23-1389M

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	66 C-5287-01	2025	1	54
F.A. NO.	STP-C528(701)			

STATE OF KANSAS

DEPARTMENT OF TRANSPORTATION

PLAN AND PROFILE OF PROPOSED

66 C-5287-01

FEDERAL AID PROJECT

NEMAHA COUNTY

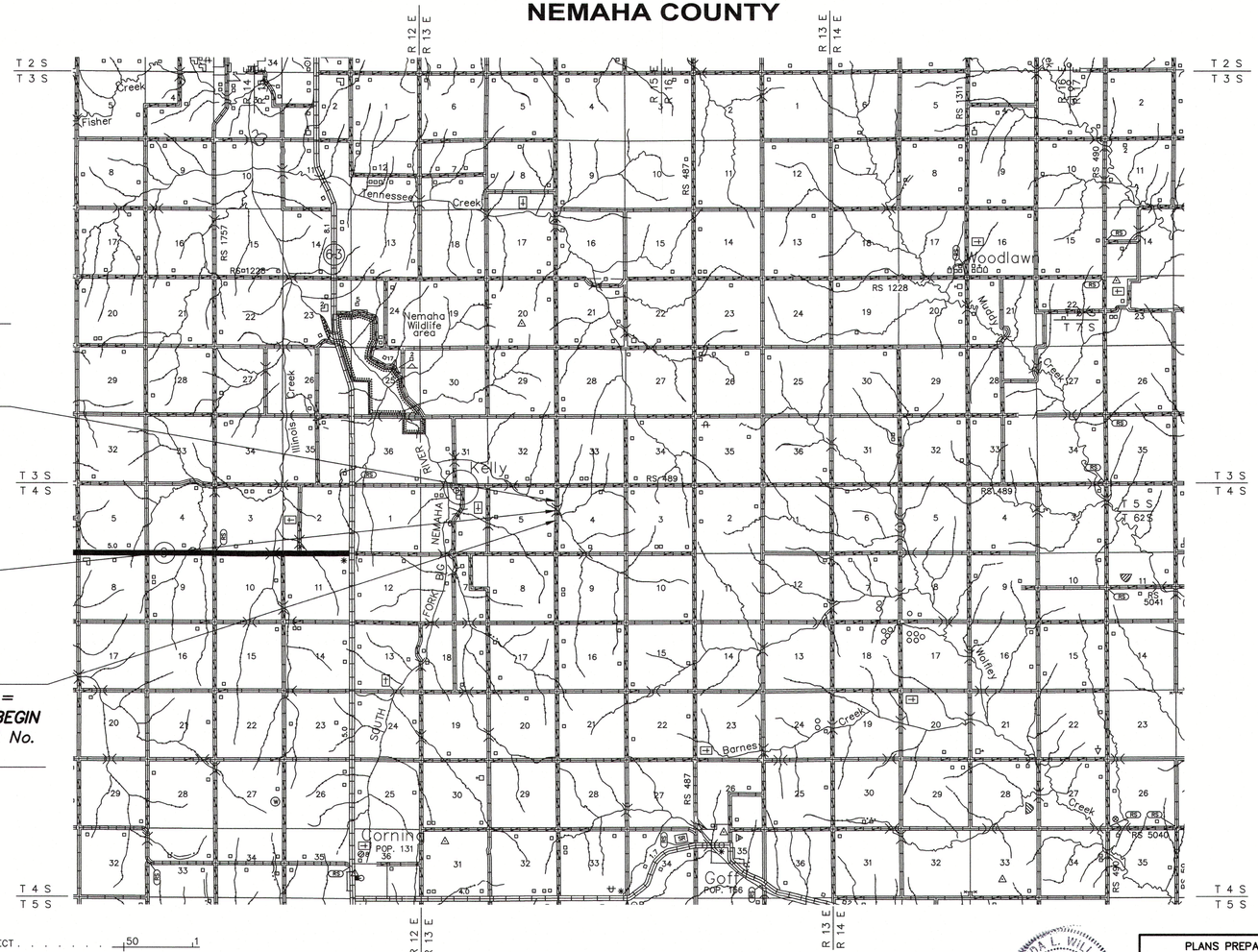
GRADING
BRIDGE
SEEDING
SURFACING

INDEX OF SHEETS

℄ Sta. 170+75 =
℄ Sta. 70+75 **END**
K.D.O.T. Project No.
66 C-5287-01

℄ Sta. 168+20 =
℄ Sta. 68+20 Construct
30'-40'-30' RCSH Span Bridge
(26' Roadway)
Br. No. 000660965003364

℄ Sta. 166+00 =
℄ Sta. 66+00 **BEGIN**
K.D.O.T. Project No.
66 C-5287-01



DESIGN DESIGNATION

AADT = 15 vpd
Design Speed = 30 mph
No Clear Zone

CONVENTIONAL SIGNS

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

GROSS LENGTH OF PROJECT	475.00	FT.	
EXCEPTIONS	0.00	FT.	
NET LENGTH OF PROJECT	475.00	FT.	0.090 MILES
NET LENGTH OF BRIDGES	102.50	FT.	0.019 MILES
NET LENGTH OF ROAD	372.50	FT.	0.071 MILES

Note: Roadway shall be closed to traffic during construction of this project.

1" = 1 Mile

RHONDA L. WILLARD LICENSED 17525 KANSAS PROFESSIONAL ENGINEER

PLANS PREPARED AND SUBMITTED BY:

BG CONSULTANTS
ENGINEERS · ARCHITECTS · SURVEYORS

RECOM. FOR APPROVAL-DATE 11-6-24

COUNTY OFFICIAL

Approved: Dec 30, 2024
Date

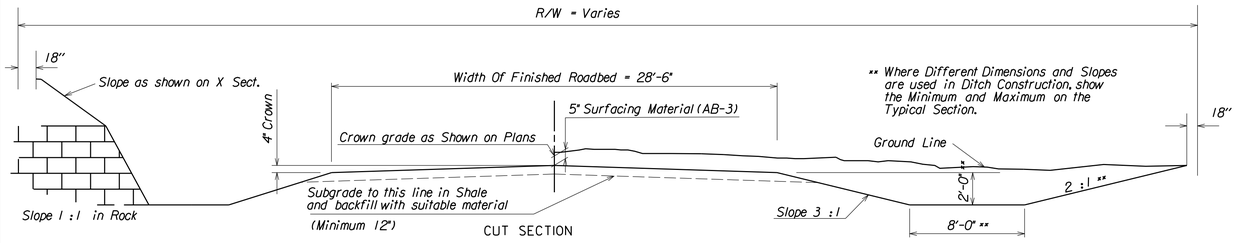
State Transportation Engineer

By:
Chief, Bureau of Local Projects

KANSAS DEPARTMENT OF TRANSPORTATION

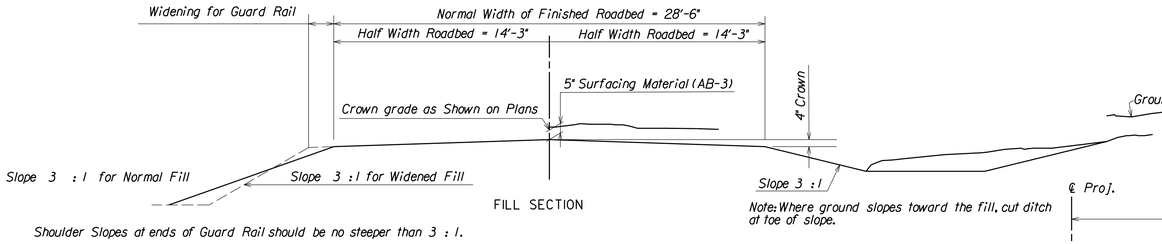
DATE
BY
SURVEYED
PLOTTED
INKED
DESIGNED
SQUAD

23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	2	54



CUT SECTION

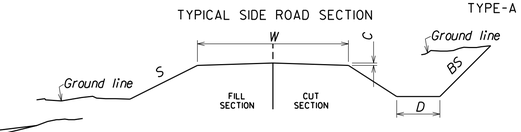
NOTE: For overbreakage in limestone, sandstone or shale see Special Provisions

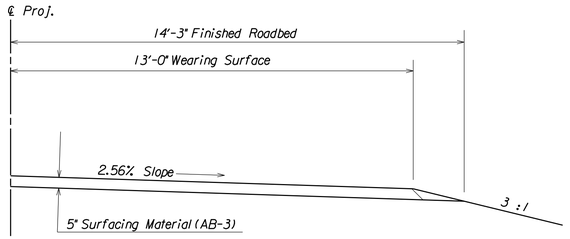


FILL SECTION

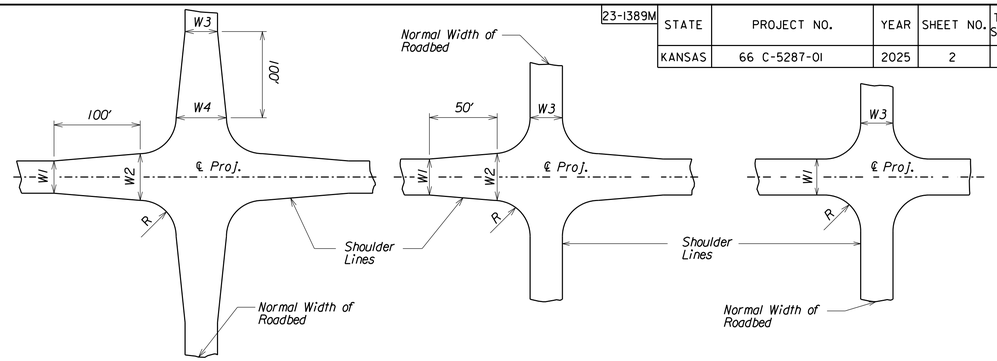
Note: Where ground slopes toward the fill, cut ditch at toe of slope.

Shoulder Slopes at ends of Guard Rail should be no steeper than 3 : 1.
When fill exceeds 6' Shoulder Slopes may be steepened



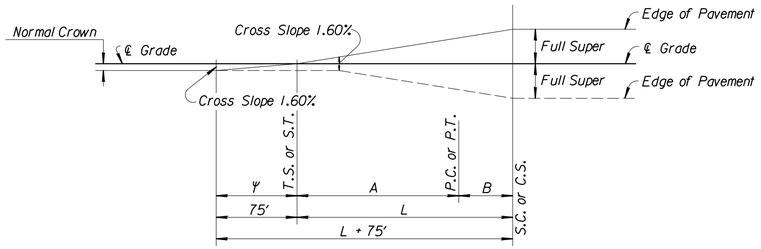


TYPICAL ½ SECTION SURFACING



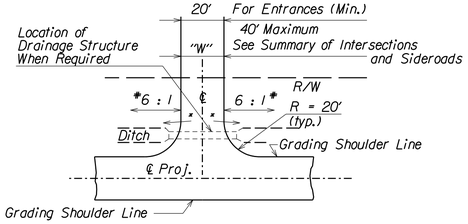
TYPICAL INTERSECTION DETAILS

SUMMARY OF INTERSECTIONS AND SIDEROADS												
STATION	SIDE OR QUADRANT	TYPE	W	W1	W2	W3	W4	R	C	S	D	BS



PROFILE SHOWING METHOD OF ATTAINING SUPERELEVATION

Sta. P.I. Curve	Radius	Design Speed	Super %	Transition - (Lin.Ft.) L	A	B

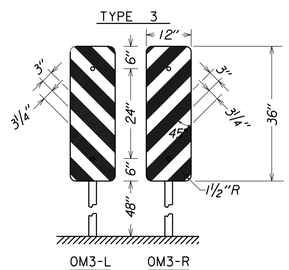


TYPICAL SIDE ROAD OR ENTRANCE DETAIL

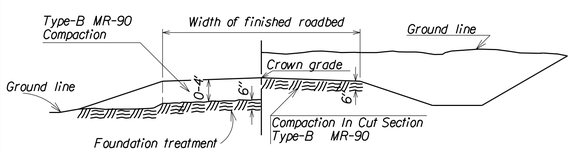
* On side roads and entrances which slope toward the roadway, construct a low point approx. 6" deep to divert surface drainage into the roadway ditch.

* On ditch plugs and side roads or entrances without drainage structures use 8 : 1 slopes where feasible.

OBJECT MARKER

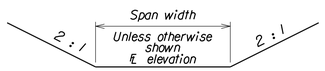


SUMMARY OF OBJECT MARKERS AND SIGNS						
STATION TO STATION	SIDE	TYPE OF STRUCT.	TYPE OF SIGN	OBJECT MARKER TYPE	OBJECT MARKER NO.	REMARKS
68+20	Lt.	RCSH		OM-3L	2	@ Lt. Quadrants ø
68+20	Rt.	RCSH		OM-3R	2	@ Rt. Quadrants ø
				TOTAL	4	
ø As you face bridge end from approach						
•Back-to-Back [Sign(s) on Both Sides of Post]						



ALL EMBANKMENT SHALL BE COMPACTED EXCEPT DITCHPLUGS AND WASTE BERMS.

FOUNDATION TREATMENT AND COMPACTION OF EARTHWORK



TYPICAL INLET AND OUTLET CHANNEL EXCAVATION SECTION FOR BOX STRUCTURES & PIPE CULVERTS

GENERAL NOTES

All signs shown on the plans, and other signs furnished and installed by the LPA with their own forces and funds will be installed in conformance with the Manual on Uniform Traffic Control Devices (latest edition).

LPA to furnish all easements and additional right of way (unless otherwise noted).

Public and private utility facilities will be adjusted by others as needed to fit the new construction unless noted otherwise on the plans or in the proposal.

Refer to KDOT Standard Drawing No. BR 100 for excavation limits for constructing box culverts.

All Sign, Fastener, and Post materials must meet the requirements of the latest edition of the KDOT Standard Specifications for State Road and Bridge Construction.

Install Object Markers Type OM3-(R)(L) at each corner of all span bridges and when indicated on the plans at box structures. Install with the inside edge of the marker in line with the inside clearance line of the structure.

NO.	REVISIONS	BY	APP'D
7	01-08-15 Revised superelevation diagram, updated misc. notes.	TLS	RJS
6	11-9-04 Changed "Culvert" to "Structure"	DMK	RJS
5	12-1-03 Rem. Delin.'s/Add Typ. Sect./Changed OM notes	DMK	RJS
4	5-14-03 Rev. Contractor note in Gen. Notes	DMK	RJS

KANSAS DEPARTMENT OF TRANSPORTATION

TYPICAL GRADING SECTION

~~LP907~~

FHWA APPROVAL			APP'D.	RJS	
DESIGNED	DETAILED	TLS	QUANTITIES	TRACED	
DESIGN CK.	DETAIL CK.	RJS	QUAN.CK.	TRACE CK.	

Plotted : 10/10/2024
Drawn By : untitled
File : \BGCONSULTANTS\Projects\2023\23-1389\CAD\Drawing Set\02-lp907.dgn

23-1389M

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
Kansas	66 C-5287-01	2025	3	54

E ¼ Corner Sec. 5, T4S, R13E = ℄ Sta. 160+72
= 3' Lt of ℄ Sta. 60+72

1. Found ½" Bar 2" Below Surface
2. Found Nail & Washr. in Top of Fence Post. 28.40' ESE
3. Found Nail & Washr. in Top of Fence Corner Post. 32.41' ENE
4. Found Nail & Washr. in Top of Fence Post. 31.40' W
5. Found Nail & Washr. in Top of Brace Post. 31.59' WNW
6. Traveled Way of "O" Rd.
7. N. 736294.29 E. 10436156.35

P.O.T. 205 = 0.11' Lt. of ℄ Sta. 165+74.93
= 3.11' Lt. of ℄ Sta. 65+74.93

1. Set 24" #4 Rebar 3" Deep. 3.00' E
2. Travel-way of "O" Rd. 48.34' NW
2. Set Mag Nail & Washr. in Top of Hedge Fence Post. 38.38' NE
3. Set Mag Nail & Washr. in Top of Hedge Fence Post. 40.00' SW
4. Set Mag Nail & Shiner in W. Face of Hedge Fence Post. 29.40' SE
5. Set 60D Nail and Shiner in S. Face of 15" Double Tree.
6. N. 736797.06 E. 10436169.30

P.O.T. 206 = 0.09' Lt. of ℄ Sta. 170+74.95
= 3.09' Lt. of ℄ Sta. 70+74.95

1. Set 24" #4 Rebar 4" Deep. 3.00' E
2. Set Mag Nail & Shiner in E. Face of PP #NMEC04671 48.34' NW
3. Travel-way of "O" Rd. 38.38' NE
2. North-South Electrified Fence. 40.00' SW
3. 2" Steel Pipe Post at S. Field Entrance. 29.40' SE
4. West End of 36" CMP.
5. East End of 36" CMP.
6. N. 737296.90 E. 10436182.31

NW Corner Sec. 4, T4S, R13E = ℄ Sta. 186+83.10
= 3' Lt. of ℄ Sta. 86+83.10

1. Found ½" Bar 2" Below Grade.
2. Set Mag Nail & Shiner in SE Face of a Power Pole. 60.65' NE
3. Set Mag Nail & Shiner in SW Face of a Power Pole. 47.60' SE
4. Set Mag Nail & Shiner in NW Face of a Power Pole. 37.64' SW
5. Set Mag Nail & Shiner in E Face of a Power Pole. 55.47' NW
6. Traveled Way of "O" Rd. 4.0' W
2. Traveled Way of 96th St. 9.0' N
3. N. 738904.51 E. 10436224.17

* Note: The steel stringers, piles and guardrail obtained from the removal of the existing bridge, along with the cattle guard, shall be removed in salvagable condition and placed within the right-of-way for removal by Nemaha County funds and forces. All other materials obtained from removal of existing structure shall become the property of Contractor and removed from site.

THIS BRIDGE CONTAINS LEAD PAINT

Note: Construction of embankment and channel widening at the bridge shall be completed by the Contractor before construction of bridge begins.

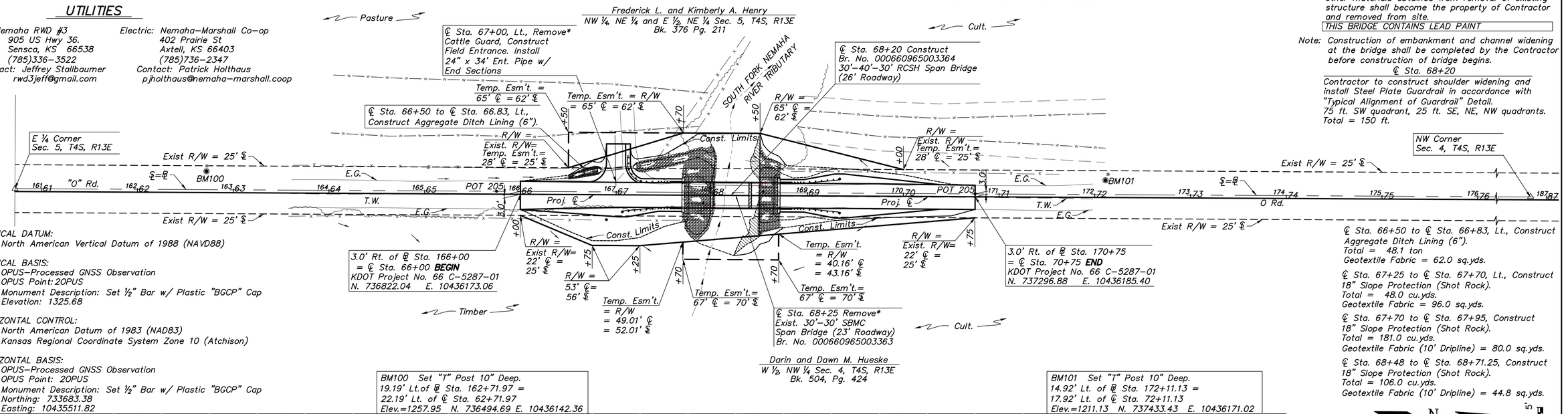
℄ Sta. 68+20

Contractor to construct shoulder widening and install Steel Plate Guardrail in accordance with "Typical Alignment of Guardrail" Detail.
75 ft. SW quadrant, 25 ft. SE, NE, NW quadrants.
Total = 150 ft.

UTILITIES

Water: Nemaha RWD #3
905 US Hwy 36.
Sensca, KS 66538
(785)336-3522
Contact: Jeffrey Stallbaumer
rwd3jeff@gmail.com

Electric: Nemaha-Marshall Co-op
402 Prairie St
Axtell, KS 66403
(785)736-2347
Contact: Patrick Holthaus
pjholthaus@nemaha-marshall.coop



VERTICAL DATUM:
North American Vertical Datum of 1988 (NAVD88)

VERTICAL BASIS:
OPUS-Processed GNSS Observation
OPUS Point: 20PUS
Monument Description: Set ½" Bar w/ Plastic "BGCP" Cap
Elevation: 1325.68

HORIZONTAL CONTROL:
North American Datum of 1983 (NAD83)
Kansas Regional Coordinate System Zone 10 (Atchison)

HORIZONTAL BASIS:
OPUS-Processed GNSS Observation
OPUS Point: 20PUS
Monument Description: Set ½" Bar w/ Plastic "BGCP" Cap
Northing: 733683.38
Easting: 10435511.82

BM100 Set "T" Post 10" Deep.
19.19' Lt.of ℄ Sta. 162+71.97 =
22.19' Lt. of ℄ Sta. 62+71.97
Elev.=1257.95 N. 736494.69 E. 10436142.36

BM101 Set "T" Post 10" Deep.
14.92' Lt. of ℄ Sta. 172+11.13 =
17.92' Lt. of ℄ Sta. 72+11.13
Elev.=1211.13 N. 737433.43 E. 10436171.02

℄ Sta. 66+50 to ℄ Sta. 66+83, Lt., Construct Aggregate Ditch Lining (6").
Total = 48.1 ton
Geotextile Fabric = 62.0 sq.yds.

℄ Sta. 67+25 to ℄ Sta. 67+70, Lt., Construct 18" Slope Protection (Shot Rock).
Total = 48.0 cu.yds.
Geotextile Fabric = 96.0 sq.yds.

℄ Sta. 67+70 to ℄ Sta. 67+95, Construct 18" Slope Protection (Shot Rock).
Total = 181.0 cu.yds.
Geotextile Fabric (10' Dripline) = 80.0 sq.yds.

℄ Sta. 68+48 to ℄ Sta. 68+71.25, Construct 18" Slope Protection (Shot Rock).
Total = 106.0 cu.yds.
Geotextile Fabric (10' Dripline) = 44.8 sq.yds.

N
50' 0 50' 100'
Vert.

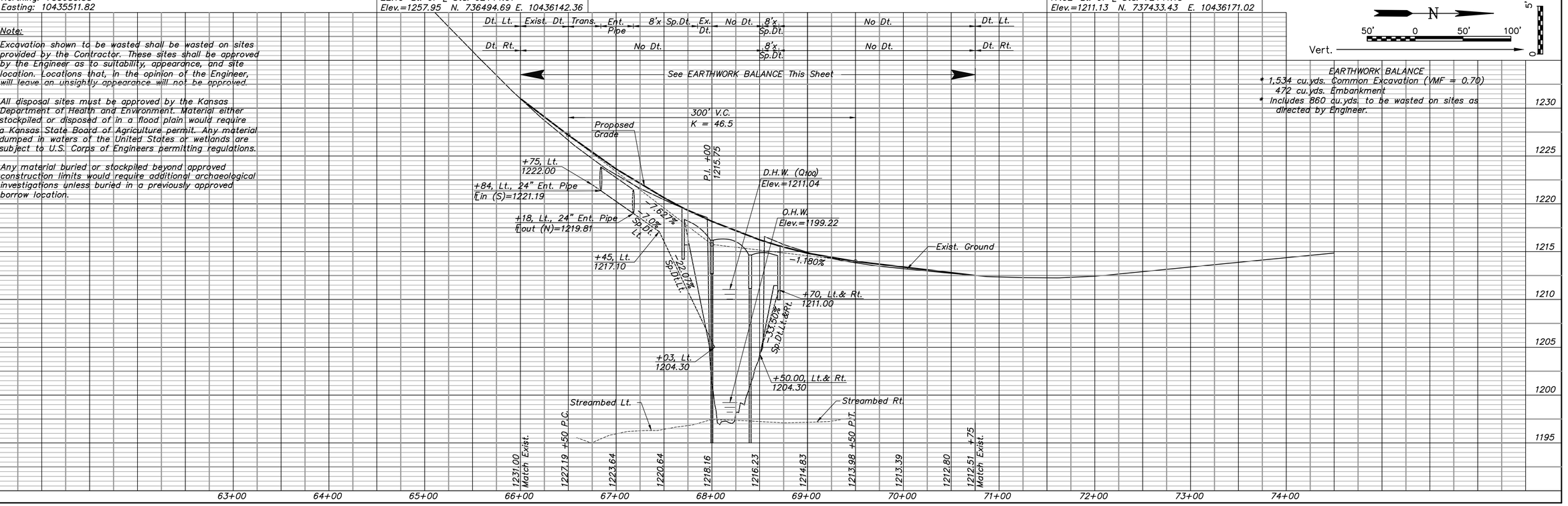
Note:

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.

All disposal sites must be approved by the Kansas Department of Health and Environment. Material either stockpiled or disposed of in a flood plain would require a Kansas State Board of Agriculture permit. Any material dumped in waters of the United States or wetlands are subject to U.S. Corps of Engineers permitting regulations.

Any material buried or stockpiled beyond approved construction limits would require additional archaeological investigations unless buried in a previously approved borrow location.

EARTHWORK BALANCE
* 1,534 cu.yds. Common Excavation (VMF = 0.70)
472 cu.yds. Embankment
* Includes 860 cu.yds. to be wasted on sites as directed by Engineer.



23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	4	54

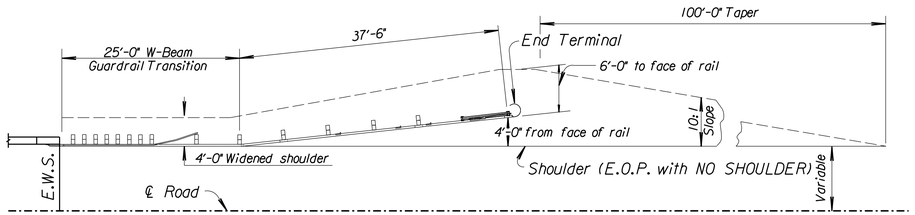
NOTE: Layouts 1, 2, 3, and 4 will be symmetric for any quadrant unless otherwise shown in the plans.

When using Rubrail, attach Std. Drawings No. RD611, RD616 and RD615 (parallel) or RD615A (flared).

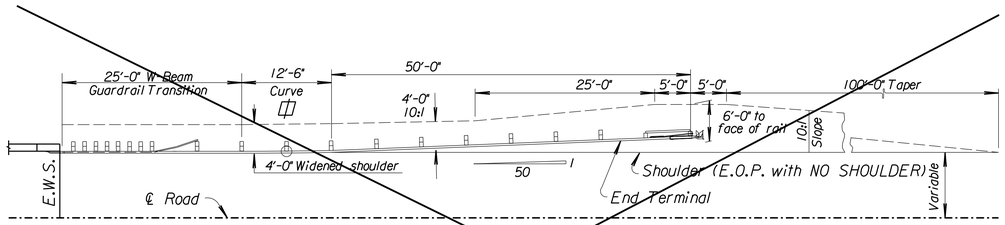
When using Thrie beam, attach Std. Drawings no. RD611 and RD608 or RD613.

Attach Std. Drawing No. RD617 (parallel) or RD 617A (flared) for post over box less than full depth.

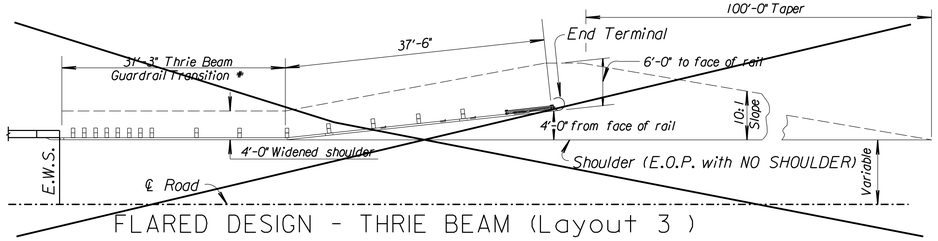
℄ Radius = 625.08'



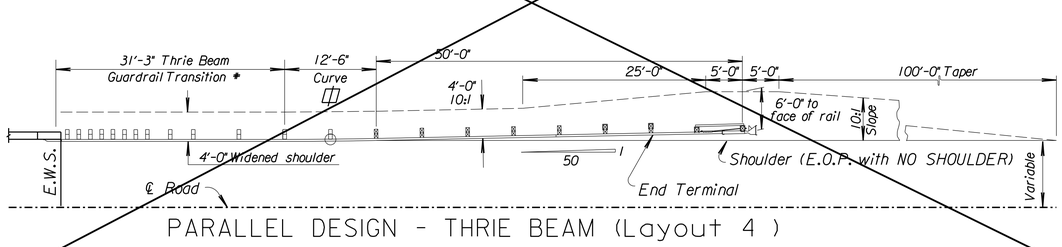
FLARED DESIGN - RUB RAIL (Layout 1)



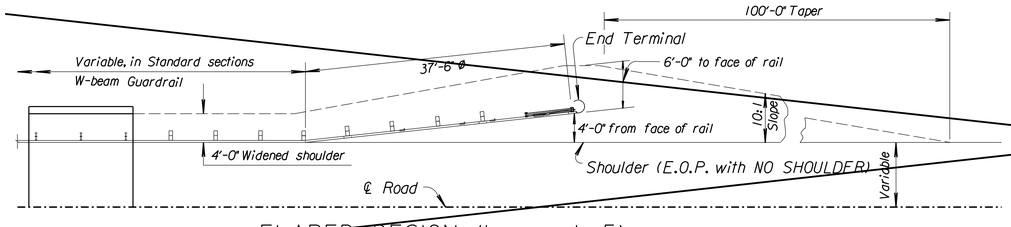
PARALLEL DESIGN - RUB RAIL (Layout 2)



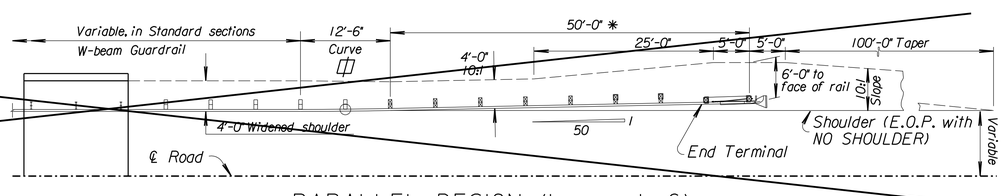
FLARED DESIGN - THRIE BEAM (Layout 3)



PARALLEL DESIGN - THRIE BEAM (Layout 4)



FLARED DESIGN (Layout 5)



PARALLEL DESIGN (Layout 6)

TYPICAL ALIGNMENT OF GUARDRAIL AT CULVERTS & BOX BRIDGES

ALLOWABLE END TERMINALS

TYPE	Layout 1	2	3	4	5	6	Required Standard Drawing
SRT	X		X		X		*RD606*
FLEAT	X		X		X		*RD606*
~~*SKT*~~		~~X~~		~~X~~		~~X~~	~~*RD606*~~

SUMMARY OF STEEL PLATE GUARDRAIL

Location	Side	Layout No.	Layout Lin. Ft. *	Additional Standard Sections Lin. Ft.	Total Pay Length Lin. Ft.	Layout 1 or 3: Gd. Rail End Term. (SRT) Alt. #1 Each	Layout 1 or 3: Gd. Rail End Term. (FLEAT) Alt. #2 Each	Layout 2, 4, or 6: Gd. Rail End Term. (SKT) Each	Layout 5: Gd. Rail End Term. (SRT) Alt. #1 Each	Layout 5: Gd. Rail End Term. (FLEAT) Alt. #2 Each
SW Quadrant	Lt.	1	25	50	75					
NW Quadrant	Lt.	1	25		25	1	1			
SE Quadrant	Rt.	1	25		25	1	1			
NE Quadrant	Rt.	1	25		25	1	1			
TOTAL LENGTH					150	3	3			

*See Guardrail Auxiliary Details (RD606) for Measurement Details. Does Not Include End Terminal.

NO.	DATE	REVISIONS	BY	APP'D
12	02-21-19	Updated per Road Memo 18-02	WFL	MJS
11	10-30-17	Removed X-Lite	WFL	MJS
10	01-06-15	Added X-Lite, Removed ET-PLUS	TLS	RJS
9	11-9-05	Added length for Thrie Beam transition	REA	RJS

KANSAS DEPARTMENT OF TRANSPORTATION

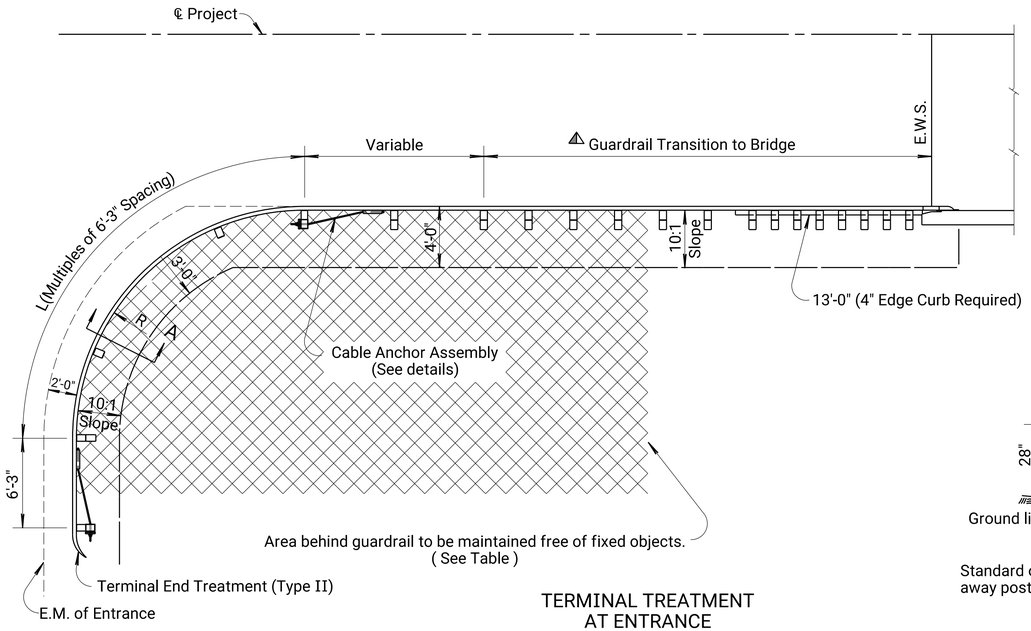
TYPICAL ALIGNMENT OF GUARDRAIL INSTALLATIONS

~~LP620~~

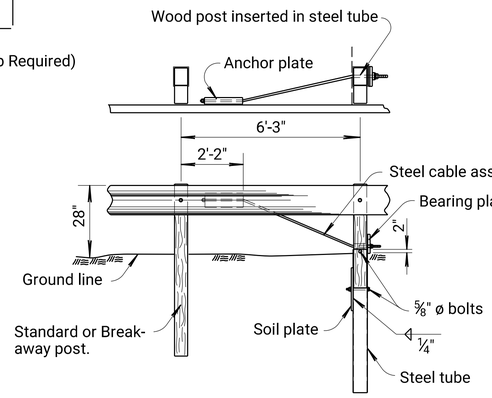
FHWA APPROVAL			APP'D.	MJS
DESIGNED	DETAILED	TLS	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	RJS	QUAN.CK.	TRACE CK.

Drawn By : untitled
File : \\BGCONSULTANTS\Projects\2023\23-1389\CADD\Drawing Set\04-lp620.dgn
Plotted : 10/9/2024

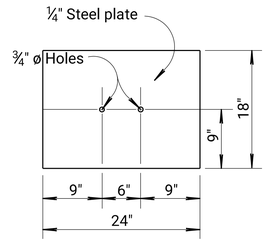
23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287 01	2025	5	54



TERMINAL TREATMENT
AT ENTRANCE

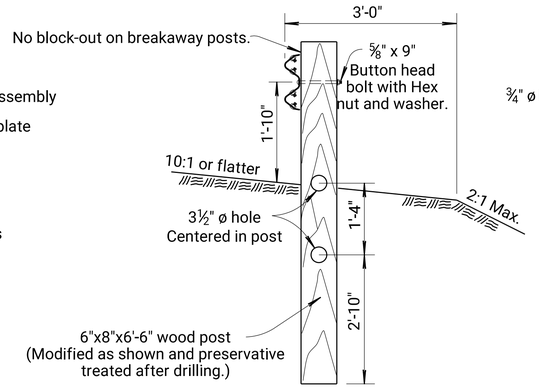


ANCHOR ASSEMBLY



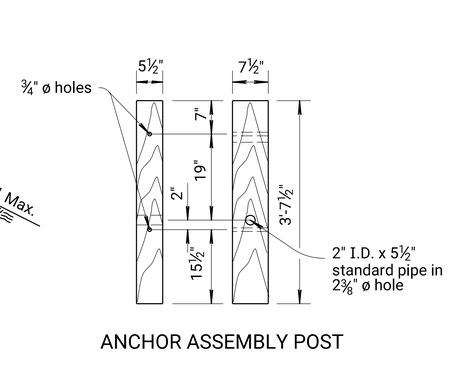
SOIL PLATE

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.

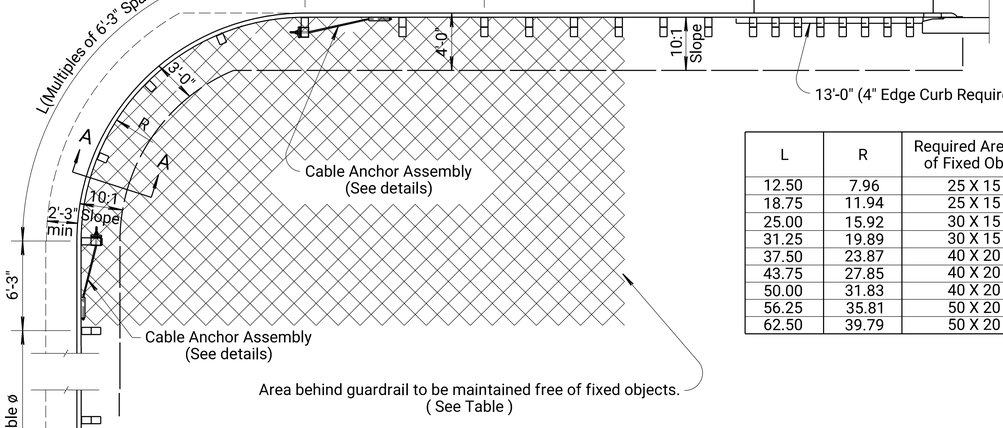


SECTION A-A

(Typical through curved portion of guardrail.)



ANCHOR ASSEMBLY POST



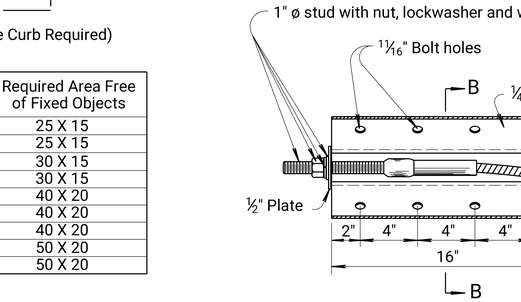
L	R	Required Area Free of Fixed Objects
12.50	7.96	25 X 15
18.75	11.94	25 X 15
25.00	15.92	30 X 15
31.25	19.89	30 X 15
37.50	23.87	40 X 20
43.75	27.85	40 X 20
50.00	31.83	40 X 20
56.25	35.81	50 X 20
62.50	39.79	50 X 20

TERMINAL TREATMENT
AT SIDEROAD

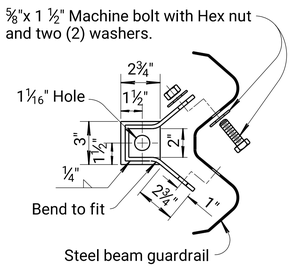
SRT shown. Other crashworthy terminals may be utilized. See the guardrail layout sheets for additional details.

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

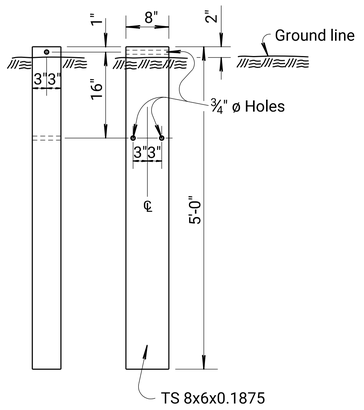
See guardrail layout details for length.



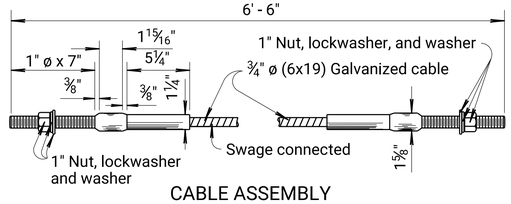
ANCHOR PLATE



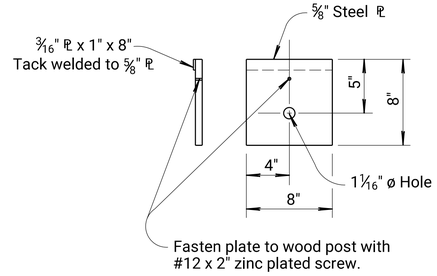
MODIFIED SECTION B-B



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
07	12-14-10	Rev. notes, details & 28" rail height	S.W.K.	J.O.B.
06	07-20-04	Rev. layout, notes, gd.fc. to guardrail	R.J.S.	J.O.B.
05	03-05-01	Add sideroad detail	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

DETAILS FOR GUARDRAIL INSTALLATION AT INTERSECTING ROADWAY

RD619

FHWA APPROVAL		01-11-11	APP'D.		James O. Brewer
DESIGNED	DETAILED		QUANTITIES	TRACED	Bowser
DESIGN CK.	DETAIL CK.		QUAN.CK.	TRACE CK.	King

KDOT Graphics Certified 06-14-2022

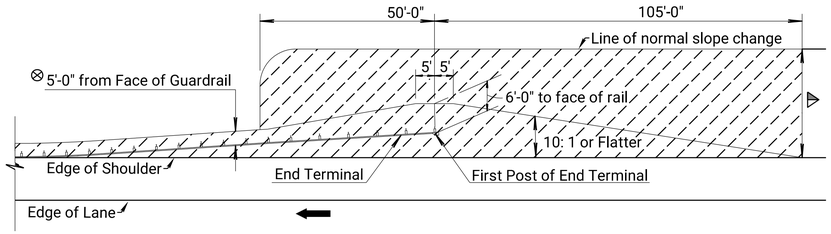
KDOT Graphics Certified

Drawn By : untitled
File : \\BGCONSULTANTS\Projects\2023\23-1389\CAD\Drawing Set\05-rd619.dgn
Plotted : 10/9/2024

Note to Designer - Design guardrail installations using guidance shown on KDOT's 'Guardrail Typical Alignments' Standard Drawings. 'Flared' guardrail installations are preferred over 'Parallel' or 'Zero Flare' installations. Where 'Flared' or 'Parallel' installations are used, the flare rate of the guardrail end terminal typically matches the flare rate of the remaining guardrail installation. For 'Zero Flare' installations, 'Parallel' guardrail end terminals should be designed using typical flare rates of 50:1 or flatter for the length of the end terminal. However, while 50:1 or flatter flare rates are typical for 'Parallel' guardrail end terminals, these end terminals may be flared as steep as 26:1 or flatter in order to offset the end terminal head as far from the edge of the through traveled lane as practicable.

GUARDRAIL CLEAR AREA

Applies to all guardrail installations unless otherwise shown in the plans.



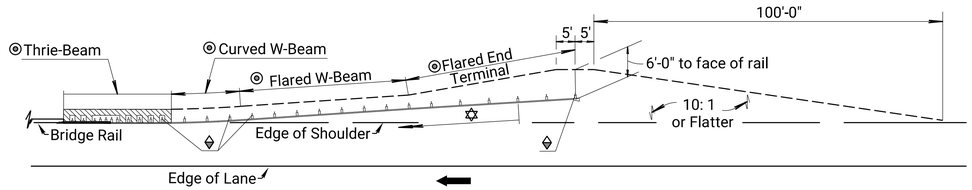
Keep Area Free of Stockpiled Material, Equipment, or Other Obstacles, Such as Temporary Signs, Regardless of Crash Worthiness. This Clear Area Extends 105 Feet in Advance of and 50 Feet behind the First Post of the Guardrail End Terminal and Then, in Order to Maintain Full Post Spacing, Continues 5 Feet behind the Face of the Guardrail through the W-Beam Portion of the Installation as Shown in the 'Guardrail Clear Area' Detail on this Sheet.

Normal Project Side Slope.

Deflection Distance for Normal Post Spacing

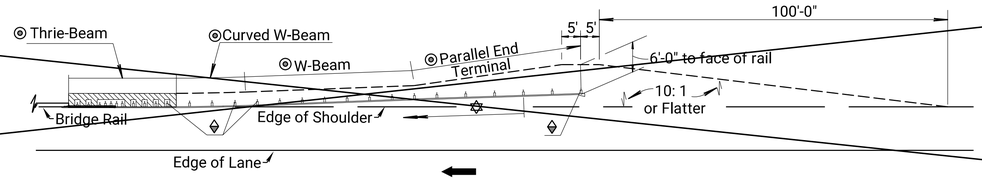
FLARED GUARDRAIL DETAIL

Applies to CGS AND MGS
(MGS Shown)



PARALLEL GUARDRAIL DETAIL

Applies to CGS AND MGS
(MGS Shown)

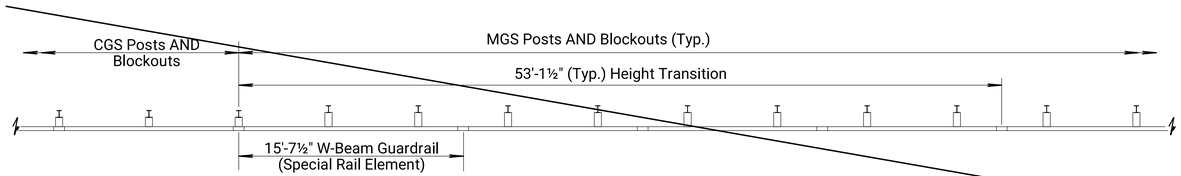


See Guardrail Layout Sheets for Details

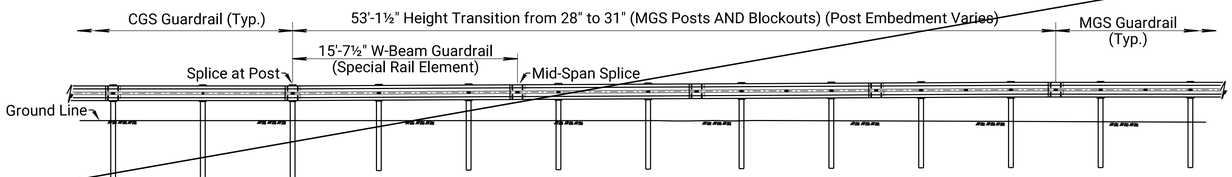
On Guardrail Layout Sheets, Show Station AND Offset from the Roadway Alignment to the Face of Post at these Locations.

Length of Need (Begins at Post 3)

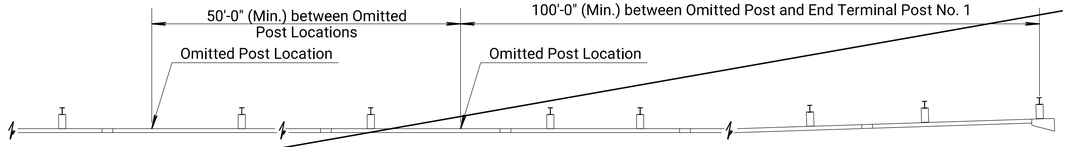
CGS TO MGS TRANSITION DETAILS (PLAN)



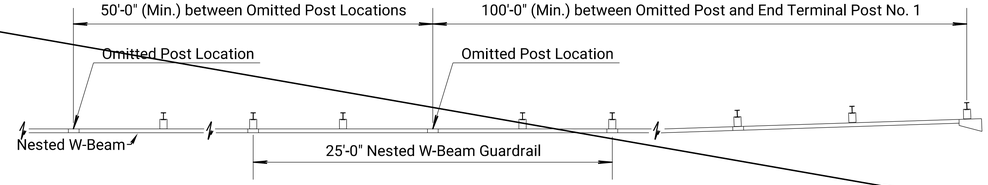
CGS TO MGS TRANSITION DETAILS (ELEVATION)



MGS OMITTED POST DETAIL



CGS OMITTED POST DETAIL



MIDWEST GUARDRAIL SYSTEM (MGS) END TERMINALS

END TERMINAL BID ITEM	FLARED OR PARALLEL	MOUNTING HEIGHT	CRASH TESTING CRITERIA	STEEL POST DESIGN AVAILABLE	WOOD POST DESIGN AVAILABLE	ENERGY ABSORBING	MANUFACTURER	DESIGN LENGTH	MANUFACTURER SYSTEM LENGTH
Guardrail End Terminal (MGS-FLEAT)	Flared	31"	NCHRP 350	Yes	Yes	Yes	Road Systems	40'-7½"	37'-6"
Guardrail End Terminal (MGS-SRT)	Flared	31"	NCHRP 350	Yes	Yes	No	Valtir	40'-7½"	37'-6"
Guardrail End Terminal (MGS-MSKT)	Parallel	31"	MASH	Yes	No	Yes	Road Systems	46'-10½"	46'-10½"
Guardrail End Terminal (MGS-SOFTSTOP)	Parallel	31"	MASH	Yes	No	Yes	Valtir	46'-10½"	50'-9½"

CONVENTIONAL GUARDRAIL SYSTEM (CGS) END TERMINALS

END TERMINAL BID ITEM	FLARED OR PARALLEL	MOUNTING HEIGHT	CRASH TESTING CRITERIA	STEEL POST DESIGN AVAILABLE	WOOD POST DESIGN AVAILABLE	ENERGY ABSORBING	MANUFACTURER	DESIGN LENGTH	MANUFACTURER SYSTEM LENGTH
Guardrail End Terminal (FLEAT)	Flared	28"	NCHRP 350	Yes	Yes	Yes	Road Systems	37'-6"	37'-6"
Guardrail End Terminal (SRT)	Flared	28"	NCHRP 350	Yes	Yes	No	Valtir	37'-6"	37'-6"
Guardrail End Terminal (SKT)	Parallel	28"	NCHRP 350	Yes	Yes	Yes	Road Systems	50'-0"	50'-0"

23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	6	54

GENERAL NOTES

Install the guardrail end terminals according to the Manufacturer's Installation Manual. The Contractor will furnish a copy of the Manufacturer's Installation Manual to the Engineer prior to the start of the installation.

Use approved steel (preferred) or wood posts provided by the Manufacturer. The guardrail end terminal post type may be independent of the post type used in the remainder of the installation. However, no mixing of post types is permitted in the remaining w-beam and thrie-beam installation.

Use approved polymer (preferred) or wood blockouts provided by the Manufacturer. The guardrail end terminal blockout size and type may be independent of the blockout size and type used in the remainder of the installation. For blockout size and types for the remaining w-beam and thrie-beam portion of the installation see the details shown on KDOT's 'Guardrail Post Details' and 'Guardrail Thrie-Beam Transition Details' Standard Drawings.

Apply retroreflective sheeting to the end terminal impact head before installation.

Tighten all cable anchor assemblies as per the Manufacturer's Installation Manual.

Lap w-beam and thrie-beam guardrail splices, in the direction of permanent traffic, even where temporary traffic may be carried in the opposite direction of the final traffic configuration. Lap end terminal splices per the Manufacturer's Installation Manual in the direction of permanent traffic, even where temporary traffic may be carried in the opposite direction of the final configuration.

The minimum length of w-beam guardrail required between the thrie-beam transition and the guardrail end terminal is 12'-6" for all installations; unless otherwise stated in the Manufacturer's Installation Manual.

Where pavement with a thickness less than or equal to 8" is encountered during installation, use the details shown on KDOT's 'Guardrail Post Details' Standard Drawings to provide openings in the pavement for the guardrail posts. Where pavement with a thickness greater than 8" or geologic rock is encountered during installation, follow the Manufacturer's Installation Manual for guidance. Where the Manufacturer's Installation Manual does not address pavement with a thickness greater than 8" or geologic rock, contact the manufacturer for instructions or install the guardrail posts as directed by the Engineer.

All work and materials required for w-beam and thrie-bean guardrail installations are paid for under the appropriate bid items for either CGS or MGS guardrail depending on the type of installation.

All work and materials required for guardrail end terminal installations are paid for under the bid item for the selected guardrail end terminal. See the table on this sheet for the appropriate end terminal bid item information.

NO.	DATE	REVISIONS	BY	APP'D
02	09-05-18	ADD. OMITTED POST AND TRANS. DETAILS	A.L.R.	T.T.R.
01	06-05-18	INITIAL RELEASE	A.L.R.	T.T.R.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL AUXILIARY DETAILS

~~RD606~~

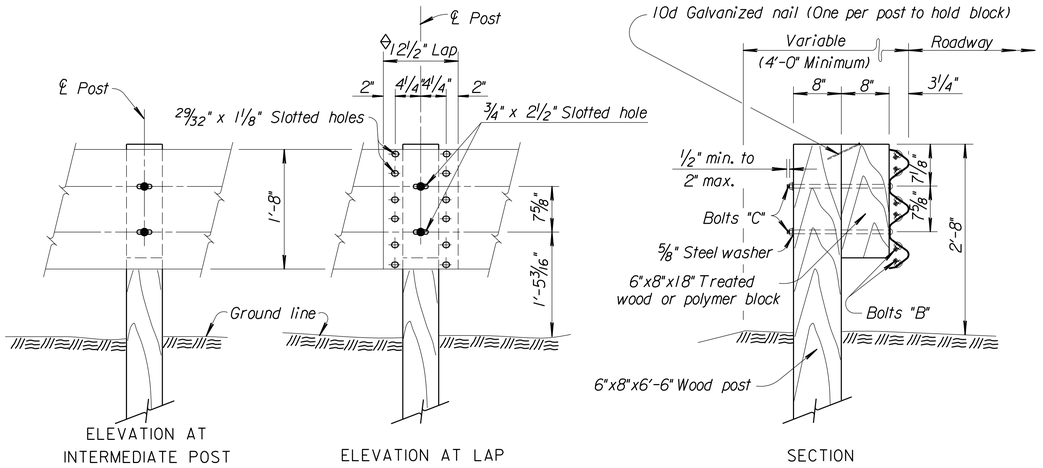
FHWA APPROVAL	09-25-18	APP'D.	Scott W. King
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

CADconform Certify This File

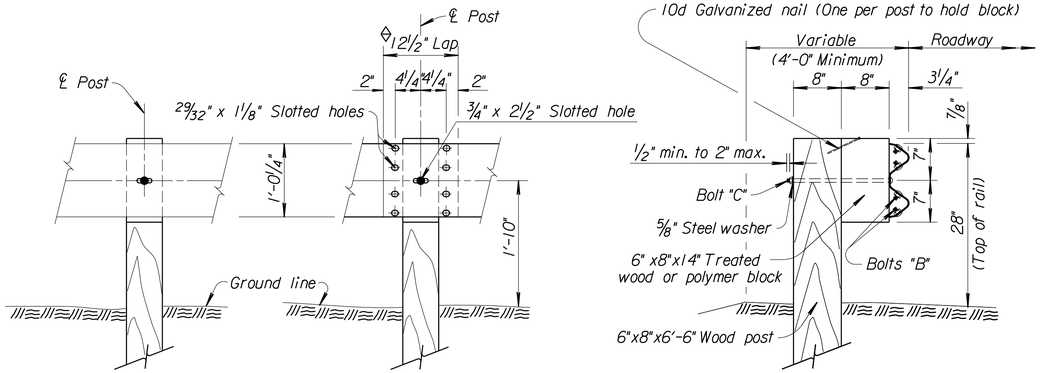
CADconform Certify This File

Plotted : 10/9/2024
Drawn By : untitled
File : \\BGCONSULTANTS\Projects\2023\23-1389\CAD\Drawing Set\06-rd606.dgn

23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	7	54

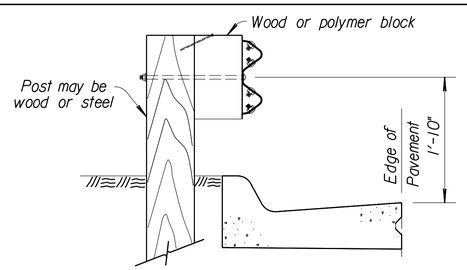


THRIE BEAM POST DETAILS



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.



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.

DETAIL OF PLACEMENT AT CURB

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.

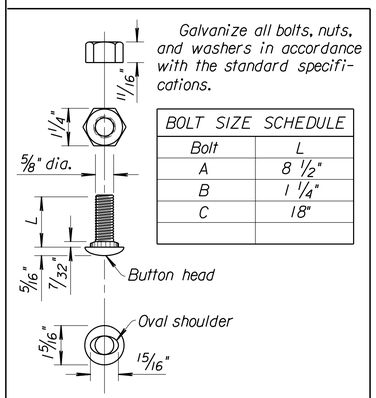
Contractor must notify Engineer at the earliest time when a non-removable man-made object (footing, pipe, etc.) is encountered and prevents installation of a full length post. Contractor must obtain Engineer approval prior to cutting post shorter than 6'-6".

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.

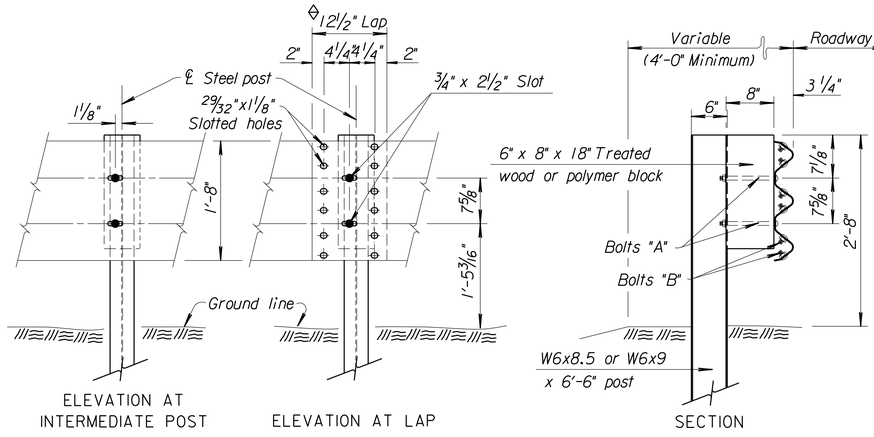
Excavation including rock, shale, and other materials for erection of Guardrail is subsidiary to various bid items for which payment is made.

Where guardrail posts are installed in pavement, form openings in the pavement for the guardrail posts.



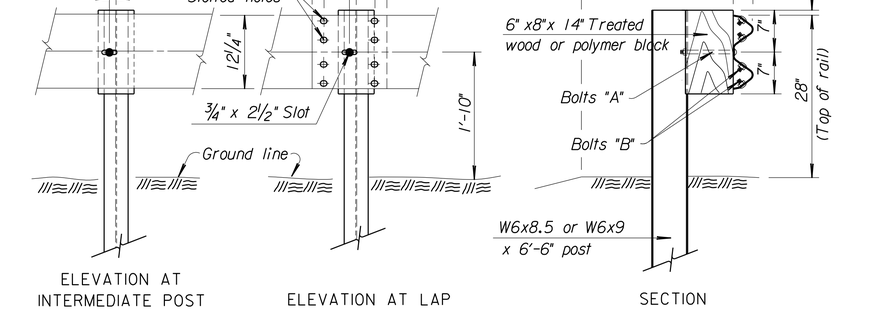
BOLT SIZE SCHEDULE	
Bolt	L
A	8 ½"
B	1 1¼"
C	18"

BOLT & NUT DETAILS



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.

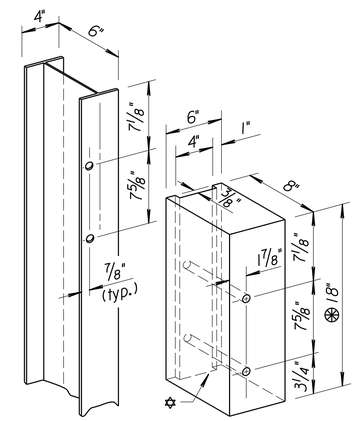
Contractor must notify Engineer at the earliest time when a non-removable man-made object (footing, pipe, etc.) is encountered and prevents installation of a full length post. Contractor must obtain Engineer approval prior to cutting post shorter than 6'-6" except as allowed on Standard Drawing RD617.

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.

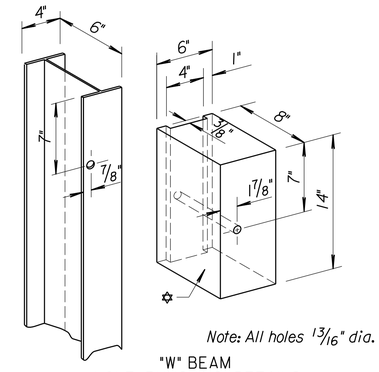
Where guardrail posts are installed in pavement, form openings in the pavement for the guardrail posts.

℗ See Standard Drawing RD613 for Thrie Beam Transition Section Blockout hole pattern.



Note: All holes 13/16" dia.

THRIE BEAM HOLE PUNCHING DETAILS



Note: All holes 13/16" dia.

"W" BEAM HOLE PUNCHING DETAILS

✡ NON-METALLIC (POLYMER) or TREATED WOOD BLOCK

NO.	DATE	REVISIONS	BY	APP'D
12	12-14-10	Revised notes, 28" w-beam rail height	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	1-11-11	APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. Kling

KDOT Graphics Certified 03-03-2017

KDOT Graphics Certified

Drawn By : untitled
File : \\BGCONSULTANTS\Projects\2023\23-1389\CADDrawing Set\07-rd611.dgn
Plotted : 10/9/2024

23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	8	54

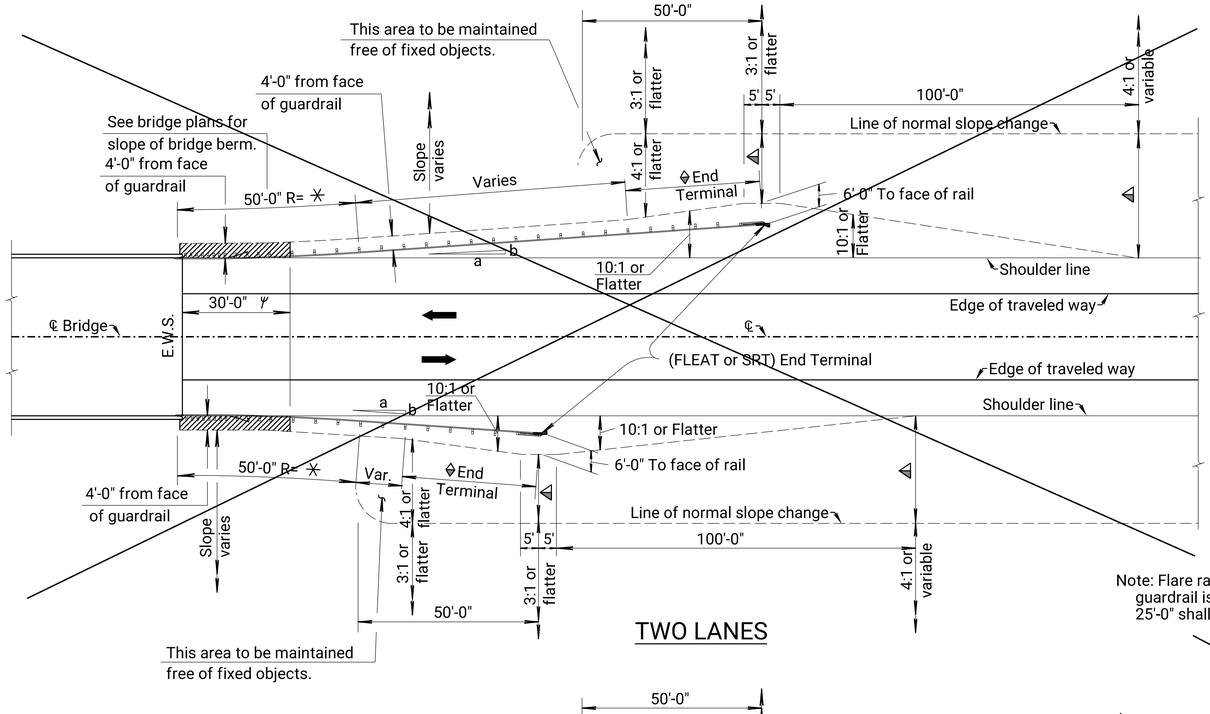
DESIGN PARAMETERS				
Design Speed (mph)	Flare Rate (a:b)	Radius (R)	Flare Rate (2a:b)	Radius (R)
70	15:1	375.55'	30:1	375.14'
60	14:1	350.59'	26:1	325.16'
55	12:1	300.69'	24:1	300.17'
50	11:1	275.76'	21:1	262.70'
45	10:1	250.83'	18:1	225.23'
40	8:1	201.04'	16:1	200.26'

GENERAL NOTE

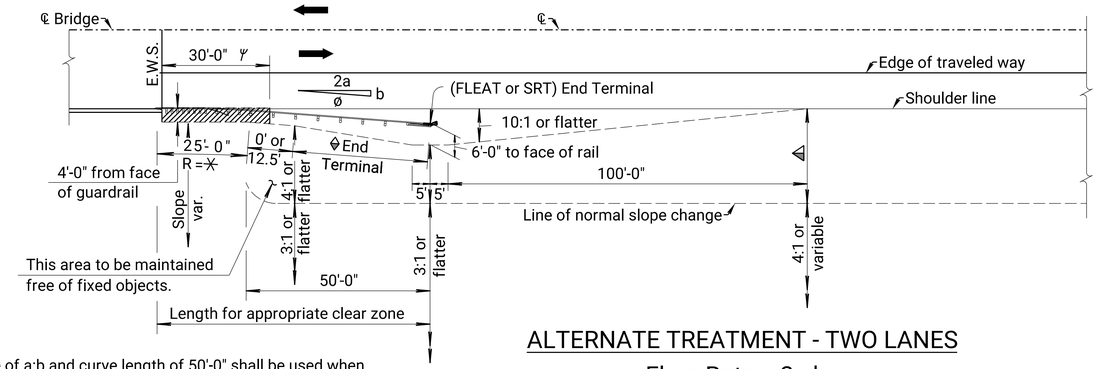
For guardrail and rubrail sections, details, and general notes see KDOT's 'W-Beam with Rubrail Bridge Approach Transition Details' Standard Drawings. For post details see KDOT's 'Guardrai Post Details' Standard Drawings

The ratio of a:b may be specified as zero for long runs of guardrail in high fill areas.

Widening, slopes & transition for Four Lane will be similar to that shown on two lane detail.



TWO LANES

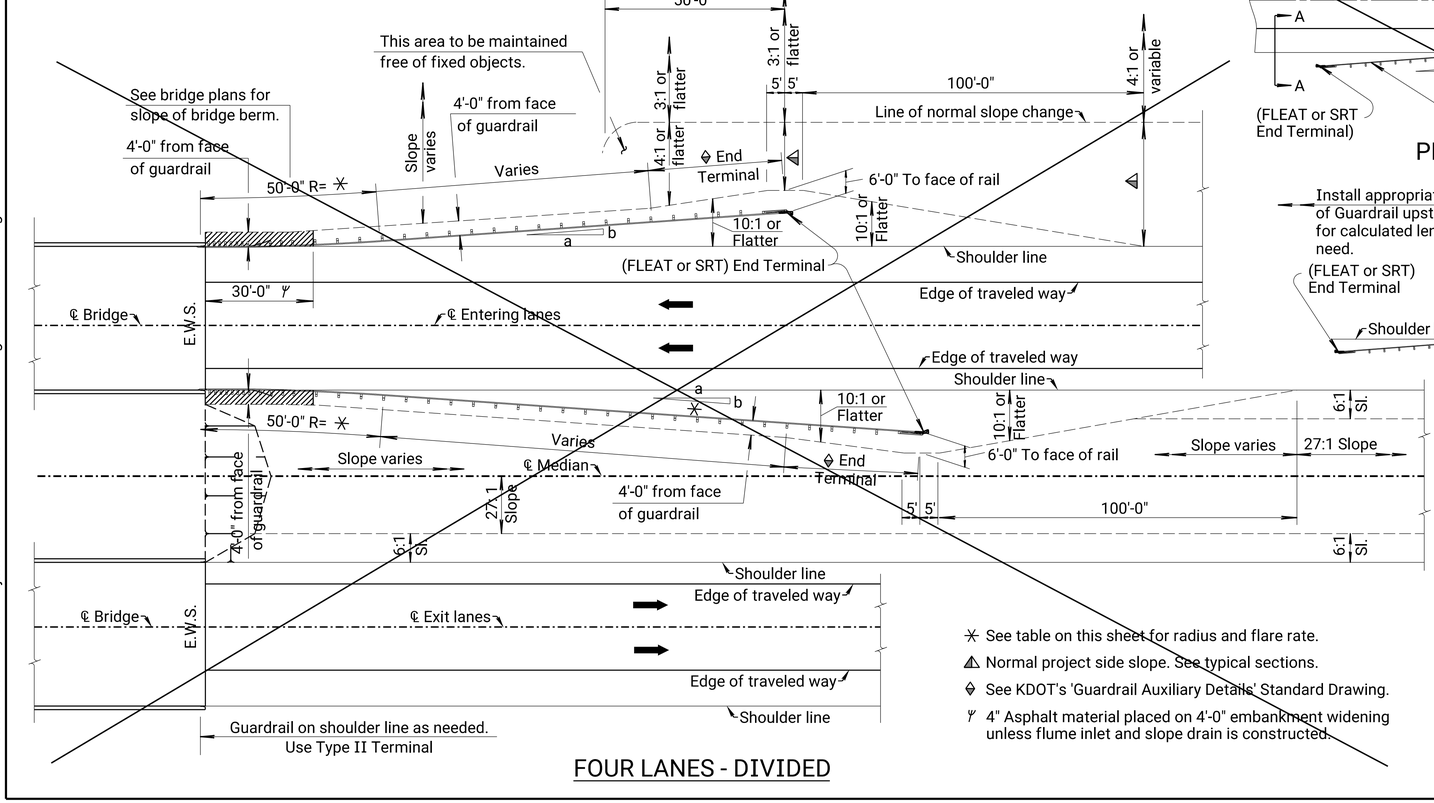


ALTERNATE TREATMENT - TWO LANES

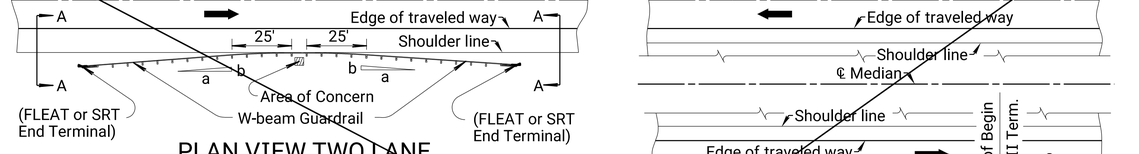
Flare Rate = 2a:b

(GUARDRAIL LENGTHS OF 62.5' AND 75')

Note: Flare rate of a:b and curve length of 50'-0" shall be used when guardrail is beyond shy line, flare rate of 2a:b and curve length of 25'-0" shall be used when guardrail is located inside the shy line.

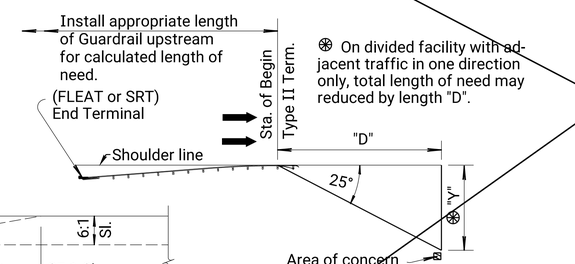


FOUR LANES - DIVIDED



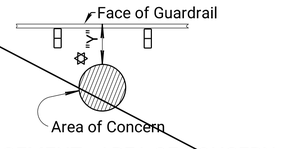
PLAN VIEW TWO LANE

PLAN VIEW FOUR LANE



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

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



ENLARGEMENT - AREA OF CONCERN

DETAILS OF GUARDRAIL PROTECTION AT ROADSIDE OBSTACLE

✳ See table on this sheet for radius and flare rate.

⚠ Normal project side slope. See typical sections.

⟠ See KDOT's 'Guardrail Auxiliary Details' Standard Drawing.

ᛉ 4" Asphalt material placed on 4'-0" embankment widening unless flume inlet and slope drain is constructed.

NO.	DATE	REVISIONS	BY	APP'D
08	06-05-18	Removed Flare-beyond-the-Flare	A.L.R.	T.T.R.
07	05-15-17	Removed X-LITE	A.L.R.	S.W.K.
06	07-02-09	Added roadside obstacle details	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

W-BEAM WITH RUBRAIL BRIDGE APPROACH TRANSITION TYPICAL ALIGNMENTS (FLARED)

~~RD615A~~

FHWA APPROVAL	06-19-18	APP'D.	Scott W. King
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

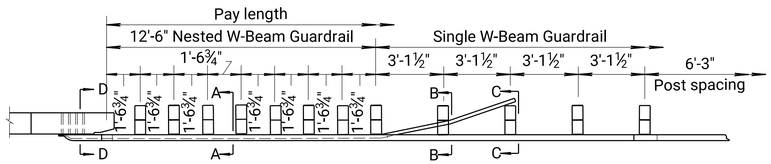
KDOT Graphics Certified 05-16-2022

KDOT Graphics Certified

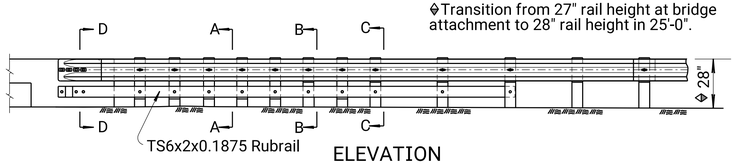
Notes to Designer: Guardrail length of need shall be determined in accordance with the AASHTO Roadside Design Guide using L$_T$= 25' for flare rate of a:b and L$_T$=12.5' for flare rate of 2a:b for a typical installation as shown on this sheet.
This sheet shall be used when the flared guardrail design for typical layout shown (FLEAT or SRT) is selected.
Material for asphalt widening shall be included in the plan quantities.

Plotted : 10/9/2024
Drawn By : untitled
File : \BGCONSULTANTS\Projects\2023\23-1389\CAD\Drawing Set\08-rd615a.dgn

23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	9	54

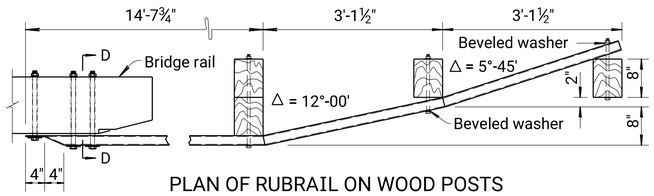


PLAN

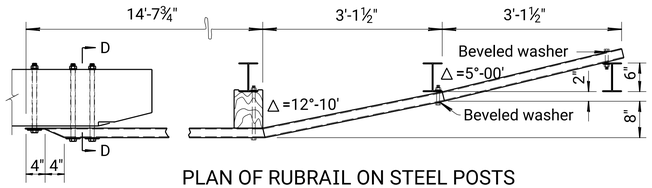


◈Transition from 27" rail height at bridge attachment to 28" rail height in 25'-0".

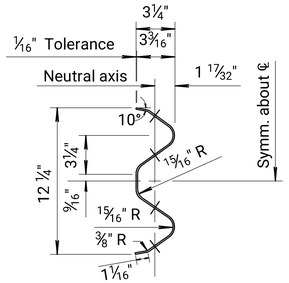
ELEVATION



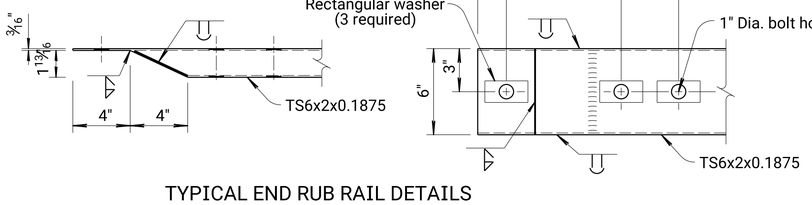
PLAN OF RUBRAIL ON WOOD POSTS



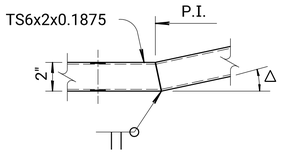
PLAN OF RUBRAIL ON STEEL POSTS



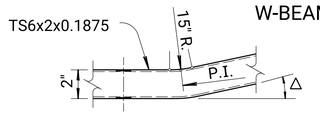
SECTION THRU TYPICAL W-BEAM RAIL ELEMENT



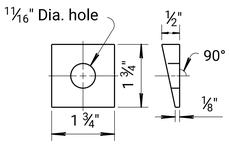
TYPICAL END RUB RAIL DETAILS



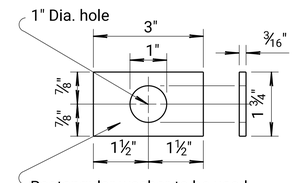
SHOP WELDED OPTION



SHOP BENT OPTION

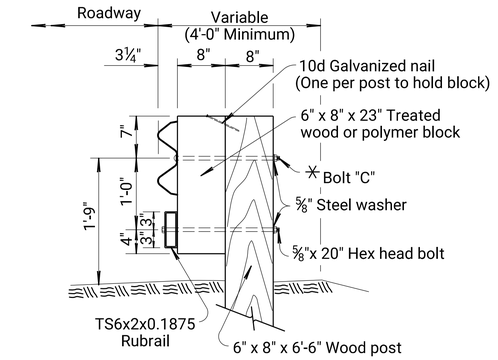


BEVELED WASHER

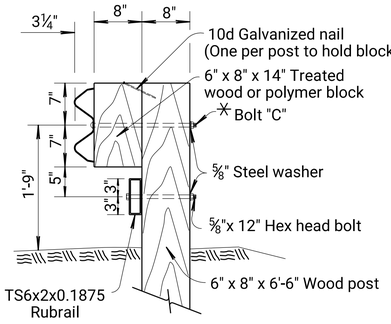


Rectangular washer to be used at bridge connections only.

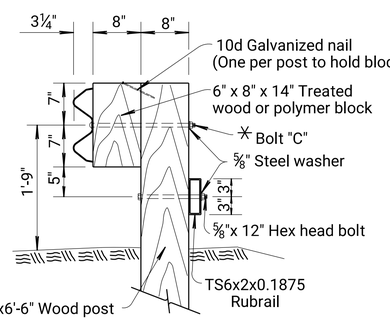
RECTANGULAR WASHER
(Other approved washer may be used.)



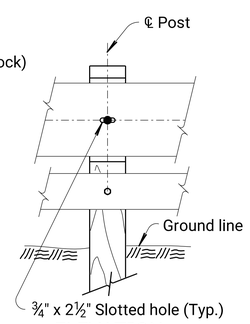
SECTION A-A



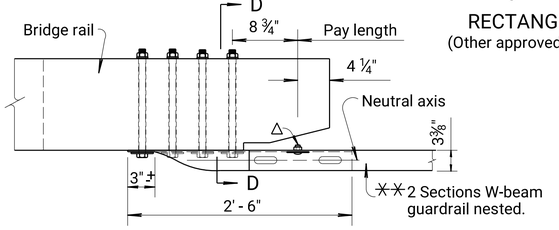
SECTION B-B



SECTION C-C

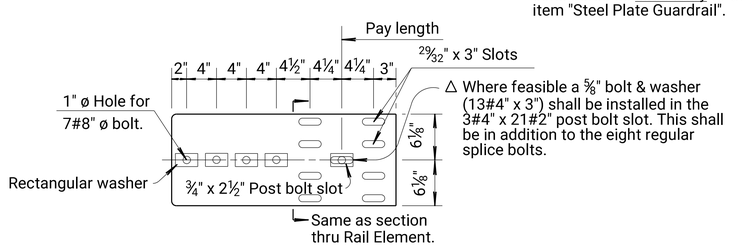


ELEVATION
WITH RUBRAIL



PLAN SPECIAL END SHOE

✳✳ One section of the two shall be considered as subsidiary to the bid item "Steel Plate Guardrail".

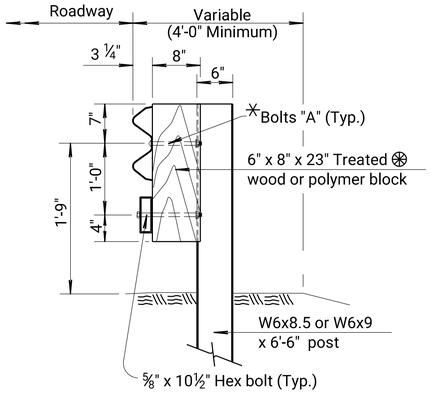


ELEVATION SPECIAL END SHOE

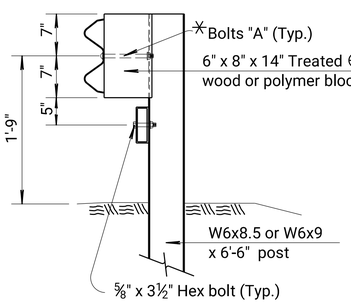
WOOD POSTS

STEEL POSTS

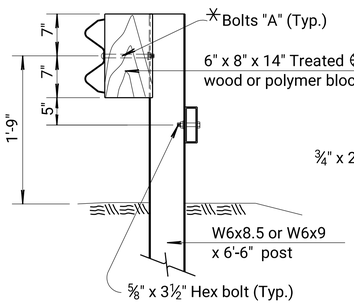
✳ See Standard Drawing RD611 for details of Bolts A, & C.



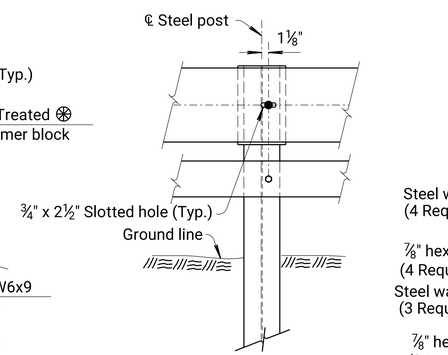
SECTION A-A



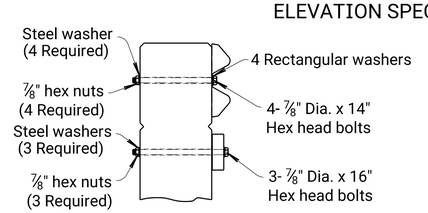
SECTION B-B



SECTION C-C



ELEVATION
WITH RUBRAIL



SECTION D-D

⊛ Blocks used with steel posts shall be grooved to fit over the flange of the post and may be Wood or Polymer.

GENERAL NOTE

Include all material and work for this installation in the pay item "Steel Plate Guardrail" paid by the lineal foot.

Use 10 or 12 gauge steel guardrail elements unless otherwise called out, see standard specifications.

Bridge Rail Transition consists of one 12'-6" W-beam section nested in back of one 25'-0" section. Furnished remaining rail elements in either 12'-6" or 25'-0" sections.

Guardrail parts furnished under this specification shall be interchangeable with similar parts regardless of the source or manufacturer.

Shop fabricate tubular steel rubrail from ASTM A36 structural steel, form angles in rubrail by shop bending or welding. Rubrail is subsidiary to the bid item "Steel Plate Guardrail".

Galvanize rail elements, post fittings, bolts, nuts, washers and anchor bolts after fabrication in accordance with the standard specifications.

Shop or field drill holes in posts and/or tubular steel rubrail for attachment. When holes are field drilled touch up any damage to the galvanized coating with zinc based paint.

Shop bend rail when radius is less than 150'.

Fabricate Special End Shoe from 10 gauge steel in accordance with standard specifications.

The Special End Shoe has the same section as guardrail and is subsidiary to guardrail.

Lap guardrail splices, including Special End Shoe, 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 Std. Drawing RD611 for additional details of posts not shown on this sheet.

NO.	DATE	REVISIONS	BY	APP'D
14	12-14-10	Revised notes 28' rail height	S.W.K.	J.O.B.
13	04-02-08	Removed Galvanized callout	S.W.K.	J.O.B.
12	02-06-07	Corrected spelling error	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

W-BEAM WITH RUBRAIL BRIDGE APPROACH TRANSITION DETAILS

RD616

FHWA APPROVAL	01-11-11	APP'D.	James O. Brewer
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

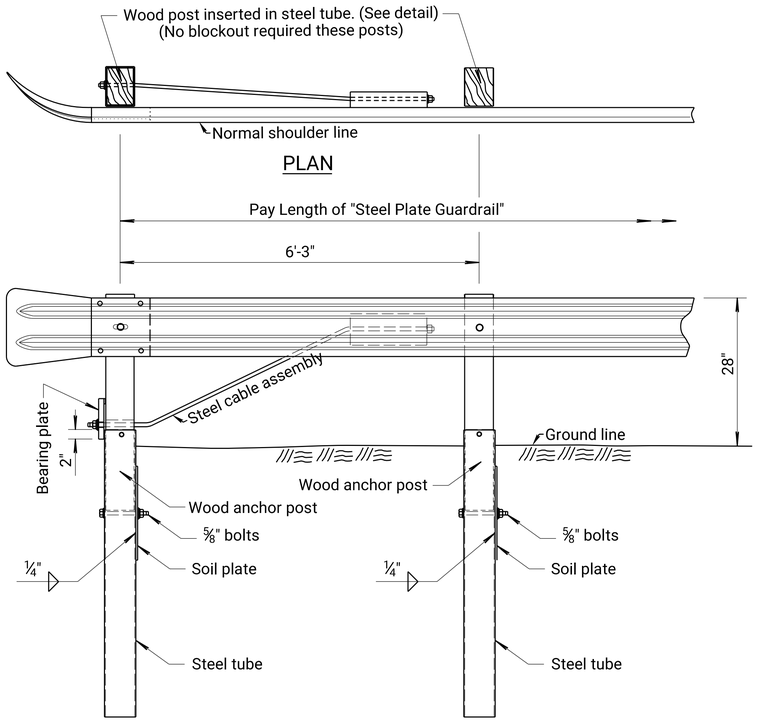
KDOT Graphics Certified 05-11-2022

KDOT Graphics Certified

Drawn By: untitled
File: \\BGCONSULTANTS\Projects\2023\23-1389\CAD\Drawing Set\09-rd616.dgn
Plotted: 10/9/2024

23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	10	54

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



DETAIL OF ANCHOR ASSEMBLY

GENERAL NOTE

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

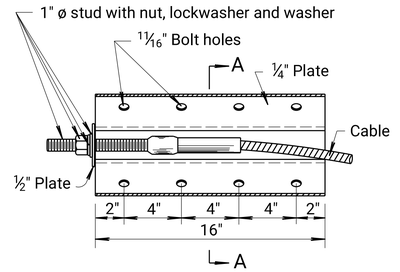
The steel soil tubes may be driven with an approved driving head. Set steel tube and soil plate before installing wood anchor post assembly. Do not drive steel soil tubes with wood post in the tube. Backfill and satisfactorily compact around steel soil tubes placed in drilled holes to prevent tube settlement.

Galvanize all steel parts after fabrication.

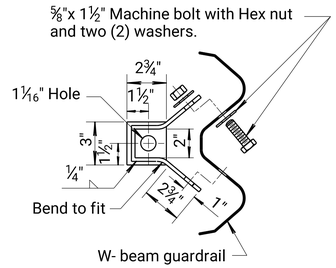
Lap guardrail splices, including terminal connector, in the direction of traffic. Where traffic is temporarily carried in the opposite direction of final configuration, lap rail splices in the direction of the permanent traffic.

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

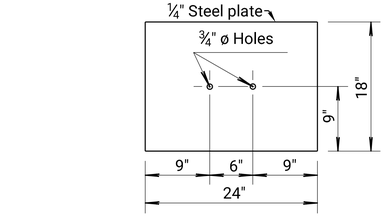
Include Type II end terminal in pay length of "Steel Plate Guardrail".



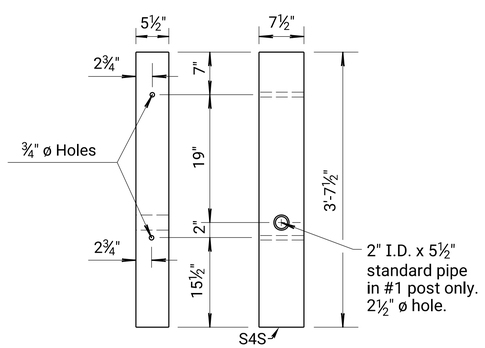
ANCHOR PLATE



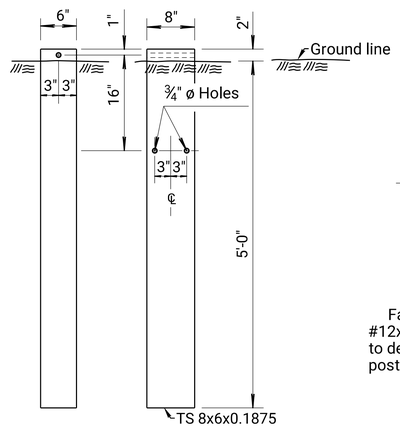
MODIFIED SECTION A-A



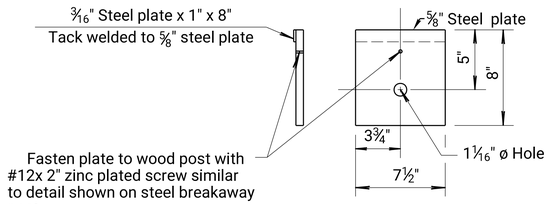
SOIL PLATE



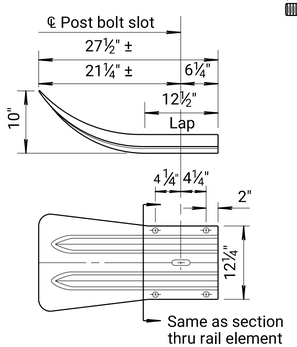
BCT WOOD POST



STEEL TUBE



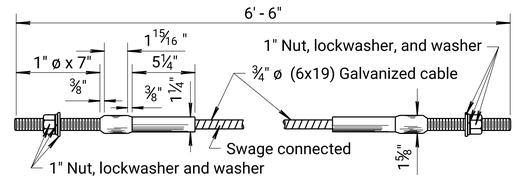
BEARING PLATE



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
06	12-14-10	Rev. notes, details & 28" rail height	S.W.K.	J.O.B.
05	07-20-04	Changed Guard Fence to Guardrail	S.W.K.	J.O.B.
04	05-18-00	Added note for temporary traffic	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL END TERMINAL TYPE II

RD618

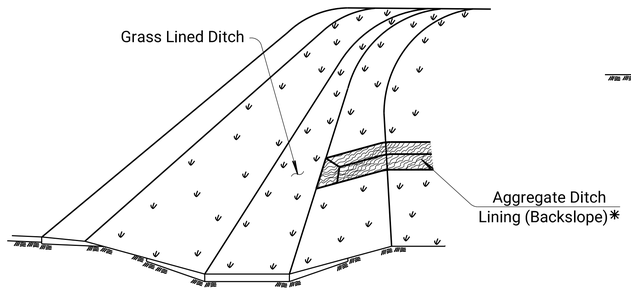
FHWA APPROVAL	01-11-11	APP'D.	James O. Brewer
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 05-11-2022

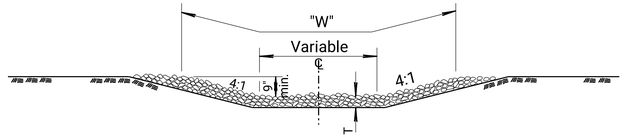
KDOT Graphics Certified

Drawn By : untitled
Plotted : 10/10/2024
File : \\BGCONSULTANTS\Projects\2023\23-1389\CAD\Drawing Set\10-rd618.dgn

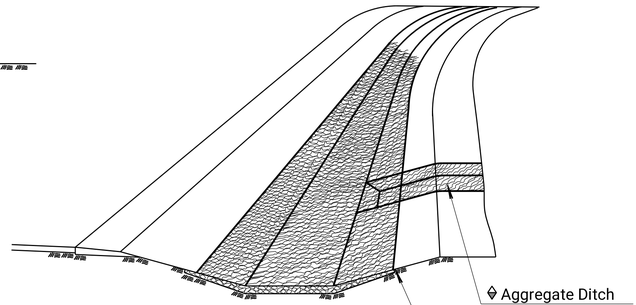
23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	11	54



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



CROSS SECTION (Backslope)



PERSPECTIVE VIEW

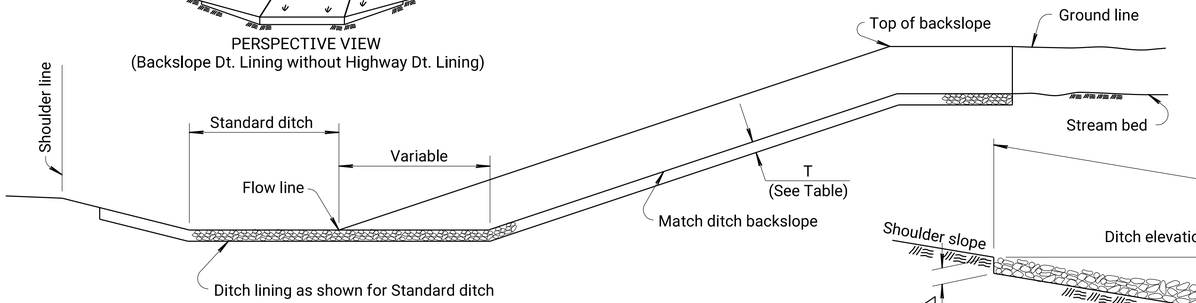
GENERAL NOTE

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

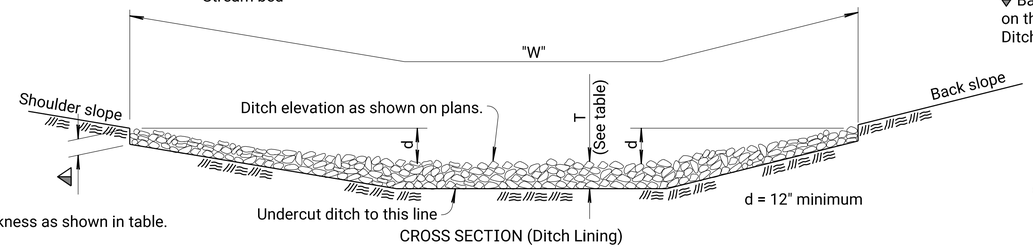
Dumped aggregate shall be spread in reasonable conformity with the ditch section as shown and as directed by the Engineer.

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)



CROSS SECTION (Ditch Lining)

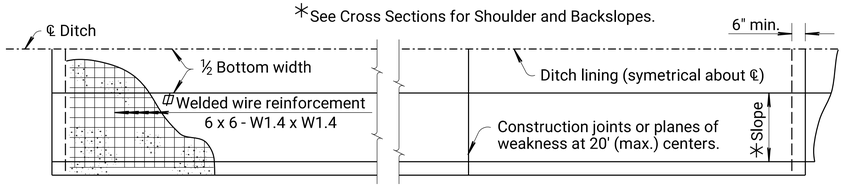
⚠ Feather edges to nominal thickness as shown in table.

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

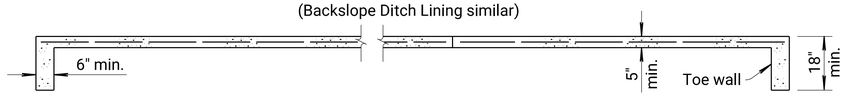
			QUANTITIES FOR TYPICAL 10' DITCH with 6:1 shoulder slope & 4:1 backslope			
D_{50}	T	⚠	Approx. Excavation per Station (cu.yd.)			
			d = 1.0	d = 2.0	d = 3.0	d = 4.0
◔ 4"	12"	8"	68	99	130	161
6"	18"	12"	102	148	195	241

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

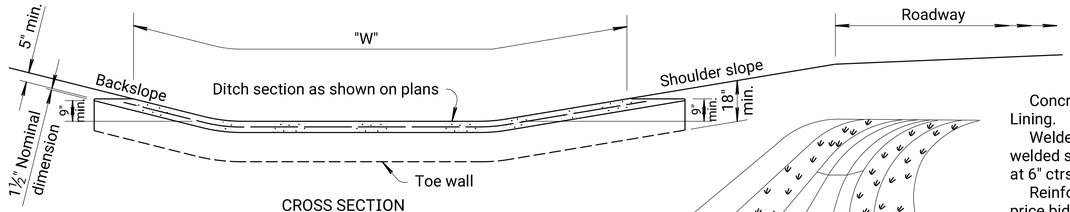
AGGREGATE DITCH LINING (D_{50})



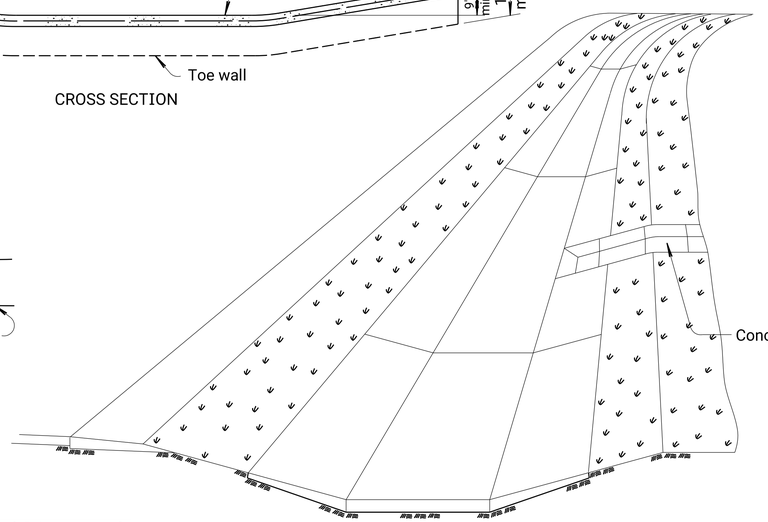
HALF PLAN
(Backslope Ditch Lining similar)



LONGITUDINAL SECTION



CROSS SECTION



PERSPECTIVE VIEW

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.

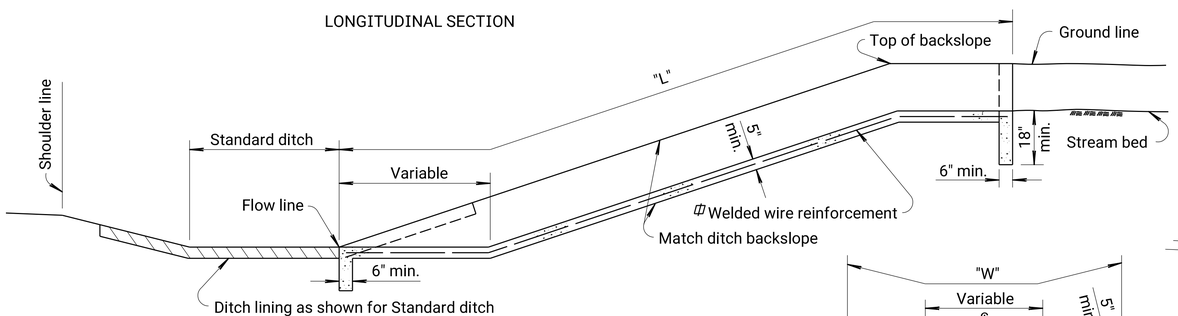
Reinforcement as shown is included in the unit price bid for "Concrete Ditch Lining".

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

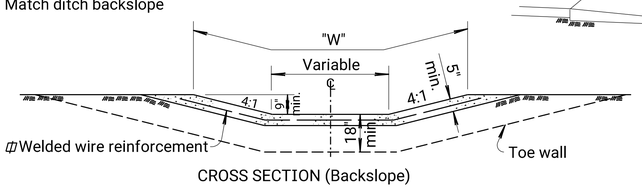
The exact location and dimensions may be adjusted, if required, by the Engineer at the time of construction.

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)

CONCRETE DITCH LINING

NO.	DATE	REVISIONS	BY	APP'D
10	03-27-18	Added Aggregate Size in Clear Zone Guidance	A.L.R.	T.T.R.
09	08-01-12	Revised General Note	S.W.K.	J.O.B.
08	03-20-08	Rev. agg. edge thickness and quant.	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

DITCH LINING

RD502

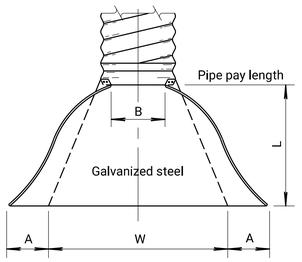
FHWA APPROVAL	06-19-18	APP'D.	Scott W. King
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 04-18-2022

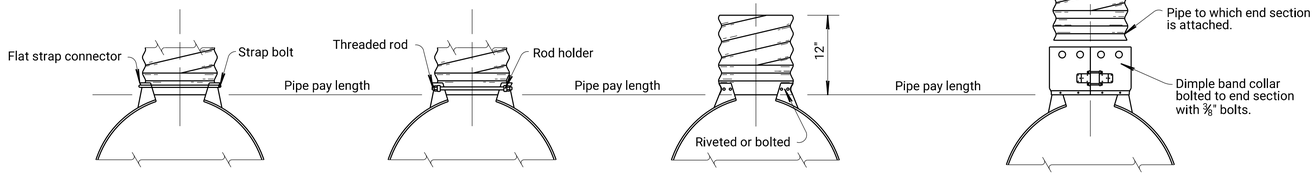
KDOT Graphics Certified

Plotted : 10/9/2024
Drawn By : untitled
File : \\BGCONSULTANTS\Projects\2023\23-1389\CAD\Drawing Set\11-rd502.dgn

23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	12	54



PLAN
(Illustrated with Type #3 Connection)



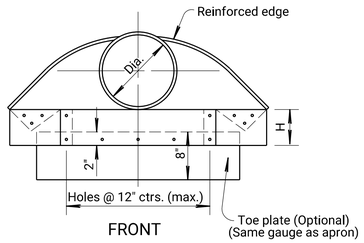
TYPE 1
Available in sizes 12" through 24" only.

TYPE 2
Available in sizes 30" and 36" Round and 17"x13" through 57"x38" Pipe-Arches.

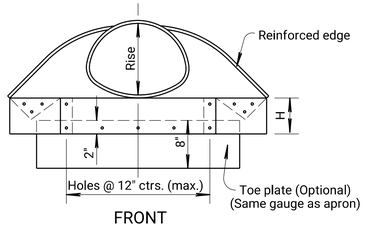
TYPE 3
Available in sizes 42" through 96" Round and 60"x46" through 81"x59" Pipe-Arches.

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).

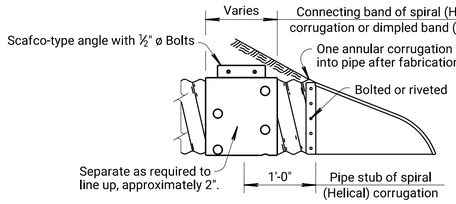
Note: Type 3 connection may be furnished instead of Type 1 or Type 2 for smaller round or arch pipe.



FRONT



FRONT



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	2½: 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.

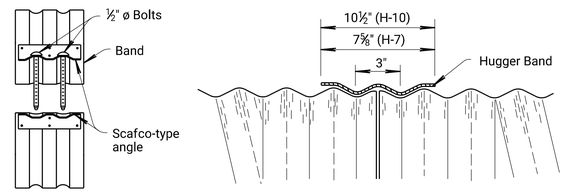
Toe plate extension, when specified, is an accessory and shall be the same gauge and metal as end section. Toe plate shall be punched to match holes in apron lip and attached with furnished 3#8" diameter nuts & bolts.

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.

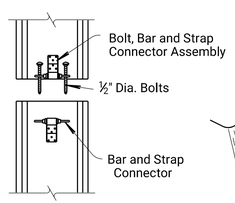
Connection of end sections by welding will not be permitted.



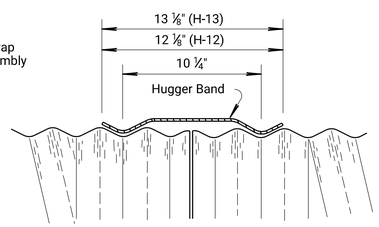
CONNECTION DETAIL
H-7 or H-10 BAND

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

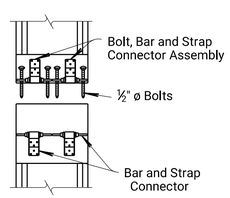
DETAILS FOR H-7 HUGGER BAND (12" thru 36")
or H-10 HUGGER BAND (12" thru 120")



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.

NO.	DATE	REVISIONS	BY	APP'D
04	09-10-09	Rev. Round and Arch tables, add. Alum.	S.W.K.	J.O.B.
03	01-20-09	Rev. Round and Arch tables, add. Alum.	S.W.K.	J.O.B.
02	04-18-08	Rev. layout, details, tables and notes	S.W.K.	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
DESIGN CK.	DETAIL CK.		QUAN.CK.	TRACE CK.

KDOT Graphics Certified 05-16-2022

KDOT Graphics Certified

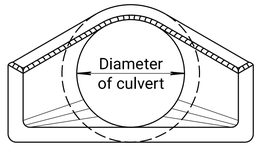
Note to Designer: KDOT Pipe Policy provides guidance in identifying the prohibited and/or restricted uses of CSP, ACSP, PEP, PVCP, CAP & RCP. Provide end sections of the same type and coating as the pipe. Exceptions to this are noted in the Standard Specifications. Refer to the KDOT Design Manual, Volume 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.

Drawn By : untitled Plotted : 10/9/2024
File : \\BGCONSULTANTS\Projects\2023\23-1389\CAD\Drawing Set\12-rd660.dgn

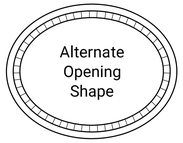
23-1389M

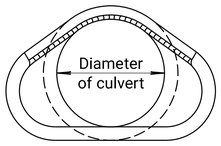
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	66 C-5287-01	2025	13	54

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.



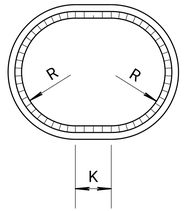
END ELEVATION (TYPE I)





SECTION A-A

Showing rounding of inside edge of end section.



END ELEVATION (TYPE III)

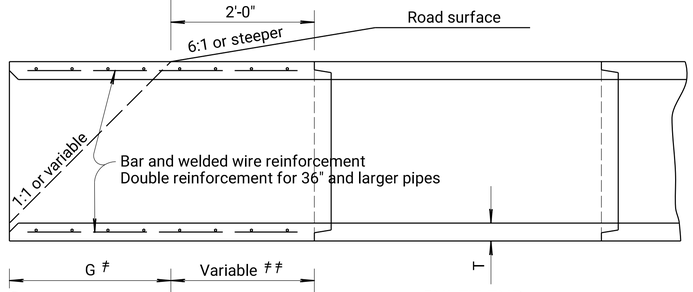
Lineal Feet of Pipe Shown on Plans (Pay Length)

Horizontal Roadway Lt.

Length of Pipe Lt.

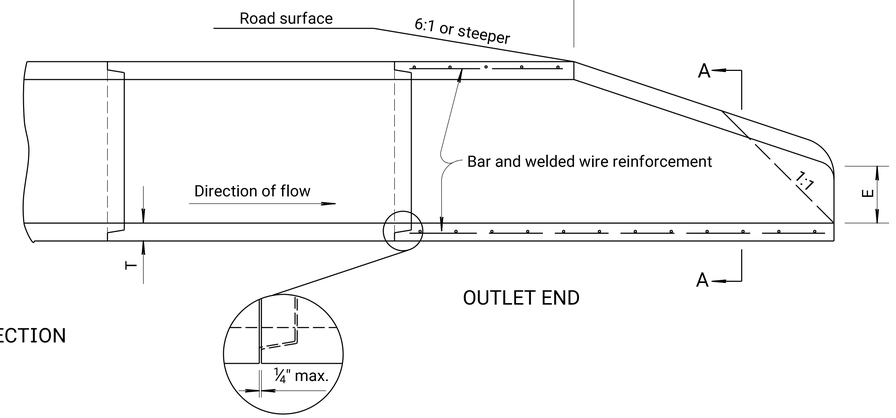
Horizontal Roadway Rt.

Length of Pipe Rt.



INLET END

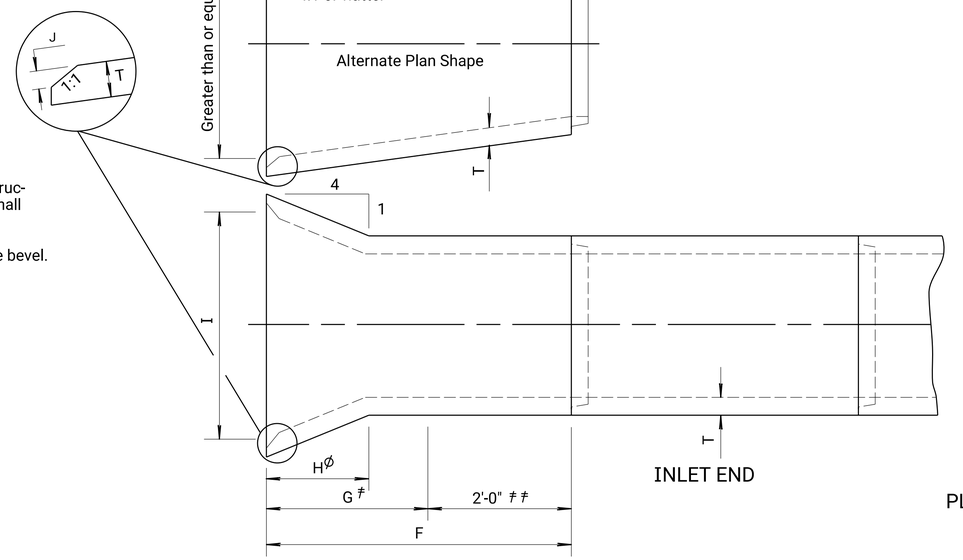
℄ Project



OUTLET END

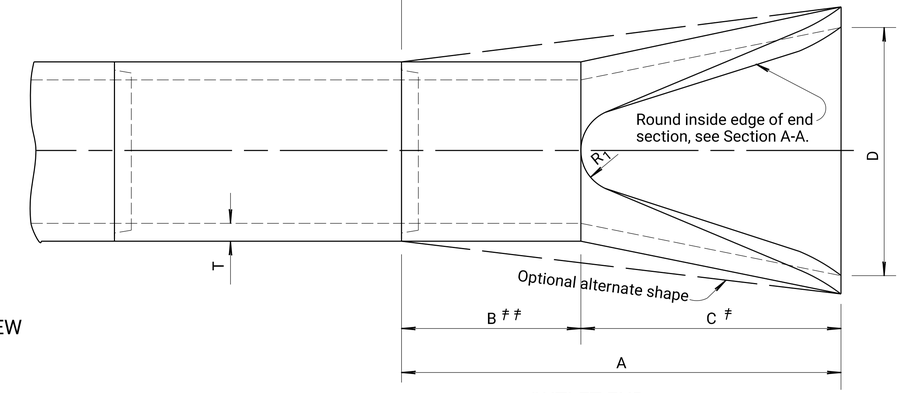
ELEVATION SECTION

Note: There shall be no payment for gain in length due to joint fit tolerance.



INLET END

℄ Project



OUTLET END

PLAN VIEW

∅ Transition to round pipe.

≠ Paid for as separate item of End Section, except when structures shall bid as alternates. In that case End Sections shall be subsidiary to bid item. "Drainage Structure No. ".

≠≠ Included in pay length of pipe.

⚹ Minimum waterway area is calculated at the inside of the bevel.

END SECTION (TYPE I) NOMINAL DIMENSIONS

Diam.	A	B≠≠	C≠	D	E	R_I	Slope	T
12"	6'-0 7/8"	4'-0 7/8"	2'-0"	2'-0"	4"	9	3:1	2"
15"	6'-1"	3'-10"	2'-3"	2'-6"	6"	11	3:1	2 ¼"
18"	6'-1"	3'-10"	2'-3"	3'-0"	9"	12	3:1	2 ½"
24"	6'-1 ½"	2'-6"	3'-7 ½"	4'-0"	9 ½"	14	3:1	3"
30"	6'-1 ¾"	1'-7 ¾"	4'-6"	5'-0"	1'-0"	15	3:1	3 ½"
36"	8'-1 ¾"	2'-10¾"	5'-3"	6'-0"	1'-3"	20	3:1	4"
42"	8'-2"	2'-11"	5'-3"	6'-6"	1'-9"	22	3:1	4 ½"
48"	8'-2"	2'-2"	6'-0"	7'-0"	2'-0"	22	3:1	5"
54"	8'-2 ¼"	2'-9 ¼"	5'-5"	7'-6"	2'-3"	24	2.4:1	5 ½"
60"	8'-3"	3'-3"	5'-0"	8'-0"	2'-11"	24	21	6"
72"	8'-3"	1'-9"	6'-6"	9'-0"	3'-0"	24	1.86:1	7"
84"	9'-3 ½"	1'-9"	7'-6 ½"	10-0"	3'-0"	24	1.6:1	8"

SIDE TAPERED INLET SECTION (TYPE III)-NOMINAL DIMENSIONS

Diam.	Min. W.W.⚹ Area Sq. Ft.	F	G	H	I	J	K	R	T
24"	4.5	4'-3"	2'-3"	1'-5 1/8"	2'-8"	1 ½"	8"	1'-0"	3"
30"	7.0	4'-9 ½"	2'-9 ½"	1'-9 ½"	3'-4"	2"	10"	1'-3"	3 ½"
36"	10.1	5'-4"	3'-4"	2'-1 ½"	4'-0"	2"	1'-0"	1'-6"	4"
42"	13.7	5'-10 ½"	3'-10 ½"	2'-5 7/8"	4'-8"	2 ½"	1'-2"	1'-9"	4 ½"
48"	17.9	6'-5"	4'-5"	2'-10 1/8"	5'-4"	3"	1'-4"	2'-0"	5"
54"	22.7	6'-11 ½"	4'-11 ½"	3'-2 ½"	6'-0"	3 ½"	1'-6"	2'-3"	5 ½"
60"	28.0	7'-6"	5'-6"	3'-6 7/8"	6'-8"	4"	1'-8"	2'-6"	6"
72"	40.3	8'-7"	6'-7"	4'-3 3/8"	8'-0"	5"	2'-0"	3'-0"	7"
84"	54.8	9'-8"	7'-8"	5'-0 3/8"	9'-4"	6"	2'-4"	3'-6"	8"

Dimensions for alternate shapes shall be equal to or greater than those shown in the table, unless otherwise shown.

NO.	DATE	REVISIONS	BY	APP'D
02	04-18-08	Added ref. to KDOT Pipe Policy	S.W.K.	J.O.B.
01	04-05-05	Revised reinforcement callout	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

CONCRETE END SECTIONS FOR CONCRETE PIPES TYPE I & SIDE TAPERED INLET SECTION (TYPE III)

RD662

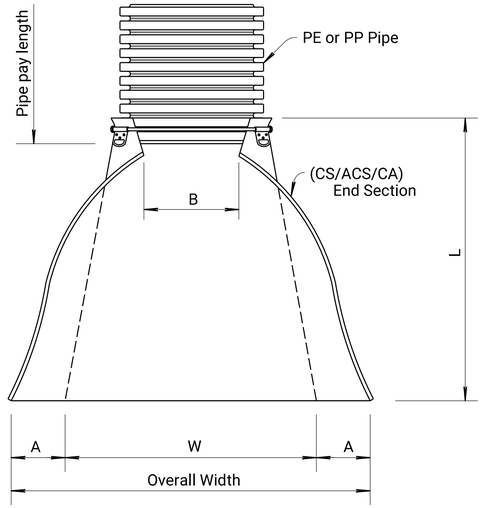
FHWA APPROVAL	06-27-08	APP'D.	James O. Brewer
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 05-16-2022

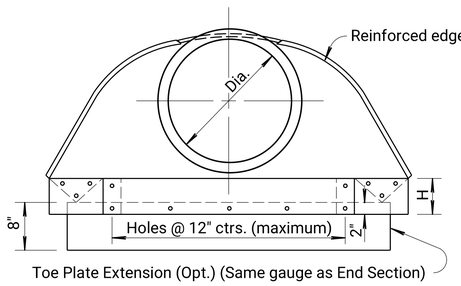
KDOT Graphics Certified

Plotted : 10/9/2024
Drawn By: untitled
File : \\BGCONSULTANTS\Projects\2023\23-1389\CAD\Drawing Set\13-rd662.dgn

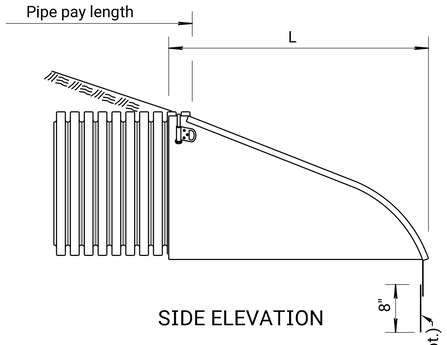
23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	14	54



PLAN
(Illustrated with Type 2 Connector)

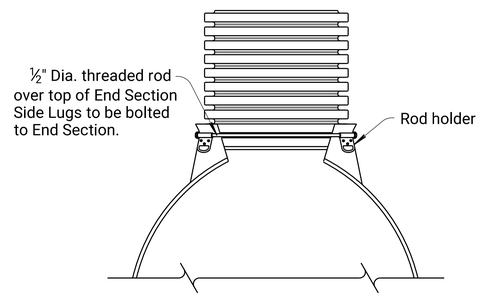


FRONT ELEVATION

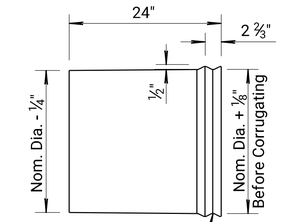


SIDE ELEVATION

⊛ Toe plate extensions where specified, to be punched to match holes in apron lip and bolted with ⅜" dia. bolts. The length of toe plate to be as follows:
W + 10" for 12" to 30" diameter pipe inclusive.
W + 20" for 36" to 60" diameter pipe inclusive.

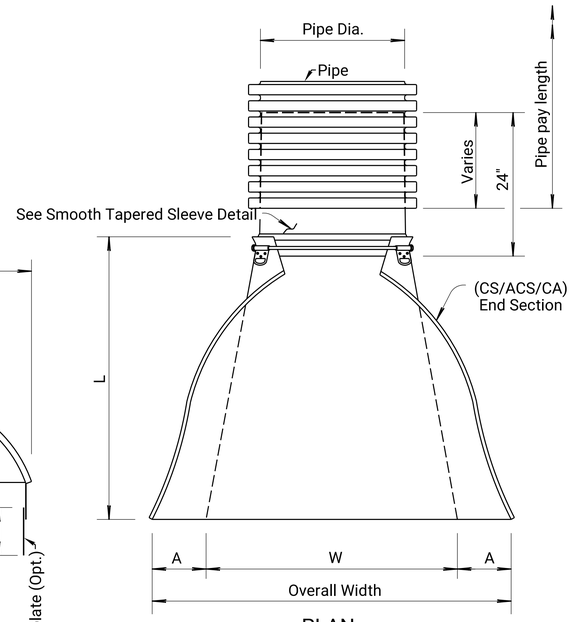


TYPE 2 CONNECTOR
(12" & Larger)

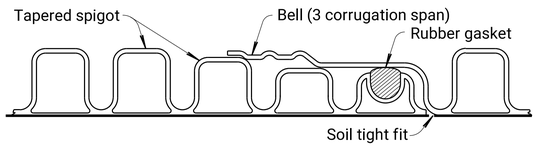


Form ½" x 2 ⅔" Corrugations in 12 ga. smooth CS (Galvanized) or ACS (Aluminized) metal, maintain inside diameter of sleeve.

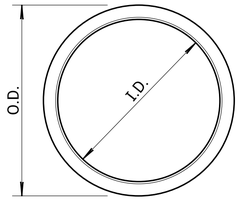
SMOOTH TAPERED SLEEVE DETAIL
(Required)



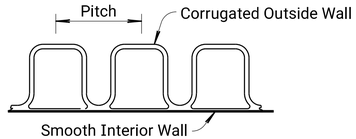
PLAN
TAPERED SLEEVE FOR ATTACHING
METAL END SECTION TO PE OR PP PIPE
(Illustrated with Type 2 Connector)



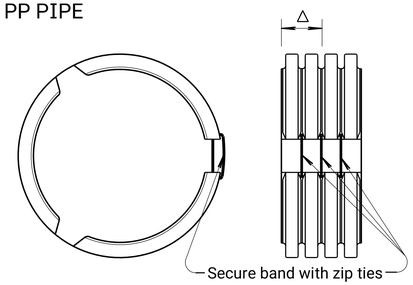
PE or PP PIPE BELL & SPIGOT CONNECTION
SOIL TIGHT JOINT



DETAILS OF CORRUGATED
PE or PP PIPE

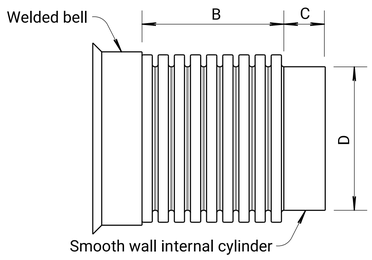


TYPICAL SECTION
CORRUGATED PE or PP PIPE



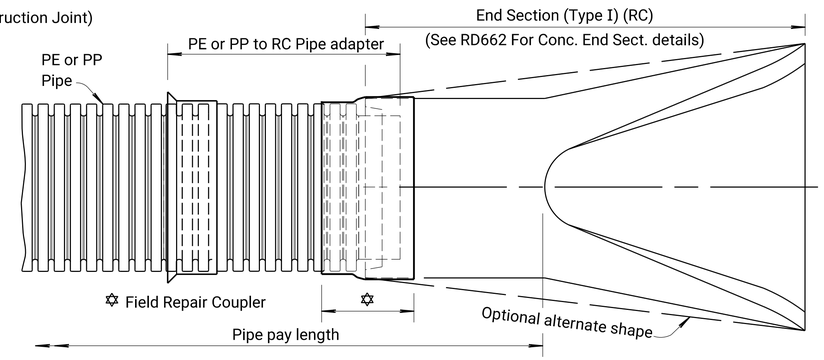
△ Two Full Corrugations (Minimum Overlap)

PE or PP PIPE SPLIT BAND COUPLER
SOIL TIGHT JOINT
This band is used for (Field Splice Construction Joint)



PE or PP to RC PIPE ADAPTER

PE or PP TO RC PIPE ADAPTER			
Pipe Dia. (In.)	B	C	D
18"	18¼"	6"	18"
24"	25"	6"	24"
30"	32 13/16"	6"	30"
36"	36¾"	6"	36"
42"	36"	6"	41¼"
48"	36¾"	6"	41¼"
60"	36"	6"	59"



PE or PP to RC PIPE ADAPTER to CONCRETE END SECTION
(This installation is for Acidic Soil Conditions)

GENERAL NOTES

The culvert type shall meet the KDOT Pipe Policy & Standard Specifications.

The size of pipe designated on the plan shall be the nominal inside diameter of a two wall corrugated PE pipe (Type S) or PP pipe (Type S).

PE or PP pipe couplings shall be designed to cover at least two full corrugations on each side of a joint.

No additional payment shall be made for any gain in length due to the fit of the pipe at connections.

All corrugated PE or PP pipe, end sections, couplings, and fittings shall conform with the Standard Specifications.

See Standard Specifications for PE or PP Pipe bedding and backfill.

Multiple panel end sections shall have lap seams which are to be tightly joined by bolts & nuts. Corner plate and toe plate to be same gauge and material as end section. When required optional toe plate extension shall be overall width less 6" x 8" high.

Attachment to PE or PP pipe 12" diameter and up shall be made with Type 2 Connector.

All work and materials required for construction and installation of end section shall be included in the bid item "End Section".

(CS/ACS/CA) END SECTION FOR PE or PP PIPE							
Pipe Dia. (In.)	Min. Gauge Ends	Dimensions in Inches					Slope
		A (min.)	B (max.)	H (min.)	L (+/-2")	W (min.)	
12"	16	6	7	6	21	24	2½:1
15"	16	7	8	6	26	30	2½:1
18"	16	8	10	6	31	36	2½:1
21"	16	9	12	6	36	42	2½:1
24"	16	10	13	6	41	48	2½:1
30"	14	12	16	8	51	60	2½:1
36"	14	14	19	9	60	72	2½:1
42"	12	16	25	11	69	84	2½:1
48"	12	18	29	12	78	90	2¼:1
54"	12	18	33	12	84	102	2¼:1
60"	12/10	18	36	12	87	114	2:1

Note to Designer:
KDOT Pipe Policy provides guidance in identifying the prohibited and/or restricted uses of CSP, ACSP, PEP, PVCP, PPP, SRPEP, 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 heights and classes of pipe.

Drawn By : untitled
File : \\BGCONSULTANTS\Projects\2023\23-1389\CAD\Drawing Set\14-fil1.dgn
Plotted : 10/9/2024

NO.	DATE	REVISIONS	BY	APP'D
03	5-9-22	Added Polypropylene pipe (PP) type	A.L.R.	S.W.K.
02	07-17-17	Changed tapered slv. requirement	A.L.R.	S.W.K.
01	02-08-08	Added ref. to KDOT pipe policy	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

METAL/CONCRETE END SECTION
(TYPE I)
for PE or PP PIPE

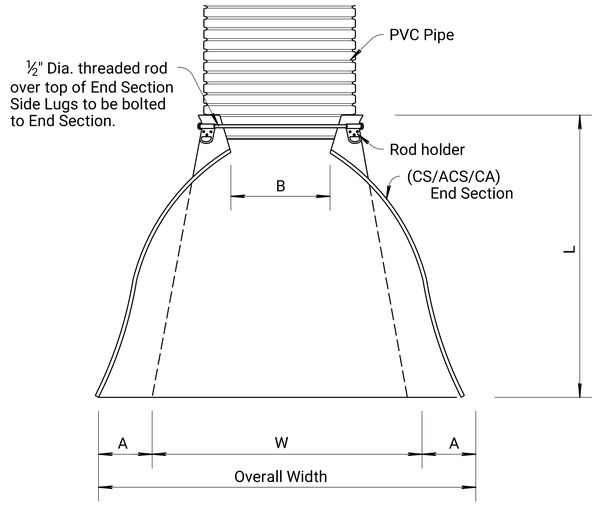
RD667

FHWA APPROVAL		06-08-22	APP'D.	Scott W. King
DESIGNED	DETAILED		QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.		QUAN.CK.	TRACE CK.

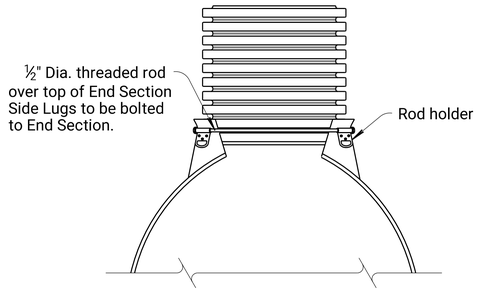
KDOT Graphics Certified 06-22-2022

KDOT Graphics Certified

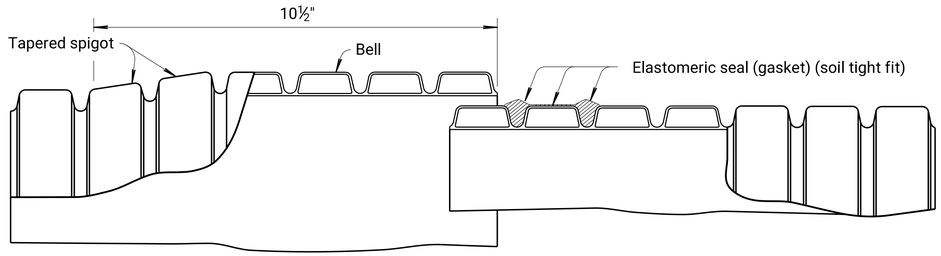
23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	15	54



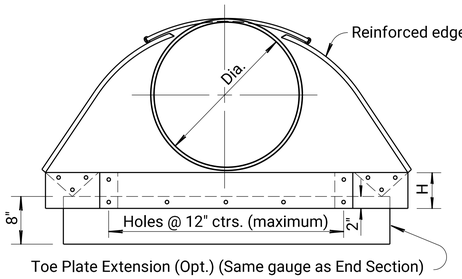
PLAN
(Illustrated with Type 2 Connector on 12" or larger)



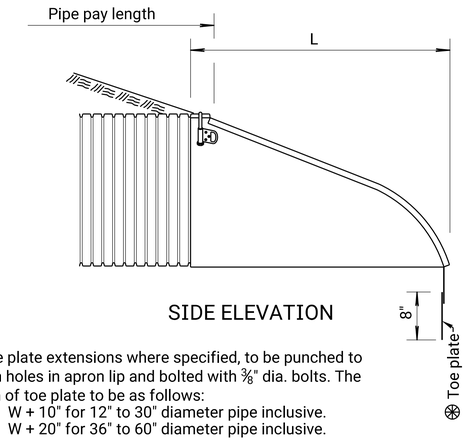
TYPE 2 CONNECTOR
(12" & Larger)



PVC BELL & SPIGOT CONNECTION
SOIL TIGHT JOINT

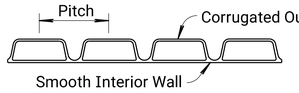


FRONT ELEVATION

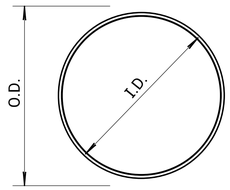


SIDE ELEVATION

⊛ Toe plate extensions where specified, to be punched to match holes in apron lip and bolted with ⅜" dia. bolts. The length of toe plate to be as follows:
W + 10" for 12" to 30" diameter pipe inclusive.
W + 20" for 36" to 60" diameter pipe inclusive.



TYPICAL SECTION
CORRUGATED PVC PIPE



DETAILS OF
CORRUGATED PVC PIPE

GENERAL NOTES

The culvert type shall meet the KDOT Pipe Policy & Standard Specifications.

The size of pipe designated on the plan shall be the nominal inside diameter of a two wall corrugated PVC pipe.

PVC pipe shall be joined with an integral bell gasket joint and Flexible Elastomeric Seals. PVC Pipe is available in lengths of 2.5' to 20'. PVC pipe can be field cut to length, cut through a corrugation valley using a hand or power saw. Gaskets are shipped loose and fitted on spigot/cut pipe end following Manufacturer's installation instructions.

No additional payment shall be made for any gain in length due to the fit of the pipe at connections.

All corrugated PVC pipe, end sections and fittings shall conform with the Standard Specifications.

See Standard Specifications for PVC Pipe bedding and backfill.

Multiple panel end sections shall have lap seams which are to be tightly joined by bolts & nuts. Corner plate and toe plate to be same gauge and material as end section. When required optional toe plate extension shall be overall width less 6" x 8" high.

The End Section attachment to PVC pipe shall be made with a Type 2 Connector for 12" or greater pipe size.

All work and materials required for construction and installation of end section shall be included in the bid item "End Section".

(CS/ACS/CA) END SECTION FOR PVC PIPE

Pipe Dia. (In.)	Min. Gauge Ends	Dimensions in Inches					Slope
		A 1" Tol.	B (max.)	H (min.)	L (+/- 2")	W (min.)	
12"	16	6	7	6	21	24	2½: 1
15"	16	7	8	6	26	30	2½: 1
18"	16	8	10	6	31	36	2½: 1
21"	16	9	12	6	36	42	2½: 1
24"	16	10	13	6	41	48	2½: 1
30"	14	12	16	8	51	60	2½: 1
36"	14	14	19	9	60	72	2½: 1

NO.	DATE	REVISIONS	BY	APP'D
01	02-08-08	Added ref. to KDOT Pipe Policy	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

METAL END SECTION (TYPE I) for PVC PIPE

RD667B

FHWA APPROVAL	06-27-08	APP'D.	James O. Brewer
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 05-16-2022

KDOT Graphics Certified

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.

Drawn By : untitled Plotted : 10/9/2024
File : \\BGCONSULTANTS\Projects\2023\23-1389\CAD\Drawing Set\15-rd667b.dgn

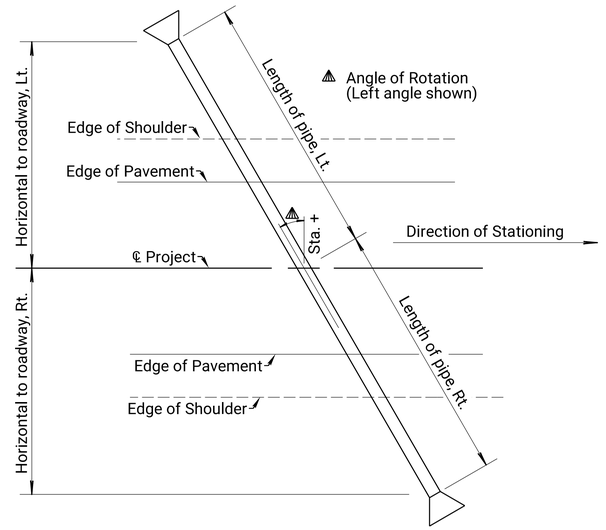
23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	16	54

PIPE CULVERT SUMMARY

Station	Type	Size or Bid Designation Sq. Ft.	Crown Grade Elev.	Flow Line Lt.	Flow Line Rt.	✳ Floor Elev. Lt.	✳ Floor Elev. Rt.	Horizontal Roadway Lt.	Horizontal Roadway Rt.	Degree of Rotation	Length of Pipe Lt.	Length of Pipe Rt.	Lin. Ft. of Pipe	Height of Fill (max.) Ft.	Concrete Pipe AASHTO Class No.	Pipe Gauge ◔ Steel	Pipe Gauge ◔ Alum.	Pipe Corrugations ◔ Steel	Pipe Corrugations ◔ Alum.	Remarks
67+00, 27.25' Lt.	Entrance	24"		1221.19	1219.81					5° Lt.	19'	15'	34'							w/ End Sections

◔ Unless otherwise noted, minimum pipe gauge & corrugations to be as shown in RD660.
See Summary of Quantities for End Section information.

✳ Only include floor elevations for embedded pipes. See RD668 for details. For structures not embedded, the floor elevations may be omitted.



PLAN
(Showing Rotation about ℄)

Type	ALLOWABLE LOCATION ⚠				
	Mainline	Side Road	Entrance	Storm Sewer Under ML	Storm Sewer Not Under ML
✡ PVCP	x	x	x		
▱ PEP	x	x	x		
▱ PPP					
≈ SRPE					
CSP					
ACSP	x	x	x		
CAP	x	x	x		
RCP	x	x	x		

✡ When inside diameter of pipe is 36" or less.

⚠ Unless otherwise specified in the plans. Some pipe types may not be allowed at a location if the fill height exceeds the maximum allowable or is less than the minimum allowable cover.

▱ When inside diameter of pipe is 60" or less.

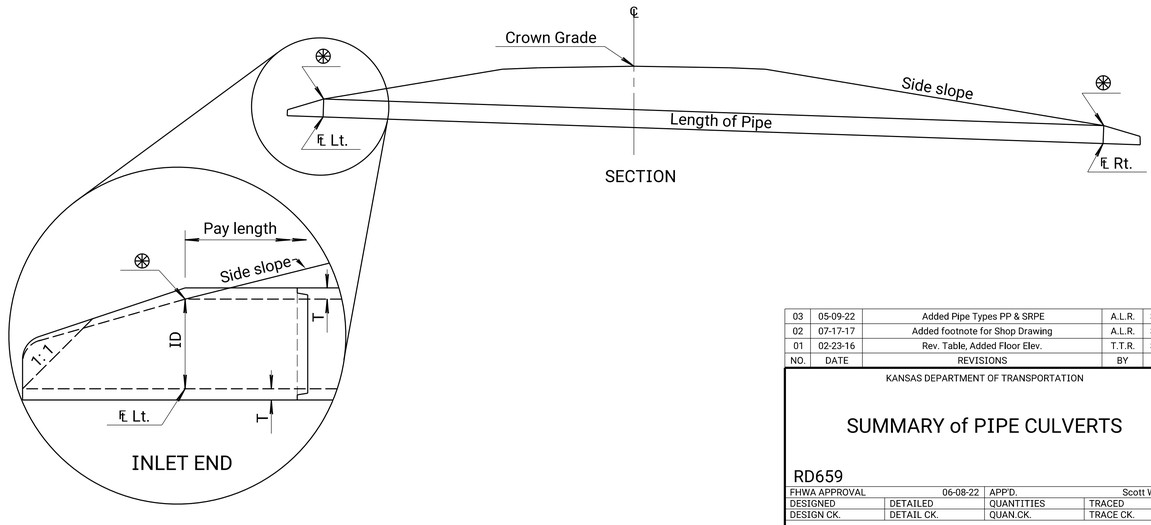
≈ For inside diameter: ≥ 30"

Type	ALLOWABLE END SECTIONS			
	◈ CS	◈ ACS	CA	RC
PVCP		x	x	Ψ
PEP		x	x	
PPP				
SRPE				
RCP				x
ACSP CAP CSP	Provide End Sections of the same material and coating type as the pipe.			

◈ Type IV End Sections are only made of CS or ACS.

Ψ Submit Shop Drawing of connection for review

⊛ Design side slope to intersect inside diameter of pipe outside of Clear Zone.



NO.	DATE	REVISIONS	BY	APP'D
03	05-09-22	Added Pipe Types PP & SRPE	A.L.R.	S.W.K.
02	07-17-17	Added footnote for Shop Drawing	A.L.R.	S.W.K.
01	02-23-16	Rev. Table, Added Floor Elev.	T.T.R.	S.W.K.

KANSAS DEPARTMENT OF TRANSPORTATION

SUMMARY of PIPE CULVERTS

RD659

FHWA APPROVAL		06-08-22	APP'D.	Scott W. King
DESIGNED	DETAILED		QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.		QUAN.CK.	TRACE CK.

KDOT Graphics Certified 06-24-2022

KDOT Graphics Certified

Note to Designer:
KDOT Pipe Policy provides guidance in identifying the prohibited and/or restricted uses of CSP, ACSP, PEP, PVCP, PPP SRPE, 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.

Drawn By : untitled Plotted : 10/10/2024
File : \\BGCONSULTANTS\Projects\2023\23-1389\CAD\Drawing Set\16-rd659.dgn

23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	17	54

SUMMARY OF QUANTITIES

Item / Location	Excavation Class I Cu. Yds.	Excavation Class II Cu. Yds.	Concrete (Grade 4.0) (AE) (SW) Cu. Yds.	Concrete (Grade 4.0) (AE) Cu. Yds.	Reinforcing Steel (Grade 60) Lbs.	*Piles (Steel) (HP 12x53) Lin. Ft.	Cast Steel Pile Points Ea.	Contractor Furnished PDA Ea.	Slope Protection (Shot Rock) Cu. Yds.	Geotextile Fabric Sq. Yds.			
Abutment No. 1	43	——	**	——	**	154	4	1	181.0	80.0			
Pier No. 1	16	44	——	37.8	3,197	455	7	——	——	——			
Pier No. 2	3	44	——	34.9	2,955	465	7	1	——	——			
Abutment No. 2	43	——	**	——	**	144	4	——	106.0	44.8			
Substr. Total	105	88	——	72.7	6,152	1,097	22	2	287.0	124.8			
Superstr. Total	——	——	194.0	——	52,867	——		——	——	——			
Total	105	88	194.0	72.7	59,020	1,097 †	22	2	287	125			

** Quantities are included in the Superstructure Total Quantity.

† Summary of Piling
Abutment No. 1 3 @ 36' & 1 @ 46.0'
Pier No. 1 7 @ 65'
Pier No. 2 6 @ 65' & 1 @ 75.0'
Abutment No. 2 4 @ 36'

*NOTE: Only HP12X53 Steel Piles shall be used on this structure.

INDEX TO BRIDGE DRAWINGS

GENERAL NOTES

CHANNEL IMPROVEMENT AND EXCAVATION: The Contractor shall excavate the channel and complete the embankment at the bridge site to the limits shown prior to the construction of the new bridge.

EMBANKMENT: Complete the embankment at the abutments as shown on the Bridge Excavation sheet prior to driving the abutment piling or commencing with the abutment footing excavation.

BACKFILL COMPACTION: Compact backfill at the abutments.

BRIDGE EXCAVATION: Elevation 1200.72 shall designate the Excavation Boundary Plane of Class I and Class II Excavation; Class I above the plane, Class II below the plane. See the Bridge Excavation sheet for the limits of pay excavation.

SOUNDINGS: Sounding shown on these plans are taken from notes obtained in the field and represent the best information available to Nemaha County.

PILING: Drive all piling to penetrate or bear upon the Glacial Drift/Nickerson Till formation. 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	52.1 tons
Abutment No. 2	52.1 tons
Pier No. 1	77.3 tons
Pier No. 2	77.3 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.

CONTRACTOR FURNISHED PDA: Use the Pile Driving Analyzer equipment at the locations shown on the Construction Layout. Use Pile Driving Analyzer equipment and method compliant with KDOT Special Provision. The piling shall remain as permanent piling. Drive the piling to the resistance value of 80.2 for Abutments and 118.9 for Piers (Strength I divided by Phi).

At any location where problems are experienced, pile damage is suspected, or the Pile Driving Formula Load occurs significantly above design pile tip elevation, the Owner's designated Engineer may request that the Pile Driving Analyzer (PDA) equipment be used.

PILING SPLICE LOCATION: Integral pile splice locations and weld testing criteria for Abutments and Piers will follow the "Standard Pile Details" Sheet (BR110).

DEMOLITION PLANS: This is a Category A Demolition. Submit detailed Demolition Plans to the Owner's designated Engineer per KDOT Specifications. No Demolition work will begin without approved Demolition Plans. A Licensed Professional Engineer is not required.

REMOVAL OF EXISTING STRUCTURES: Removal of existing structure is included in the bid item "Removal of Existing Structure", Lump Sum. The steel stringers, piles and guardrail obtained from the removal of the existing bridge, along with the cattle guard, shall be removed in salvagable condition and placed within the right-of-way for removal by Nemaha County funds and forces. All other materials obtained from removal of existing structure shall become the property of Contractor and removed from site.

THIS BRIDGE CONTAINS LEAD PAINT

CONCRETE: Superstructure concrete is bid as Concrete (Grade 4.0)(AE)(SW). Substructure concrete is bid as Concrete (Grade 4.0)(AE). Bevel all exposed edges of all concrete with a ¾" triangular molding, except as otherwise noted on the plans. Construction joints are optional with the Contractor, but if used, place only at locations shown, or at locations approved by the Engineer.

REINFORCING STEEL: All reinforcing steel dimensions are to the centerline of bars unless otherwise noted. All reinforcing steel shall conform to the requirements of ASTM A615, Grade 60.

CAMBER: Provide camber as shown on the Camber Diagram unless the Contractor uses either long span steel beam falsework (concrete dead load deflection greater than ¼") or timber falsework with greater than 12'-0" clear span. If either case exists, submit falsework plans that show the additional required camber.

CONSTRUCTION JOINTS: Construction joints shown are optional with the Contractor. If used, place the construction joints at locations shown or at locations approved by the Engineer.

CONSTRUCTION LOADS: Limited traffic is permitted on the new sub-deck, one-course deck or any concrete overlay during the curing period, **keep any exposed deck wet during the curing period**. See KDOT Specifications Section 710, Tables 710-1 and 710-2 for additional information.

FALSEWORK PLANS: A licensed Professional Engineer shall design the falsework details. Details shall bear the seal of a licensed Professional Engineer. Submit electronic plans conforming to Section 105 of the Standard Specification with details in compliance with KDOT Specifications to the Field Engineer for review.

FALSEWORK INSPECTION: This project has falsework plan requirements which are considered "Category 2" by KDOT specifications. If falsework deficiencies or variations from the approved and sealed plans are found, the falsework design Engineer of Record will provide written approval of the changes. If for the convenience of the Contractor the falsework becomes "Category 1" by the use of non-typical supports; then the inspection and review requirement of "Category 1" will be fully enforced, but at no cost to the Owner. "Category 2" falsework inspection is not paid for directly, but is subsidiary to other bid items.

FALSEWORK: Leave the falsework in place for the entire unit until 15 days after the last concrete pour for the unit or longer as directed by the Engineer.

FALSEWORK PLANS AND SHOP DRAWINGS: Use U.S. Customary system of units on falsework plans and shop drawings.

CORRAL RAIL: Build the corral rail after the falsework is struck.

HEADER BOARD: Immediately after the vertical forms on the EWS are removed, protect the exposed EWS by bolting a wooden header (Minimum dimension of 2⅝" by 7½") to the exposed vertical surface of the EWS. Extend the header board the full width of the EWS or use 1 section of header board for each lane of traffic. Shape the header board to comply with the crown surface of the bridge surface, and install it flush with the concrete wearing surface. This item shall be paid for subsidiary to the bid item "Concrete (Grade 4.0) (AE) (SW)".

CONCRETE PLACING SEQUENCE: The sequence of placing concrete in the slab and curbs shall be as shown, or the Contractor may submit an alternate placing sequence for review. Submit the alternate placing sequence to the Engineer at the Preconstruction Conference. Include the proposed rate of concrete placement in C.Y./h, the plant capacity, placement direction, construction joint location, a description of the equipment used in placing the concrete, proposed admixtures and the quantity of concrete in each placing segment. Any additional cost for the Contractor's alternate plan of placing the concrete, including admixtures, shall be at the Contractor's expense and shall be considered subsidiary to the bid item, "Concrete (Grade 4.0) (AE) (SW)". Approval of the Contractor's alternate sequence is required prior to placement of concrete in the deck.

SLOPE PROTECTION (Shot Rock): Place Slope Protection (Shot Rock) (18") to the limits and thicknesses shown on the plans or as directed by the Engineer.

DRIP LINE PROTECTION: Place a 10 ft. wide mat of geotextile under the rock/rubble embankment on the berm and berm slopes and centered on the drip lines of the slab.

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

CONTRACTOR CONSTRUCTION STAKING: Contractor Construction Staking for clear span bridges requires two independent surveys. See KDOT Specifications.

DESIGN DATA

DESIGN SPECIFICATIONS:
AASHTO Specifications, 8th Edition, 2017 with latest Interim Specifications. Load and Resistance Factor Design.

DESIGN LOADING:
HL-93

Design Dead Load includes an allowance of 25 psf for a future wearing surface.

UNIT STRESSES:

Concrete (Grade 4.0)	f'c	=	4.0 ksi
Concrete (Grade 4.0)(AE)	f'c	=	4.0 ksi
Concrete (Grade 4.0)(AE)(SW)	f'c	=	4.0 ksi
Reinforcing Steel (Grade 60)	fy	=	60 ksi

LRFD DESIGN PILE LOAD:

Design Loading (Tons/Pile)	Strength I	Service I	Phi
Abutment	52.1	34.4	0.65
Pier	77.3	50.1	0.65

LFD & LRFR RATING FACTORS

Truck / Rating Level	Inventory	Operating
HS-20 (36T)	1.72	2.21
2002 LFD Rating, 17th Edition AASHTO		
HL-93 Loading	1.07	1.38
NRL	1.41	1.82
2016 Manual for Bridge Evaluation		

NO.	DATE	REVISIONS	BY	APP'D
6	10/19/15	Added Asbestos Not8221 Option	JPJ	CER
5	2/4/15	Modified Per 2015 Specification	JPJ	CER
4	4/7/14	Current Release	JPJ	CER
3	1/12/14	Added Benchmark	JPJ	CER
2	08/2/12	ADDED NOT3135 & NOT3145	JPJ	TLF
1	04/29/10	ADDED RATING TABLES	JPJ	KFH

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 000660965003364 Sta. 68+20

GENERAL NOTES AND QUANTITIES

Proj. No. 66 C-5287-01 Nemaha Co.

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

Plotted By: $$USERNAME$$ | Plot Location: $UNIT$
File: $$$$$$$$$$$$$DGNSPEC$$$$$$$$$$$$$
Plot Date: $$$$$SYTIME$$$$$

23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	Kansas	66 C-5287-01	2025	18	54

E ¼ Corner Sec. 5, T4S, R13E = ℄ Sta. 160+72 = 3' Lt of ℄ Sta. 60+72

1. Found ½" Bar 2" Below Surface
2. Found Nail & Washr. in Top of Fence Post. 28.40' ESE
3. Found Nail & Washr. in Top of Fence Corner Post. 32.41' ENE
4. Found Nail & Washr. in Top of Fence Post. 31.40' W
5. Found Nail & Washr. in Top of Brace Post. 31.59' WNW
6. Traveled Way of "O" Rd.
7. N. 736294.29 E. 10436156.35

P.O.T. 205 = 0.11' Lt. of ℄ Sta. 165+74.93 = 3.11' Lt. of ℄ Sta. 65+74.93

1. Set 24" #4 Rebar 3" Deep. 3.00' E
2. Travel-way of "O" Rd. 48.34' NW
2. Set Mag Nail & Washr. in Top of Hedge Fence Post. 38.38' NE
3. Set Mag Nail & Washr. in Top of Hedge Fence Post. 40.00' SW
4. Set Mag Nail & Shiner in W. Face of Hedge Fence Post. 29.40' SE
5. Set 60D Nail and Shiner in S. Face of 15" Double Tree.
6. N. 736797.06 E. 10436169.30

P.O.T. 206 = 0.09' Lt. of ℄ Sta. 170+74.95 = 3.09' Lt. of ℄ Sta. 70+74.95

1. Set 24" #4 Rebar 4" Deep. 3.00' E
2. Set Mag Nail & Shiner in E. Face of PP #NMEC04671 48.34' NW
3. Travel-way of "O" Rd. 38.38' NE
2. North-South Electrified Fence. 40.00' SW
3. 2" Steel Pipe Post at S. Field Entrance. 29.40' SE
4. West End of 36" CMP.
5. East End of 36" CMP.
6. N. 737296.90 E. 10436182.31

NW Corner Sec. 4, T4S, R13E = ℄ Sta. 186+83.10 = 3' Lt. of ℄ 86+83.10

1. Found ½" Bar 2" Below Grade.
2. Set Mag Nail & Shiner in SE Face of a Power Pole. 60.65' NE
3. Set Mag Nail & Shiner in SW Face of a Power Pole. 47.60' SE
4. Set Mag Nail & Shiner in NW Face of a Power Pole. 37.64' SW
5. Set Mag Nail & Shiner in E Face of a Power Pole. 55.47' NW
6. Traveled Way of "O" Rd. 4.0' W
2. Traveled Way of 96th St. 9.0' N
3. N. 738904.51 E. 10436224.17

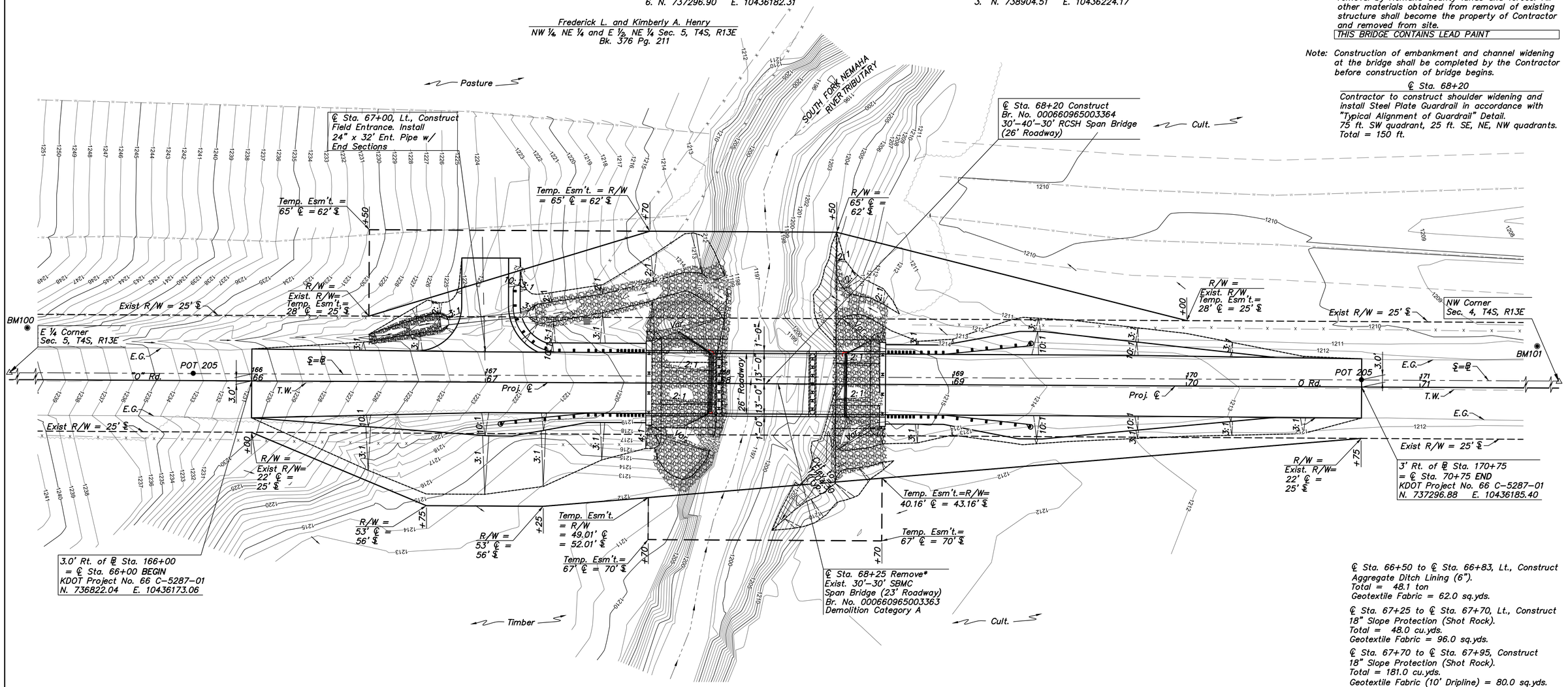
* Note: The steel stringers, piles and guardrail obtained from the removal of the existing bridge, along with the cattle guard, shall be removed in salvagable condition and placed within the right-of-way for removal by Nemaha County funds and forces. All other materials obtained from removal of existing structure shall become the property of Contractor and removed from site.

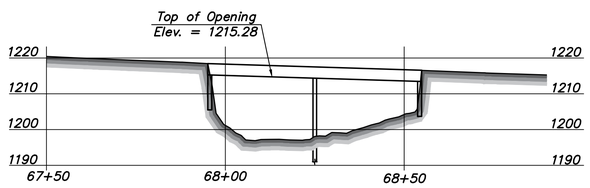
THIS BRIDGE CONTAINS LEAD PAINT

Note: Construction of embankment and channel widening at the bridge shall be completed by the Contractor before construction of bridge begins.

℄ Sta. 68+20

Contractor to construct shoulder widening and install Steel Plate Guardrail in accordance with "Typical Alignment of Guardrail" Detail.
75 ft. SW quadrant, 25 ft. SE, NE, NW quadrants.
Total = 150 ft.

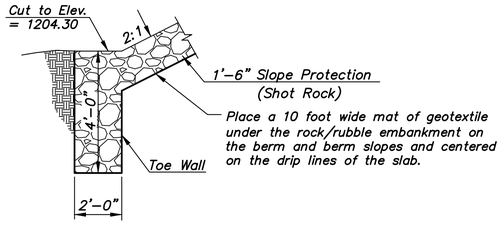




EXISTING WATERWAY OPENING

Area = 722.6 sq. ft.
Scale = 1" = 20'

BM100 Set "T" Post 10" Deep.
19.19' Lt.of ℄ Sta. 162+71.97 = 22.19' Lt. of ℄ Sta. 62+71.97
Elev.=1257.95 N. 736494.69 E. 10436142.36



TOE WALL DETAIL

No Scale

BM101 Set "T" Post 10" Deep.
14.92' Lt. of ℄ Sta. 172+11.13 = 17.92' Lt. of ℄ Sta. 72+11.13
Elev.=1211.13 N. 737433.43 E. 10436171.02

N

10' 0 20' 40'

Contour Intervals = 1 ft.

℄ Sta. 66+50 to ℄ Sta. 66+83, Lt., Construct Aggregate Ditch Lining (6").
Total = 48.1 ton
Geotextile Fabric = 62.0 sq.yds.

℄ Sta. 67+25 to ℄ Sta. 67+70, Lt., Construct 18" Slope Protection (Shot Rock).
Total = 48.0 cu.yds.
Geotextile Fabric = 96.0 sq.yds.

℄ Sta. 67+70 to ℄ Sta. 67+95, Construct 18" Slope Protection (Shot Rock).
Total = 181.0 cu.yds.
Geotextile Fabric (10' Dripline) = 80.0 sq.yds.

℄ Sta. 68+48 to ℄ Sta. 68+71.25, Construct 18" Slope Protection (Shot Rock).
Total = 106.0 cu.yds.
Geotextile Fabric (10' Dripline) = 44.8 sq.yds.

NEMAHA COUNTY HIGHWAY DEPARTMENT

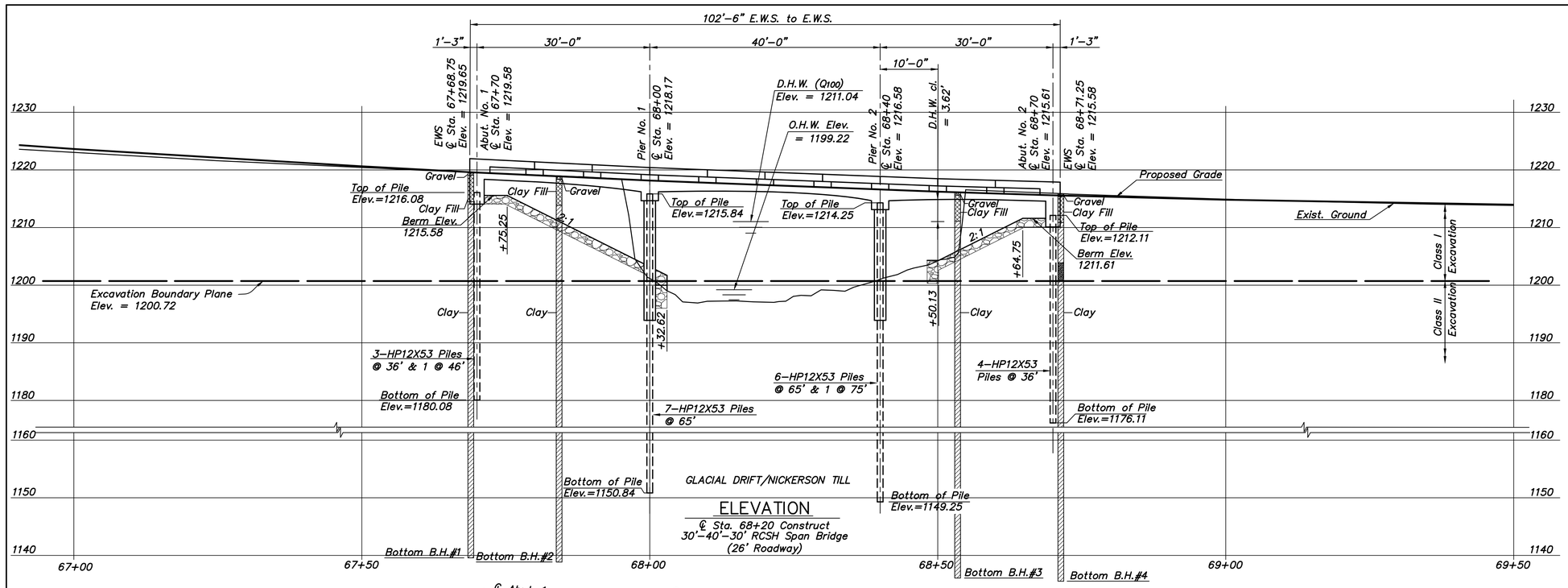
Br. No. 000660965003364 Sta. 68+20

CONTOUR MAP

Project No. 66 C-5287-01 No. 0-14

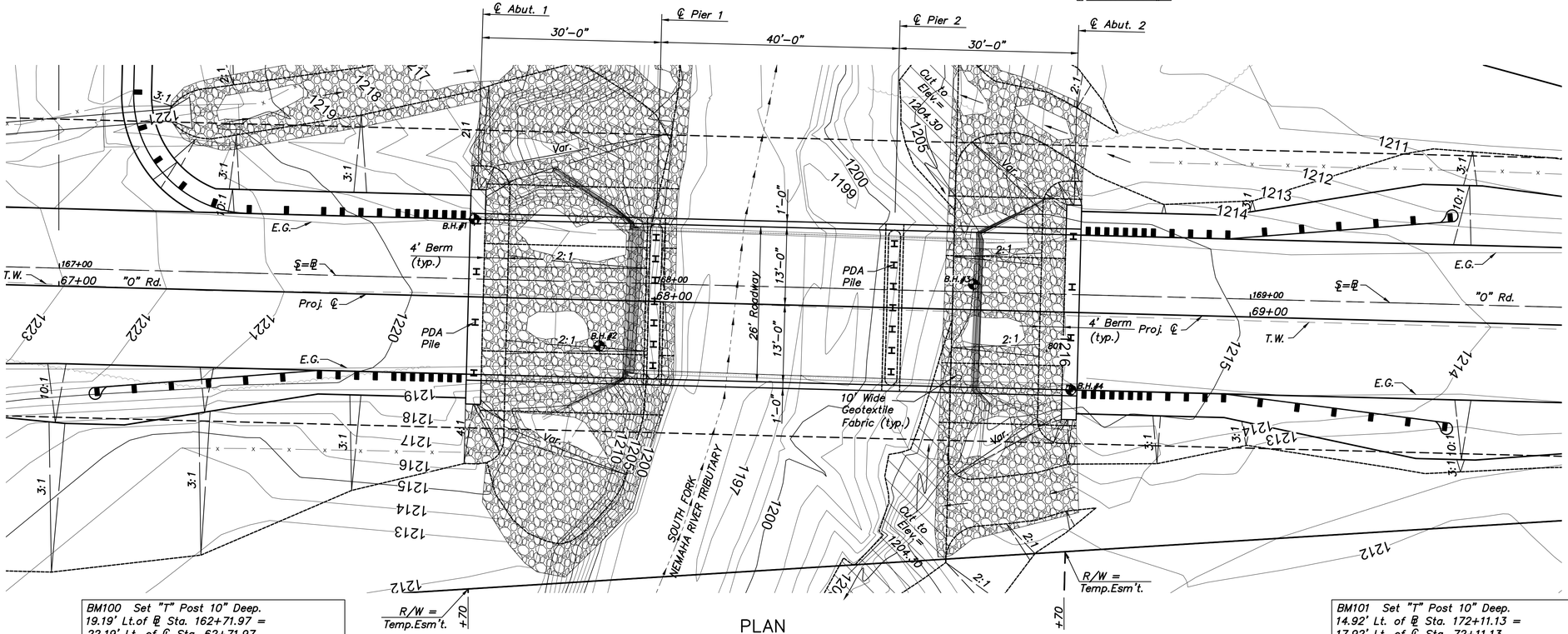
BG CONSULTANTS
ENGINEERS · ARCHITECTS · SURVEYORS

23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	Kansas	66 C-5287-01	2025	19	54



ELEVATION

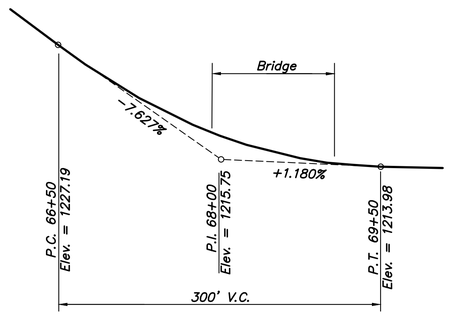
℄ Sta. 68+20 Construct
30'-40'-30' RCSH Span Bridge
(26' Roadway)



PLAN

BM100 Set "T" Post 10" Deep.
19.19' Lt.of ℄ Sta. 162+71.97 =
22.19' Lt. of ℄ Sta. 62+71.97
Elev.=1257.95 N. 736494.69 E. 10436142.36

BM101 Set "T" Post 10" Deep.
14.92' Lt. of ℄ Sta. 172+11.13 =
17.92' Lt. of ℄ Sta. 72+11.13
Elev.=1211.13 N. 737433.43 E. 10436171.02



VERTICAL CURVE DATA

No Scale

N

5' 0 10' 20'

Contour Interval = 1 Ft.

DRAINAGE DATA

Drainage Area	4.8 Sq. Mi.
Design Frequency (Q100)	100 Years
Design Discharge (Q0t)	4,490 cfs
Design High Water Elevation	1211.04
Change in Design Backwater	-0.52 ft.
Overtopping Elevation (Sta. 71+60.71)	1212.26
Overtopping Discharge	4,793 cfs
Overtopping Frequency	>100 Years
Discharge at Q100	4,490 cfs
Change in Backwater at Q100	-0.52 Ft.
Backwater Elevation at Q100	1211.04
Historic High Water Elevation	Unknown
Ordinary High Water Elevation	1199.22
Total Waterway Provided	1,086 Sq. Ft.
Design Waterway Provided	664 Sq. Ft.
Estimated Ordinary High Water Discharge	136 cfs
Change in Waterway Opening	456 Sq. Ft.

NEMAHA COUNTY HIGHWAY DEPARTMENT

Br. No. 000660965003364 Sta. 68+20

CONSTRUCTION LAYOUT

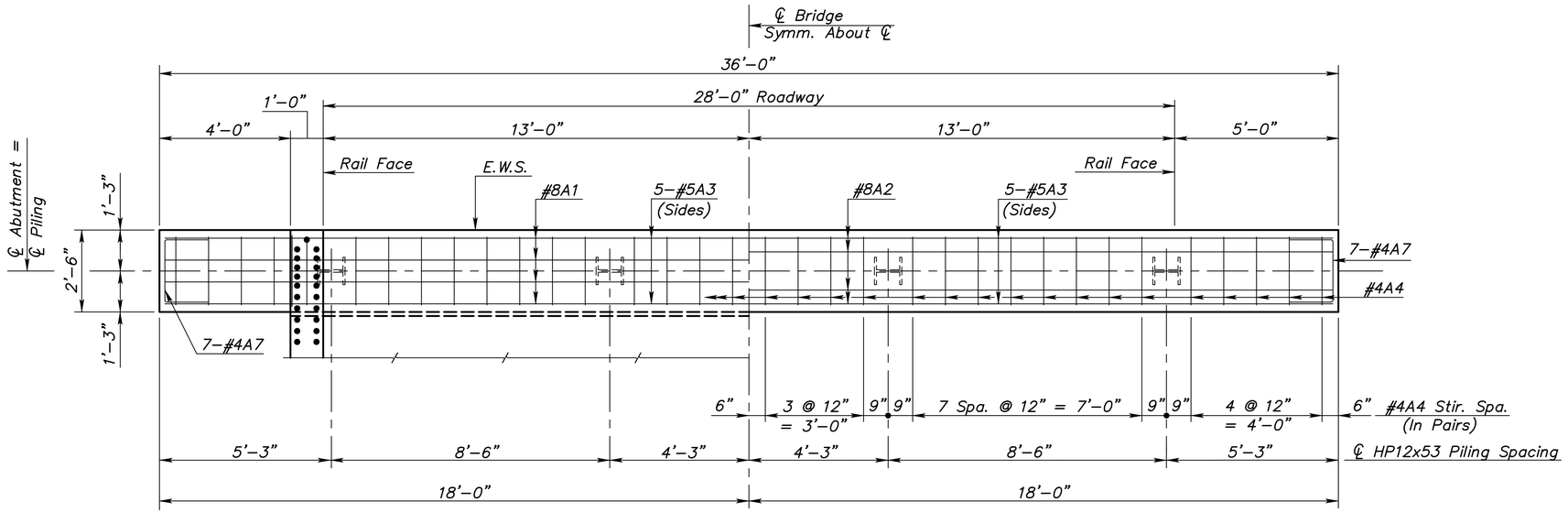
Project No. 66 C-5287-01 No. 0-14

BG CONSULTANTS
ENGINEERS · ARCHITECTS · SURVEYORS

23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	20	54

hslab-lrfd\br500.dgn
LRFD
Roadway Width = 28'-0"
Skew and Direction = 0_____
Number of Piles = 4

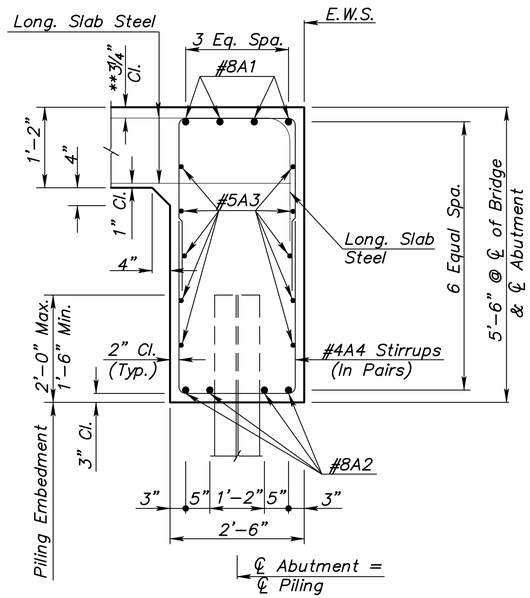
Note to designer: Do not remove this information



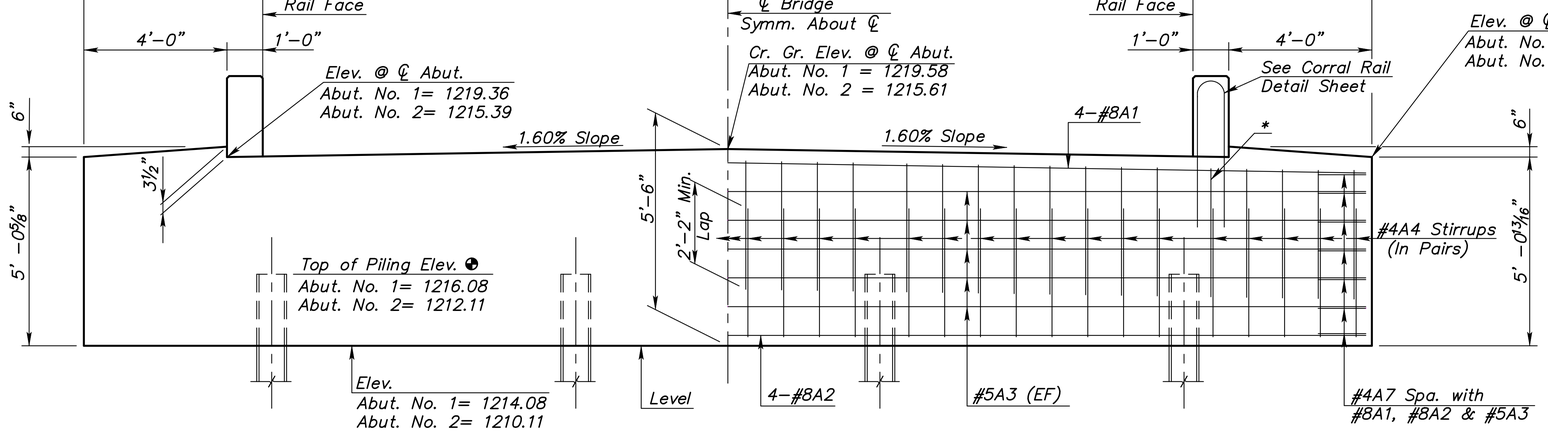
Reinforcing Steel in Top of Abutment

Reinforcing Steel in Bottom of Abutment

PLAN



TYPICAL SECTION



ELEVATION

(Along ℄ Abutment)

*Adjust stirrup to avoid conflict with rail bars.

◕ Note: Top of piling elevations are based on 2'-0" maximum embedment.

Max. Factored Design Pile - Load (Strength I) = 52.1 ton/pile
Factored Resistance = 96 tons/pile
Phi = 0.65
Use HP12x53 Gr. Steel Piles

Legend
EF = Each Face

NO.	DATE	REVISIONS	BY	APP'D
4	7/29/09	Remove Factored Resistance	DRT	KFH
3	3/24/09	Add Factored Resist. to Pile Loading	DRT	KFH
2	3/6/07	correct Abut. Dim."A" for 54-72-54	DRT	KFH
1	4/6/06	Adj. Abut. Vol. & DL	DRT	KFH

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 000660965003364 Sta. 68+20

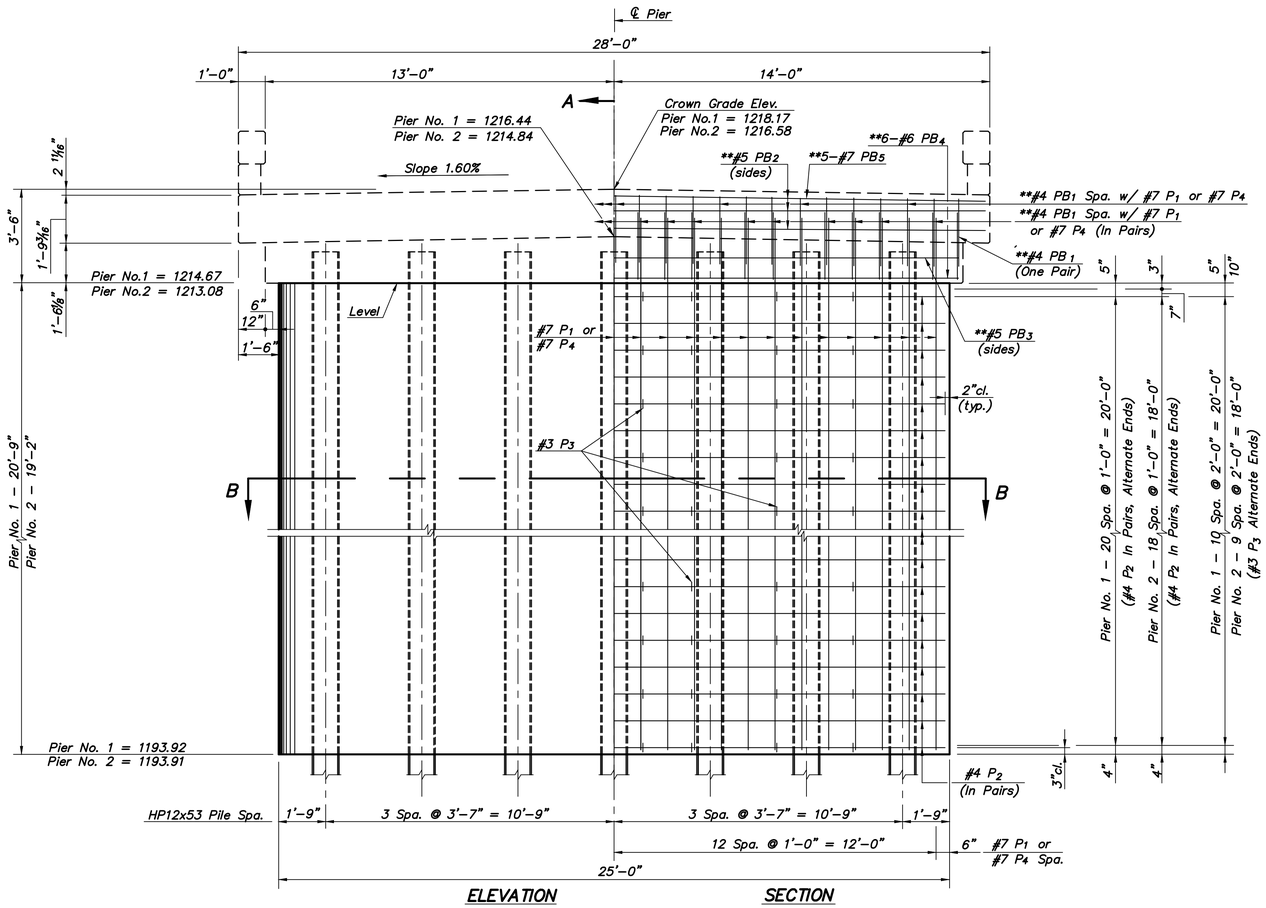
ABUTMENT DETAILS

Proj. 066 C-5287-01 Nemaha Co.

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

Plotted By: $$USERNAME$$ Plot Location: $UNIT$
File: $$$$$$$$$$$$DGNSPEC$$$$$$$$$$$$
Plot Date: $$$$$SYTIME$$$$$

23-1389M	State	Project No.	Year	Sheet No.	Total Sheets
	Kansas	66 C-5287-01	2025	21	54

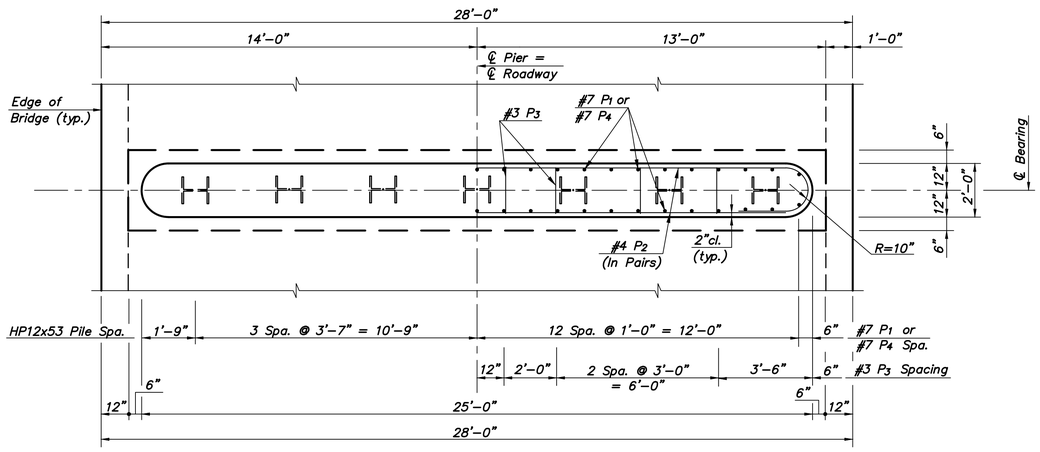


ELEVATION SECTION

PIER NO. 1 & PIER NO. 2

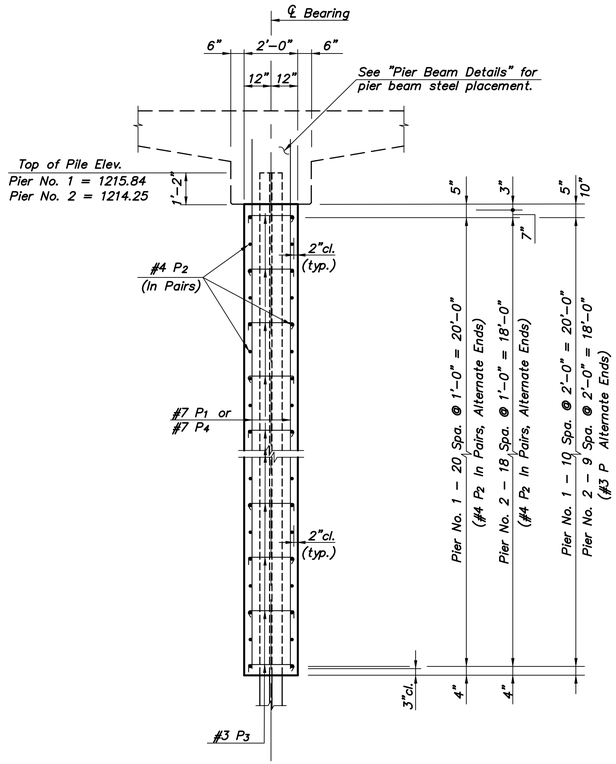
(Pier No. 1 Shown, Pier No. 2 Similar)

SCALE: 3/8" = 1'



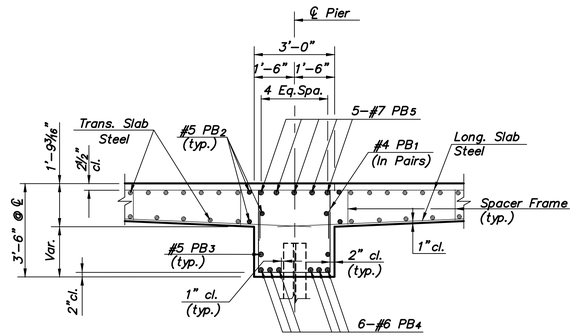
SECTION B-B

SCALE: 3/8" = 1'



SECTION A-A

SCALE: 3/8" = 1'



PIER BEAM DETAILS **

**Note: All PB bars to be placed with deck steel.

Max. Factored Design Pile Load (Strength I) = 77.3 tons/pile
Factored Resistance = 96 tons/pile
Phi. = 0.65
Use HP12x53 Gr. 50 Steel Piles

NEMAHA COUNTY HIGHWAY DEPARTMENT

BR. NO. 000660965003364 STA. 68+20

PIER DETAILS

PROJ. NO. 66 C-5287-01 NEMAHA COUNTY

BG CONSULTANTS
ENGINEERS · ARCHITECTS · SURVEYORS

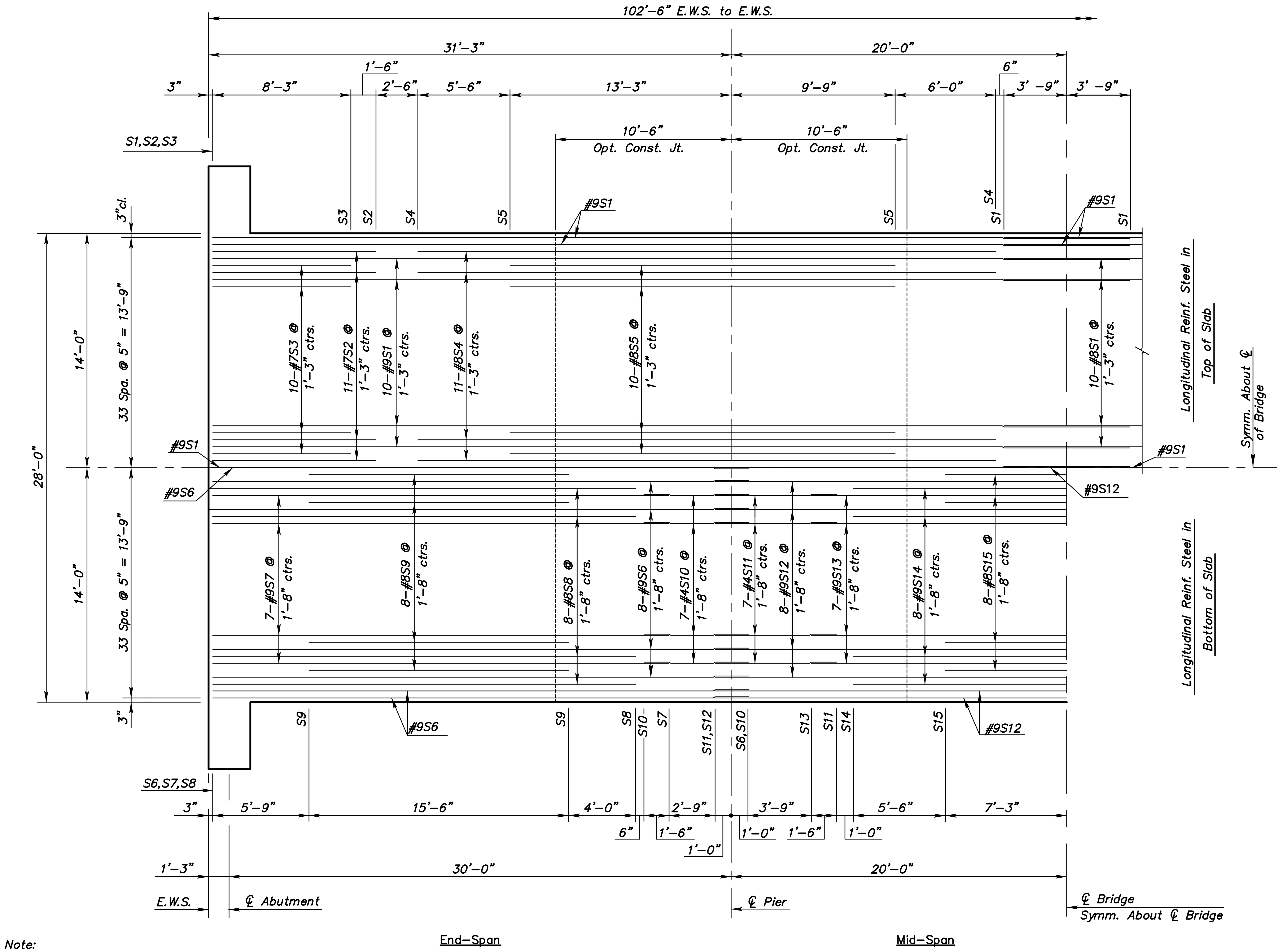
lrfd\br511.dgn	Plot 2
Roadway Width = 28'___	Longest Span Length = 40'_
Skew and Direction = 0__	Total No. of Spans = 3_
Loading = HL-93	Railing Type = Corral

LFD & LRFR RATING FACTOR

Truck / Clr.		2½" Inv.	2½" Oper.	3" Inv.	3" Oper.
LFD	HS-20	1.84	3.07	1.87	3.13
LFD	HET		1.45		1.47
LRFR	HL-93	1.40	1.82	1.46	1.90

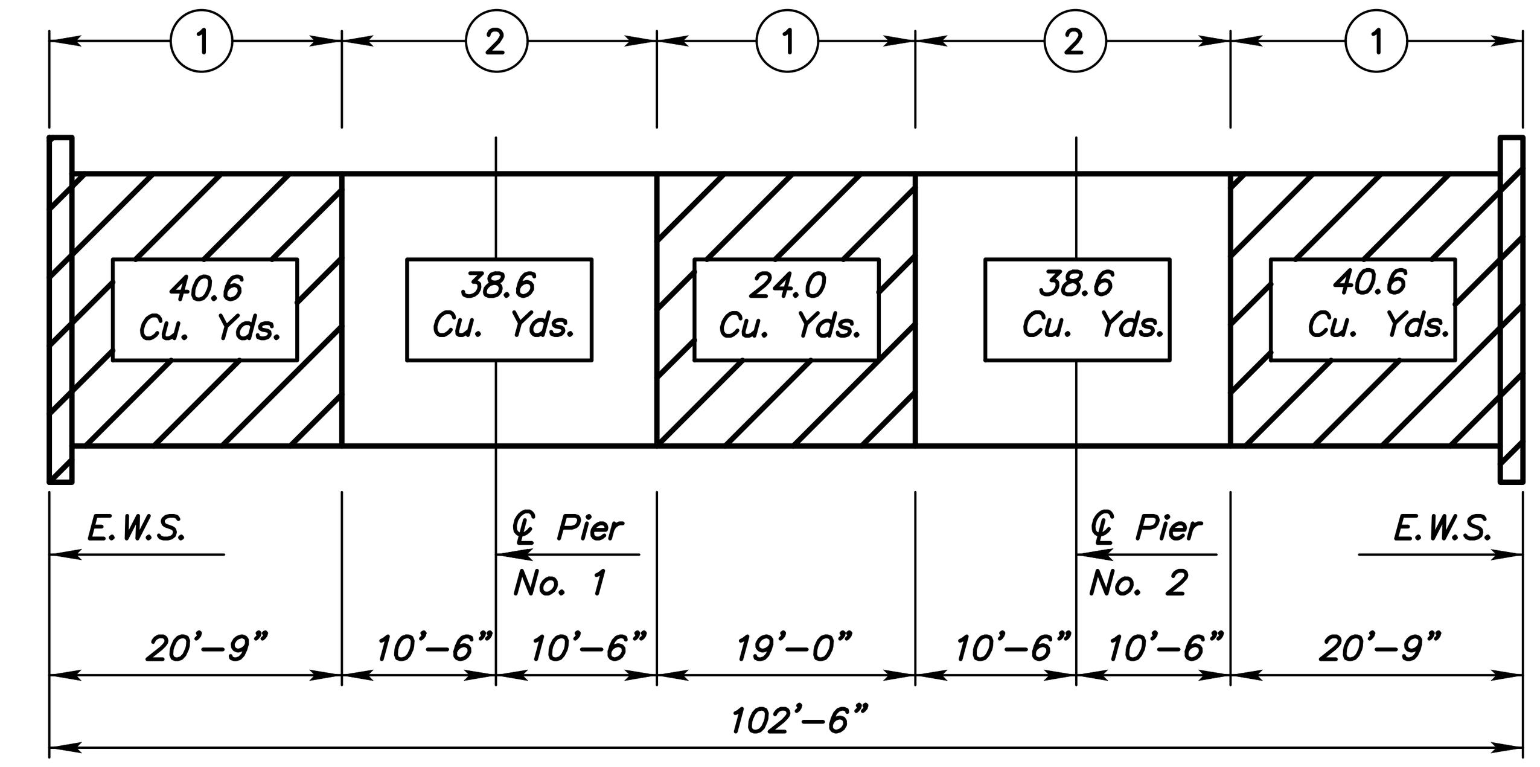
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	66 C-5287-01	2025	22	54

23-1389M



Note:
See longitudinal section for transverse reinforcing steel.

HALF PLAN



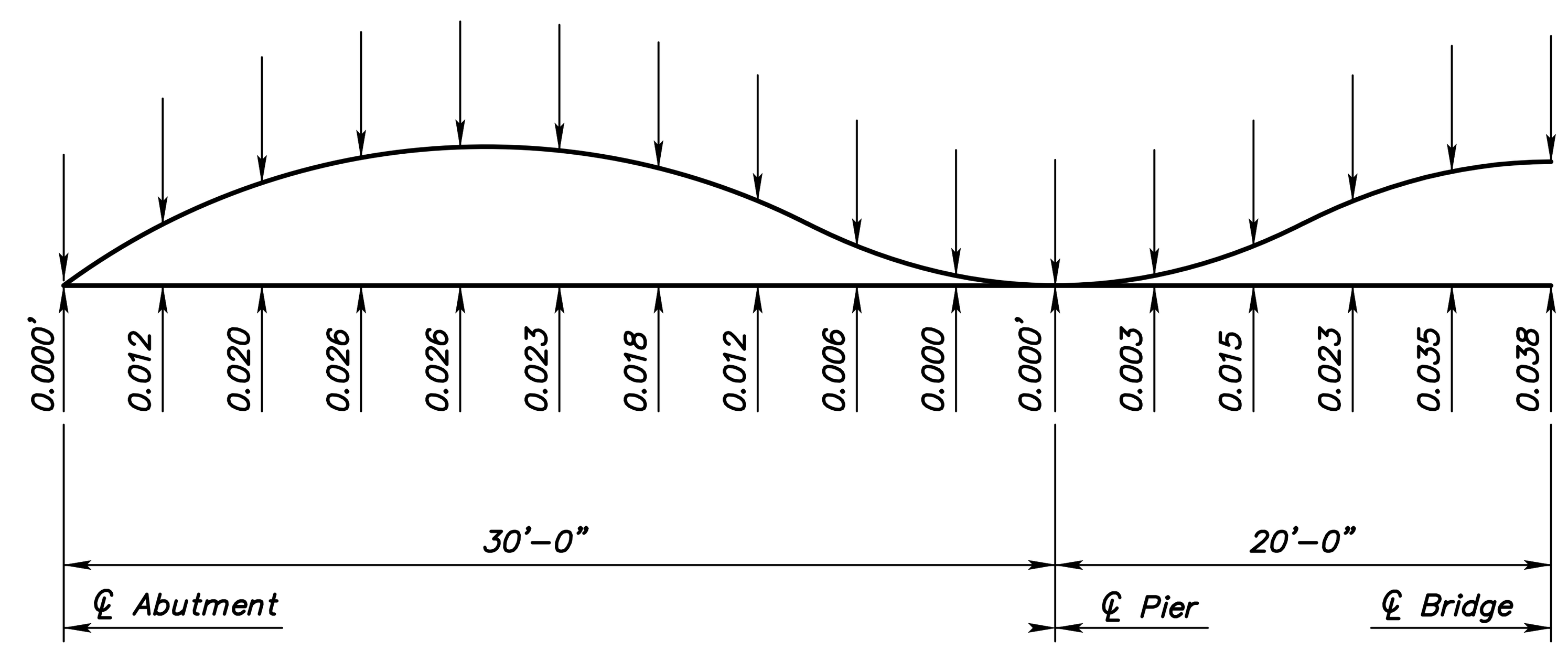
CONCRETE PLACING SEQUENCE DIAGRAM

CONCRETE PLACING SEQUENCE

When long span steel beams having a concrete dead load deflection greater than ¼" are used or when timber falsework with greater than 12'-0" clear span is used, follow the placing sequence shown. Segmental, combined or continuous pours are allowed, but stop a discontinuous pour at a construction joint short of a pier.

When timber falsework with 12'-0" or less clear span is used, the Contractor, subject to the approval of the Engineer, may use a continuous pour or may discontinue the pour at any construction joint shown.

The Contractor may place the corral rail continuously from one end of the bridge to the other.



DEAD LOAD CAMBER DIAGRAM AT TENTH POINTS

Long Term Deflections = Initial Deflections x 3.5
(Initial Deflections Based on E_C= 3.644 x 10^6p.s.i.)
(camber values in feet)

Note: 1.0 & 4.0 pts. are taken at ℄ of abutments
2.0 & 3.0 pts. are taken at ℄ of piers

Top of Form Elevation at 10th Points, (ft.)															
1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5
1218.42	1218.31	1218.17	1218.03	1217.88	1217.70	1217.48	1217.24	1216.96	1216.66	1215.24	1216.41	1216.45	1216.43	1216.36	1216.23
2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	
1216.04	1215.79	1215.50	1215.14	1213.65	1214.83	1214.90	1214.93	1214.94	1214.91	1214.86	1214.77	1214.67	1214.58	1214.45	

Note: Elevations are taken at Crown Grade.

Note: The change in elevation from Crown Grade to the Edge of Slab is −0.224'

NO.	DATE	REVISIONS	BY	APP'D
4	08/22/23	Summary of Quantities corrections	MLL	MAH
3	03/12/12	ADDED TOF Elevation Table	JPJ	TLF
2	02/08/11	ADDED QUANTITIES	JPJ	TLF

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 000660965003364 Sta. 68+20

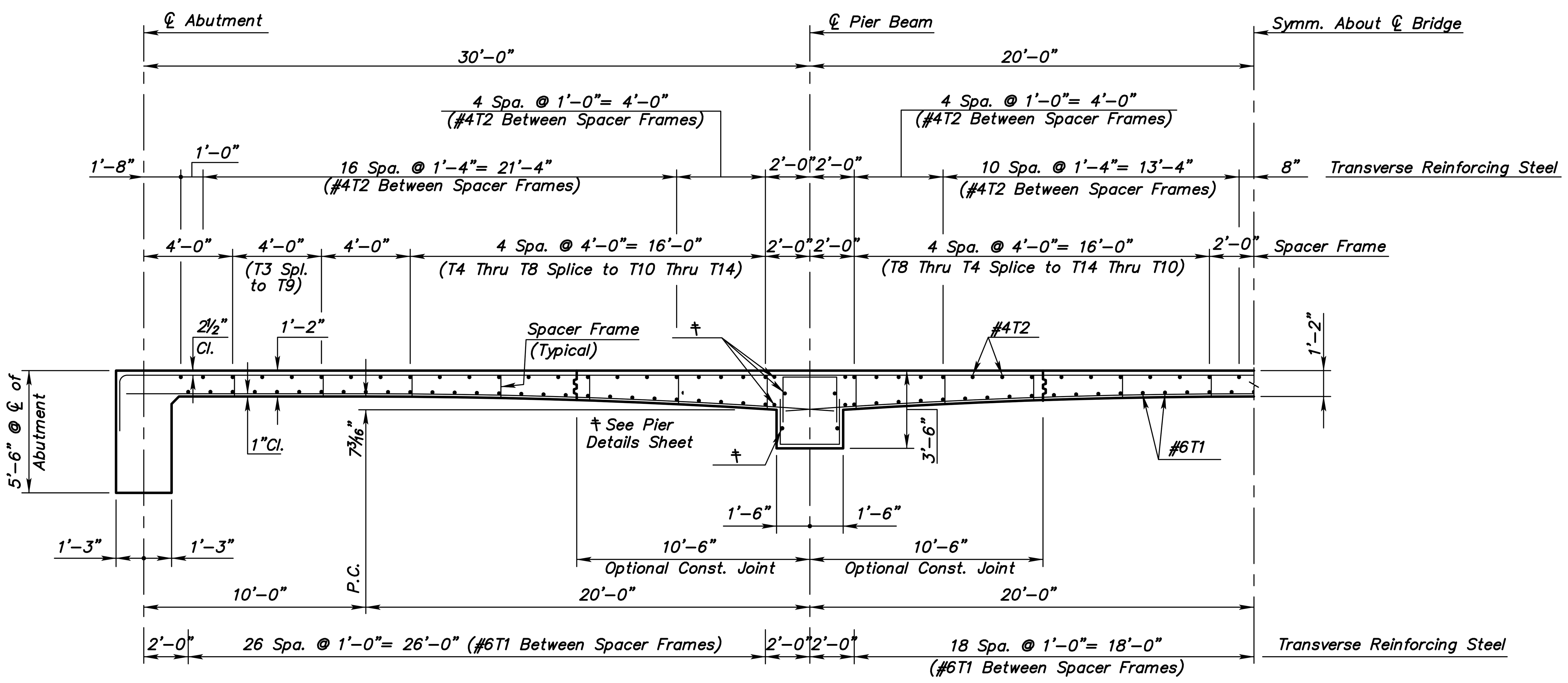
SUPERSTRUCTURE DETAILS

Proj. 066 C-5287-01 Nemaha Co.

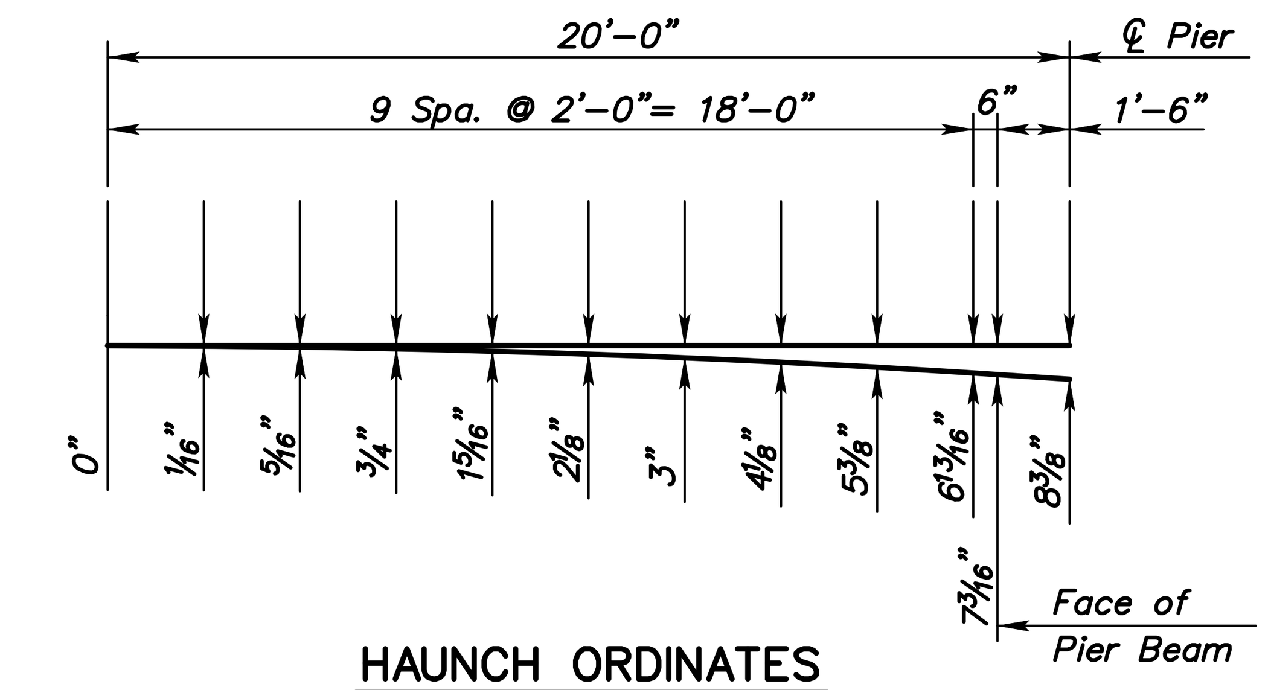
SHEET NO. OF	SCALE	APP'D	
DESIGNED DRT	DETAILED DRT	QUANTITIES BRW	CADD RCJ
DESIGN CK. MEH	DETAIL CK.	QUAN. CK.	CADD CK.

23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	23	54

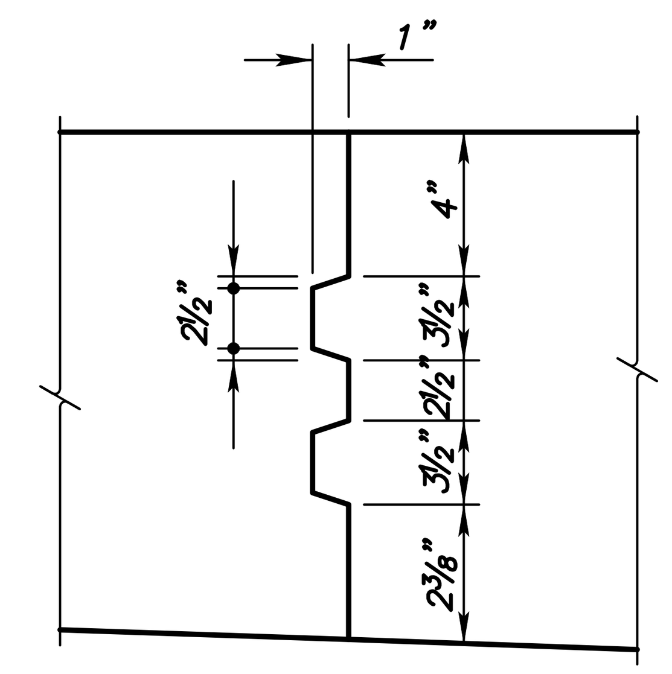
lrfd\br511.dgn	Plot 3
Roadway Width = 28'___	Longest Span Length = 40'_
Skew and Direction = 0__	Total No. of Spans = 3_
Loading = HL-93	Railing Type = Corral



HALF LONGITUDINAL SECTION ALONG ℄ BRIDGE

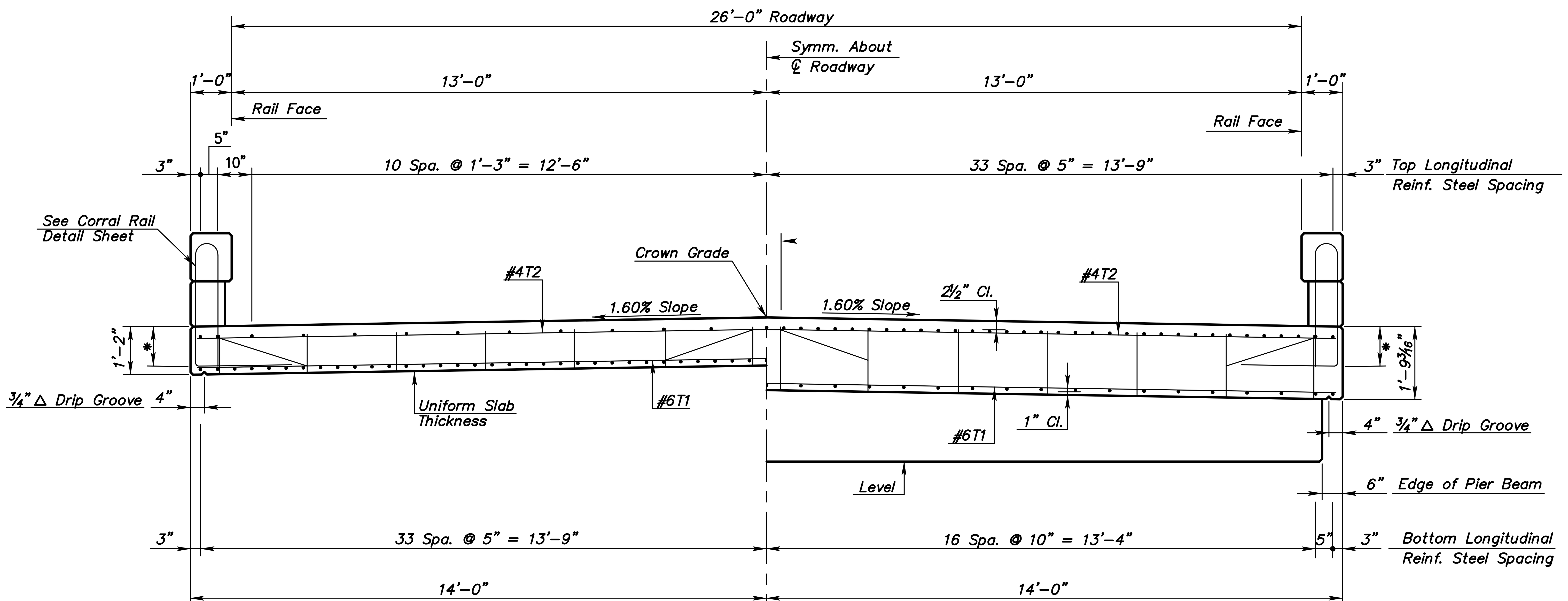


HAUNCH ORDINATES



TRANSVERSE SLAB CONSTRUCTION JOINT

(Optional)



Half Section Near Mid–Span

Half Section at Face of Pier Beam

✳ See Corral Rail Detail Sheet.

TYPICAL SECTION OF SLAB

Plotted By: $$USERNAME$$	Plot Location: $UNIT$
File: $$$$$$$$$$$DGNSPEC$$$$$$$$$$$$$$	
Plot Date: $$$$$SYTIME$$$$$$	

NO.	DATE	REVISIONS	BY	APP'D
4				
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

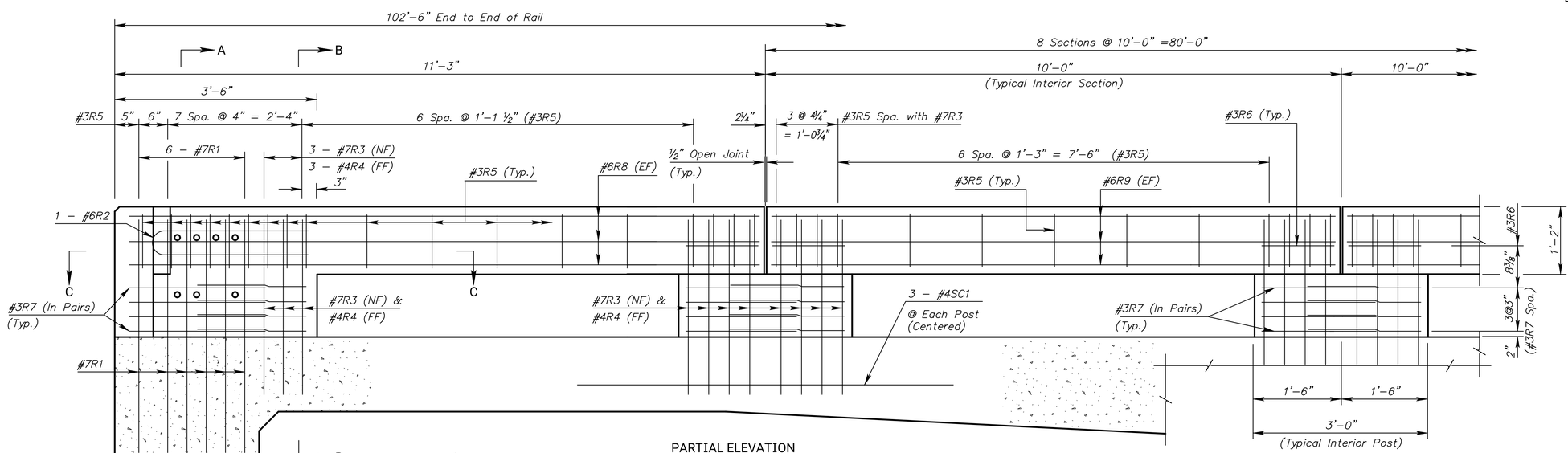
Br. No. 000660965003364 Sta. 68+20

SUPERSTRUCTURE DETAILS

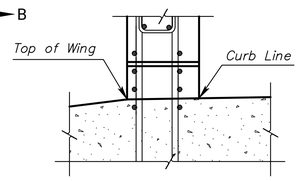
Proj. 066 C-5287-01 Nemaha Co.

SHEET NO. OF	SCALE	APP'D	
DESIGNED DRT	DETAILED DRT	QUANTITIES	CADD RCL
DESIGN CK. MEH	DETAIL CK.	QUAN. CK.	CADD CK.

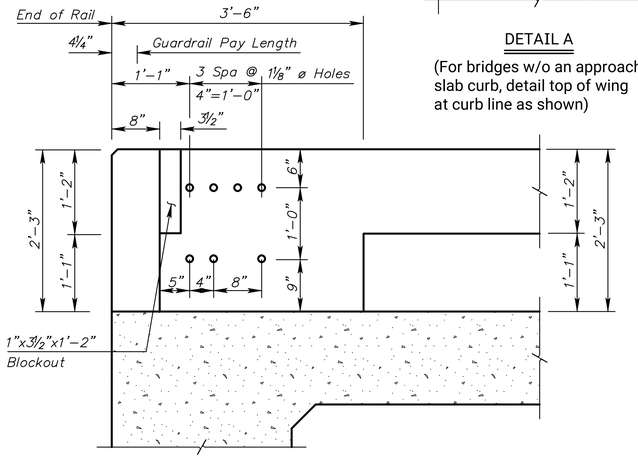
23-1389M					
	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	24	54



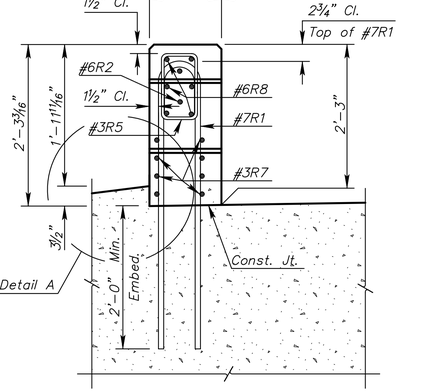
PARTIAL ELEVATION
(Along Traffic Face)



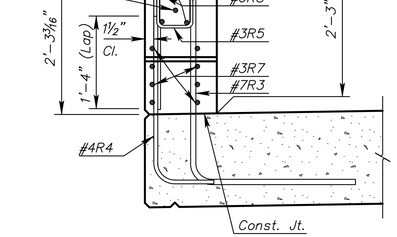
DETAIL A
(For bridges w/o an approach slab curb, detail top of wing at curb line as shown)



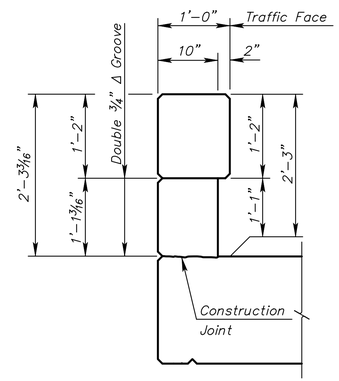
ELEVATION
(Dimensions at traffic face of rail.)



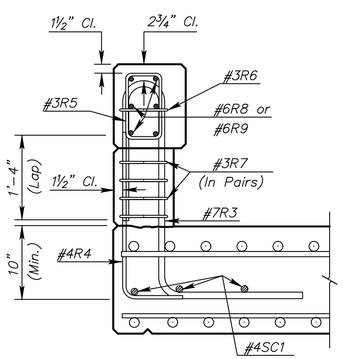
SECTION A-A



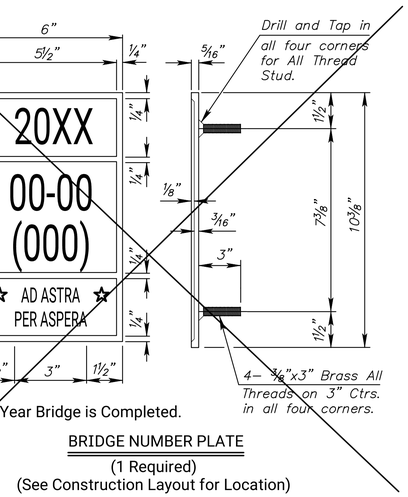
SECTION B-B



TYPICAL INTERIOR POST



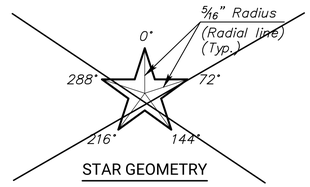
SECTION THRU POST



XX Year Bridge is Completed.

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

BRIDGE NUMBER PLATE PLACEMENT DETAIL
(If Required)



STAR GEOMETRY

NO.	DATE	REVISIONS	BY	APP'D
03				
02	12-03-21	Changed Bridge Number Plate Detail	MLL	MAH
01	06-30-05	Current Release	---	---

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 000660965003364 Sta. 68+20

27" KANSAS CORRAL RAIL
(W-BEAM WITH RUBRAIL)
R.C. HAUNCHED SLAB (Without Curb)

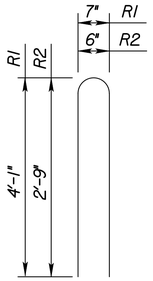
Proj. 66 C-5287-01 Nemaha Co.

DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN.CK.	CADD CK.

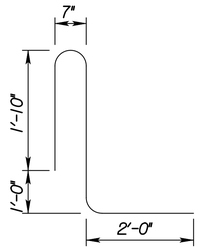
LEGEND
NF = Near Face
FF = Far Face
EF = Each Face

Drawn By: $$USERNAME$$ Plotted: $$$$$$SYTIME$$$$$$
File: $$$$$$$$$$$$$$$$DGNSPEC$$$$$$$$$$$$$$$$

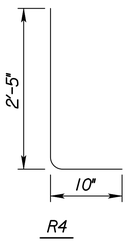
23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	25	54



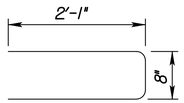
R1 & R2



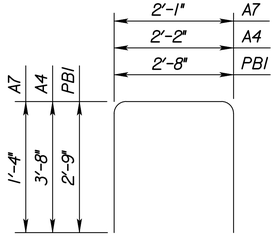
R3



R4

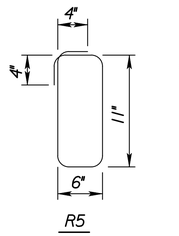


R7

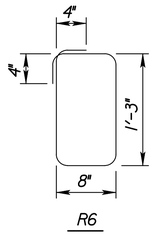


A4, A7 & PB1

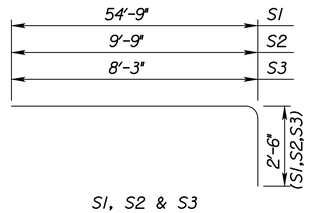
BILL OF REINFORCING STEEL Non-Epoxy Coated - Grade 60							
	Straight Bars				Bent Bars			
	Mark	Size	Number	Length	Mark	Size	Number	Length
Substructure	P1	#7	50	21'-8"	P2	#4	80	26'-5"
	P4	#7	50	20'-1"	P3	#3	160	2'-4"



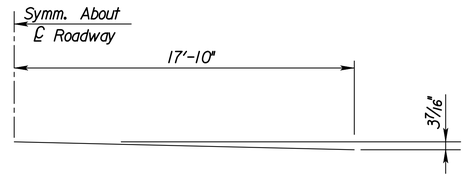
R5



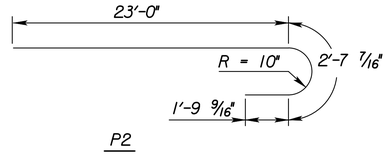
R6



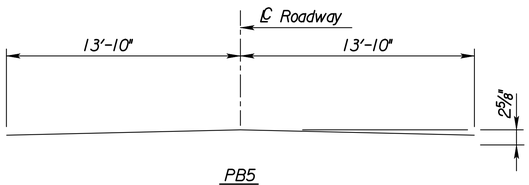
S1, S2 & S3



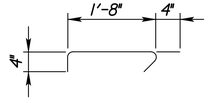
A1



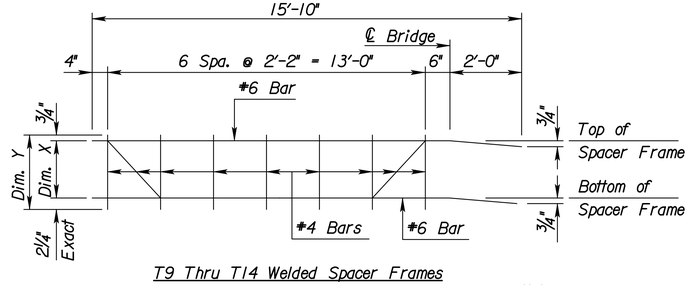
P2



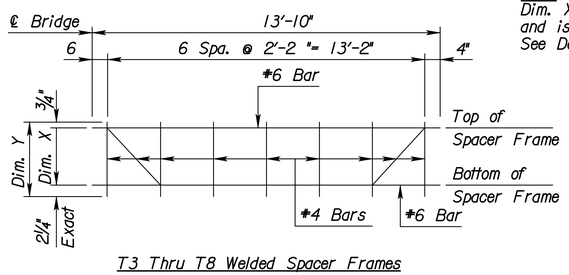
PB5



P3



T9 Thru T14 Welded Spacer Frames

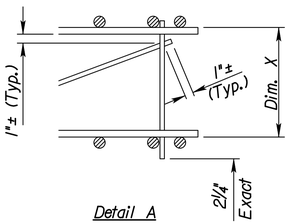


T3 Thru T8 Welded Spacer Frames

Note:
Dim. X is out to out and is an exact dim. See Detail A.

⊗ SPACER FRAMES (Non-Epoxy Coated)			
Mark	No. Ea.	Dim. X	Dim. Y
T3, T9	4	8"	11"
T4, T10	4	8 1/16"	11 11/16"
T5, T11	4	8 3/4"	11 3/4"
T6, T12	4	10 1/8"	1'-1 1/8"
T7, T13	4	1'-0 1/8"	1'-3 1/8"
T8, T14	4	1'-2 13/16"	1'-5 13/16"

Weight of spacer frames included in the weight of reinforcing steel.



Detail A

BENDING DIAGRAMS

(All dimensions are out to out of bars.)

BILL OF REINFORCING STEEL Non-Epoxy Coated - Grade 60								
		Straight Bars			Bent Bars			
		Mark	Size	Number	Length	Mark	Size	Number	Length
Superstructure	Abutment - Deck - Rail	S6	#9	42	32'-0"	S1	#9	50	57'-3"
		S7	#9	28	27'-3"				
		S12	#9	21	42'-0"	A1	#8	8	35'-8"
		S13	#9	14	30'-6"				
		S14	#9	16	25'-6"	R1	#7	24	8'-7"
						R3	#7	156	7'-1"
		S4	#8	44	34'-6"	S2	#7	44	12'-3"
		S5	#8	40	23'-6"	S3	#7	36	10'-9"
		S8	#8	32	25'-3"				
		S9	#8	32	15'-6"	R2	#6	4	5'-10"
		S15	#8	16	14'-6"				
		A2	#8	8	35'-8"	A4	#4	136	9'-6"
						A7	#4	28	4'-9"
		R8	#6	24	10'-11"	R4	#4	156	3'-3"
		R9	#6	96	9'-8"				
		T1	#6	67	27'-8"	R5	#3	280	3'-6"
						R6	#3	36	4'-6"
		A3	#5	20	35'-8"	R7	#3	176	4'-10"
		S10	#4	28	6'-3"				
		S11	#4	28	7'-3"	T3-T14			⊗
		SC1	#4	54	6'-6"				
		T2	#4	50	27'-8"				
	Pier Beam	PB4	#6	12	25'-8"	PB5	#7	10	27'-8"
		PB2	#5	12	27'-8"	PB1	#4	94	8'-2"
		PB3	#5	4	25'-8"				

⊗ See Bending Diagram

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1	7/30/09	corrected Qty. on note to Designer	DRT	KFH

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 000660965003364 Sta. 68+20

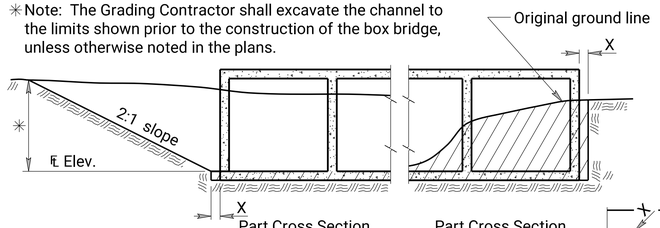
BILL OF REINFORCING STEEL AND BENDING DIAGRAMS

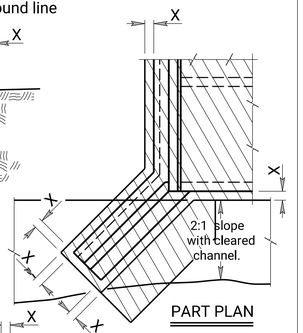
Proj. 066 C-5287-01 Nemaha Co.

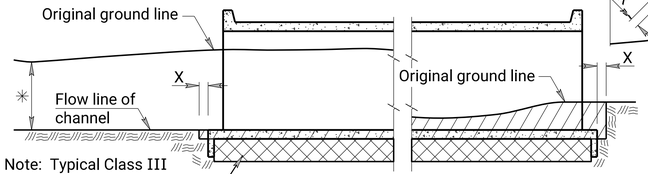
SHEET NO. OF	SCALE	APP'D	
DESIGNED DRT	DETAILED DRT	QUANTITIES	CADD RCJ
DESIGN CK.	DETAIL CK.	QUAN. CK.	CADD CK.

23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	26	54

✳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.

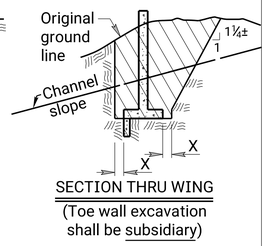






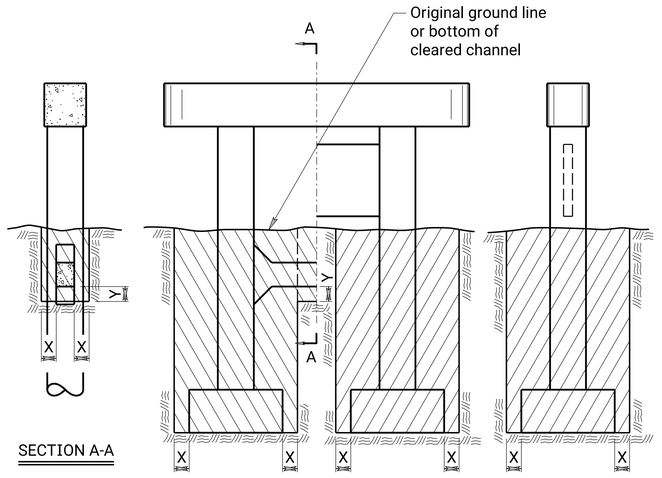
Note: Typical Class III Excavation for box bridges shall be below the "cleared" channel unless otherwise noted on the plans.

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



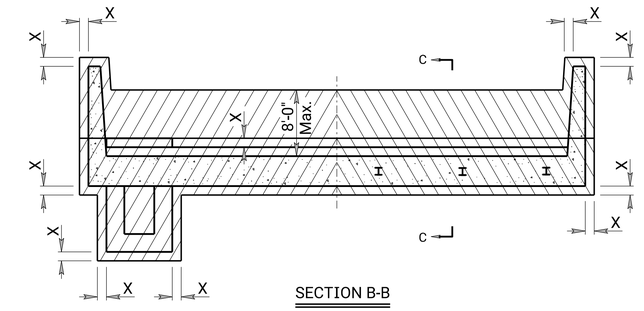
EXCAVATION DETAILS FOR REINFORCED CONCRETE BOX CULVERT

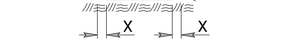
Note: Excavation for culverts less than bridge length and the additional excavation for "Embedded Structures" shall not be paid for as Class III Excavation, but shall be subsidiary to Grade 4.0 Concrete.



EXCAVATION DETAILS FOR TYPICAL PIERS

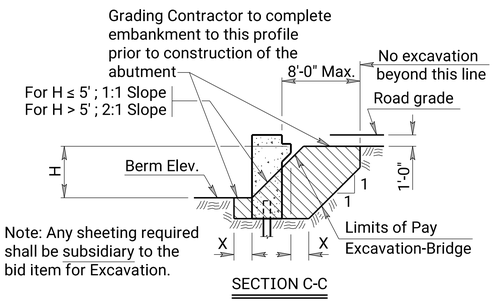
See detail when rock or shale (rock) is encountered. ⊛





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

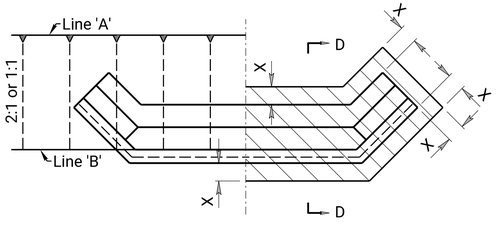
Note: Bridge Contractor shall finish the embankment and berms after the construction of the abutment and dispose of any excess material as approved by the Engineer.

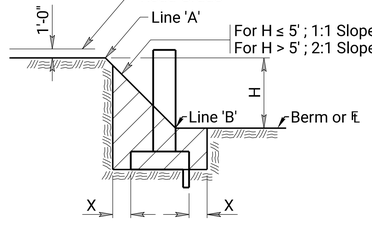


Note: Any sheeting required shall be subsidiary to the bid item for Excavation.

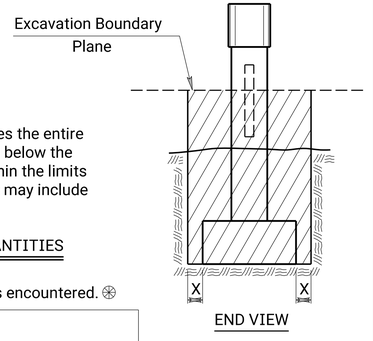
EXCAVATION DETAILS FOR TYPICAL ABUTMENTS

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

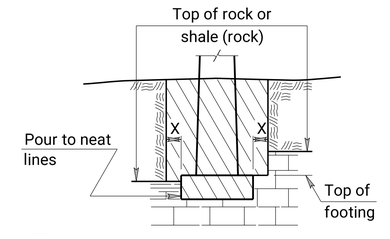
See detail when rock or shale (rock) is encountered. ⊛

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.

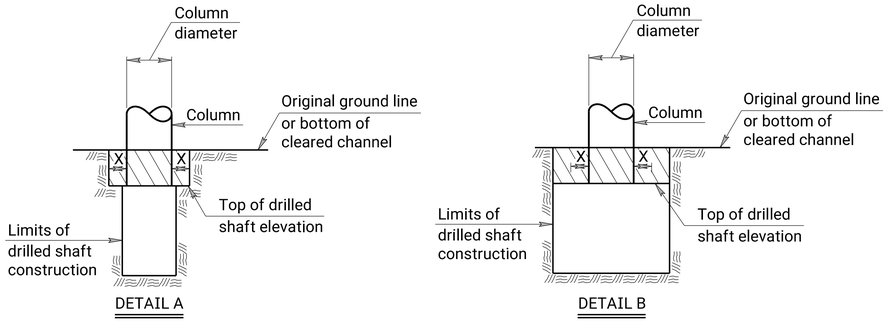
Dimension "Y" shall be 1'-6" unless indicated otherwise on the general plans.



⊛ 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
06	08-15-12	Embedment Excavation Subsidiary	J.P.J.	T.L.F.
05	05-15-12	Revised Wing Excavation	J.P.J.	T.L.F.
04	03-03-10	Revised Wing Excavation	J.P.J.	T.L.F.

KANSAS DEPARTMENT OF TRANSPORTATION

BRIDGE EXCAVATION (LRFD)

BR100B

FHWA APPROVAL		04-17-10	APP'D.	Terry L. Fleck
DESIGNED	DETAILED	R.D.R.	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	L.R.R.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 06-20-2022

KDOT Graphics Certified

Plotted : 10/9/2024
Drawn By : untitled
File : \\BGCONSULTANTS\Projects\2023\23-1389\CAD\Drawing Set\26-br100b.dgn

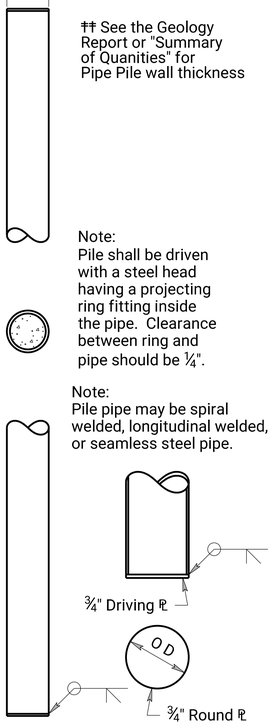
23-1389M					
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS	
KANSAS	66 C-5287-01	2025	27	54	

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

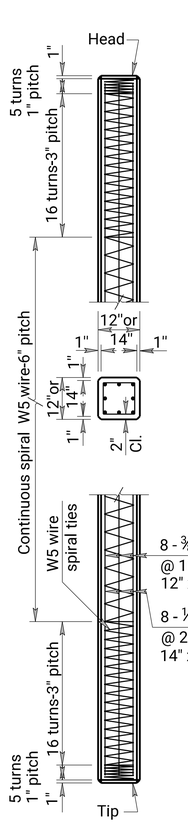
†† See the Geology Report or "Summary of Quanities" for Pipe Pile wall thickness

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.

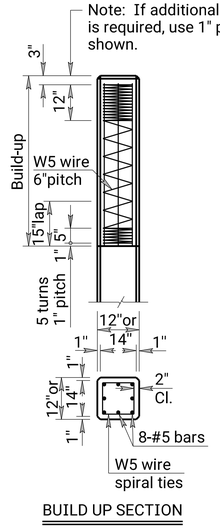


PLAIN ROUND
CAST-IN-PLACE CONCRETE PILES

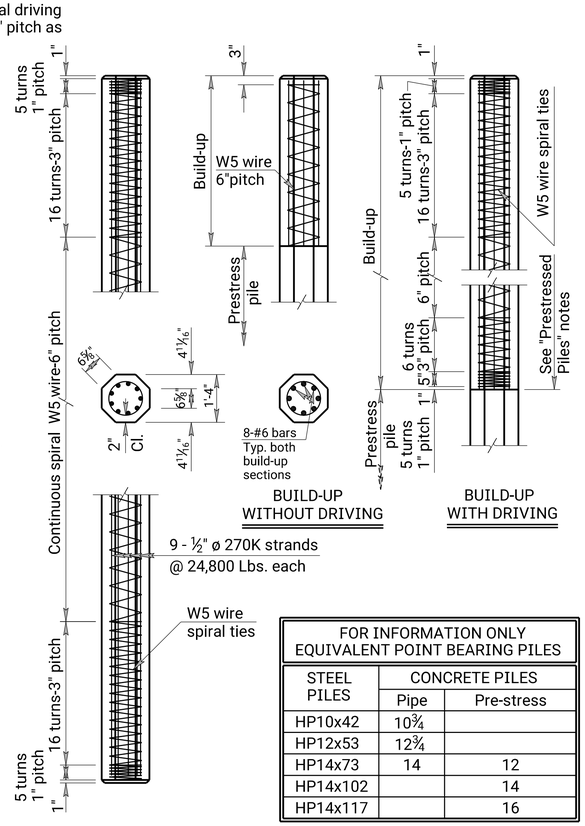


12" OR 14"
PRESTRESSED
CONCRETE PILES

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



BUILD UP SECTION



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.

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 low relaxation prestressing strand conforming to ASTM A416, Gr. 270.

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.

SPECIFICATIONS: Standard Specifications for State Road and Bridge Construction as currently used by the Kansas Department of Transportation.

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.

New electrodes are to be purchased for each KDOT project. The electrodes 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 concrete piles shall conform to the requirements of the Standard Specifications.

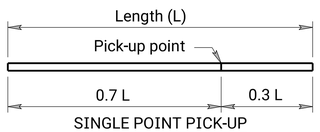
All piles driven without a mandrel shall be of the minimum thicknesses shown. Piles driven with a mandrel shall be of sufficient strength and thickness to withstand driving without injury and to resist harmful distortion and/or buckling due to soil pressure after the mandrel is removed.

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.

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.



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.

Outside Flange

Inside Flange

SHELL PILE POINT

H-Pile Point

CAST STEEL PILE POINT

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

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.

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.

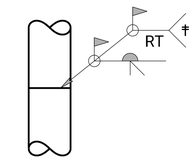
Verify that enough filler metal has been correctly placed in all weld locations to obtain a flush or convex surface with no concavity produced upon completion of the final welds.

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

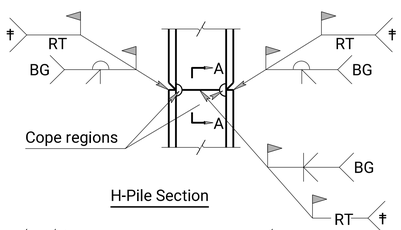
For integral pile bent abutments and piers, if a pile splice is required, do not locate the pile splice within a region extending 2'-0" above and 10'-0" below the bottom of the concrete web wall. For abutments, locate the pile splice at least 10'-0" below top of fill.

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 prior to driving, will locate the splice so that the splice will not fall within the regions described above.

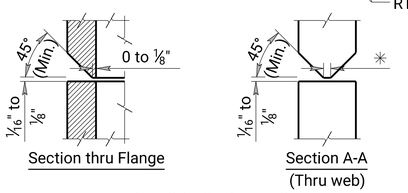
† For integral pile bent abutments and piers, if a splice is located within the regions described above, then the Contractor will test the welds by Radiograph (RT) test methods. Repair and retest any welds not passing the test(s). Each weld tested will have written confirmation of results. Report these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



Pipe Section



H-Pile Section



✳ Minimum as required by welding process.

BG = Backgouge

PILE SPLICE DETAILS

NO.	DATE	REVISIONS	BY	APP'D
04	08-16-18	Add splice web section, clarify note	M.L.L.	J.P.J.
03	09-15-15	Clarify Notes	J.P.J.	C.E.R.
02	06-18-12	Clarify f'c, rod type, use and weld	J.P.J.	T.L.F.

KANSAS DEPARTMENT OF TRANSPORTATION

STANDARD PILE DETAILS

BR110

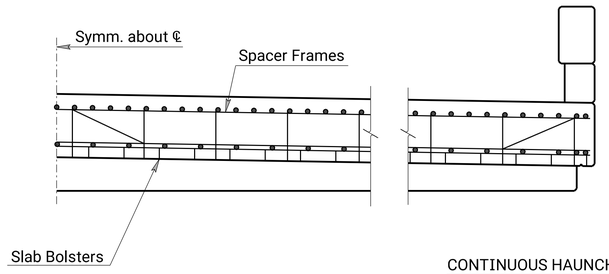
FHWA APPROVAL		10-04-12	APP'D.		Terry L. Fleck
DESIGNED	J.P.J.	DETAILED		QUANTITIES	TRACED R.A.A.
DESIGN CK.		DETAIL CK.		QUAN.CK.	TRACE CK.

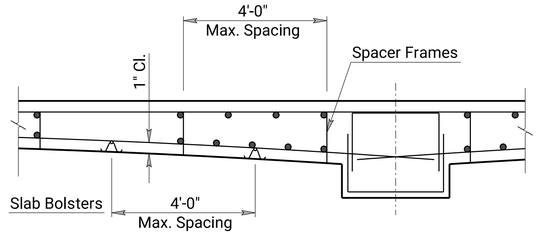
KDOT Graphics Certified 06-20-2022

KDOT Graphics Certified

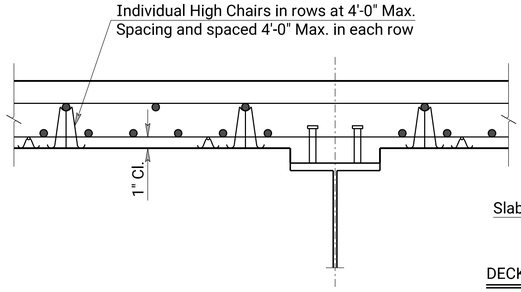
Plotted : 10/9/2024
Drawn By : untitled
File : \\BGCONSULTANTS\Projects\2023\23-1389\CAD\Drawing Set\27-br110.dgn

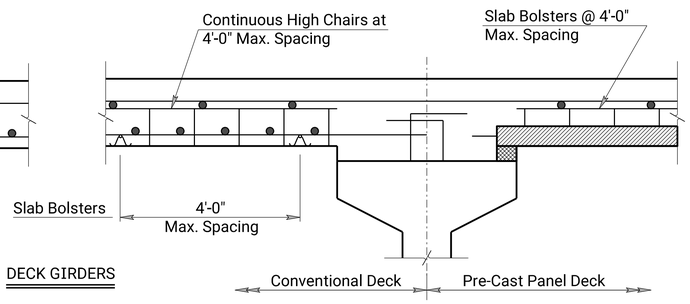
23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	28	54



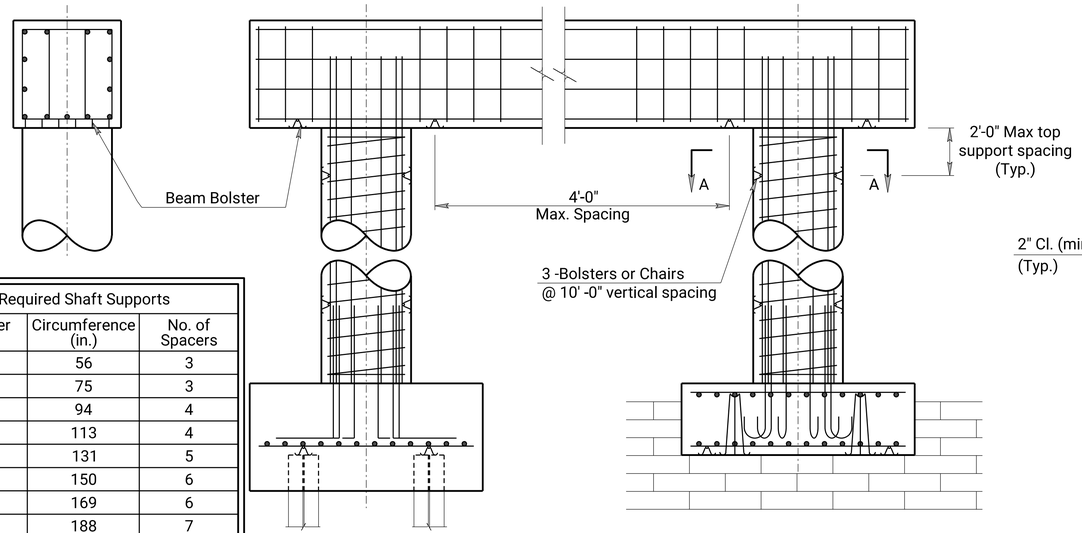


CONTINUOUS HAUNCHED SLAB



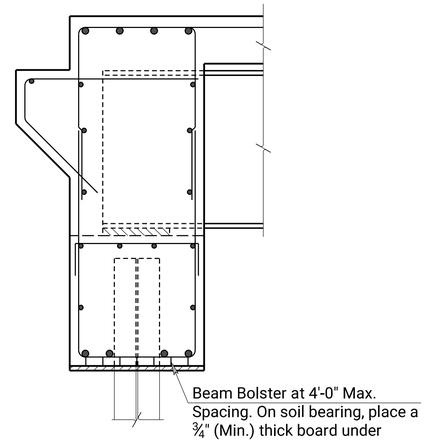


DECK GIRDERS

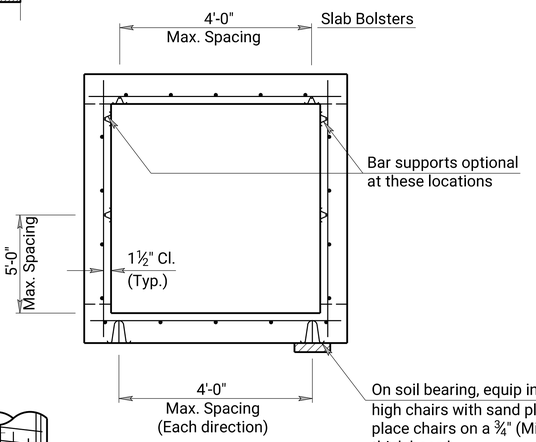


PIER

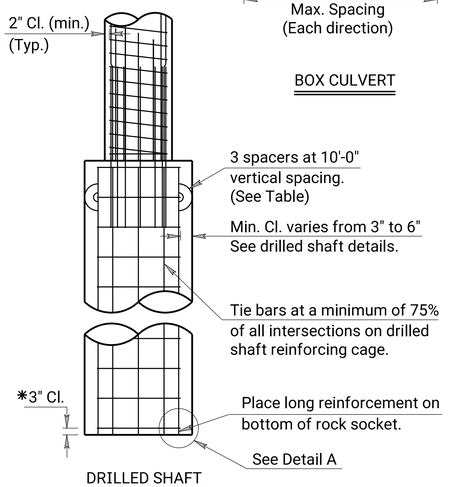
Required Shaft Supports		
Diameter (in.)	Circumference (in.)	No. of Spacers
18	56	3
24	75	3
30	94	4
36	113	4
42	131	5
48	150	6
54	169	6
60	188	7
66	207	7
72	226	8
78	244	9
84	263	9
90	282	10
96	301	11
102	320	11
108	339	12



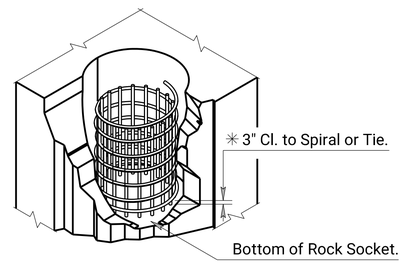
ABUTMENT



BOX CULVERT

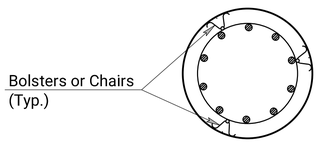


DRILLED SHAFT



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 ¼" 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
05	11-10-10	Column Bar Supports Required	J.P.J.	T.L.F.
04	12-01-05	Drilled Shaft Spiral Steel Placement	J.P.J.	K.F.H.
03	08-21-00	Added Pre-Cast Panel Detail	R.A.M.	K.F.H.

KANSAS DEPARTMENT OF TRANSPORTATION

SUPPORTS AND SPACERS FOR REINFORCING STEEL

BR120

FHWA APPROVAL		11-17-10	APP'D.		Terry L. Fleck
DESIGNED	R.A.M.	DETAILED	R.A.A.	QUANTITIES	TRACED R.A.A.
DESIGN CK.	L.R.R.	DETAIL CK.	R.A.M.	QUAN.CK.	TRACE CK. R.A.M.

KDOT Graphics Certified 06-20-2022

KDOT Graphics Certified

Plotted : 10/9/2024
Drawn By : untitled
File : \\BGCONSULTANTS\Projects\2023\23-1389\CAD\Drawing Set\28-br120.dgn

23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	29	54

GUARDRAIL, STEEL PLATE

Location	Lin. Ft.	SRT End Terminals (Alt 1)	FLEAT End Terminals (Alt 2)
SW Quadrant	75		
NW Quadrant	25	1	1
SE Quadrant	25	1	1
NE Quadrant	25	1	1
Total	150	3	3

GUARDRAIL END SECTION

Location	SRT End Terminals (Alt 1)	FLEAT End Terminals (Alt 2)	**TYPE II End Terminals
NW Quadrant	1	1	
NE Quadrant	1	1	
SW Quadrant			1**
SE Quadrant	1	1	
Total	3	3	1**

**Type II End Terminal subsidiary to bid item "Guardrail, Steel Plate".

SLOPE PROTECTION (SHOT ROCK)

Location	Side	Cu.Yds.
Sta. 67+25 to Sta. 67+70	Lt.	48.0
TOTAL		48.0

AGGREGATE DITCH LINING (6")

Location	Side	Tons
Sta. 66+50 to Sta. 66+83	Lt.	48.1
TOTAL		48.1

GEOTEXTILE FABRIC

Location	Side	Sq.Yds.
Sta. 66+50 to Sta. 66+83	Lt.	62.0
Sta. 67+25 to Sta. 67+70	Lt.	96.0
TOTAL		158.0

REMOVAL OF EXISTING STRUCTURES (For Information Only)

Location	Structure
℄ Sta. 67+00, Lt.	Cattle Guard
℄ Sta. 68+25	Existing Bridge

DRAINAGE STRUCTURES

STATION	SIDE	SIZE	TYPE		ENTRANCE PIPE (FT.) 24"					END SECTIONS (EA.) 24"				
67+00	Lt.	24"	Entrance		34'					2				
			Total		34'					2				

EARTHWORK

STATION to STATION	EXCAVATION COMMON CU.YDS.	VMF	EXCAVATION ROCK CU.YDS.	VMF	CONTR. FURN. CU.YDS.	COMPACTION TYPE AA MR- CU.YDS.	COMPACTION TYPE B MR-90 CU.YDS.		THROUGH CUTS NOT SUBGRADED COMM. CU.YDS.	TYPE AA CU.YDS.		*EMBANKMENT (CU.YDS.) INITIAL CONSOL.	SETTLE-MENT	▲PLACE. SELECT SOIL CU.YDS.
℄ Sta. 66+50 to ℄ Sta. 170+75	1,534	0.70					472							
TOTALS	1,534						472							

*Subsidiary (see General Note).

▲ See General note.

RECAPITULATION OF BRIDGE QUANTITIES

BRIDGE NUMBER	STATION	SEE SHEET NO.
000660965003364	68+20	Sheet No. 17

RECAPITULATION OF ROAD QUANTITIES

ITEM	QUANTITY	UNIT
Mobilization	Lump Sum	L.S.
Mobilization (DBE)	Lump Sum	L.S.
Clearing and Grubbing	Lump Sum	L.S.
Removal of Existing Structures	Lump Sum	L.S.
Common Excavation (Rural Small)	1,534	Cu. Yds.
Compaction of Earthwork (Type B)(MR-90)	472	Cu. Yds.
Field Office and Laboratory (Type C)	1	Each
Water (Grading)(Set Price)	1	Mgal.
Slope Protection (Shot Rock)	48	Cu. Yds.
Aggregate Ditch Lining (6")	48	Tons
Geotextile Fabric	158	Sq. Yds.
Entrance Pipe (24")	34	Lin. Ft.
End Section (24")	2	Each
Guardrail, Steel Plate	150	Lin. Ft.
Guardrail End Terminal (SRT) (Alt 1)	3	Each
Guardrail End Terminal (FLEAT) (Alt 2)	3	Each
Signing Object Marker (Type 3)	4	Each
Contractor Construction Staking	Lump Sum	L.S.
Temporary Surfacing Material (Aggregate)(Set Price)	1	Cu. Yd.
Foundation Stabilization (Set Price)	1	Cu. Yds.
Concrete For Seal Course (Set Price)	1	Cu. Yds.
Curing Environment	Lump Sum	L.S.

See Sheet No. 17 for Bridge Quantities.
See Sheet No. 30 for Surfacing Quantities.
See Sheet No. 31 for Temporary Erosion and Pollution Control Quantities.
See Sheet No. 32 for Erosion Control (Class I, Type C) Quantities.
See Sheet No. 40 for Project Seeding Quantities.
See Sheet No. 46 for Traffic Control Quantities.

NO.	DATE	REVISIONS	BY	APP'D
2	1-14-08	Rem. Drainage Structure summary	S.W.K.	J.O.B.
1	1-9-91	Detailed on CADD	R.J.S	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

SUMMARY OF QUANTITIES

RD050

FHWA APPROVAL	5-28-08	APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED B.N.B.
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. S.W.K.

23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	30	54

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-)".

~~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 B -MR90) 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 AB-3 @ 4" thickness 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 (AB-3) shall be used for surfacing house entrances and side roads (0.11 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.

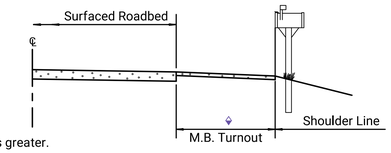
Asphalt Material quantities are calculated on the basis of 8.328 lbs. per gal.

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

SUMMARY OF QUANTITIES

ITEM	℄ STA. TO ℄ STA.	SIDE	AVG. WIDTH	LENGTH	TONS*
Surfacing Material (AB-3)†	66+00 TO 67+00	℄	27.75'	100.00'	97.5
	67+00 TO 67+68.75	℄	26.00'	68.75'	62.8
	68+71.25 TO 69+75	℄	26.00'	103.75'	94.8
	69+75 TO 70+75	℄	25.68'	100.00'	90.2
	Ent. 67+00	LT.	25.35'	40.00'	28.4
			TOTAL	412.50'	373.7

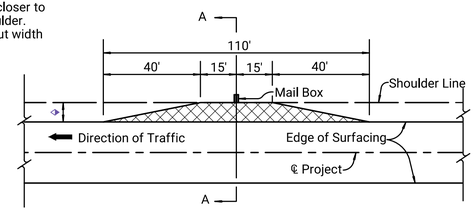
* Quantity includes an 8% increase for contingencies.



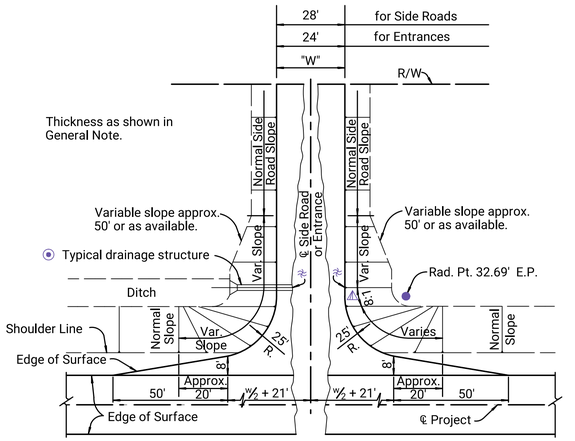
♦ Width shall be 8' or shoulder width, whichever is greater.

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.

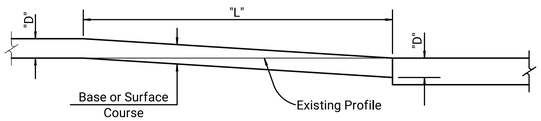


DETAIL FOR SURFACING OF MAIL BOX TURNOUTS



WITH DRAINAGE STRUCTURE — MOUND ENTRANCE OR SIDE ROAD

DETAIL FOR SURFACING OF SIDE ROADS & HOUSE ENTRANCES



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'

RATES OF APPLICATION

RATE/STA.	UNIT	ITEM	QUANTITY	STATIONS
92.6	Tons	Surfacing Material (AB-3)†	345.3	3.73
71.0	Tons	Surfacing Material (AB-3)† (Entrance)	28.4	0.40
		Surfacing Material (AB-3)	373.7	4.13

† Computed at the rate of 156 lb./ cu.ft.

RECAPITULATION OF QUANTITIES

ITEM	TOTAL	UNIT
Surfacing Material (AB-3)†	374	Tons

⚠ 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 6:1) at approximate ℄ Structure or appropriate clear zone width.

⇼ 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	01-10-07	Changed bituminous to asphalt	S.W.K.	J.O.B.
11	08-30-06	Changed tack type/rate	S.W.K.	J.O.B.
10	03-24-05	Revised compaction, tack type/rate	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

SUMMARY OF QUANTITIES (Surfacing)

RD051

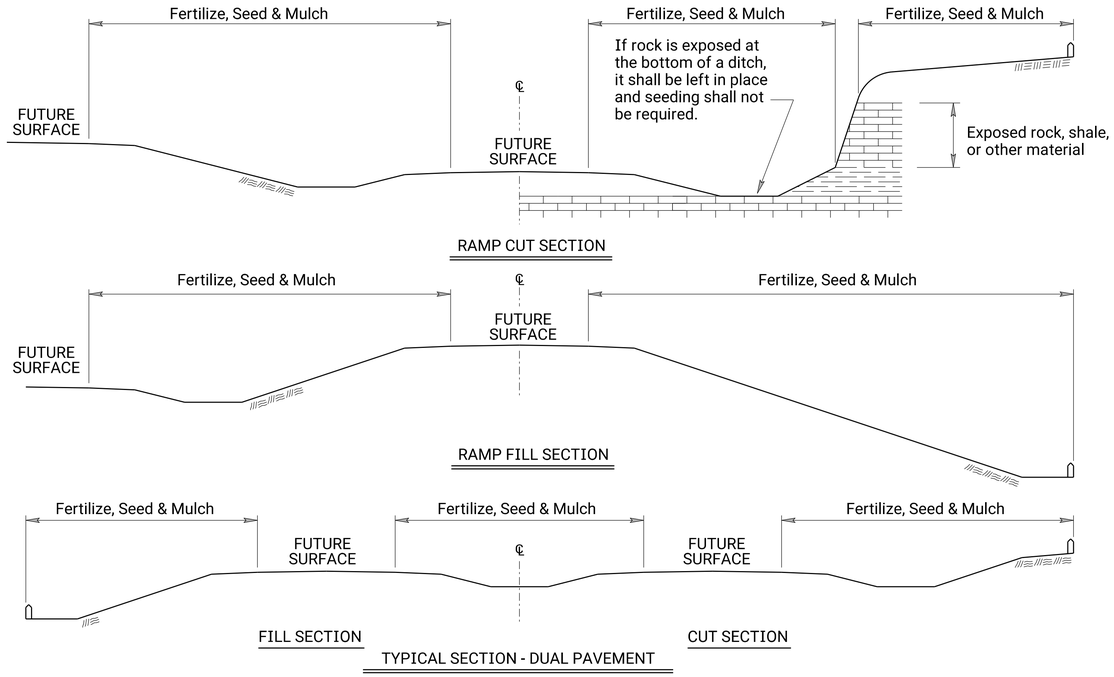
FHWA APPROVAL	09-06-06	APP'D.	James O. Brewer
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 04-15-2022

KDOT Graphics Certified

Drawn By: $$USERNAME$$ Plotted: $$$$$$SYTIME$$$$$$
File: $$$$$$$$$$$$$$$$DGNSPEC$$$$$$$$$$$$$$$$

23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	31	54



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 = 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.

SUMMARY OF SEEDING / EROSION CONTROL QUANTITIES

P.L.S. RATE/ ACRE		ACRES		BID ITEM	QUANTITY	UNIT
CLT	SL/CH	CLT	SL/CH			
	150		0.20	Temporary Fertilizer (15 - 30 - 15)	30	LB
				Temporary Seed (Canada Wildrye)		LB
				Temporary Seed (Grain Oats)		LB
				Temporary Seed (Sterile Wheatgrass)		LB
	109.9		0.20	Soil Erosion Mix	22	LB
				Erosion Control (Class 1, Type C)	1117	SQ YD
				Erosion Control (Class 2, Type Y)		SQ YD
				Sediment Removal (Set Price)	1	CU YD
				Synthetic Sediment Barrier		LF
				Temporary Berm (Set Price)	1	LF
				Temporary Ditch Check (Rock)	32	CU YD
				Temporary Inlet Sediment Barrier		EACH
				Temporary Sediment Basin		CU YD
				Temporary Slope Drain		LF
				Temporary Stream Crossing		EACH
				Biodegradable Log (9")	18	LF
				Biodegradable Log (12")	18	LF
				Biodegradable Log (20")	35	LF
				Filter Sock (****)		LF
				Geotextile (Erosion Control)	500	SQ YD
				Silt Fence	35	LF
				SWPPP Design †		LS
				SWPPP Inspection †		EACH
				Water Pollution Control Manager †		EACH
900 lbs / acre				Mulch Tacking Slurry		LB
2 tons / acre				Mulching		TON
				Water (Erosion Control) (Set Price)	1	MGAL
						LS

**Included in bid item "Seeding, Lump Sum".

NOTE: When seeding less than one acre, temporary and permanent seeding shall be combined and seeded at the same time. There is no seasonal restriction for seeding projects less than 1 acre.

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)
0.5	Seed (Blue Grama Grass) (Lovington)	0.10
4.5	Seed (Buffalograss) (Treated)	0.90
45	Seed (Perennial Ryegrass)	9.00
2.6	Seed (Prairie Junegrass)	0.52
6.3	Seed (Side Oats Grama Grass) (ElReno)	1.26
45	Seed (Tall Fescue) (Endophyte Free)	9.00
6	Seed (Western Wheatgrass) (Barton)	1.20
	Total (lb)	21.98

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
03	08-03-20	Added Note	M.R.D.	M.L.
02	12-01-17	Revised Standard	M.R.D.	S.H.S.
01	06-01-17	Revised Standard	M.R.D.	S.H.S.

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION AND POLLUTION CONTROL

LA852A

FHWA APPROVAL			01-26-18	APP'D.	Scott H. Shields
DESIGNED	M.R.D.	DETAILED	M.R.D.	QUANTITIES	TRACED
DESIGN CK.	S.H.S.	DETAIL CK.	S.H.S.	QUAN.CK.	TRACE CK.

CADconform Certify This File

23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	32	54

EROSION CONTROL- CLASS 1, TYPE C

STATION TO STATION	SIDE	LENGTH	WIDTH	SQ YARD
66+00 to 66+50	Lt.	50'	1.9'	10.56
66+00 to 66+50	Rt.	50'	12.3'	68.33
66+50 to 66+91	Lt.	41'	8.5	38.72
66+50 to 67+50	Rt.	100'	30.3'	336.67
67+10 to 68+00	Lt.	90'	16.6'	166.00
67+50 to 67+68.75	Rt.	18.8'	17.5'	36.56
68+23 to 68+75	Rt.	52'	7.4'	42.76
68+50 to 68+77	Lt.	27'	6.1'	18.30
68+71.25 to 70+75	Rt.	202.8'	9.1'	205.05
68+71.25 to 70+75	Lt.	202.8'	8.6'	193.79
TOTAL EROSION CONTROL (CLASS 1, TYPE C) =				1,116.74

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

EROSION CONTROL SEEDING-SODDING

LA852A-EC

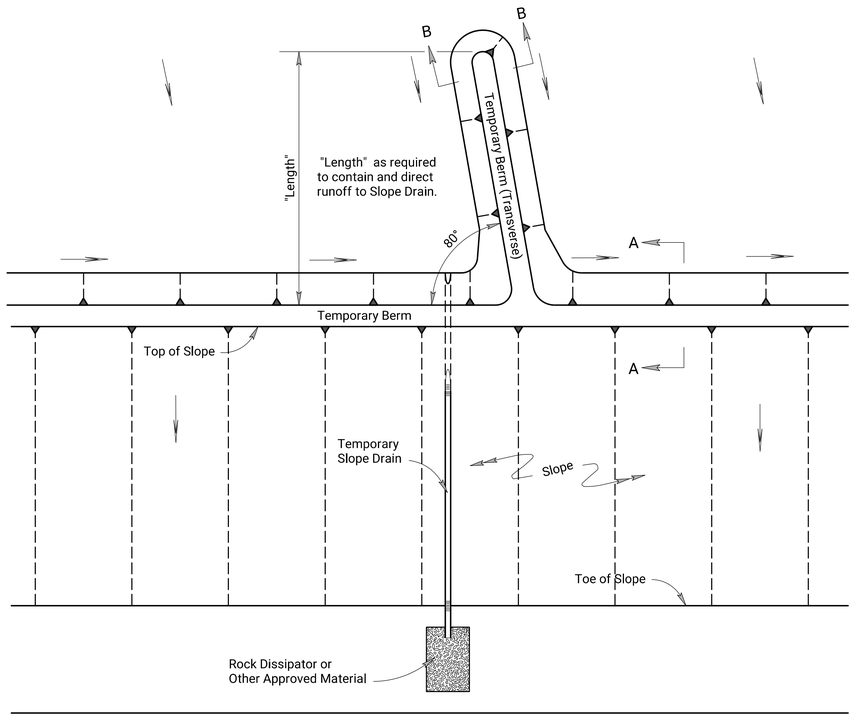
FHWA APPROVAL				APP'D.	Scott H. Shields		
DESIGNED	M.R.M.	DETAILED	M.R.M.	QUANTITIES		TRACED	M.R.M.
DESIGN CK.	S.H.S.	DETAIL CK.	S.H.S.	QUAN.CK.		TRACE CK.	S.H.S.

KDOT Graphics Certified 07-14-2022

KDOT Graphics Certified

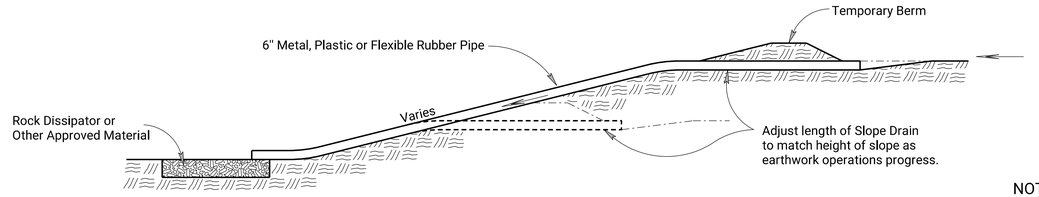
Drawn By : untitled
File : \\BGCONSULTANTS\Projects\2023\23-1389\CAD\Drawing Set\32-la852a-ec.dgn
Plotted : 12/30/2024

23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	33	54



TYPICAL PLAN VIEW OF TEMPORARY BERM AND TEMPORARY SLOPE DRAIN

NO SCALE



TYPICAL PROFILE OF TEMPORARY SLOPE DRAIN

NO SCALE

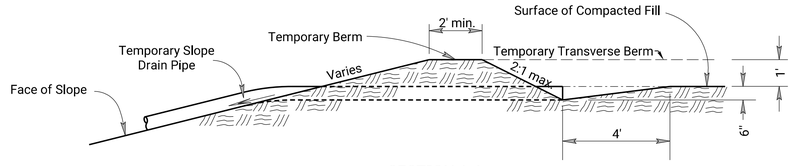
NOTES:

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.

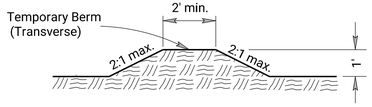
3) Pipe shall be secured in place as approved by Engineer.

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



SECTION A-A

NO SCALE

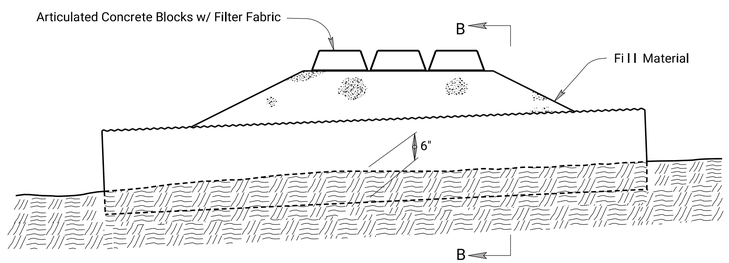


SECTION B-B

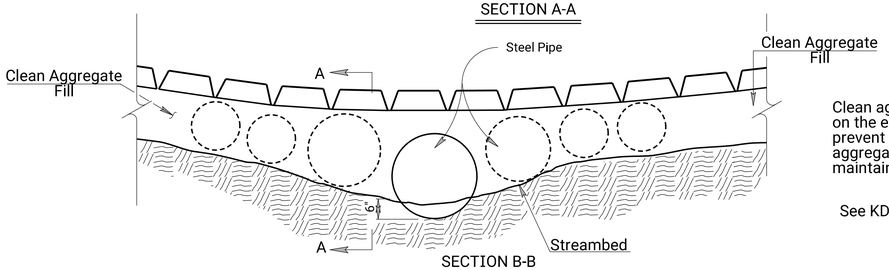
NO SCALE

TYPICAL PROFILE OF TEMPORARY BERM

NO SCALE



SECTION A-A



SECTION B-B

TEMPORARY STREAM CROSSING (ARTICULATED CONCRETE BLOCKS)

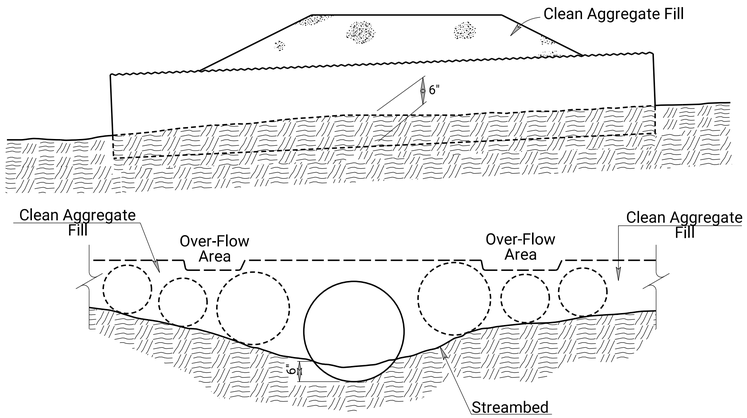
NO SCALE

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.

Clean aggregate fill will extend a minimum of 50' on the entrance and exit side of the crossing to prevent tracking. The aggregate shall be clean aggregate and a minimum of 6" thick and will be maintained through the use of 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.

Clean aggregate fill will extend a minimum of 50' on the entrance and exit side of the crossing to prevent tracking. The aggregate shall be clean aggregate and a minimum of 6" thick and will be maintained through the use of the crossing.

See KDOT Specifications for more information.

NO.	DATE	REVISIONS	BY	APP'D
03	01-21-22	Temp Stream Crossing - Clean Aggregate Fill Note Added	M.R.D.	M.L.
02	08-24-21	Temp Stream Crossing - Clean Aggregate Fill Note Added	M.R.D.	M.L.
01	06-11-13	Revised Standard	M.R.M.	S.H.S.

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION AND POLLUTION CONTROL TEMPORARY SLOPE DRAIN, TEMPORARY STREAM CROSSING (AGGREGATE)

LA852B

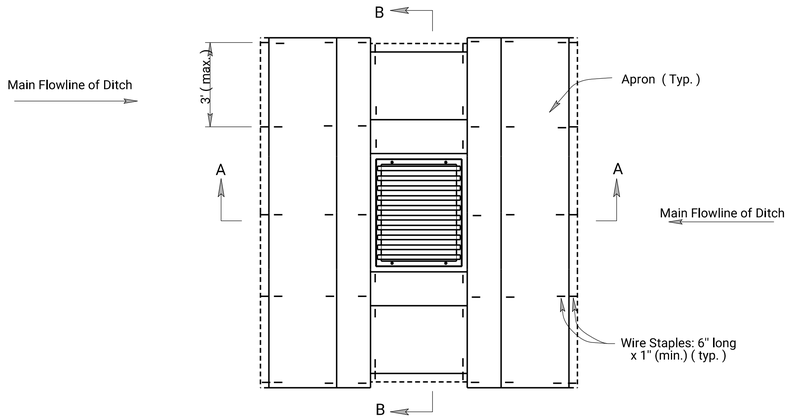
FHWA APPROVAL		01-21-22	APP'D.	Mervin Lare
DESIGNED	DETAILED		QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.		QUAN.CK.	TRACE CK.

KDOT Graphics Certified 06-17-2022

KDOT Graphics Certified

Plotted : 12/30/2024
Drawn By : untitled
File : \\BGCONSULTANTS\Projects\2023\23-1389\CAD\Drawing Set\33-la852b.dgn

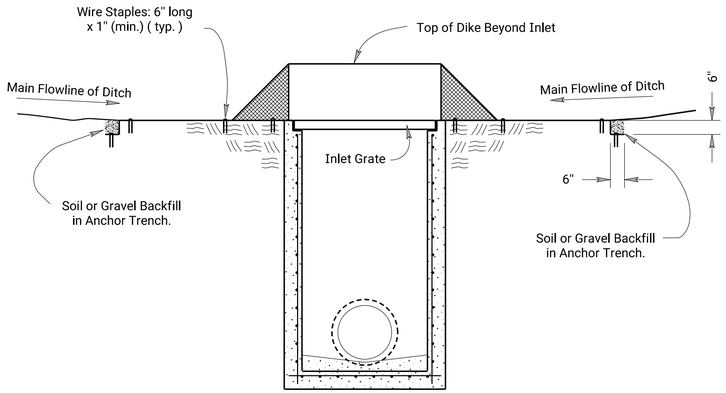
23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	34	54



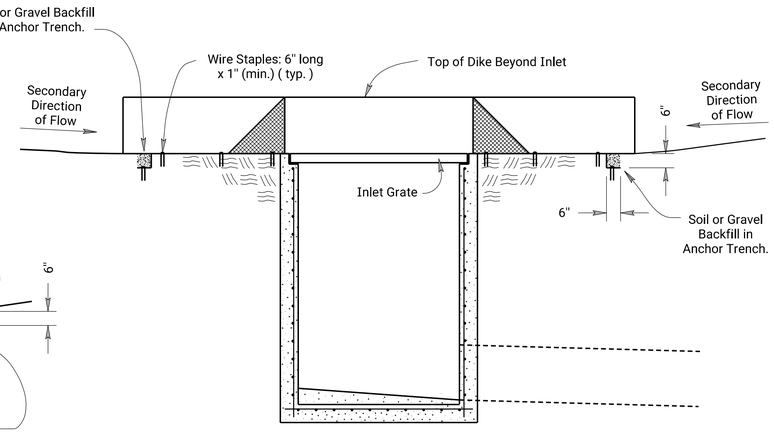
PLAN

TEMPORARY I NLET SEDI MENT BARRI ER
(TRI ANGULAR SI LT DI KE METHOD)

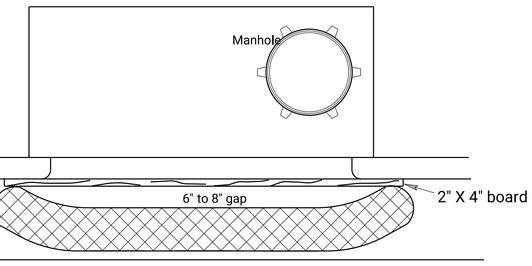
NO SCALE



SECTION A - A



SECTION B - B

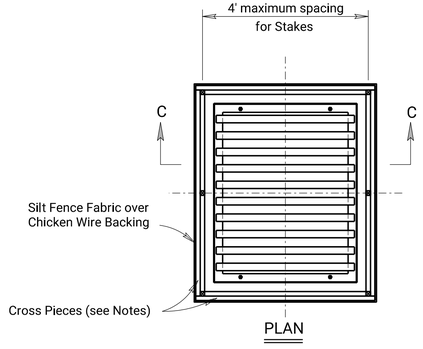


Bags = synthetic net (3mm mesh) or burlap bags

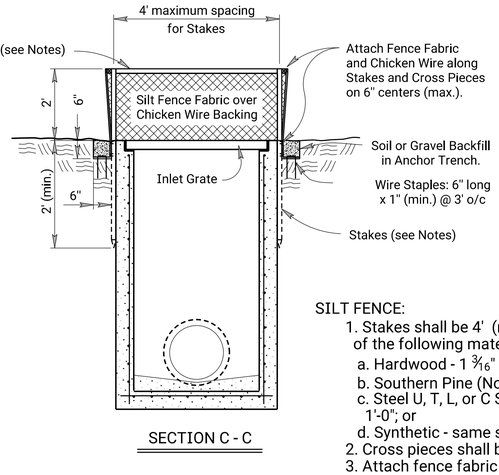
Rock = approximately 1" to 2" diameter

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



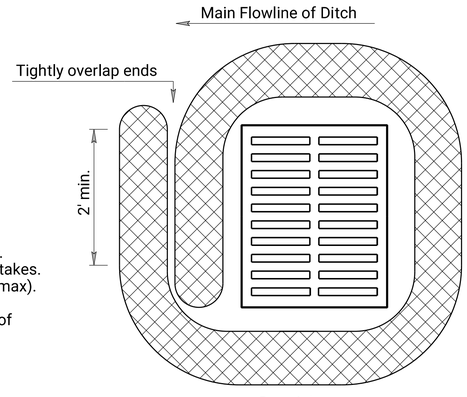
SECTION C - C

TEMPORARY I NLET SEDI MENT BARRI ER
(SI LT 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

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

Stake every 4'

BIODEGRADABLE LOG/FILTER SOCK
DROP INLET PROTECTION

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 ¼" openings or larger. Mesh must allow water infiltration but also hold fill material in place.

NO.	DATE	REVISIONS	BY	APP'D
03	09-26-19	Changed Direction of Main Flowline of Ditch Arrow	M.R.D.	S.H.S.
02	03-10-15	Revised Standard	R.A.	S.H.S.
01	06-01-13	Revised Standard	M.R.M.	S.H.S.

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION AND POLLUTION CONTROL, TEMPORARY INLET SEDIMENT BARRIER (SILT FENCE) TEMP. INLET SEDIMENT BARRIER (T.S.D.)

LA852C

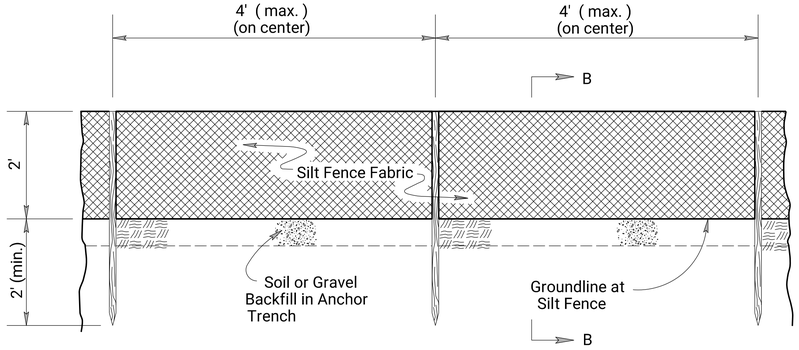
FHWA APPROVAL				03-10-15	APP'D.	Scott H. Shields	
DESIGNED	R.A.	DETAILED	R.A.	QUANTITIES		TRACED	
DESIGN CK.	S.H.S.	DETAIL CK.	S.H.S.	QUAN.CK.		TRACE CK.	

KDOT Graphics Certified 07-14-2022

KDOT Graphics Certified

Drawn By : untitled
File : \\BGCONSULTANTS\Projects\2023\23-1389\CAD\Drawing Set\34-la852c.dgn
Plotted : 12/30/2024

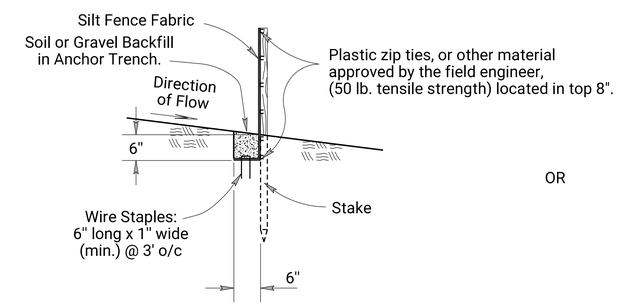
23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	35	54



TYPICAL ELEVATION

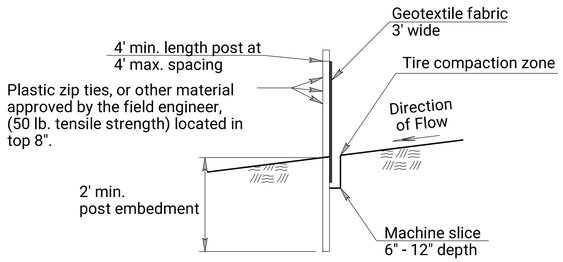
SILT FENCE BARRIER

NO SCALE

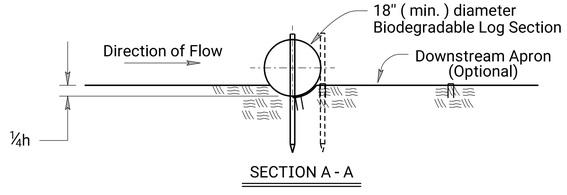


SECTION B-B

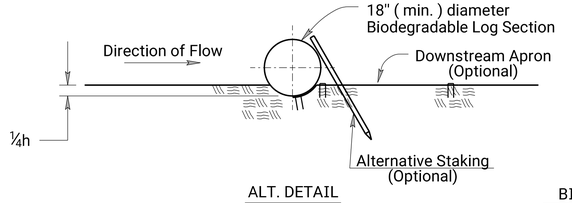
OR



SECTION B-B

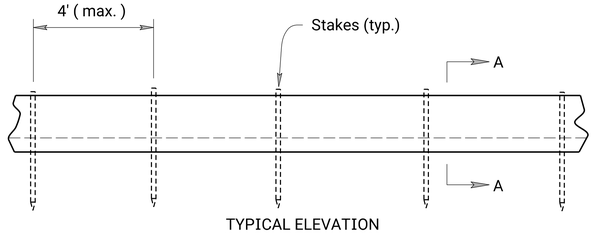


SECTION A - A



ALT. DETAIL

OPTIONAL



TYPICAL ELEVATION

BIODEGRADABLE LOG SLOPE INTERRUPTIONS

OR Filter Sock

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 aperformance 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 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

Slope Gradient	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)
≤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

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
03	06-28-16	Revised Standard	R.A.	S.H.S.
02	03-01-15	Revised Standard	R.A.	S.H.S.
01	06-01-13	Revised Standard	M.R.M.	S.H.S.

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION AND POLLUTION CONTROL SLOPE INTERRUPTIONS BIODEGRADABLE LOG / SILT FENCE

LA852D

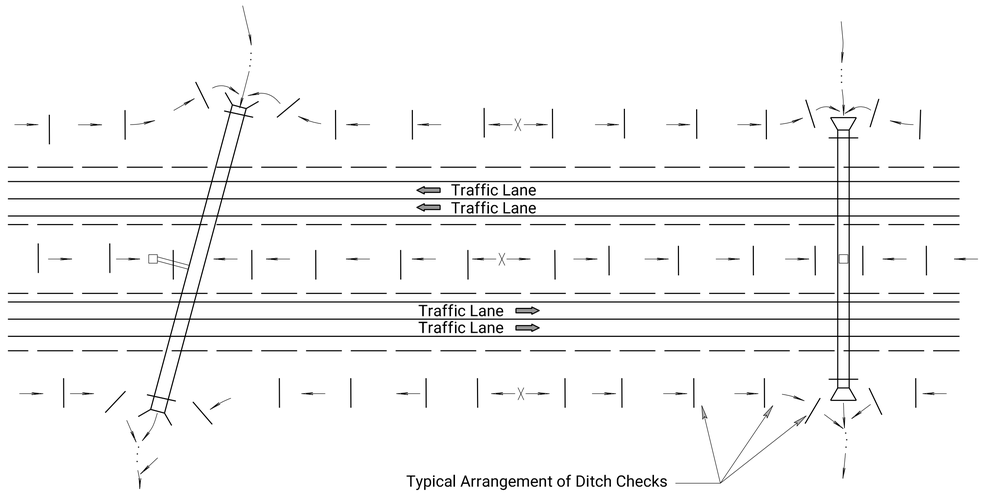
FHWA APPROVAL		09-14-16	APP'D.	Scott H. Shields	
DESIGNED	S.H.S.	DETAILED	R.A.	QUANTITIES	TRACED
DESIGN CK.	S.H.S.	DETAIL CK.		QUAN.CK.	TRACE CK.

KDOT Graphics Certified 06-18-2022

KDOT Graphics Certified

Plotted : 12/30/2024
Drawn By: untitled
File : \\BGCONSULTANTS\Projects\2023\23-1389\CAD\Drawing Set\35-la852d.dgn

23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	36	54



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.

NO.	DATE	REVISIONS	BY	APP'D
03	08-10-16	Revised Standard	R.A.A.	S.H.S.
02	06-28-16	Revised Standard	R.A.A.	S.H.S.
01	06-01-13	Revised Standard	M.R.M.	S.H.S.

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION AND POLLUTION CONTROL DITCH CHECKS

LA852E

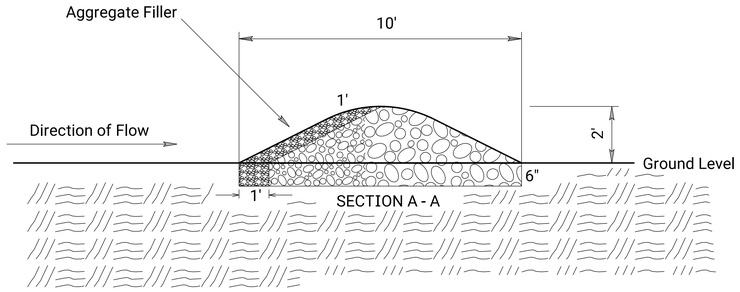
FHWA APPROVAL			09-14-16	APP'D.		Scott H. Shields	
DESIGNED	S.H.S.	DETAILED	R.A.A.	QUANTITIES		TRACED	R.A.A.
DESIGN CK.	S.H.S.	DETAIL CK.	S.H.S.	QUAN.CK.		TRACE CK.	S.H.S.

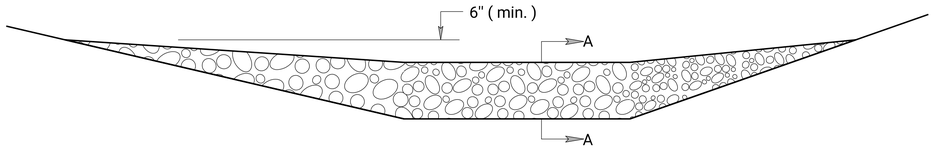
KDOT Graphics Certified 06-18-2022

KDOT Graphics Certified

Drawn By : untitled
Plotted : 12/30/2024
File : \\BGCONSULTANTS\Projects\2023\23-1389\CAD\Drawing Set\36-la852e.dgn

23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	37	54





TYPICAL ELEVATION

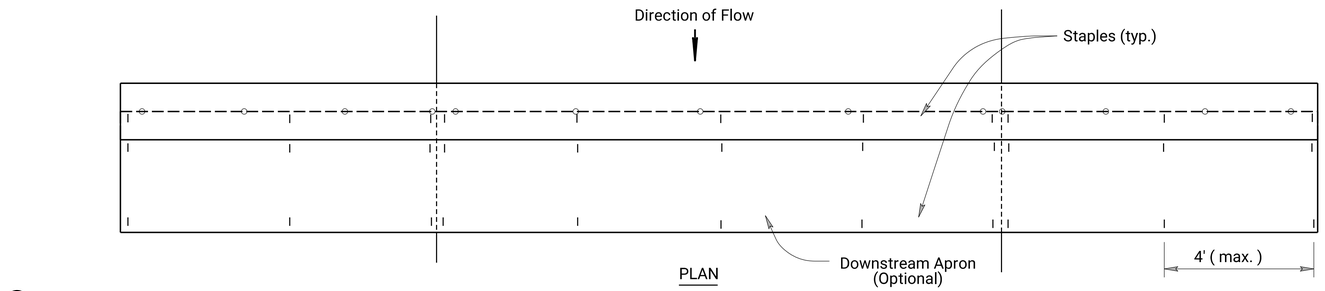
ROCK DITCH CHECK

NO SCALE

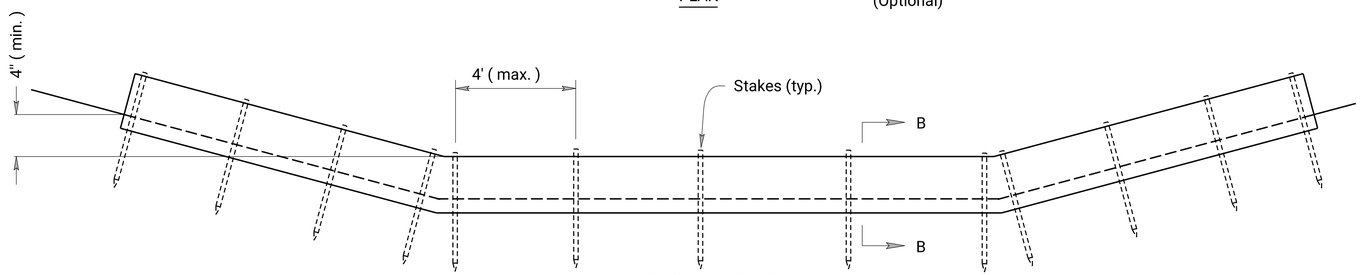
TEMPORARY ROCK DITCH CHECK SPACING	
DITCH ℄ SLOPE (%)	SPACING INTERVAL (FEET)
5.0	60
6.0	50
7.0	43
8.0	36
9.0	33
10.0	29
NOTE: Use this spacing for Rock Ditch Checks only.	

ROCK DITCH CHECK NOTES

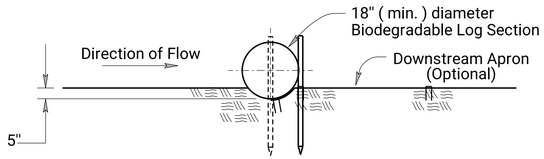
1. Rock shall be clean aggregate, D50-6" and aggregate filler.
2. Place rock in such manner that water will flow over, not around ditch check.
3. Do not use rock ditch checks in clear zone.
4. Excavation: The ditch area shall be reshaped to fill any eroded areas. Prior to placement of the rock, the ditch 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, D50-6" rock will be placed between the larger aggregate and the aggregate filler.
8. Aggregate filler will be placed on the upstream face of the ditch check. Aggregate filler will comply with Filter Course Type I, Division 1114.



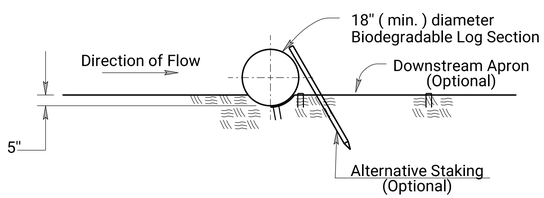
PLAN



TYPICAL ELEVATION



SECTION B - B



ALT. DETAIL
OPTIONAL

BIODEGRADABLE LOG DITCH CHECK

OR Filter Sock Ditch Check

NO SCALE

BIODEGRADABLE LOG DITCH CHECK 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
03	11-19-20	Revised Standard	M.R.D.	M.L.
02	08-10-16	Revised Standard	R.A.A.	S.H.S.
01	10-21-15	Revised Standard	R.A.A.	S.H.S.

KANSAS DEPARTMENT OF TRANSPORTATION

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

LA852G

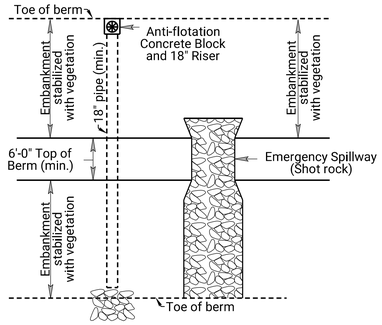
FHWA APPROVAL			11-19-20	APP'D.		Mervin Lare	
DESIGNED	M.L.	DETAILED	D.K.	QUANTITIES		TRACED	R.A.A.
DESIGN CK.	M.L.	DETAIL CK.	M.L.	QUAN.CK.		TRACE CK.	R.A.A.

KDOT Graphics Certified 07-14-2022

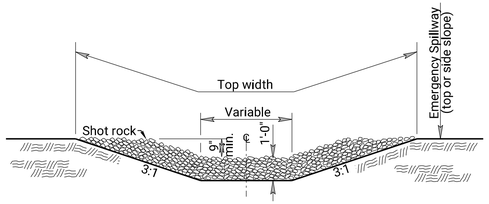
KDOT Graphics Certified

Drawn By: untitled
Plotted: 12/30/2024
File: \\BGCONSULTANTS\Projects\2023\23-1389\CAD\Drawing Set\37-la852g.dgn

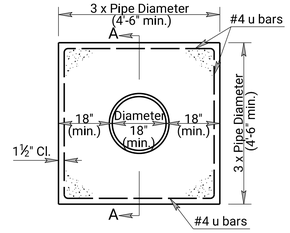
23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	38	54



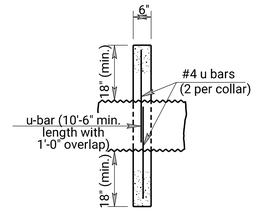
SEDIMENT STORAGE BASIN (PLAN)



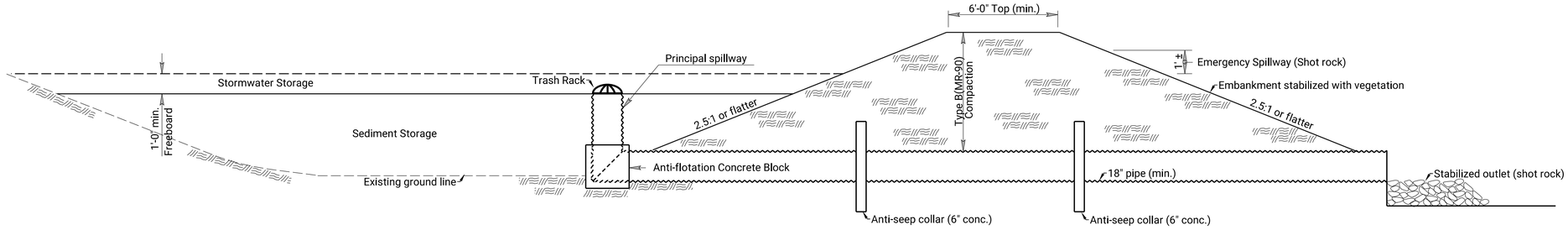
CROSS SECTION (EMERGENCY SPILLWAY)



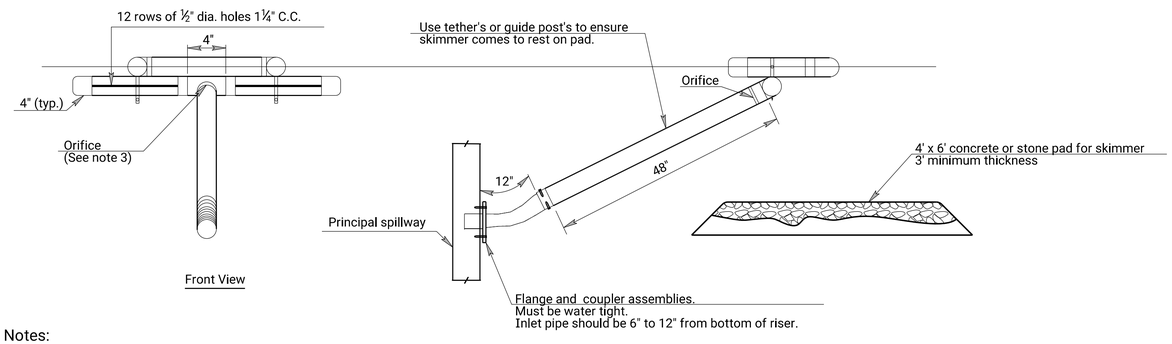
CONCRETE ANTI-SEEP COLLAR



SECTION A-A



SEDIMENT STORAGE BASIN (ELEVATION)



Notes:

1. All P.V.C. pipes are to be schedule 40.
2. HDPE flexible drain pipes is to be attached to the pond outlet structure with water-tight connections.
3. The orifice shall be sized of to provide drawdown time to 2 to 5 days and approved by the engineer.
4. Other skimmer designs maybe used that dewaters from the surface at a controlled rate. The design must be approved by the engineer.

SKIMMER DEWATERING DEVICE

NOTES:

1) Temporary Sediment Basins shall be constructed at locations as directed by the Engineer or as approved in the SWPPP Schedule. All work and materials necessary, including but not limited to, the fill material, compaction, drainage pipes, aggregates and all other incidentals necessary to construct the basin, shall be paid as "Temporary Sediment Basin".

2) Lengths and top dimensions shall be determined in the field by the Engineer.

3) Skimmer dewatering device required and must be used reguardless the size of the drainage area.

SEDIMENT STORAGE BASIN LOCATIONS

STATION TO STATION	SIDE	REQUIRED STORAGE CAPACITY

NO.	DATE	REVISIONS	BY	APP'D
02	09-03-13	Added Skimmer Dewatering Device	M.R.M.	S.H.S.
01	07-17-13	Revised Standard	M.R.M.	S.H.S.

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION AND POLLUTION CONTROL SEDIMENT STORAGE BASIN

LA852H

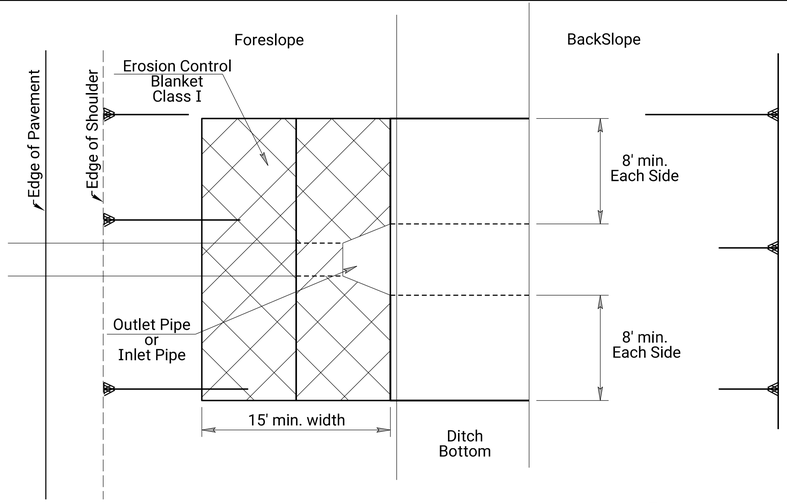
FHWA APPROVAL		09-24-13	APP'D.		
DESIGNED	B.B.	DETAILED	B.B.	QUANTITIES	TRACED B.B.
DESIGN CK.	S.H.S.	DETAIL CK.	S.H.S.	QUAN.CK.	TRACE CK. S.H.S.

KDOT Graphics Certified 06-20-2022

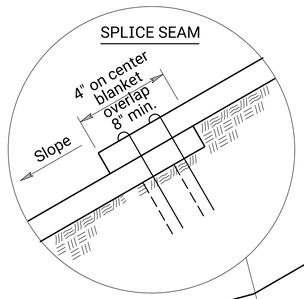
KDOT Graphics Certified

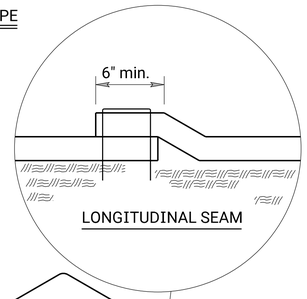
Drawn By : untitled
File : \\BGCONSULTANTS\Projects\2023\23-1389\CAD\Drawing Set\38-la852h.dgn
Plotted : 12/30/2024

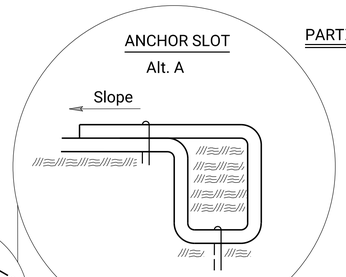
23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	39	54



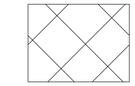
PARTIAL PLAN PIPE



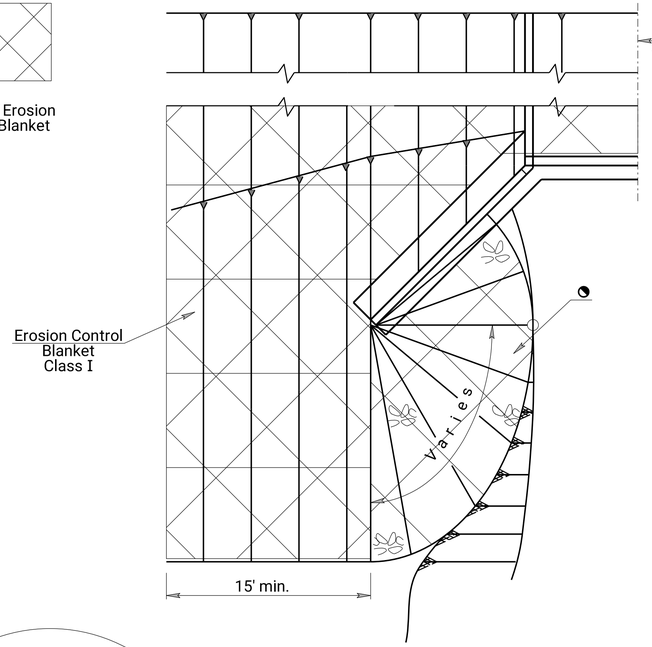




ISOMETRIC VIEW



Limits of Erosion Control Blanket



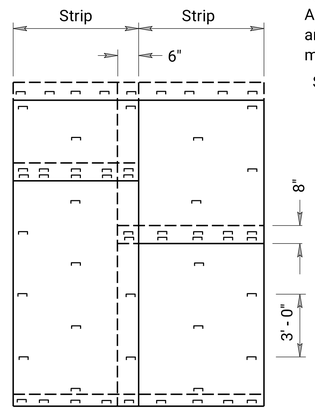
PARTIAL PLAN BOX CULVERT

◔ Erosion Control Class I may be omitted if the area is immediately covered by permanent slope protection (where directed by the plans).

INSTALLATION DETAILS FOR EROSION CONTROL CLASS 1

Erosion Control Blankets shall be laid loosely in the direction of the slope, beginning at the bottom of the slope. In order for blanket to be in contact with the soil, lay blanket loosely, avoiding stretching.

1. ANCHOR SLOTS: The top of the blanket should be "slotted in" at the top of the slope and anchored in place with anchors 6 inches apart. The slots should be 6 inches wide x 6 inches deep with the blanket anchored in the bottom of the slot, then backfilled, tamped and seeded.
2. LONGITUDINAL SEAMS: The edges of the blanket should overlap each other a minimum of 6 inches, with anchors catching the edges of both blankets.
3. SPLICE SEAM: When splices are necessary, overlap end a minimum of 8 inches in direction of water flow. Stagger splice seams.
4. TERMINAL FOLD: The bottom edge of the blanket shall be turned under a minimum of 4 inches, then anchored in place with anchors 9 inches apart.
5. TYPICAL ANCHORS: Anchor design shall be as recommended by the manufacturer.
6. STAPLE CHECK: †Establish Staples in 2 rows 4" on center apart. Staple Checks - shall be 30' apart.



PLAN VIEW - ANCHORING DIAGRAM

NOTE:
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.

Single post ring and shank staple is acceptable.

NO.	DATE	REVISIONS	BY	APP'D
04	03-01-15	Revised Standard	R.A.A.	S.H.S.
03	02-23-15	Revised Standard	R.A.A.	S.H.S.
02	09-15-14	Revised Standard	M.R.M.	S.H.S.

KANSAS DEPARTMENT OF TRANSPORTATION

INSTALLATION DETAIL EROSION CONTROL CLASS 1 SLOPE PROTECTION

LA855

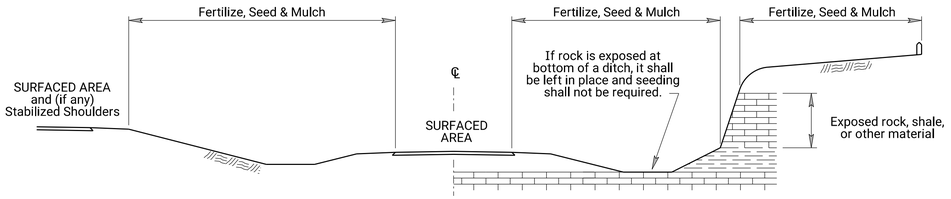
FHWA APPROVAL			03-10-15	APP'D.	Scott H. Shields
DESIGNED	R.A.A.	DETAILED	R.A.A.	QUANTITIES	TRACED R.A.A.
DESIGN CK.		DETAIL CK.		QUAN.CK.	TRACE CK. R.A.A.

KDOT Graphics Certified 06-20-2022

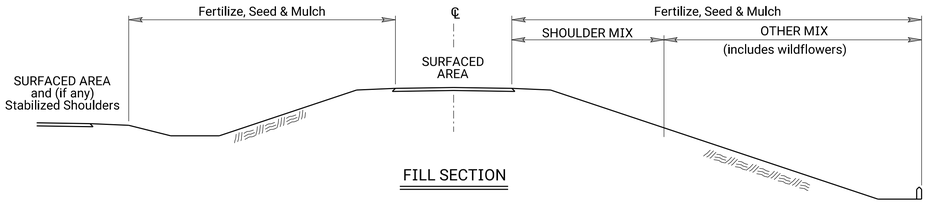
KDOT Graphics Certified

Drawn By : untitled
Plotted : 12/30/2024
File : \\BGCONSULTANTS\Projects\2023\23-1389\CAD\Drawing Set\39-la855.dgn

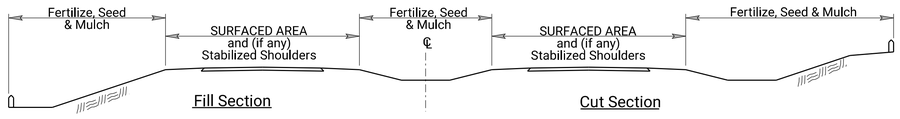
23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	40	54



CUT SECTION



FILL SECTION



TYPICAL SECTION - DUAL PAVEMENT

GRASS & WILDFLOWER SEEDING SEASONS

COOL SEASON GRASSES	WARM SEASON GRASSES & WILDFLOWERS
February 15 thru April 20 August 15 thru September 30	November 15 thru June 1
SPECIES	SPECIES
Bluegrasses	Bermuda Grass
Brome Grasses	Big Bluestem
Canada Wildrye	Blue Grama
Fescues	Buffalo Grass
Prairie Junegrass	Indiangrass
Ryegrasses	Little Bluestem
Sterile Wheatgrass	Sand Bluestem
Tall Dropseed	Sand Dropseed
Western Wheatgrass	Sand Lovegrass
	Side Oats Grama
	Switchgrass
	Wildflower Mixes

When the area to be seeded is 1 acre or more, if Cool Season grasses are mixed with Warm Season grasses, seed the area during the Warm Season.

When the area to be seeded is less than 1 acre, seed the area any time of the year.

SODDING SEASONS

COOL SEASON GRASSES	WARM SEASON GRASSES
March 1 thru April 15 September 1 thru November 15	May 15 thru September 1
SPECIES	SPECIES
Bluegrass Sod	Buffalo Grass Sod
Fescue Sod	

If the soil is workable, the Engineer may allow placement of sod between November 15 and March 1. If sod is placed during this time, maintain the sod until 20 days after the beginning of the spring sodding season.

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.

When seeding is less than 1 acre, temporary and permanent seeding shall be combined and seeded at the same time.

There is no seasonal restriction when seeding projects less than one acre.

NATIVE WILDFLOWER MIX 1

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

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 ⅛" -¼". Place the wildflower seed in a separate seed box and drill (cover) seed $\frac{1}{16}$" 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				ACRES				BID ITEM	QUANTITY	UNIT
SHLDR	OTHER			SHLDR	OTHER					
								Site is to be fully blanketed.		
								See LA852A for Soil Erosion Mix to		
								be used as Permanent Seeding Mix.		
								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
02	11-25-20	Updated Seeding / Sodding Periods Charts	M.R.D.	M.L.
01	08-03-20	Revised Standard	M.R.D.	S.H.S.

KANSAS DEPARTMENT OF TRANSPORTATION

PERMANENT SEEDING
SUMMARY OF SEEDING QUANTITIES

LA850

FHWA APPROVAL		05-06-19	APP'D.	Mervin Lare
DESIGNED	DETAILED	QUANTITIES	TRACED	
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.	

CADconform Certify This File

23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	41	54

1) Design Speed: Those items delegated to temporary traffic control should be designed and installed using the posted/legal speed of the roadway prior to work starting.

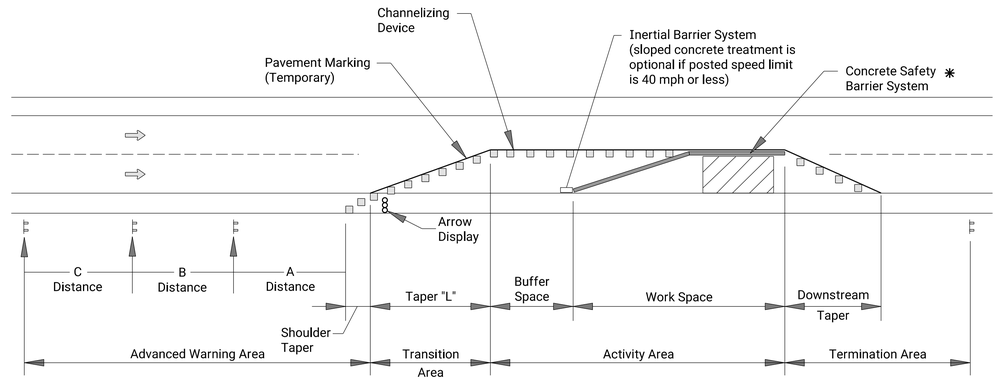
2) Minimum Lane Width: Lane widths shall be a minimum of 11' (measured between centerlines of pavement markings) or as shown on the plans, or as directed by the engineer. A lane width less than 11' may require restricted roadway width signing.

3) Consideration should be made to separate pedestrian and, if needed, bicycle movements from both work site activity and vehicular traffic. Unless a reasonable safe route that does not involve crossing the roadway can be provided, pedestrians should be appropriately directed with advance signing that encourages them to cross to the opposite side of the roadway. In urban and suburban areas with high vehicular traffic volumes, these signs should be placed at intersections (rather than midblock locations) so that pedestrians are not confronted with midblock work sites that will induce them to attempt skirting the work site or making a midblock crossing.

4) When existing pedestrian facilities are disrupted, closed, or relocated, the temporary facilities shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility.

5) When the driving surface open to traffic is milled or is a temporary surface made of loose material, or when directed by the engineer a W8-15 (Grooved Pavement) or W8-7 (Loose Gravel) sign shall be used on mainline approaches. This sign should be placed a "C" distance after the W20-1 (Road Work Ahead) sign. A W8-15p motorcycle plaque shall be used to supplement the W8-15 or W8-7 signs. All signs shall be displayed as long as the condition is present.

6) Alternative temporary rumble strip options may be available. Please contact the Temporary Traffic Control Unit for more information at 785-296-1179 or 785-296-1183.



TYPICAL WORK ZONE COMPONENTS

✳ When concrete barrier system is used, portable channelizing devices are not needed along the tangent barrier section.

Minimum advance warning sign spacing (in feet):

SPEED (MPH) ✳	*A*	*B*	*C*
URBAN (40 MPH OR LOWER)	*100*	*100*	*100*
URBAN (45 MPH OR HIGHER)	*350*	*350*	*350*
RURAL (55 MPH OR LOWER)	*500*	*500*	*500*
RURAL (60 MPH OR HIGHER)	*750*	*750*	*750*
EXPRESSWAY/FREEWAY	*1000*	*1500*	*2640*

✳ Posted speed prior to work starting

The minimum spacing between signs shall be no less than 100', unless directed by the engineer.

The spacing between any signs may be increased beyond the minimum values in the table above as approved by the engineer in order to maximize visibility.

Taper Formulas:

L = WS for speeds of 45 MPH or more

$L = WS^2/60$ for speeds of 40 MPH or less

Where: L = Minimum length of taper in feet
S = Numericial value of posted speed prior to work starting in MPH
W = Width in offset feet

Shifting Taper=1/2 L
Shoulder Taper=1/3 L

Channelizer Placement:

(1) The spacing between devices in transition area (taper) should not exceed a distance in feet equal to 1/2 the posted speed limit in mph prior to work starting.

(2) The spacing between devices in the advanced warning area and the activity area should not exceed a distance in feet equal to two times the posted speed limit in mph prior to work starting.

(3) Channelizing devices shall be placed for optimum visibility, normally at right angles to the traffic flow.

(4) Place directional indicator barricades in series to direct traffic onto the new path. The arrow sign should not be visible to opposing traffic.

(5) Alternating diagonal orange and white striping must slope downward in the direction traffic is expected to pass.

Buffer Space

SPEED (MPH) ✳	*20*	*25*	*30*	*35*	*40*	*45*	*50*	*55*	*60*	*65*	*70*	*75*
LENGTH (ft)	*115*	*155*	*200*	*250*	*305*	*360*	*425*	*495*	*570*	*645*	*730*	*820*

✳ Posted speed prior to work starting

Neither work activity nor storage of equipment, vehicles, or material should occur in the buffer space. When a protection vehicle is placed in advance of the work space, only the space upstream of the vehicle constitutes the buffer space.

If temporary concrete safety barrier system is used to separate approaching traffic from the work space, the barrier system shall be considered part of the activity area. A full lane width should be available throughout the length of the buffer space. See typical work zone components above.

NO.	DATE	REVISIONS	BY	APP'D
02	03-13-18	W8-15p usage changed to Shall	R.W.B.	E.K.G.
01	08-18-15	Channelizer spacing info	R.W.B.	K.E.

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL GENERAL NOTES

TE700

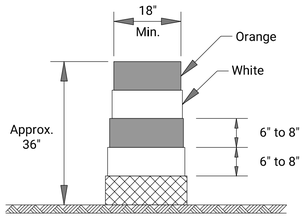
FHWA APPROVAL		03-13-18	APP'D.	Eric Kocher	
DESIGNED	B.A.H.	DETAILED R.W.B.	QUANTITIES	TRACED	
DESIGN CK.		DETAIL CK.	QUAN.CK.	TRACE CK.	

KDOT Graphics Certified 07-18-2022

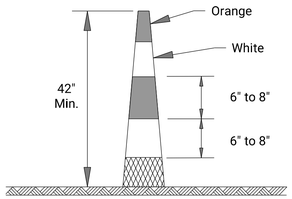
KDOT Graphics Certified

Drawn By : untitled
File : \\BGCONSULTANTS\Projects\2023\23-1389\CAD\Drawing Set\41-te700.dgn
Plotted : 10/9/2024

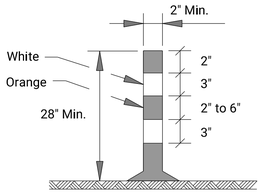
23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	42	54



DRUM

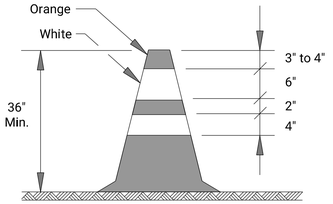


CONICAL DELINEATOR

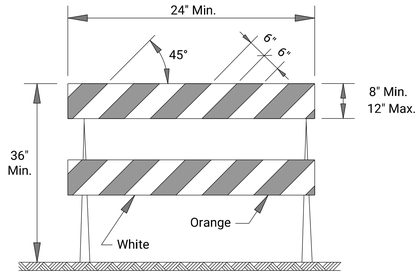


TUBULAR MARKER

Striping as shown for up to 42".

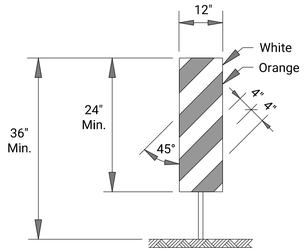


TRAFFIC CONE



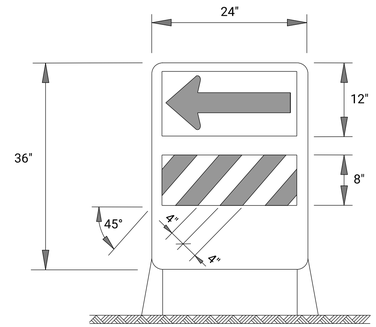
TYPE 2 BARRICADE

For rails less than 36" long, 4" wide stripes may be used. All stripes shall slope downward to the traffic side for channelization.



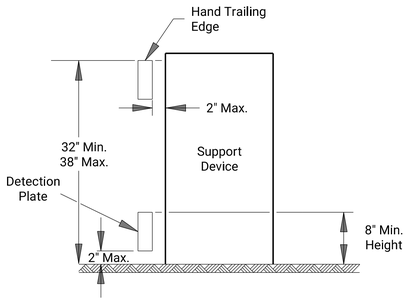
VERTICAL PANEL

The stripes shall slope downward to the traffic side for channelization.



DIRECTION INDICATOR BARRICADE

The stripes shall slope downward in the direction traffic is to pass. The direction indicator barricade shall be used in series to direct the motorist into the intended lane of travel.



PEDESTRIAN CHANNELIZER

1. Support device shall not project beyond the detection plate into the pathway.
2. Hand trailing edges and detection plates are optional for continuous walls.
3. Interconnect pedestrian channelizers to prevent displacement and to provide continuous guidance through or around work.
4. Alternate pathways shall be firm, stable, and slip resistant.
5. Treat height differentials > 1/2" in the surfaces of alternate paths with a firm, stable, and slip resistant temporary ramp having a slope of 12:1 or flatter and having a width equal to the alternate path.
6. Use alternating orange/white on interconnected devices.

Item	Location	Cross-overs	Shoofly Diversions	Tangents	Tapers	Ramps	Head to Head	Object Identifier	Lead-in Devices	Gores
Portable										
	Drums	Yes	Yes	Yes	Yes	Yes	(1)	Yes	Yes	Yes
	Conical Delineators	Yes	Yes	Yes	Yes	Yes	(1)	Yes	Yes	Yes
	Vertical Panels	(2)	(2)	(2)	(2)	(2)	(1,2)	Yes	(2)	(2)
	Direction Indicator Barricade	No	No	No	Yes	No	No	No	No	No
	Type 2 Barricade	(2)	(2)	(2)	(2)	No	No	Yes	No	No
	Traffic Cones	No	No	(4)	(4)	(4)	No	(4)	(4)	(4)
Fixed										
	Tubular Markers	(3)	(3)	(3)	No	(3)	Yes	No	Yes	Yes
	Vertical Panels	(3)	(3)	(3)	(3)	(3)	(3)	Yes	(2,3)	(2)

(1) Not allowed on centerline delineation along freeways or expressways.
(2) The stripes shall slope downward to the traffic side for channelization.
(3) May be used upon the approval of the engineer.
(4) Daytime operations only.

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL CHANNELIZING DEVICES

TE702

FHWA APPROVAL			06-01-15	APP'D.	Kristina Ericksen
DESIGNED	L.E.R.	DETAILED	R.W.B.	QUANTITIES	TRACED
DESIGN CK.		DETAIL CK.		QUAN.CK.	TRACE CK.

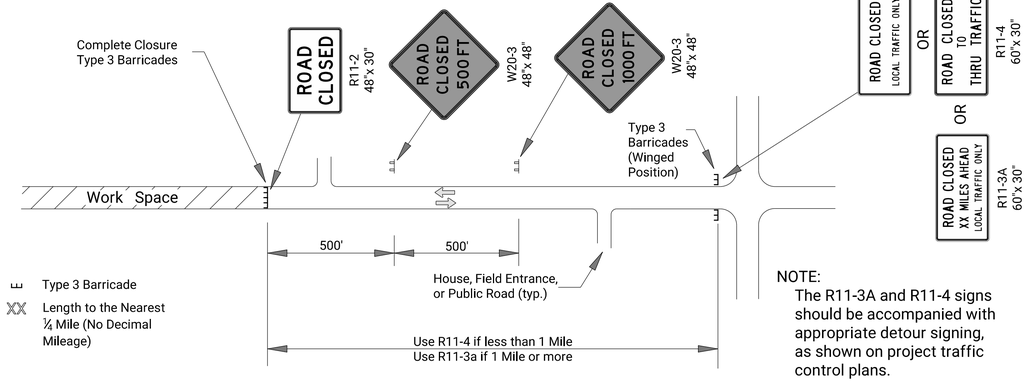
KDOT Graphics Certified 07-18-2022

KDOT Graphics Certified

Drawn By : untitled
File : \\BGCONSULTANTS\Projects\2023\23-1389\CAD\Drawing Set\42-te702.dgn
Plotted : 10/9/2024

23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	43	54

Note: Signs shown for one approach to work zone.



NOTE:
The R11-3A and R11-4 signs should be accompanied with appropriate detour signing, as shown on project traffic control plans.

FIGURE 1: TYPICAL SIGNING FOR ROAD CLOSURE (MAINLINE OR SIDE ROAD)

Note: Sign shown for one approach to intersection (work zone).

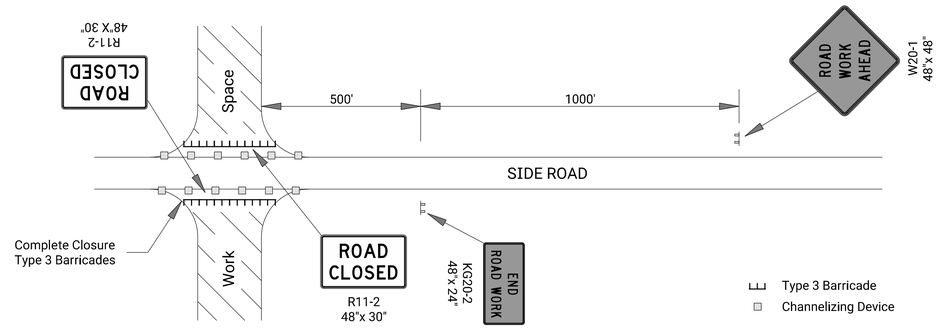


FIGURE 2: TYPICAL SIGNING FOR SIDE ROAD OPEN

Note: Signs shown for one approach to work zone.

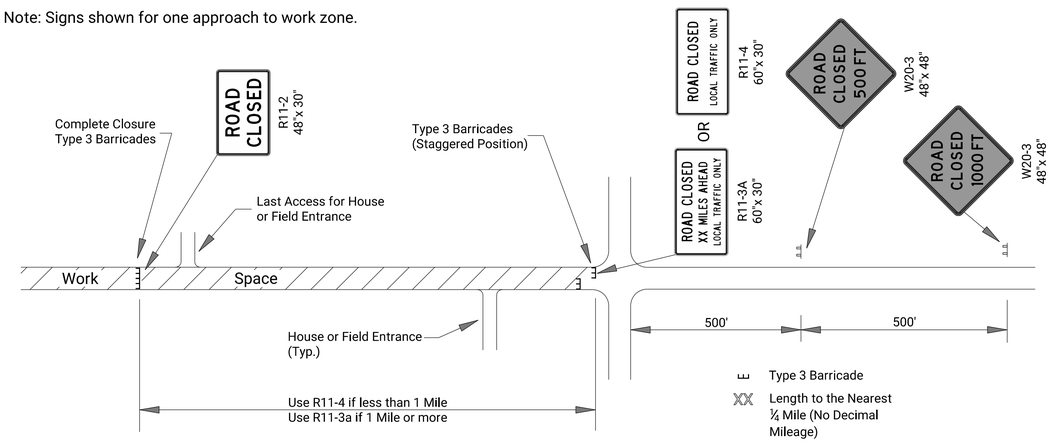


FIGURE 3: TYPICAL SIGNING FOR ROAD CLOSURE - LOCAL TRAFFIC ACCESS

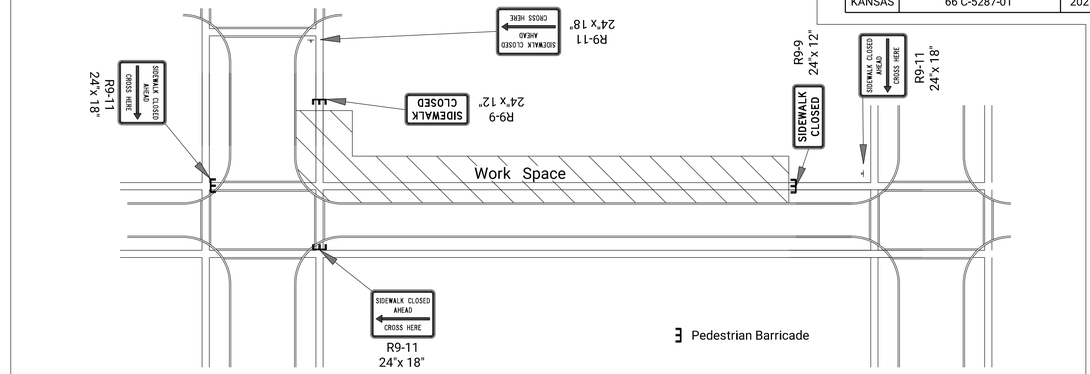
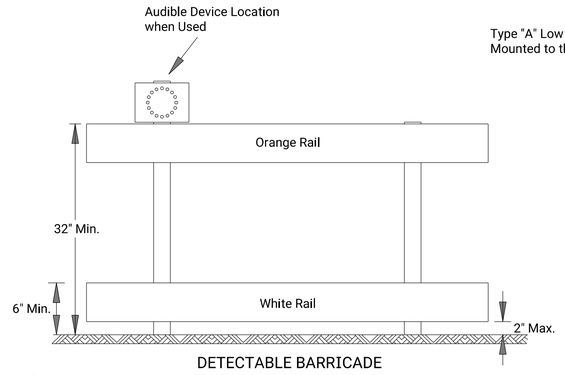
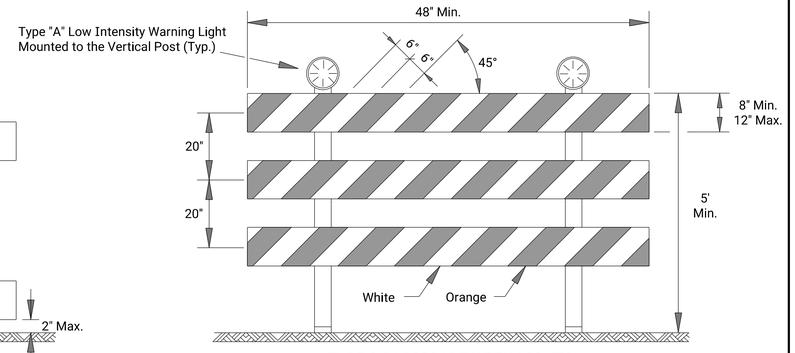


FIGURE 4: TYPICAL SIGNING FOR SIDEWALK CLOSED WITH OPPOSITE SIDEWALK AVAILABLE



DETECTABLE BARRICADE

1. Support device shall not project beyond the detection plate into the pathway.
2. Barricades shall be used to close the entire width of the pathway.
3. Do not use warning lights on pedestrian barricades.
4. Do not use warning lights on audible devices.



TYPE 3 BARRICADE WITH LIGHTS

Approved signs mounted on Type 3 barricades should not cover more than 50% of the top two rails or 33% of the total area of the three rails.

When barricades are placed end-to-end or staggered, a Type "A" low intensity warning light shall be mounted to the vertical post near each outside corner of the end barricades.

ROAD CLOSED GENERAL NOTES

As shown in Figure 1, at the point where thru traffic must detour and local traffic can proceed to the location where the roadway is completely closed, the R11-3a (ROAD CLOSED # MILES AHEAD LOCAL TRAFFIC ONLY) or R11-4 (ROAD CLOSED LOCAL TRAFFIC ONLY or ROAD CLOSED TO THRU TRAFFIC) sign shall be used with Type 3 barricades (winged position), placed on the shoulders of roadway.

As shown in Figure 3, when local traffic must be allowed access into the work zone, Type 3 barricades shall be longitudinally staggered to maintain the appearance of a closed roadway. A second line of end-to-end Type 3 barricades shall be placed just beyond the last access point in the work zone, to completely close the roadway.

The R11-4 (ROAD CLOSED TO THRU TRAFFIC or ROAD CLOSED LOCAL TRAFFIC ONLY) sign shall be used when the distance to the point of complete closure of the roadway is less than 1 mile.

The R11-3a (ROAD CLOSED # MILES AHEAD LOCAL TRAFFIC ONLY) sign shall be used when the distance to the point of complete closure of the roadway is 1 mile or greater.

The words "BRIDGE OUT" (or BRIDGE CLOSED) may be substituted for the words "ROAD CLOSED" on the R11-3a or R11-4 sign where applicable.

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL CLOSURES

TE704

FHWA APPROVAL		06-01-15	APP'D.		Kristina Ericksen
DESIGNED	B.A.H.	DETAILED R.W.B.	QUANTITIES		TRACED
DESIGN CK.		DETAIL CK.	QUAN.CK.		TRACE CK.

KDOT Graphics Certified 07-18-2022

KDOT Graphics Certified

Drawn By : untitled
Plotted : 10/9/2024
File : \\BGCONSULTANTS\Projects\2023\23-1389\CAD\Drawing Set\43-te704.dgn

SIGN LAYOUT INFORMATION

KG20-2

Std. Size Expwy/Freeway
6" C
48"x 24"

KG20-5

Std. Size Expwy/Freeway
6" C
48"x 24"

KM4-20

Std. Size
3" C
24"x 6"

Expwy/Freeway
6" C
48"x 12"

W7-3a

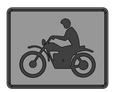
Mileage to be Determined by the Engineer.

W8-15

Std. Size Expwy/Freeway
8" D
48"x 48"

W8-7

Std. Size Expwy/Freeway
8" D
48"x 48"



W8-15p

Std. Size Expwy/Freeway
30"x 24"

W8-17

Std. Size Expwy/Freeway
48"x 48"

W8-11

Std. Size Expwy/Freeway
8" D
48"x 48"

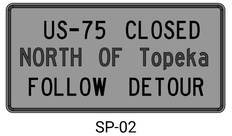
W8-17P
(Optional)

Std. Size Expwy/Freeway
30"x 24"

SP-01
(Special Sign)

Std. Size
6" C

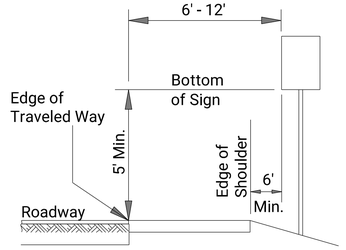
Expwy/Freeway
10" D



SP-02
(Special Sign)

Std. Size		Expwy/Freeway	
Uppercase:	6" C	Uppercase:	10" D
Lowercase:	4.5" C	Lowercase:	8" D

All city names and street names on special signs and destination signs must have upper and lower case letters.

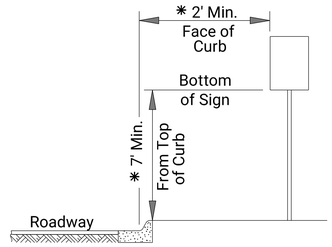


RURAL

1) Ground-mounted signs shall be mounted at a minimum height of 5' measured from the bottom of sign to the near edge of the pavement.

2) Large signs having an area exceeding 50 square feet installed on multiple breakaway posts shall be mounted a minimum of 7' above the ground.

3) The height of the secondary sign mounted below another sign may be 4' measured from the bottom of the sign to the near edge of the pavement. Signs shall not overlap each other.



URBAN

1) Signs shall be mounted at a minimum height of 7' measured from the bottom of sign to the near edge of the pavement.

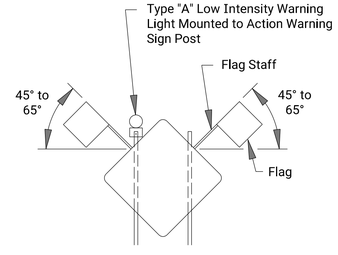
2) Neither portable nor permanent sign supports should be located on sidewalks or areas designated for pedestrian or bicycle traffic.

3) Signs mounted lower than 7' should not project more than 4" into pedestrian facilities.

4) The height from of the secondary sign mounted below another sign may be 6' measured from the bottom of sign to the near edge of the pavement. Signs shall not overlap each other.

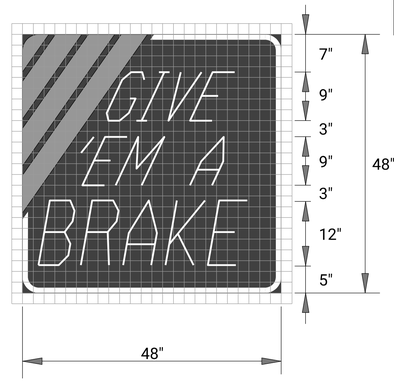
5) Large signs having an area exceeding 50 square feet installed on multiple breakaway posts shall be mounted a minimum of 7' above the ground.

* 6) Pedestrian detour signing shall be a minimum of 2' measured from the top of the pedestrian pathway to the bottom of the sign and shall not protrude into the walkway nor shall it project beyond the back of curb.



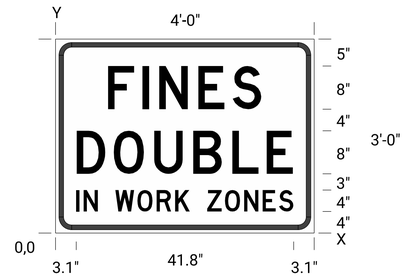
When the sign width is equal to or greater than 9', three or more wood posts may be used with a minimum of 4' between the centerline of each post. All signs less than 9' in width shall use a maximum of two wood posts.

In the case of hitting rock when driving posts
1. Shift the sign location. Do not violate minimum sign spacing.
2. With the engineer's approval, use acceptable alternative sign stands.



KI-104a

Sign Number	GIVE EM A BRAKE
Width x Height	4'-0" x 4'-0"
Border Width	1.0"
Corner Radius	4.0"
Stripe Width	3.0"
Mounting	Ground
Background	Type: Non-Reflective
	Color: Black
Legend/Border	Type: Reflective
	Color: White
Legend Font	Dutch 801 Roman SWC 25 Degree Slant
Stripes	Type: Reflective
	Color: Orange



KI-105a

Sign Number	FINES DOUBLE
Width x Height	4'-0" x 3'-0"
Border Width	0.9"
Corner Radius	3.0"
Mounting	Ground
Background	Type: Reflective
	Color: White
Legend/Border	Type: Non-Reflective
	Color: Black

Dimensions in inches — Spacings are to start of next letter

Y FONT	LETTER SPACINGS															HT LEN
23.0 D		F	I	N	E	S										8.0
	9.7	6.4	3.2	7.3	6.4	5.4	9.7									28.6
11.0 D		D	O	U	B	L	E									8.0
	3.9	6.9	7.5	7.3	7.3	6.4	4.9	3.9								40.3
4.0 D		I	N		W	O	R	K		Z	O	N	E	S		4.0
	3.1	1.6	2.7	3.2	4.3	3.8	3.6	2.8	3.2	3.4	3.8	3.6	3.2	2.7	3.1	41.8

Notes:

Typically, there are two sets of informational signs installed per project: one for each direction of traffic.

Install signs a minimum of 500' in advance of the road work ahead sign. The engineer may designate a more appropriate location if conditions dictate.

The informational signs are not to interfere with the traffic control signs for the project.

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL SIGN INFORMATION

TE710

FHWA APPROVAL			06-01-15	APP'D.	Kristina Ericksen
DESIGNED	R.W.B.	DETAILED	R.W.B.	QUANTITIES	TRACED
DESIGN CK.		DETAIL CK.		QUAN.CK.	TRACE CK.

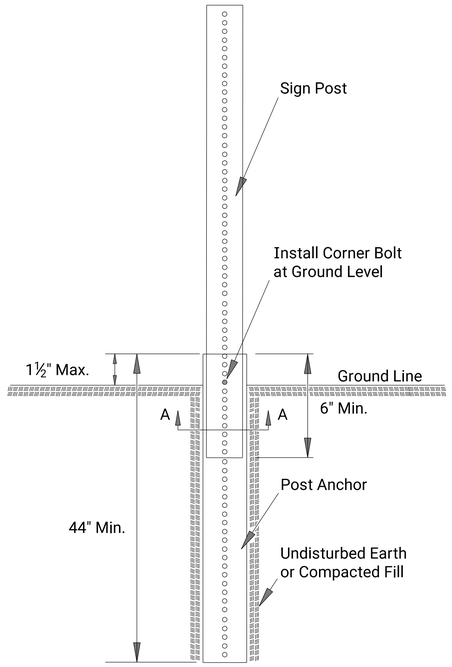
KDOT Graphics Certified 12-16-2022

KDOT Graphics Certified

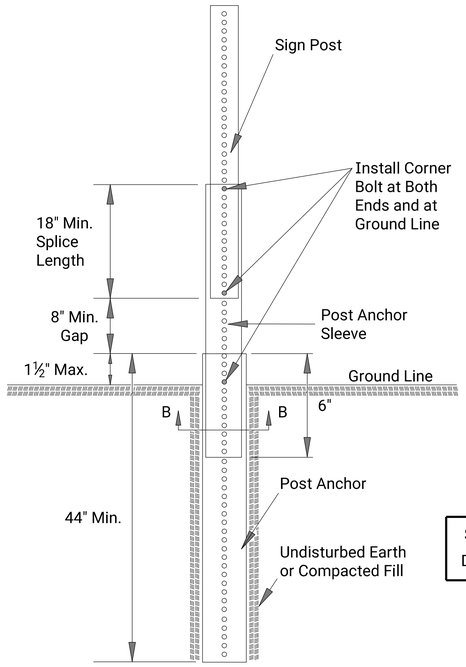
Drawn By : untitled
Plotted : 10/9/2024
File : \\BGCONSULTANTS\Projects\2023\23-1389\CAD\Drawing Set\44-te710.dgn

23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	45	54

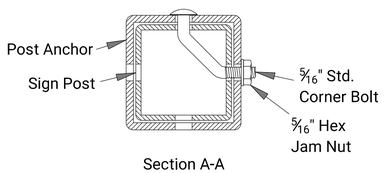
PERFORATED SQUARE STEEL TUBE (P.S.S.T.) POST SETUP



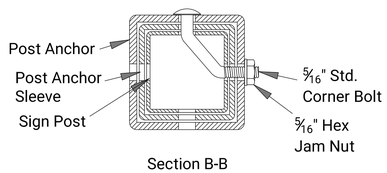
P.S.S.T. Detail



Telescoping P.S.S.T. Detail



Section A-A

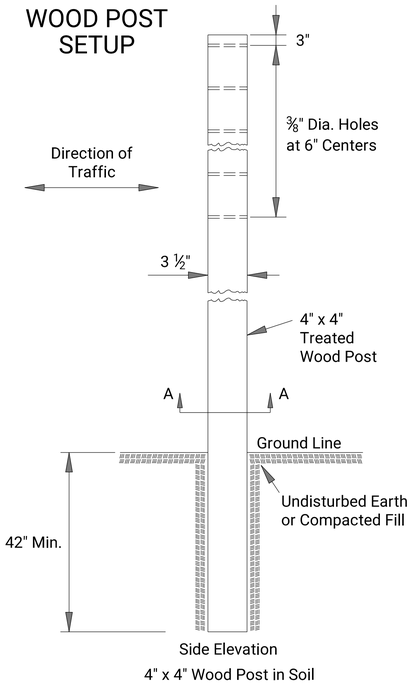


Section B-B

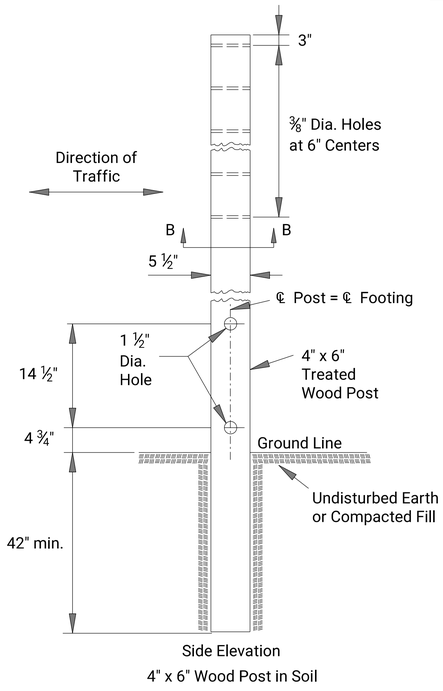
Details for 2", 2 ¼", or 2 ½" sign posts

Place bolts in the same corner along each sign post.

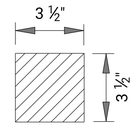
WOOD POST SETUP



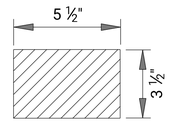
Side Elevation
4" x 4" Wood Post in Soil



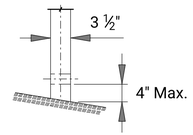
Side Elevation
4" x 6" Wood Post in Soil



Section A-A



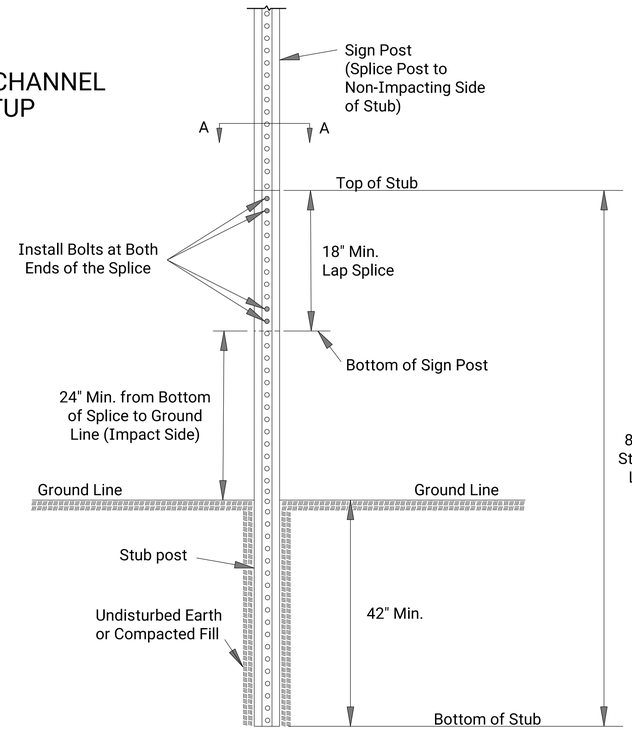
Section B-B



Front Elevation

See TE710 for Additional Details and Requirements

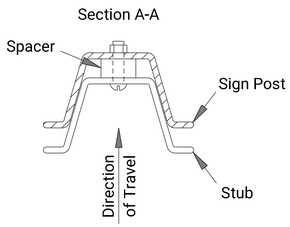
3 LB/F U-CHANNEL SETUP



Notes:

Place two bolts at both ends of the splice through the holes nearest the ends of the splice.

Use manufacturer recommended spacers over the bolts between the spliced pieces of U-Channel.



NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL SIGN POSTS

TE712

FHWA APPROVAL		06-01-15	APP'D.		Kristina Ericksen
DESIGNED	B.A.H.	DETAILED R.W.B.	QUANTITIES		TRACED
DESIGN CK.		DETAIL CK.	QUAN.CK.		TRACE CK.

KDOT Graphics Certified 07-18-2022

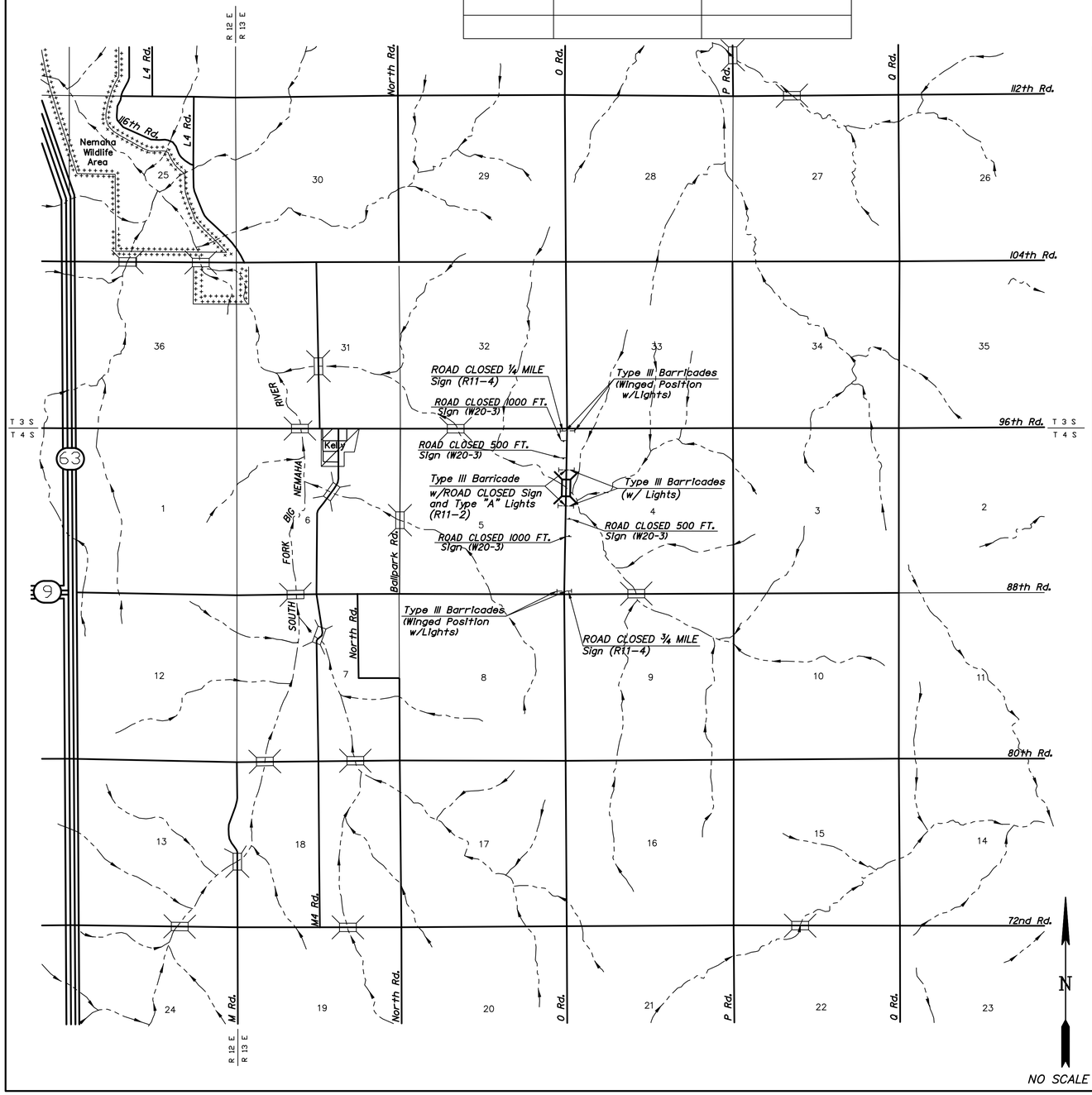
KDOT Graphics Certified

Drawn By : untitled
Plotted : 10/9/2024
File : \\BGCONSULTANTS\Projects\2023\23-1389\CAD\Drawing Set\45-te712.dgn

23-1389M	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
	KANSAS	66 C-5287-01	2025	46	54

Summary Of Traffic Control Devices (Each)

Work Zone Sign (Special)		
Sign No.	16.25 Sq.Ft. & Less	16.26 Sq.Ft. & Over



Summary Of Traffic Control Devices (Each Per Day)

✱ Quantity Most Used On The Project At Any One Time

Work Zone Signs ✱			
Sign No.	Size - Sq.Ft.		
	0-9.25	9.26-16.25	16.26 & Over
W20-7		2	
R11-2		2	
W20-3		4	
R11-4		2	

Barricades ✱		Channelizing Devices ✱		
Type 3 (4' To 12')	Pedestrian	Fixed	Portable	Pedestrian
10				

Lighted Devices ✱	
Work Zone Warning Light (Type "A" Low Intensity)	8
Work Zone Warning Light (Red Type "B" High Intensity)	
Arrow Display	
Portable Changeable Message Sign	

Recapitulation Of Quantities		
Item	Quantity	Unit
Work Zone Signs (O To 9.25 Sq.Ft.)		Each Per Day
Work Zone Signs (9.26 To 16.25 Sq.Ft.)		Each Per Day
Work Zone Signs (16.26 Sq.Ft. & Over)		Each Per Day
Work Zone Barricades (Type 3 - 4' To 12')		Each Per Day
Work Zone Barricades (Pedestrian)		Each Per Day
Channelizer (Fixed)		Each Per Day
Channelizer (Portable)		Each Per Day
Channelizer (Pedestrian)		Each Per Day
Work Zone Warning Light (Type "A" Low Intensity)		Each Per Day
Work Zone Warning Light (Red Type "B" High Intensity)		Each Per Day
Arrow Display		Each Per Day
Portable Changeable Message Sign		Each Per Day
Pavement Marking (Temporary)		
4" Solid (Type I)		Sta./Line
4" Solid (Type II)		Sta./Line
4" Broken (8.0') (Type I)		Sta./Line
4" Broken (8.0') (Type II)		Sta./Line
4" Broken (3.0') (Type I)		Sta./Line
4" Broken (3.0') (Type II)		Sta./Line
4" Dotted Extension (Type I)		Sta./Line
4" Dotted Extension (Type II)		Sta./Line
Solid (Line Masking Tape)		Sta./Line
Broken (Line Masking Tape)		Sta./Line
Symbol (Type I)		Each
Symbol (Type II)		Each
Flexible Raised Pavement Marker (4" Broken (8.0'))		Sta./Line
Flexible Raised Pavement Marker (4" Broken (3.0'))		Sta./Line
Pavement Marking Removal		Lin. Ft.
Work Zone Sign (Special) (16.25 Sq. Ft. & Less)		Each
Work Zone Sign (Special) (16.26 Sq. Ft. & More)		Each
Temporary Raised Pavement Marker (Type I)		Each
Temporary Raised Pavement Marker (Type I)		Each
Traffic Signal Installation (Temporary)		Lump Sum
Traffic Control (Initial Set Up)		Lump Sum
Traffic Control	Lump Sum	Lump Sum
Flagger (Set Price)	1	Hour

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

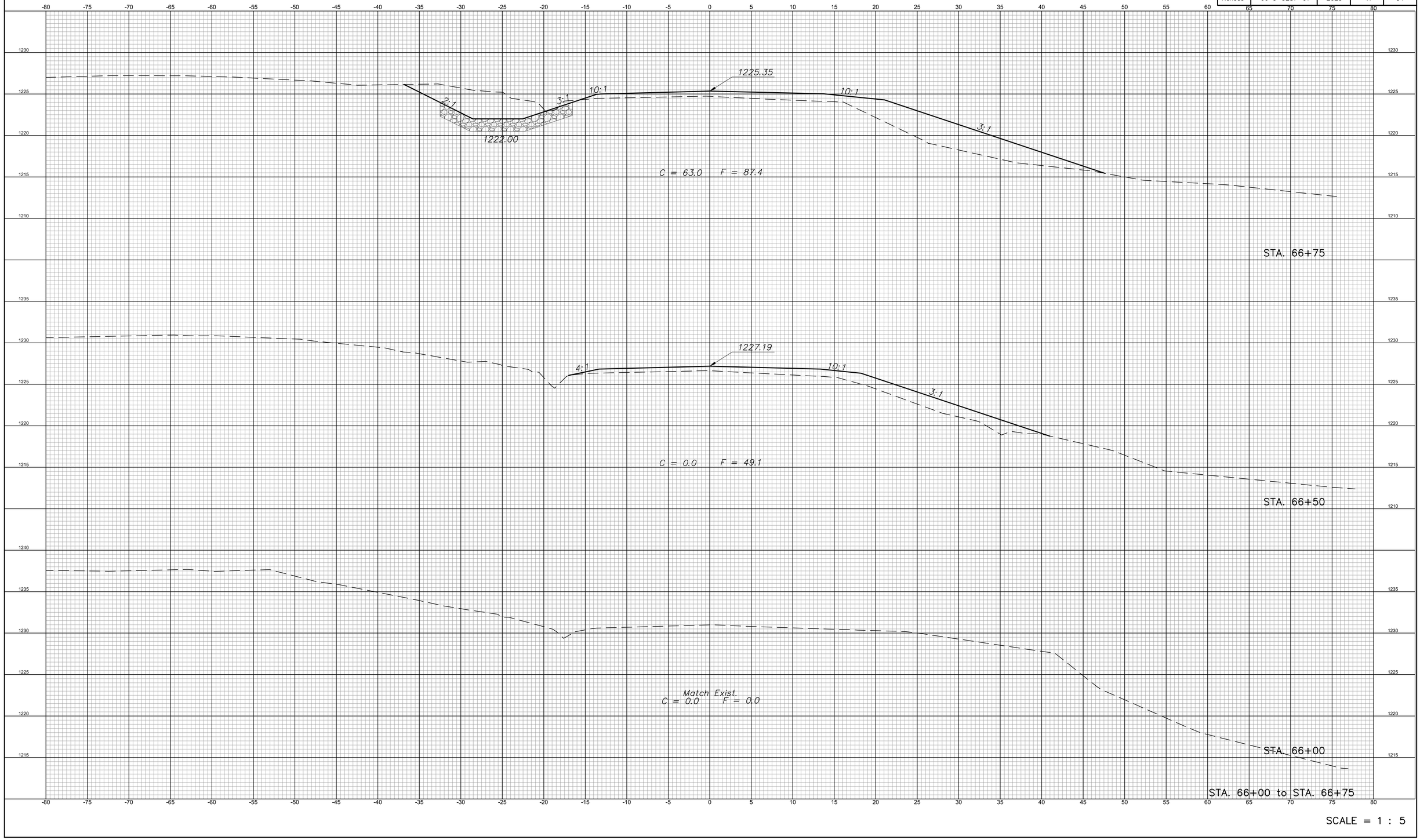
TRAFFIC CONTROL SUMMARY OF DEVICES RECAPITULATION OF QUANTITIES

~~TE795~~

FHWA APPROVAL	06/01/15	APP'D	Kristina Ericksen
DESIGNED B.A.H.	DETAILED R.W.B.	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN. CK.	TRACE CK.

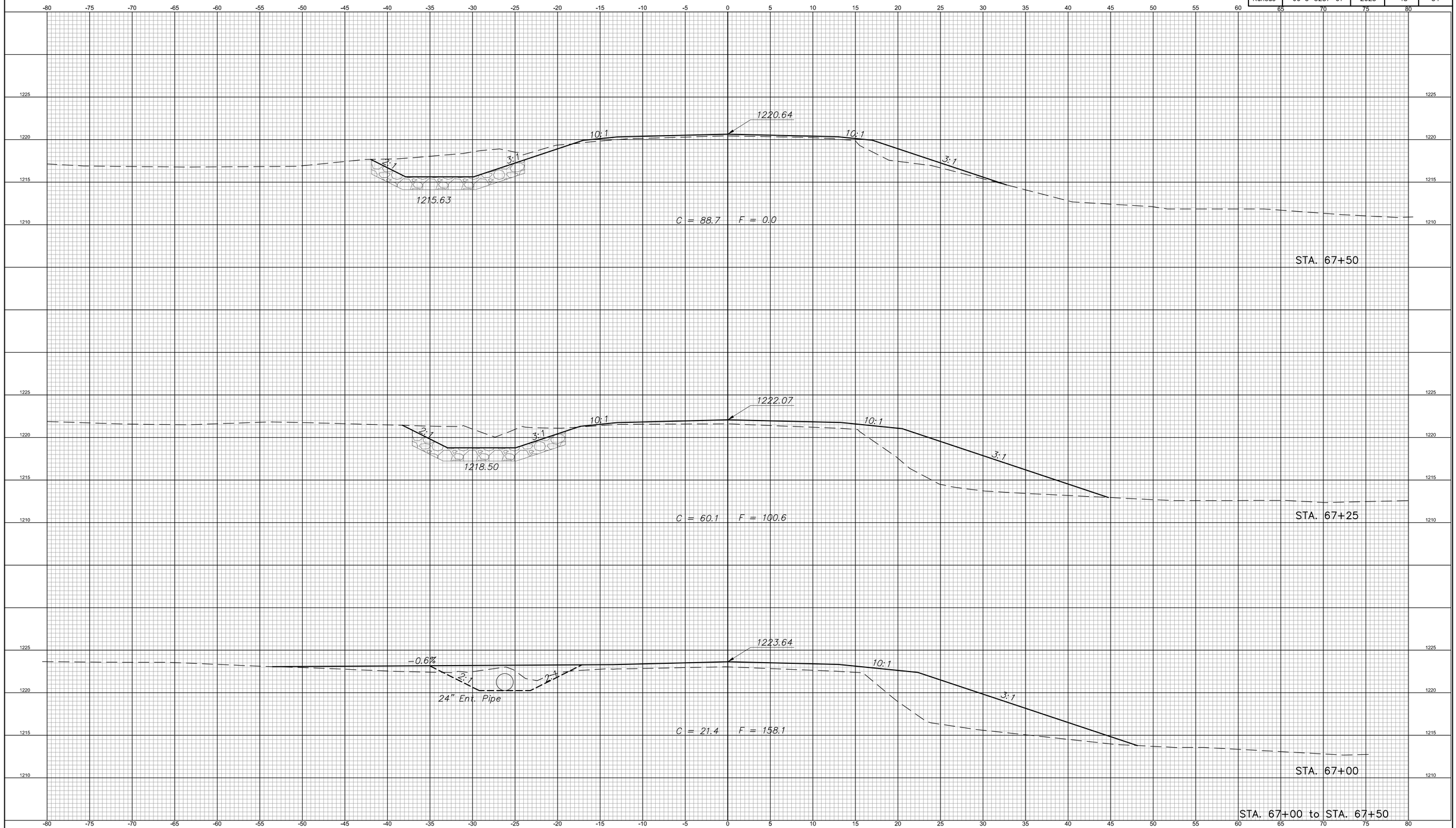
Drawn By : $$USERNAME$$ Plotted : $$YTIME$$
File : $$DGNSPEC$$ $$KDOTGRP$$

23–1389M	State	Project No.	Fiscal Year	Sheet No.	Total Sheets
	Kansas	66 C–5287–01	2025	47	54

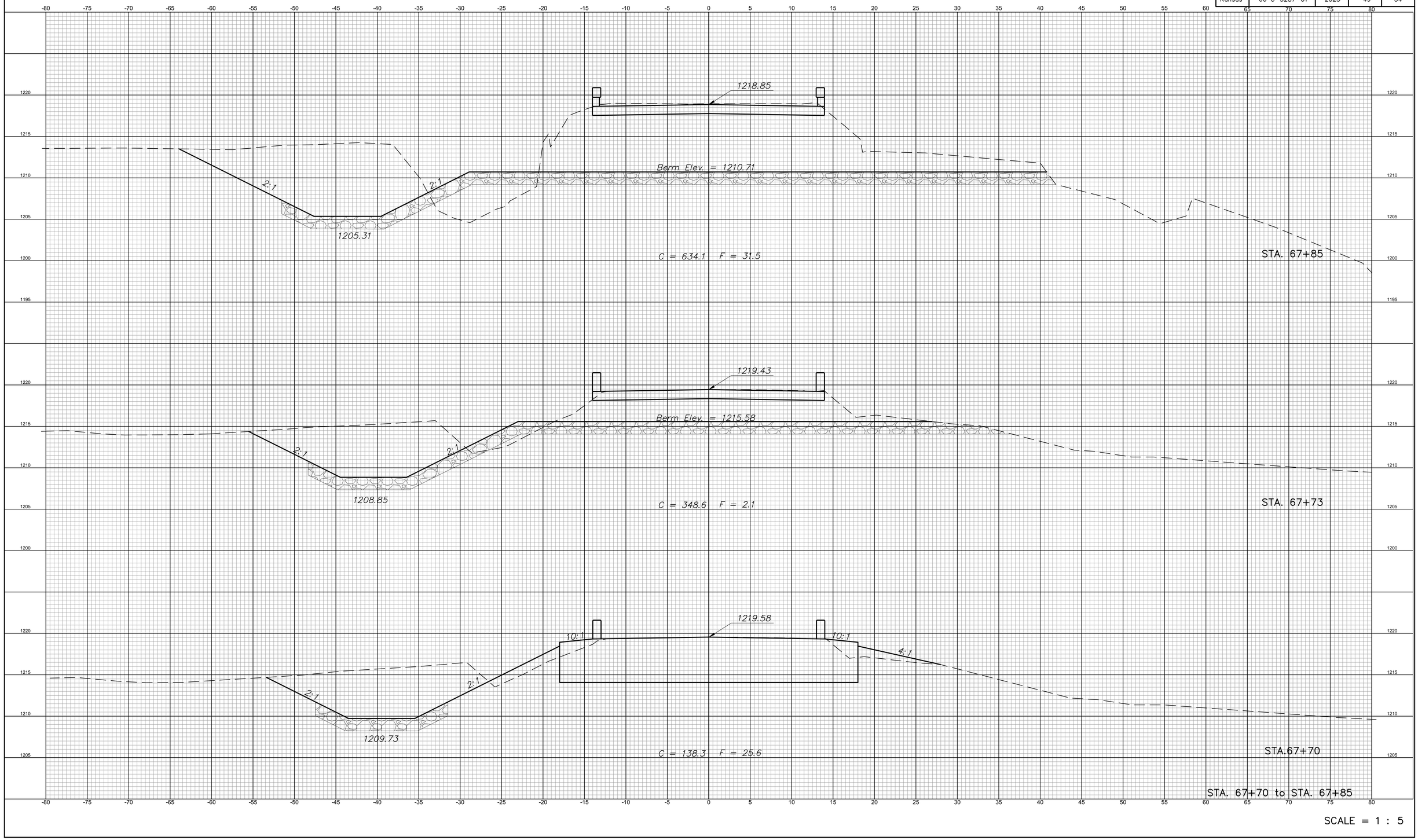


SCALE = 1 : 5

23–1389M	State	Project No.	Fiscal Year	Sheet No.	Total Sheets
	Kansas	66 C–5287–01	2025	48	54



23–1389M					
	State	Project No.	Fiscal Year	Sheet No.	Total Sheets
	Kansas	66 C–5287–01	2025	49	54



23–1389M	State	Project No.	Fiscal Year	Sheet No.	Total Sheets
	Kansas	66 C–5287–01	2025	50	54

1217.33

C = 0.0 F = 0.0

STA. 68+20

1218.16

Berm Elev. = 1204.30

Ahead C = 0.0 F = 0.0
Back C = 99.5 F = 0.0

STA. 68+00

1218.39

2:1

2:1

Berm Elev. = 1205.71

1202.36

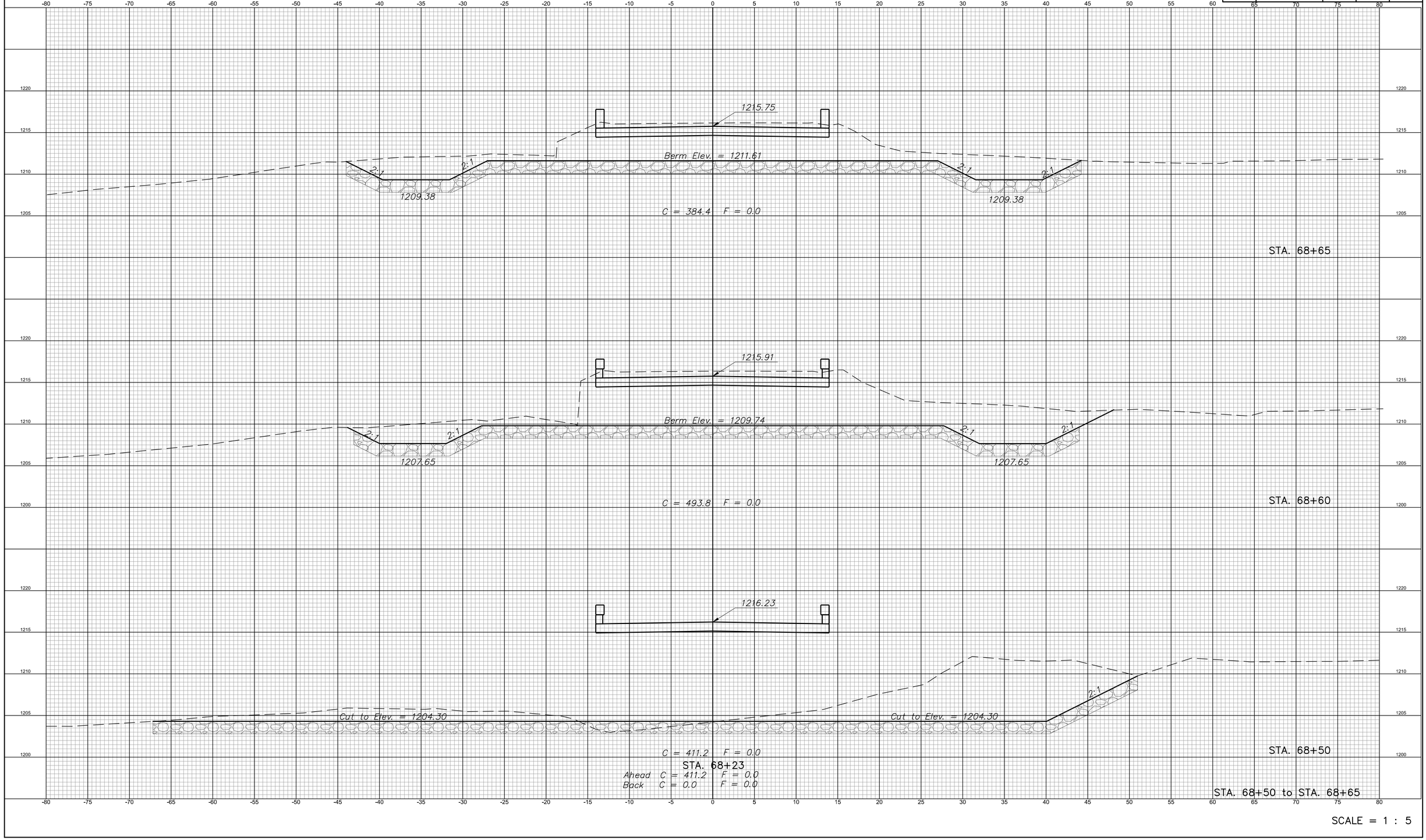
C = 543.7 F = 10.3

STA. 67+95

STA. 67+95 to STA. 68+20

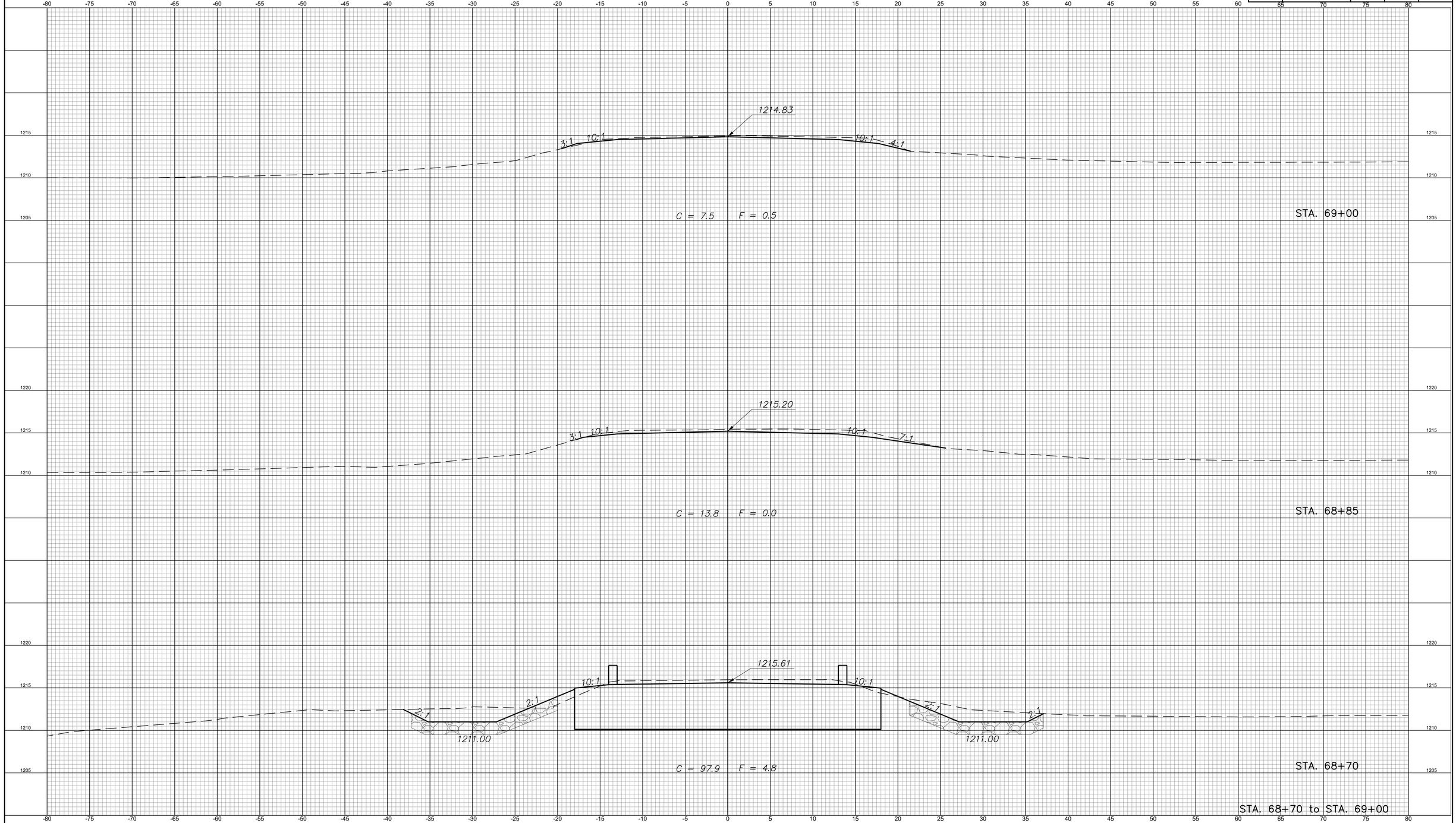
SCALE = 1 : 5

23–1389M	State	Project No.	Fiscal Year	Sheet No.	Total Sheets
	Kansas	66 C–5287–01	2025	51	54



23–1389M

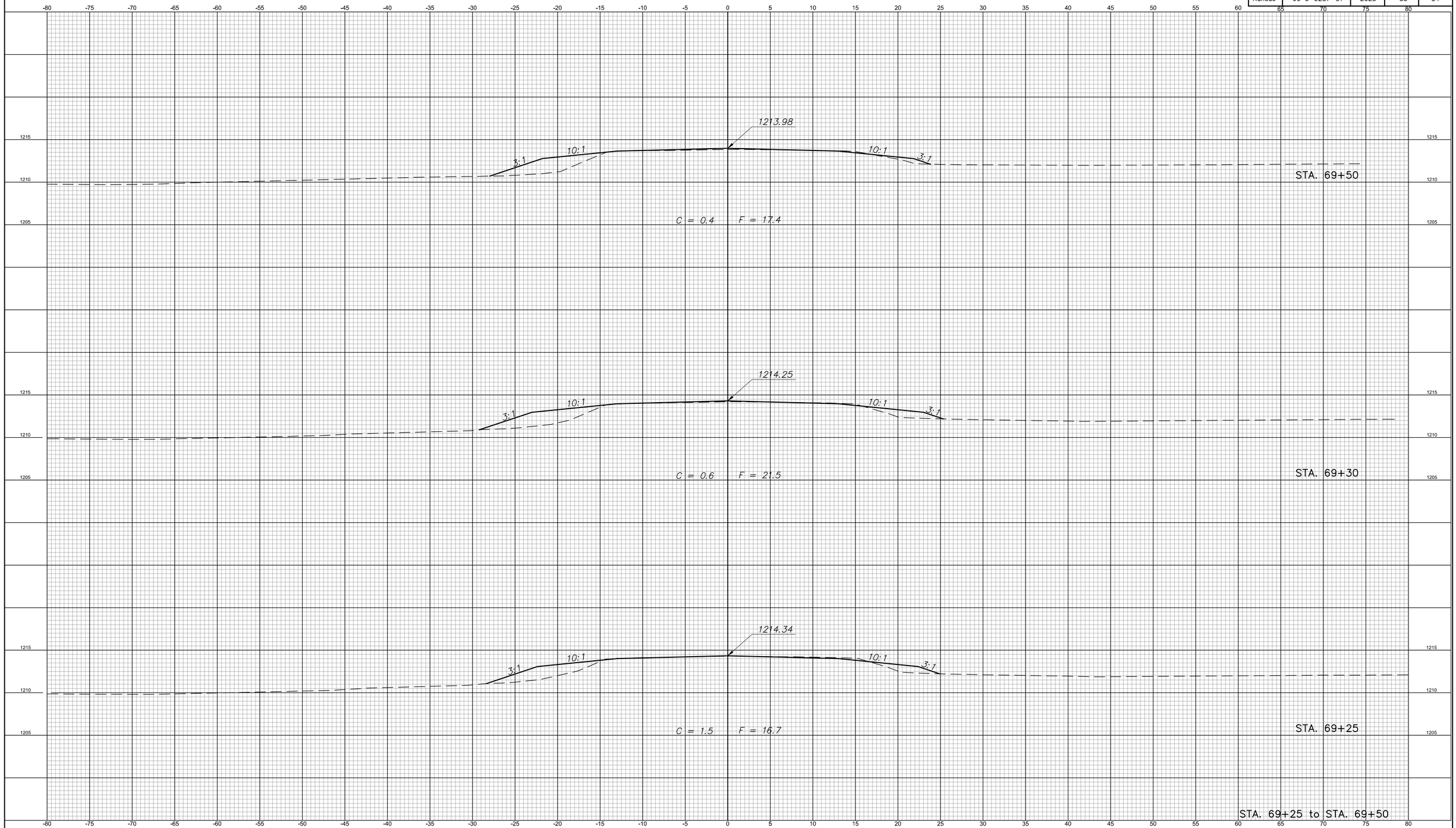
State	Project No.	Fiscal Year	Sheet No.	Total Sheets
Kansas	66 C–5287–01	2025	52	54



SCALE = 1 : 5

23–1389M

State	Project No.	Fiscal Year	Sheet No.	Total Sheets
Kansas	66 C–5287–01	2025	53	54



SCALE = 1 : 5

23-1389M				
State	Project No.	Fiscal Year	Sheet No.	Total Sheets
Kansas	66 C-5287-01	2025	54	54

STA. 71+00

Match Exist.
C = 0.0 F = 0.0

STA. 70+75

1212.80

11:1

C = 2.6 F = 0.5

STA. 70+50

1213.39

3:1 10:1 10:1 5:1

C = 0.9 F = 6.0

STA. 70+00

STA. 70+00 to STA.71+00

SCALE = 1 : 5