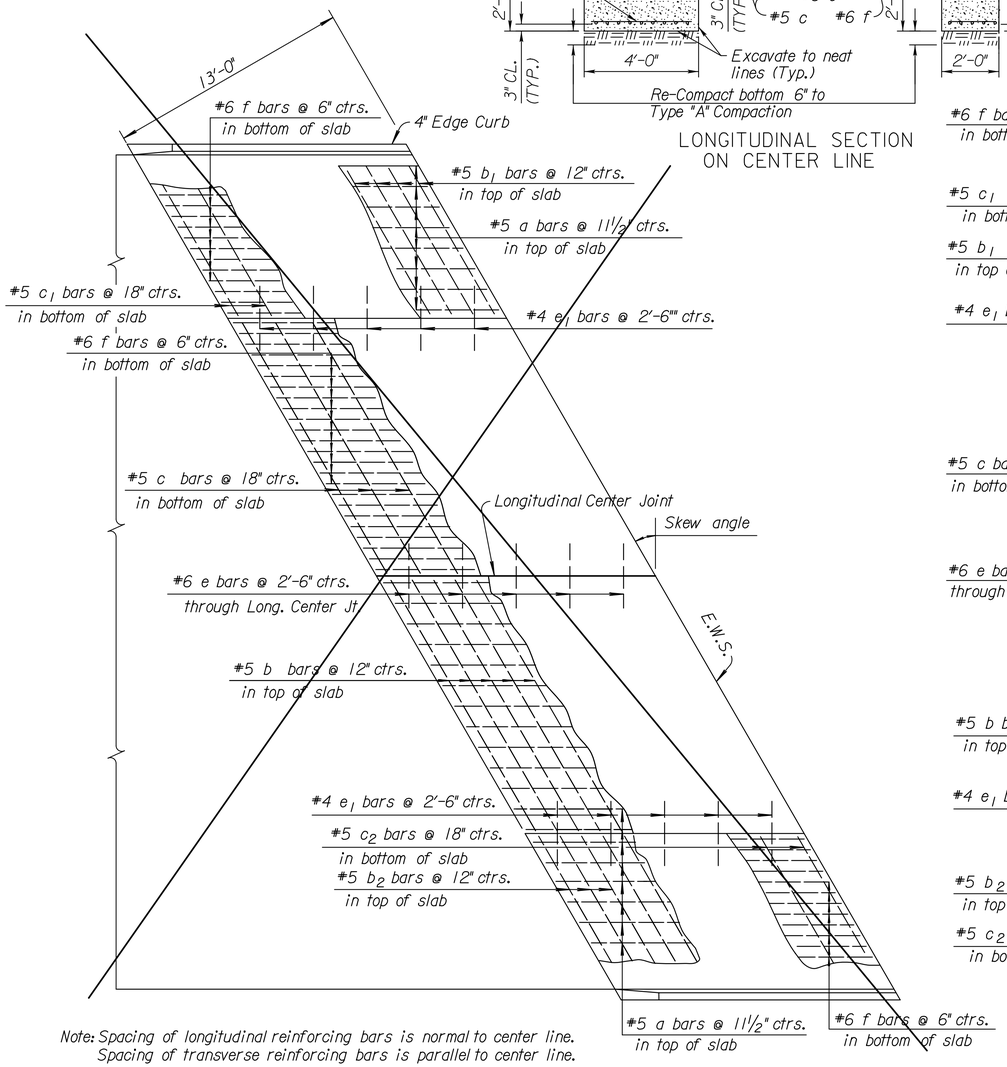
See Standard Drawing RD711 for details of Joints and edge curb.

Clearance from the face of concrete for all reinforcing steel shall be 2 inches.

Standard reinforcing bar hooks in accordance with the latest ACI specifications shall be used throughout.

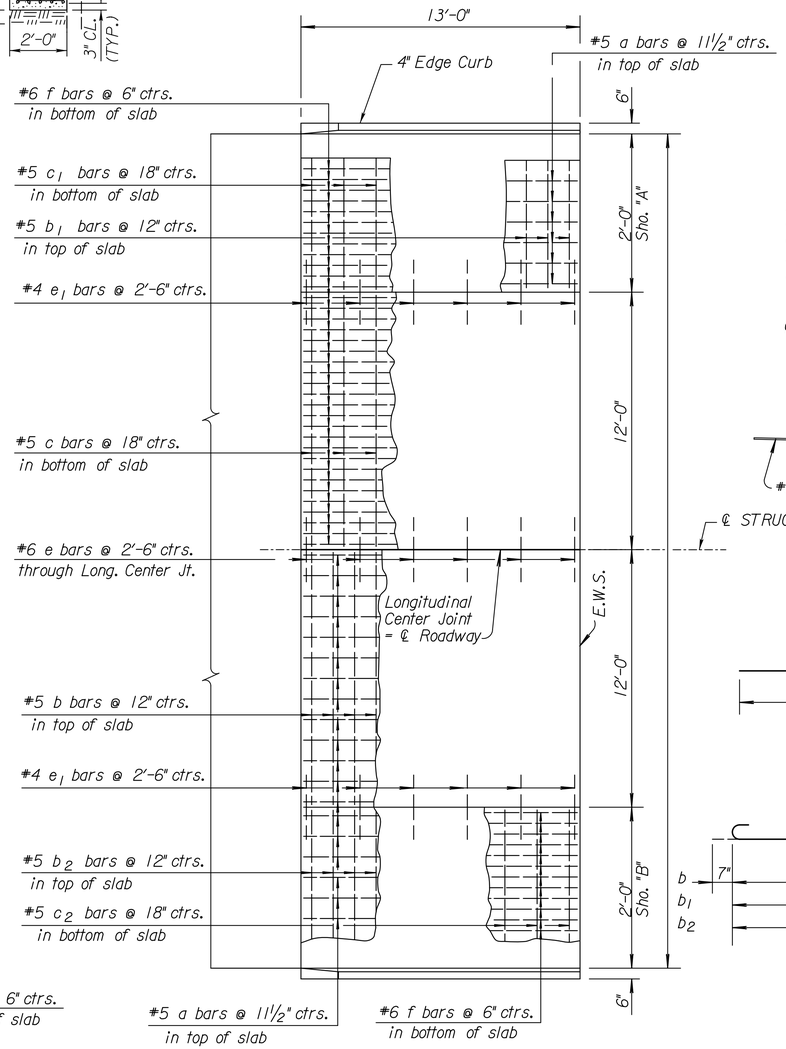
BRIDGE APPROACH SLAB FOOTING

Pay for the Bridge Approach Slab Footings at the unit price bid per cubic yard - for "Bridge Approach Slab Footing". This price will be full compensation for furnishing all materials and labor including Concrete (Grade 4.0)(AE) Pavement, Reinforcing Steel (Gr. 60)(Epoxy Coated), Excavation, Type "A" Compaction and materials to prevent bonding of concrete. The Contractor may use Concrete (Grade 4.0)(AE) or the mix used in the concrete pavement for the slab footings.

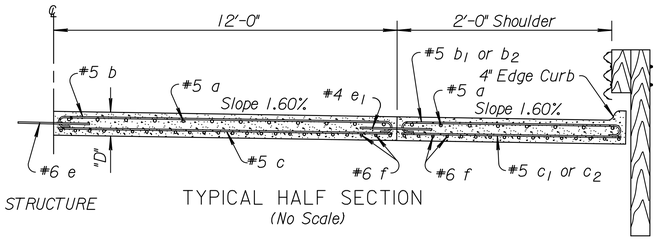


Note: Spacing of longitudinal reinforcing bars is normal to center line. Spacing of transverse reinforcing bars is parallel to center line.

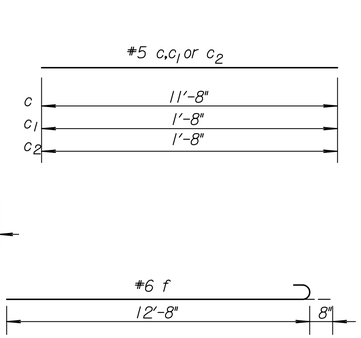
PLAN FOR SKEWED APPROACH (SKEW ≤ 5°)
(No Scale)



PLAN FOR NORMAL APPROACH
(No Scale)



TYPICAL HALF SECTION
(No Scale)



Note: All dimensions are out to out on bars. unless noted otherwise.

BENDING DIAGRAMS

"D" Thickness = Thickness of Project Concrete Pavement (10" minimum).

Note: Bridge to be constructed normal to roadway ℄, only Approach Slabs are to be skewed as shown.

BILL OF MATERIALS

BAR SCHEDULE

NORMAL APPROACH

Bar	a	b	b_1	b_2	c	c_1	c_2	e	e_1	f
No.	32	26	13	13	18	9	9	6	12	58
Size	#5	#5	#5	#5	#5	#5	#5	#6	#4	#6
Length	12'-8"	12'-10"	1'-8"	1'-8"	11'-8"	1'-8"	1'-8"	3'-0"	3'-0"	13'-4"

Reinforcing Steel (Grade 60) (Epoxy Coated) 2280 lbs.

Concrete Pavement (10" Unif.)(AE) 41.9 Sq. Yds.

__° SKEW

a	b	b_1	b_2	c	c_1	c_2	e	e_1	f
#5	#5	#5	#5	#5	#5	#5	#6	#4	#6
							3'-0"	3'-0"	

Reinforcing Steel (Grade 60) (Epoxy Coated) lbs.

Concrete Pavement (10" Unif.)(AE) Sq. Yds.

__° SKEW

a	b	b_1	b_2	c	c_1	c_2	e	e_1	f
#5	#5	#5	#5	#5	#5	#5	#6	#4	#6
							3'-0"	3'-0"	

Reinforcing Steel (Grade 60) (Epoxy Coated) lbs.

Concrete Pavement (10" Unif.)(AE) Sq. Yds.

Note: Reinforcing steel and joint lengths shown for information only.

NO.	DATE	REVISIONS	BY	APP'D
9	9-09-09	Revised Reinforcing Steel listing	S.W.K.	J.O.B.
8	5-14-09	Revised General Note	S.W.K.	J.O.B.
7	10-30-08	Added guardrail post detail at curb	S.W.K.	J.O.B.
6	11-07-07	Revised pavement slope to percent	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

CONCRETE BRIDGE APPROACH PAVEMENT

RD715

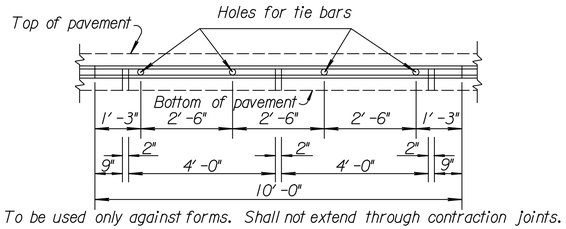
FHWA APPROVAL	6-9-09	APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. King

Sh. No. 24

Plotted : 13-DEC-2021 10:56
Drawn By : mrockwell
File : 09-Approach Slab.dgn

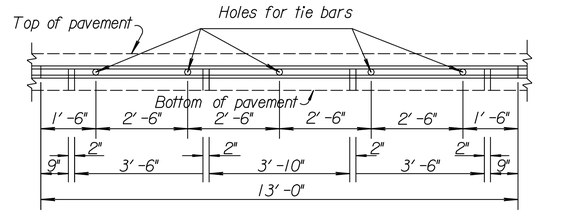
CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	130563.00	2020	25	51



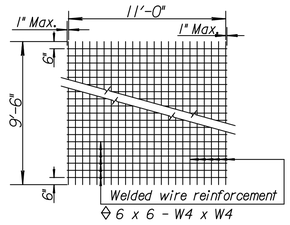
To be used only against forms. Shall not extend through contraction joints.

METAL STRIP FOR
LONGITUDINAL CONSTRUCTION JOINT (10'-0")



To be used only against forms. Shall not extend through contraction joints.

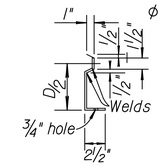
METAL STRIP FOR
LONGITUDINAL CONSTRUCTION JOINT (13'-0")



◊ 6 x 6 - W4 x W4

TYPICAL SHEET OF WELDED WIRE REINFORCEMENT
FOR SPECIAL BRIDGE APPROACH PAVEMENT

◊ Note: Epoxy coated #3 bars longitudinally @ 12" ctrs. & #3 bars transversely @ 18" ctrs. may be substituted for each layer of epoxy coated welded wire reinforcement.



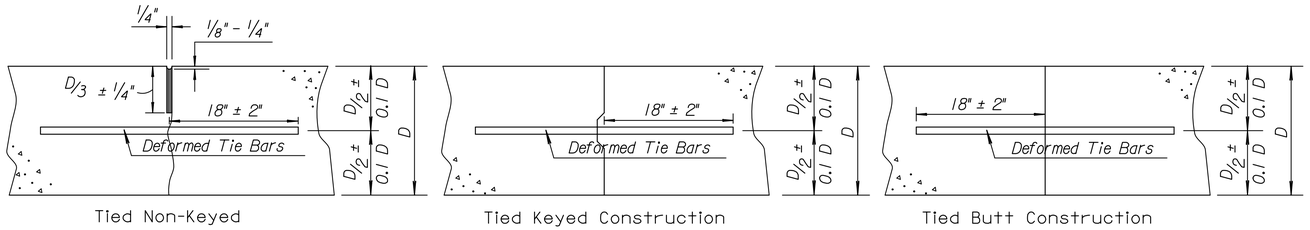
ϕ Snap-in leg or other approved designs may be used in lieu of welded leg.

SECTION OF RECESSED
FORM LEG

DETAIL OF LAP FOR WELDED WIRE REINFORCEMENT

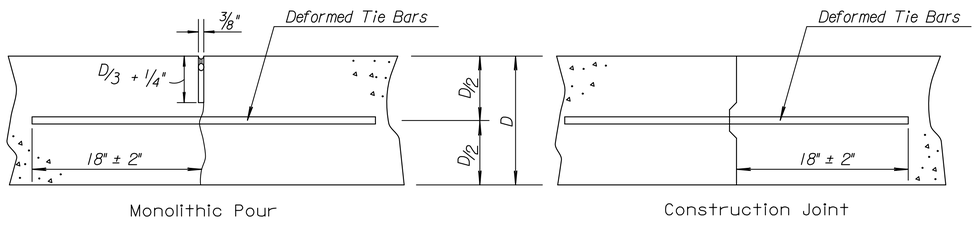
The lap shall extend beyond the first transverse or bag wire of each sheet.

The sheet shall be wired securely at the edges and at intervals not to exceed 2'-6" for the full width of the sheet. Approximate weight of welded wire reinforcement = 58 lbs. per 100 sq. ft. Other methods for fastening the sheets of welded wire reinforcement at the laps may be used with the approval of the Engineer.



LONGITUDINAL JOINTS

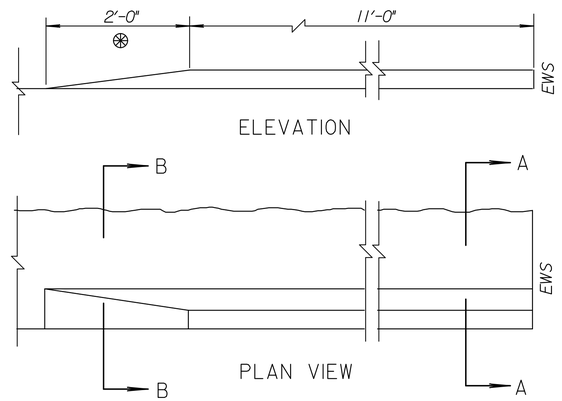
Note: For longitudinal construction joints the contractor has the option of using either the keyed or butt type. Place deformed tie bars mid-depth of the shoulder.



TRANSVERSE JOINTS

Note: A construction joint is required when the concrete placement has been interrupted for a substantial length of time or at the end of a day's placement.

⊛ No 4" Curb transition when adjacent to Flume Inlet.



4" EDGE CURB DETAIL

GENERAL NOTES

All work shall be done in conformity with the Standard Specifications applicable to the project.

The cost of all bars and joint material shown on this sheet is to be included in the bid price for Concrete Pavement.

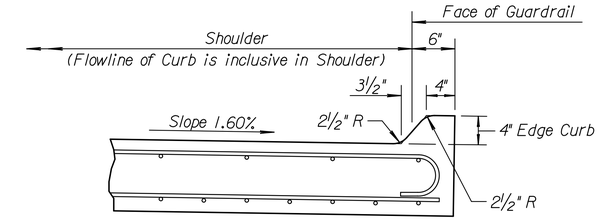
At each planned transverse joint location, a 4 to 6 inch wide strip of the pavement surface shall be protected from the texturing operation to provide a transverse textureless surface centered over the joint sawcut.

All sawed joints on this project shall be filled with sealant in accordance with Standard Specifications.

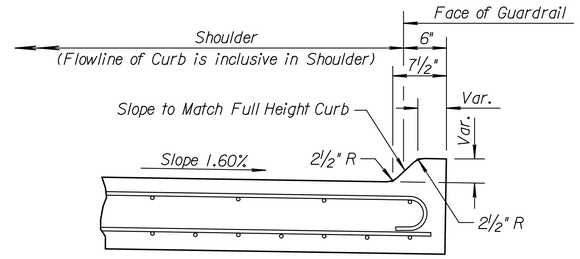
The 4 inch edge curb shall be constructed integral with the approach slab shoulder.

All materials and work required for this construction shall be Subsidiary to the concrete approach slab.

Tie bars shall be evenly spaced along the length of the slab and no tie bars shall be within 12" of contraction joint.



SECTION A-A



SECTION B-B

NO.	DATE	REVISIONS	BY	APP'D
13	5-17-13	Revised Note, Longitudinal Joints	S.W.K.	J.O.B.
12	5-14-09	Pres. Relief Jt. to RD712/tie bar lab.	S.W.K.	J.O.B.
11	10-23-08	Revised Sec. A-A and Sec. B-B	S.W.K.	J.O.B.
10	10-3-07	Add. manufacturer jt. size recom'd.	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

MISCELLANEOUS DETAILS FOR CONCRETE BRIDGE APPROACH PAVEMENT

RD711

FHWA APPROVAL	10-23-13	APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. King

Sh. No. 25

Drawn By : mrockwell
File : 10-Misc Approach Slab Details.dgn
Plotted : 13-DEC-2021 10:56

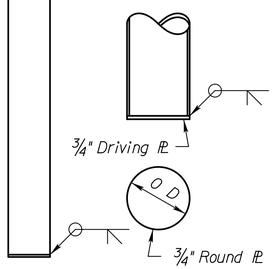
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	130563.00	2020	26	51

O D 10¾" T. = ††
O D 12¾" T. = ††
O D 14" T. = ††

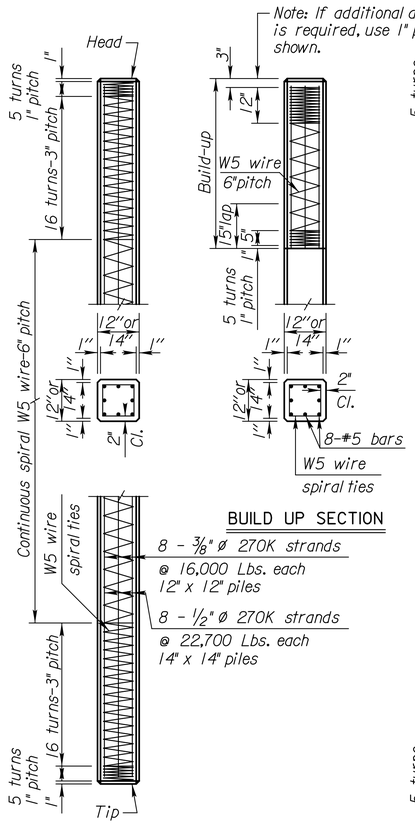
†† See the Geology Report or "Summary of Quanities" for Pipe Pile wall thickness

Note: Pile shall be driven with a steel head having a projecting ring fitting inside the pipe. Clearance between ring and pipe should be ¼".

Note: Pile pipe may be spiral welded, longitudinal welded, or seamless steel pipe.



PLAIN ROUND CAST-IN-PLACE CONCRETE PILES



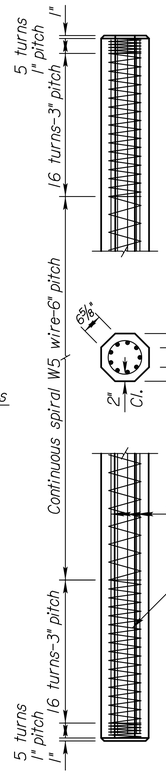
12" OR 14" PRESTRESSED CONCRETE PILES

Note: If additional driving is required, use 1" pitch as shown.

BUILD UP SECTION

8 - ⅜" Ø 270K strands @ 16,000 Lbs. each 12" x 12" piles

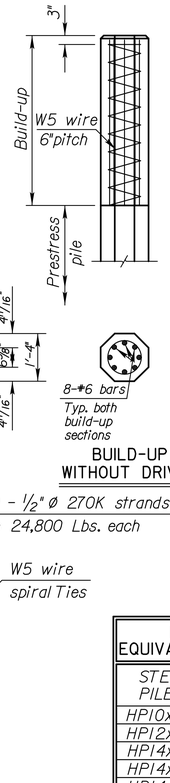
8 - ½" Ø 270K strands @ 22,700 Lbs. each 14" x 14" piles



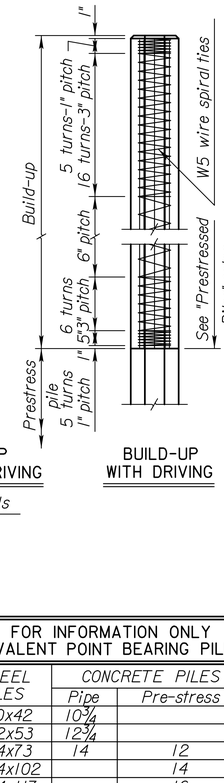
9 - ½" Ø 270K strands @ 24,800 Lbs. each

W5 wire spiral Ties

16" PRESTRESSED CONCRETE PILES



BUILD-UP WITHOUT DRIVING



BUILD-UP WITH DRIVING

FOR INFORMATION ONLY EQUIVALENT POINT BEARING PILES		
STEEL PILES	CONCRETE PILES	
	Pipe	Pre-stress
HP10x42	10¾	
HP12x53	12¾	
HP14x73	14	12
HP14x102		14
HP14x117		16

GENERAL NOTES

PRESTRESSED PILES: Fabricate prestressed concrete pile splices in accordance with the Manufacturer's recommendations subject to the approval of the Engineer.

Method of attachment of pile to build-up may be by any of the methods" given in the notes on "Alternate Methods. If mild reinforcing steel is used for attachment,the area shall be no less than that used in the build-up.

ALTERNATE METHODS: Method of attachment of a pile to build-up may be by any of the following methods:
1. Cut off at least 2'-0" of pile and expose a minimum of 2'-0" of strands.
2. Cast 8-#6, or 8-#5 bars (equally (spaced into pile head. All bars shall extend into pile head and project from pile head a minimum of 2'-0".
3. Drill 8 holes in pile head (equally spaced) for installation of 8 grouted dowel bars of same size and length as in 2.
4. Provide cored holes for bars as in 3.
No bars or strands are to extend from head of pile or build-up into footing or pile cap unless approved by the Engineer.

TEST PILES: Drive test piles where called for on the bridge plans. The test piles located within the limits of the substructure will become a part of the bridge pile system.

DRIVING FORMULA: Driving formula shall conform to the Standard Specifications.

MEASUREMENT AND PAYMENT: Measurement and payment for all piles shall comply with the Standard Specifications.

The following items are covered in Division 1000 of the Standard Specifications:

REINFORCEMENT: Use reinforcing steel conforming to ASTM A615, Grade 60. Hoops and spirals may be either plain or deformed bars.

PRESTRESSING STEEL: Use uncoated seven-wire stress relieved or low relaxation prestressing strand conforming to ASTM A416, Gr. 270.

SPECIFICATIONS: Standard Specifications for State Road and Bridge Construction as currently used by the Kansas Department of Transportation. The following items are covered in Division 700 of the Standard Specifications:

CONCRETE: Concrete for cast-in-place shall be f'c = 3,500 PSI.. Concrete for prestressed shall be f'c = 5,000 PSI.

WELDING: All field welding shall meet the requirements of the Standard Specifications.

Use only Shielded Metal Arch Welding SMAW (stick welding) for pile splices.

Use only low hydrogen E7018, 7016, or 7015 series welding rod (electrode) for all welding applications during pile splicing. See General Notes or proper storage of welding rod. welding filler rod (electrode) for field welding of splices.

New electrode are to be purchased for each KDOT project. The electrode shall arrive on the project in factory hermetically sealed containers opened and labeled with indelible ink in front of the engineer. The label shall include the current date and the project number. If the container seal is questionable or shows signs of damage the electrode is to be dried in an oven at least one hour at a temperature of 700°F to 800°F.

Upon removal from intact hermetically sealed factory packaging or the drying oven the electrode is to be placed in a storage oven with a minimum temperature of 250°F.

When electrodes are removed from the hermetically sealed container or storage oven and exposed to the atmosphere for less than 4 hours place into the storage oven for at least 4 hours before removing for use.

If electrode is exposed to the atmosphere for 4 hours or more (or 9 hours for moisture resistant electrodes designated with an R in their labeling) then electrode can be dried in a drying oven at a temperature of 450°F to 550°F.

If the electrode is exposed to the atmosphere for 4 hours or more a second time or the rod becomes wet discard rod.

CAST-IN-PLACE SHELLS: Steel shells for cast-in-place piles shall conform to the requirements of the Standard Specifications.

All piles driven without a mandrel shall be of the minimum thicknesses shown. Piles driven with a mandrel shall be of sufficient strength and thickness to withstand driving without injury and to resist harmful distortion and/or buckling due to soil pressure after the mandrel is removed.

Remove, replace or correct to the satisfaction of the Engineer improperly driven, broken or otherwise defective pipe piles. Otherwise drive an additional pile at no extra cost.

The Contractor shall maintain a light suitable for visual inspection of the pile on the job at all times prior to and during the filling of the pipe.

STEEL PILE: Steel pile shall conform to the requirements of the Standard Specifications.

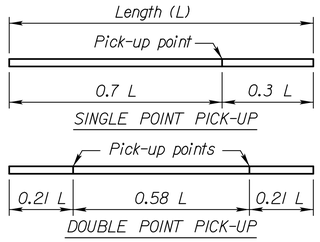
PILE POINTS: Pile points shall conform to the dimensions shown and to requirements of the Standard Specifications.

PAINT: All paint shall comply with the Standard Specifications, or as specified on the plans.

MILL TEST REPORTS: Steel piles test reports and steel shell test reports shall comply with the Standard Specifications.

CAST STEEL PILE POINT

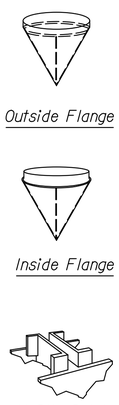
The pile point shall be a one-piece unit of cast steel. Weld pile points in accordance with manufacturers recommendations to each steel pile before driving.



PICK-UP POINTS FOR PRESTRESSED PILING

Max. length - 55' single point pick-up
Max. length - 80' double point pick-up

Note: Piles shall be marked at Pick-up points to indicate proper points for attaching handling lines.



PIPE PILE POINT

Weld Symbology Definition

Use grinder to bevel edges of splice as shown in weld symbology and drawing. In addition to bevels, produce clean, bare, and shiny surfaces at and around the splice welding location.

Use E7018, 7016, or 7015 series welding rod (electrode) for all welding applications during pile splicing. See General Notes for proper storage of welding rod.

Lay full penetration root weld from beveled side of splice.

Back gouge root weld from side opposite of root welding application making sure to remove all foreign materials, porous steel, and inclusions from root weld. Finish welding the non beveled side of the splice.

Finish welding beveled side of the splice while removing slag, foreign materials, porous steel, and inclusions in between welding passes, use of a grinder may be needed.

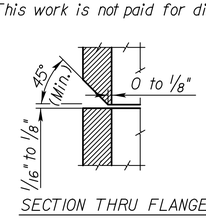
Verify that enough filler metal has been correctly placed in all weld locations to obtain a flush or convex surface with no concavity produced upon completion of the final welds.

SPLICES: Splices for steel piles and shell piling shall be in accordance with details shown on this sheet and the Standard Specifications.

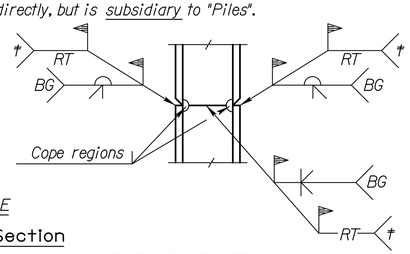
For integral pile bent abutments and piers, if a pile splice is required, do not locate the pile splice within a region extending 2'-0" above and 10'-0" below the bottom of the concrete web wall. For abutments, locate the pile splice at least 10'-0" below top of fill.

With the approval of the Engineer, one splice per bent may be allowed in the region described above without testing. If additional splices are anticipated, based on the geology, the Contractor will add a sufficient amount to the bottom of pile, prior to driving, so that the splice is below the regions described above in the completed pile.

† For integral pile bent abutments and piers, if a splice is located within the regions described above, then the Contractor will test the welds by Radiograph (RT) test methods. Repair and retest any welds not passing the test(s). Each weld tested will have written confirmation of results. Report these results to the Engineer. This work is not paid for directly, but is subsidiary to "Piles".



H-Pile Section



Pipe Section

PILE SPLICE DETAILS

BG = Backgouge

NO.	DATE	REVISIONS	BY	APP'D
4	09-15-15	Clarify Notes	JPJ	CER
3	06-18-12	Clarify f'c, rod type, use and weld	JPJ	TLF
2	1-5-09	Pile Splice Location and Weld Test	JPJ	KFH
1	6-14-06	Rev. Pile Splice Note & Reinforcing	JPJ	KFH

KANSAS DEPARTMENT OF TRANSPORTATION

STANDARD PILE DETAILS

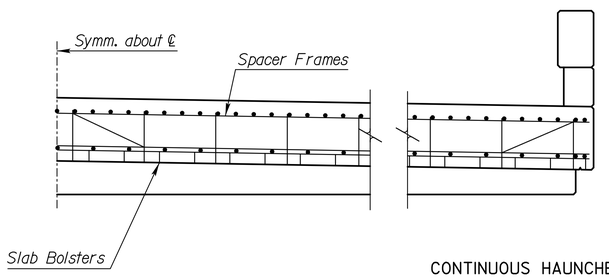
BRIIO

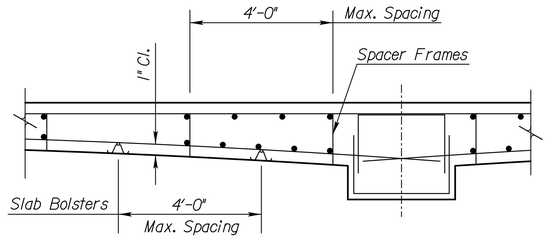
FHWA APPROVAL		10-04-12	APP'D	Terry L. Fleck
DESIGNED	JPJ	DETAILED	QUANTITIES	CADD RAA
DESIGN CK.		DETAIL CK.	QUAN.CK.	CADD CK.

Std. Base File: brl10.dgn
Plotted By: mrockwell
File: I:\Standard Pile Details.dgn
Plot Date: 13-DEC-2021 10:56
Plot Location:

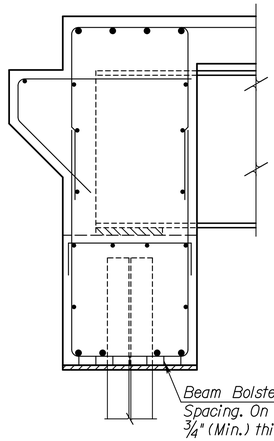
CADconform Certify This File

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	130563.00	2020	27	51



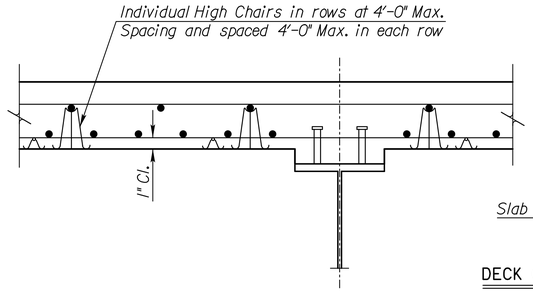


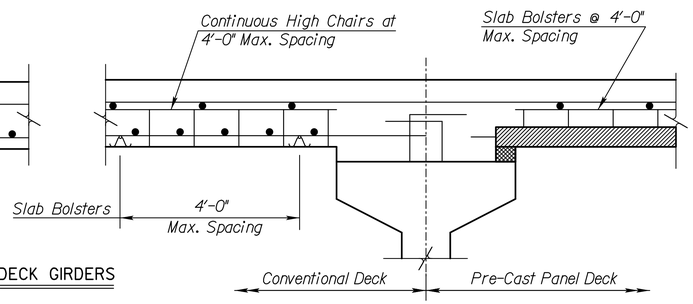
CONTINUOUS HAUNCHED SLAB



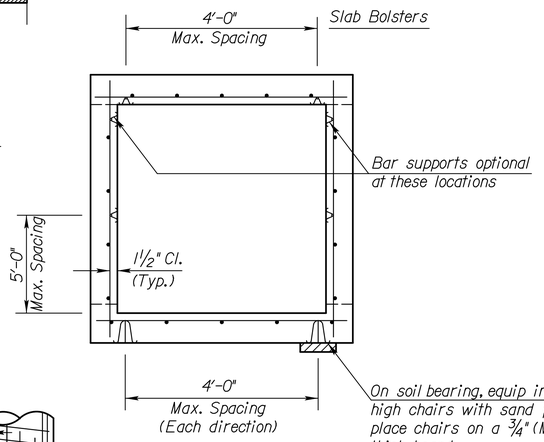
Beam Bolster at 4'-0" Max. Spacing. On soil bearing, place a 3/4" (Min.) thick board under bolster.

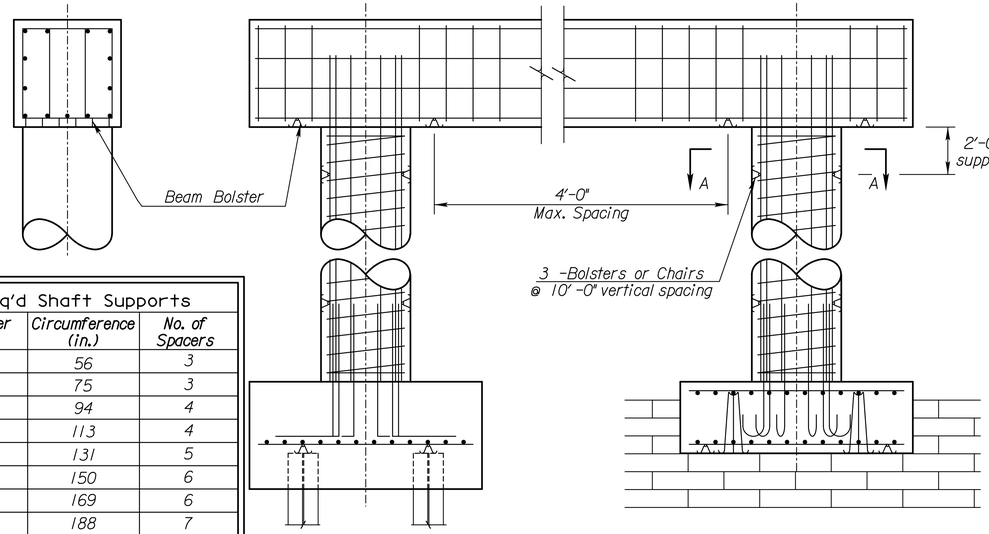
ABUTMENT





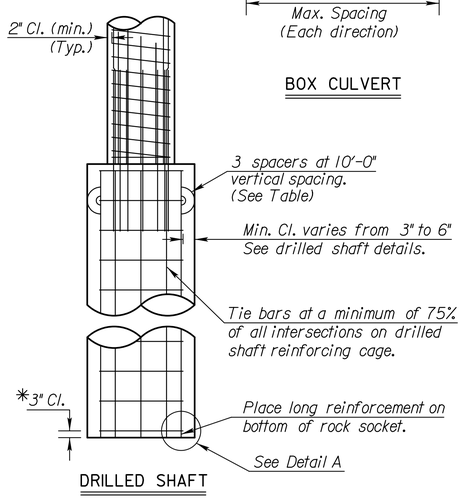
DECK GIRDERS





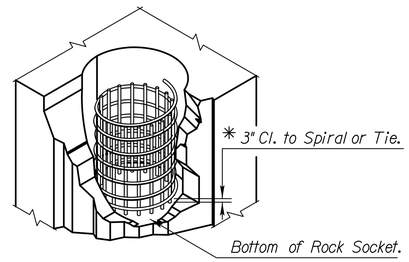
PIER

Req'd Shaft Supports		
Diameter (in.)	Circumference (in.)	No. of Spacers
18	56	3
24	75	3
30	94	4
36	113	4
42	131	5
48	150	6
54	169	6
60	188	7
66	207	7
72	226	8
78	244	9
84	263	9
90	282	10
96	301	11
102	320	11
108	339	12



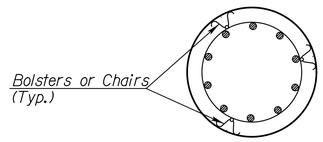
DRILLED SHAFT

BOX CULVERT



DETAIL A

* Note: Longitudinal reinforcing steel is placed on the bottom of the rock socket. Maintain 3" clearance from the bottom of rock socket to the first spiral or tie bar.



SECTION A-A

GENERAL NOTES

Reference is made to the latest edition of the CRSI "Manual of Standard Practice" for recommended industry practices concerning reinforcing steel.

Use only the following types of bar supports:

1) Wire Bar Supports:

a) Epoxy coated reinforcing: Class 1 Protection
b) Non-epoxy coated reinforcing: Class 1, 2, or 3 Protection

2) Plastic Bar Supports

3) Supplementary bars

When securing epoxy coated reinforcement, use tie wires or metal clips that are epoxy or plastic coated.

Do not weld reinforcing steel to bar supports or to other reinforcing steel. Shop weld spacer frames for haunched slabs.

Tie bars at all intersections around the perimeter of each mat and at not less than 2'-0" centers or at every intersection, whichever is greater.

Where more than one length of bar support is required, lap the end legs so they are locked or tied together.

Use proper height supports to maintain the distance between the reinforcing and the formed surface or the top surface of deck slabs within 1/4" of that indicated on the plans.

Spacings shown are maximums. Use sufficient supports, as determined by the Engineer, to retain the reinforcing steel in position.

Construct any platforms, required for the support of workers and/or equipment during concrete placement, directly on the forms and not on the reinforcing steel.

Designs and arrangements of Supports or Spacers other than as shown on this sheet, may be used with the permission of the Engineer.

NO.	DATE	REVISIONS	BY	APP'D
5	11-10-10	Column Bar Supports Req'd	JPJ	TLF
4	12-01-05	Drilled Shaft Spiral Steel Placement	JPJ	KFH
3	8-21-00	Added Pre-Cast Panel Detail	RAM	KFH
2	12-20-99	Added Haunched Slab Bolsters	RAM	KFH
1	12-09-99	Revised Drilled Shaft Clearance	RAM	KFH

KANSAS DEPARTMENT OF TRANSPORTATION

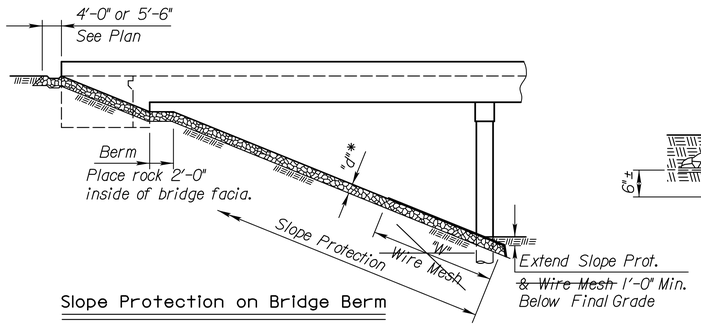
SUPPORTS AND SPACERS FOR REINFORCING STEEL

BRI20

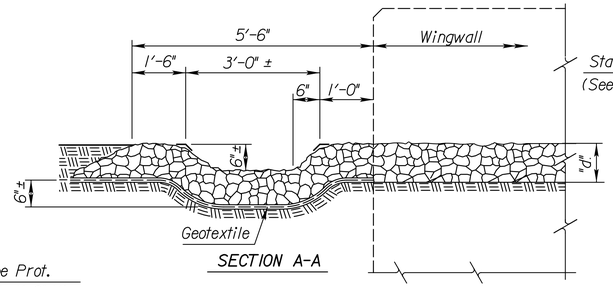
FHWA APPROVAL		11-17-10	APP'D	Terry L. Fleck	
DESIGNED	RAM	DETAILED	RAA	QUANTITIES	CADD RAA
DESIGN CK.	LRR	DETAIL CK.	RAM	QUAN.CK.	CADD CK. RAM

Std. Base File: bri20.dgn
Plotted By: mrockwell
File: 12-Supports and Spacers for Reinf. Steel.dgn
Plot Location:
Plot Date: 13-DEC-2021 10:56

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	130563.00	2020	28	51

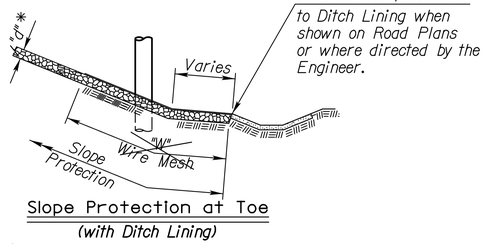


Slope Protection on Bridge Berm

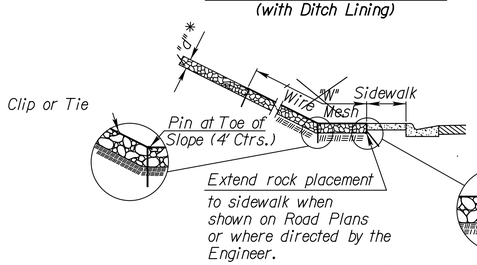


SECTION A-A

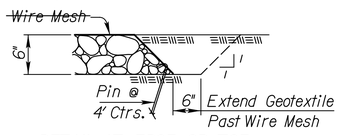
NOTE: Section A-A, Rock Flume required when curb is omitted on the approach slab or when shown on the Construction Layout sheet.



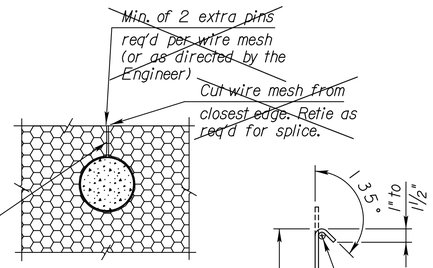
Slope Protection at Toe
(with Ditch Lining)



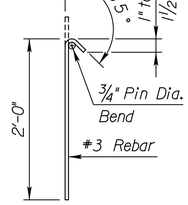
Slope Protection at Toe
(with Sidewalk)



DETAIL AT EDGE OR TOE

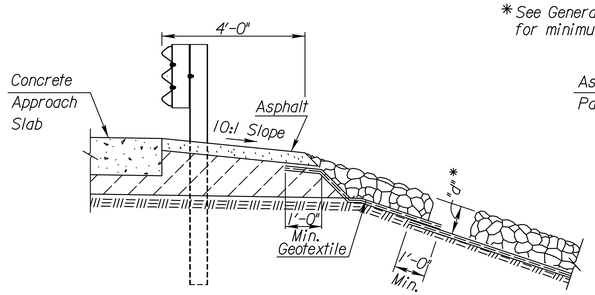


DETAIL AT COLUMNS
(Or Other Obstruction)



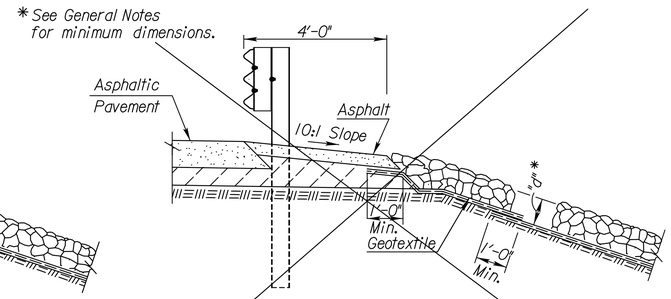
TYPICAL PIN
DETAIL

Note:
Pins shall be sharpened or geotextile shall be cut to allow penetration of stake without tearing or ripping the geotextile fabric.



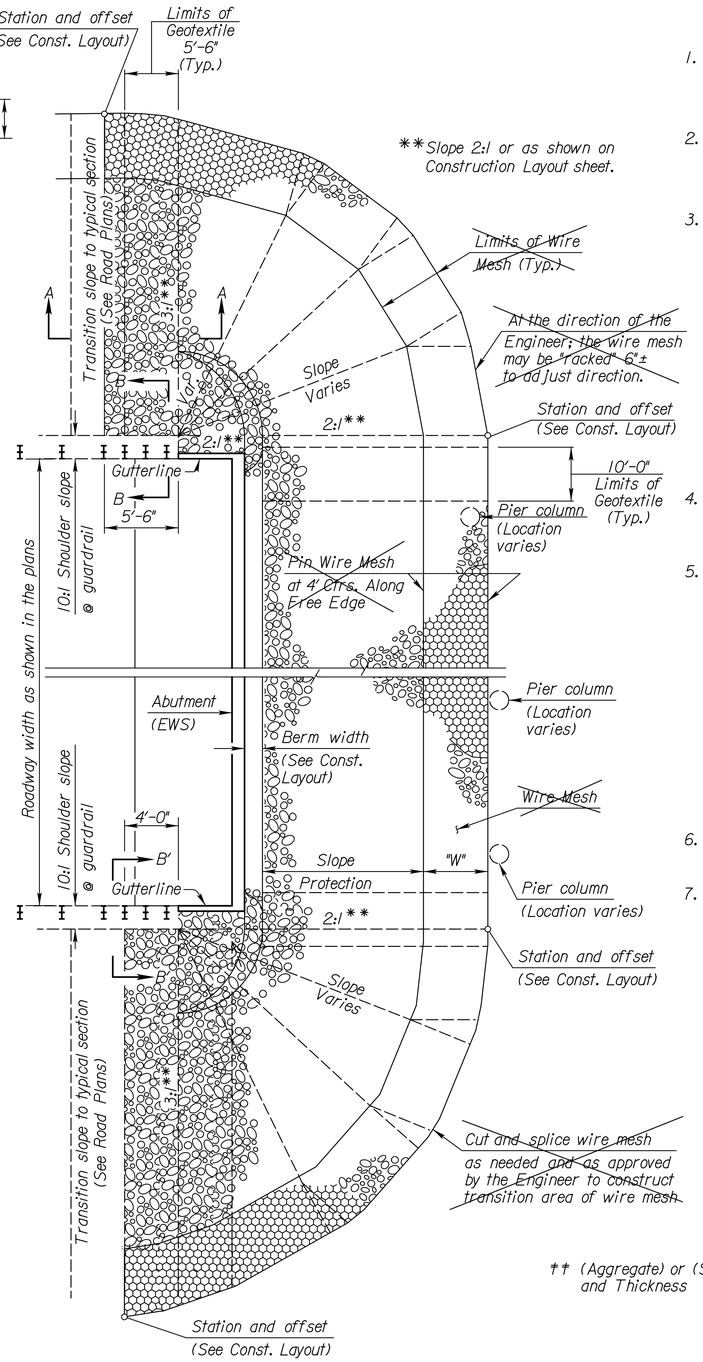
SECTION B-B
(For Concrete Approach Slab)

* See General Notes for minimum dimensions.



TYPICAL ELEVATIONS

SECTION B'-B'
(For Asphaltic Pavement)



PLAN - BERM
AND SLOPE PROTECTION
U-TYPE ABUTMENT

GENERAL NOTES

1. Limits of slope protection are shown on the Construction Layout sheet. Limits may be adjusted as needed at the direction of the Engineer to match ground elevations found at the site.
2. Gradation and aggregate for the Slope Protection (Aggregate) shall meet the requirements of stone for Aggregate Ditch Lining and have a D_{50} of 4 inches unless otherwise noted on the Plans.
3. ~~Wire mesh shall be PVC coated and have a nominal mesh opening of 2½"x3¼". Wire mesh shall be furnished full width up to widths of 12.0 feet ("W"= 12.0 ft.). When widths greater than 12.0 feet are specified on the plans, the furnished width shall be as recommended by the manufacturer but not less than 6.0 feet. All splices shall be made with PVC coated lacing wire, PVC coated wire ties, or stainless steel fastener clips. The longitudinal edges of the wire mesh shall be securely selvedged to prevent ravelling of the mesh. Wire mesh and tie wires shall meet the material requirements for Gabions in the KDOT Specifications. Wire mesh shall not be used unless noted in the Plans and shown in the Table of Quantities. When wire mesh is specified, the bid item shall be "Slope Protection (Special)" and wire mesh shall be subsidiary.~~
4. Excavation and grading for placement of slope protection and all work and material to install geotextile fabric shall be subsidiary to slope protection.
5. Slope protection shall be underlain with geotextile fabric within limits shown. Fabric damaged or displaced during construction shall be replaced at no cost to KDOT. Fabric shall be installed and secured as recommended by the fabric manufacturer. One (1) copy of the fabric manufacturer's installation procedure shall be submitted to the Engineer. The installation procedure shall show details of the splices, overlaps, and pin layout. Minimum overlap of geotextile shall be 1 ft. Fabric shall be anchored along edges and splices at a maximum of 3 foot centers with staples or pins (w/washers). Interior area of fabric shall be pinned or stapled as recommended by the manufacturer but not more than 5 foot centers. Pins or staples shall be a minimum of 12 inches in length. Geotextile fabric shall meet the requirements of KDOT Specifications.
6. Unless noted otherwise on the Construction Layout, "d" shall be a minimum of 6 in., ~~"W" shall be 12.0 ft.~~
7. The Contractor shall place the rock from the bottom to the top of the slope. Place the rock in a manner which produces a reasonably well graded mass of rock without segregation of the material sizes. Placement, measurement, and payment shall conform to KDOT Specifications for Slope Protection.

QUANTITIES
† For Information Only

Bridge Number F-46	Slope Protection (††) Cu. Yds.	†Geotextile Sq. Yds.	†Wire Mesh Sq. Yds.
Abut. No. 1	119.4	179.1	----
Abut. No. 2	112.3	168.4	----

†† (Aggregate) or (Special) and Thickness

NO.	DATE	REVISIONS	BY	APP'D
3	12/10/10	Clarified Geotextile	JPJ	TLF
2	7/14/04	Changed to guard "rail"	RAM	KFH
1	5/15/02	Clarified Bid Items	RAM	KFH

KANSAS DEPARTMENT OF TRANSPORTATION

BRIDGE BERM AND
SLOPE PROTECTION
U-TYPE ABUTMENT

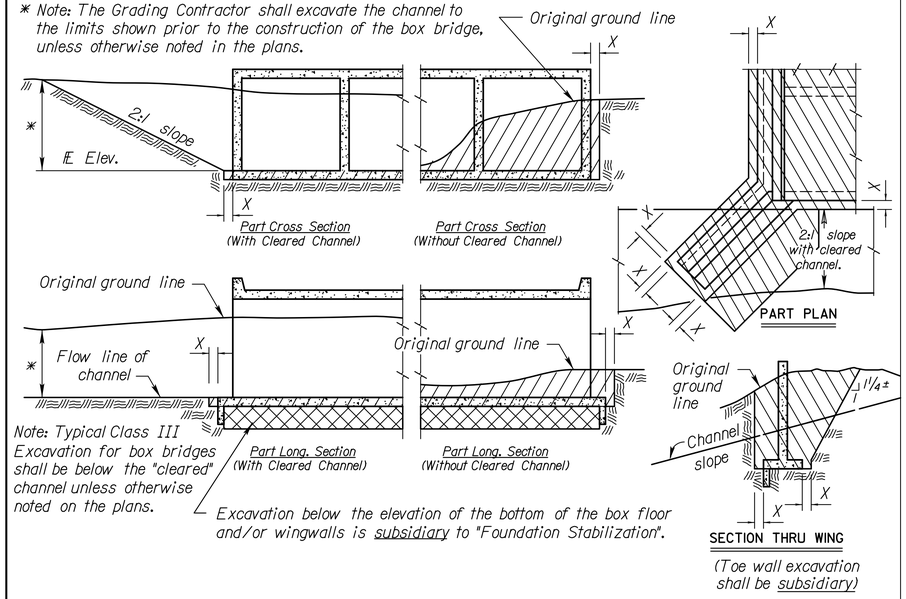
BRI32B

FHWA APPROVAL			6/4/02	APP'D	KENNETH F. HURST
DESIGNED	RRR	DETAILED	PGF	QUANTITIES	CADD 5/95 PGF
DESIGN CK.		DETAIL CK.	RRR	QUAN.CK.	CADD CK.

Std. Base File: br132b.dgn
Plotted By: mrockwell
File: 13-Berm and Slope Protection.dgn
Plot Date: 13-DEC-2021 10:56
Plot Location:

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	130563.00	2020	29	51

* Note: The Grading Contractor shall excavate the channel to the limits shown prior to the construction of the box bridge, unless otherwise noted in the plans.

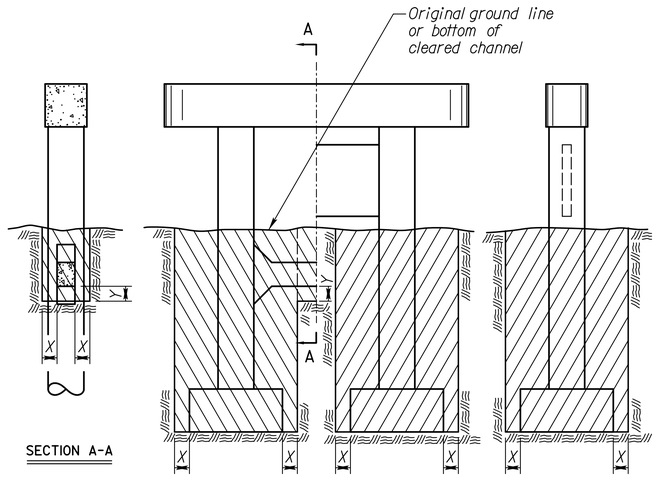


Note: Typical Class III Excavation for box bridges shall be below the "cleared" channel unless otherwise noted on the plans.

Excavation below the elevation of the bottom of the box floor and/or wingwalls is subsidiary to "Foundation Stabilization".

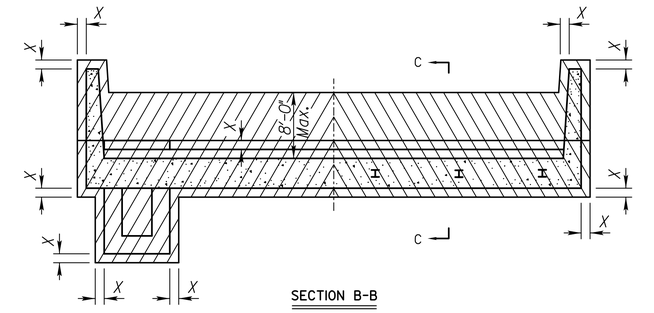
EXCAVATION DETAILS FOR REINFORCED CONCRETE BOX CULVERT

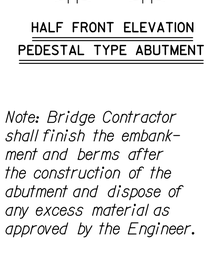
Note: Excavation for culverts less than bridge length and the additional excavation for "Embedded Structures" shall not be paid for as Class III Excavation, but shall be subsidiary to Grade 4.0 Concrete.



EXCAVATION DETAILS FOR TYPICAL PIERS

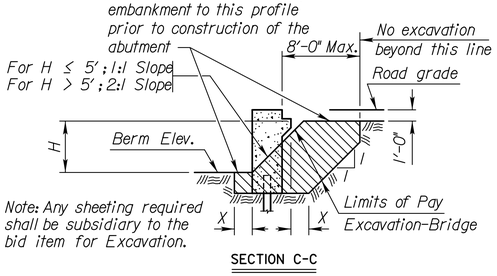
See detail when rock or shale (rock) is encountered. ⊛





Note: Bridge Contractor shall finish the embankment and berms after the construction of the abutment and dispose of any excess material as approved by the Engineer.

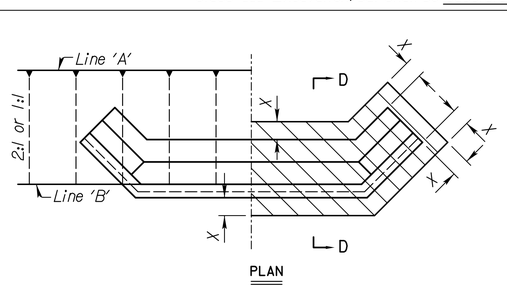
Grading Contractor to complete embankment to this profile prior to construction of the abutment

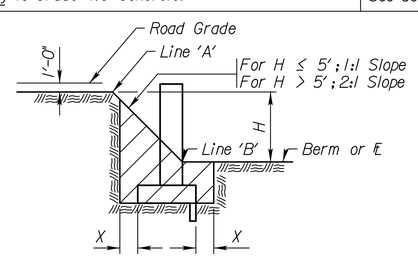


Note: Any sheeting required shall be subsidiary to the bid item for Excavation.

EXCAVATION DETAILS FOR TYPICAL ABUTMENTS

See detail when rock or shale (rock) is encountered. ⊛



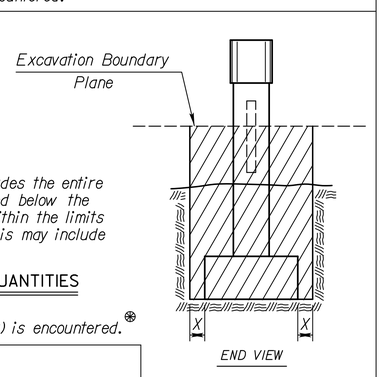


EXCAVATION DETAILS FOR ABUTMENTS WITH FLARED WINGWALLS

Note: Class II Excavation includes the entire volume of whatever nature found below the "Excavation Boundary Plane", within the limits specified for measurement. This may include water or air.

CLASS II EXCAVATION QUANTITIES

See detail when rock or shale (rock) is encountered. ⊛

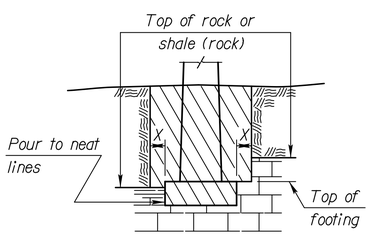


Note: All bridge excavation shall be computed on the basis of the cross-hatch areas and boundary lines indicated on this sheet and the Excavation Boundary Plane on the Construction Layout.

Sides of trenches in hard or compacted soil including embankments shall be shored, sheeted, braced or otherwise supported when the trench is more than 5 feet in depth and 8 feet or more in length. In lieu of the shoring, the sides of the trench above the 5 foot level may be sloped to preclude collapse. The slope for average soils shall be 1:1. If the angle of repose of the soil is less, flatter slopes shall be required.

Dimension "X" shall be 2'-0" unless indicated otherwise on the general plans.

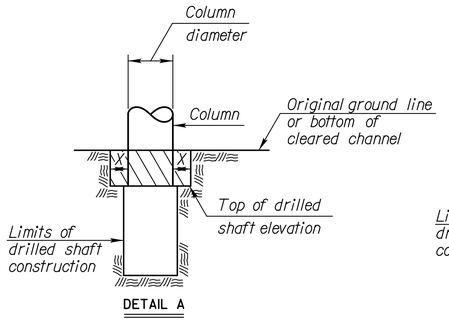
Dimension "Y" shall be 1'-6" unless indicated otherwise on the general plans.

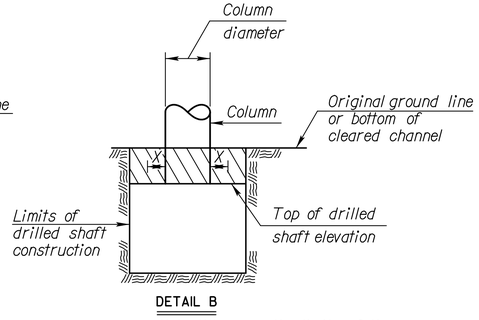


⊛ EXCAVATION DETAIL FOR FOOTINGS IN ROCK OR SHALE (ROCK)

(Piers and Abutments)

Note: Excavation below top of rock, hard shale or below top of footing, whichever is lower, shall be to neat lines of the concrete construction.





DRILLED SHAFT DETAILS

Note: Whenever the limits of the drilled shaft construction are greater than the Column Diameter + 2X, the limits of Class I, II or III Excavation shall be the limits of the drilled shaft construction. (See Detail B)

NO.	DATE	REVISIONS	BY	APP'D
7				
6	8-15-12	Embeddement Excavation Subsidiary	JPJ	TLF
5	5-15-12	Revised Wing Excavation	JPJ	TLF
4	3-3-10	Revised Wing Excavation	JPJ	TLF
3	10-16-06	Revised 'Foundation Stab.' Note	JPJ	KFH
2	10-19-04	Concrete - Class to Grade	RAM	KFH
1	4-10-02	Added 'Foundation Stab.' Note	RAM	KFH

KANSAS DEPARTMENT OF TRANSPORTATION

BRIDGE EXCAVATION (LRFD)

BRIOOB

FHWA APPROVAL			4/17/10	APP'D	TERRY L. FLECK
DESIGNED	DETAILED	RDR	QUANTITIES	CADD	
DESIGN CK.	DETAIL CK.	LRR	QUAN.CK.	CADD CK.	

Sh. No. 29

Std. Base File: br100.dgn
Plotted By: mrockwell
File: 14-Bridge Excavation.dgn
Plot Date: 13-DEC-2021 10:56
Plot Location:

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	30	51

CLEARING AND GRUBBING
1 acre

REMOVAL OF EXISTING STRUCTURES							
SHEET	BEGIN STATION	END STATION	LOCATION	SIDE	DESCRIPTION	QUANTITY	UNIT
PP	48+70.00		166th St	LT	Remove existing CMP	1	EA
PP	50+00.00		166th St	CT	Remove existing simple steel beam span	30	LF
					TOTAL	1 LUMP SUM	

EARTHWORK							
BEGIN STATION	END STATION	LOCATION	COMMON EXCAVATION (CY)	ROCK EXCAVATION (PAVEMENT REMOVAL) (CY)	COMPACTION (CY)	WASTE (CY)	REMARKS
48+30	52+36.18	166th St	681	183	545	50	
		TOTAL	681	183	545	50	

Assumed VMF=0.80

GUARDRAIL									
BEGIN STATION	END STATION	LOCATION	SIDE	MGS (FT)	CGS (FT)	GUARDRAIL END TERMINAL (MGS MSKT) (ALT #1) (EA)	GUARDRAIL END TERMINAL (MGS SOFTSTOP) (ALT #2) (EA)	TYPE II END TERMINAL (EA)	REMARKS
48+93.83	49+77.50	166th St	LT	37.5		1	1		
48+96.81	49+77.50	166th St	RT		93.75			1	Guardail length incl. Type II End Terminal
50+22.50	51+18.69	166th St	LT	50		1	1		
50+22.50	51+06.17	166th St	RT	37.5		1	1		
			TOTALS	125	94	3	3		

DRAINAGE STRUCTURES				
STATION	LOCATION	SIDE	24" EP (LF)	24" END SECTION (EA)
48+70.14	166th	LT	52	2
48+83.00	166th	RT	5	1
			57	3
		TOTALS	57	3

MOBILIZATION
1 LUMP SUM

CONTRACTOR FURNISHED SURVEYING & STAKING
1 LUMP SUM

PAVEMENT MARKING						
BEGIN STATION	END STATION	LOCATION	SIDE	MULTI-COMPONENT 6 IN SOLID WHITE (LF)	MULTI-COMPONENT 4 IN SOLID YELLOW (LF)	REMARKS
48+30	51+50	166th St	LT	320		EDGE LINE
48+30	51+50	166th St	RT	320		EDGE LINE
48+30	51+50	166th St	CL		640	DOUBLE LINE
			TOTAL	640	640	

RECAPITULATION OF ROAD QUANTITIES		
ITEM	QUANTITY	UNITS
Contractor Construction Staking	1	L.S.
Mobilization	1	L.S.
Removal of Existing Structures	1	L.S.
Clearing and Grubbing	1	L.S.
Common Excavation	681	C.Y.
Compaction of Earthwork (Type AA)(MR-5-5)	545	C.Y.
Rock Excavation (Pavement Removal)	183	C.Y.
Aggregate Ditch Lining (6")	54	TONS
Guardrail, Steel Plate (CGS)	94	Lin. Ft.
Guardrail, Steel Plate (MGS)	125	Lin. Ft.
Guardrai End Terminal (MGS MSKT) (Alt #1)	3	EA
Guardrai End Terminal (MGS SOFTSTOP) (Alt #2)	3	EA
Entrance Pipe (24")	57	L.F.
End Section (24")	3	EA
Pavement Marking (Multi-Component)(White)(6")	640	Lin. Ft.
Pavement Marking (Multi-Component)(Yellow)(4")	640	Lin. Ft.

For Temporary Erosion & Pollution Control, See Sheet No. 33
For Permanent Seeding Quantities, See Sheet No. 41
For Bridge Quantities, See Sheet No. 16
For Surfacing Quantities, See Sheet No. 31

AGGREGATE DITCH LINING					
BEGIN STATION	END STATION	LOCATION	SIDE	AGGREGATE DITCH LINING (6") (TONS)	REMARKS
51+00	51+25	211th St	RT	54	
			TOTALS	54	

Plotted :13-DEC-2021 10:56
Drawn By : mrockwell
File : F46_SOQ.dgn

SUMMARY OF QUANTITIES
166TH STREET

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		202I	3I	5I

GENERAL NOTE:

On surfacing projects, the 6" of Compaction Type AA, shown for the center portion on the roadbed, is for the purpose of restoring the original Compaction Type AA which may have been lost since grading operations. The exact locations of this Compaction Type AA, which will be required, is to be determined by the Engineer at the time of construction. This work shall be paid under the bid item "Compaction of Earthwork (Type AA)(MR-5-5)".

~~Over all structures, unless otherwise directed by the Engineer, where the top of the hubguard is level with or above the finished shoulder grade, the earth cover over the structure slab shall be removed and backfilled with _____ material as directed by the Engineer. The removal of this material will be subsidiary.~~

~~The _____ material used to backfill over the structure shall be paid for at the prices shown in the contract.~~

~~The earth shoulders shall be compacted full depth (Type MR) except, when ordered by the Engineer, the top 3" shall be left uncompacted for seeding.~~

~~All side roads and house entrances shall be surfaced with _____ to the R/W line as indicated on the detail. All side roads and house entrances with existing asphalt surface shall be surfaced with _____ at least to the R/W line or to the end of construction, as directed by the Engineer. Each mailbox turnout (ON PROJECTS WHERE STABILIZED SHOULDERS ARE NOT SPECIFIED) shall be surfaced with _____ to the limits shown on the detail.~~

~~Surfacing material (SA-_____) shall be used for surfacing house entrances and side roads (_____C.Y./SQ. YD.) beyond the limits of the asphalt surface to the limits of construction as determined by the Engineer.~~

The thickness of side road and entrance surfacing may be increased to the same thickness as the stabilized shoulder within the approximate limits of the shoulder.

On projects which specify both asphalt base and surface course materials, side roads, house entrances and mailbox turnouts may be surfaced with both materials at the contractors option, with the approval of the Engineer.

~~Quantities for aggregate for shoulders, AS-1, are calculated on the basis of 150 lbs. per cu. ft. Quantities for stabilized base course, AB-3, are calculated on the basis of 1.56 lbs. per cu. ft. Weight/cu. ft. includes moisture allowed by specification.~~

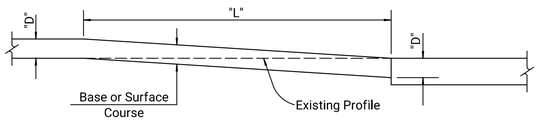
The base course shall be constructed to the plan thickness as shown.

Thicknesses indicated for all construction which is paid for on a weight or volume basis are approximate and may vary to correct for unevenness in the foundations or for other normal unevenness encountered in placement operations.

A tack coat of SS-1HP shall be provided between each lift of all base courses and surface courses and under the first lift of base or surface courses when they are placed on an existing asphalt, brick, or concrete surface, when so ordered by the Engineer and at the rate designated by him. ~~Quantities are included for these tacks calculated at the rate of 0.06 gal. /sq. yd.~~

~~Asphalt Material quantities are calculated on the basis of 8.328 lbs. per gal.~~

Shoulder rumble strips will not be constructed as part of this project.



TYPICAL PROFILE AT GRADE CONTROL POINTS

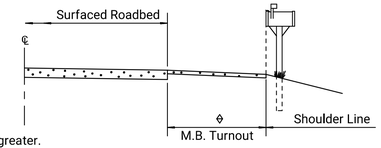
The Contractor shall cut the subgrade in accordance with this profile at all grade control points, i.e.; existing pavements, grade bridges and R.R. crossings, also at changes in thickness of base or surface courses. Corresponding dimensions of "D" and "L" shall be as given in the table below.

The work of cutting the subgrade and disposing of excess excavated material shall be subsidiary to other items in the contract.

TABLE OF DIMENSIONS												
D	L	D	L	D	L	D	L	D	L	D	L	
1"	25'	3"	75'	5"	125'	7"	175'	9"	225'	11"	275'	
2"	50'	4"	100'	6"	150'	8"	200'	10"	250'	12"	300'	

SUMMARY OF QUANTITIES							
ITEM	MAINLINE	ENTRANCE				TOTAL	UNITS
HMA Commercial Grade (Class A)(8") †	421	15				436	TONS
AGGREGATE BASE (AB-3) (4")	968					968	S.Y.

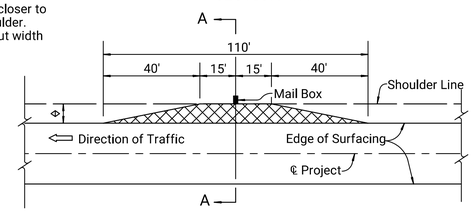
† Computed at the rate of 145 lbs. per cu.ft.



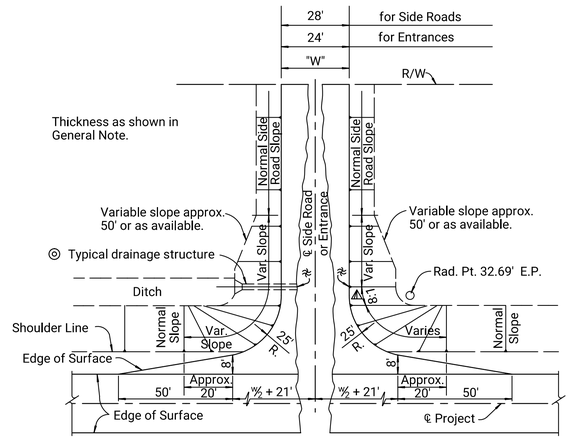
◊ Width shall be 8' or shoulder width, whichever is greater.

SECTION A-A

Note: The face of Mail Box should be no closer to the roadway than the edge of the shoulder. Align with edge of turnout when turnout width is greater than shoulder width.



DETAIL FOR SURFACING OF MAIL BOX TURNOUTS



WITH DRAINAGE STRUCTURE — MOUND ENTRANCE OR SIDE ROAD

DETAIL FOR SURFACING OF SIDE ROADS & HOUSE ENTRANCES

RATES OF APPLICATION				
RATE	UNIT	ITEM		

† Computed at the rate of

†† Computed at the rate of

RECAPITULATION OF QUANTITIES					
ITEM				TOTAL	UNIT
HMA Commercial Grade (Class A)(8")				436	TONS
AGGREGATE BASE (AB-3) (4")				968	S.Y.

⚠ 8:1 Slope at the appropriate clear zone shall apply to all mound entrances and mound side roads to 10' fill height. Normal Slope (but not steeper than 6:1) for over 10' fill height.

◎ Normal Slope (but not steeper than appropriate clear zone width. 6:1) at approximate ℄ Structure or

✲ On side roads and entrances which slope toward the highway, a low point approx. 6" deep shall be constructed to divert surface drainage into the highway ditch, unless otherwise shown on the plans.

NO.	DATE	REVISIONS	BY	APP'D.
12	1-10-07	Changed bituminous to asphalt	S.W.K.	J.O.B.
11	8-30-06	Changed tack type/rate	S.W.K.	J.O.B.
10	3-24-05	Revised compaction, tack type/rate	S.W.K.	J.O.B.
9	6-12-02	Added low point off shoulder.	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

SUMMARY OF QUANTITIES (Surfacing)

RD051

FHWA APPROVAL 9-06-06		APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. Hecht

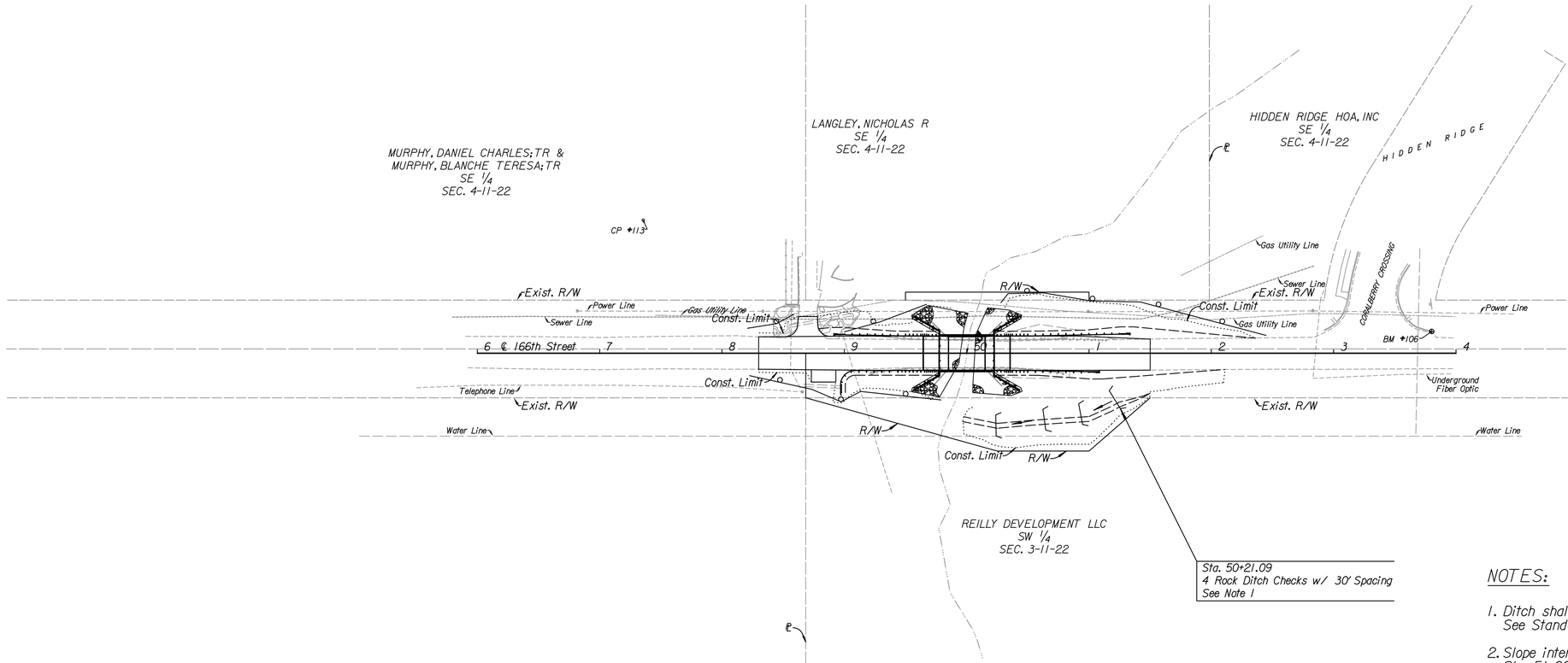
Sh. No. 3I

Plotted :13-DEC-2021 10:56

Drawn By : mrockwell
File : F46_rd051.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	32	51

SCALE
50' 0 50' 100'
PLAN: Lat. & Long.



NOTES:

1. Ditch shall be lined with Class II Type F channel liner. See Standard Drawing LA856.
2. Slope interruption shall be installed Sta. 50+50.00 to Sta. 51+00.00 RT according to Standard Drawing LA852D.

LEGEND

—o— Silt Fence

LEAVENWORTH COUNTY PUBLIC WORKS

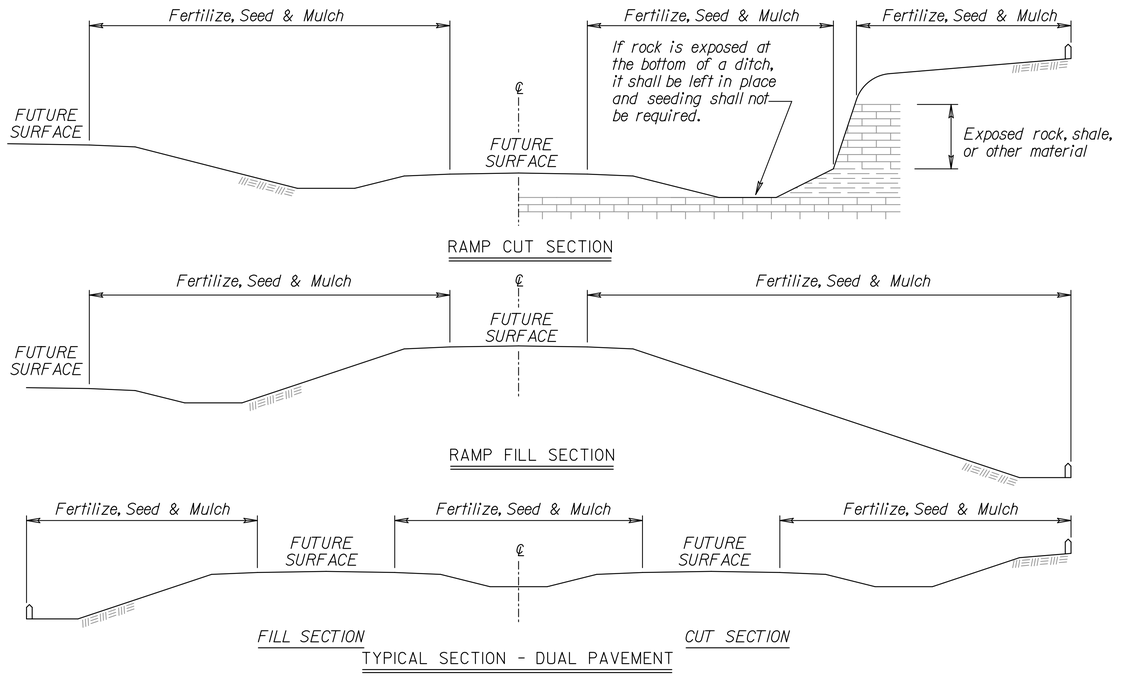
EROSION CONTROL

166TH STREET

Sh. No. 32

Plotted : 13-DEC-2021 10:56
Drawn By : mrockwell
File : F46_EC.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	33	51



FERTILIZER: A ratio and application rate that equals or exceeds the required minimum rate per acre of N, P_2O_5, K_2O listed in Summary of Quantities will be acceptable.

- * - N = Nitrogen Rate of Application
- ** - P_2O_5 = Phosphorous Rate of Application
- *** - K_2O = Potassium Rate of Application

The Contractor will be required to finish areas of excavation, borrow and embankment in accordance with the specifications. Areas that require installation or construction of temporary water pollution control items will be finished in reasonable close conformity to the alignment, grade and cross section shown on the plans or as established by the Engineer.

CLT = Construction Limit Tract. This area is defined by the entire disturbed area of the project that requires seeding and erosion control measures to be placed. Any impervious areas (i.e. pavement, gravel, riprap, etc.) shall not be included in this measurement.

Slope = Defined by the area of the project that requires Class 1 erosion control material to be placed. This area shall be seeded using the Soil Erosion Mix prior to placement of the material. Drilling seed is preferred, however, broadcasting is acceptable if drilling is not possible.

Channel = Defined by the area of the project that requires Class 2 erosion control material to be placed. This area shall be seeded using the Soil Erosion Mix prior to placement of the material. Drilling seed is preferred, however, broadcasting is acceptable if drilling is not possible.

GENERAL NOTES

The entire disturbed area, excepting the paved or surfaced areas, steep rocky slopes and areas of undisturbed native sod or other desirable vegetation shall be fertilized (limed when required), seeded, and mulched. Soil preparation shall conform to the Standard Specifications.

Temporary seeding shall be done during any time of the year that the soil can be cultivated. After the temporary seeding has been completed on the entire project, permanent seeding shall be done during the normal seeding season.

MULCHING: Mulch shall be spread uniformly over all disturbed areas and punched in the soil, unless otherwise noted on the plans. The rate of application per acre, thickness in place, for the mulching materials is generally as follows:

1¾ - 2¼ Tons per Acre = 11½" loose depth spread uniformly over acre.

Agricultural products, such as native prairie hay, used for mulching and erosion control practices, excluding wood based mulch, shall meet the North American Weed Free Forage Standards.
Other vegetative mulches are acceptable only with the Engineer's concurrence.

The above rate is a guide. It will be at the discretion of the Engineer to determine what rate is sufficient for adequate protection of newly seeded areas.

SUMMARY OF SEEDING / EROSION CONTROL QUANTITIES

P.L.S. RATE/ ACRE		ACRES		BID ITEM	QUANTITY	UNIT
CLT	SL/CH	CLT	SL/CH			
150				Temporary Fertilizer (15 - 30 - 15)		LB
20				Temporary Seed (Canada Wildrye)		LB
45				Temporary Seed (Grain Oats)		LB
45				Temporary Seed (Sterile Wheatgrass)		LB
				Soil Erosion Mix		LB
				Erosion Control (Class 1, Type Y)		SQ YD
				Erosion Control (Class 2, Type F)	57	SQ YD
				Sediment Removal (Set Price)	1	CU YD
				Synthetic Sediment Barrier		LF
				Temporary Berm (Set Price)	1	LF
				Temporary Ditch Check (Rock)	56.8	CU YD
				Temporary Ditch Check (Non-Rock)		LF
				Temporary Inlet Sediment Barrier		EACH
				Temporary Sediment Basin		CU YD
				Temporary Slope Drain		LF
				Temporary Stream Crossing		EACH
				Biodegradable Log (9")	15	LF
				Biodegradable Log (12")	20	LF
				Biodegradable Log (20")	156	LF
				Filter Sock (12")	15	LF
				Filter Sock (18")	117	LF
				Geotextile (Erosion Control)		SQ YD
				Silt Fence	117	LF
				SWPPP Design †		LS
				SWPPP Inspection †		EACH
				Water Pollution Control Manager †		EACH
900 lbs / acre				Mulch Tacking Slurry		LB
2 tons / acre				Mulching	1.1	TON
				Water (Erosion Control) (Set Price)	1	MGAL

NOTE: Projects less than 1 acre shall be bid as "Seeding" by the lump sum. See Permanent Seeding Summary of Seeding Quantities sheet LA850 for further details.

Geotextile (Erosion Control) shall be removed prior to placement of permanent slope protection.

Regreen and Quick Guard are the approved sterile wheatgrass products.

† If the total disturbed area of the project, not just the seeding area, is 1 acre or more, then these bid items must be included.

***** List size of material.*

The amount of mulch and mulch tacking slurry in the bid quantities is estimated. (Acres of Seeding X 1.5 X 2 Tons/Acre). The estimated quantity includes mulching associated with both temporary and permanent seeding operations. The total mulch and mulch tacking slurry required shall be determined in the field. The bid item for mulching and mulch tacking slurry shall be paid for according to the Standard Specifications.

Quantities for all erosion control items are estimated to give full flexibility for compliance with the NPDES permit. Final quantities will be determined in the field.

SOIL EROSION MIX

PLS RATE	NAME	QTY (lb)
	Total (lb)	

The Soil Erosion Mix is to be placed under the Class 1 and/or Class 2 erosion control material.

The Soil Erosion Mix consists of the Shoulder Area of the Permanent Seed Mix used on the project.

NO.	DATE	REVISIONS	BY	APP'D
3	08/03/20	Added Note	MRD	ML
2	12/01/17	Revised Standard	MRD	SHS
1	06/01/17	Revised Standard	MRD	SHS

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION AND POLLUTION CONTROL

LA852A

FHWA APPROVAL		1/26/2018	APP'D	Scott H. Shields	
DESIGNED	MRD	DETAILED	MRD	QUANTITIES	CADD
DESIGN CK.	SHS	DETAIL CK.	SHS	QUAN.CK.	CADD CK.

Std. Base File:		Plot Location:	
Plotted By: mrockwell			
File: la852a.dgn			
Plot Date: 13-DEC-2021 10:56			

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	34	51

EROSION CONTROL- CLASS 2, TYPE F

STATION TO STATION	SIDE	LENGTH	WIDTH	SQ YARD
50+22.50 TO 51+50.00	RT	127.50	4.00	57
TOTAL EROSION CONTROL (CLASS 2, TYPE F) =			57	SQ YARD

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

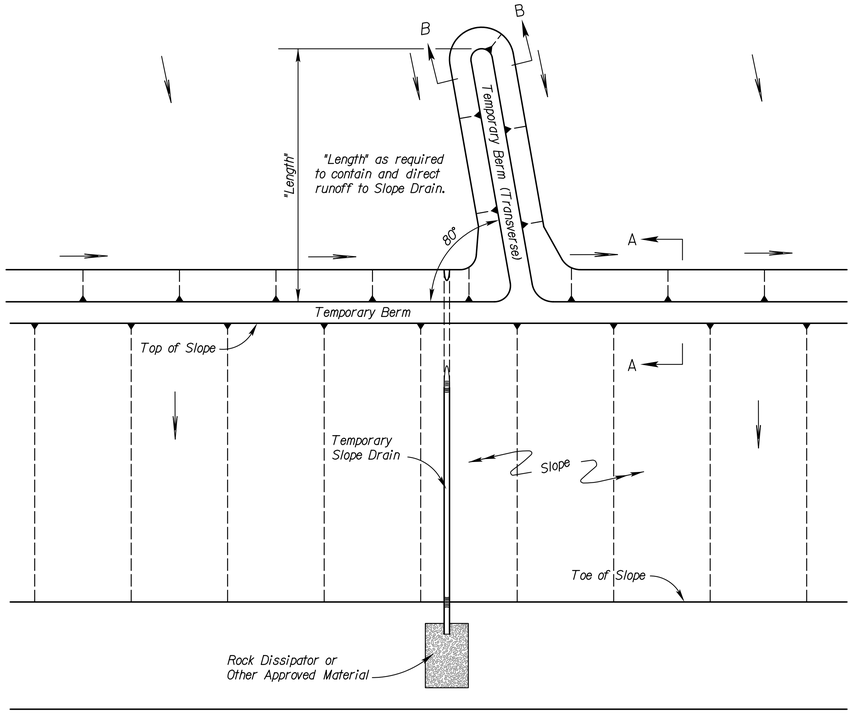
EROSION CONTROL
SEEDING-SODDING

LA852A-EC

FHWA APPROVAL		1/04/2006		APP'D		Scott H. Shields	
DESIGNED	MRM	DETAILED	MRM	QUANTITIES		CADD	MRM
DESIGN CK.	SHS	DETAIL CK.	SHS	QUAN.CK.		CADD CK.	SHS

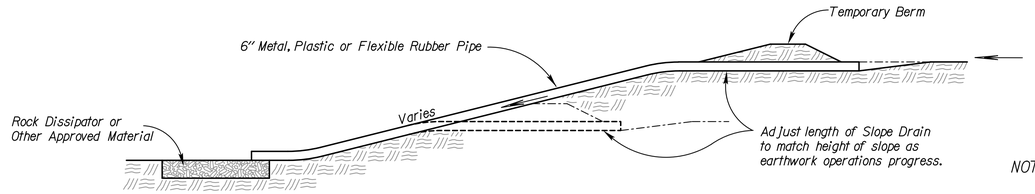
Std. Base File: _____
Plotted By: *mrockwell* | Plot Location:
File: *la852a-ec.dgn*
Plot Date: *13-DEC-2021 10:56*

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	35	51



TYPICAL PLAN VIEW OF TEMPORARY BERM AND TEMPORARY SLOPE DRAIN

NO SCALE



TYPICAL PROFILE OF TEMPORARY SLOPE DRAIN

NO SCALE

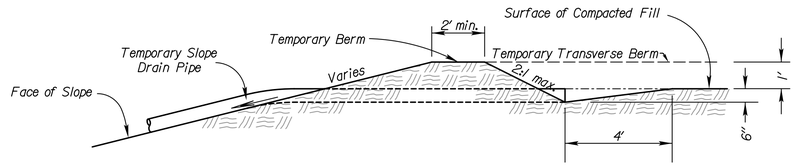
NOTES:

1) Temporary Slope Drain and Temporary Berm may be used on either project foreslopes or project backslopes.

2) Discharge of Slope Drains shall be into stabilized ditch or area, or into Sediment Basin.

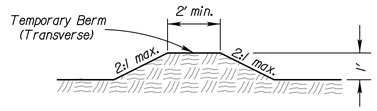
3) Pipe shall be secured in place as approved by Engineer.

4) Temporary Berms under 2,000 feet shall be bid by Set Price.



SECTION A-A

NO SCALE

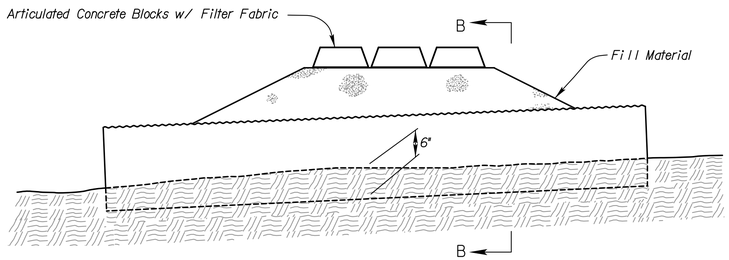


SECTION B-B

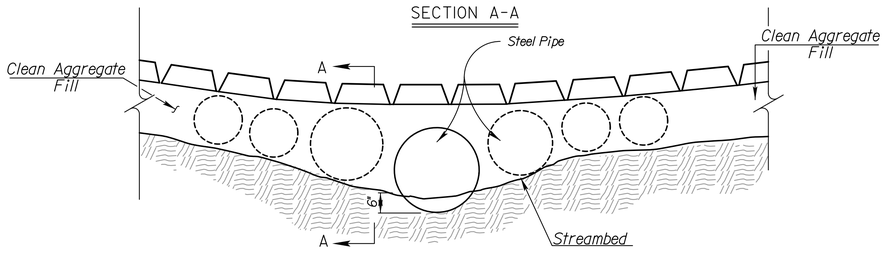
NO SCALE

TYPICAL PROFILE OF TEMPORARY BERM

NO SCALE



SECTION A-A



SECTION B-B

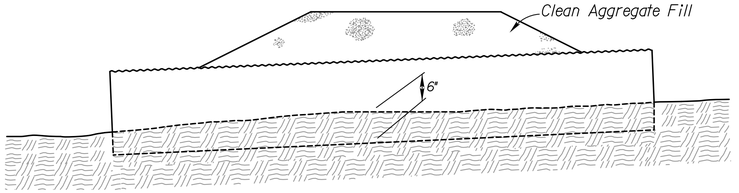
TEMPORARY STREAM CROSSING (ARTICULATED CONCRETE BLOCKS)

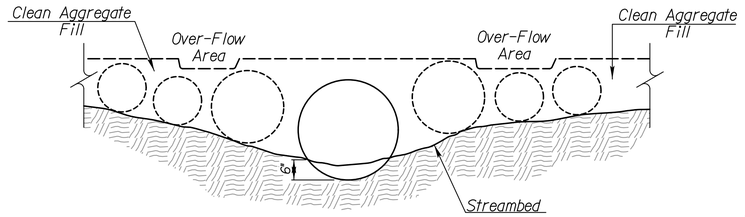
NO SCALE

Pipe size may vary

Place 1 pipe buried 6" into stream bottom, in the lowest point of the channel to allow the passage of aquatic organisms, with additional pipes placed along the remainder of the stream channel bottom such that ordinary high water (OHW) flows designated in the Contract Documents shall flow through the pipes without overtopping the crossing.

See KDOT Specifications for more information





SECTION B-B

TEMPORARY STREAM CROSSING (AGGREGATE)

NO SCALE

Pipe size may vary

Place 1 pipe buried 6" into stream bottom, in the lowest point of the channel to allow the passage of aquatic organisms, with additional pipes placed along the remainder of the stream channel bottom such that ordinary high water (OHW) flows designated in the Contract Documents shall flow through the pipes without overtopping the crossing.

See KDOT Specifications for more information

NO.	DATE	REVISIONS	BY	APP'D
3	6/11/13	Revised Standard	MRM	SHS
2	11/01/10	Revised Standard	MRM	SHS
1	10/15/10	Revised Standard	WCL	RDR

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION AND POLLUTION CONTROL

TEMPORARY SLOPE DRAIN

TEMPORARY STREAM CROSSING (AGGREGATE)

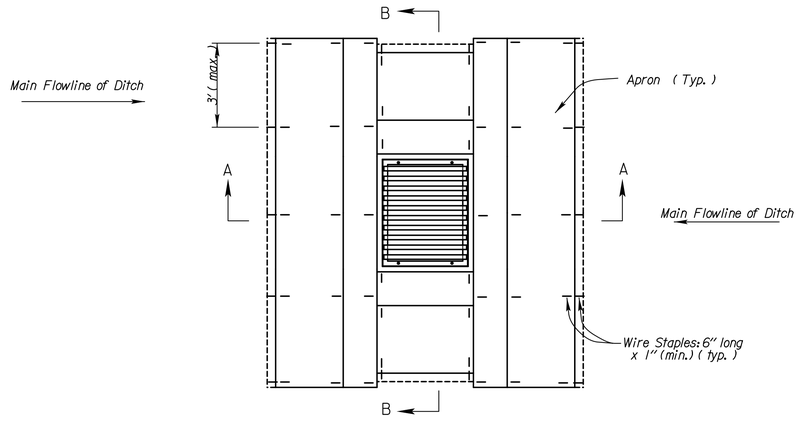
TEMP. STREAM CROSS. (ARTC. CONC. BLOCKS)

LA852B

FHWA APPROVAL	11/08/2010	APP'D	Scott H. Shields
DESIGNED MRM	DETAILED	QUANTITIES	CADD
DESIGN CK. SHS	DETAIL CK.	QUAN.CK.	CADD CK.

Std. Base File:
Plotted By: mrockwell | Plot Location:
File: la852b.dgn
Plot Date: 13-DEC-2021 10:56

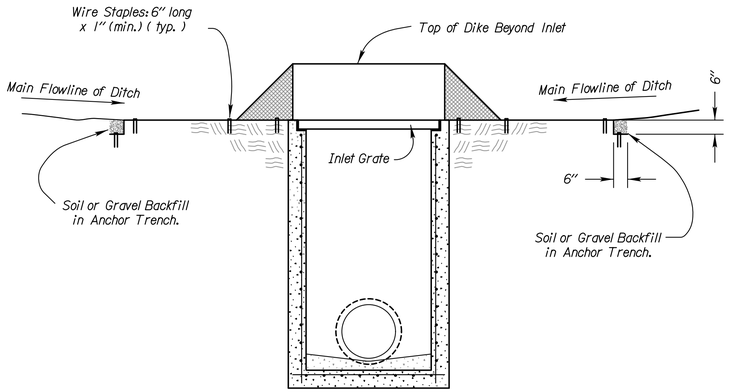
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	36	51



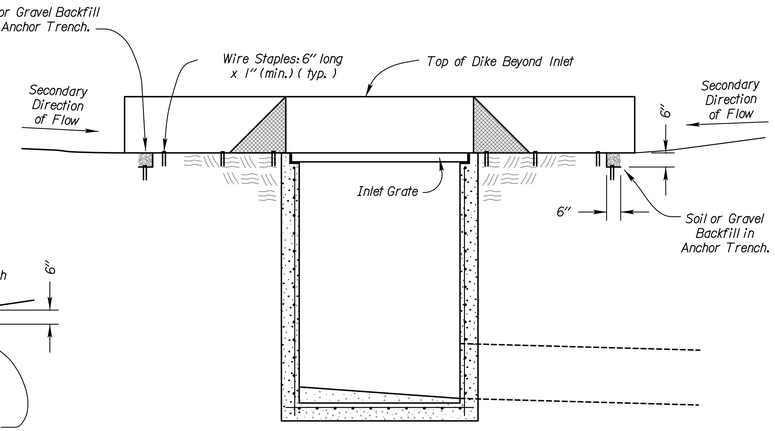
PLAN

TEMPORARY INLET SEDIMENT BARRIER
(TRIANGULAR SILT DIKE METHOD)

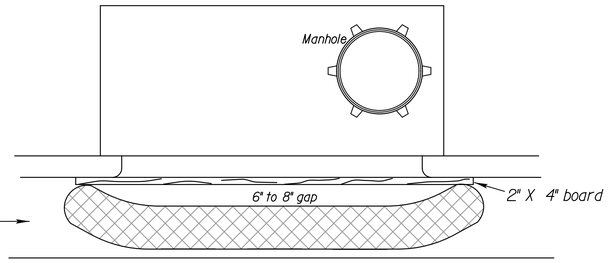
NO SCALE



SECTION A - A



SECTION B - B

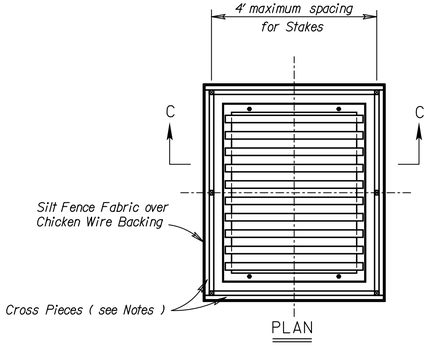


Bags = synthetic net (3mm mesh) or burlap bags

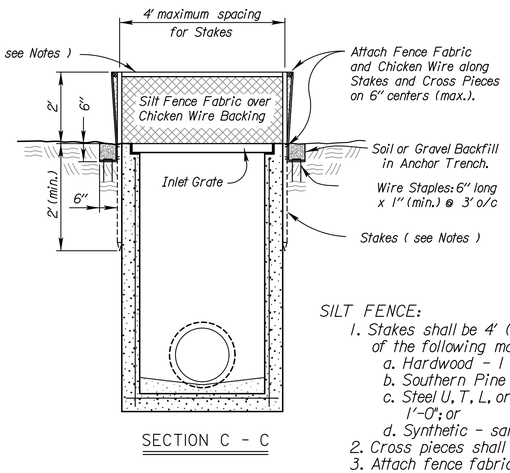
Rock = approximately 1" to 2" diameter

CURB INLET PROTECTION

1. If multiple gravel bags are required, place them in such a way that no gaps are evident.
2. Height of bags (8" minimum diameter) must not be above top of curb.
3. Alternative products may be used other than gravel bags such as the "Gutter Buddy". Products must be approved by the Engineer.
4. Curb inlet protection will be measured and paid for as Filter Sock.



PLAN



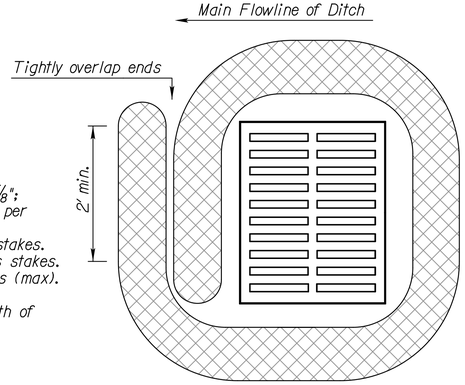
SECTION C - C

TEMPORARY INLET SEDIMENT BARRIER
(SILT FENCE METHOD)

NO SCALE

SILT FENCE:

1. Stakes shall be 4' (min.) long and of one of the following materials:
   a. Hardwood - 1 3/16" x 1 3/16";
   b. Southern Pine (No. 2) - 2 5/8" x 2 5/8";
   c. Steel U, T, L, or C Section - .95 lbs. per 1'-0"; or
   d. Synthetic - same strength as wood stakes.
2. Cross pieces shall be of same material as stakes.
3. Attach fence fabric securely on 6" centers (max).
4. Use of high flow material is acceptable.
5. Refer to plan sheets to estimate the length of silt fence required.



Drop inlet use
1'-6" TO 1'-8" diameter log

BIODEGRADABLE LOG/FILTER SOCK
DROP INLET PROTECTION

Note: 25% of log shall be keyed into ground during installation.

Stake every 4'

Material Requirements
Use 100% shredded mulch or other non-compost biodegradable material as fill for logs.
No compost or fines.
No hay or straw.
Do not use material which prohibits water infiltration.
Log Mesh: Use mesh with 1/4" openings or larger. Mesh must allow water infiltration but also hold fill material in place.

NO.	DATE	REVISIONS	BY	APP'D
3	9/26/19	Changed Direction of Main Flowline of Ditch Arrow	MRD	SHS
2	3/10/15	Revised Standard	RA	SHS
1	6/01/13	Revised Standard	MRM	SHS

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION AND POLLUTION CONTROL

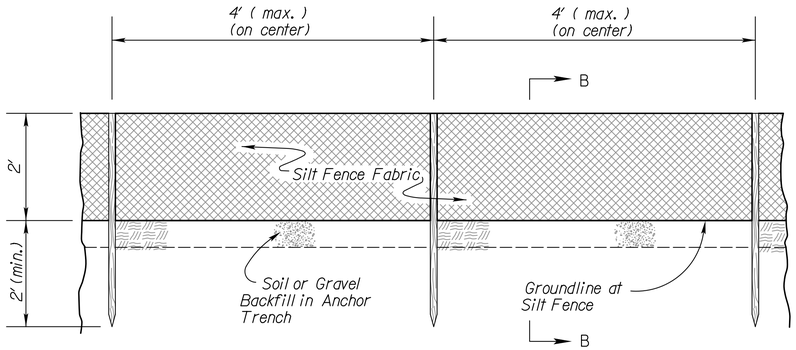
TEMP. INLET SEDIMENT BARRIER (SILT FENCE)
TEMP. INLET SEDIMENT BARRIER (T.S.D.)
CURB INLET PROTECTION
DROP INLET PROTECTION

LA852C

FHWA APPROVAL		3/10/2015	APP'D	Scott H. Shields	
DESIGNED	RA	DETAILED	RA	QUANTITIES	CADD
DESIGN CK.	SHS	DETAIL CK.	SHS	QUAN.CK.	CADD CK.

Std. Base File:
Plotted By: mrockwell | Plot Location:
File: la852c.dgn
Plot Date: 13-DEC-2021 10:56

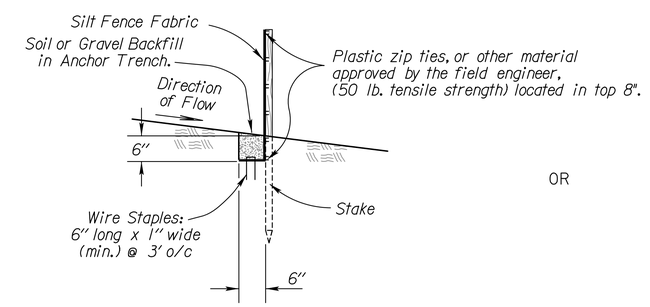
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	37	51



TYPICAL ELEVATION

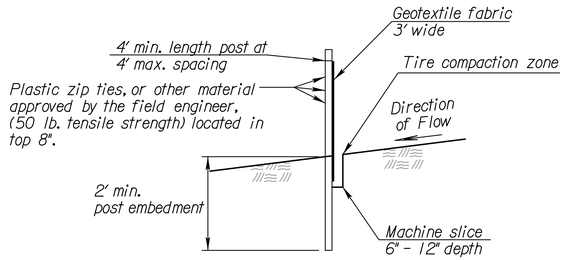
SILT FENCE BARRIER

NO SCALE



SECTION B-B

OR



SECTION B-B

INSTALLATION NOTES

SILT FENCE:

1. Stakes shall be 4' (min.) long and of one of the following materials:
   a. Hardwood - 1 3/16" x 1 3/16";
   b. Southern Pine (No. 2) - 2 5/8" x 2 5/8";
   c. Steel U, T, L, or C Section - .95 lbs. per 1'-0"; or
   d. Synthetic - same strength as wood stakes.
2. Attach fence fabric with 3 zip ties within the top 8" of the fence
   Alternate attachment methods may be approved by the Engineer on a performance basis.
3. Use of high flow material is acceptable.
4. Refer to plan sheets to estimate the length of silt fence required.

BIODEGRADABLE LOG OR FILTER SOCK

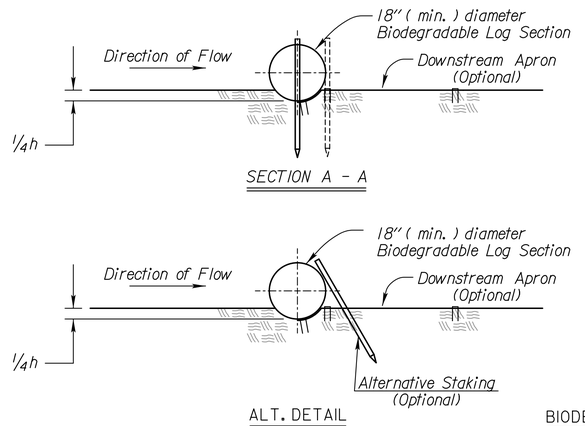
1. Place biodegradable logs or filter sock tightly together minimum overlap of 18".
2. Wood stakes shall be 2" x 2" (nom.).
3. Refer to plan sheets to estimate the length of biodegradable log and filter sock required.
4. Each log or sock (except compost filter socks) should be keyed into the ground at a minimum of 25% of its height. Compost filter socks should be placed on smooth prepared ground with no gaps between the sock and soil.
5. Length of stakes should be 2 times the height of the log at a minimum with minimum ground embedment equal to the height of the log / sock.

Biodegradable Log or Filter Sock Slope Interruptions

		PRODUCT		
		9" Sediment Log or 8" Filter Sock (ft)	12" Sediment Log or 12" Filter Sock (ft)	20" Sediment Log or 18" Filter Sock (ft)
Slope Gradient	≤4H:1V	40	60	80
	3H:1V	30	45	60

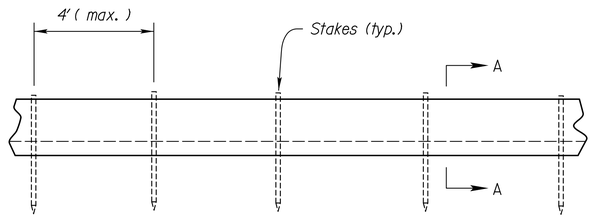
Deviations should be approved by the Field Engineer.

	BIODEGRADABLE LOG MATERIAL	
	LOW FLOW	HIGH FLOW
9"	Straw/Compost	Excelsior / Wood Chips / Coconut Fiber
12"	Straw/Compost	Excelsior / Wood Chips / Coconut Fiber
18"-20"	Straw/Compost	Excelsior / Wood Chips / Coconut Fiber



ALT. DETAIL

OPTIONAL



TYPICAL ELEVATION

BIODEGRADABLE LOG SLOPE INTERRUPTIONS

OR Filter Sock

GENERAL NOTES

1) Slope interruptions shall be placed along contour lines, with a short section turned upgrade at each end of the barrier.
2) The maximum length of the slope interruptions shall not exceed 250 feet, and the barrier ends need to be staggered.
3) Interruptions damaged by Contractor's negligence, including improper maintenance or lack of maintenance, shall be repaired immediately by Contractor at no additional cost to KDOT.
4) Agricultural products, such as native prairie hay, used for mulching and erosion control practices, excluding wood based mulch, shall meet the North American Weed Free Forage Standards.

NO.	DATE	REVISIONS	BY	APP'D
3	6/28/16	Revised Standard	RA	SHS
2	3/01/15	Revised Standard	RA	SHS
1	6/01/13	Revised Standard	MRM	SHS

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION AND POLLUTION CONTROL

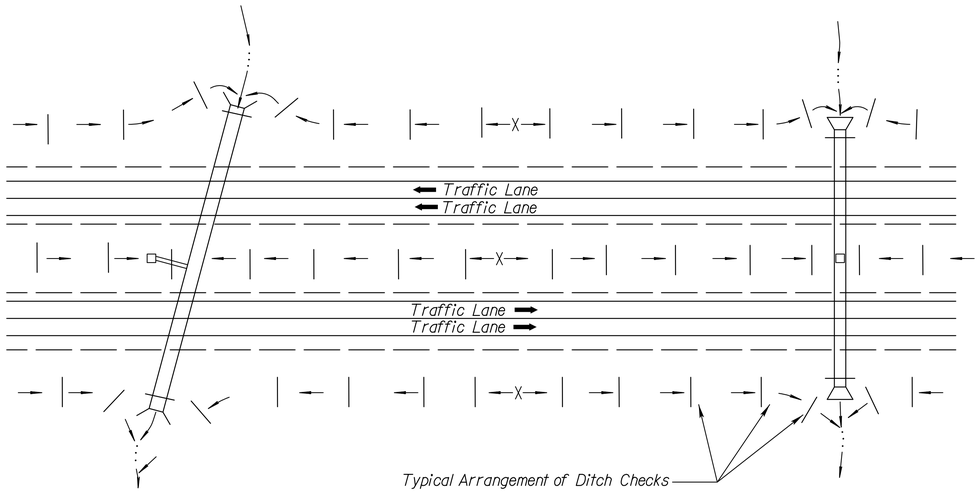
SLOPE INTERRUPTIONS BIODEGRADABLE LOG / SILT FENCE

LA852D

FHWA APPROVAL		9/14/2016	APP'D	Scott H. Shields	
DESIGNED	SHS	DETAILED RA	QUANTITIES	CADD	
DESIGN CK.	SHS	DETAIL CK.	QUAN.CK.	CADD CK.	

Std. Base File:
Plotted By: mrockwell | Plot Location:
File: la852d.dgn
Plot Date: 13-DEC-2021 10:56

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	38	51



TYPICAL DITCH CHECK LAYOUT PLAN

NO SCALE

20" BIOLOG CHECK SPACING	
DITCH ℄ SLOPE (%)	SPACING INTERVAL (FEET)
1.0	*125*
2.0	*60*
3.0	*40*
4.0	*30*
5.0	*25*
NOTE: Use this spacing for all except Rock Ditch Checks.	

18" FILTER SOCK CHECK SPACING	
DITCH ℄ SLOPE (%)	SPACING INTERVAL (FEET)
1.0	*110*
2.0	*55*
3.0	*35*
4.0	*25*
5.0	*20*
NOTE: Use this spacing for all except Rock Ditch Checks.	

GENERAL NOTES

1) *The choice of ditch check methods is at the option of the Contractor.*

2) *Use only rock checks in situations where the ditch slope is 6 percent or greater.*

2) *Ditch checks damaged by Contractor's negligence, including improper maintenance or lack of maintenance, shall be repaired by Contractor at no extra cost to KDOT.*

Std. Base File:	
Plotted By: *mrockwell*	Plot Location:
File: *la852e.dgn*	
Plot Date: *13-DEC-2021 10:56*	

NO.	DATE	REVISIONS	BY	APP'D
3	8/10/16	Revised Standard	RAA	SHS
2	6/28/16	Revised Standard	RAA	SHS
1	6/01/13	Revised Standard	MRM	SHS

KANSAS DEPARTMENT OF TRANSPORTATION

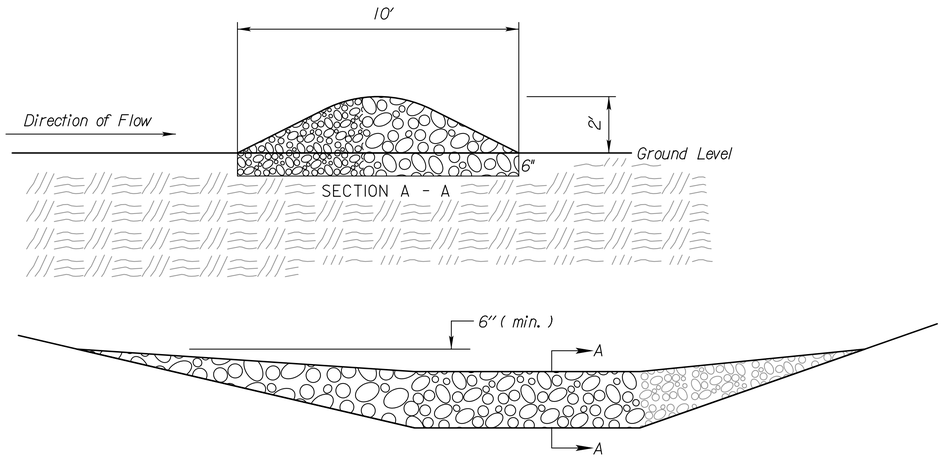
TEMPORARY EROSION AND POLLUTION CONTROL

DITCH CHECKS

LA852E

FHWA APPROVAL	9/14/2016	APP'D	Scott H. Shields		
DESIGNED	SHS	DETAILED	RAA	QUANTITIES	CADD RAA
DESIGN CK.	SHS	DETAIL CK.	SHS	QUAN.CK.	CADD CK. SHS

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	39	51



TYPICAL ELEVATION

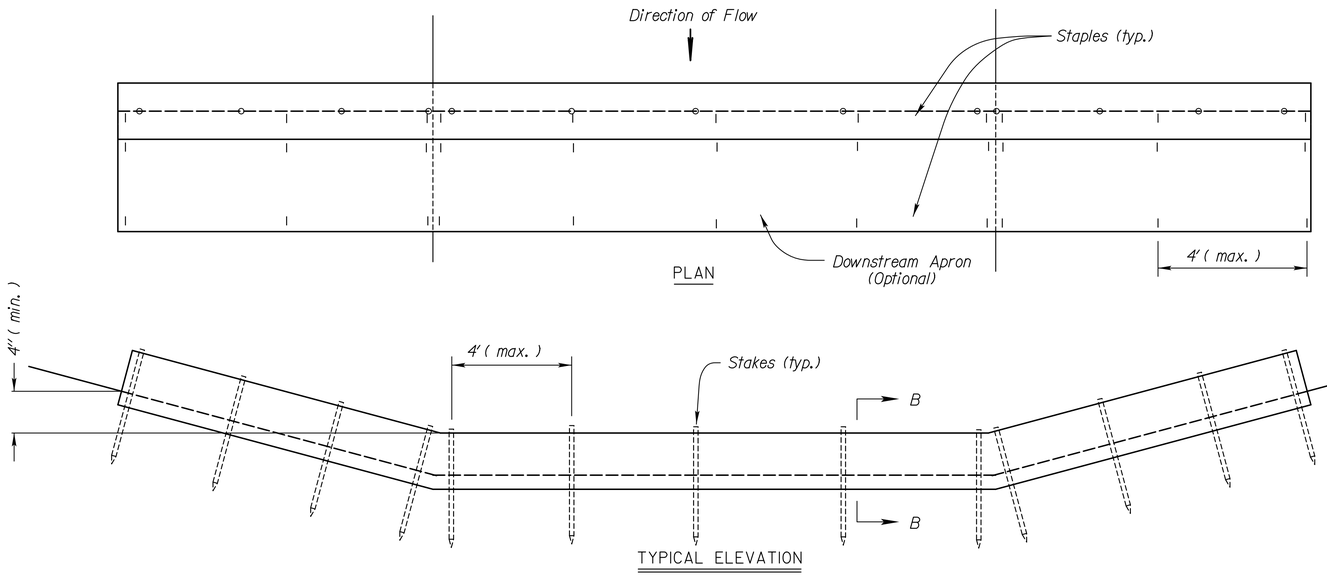
ROCK DITCH CHECK

NO SCALE

TEMPORARY ROCK DITCH CHECK SPACING	
DITCH ℄ SLOPE (%)	*SPACING INTERVAL (FEET)*
5.0	60
6.0	50
7.0	43
8.0	36
9.0	33
10.0	29
NOTE: Use this spacing only for Rock Ditch Checks.	

ROCK DITCH CHECK NOTES

1. Rock shall be clean aggregate, D50 = 6".
2. Place rock in such manner that water will flow over, not around ditch check.
3. Do not use rock ditch checks in clear zone.
4. Excavation: The ditch area shall be reshaped to fill any eroded areas. Prior to placement of the rock, the ditch shall be excavated to the dimensions of the Rock Ditch Check and to a minimum depth of 6" (150mm). After placement of the rock, backfill and compact any over excavated soil to ditch grade. This work shall be subsidiary to the bid item Temporary Ditch Check (Rock).
5. Aggregate excavated on site may be used as an alternate to the 6" rock, if approved by the Engineer.
6. The Engineer may approve the use of larger aggregates for the downstream portion of the check when conditions warrant their use.
7. When the use of larger rock is approved, the upstream portion of the check should be constructed of D50 = 6" or smaller.

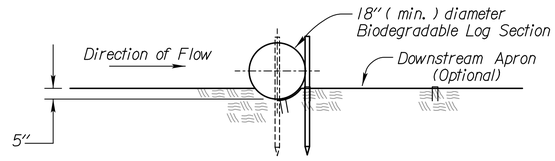


TYPICAL ELEVATION

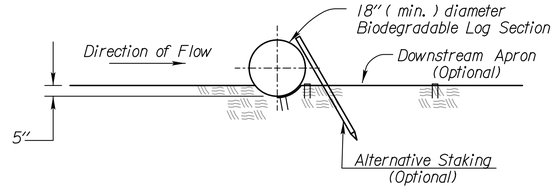
BIODEGRADABLE LOG DITCH CHECK

OR Filter Sock Ditch Check

NO SCALE



SECTION B - B



ALT. DETAIL
OPTIONAL

BIODEGRADABLE LOG DIKE NOTES

1. Use as many biodegradable log sections as necessary to ensure water does not flow around end of ditch check.
2. Overlap sections a minimum of 18".
3. Stakes shall be wood or steel according to Section 2114 of the Standard Specifications. Length of stakes shall be a minimum of 2 x the diameter of the log.
4. Use Erosion Control (Class 1) (Type C) as the downstream apron when required.
5. A downstream apron is required when directed by the Engineer. Apron material will be paid at the contract unit price.
6. Each log or sock (except compost filter socks) should be keyed into the ground at a minimum of 25% of its height. Compost filter socks should be placed on smooth prepared ground with no gaps between the sock and soil.

NO.	DATE	REVISIONS	BY	APP'D
3	8/10/16	Revised Standard	RAA	SHS
2	10/21/15	Revised Standard	RAA	SHS
1	9/15/14	Revised Standard	RAA	SHS

KANSAS DEPARTMENT OF TRANSPORTATION

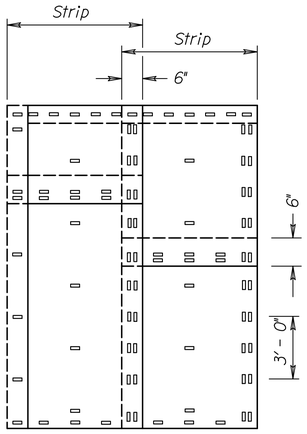
TEMPORARY EROSION AND POLLUTION CONTROL
ROCK DITCH CHECKS
BIODEGRADABLE LOG DITCH CHECKS

LA852G

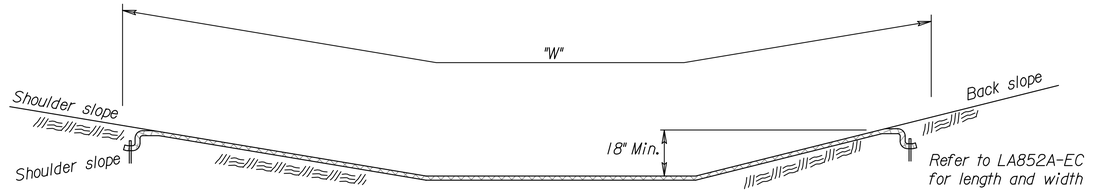
FHWA APPROVAL		9/14/2016	APP'D	Scott H. Shields	
DESIGNED	SHS	DETAILED	RAA	QUANTITIES	CADD RAA
DESIGN CK.	SHS	DETAIL CK.	SHS	QUAN.CK.	CADD CK. RAA

Std. Base File: la852g.dgn
Plotted By: mrockwell | Plot Location:
File: la852g.dgn
Plot Date: 13-DEC-2021 10:56

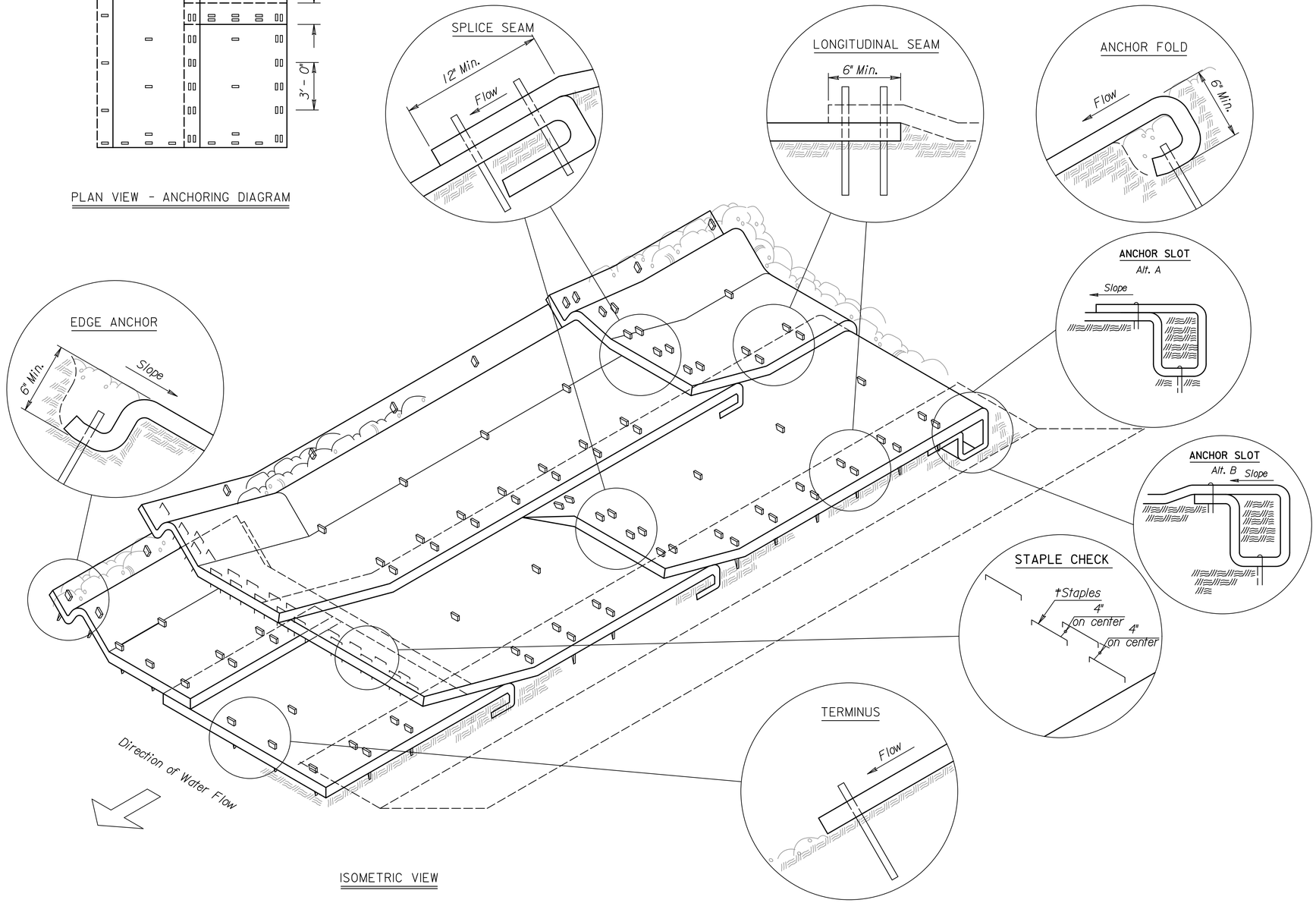
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	40	51



PLAN VIEW - ANCHORING DIAGRAM



CROSS SECTION (Ditch Lining)



ISOMETRIC VIEW

INSTALLATION DETAILS FOR EROSION CONTROL CLASS 2

Erosion Control Mats shall be laid loosely in the direction of the flow, with the first course at the centerline of channel, where applicable. In order for the mat to be in contact with the soil, lay the mat loosely, avoiding stretching.

1. *ANCHOR FOLD: The top of the mat should be folded under, buried and secured with approved anchors placed 6 inches apart. The top edge of the mat should be buried in a slot, 6 inches wide x 6 inches deep; anchored in the bottom of the slot, backfilled, and the mat folded over the top as shown in detail.*

2. *LONGITUDINAL SEAMS: The adjacent edges of the mat should overlap a minimum of 6 inches, with anchors catching the edges of both mats.*

3. *SPLICE SEAM: When splices are necessary, overlapend a minimum of 12 inches in direction of water flow. Stagger splice seams.*

4. *STAPLE CHECK: †Establish Staples in 2 rows 4" on center apart. Staple Checks - shall be 30' apart.*

5. *EDGE ANCHOR: Lay outside edge of mat into trench at top of side slope. Anchor at 3 foot intervals along trench.*

6. *TERMINUS: The bottom edge of the mat shall be anchored in place with anchors spaced at 9 inch intervals along the terminating edge.*

7. *TYPICAL ANCHORS: Anchor design shall be as recommended by the manufacturer.*

4	9/25/15	Modified Staple Check	RAA	SHS
3	9/15/14	Revised Standard	RAA	SHS
2	3/01/13	Revised Standard	MRM	SHS
1	9/22/99	Revised Standard	WCL	RDR
NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

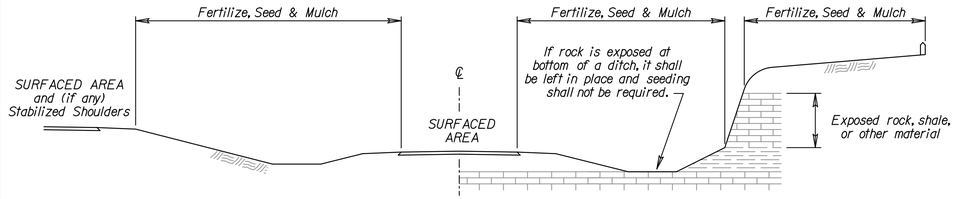
INSTALLATION DETAIL
EROSION CONTROL CLASS 2
FLEXIBLE CHANNEL LINER

LA856

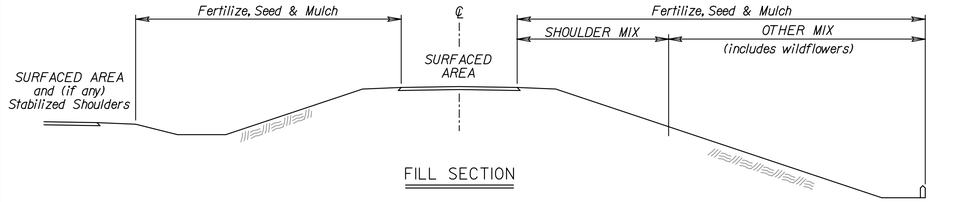
FHWA APPROVAL		11/02/2015	APP'D	Scott H. Shields	
DESIGNED	RAA	DETAILED	RAA	QUANTITIES	CADD RAA
DESIGN CK.	SHS	DETAIL CK.	SHS	QUAN.CK.	CADD CK.

Std. Base File: la856.dgn
Plotted By: mrockwell | Plot Location:
File: la856.dgn
Plot Date: 13-DEC-2021 10:56

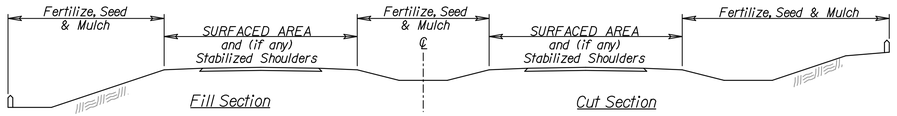
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	41	51



CUT SECTION



FILL SECTION



TYPICAL SECTION - DUAL PAVEMENT

SEEDING PERIODS

COOL SEASON	WARM SEASON
February 15 to April 20 and August 15 to Sept. 30	November 15 to June 1
SPECIES	SPECIES
Bluegrasses	Big Bluestem
Bromegrasses	Blue Grama
Canada Wildrye	Buffalograss
Fescues	Indiangrass
Prairie Junegrass	Little Bluestem
Ryegrasses	Sand Bluestem
Sterile Wheatgrass	Sand Dropseed
Tall Dropseed	Sand Lovegrass
Western Wheatgrass	Side Oats Grama
	Switchgrass
	Wildflower Mixes

In areas of 1 acre or more, if Cool Season grasses are mixed with Warm Season grasses, seed the area during the Warm Season seeding period.

See Leavenworth County Road Construction and Drainage Standards for additional seeding requirements.

SODDING PERIODS

COOL SEASON	WARM SEASON
March 1 to April 15	May 15 to September 15
SPECIES	SPECIES
Bluegrass Sod	Buffalograss Sod
Fescue Sod	

GENERAL NOTES

The entire disturbed area, excepting the paved or surfaced areas, steep rocky slopes and areas of undisturbed native sod or other desirable vegetation shall be fertilized (limed when required), seeded and mulched. Soil preparation shall conform to the Standard Specifications except as noted below.

All borrow areas shown on the plans are to be fertilized, seeded, and mulched. However, operation in borrow areas where crops are growing may be omitted when requested by the owner.

If temporary cover has provided stable slopes with no erosion, seed the permanent grasses into the existing cover. If there has been erosion that requires repair prior to seeding, then it may be necessary to regrade the area, resulting in bare ground.

FERTILIZER: A ratio and application rate that equals or exceeds the required minimum rate per acre of N, P_2O_5, K_2O listed in Summary of Seeding Quantities will be acceptable.

MULCHING: Mulch shall be spread uniformly over all disturbed areas and punched in the soil, unless otherwise noted on the plans. The rate of application per acre, thickness in place, for the mulching material is generally as follows:

1¾ - 2¼ Tons per Acre = 1½" loose depth spread uniformly over acre.

Agricultural products, such as native prairie hay, used for mulching and erosion control practices, excluding wood based mulch, shall meet the North American Weed Free Forage Standards.

Other vegetative mulches are acceptable only with the Engineer's concurrence.

The above rate is a guide. It will be at the discretion of the Engineer to determine what rate is sufficient for adequate protection of newly seeded areas.

NATIVE WILDFLOWER MIX 1

PLS RATE	NAME	QTY (lb)
0.3	Butterfly Milkweed	0.2
0.3	Common Milkweed	0.2
0.3	Black Eyed Susan	0.2
0.5	Blanket Flower	0.2
0.5	False Sunflower	0.2
0.5	Lance-Leaf Coreopsis	0.2
0.2	Maximilian Sunflower	0.1
0.1	New England Aster	0.1
0.2	Pinnate Prairie Coneflower	0.1
0.2	Plains Coreopsis	0.1
0.3	Purple Coneflower	0.2
0.3	Upright Prairie Coneflower	0.2
0.3	Dames Rocket	0.2
0.3	Lemon Mint	0.2
0.2	Pitcher Sage	0.1
0.2	Wild Bergamot	0.1
1.0	Illinois Bundleflower	0.4
0.2	Common Evening Primrose	0.1
0.1	Hoary Verbena	0.1
0.8	Purple Prairie Clover	0.3
0.3	Roundhead Lespedeza	0.2
3.0	Showy Partridge Pea	1.1
0.2	White Prairie Clover	0.1
10.3	Total (lb)	4.9

NATIVE WILDFLOWER MIX 2

PLS RATE	NAME	QTY (lb)
0.3	Butterfly Milkweed	
0.3	Black Eyed Susan	
0.5	Black Sampson Coneflower	
1.0	Blanket Flower	
0.2	Maximilian Sunflower	
0.2	Plains Coreopsis	
0.2	Upright Prairie Coneflower	
0.2	Western Yarrow	
0.3	Lemon Mint	
0.4	Pitcher Sage	
1.5	Illinois Bundleflower	
0.2	Common Evening Primrose	
1.0	Blue Wild Indigo	
0.4	Leadplant	
0.4	Purple Prairie Clover	
0.3	White Prairie Clover	
7.4	Total (lb)	

Package and deliver the wildflower seed separately from the grass seed mix. Package and deliver the Tall Drop Seed separately from the grass seed and the wildflower mix. Place the grass seed (except Tall Drop Seed) in the large seed box and drill (cover) seed 1/8" - 1/4". Place the wildflower seed in a separate seed box and drill (cover) seed 1/16" maximum. Place the Tall Drop Seed in a separate (third) seed box and place the seed (using the seed drill) on the soil surface.

OPTION: Broadcast Tall Drop Seed on the soil surface.

SUMMARY OF SEEDING QUANTITIES

P.L.S. RATE/ACRE SHLDR	P.L.S. RATE/ACRE OTHER	ACRES SHLDR	ACRES OTHER	BID ITEM	QUANTITY	UNIT
	80			Fertilizer (15-30-15)		
	2			Big Bluestem Grass Seed (Kaw)		
	10			Canada Wildrye Grass Seed		
	2			Indiangrass Seed (Osage)		
	2			Little Bluestem Grass Seed (Aldous)		
	6.3			Sideoats Grama Grass Seed (El Reno)		
	10			Sterile Wheatgrass (Regreen/Quick Guard)		
	0.7			Switchgrass Seed (Blackwell)		
	0.5			Tall Dropseed		
	4			Western Wheatgrass Seed (Barton)		
	10.3			Native Wildflower Mix 1		
				LUMP SUM	1	LS
				Mulching *		

SHLDR = Seeded with the Shoulder Mix. Typically 15 feet for 2-lane roads and 30 feet for 4-lane roads. Includes outside roadsides, turfed portions of shoulders, and turfed portion of the median.

OTHER = Seeded with the "Other" Mix. Designated as all other turf areas, except the Shoulder. Usually includes a Native Wildflower Mix.

NOTE: Projects less than 1 acre shall be bid as "Seeding" by the lump sum. All disturbed areas shall be seeded, fertilized and mulched at the listed rate per acre. The acres are estimated.

Refer to the Standard Specifications, Division 900, Section 904 'Seeding', and Section 907 'Sodding', for the seeding and sodding seasons.

** See LA852A for mulching quantity. The quantity of mulch is estimated (Acres of Seeding X 1.5 X 2 Tons/Acre). The total mulch required shall be determined in the field. The bid item for mulching shall be paid for according to the Standard Specifications.*

NO.	DATE	REVISIONS	BY	APP'D
2	08/03/20	Added Seeding / Sodding Periods Charts	MRD	ML
1	04/18/19	Revised Standard	MRD	SHS

KANSAS DEPARTMENT OF TRANSPORTATION

PERMANENT SEEDING
SUMMARY OF SEEDING QUANTITIES

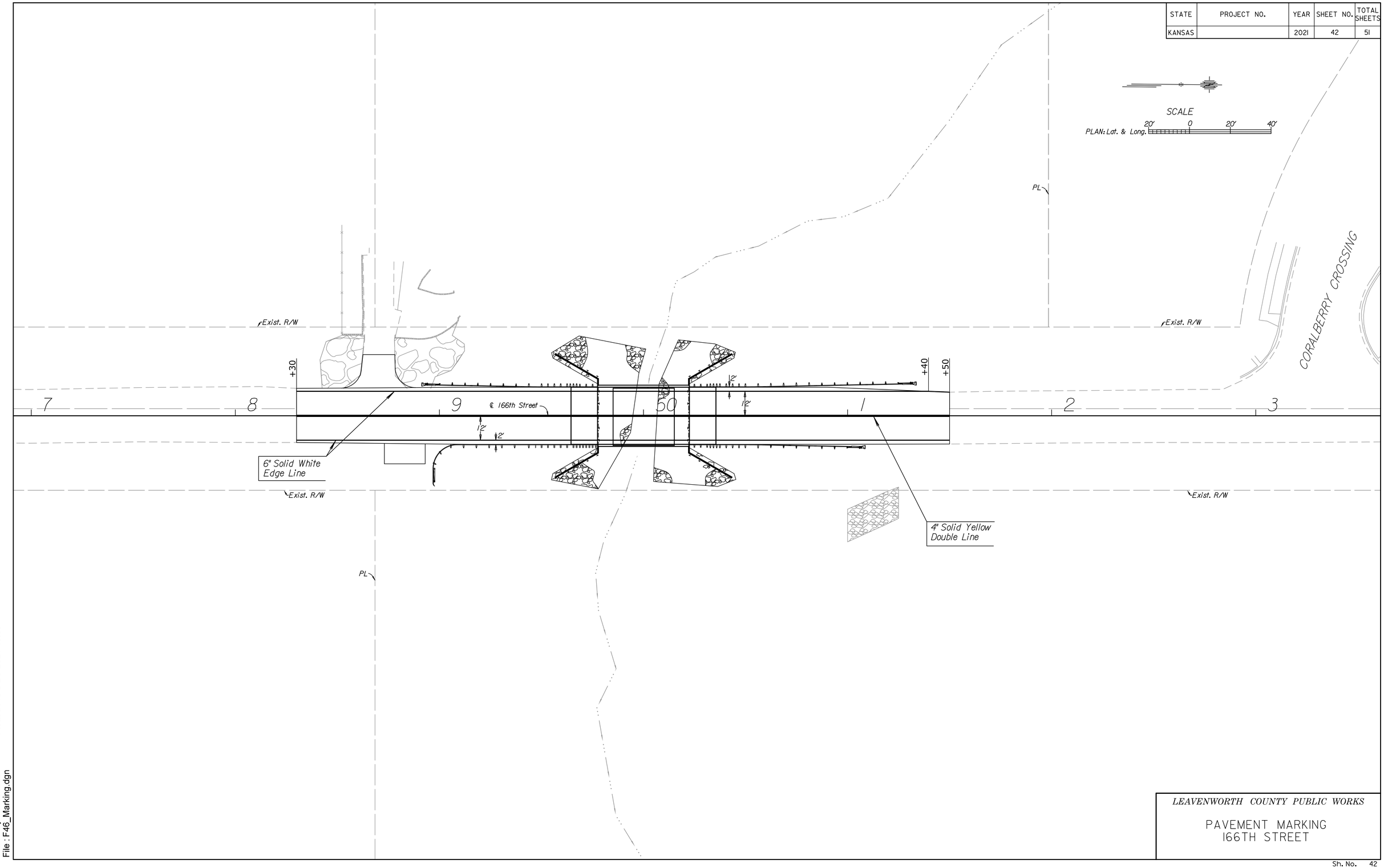
LA850

FHWA APPROVAL	05/06/2019	APP'D	Scott H. Shields
DESIGNED MRD	DETAILED MRD	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN.CK.	CADD CK.

Std. Base File:
Plotted By: mrockwell | Plot Location:
File: la850.dgn
Plot Date: 13-DEC-2021 10:56

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	42	51

SCALE
20' 0 20' 40'
PLAN: Lat. & Long.

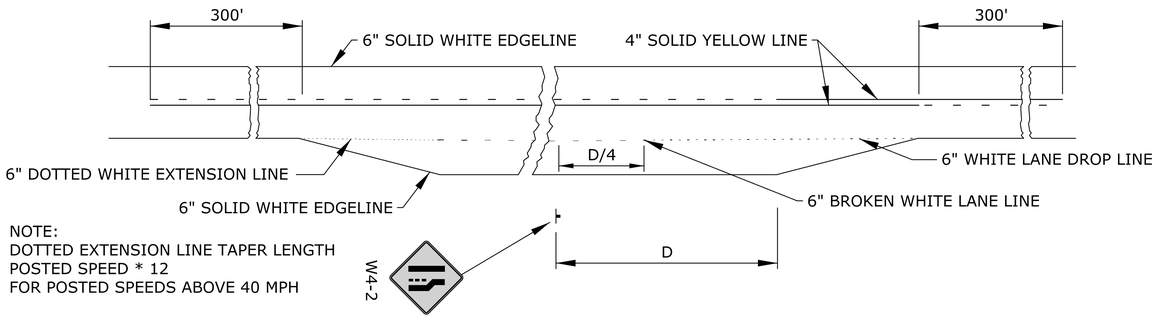


LEAVENWORTH COUNTY PUBLIC WORKS

PAVEMENT MARKING
166TH STREET

Drawn By : mrockwell
File : F46_Marking.dgn
Plotted : 13-DEC-2021 10:56

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	43	51

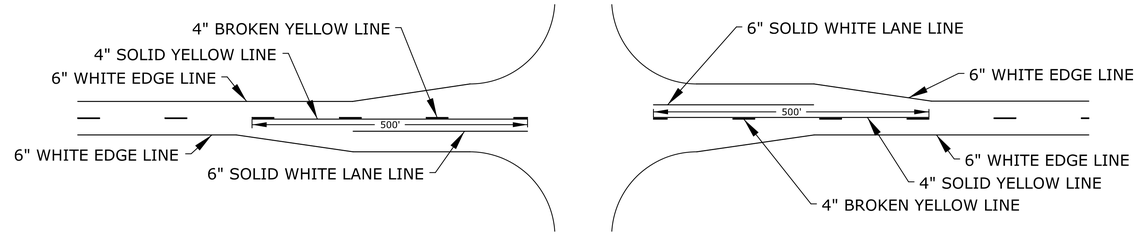


NOTE:
DOTTED EXTENSION LINE TAPER LENGTH
POSTED SPEED * 12
FOR POSTED SPEEDS ABOVE 40 MPH

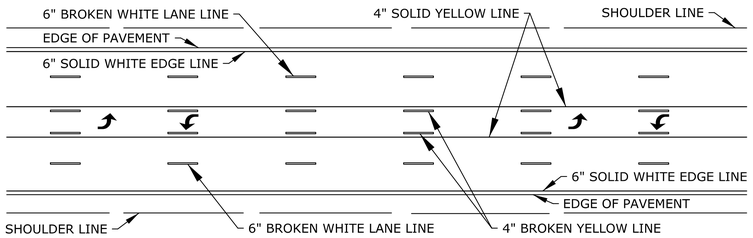
TYPICAL MARKING FOR AUXILIARY PASSING LANE

NOTE:
ALL PAVEMENT MARKINGS SHALL BE BROKEN AT CROSS ROADS.

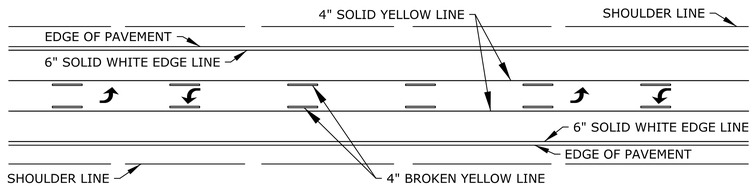
FOR HIGHWAY JUNCTIONS THE NO PASSING ZONE WILL EXTEND 1000' FROM INTERSECTION.



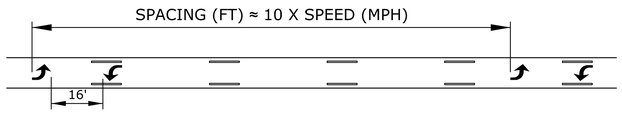
TYPICAL ROAD JUNCTION MARKINGS WITH BYPASS LANES



TWO-WAY LEFT TURN DETAIL FOR FIVE LANE ROADWAY

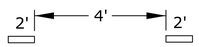


TWO-WAY LEFT TURN DETAIL FOR THREE LANE ROADWAY

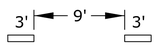


TWO-WAY LEFT TURN ARROW SPACING DETAIL

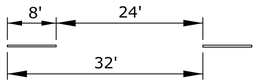
NOTE:
IF ARROWS ARE USED SPACE THE ARROWS AS SHOWN IN THE SPACING DETAIL.



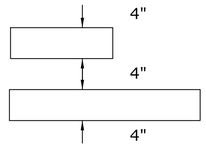
TYPICAL SPACING FOR DOTTED EXTENSION LINES, UNLESS OTHERWISE NOTED ON PLANS.



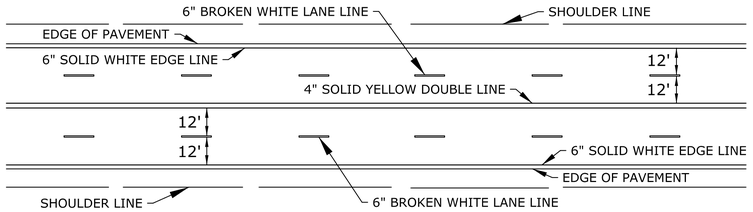
TYPICAL SPACING FOR LANE DROP. UNLESS OTHERWISE NOTED ON PLANS.



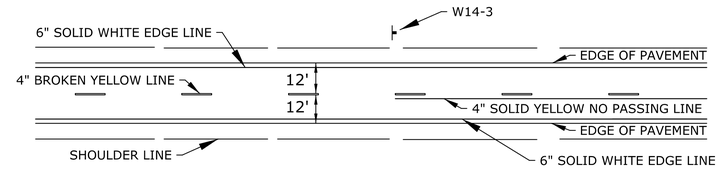
TYPICAL SPACING FOR BROKEN LINES UNLESS OTHERWISE NOTED ON PLANS



TYPICAL SPACING FOR NO PASSING LINES UNLESS OTHERWISE NOTED ON PLANS



TYPICAL MARKINGS FOR FOUR LANE ROADWAY



TYPICAL TWO LANE MARKINGS

NOTE:
LONGITUDINAL PAVEMENT MARKING LINES SHALL BE OFFSET A MINIMUM OF 2" FROM LONGITUDINAL PAVEMENT JOINTS.

NOTE:
ON NON I, US, AND K ROUTES, 4" EDGE LINES MAY BE INSTALLED.
6" EDGE LINES ARE NOT REQUIRED ON NON I, US, AND K ROUTES.

NO.	DATE	REVISIONS	BY	APP'D
3	5/25/12	Added Dotted Extension and Lane Drop Lines	B.A.H.	B.D.G.
2	9/20/05	Removed Aux. Passing Lane Dotted Ext. Line	J.F.F.	B.D.G.
1	7/26/05	New FHWA Approval Date	J.F.F.	B.D.G.

KANSAS DEPARTMENT OF TRANSPORTATION

TYPICAL PAVEMENT MARKING DETAILS FOR UNDIVIDED ROADWAYS

TE308

FHWA APPROVAL		5/25/2012	APP'D	Brian D. Gower	
DESIGNED	J.F.F.	DETAILED	J.F.F.	QUANTITIES	TRACED
DESIGN CK.	B.D.G.	DETAIL CK.	B.D.G.	QUAN. CK.	TRACE CK.

KDOT Graphics Certified 07-17-2018

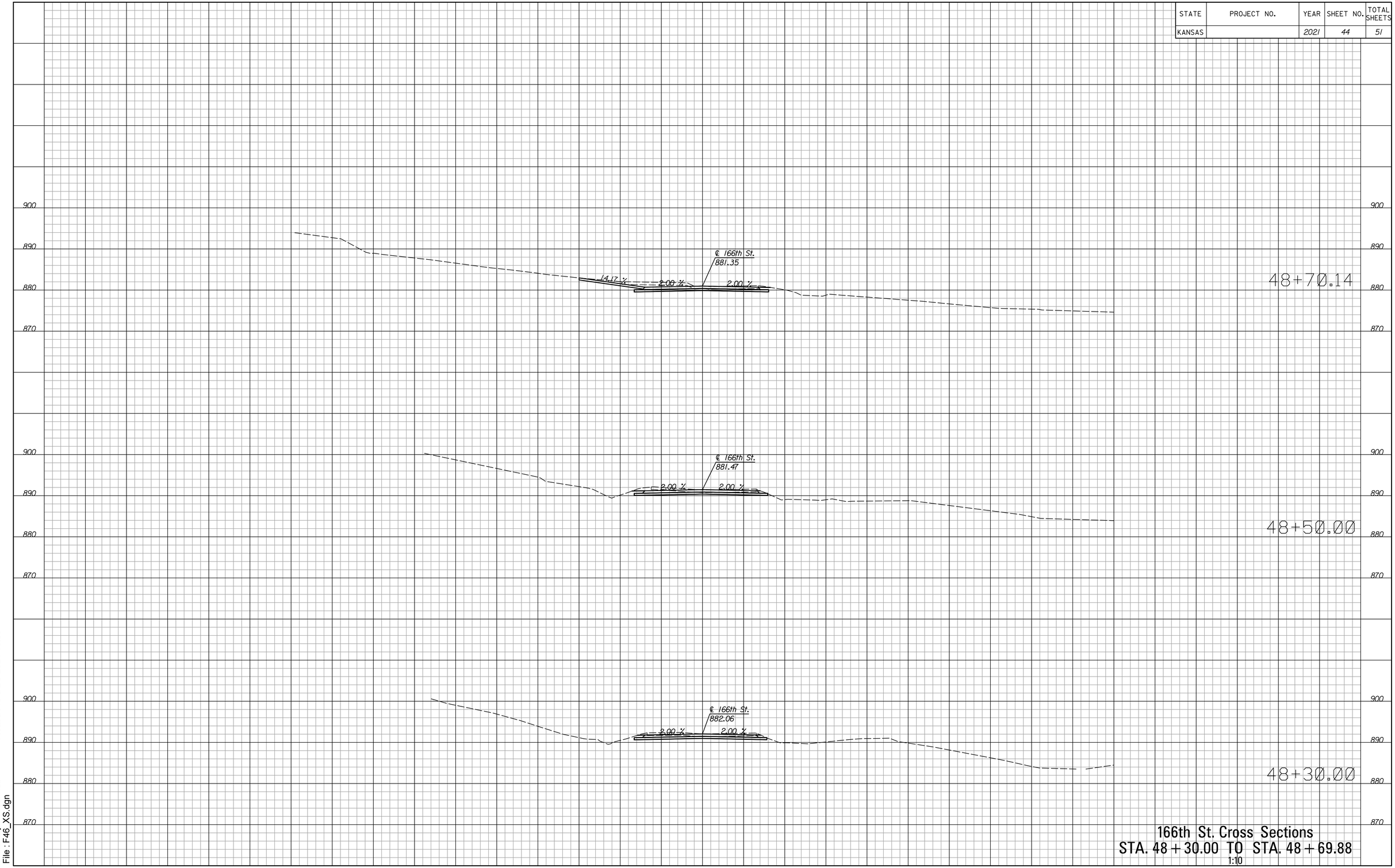
Sh. No. 43

KDOT Graphics Certified

Plotted : 13-DEC-2021 10:56

Drawn By : mrockwell
File : te308.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	44	51



166th St. Cross Sections
STA. 48+30.00 TO STA. 48+69.88
1:10

Plotted : 13-DEC-2021 10:56
Drawn By : mrockwell
File : F46_XS.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	45	51

166th St. Cross Sections
STA. 48 + 85.03 TO STA. 49 + 22.77
1:10

Plotted : 13-DEC-2021 10:56
Drawn By : mrockwell
File : F46_XS.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	46	51

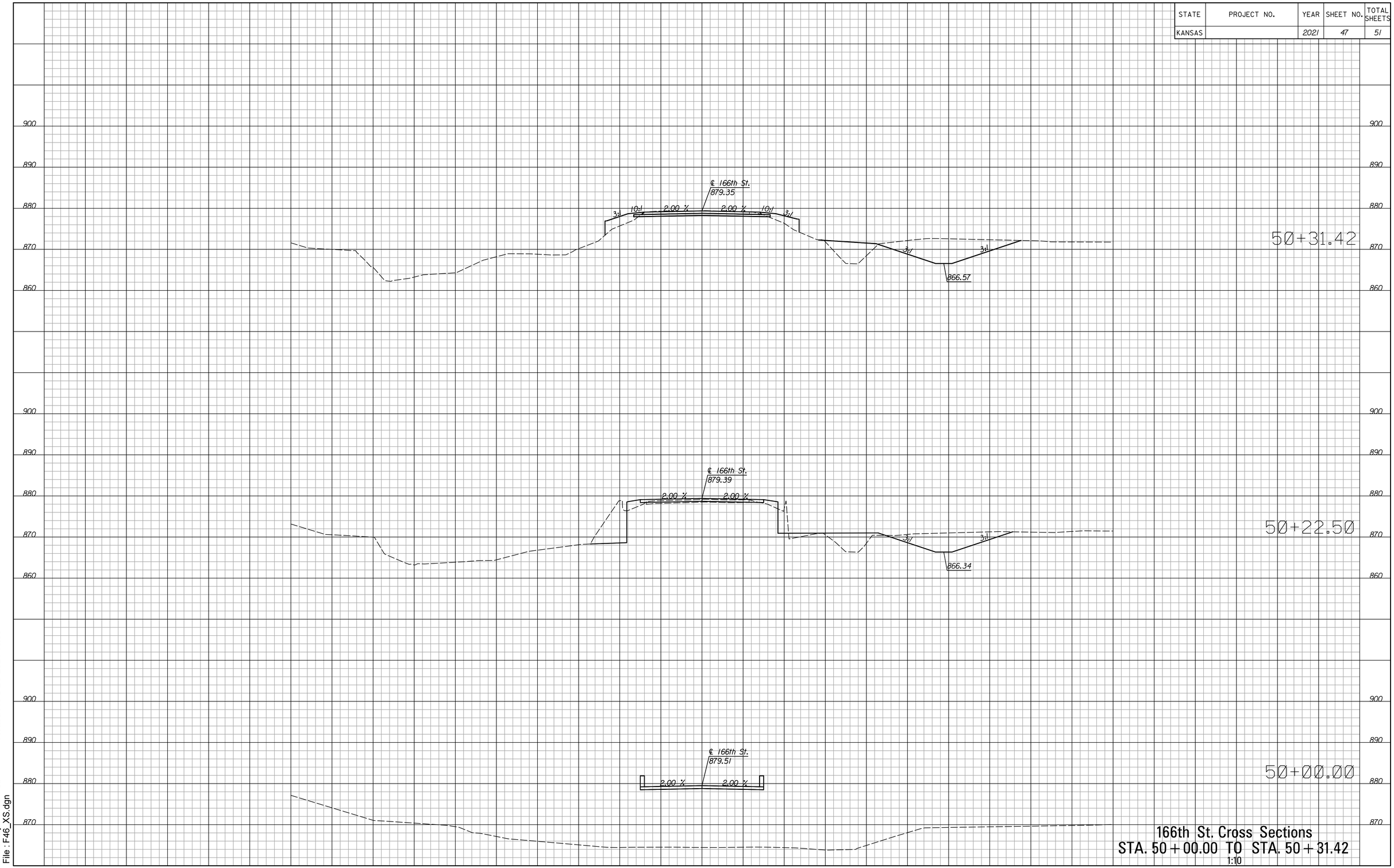
Plotted : 13-DEC-2021 10:56

Drawn By : mrockwell
File : F46_XS.dgn

166th St. Cross Sections
STA. 49+50.00 TO STA. 49+77.50

1:10

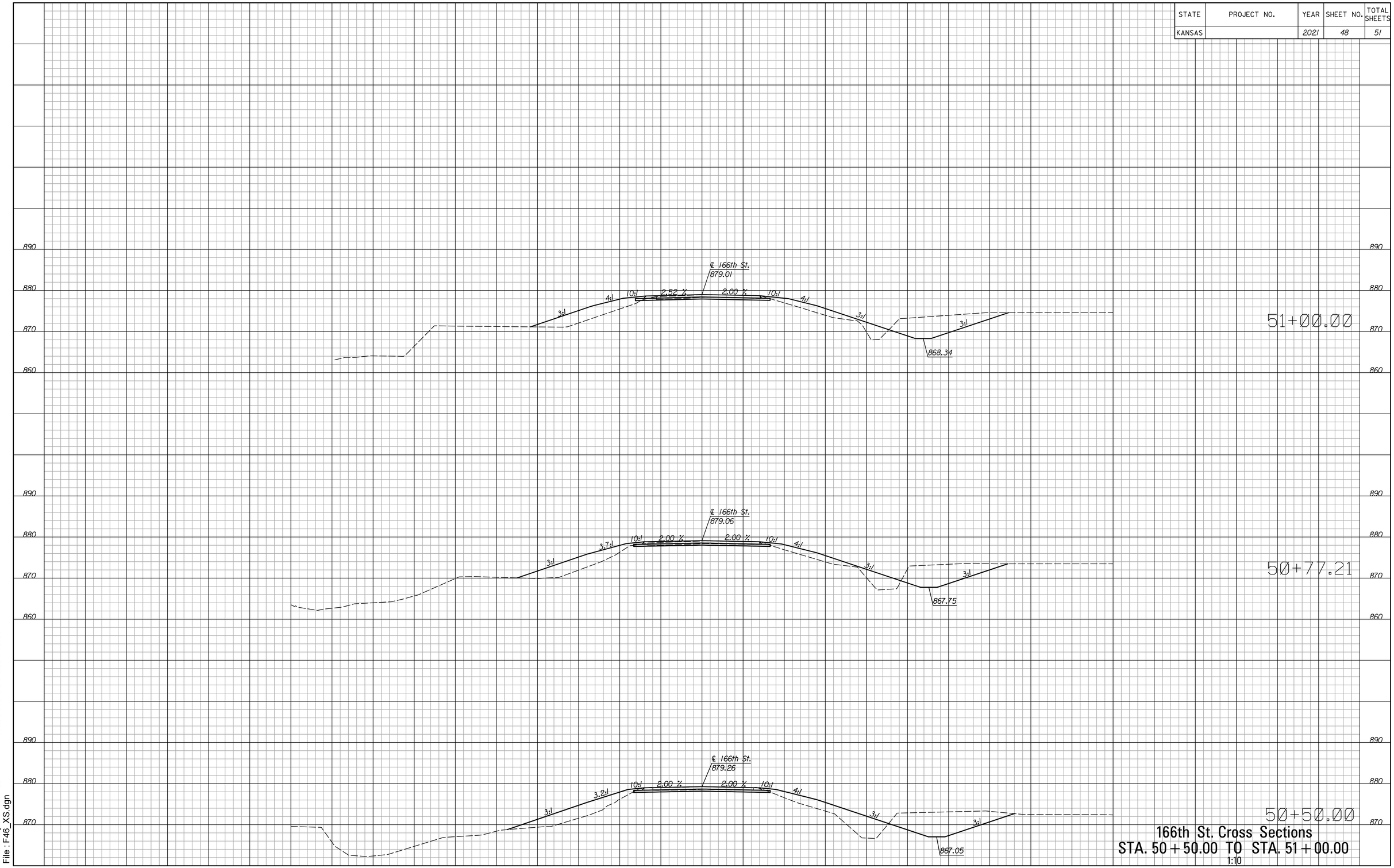
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	47	51



166th St. Cross Sections
STA. 50+00.00 TO STA. 50+31.42
1:10

Plotted : 13-DEC-2021 10:56
Drawn By : mrockwell
File : F46_XS.dgn

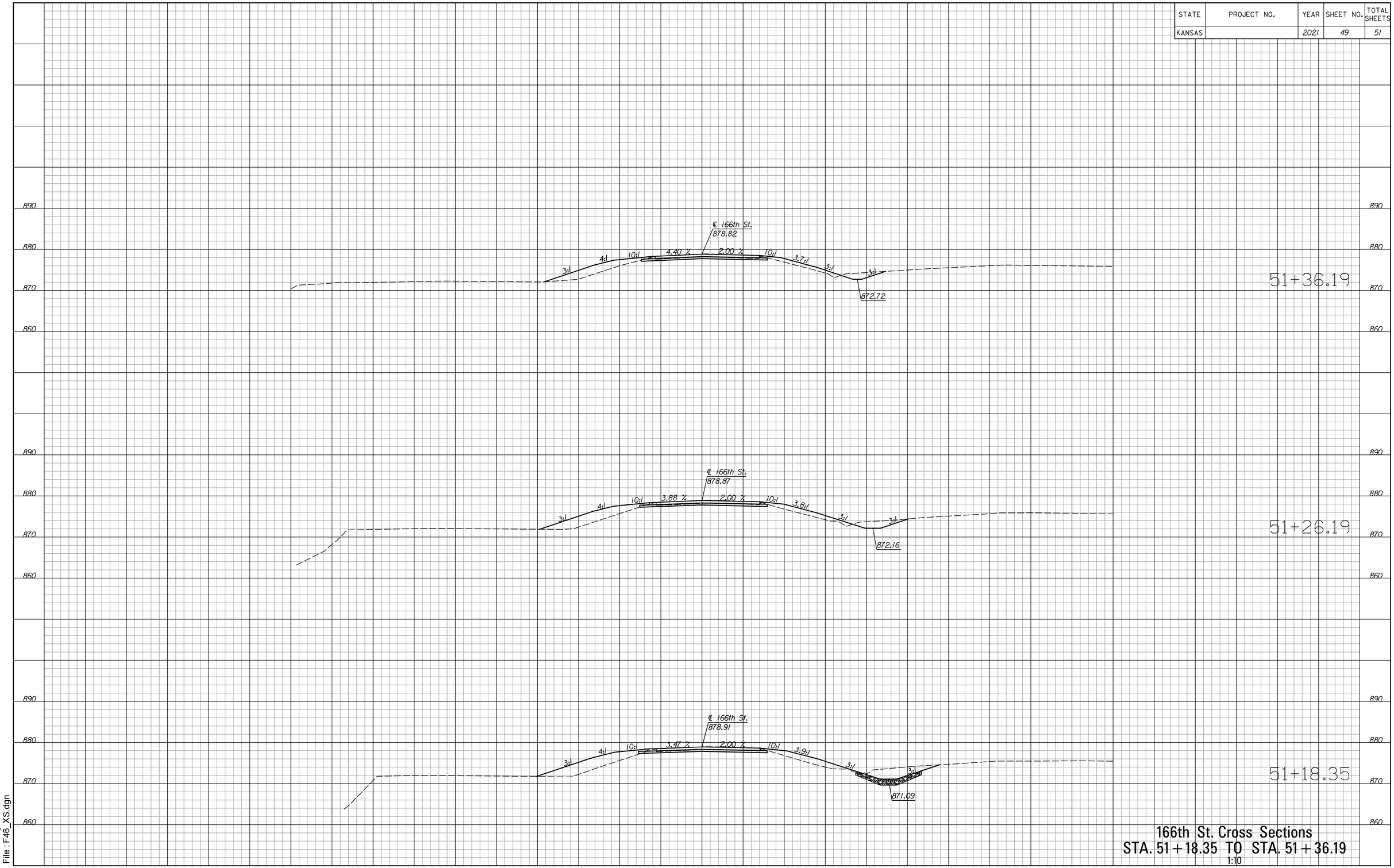
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	48	51



166th St. Cross Sections
STA. 50+50.00 TO STA. 51+00.00
1:10

Plotted : 13-DEC-2021 10:56
Drawn By : mrockwell
File : F46_XS.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	49	51

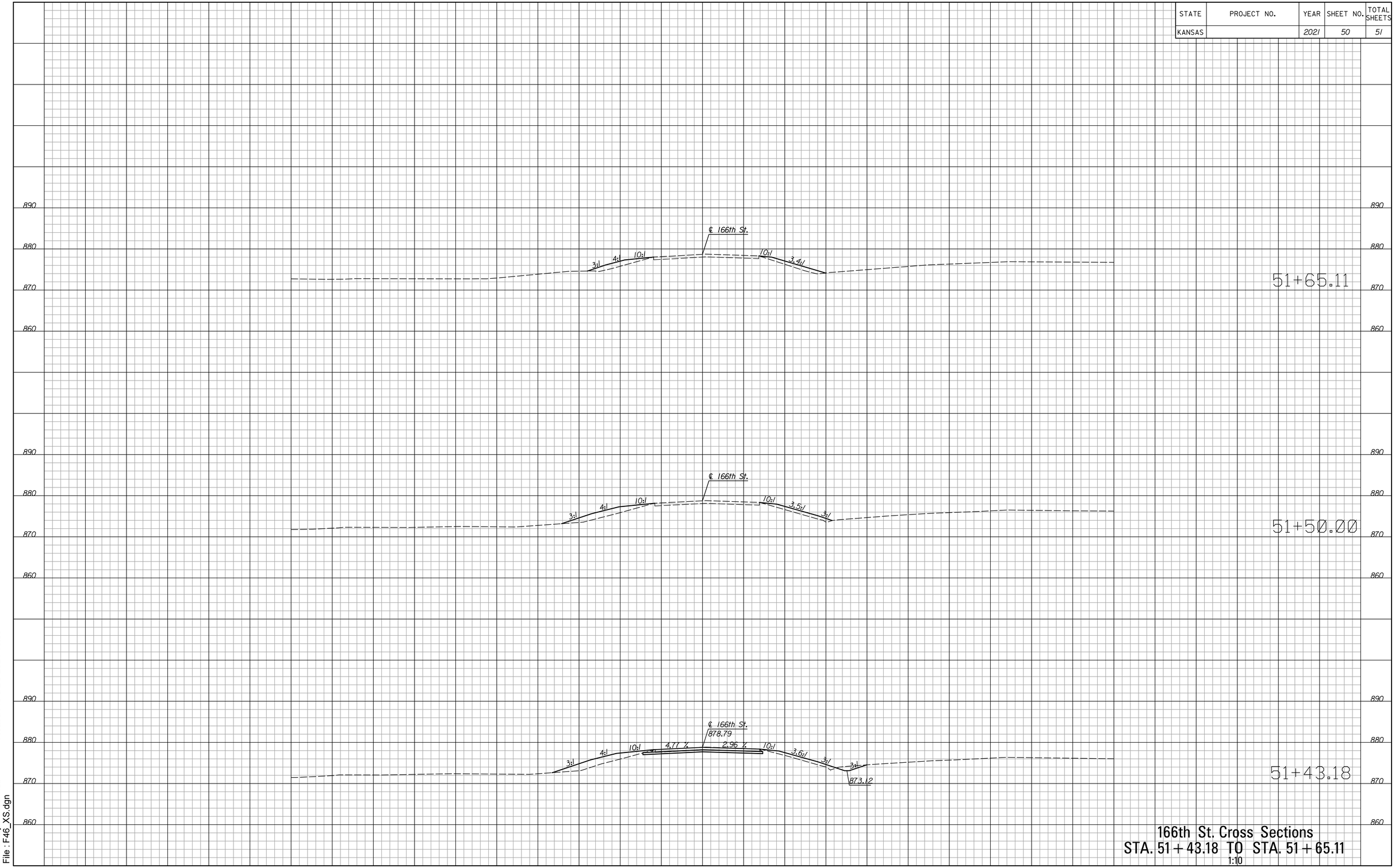


166th St. Cross Sections
STA. 51+18.35 TO STA. 51+36.19
1:10

Sht.49

Plotted : 13-DEC-2021 10:56
Drawn By : mrockwell
File : F46_XS.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	50	51

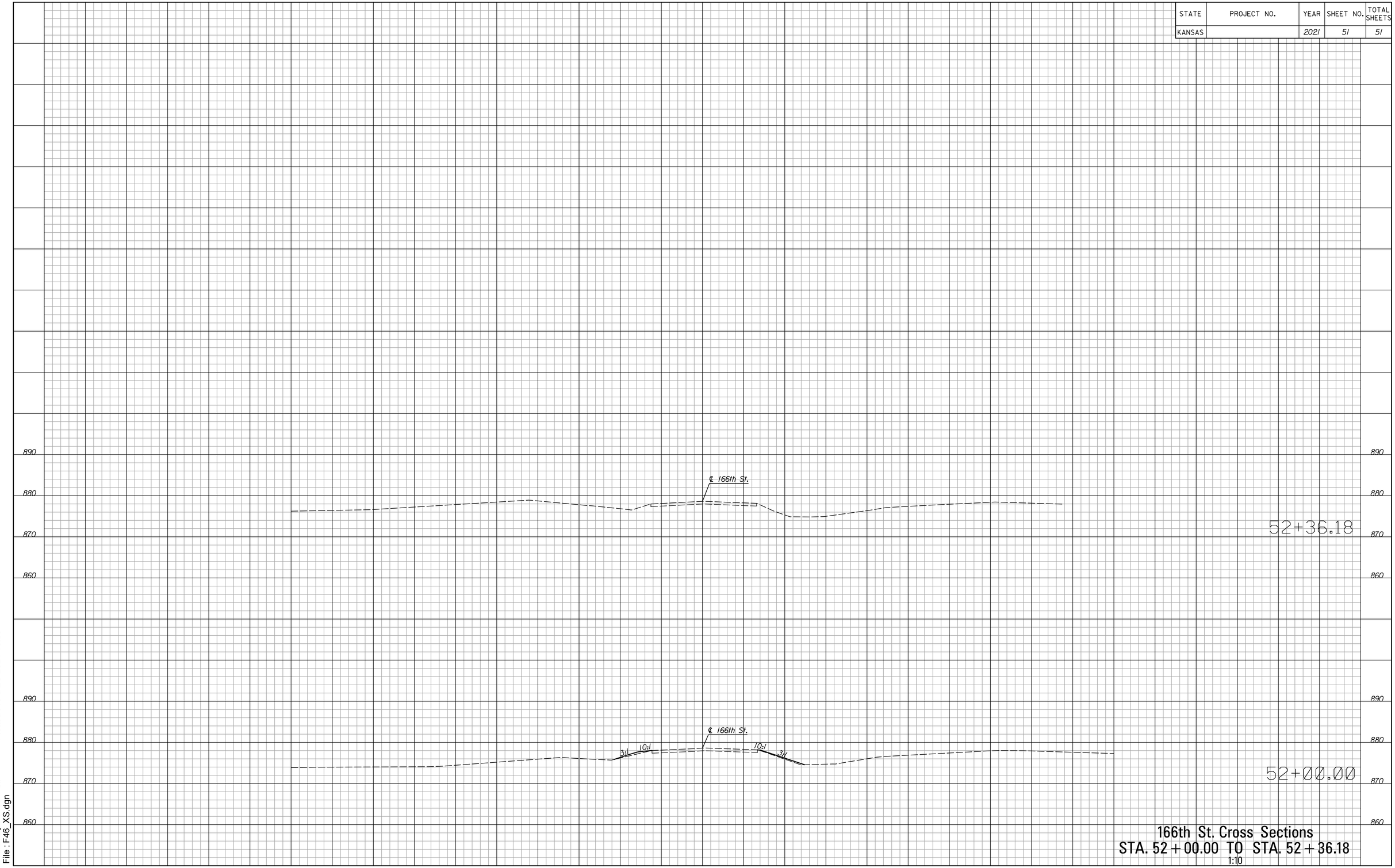


166th St. Cross Sections
STA. 51+43.18 TO STA. 51+65.11
1:10

Plotted : 13-DEC-2021 10:56
Drawn By : mrockwell
File : F46_XS.dgn

Sht.50

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS		2021	51	51



166th St. Cross Sections
STA. 52+00.00 TO STA. 52+36.18
1:10

Plotted : 13-DEC-2021 10:56
Drawn By : mrockwell
File : F46_XS.dgn