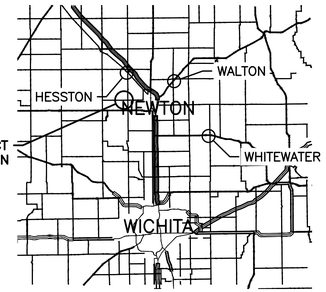
BRIDGE REPLACEMENT FOR

HARVEY COUNTY BRIDGE K-15.9

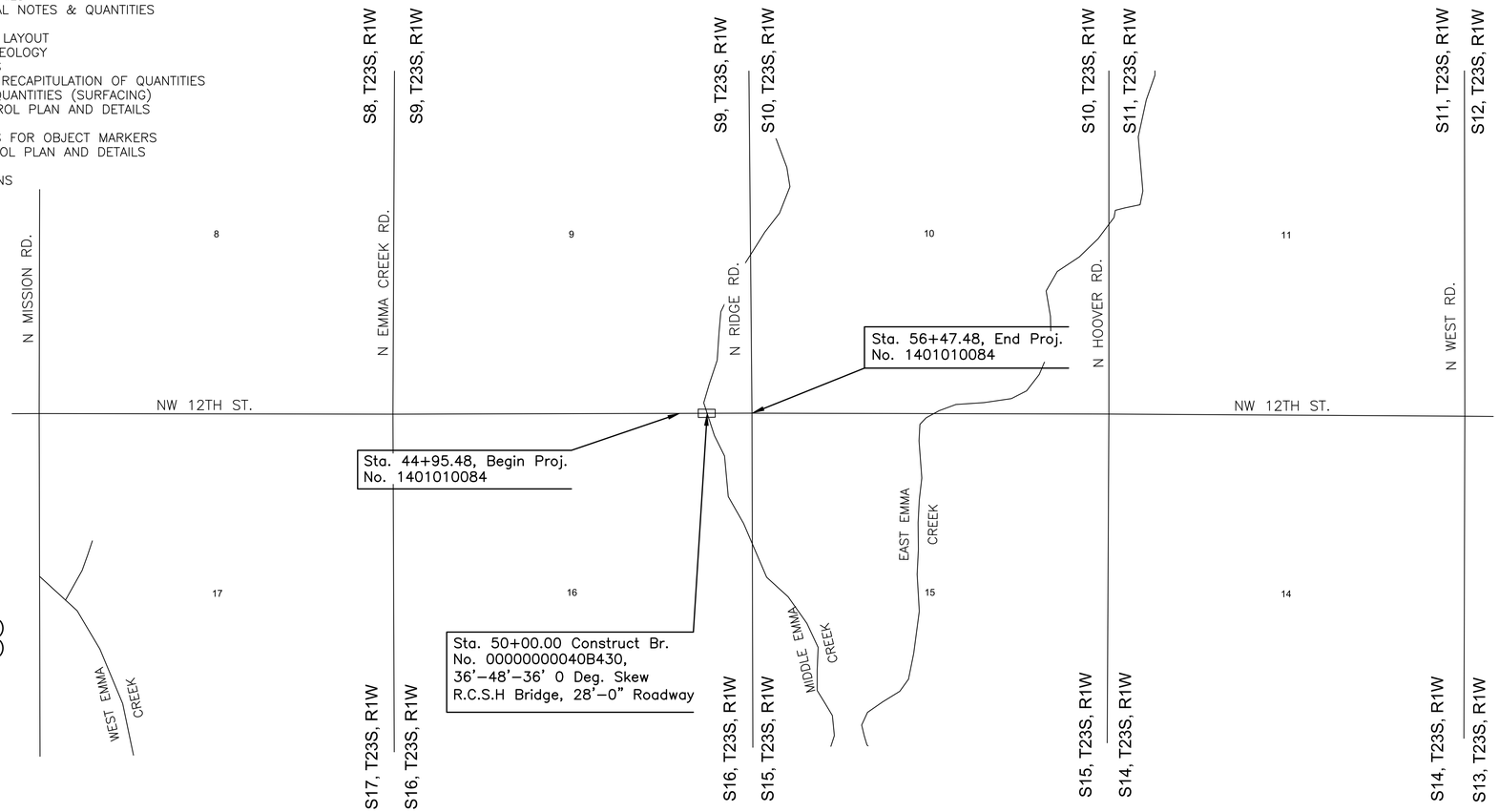
1401010084

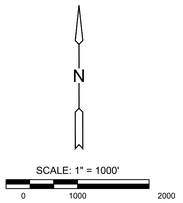
GRADING
SURFACING
BRIDGE
SEEDING



LOCATION MAP

INDEX OF SHEETS





Prepared and Submitted by:
MKEC Engineering, Inc.
Wichita, Kansas

DESIGN DESIGNATION

AADT=	435 (2021)
AADT=	646 (2041)
DHV=	10%
D=	60%
T=	10%
V=	55 mph
C of A=	None
Clear Zone=	20 feet

CONVENTIONAL SIGNS

COUNTY LINE		CENTER LINE OF PROJECT	50 — 1
CITY LIMITS		TERRACE	
STATE OR NATIONAL LINE		CULVERTS	
TOWNSHIP, SECTION or GRANT LINE		DROP INLET & STORM SEWER	
PROPERTY LINE	—℄—	ACCESS CONTROL	
HIGHWAY FENCE	—o—o—	POWER POLE	
EXISTING FENCE	—x—	TELEPHONE POLE	
GUARDRAIL		MARSH	
CONSTRUCTION LIMITS		HEDGE	
RIGHT OF WAY LINE		TREES	
TRAVELED WAY		PROFILE ELEVATION	1172.8
RAILROADS		STREAM or CREEK	

GROSS LENGTH OF PROJECT	1152.00	FT.		
EXCEPTIONS	0.00	FT.		
ADDITIONS	0.00	FT.		
NET LENGTH OF PROJECT	1152.00	FT.	0.22	MILES
NET LENGTH OF BRIDGES	122.5	FT.	0.02	MILES
NET LENGTH OF ROAD	1029.5	FT.	0.20	MILES

NOTE: ROAD SHALL BE CLOSED TO TRAFFIC DURING CONSTRUCTION.

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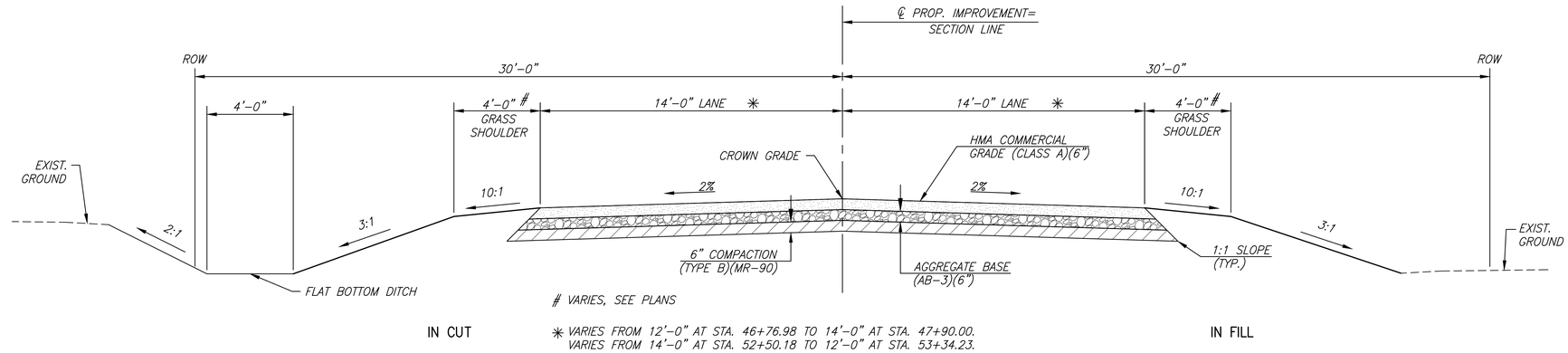
BRIDGE REPLACEMENT FOR
BRIDGE K-15.9
HARVEY COUNTY, KANSAS

TITLE SHEET

PROJECT NO. 1401010084
SCALE 1" = 1000'
DRAWN LWG | DESIGNED DJL | CHECKED JRA

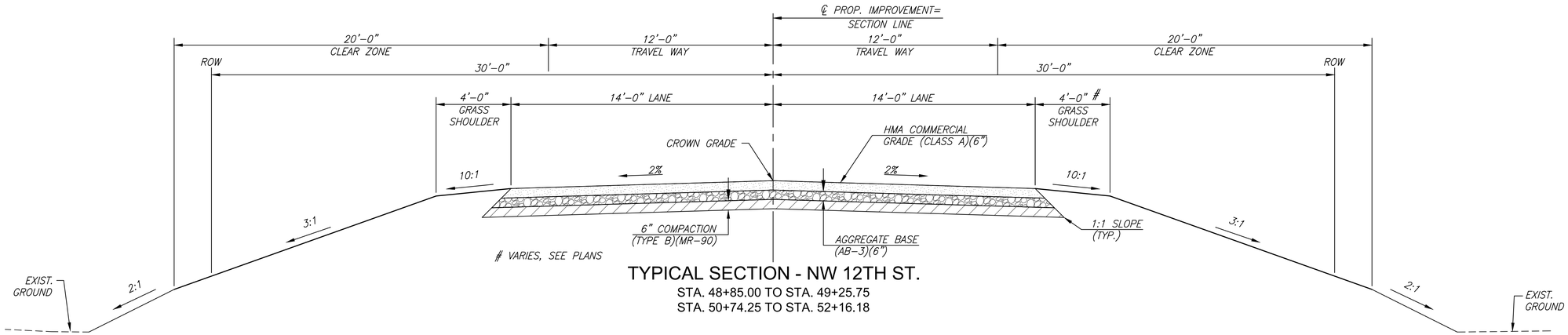
NO.	REVISION	DATE

SHEET NO. 1 OF 61



TYPICAL SECTION - NW 12TH ST.

STA. 44+95.48 TO STA. 48+85.00
STA. 52+16.18 TO STA. 56+19.02



TYPICAL SECTION - NW 12TH ST.

STA. 48+85.00 TO STA. 49+25.75
STA. 50+74.25 TO STA. 52+16.18

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DAKOTA JAMES LEWIS
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30161
11/09/2023
KANSAS
PROFESSIONAL ENGINEER

BRIDGE REPLACEMENT FOR

BRIDGE K-15.9

HARVEY COUNTY, KANSAS

TYPICAL SECTIONS

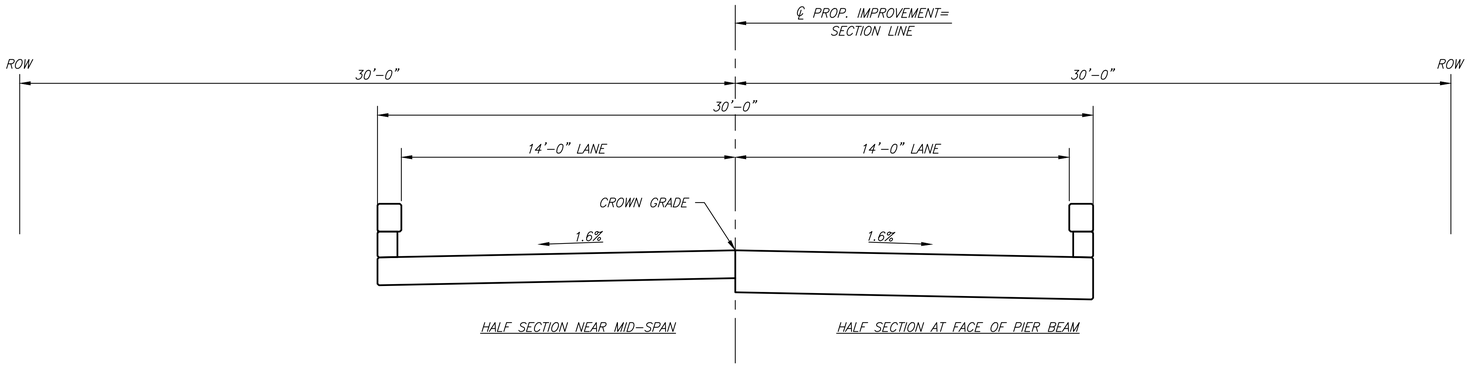
PROJECT NO. 1401010084

SCALE 1" = 3'

DRAWN	DESIGNED	CHECKED
LWG	DJL	JRA

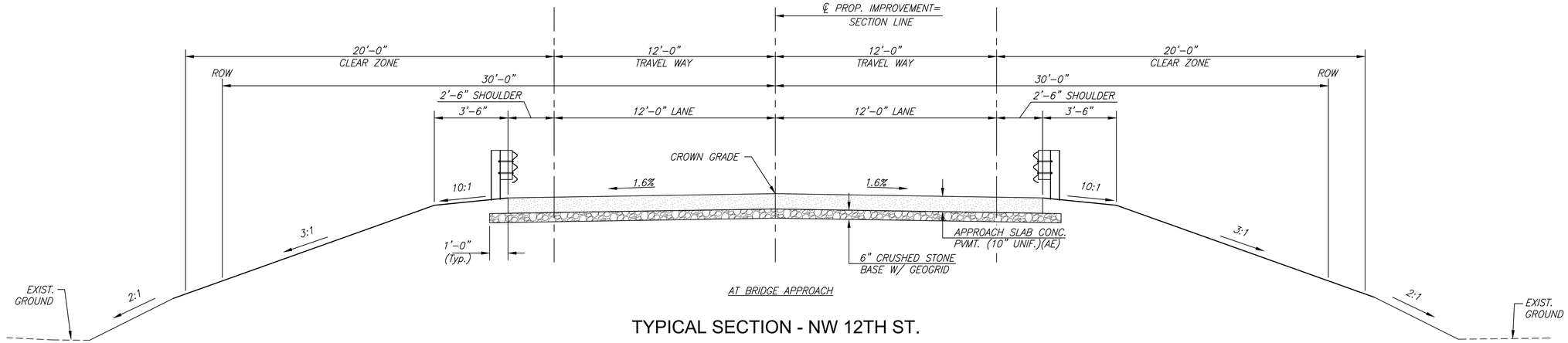
NO.	REVISION	DATE

SHEET NO. 2 OF 61



TYPICAL SECTION - NW 12TH ST.

STA. 49+38.75 TO STA. 50+61.25



TYPICAL SECTION - NW 12TH ST.

STA. 49+25.75 TO STA. 49+38.75

STA. 50+61.25 TO STA. 50+74.25

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BRIDGE REPLACEMENT FOR

BRIDGE K-15.9

HARVEY COUNTY, KANSAS

TYPICAL SECTIONS

PROJECT NO. 1401010084

SCALE 1"= 3'

DRAWN	DESIGNED	CHECKED
LWG	DJL	JRA

NO.	REVISION	DATE

SHEET NO.
3 OF 61

GENERAL NOTES

1. "KDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2015 EDITION" ARE REFERENCED FOR CONSTRUCTION. WHEN DIFFERENCES OCCUR BETWEEN PLAN NOTES AND THESE SPECIFICATIONS, THE PLAN NOTES GOVERN.

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

3. ALL BARRICADES, WARNING SIGNS, LIGHTS, DEVICES, ETC. FOR THE GUIDANCE AND PROTECTION OF TRAFFIC AND PEDESTRIANS MUST CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

4. CONTRACTOR SHALL MAKE DAILY INSPECTIONS OF BARRICADES AND FLASHING LIGHTS TO ENSURE PROPER FUNCTIONING OF WARNING DEVICES.

5. ADEQUATE DRAINAGE SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION AND ANY DRAINAGE DITCH OR STRUCTURE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO THE SATISFACTION OF THE OWNING AUTHORITY

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

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

8. 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.

9. THE BID ITEM "EMBANKMENT (CONTRACTOR FURNISHED)" IS FOR THE CONSTRUCTION OF ROADWAY EMBANKMENTS AND ALL OTHER PROJECT FILLS. IMPORTED MATERIAL SHALL BE SUITABLE ENGINEERING FILLS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. ALL COMPACTION SHALL BE TYPE B MR-90. COMPACTION BELOW NEW AGGREGATES BASES AND SURFACES SHALL BE SUBSIDIARY TO "AGGREGATE BASE (AB-3)". EXCAVATION AND BACKFILL FOR THE CONSTRUCTION OF THE NEW STRUCTURE SHALL BE SUBSIDIARY TO THE BID ITEM "CONCRETE (GRADE 4.0)".

10. THE PLAN QUANTITY FOR "EMBANKMENT (CONTRACTOR FURNISHED)" IS BASED ON THE GEOMETRIC VOLUME OF THE DIFFERENCE BETWEEN THE PROPOSED SURFACE MODEL AND THE EXISTING SURFACE MODEL. THE PLAN QUANTITY HAS NOT BEEN ADJUSTED TO ACCOUNT FOR THE REMOVAL OR ADDITION OF TOPSOIL AND THE REMOVAL OR ADDITION OF RIPRAP. NO MODIFICATIONS WILL BE MADE TO THE PLAN QUANTITY FOR ANY REASON.

11. THE PLAN ASSUMES ALL MATERIAL EXCAVATED FROM THE RIVER CHANNEL WILL NOT BE SUITABLE FOR REUSE FOR PROJECT EMBANKMENTS. EXCAVATED MATERIAL MAY BE REUSED IF APPROVED BY THE COUNTY ALL EXCAVATIONS ARE SUBSIDIARY TO OTHER ITEMS IN THE CONTRACT. CHANNEL EXCAVATION QUANTITIES SHOWN IN THESE PLANS ARE FOR INFORMATION ONLY.

12. 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 IS SUBJECT TO U.S. CORPS OF ENGINEERS PERMITTING REGULATIONS. EXCAVATION REQUIRED FOR PLACING SELECT SOIL IS INCLUDED IN THE COMMON EXCAVATION QUANTITIES.

13. EXISTING UTILITIES AND THEIR LOCATIONS, AS SHOWN ON THE PLANS, REPRESENT THE BEST INFORMATION OBTAINABLE FOR DESIGN. LOCATION INFORMATION HAS BEEN OBTAINED FROM THE VARIOUS UTILITY COMPANIES, EITHER FROM COMPANY RECORD DRAWINGS OR COMPANY PROVIDED FIELD LOCATION. THE PLAN LOCATIONS SHOWN ARE NOT GUARANTEED. ADDITIONAL EXISTING UTILITIES MAY ALSO BE ENCOUNTERED.

14. ALL SAW CUTS SHALL BE FULL DEPTH. THIS WORK SHALL NOT BE PAID FOR DIRECTLY, BUT SHALL BE SUBSIDIARY TO OTHER ITEMS OF THE CONTRACT.

15. SURFACING CROSS-SLOPE TRANSITIONS WILL BE REQUIRED WHERE THE PROPOSED SURFACE MATCHES EXISTING SURFACE. SIMILAR TRANSITIONS ARE REQUIRED TO MATCH THE PROPOSED CROWN GRADE TO EXISTING CROWN GRADE. TRANSITIONS SHALL BE MADE OVER AN ADEQUATE LENGTH TO PROVIDE A SMOOTH DRIVING SURFACE.

16. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO SATISFY HIMSELF AS TO THE EXISTENCE OF UNUSUAL SUBSURFACE CONDITIONS AND TO ALLOW FOR SUCH CONDITIONS IN THE BID.

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

PROJECT SURVEY CONTROL

Datum:
The Horizontal Datum is based on the Kansas Coordinate System of 1983, NAD83(2011), EPOCH:2010.0000, South Zone. Coordinates shown have been modified to the ground using a combined adjustment factor of 1.000124556. State Plane coordinates can be calculated by multiplying the shown values by 0.999887546.

All elevations shown are based on the NAVD 88 vertical datum, Geoid 18.

CONTROL:

Pt. No.	North	East	Elev.	Description
CP/BM-10	1820758.857	1620383.989	1435.185	5/8" Rebar w/ 2" MKEC Aluminum Control Cap
CP/BM-11	1820795.683	1620777.838	1428.820	Chiseled "+" on NE Bridge Concrete Curb
CP-12	1820818.731	1621441.067	1421.845	5/8" Rebar w/ 2" MKEC Aluminum Control Cap
CP-21	1819762.735	1616083.154	1418.430	3/4" Rebar w/ 2" MKEC Aluminum Control Cap
CP-23	1820684.466	1616040.105	1417.54	3/4" Rebar w/ 2" MKEC Aluminum Control Cap

Note:
All Control Points shown have elevations established using standard surveying procedures and can be used as temporary benchmarks. When using a Control point as a temporary benchmark, it is recommended that cross-checks be made to other control points or benchmarks to confirm elevations prior to use.

UTILITIES

The underground utilities shown hereon were marked in the field by the utility owners in response to Kansas One Call Ticket Number: 25081044 and 25151193. The surveyor makes no guarantee that the underground utilities shown comprise all such utilities in the area, either in service or abandoned. The surveyor further does not warrant that the underground utilities shown are in the exact location indicated although he does certify that they are located as accurately as possible from information available. The surveyor has not physically located the underground utilities.

Contractor will be required to provide a minimum advance notice of seventy-two (72) hours to utility companies prior to starting any excavation as follows:

Kansas one-call 1-800-344-7233
The contractor must notify the following in case of emergency.

Shannon Brinkmeyer
AT&T
(316) 268-2359

Harvey County RWD #1
(620)-837-5634

Shane Price
Evergy
(316) 261-6315

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DAKOTA JAMES PRICE LICENSED 30161 11/06/2023 KANSAS PROFESSIONAL ENGINEER

BRIDGE REPLACEMENT FOR
BRIDGE K-15.9
HARVEY COUNTY, KANSAS

GENERAL NOTES

PROJECT NO. 1401010084
SCALE NONE
DRAWN LWG | DESIGNED DJL | CHECKED JRA

NO.	REVISION	DATE

SHEET NO. 4 OF 61

S ¼" Cor. Sec. 9, T23S, R1w
Sta. 29+89.91, 0.0' Rt.
Found ⅝" Rebar

Sta. 50+00.00 Construct Br. No. 00000000040B430, 36'–48'–36' R.C. Haunched Slab Spans Bridge, 28'–0" Roadway

Install 594 c.y. Slope Protection (Light Stone)(200lb). See Sheet 19.

Install 402 c.y. Slope Protection (Light Stone)(200lb). See Sheet 19.

SE Cor. Sec. 9, T23S, R1w
Sta. 56+59.48, 0.0' Rt.
Found 1" Bolt

VEAZEY FAMILY FARM TRUST
2714 N LAKE RIDGE ST
WICHITA, KS 67205–1663

SE 1/4 SEC. 9, T23S, R1W

GAS VENT

Sta. 29+89.91, 0.0' Rt.
S ¼ Cor. Sec. 9, T23S, R1W

Sta. 49+03.01 Install 24"x39' "Entrance Pipe (CMP)" w/24" End Sections, Lt. Connect to existing inlet. See Sh. No. 33

+80.00 Temp. Const. Esmt. 120' ℄

+80.00 Temp. Const. Esmt. 120' ℄

+40.00 Temp. Const. Esmt. 40' ℄

30' Water District No. 1 Easement

Sta. 52+18.47 Install 24"x31' "Entrance Pipe (CMP)" w/24" End Sections, Lt. See Sh. No. 7

Sta. 46+99.25 Install 24"x43' "Entrance Pipe (CMP)" w/24" End Sections, Lt. See Sh. No. 7

Sta. 56+47.48
N=1820784.9247
E=1621123.6270

+20.00 Temp. Const. Esmt. 40' ℄

Sta. 46+00.00
N=1820779.5910
E=1620323.6447

EX. 40' R/W

CONST. LIMITS

EX. 40' R/W

NW 12TH ST.

CP–10

CP–11

SN WEIGHT

Sta. 44+95.48, Begin Proj. No. 1401010084

EX. 40' R/W

Sta. 48+01.09 and Sta. 48+30.86 remove concrete ditch check.

+10.00 Temp. Const. Esmt. 40' ℄

℄ Prop. Improvements = Section Line

EX. 40' R/W

Existing 2–29"x49' CMP to Remain

Sta. 46+80.22 Install 24"x50' "Entrance Pipe (CMP)" w/24" End Sections, Rt. See Sh. No. 7

+70.00 Temp. Const. Esmt. 40' ℄

+50.00 Temp. Const. Esmt. 80' ℄

Middle Branch Emma Creek

+50.00 Temp. Const. Esmt. 80' ℄

Sta. 50+00.00 Remove Br. No. 000000000400430, 34'–42'–34' SBC (Steel Beam Continuous), 26'–0" Roadway

Sta. 56+59.48, 0.0' Rt. SE ¼ Cor. Sec. 9, T23S R1W

EWY, JENNIFER A; TR
122 ERB ST
HESSTON, KS 67062–9114

NE 1/4 SEC. 16, T23S, R1W

LEGEND

- Full Depth Asphalt Repair
- 2" Mill and Overlay
- Bridge Approach
- Aggregate Sufacing
- Top of Guardrail Berm
- Slope Protection (Light Stone)(200lb)

N

SCALE

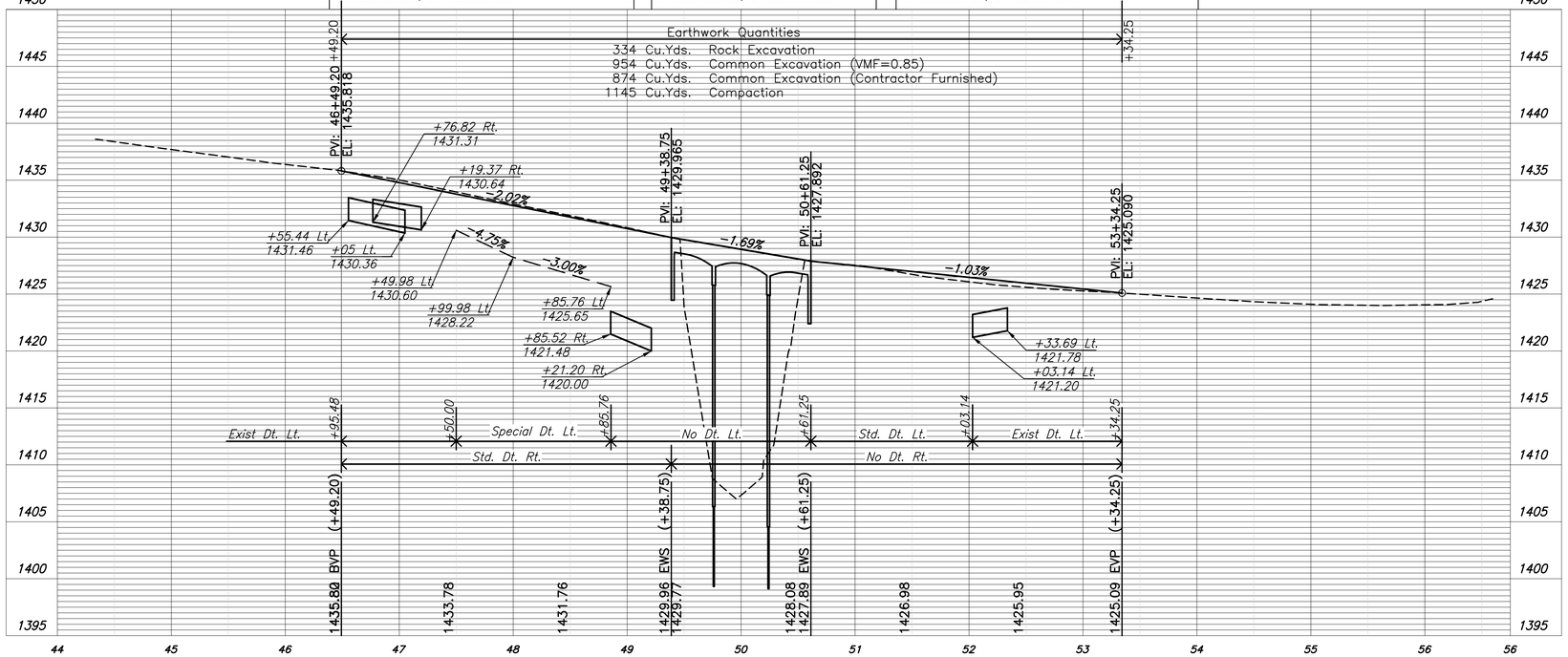
PLAN: Lat. & Long. 50' 0 50' 100'

PROFILE: Horiz. same as above, Vert. 5' 0

CP/BM–10 ⅝" Rebar with MKEC aluminum control cap
Sta. 46+60.20, 21.1' Lt. Elev. 1435.19
N=1820758.857, E=1620383.989

CP/BM–11 Chiseled Plus
Sta. 43+95.21, 17.0' Rt. Elev. 1428.82
N=1820795.683, E=1620777.838

CP–12 ⅝" Rebar with MKEC 2" Aluminum control cap
Sta. 57+17.69, 31.6' Rt. Elev. 1421.85
N=1820818.731, E=1621441.067



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DAKOTA JAMES LEE
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30161
11/04/2025
KANSAS
PROFESSIONAL ENGINEER

BRIDGE REPLACEMENT FOR

BRIDGE K-15.9

HARVEY COUNTY, KANSAS

PLAN & PROFILE

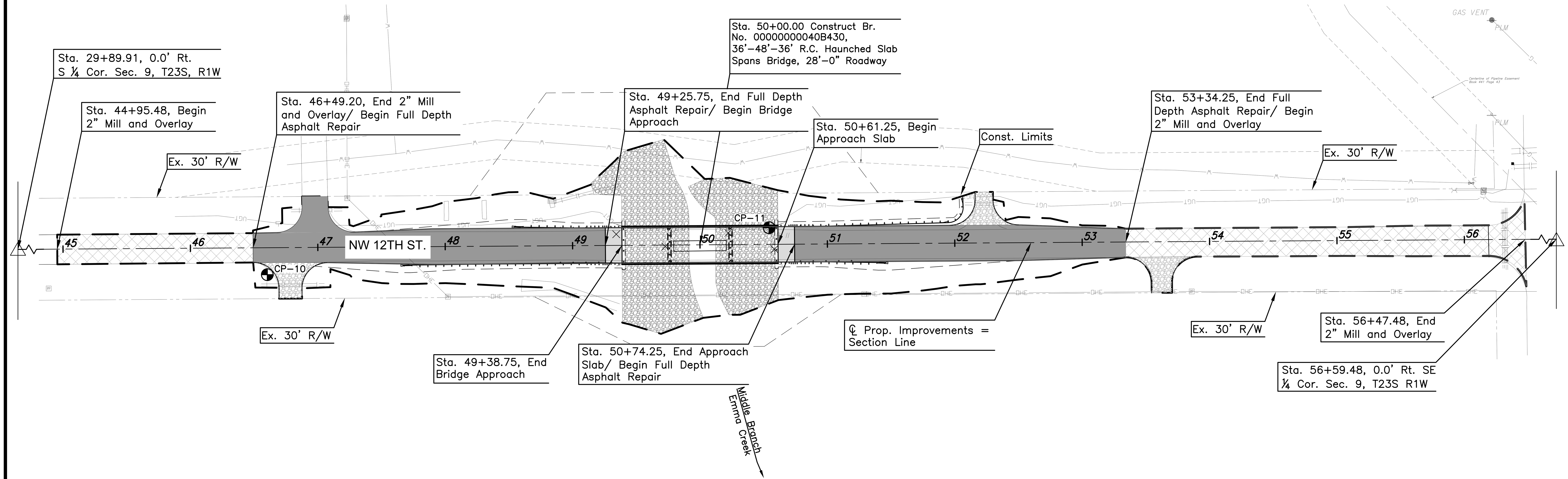
PROJECT NO. 1401010084

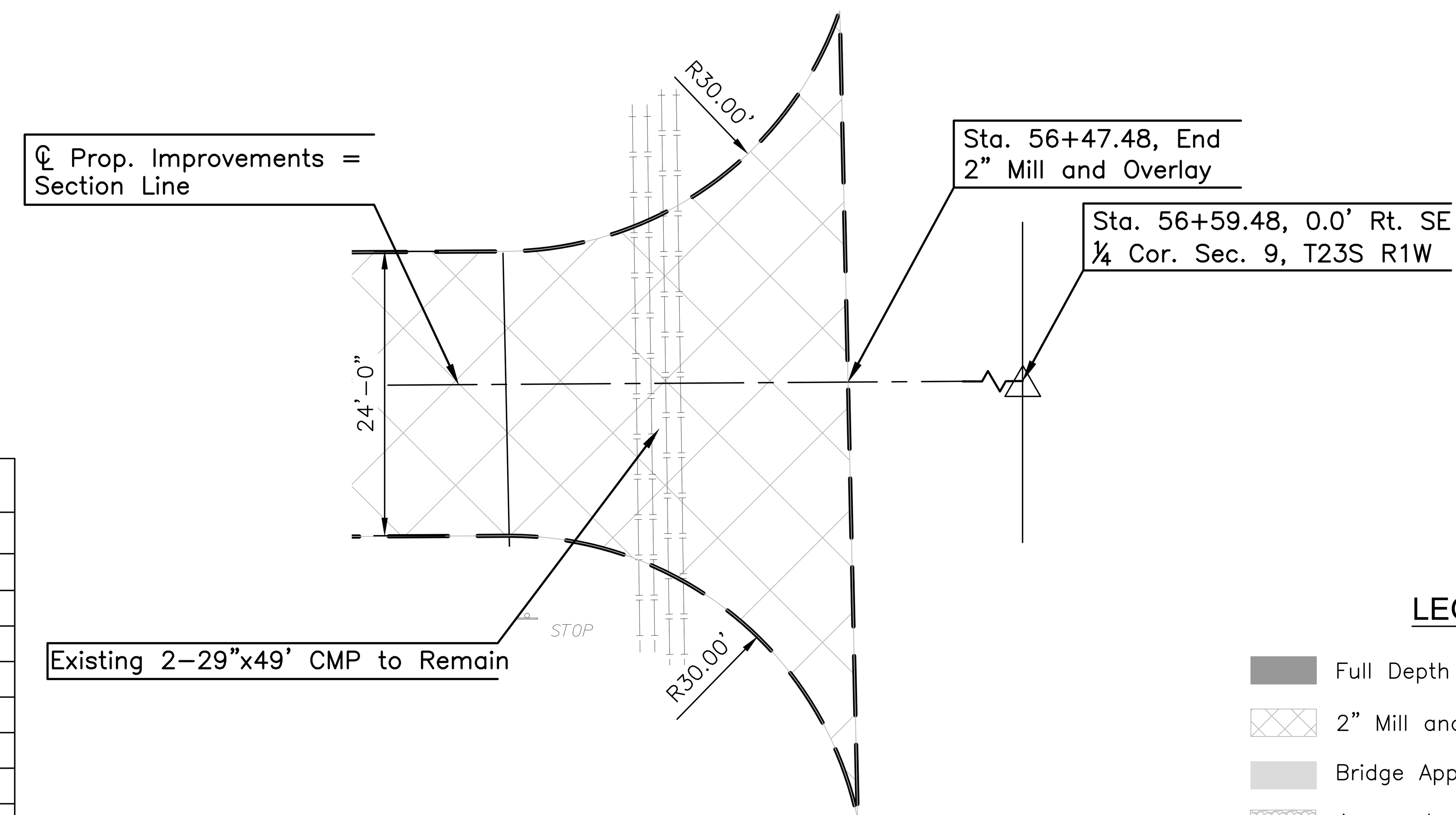
SCALE 1" = 50'

DRAWN	DESIGNED	CHECKED
LWG	DJL	JRA

NO.	REVISION	DATE

SHEET NO.
5 OF 61





Pavement Improvements

Type	Station to Station	S.Y.	Pavement Widths
2" Mill & Overlay	44+95.48 to 46+49.20	396	12'-0"
Full Depth Asphalt Repair	46+49.20 to 47+07.36	152	12'-0"
Full Depth Asphalt Repair	47+07.36 to 47+90.00	236	Varies from 12'-0" to 14'-0"
Full Depth Asphalt Repair	47+90.00 to 49+25.75	423	14'-0"
Bridge Approach	49+25.75 to 49+38.75	41	14'-0"
Bridge Approach	50+61.25 to 50+74.25	41	14'-0"
Full Depth Asphalt Repair	50+74.25 to 52+50.18	548	14'-0"
Full Depth Asphalt Repair	52+50.18 to 53+34.25	236	Varies from 14'-0" to 12'-0"
2" Mill & Overlay	53+34.25 to 56+47.87	844	12'-0"

LEGEND

- Full Depth Asphalt Repair
- 2" Mill and Overlay
- Bridge Approach
- Aggregate Sufacing
- Top of Guardrail Berm
- Slope Protection (Light Stone)(200lb)

N

SCALE

SCALE: 1"=50'

0 50 100

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DAKOTA JAMES LEAH LICENSED 30161 KANSAS PROFESSIONAL ENGINEER 11/06/2025

BRIDGE REPLACEMENT FOR

BRIDGE K-15.9

HARVEY COUNTY, KANSAS

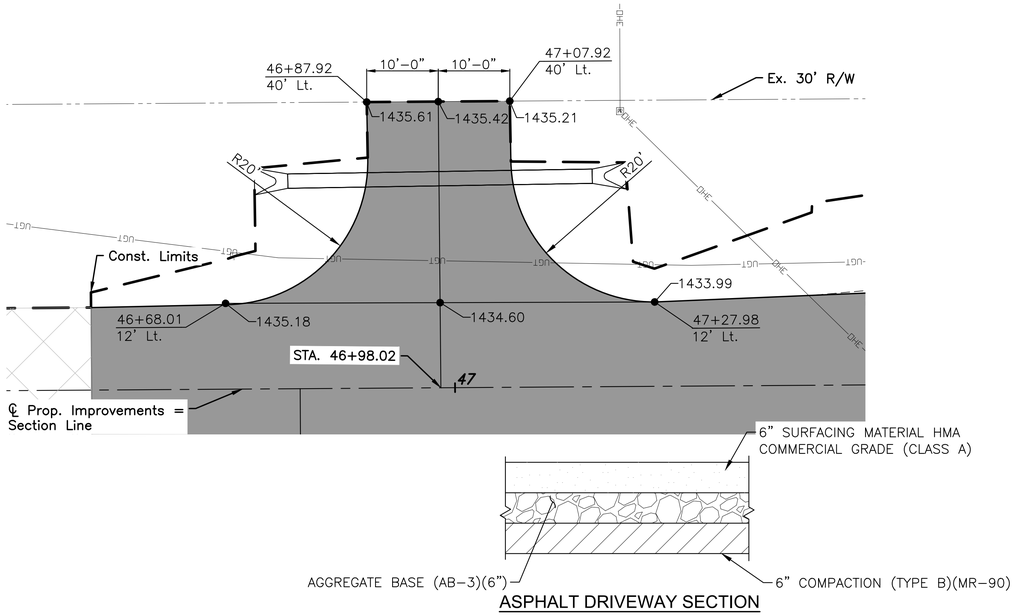
PAVEMENT IMPROVEMENTS

PROJECT NO.	1401010084
SCALE	NTS

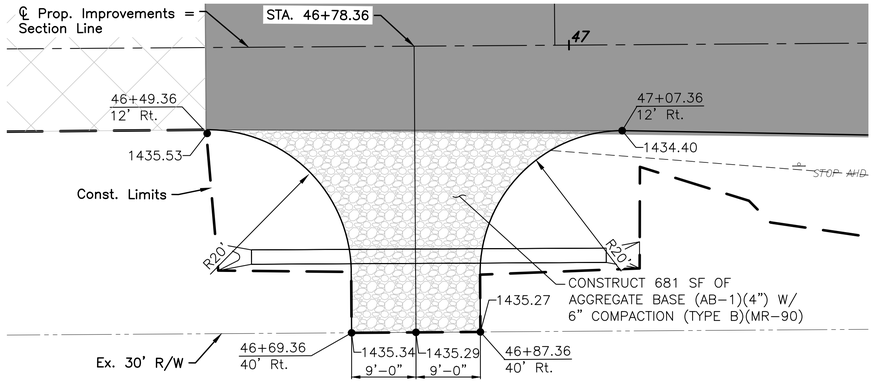
DRAWN	DESIGNED	CHECKED
LWG	DJL	JRA

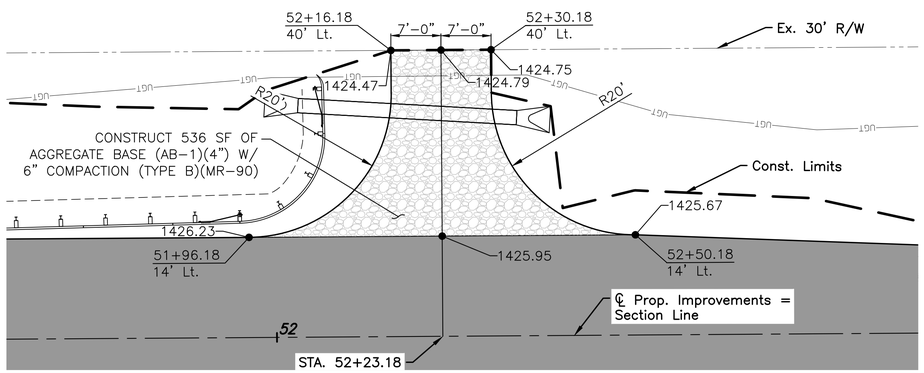
NO.	REVISION	DATE

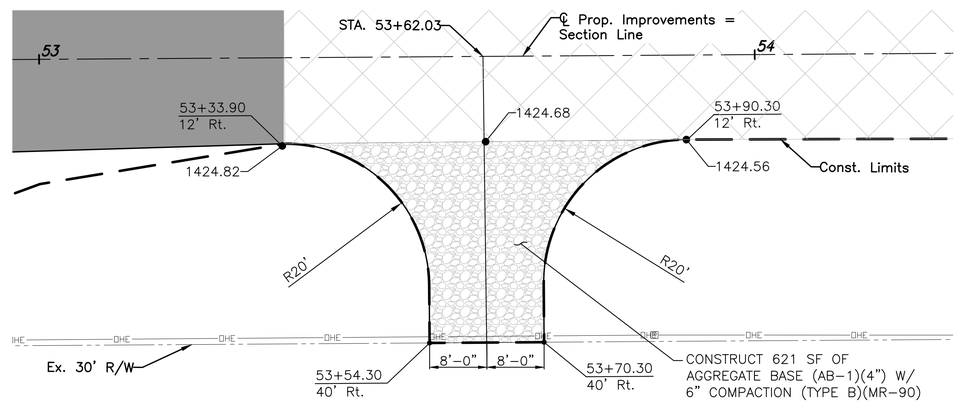
SHEET NO. 6 OF 61



ASPHALT DRIVEWAY SECTION







LEGEND

- Full Depth Asphalt Repair
- 2" Mill and Overlay
- Aggregate Sufacing

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DAKOTA JAMES ALLEN
LICENSED
30161
11/06/2025
KANSAS
PROFESSIONAL ENGINEER

BRIDGE REPLACEMENT FOR

BRIDGE K-15.9

HARVEY COUNTY, KANSAS

DRIVEWAY
GRADING PLAN

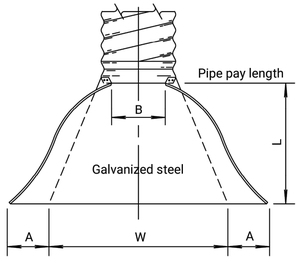
PROJECT NO.	
	1401010084
SCALE	
	1" = 10'

DRAWN	DESIGNED	CHECKED
LWG	DJL	JRA

NO.	REVISION	DATE

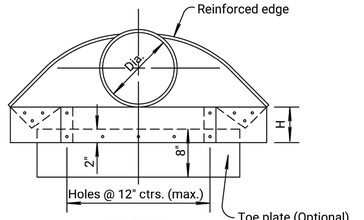
SHEET NO.
7 OF 61

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	8	61

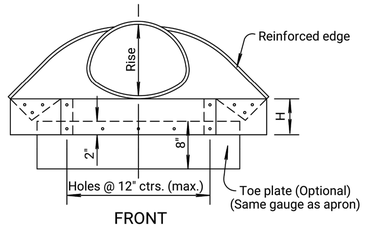


PLAN

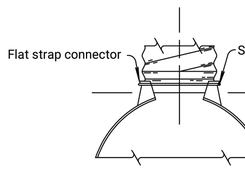
(Illustrated with Type #3 Connection)



FRONT

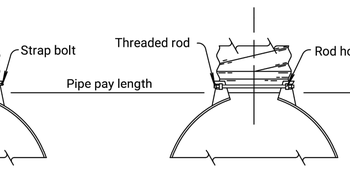


FRONT



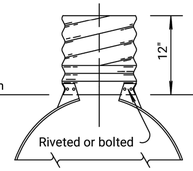
TYPE 1

Available in sizes 12" through 24" only.



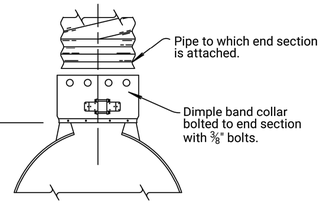
TYPE 2

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



TYPE 3

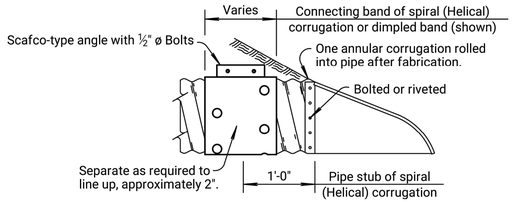
Available in sizes 42" through 96" Round and 60"x46" through 81"x59" Pipe-Arches.



TYPE 5

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

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



SPIRAL (HELICAL) CORRUGATION

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

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

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

Bid Designation Sq. Ft.	Nom. W.W. Area Sq. Ft.	Pipe Arch	Dimensions in Inches 2⅔" x ½" Corrugations						Dimensions in Inches 3" x 1" or 5" x 1" Corr.						Approx. Slope
		Span & Rise	CS, ACS or CA Gauge	A (min.)	B (max.)	H (min.)	L (±2")	W (min.)	CS, ACS or CA Gauge	A (min.)	B (max.)	H (min.)	L (±2")	W (min.)	
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

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.

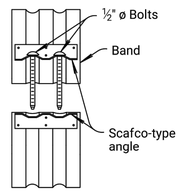
Toe plate extension, when specified, is an accessory and shall be the same gauge and metal as end section. Toe plate shall be punched to match holes in apron lip and attached with furnished 3#8" diameter nuts & bolts.

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.

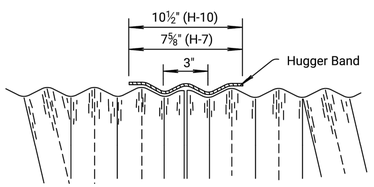
Multiple panel end sections may contain dual gauges of like metal and shall have lap seams which are tightly joined with rivets or bolts. For 60" and larger diameter round pipe end sections and 77"x52" arch pipe end sections, the reinforced edges are supplemented with stiffener angles. The angles are 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.

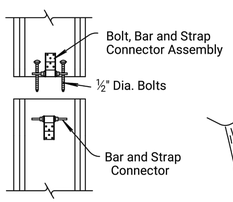


CONNECTION DETAIL
H-7 or H-10 BAND

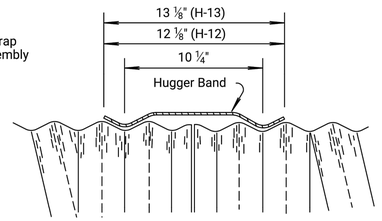


UNIVERSAL REFORMED END with
H-7 or H-10 HUGGER BAND

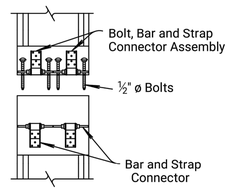
DETAILS FOR H-7 HUGGER BAND (12" thru 36")
or H-10 HUGGER BAND (12" thru 120")



CONNECTION DETAIL
SINGLE HARNESS



UNIVERSAL REFORMED END with
HUGGER BAND



CONNECTION DETAIL
DOUBLE HARNESS

Pipe Dia. Inches	Minimum Gauge of Round Pipe					
	2⅔" x ½" Corr.	3" x 1" Corr.		5" x 1" Corr.	2⅔"x ½" Corr.	3" x 1" Corr.
	CSP or ACSP	CSP or ACSP		CSP or ACSP	CAP	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

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

Bid Designation Sq. Ft.	Pipe Dimension Span & Rise	Sq. Ft.	Equiv. Round Pipe Diameter	Minimum Gauge of Arch Pipe				
				2⅔"x ½" Corr.	3" x 1" Corr.	5" x 1" Corr.	2⅔"x ½" Corr.	3" x 1" Corr.
				CSP or ACSP	CSP or ACSP	CSP or ACSP	CAP	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

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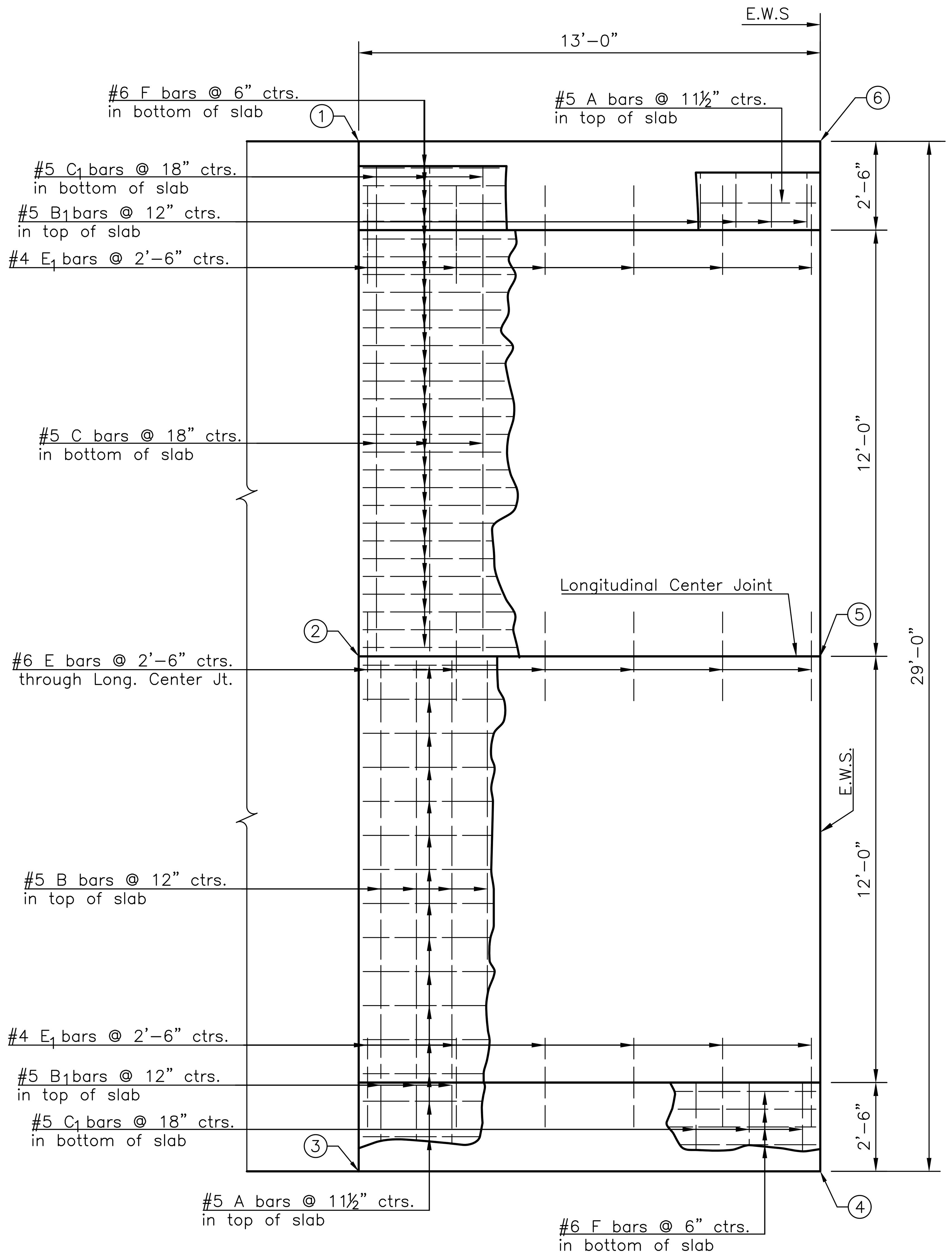
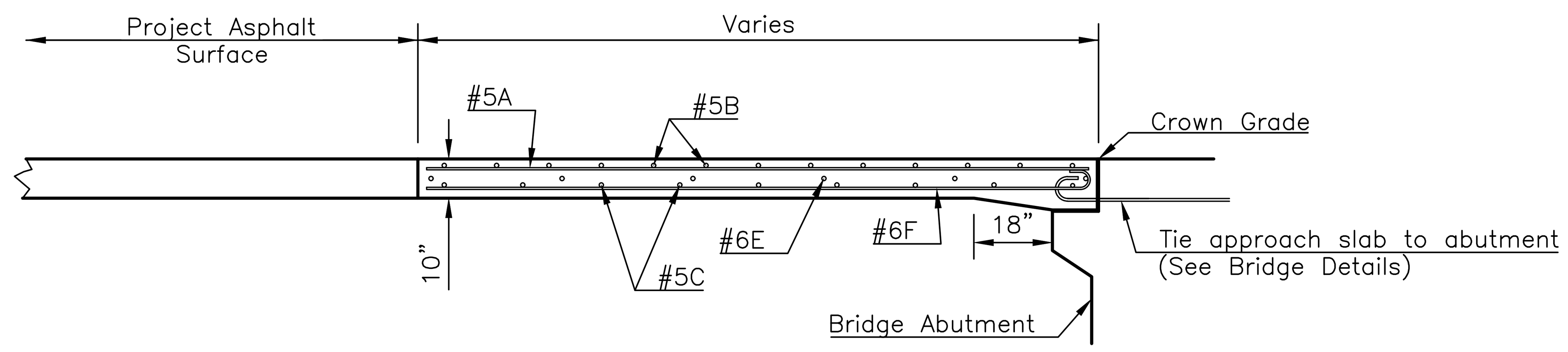
GENERAL NOTE

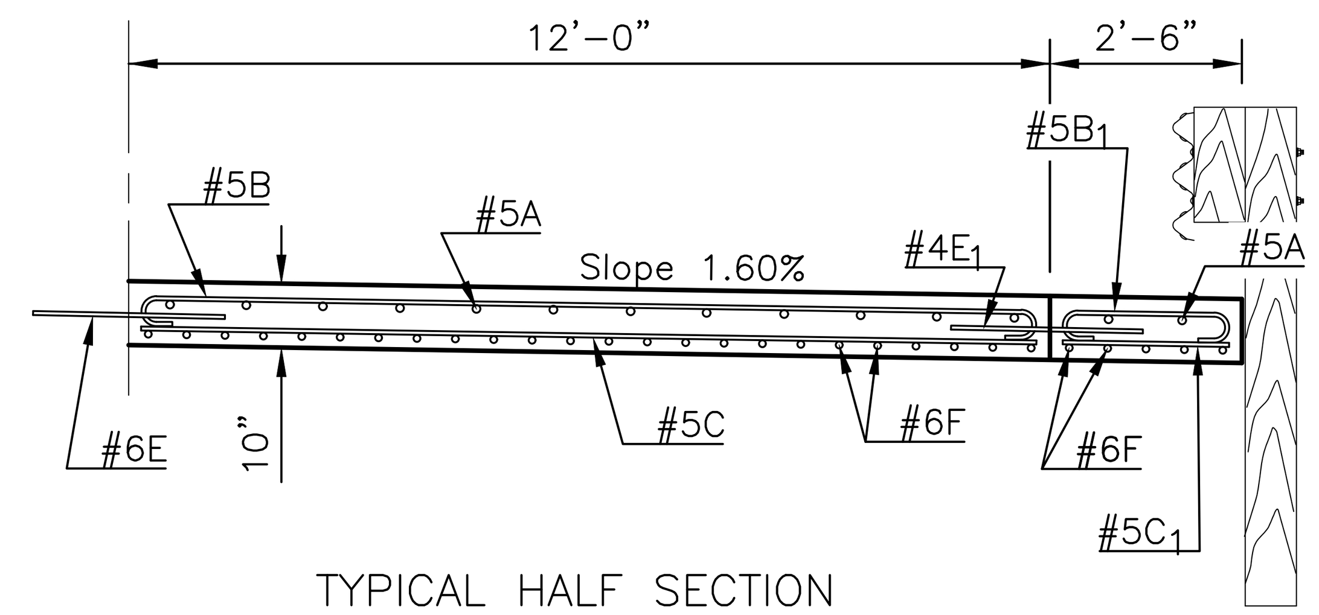
1. Special Concrete Bridge Approach shall be paid for as Sq. Yds. of Concrete Pavement (10" Unif.)(AE)(Br. App.) and includes all work and materials required to construct the approach slab as shown on this sheet.
2. All work and materials required for installation of joint material shall be subsidiary to this bid item.
3. At the Contractor's option #4x3'–0" tie bars @ 15" centers may be substituted for the #6 e bars at 2'–6" centers.
4. All reinforcing steel shall be epoxy coated.
5. See Standard Drawing RD711 for details of joints and edge curb.
6. Clearance from the face of concrete for all reinforcing steel shall be 2 inches.
7. Standard reinforcing bar hooks in accordance with the latest ACI specifications shall be used throughout.



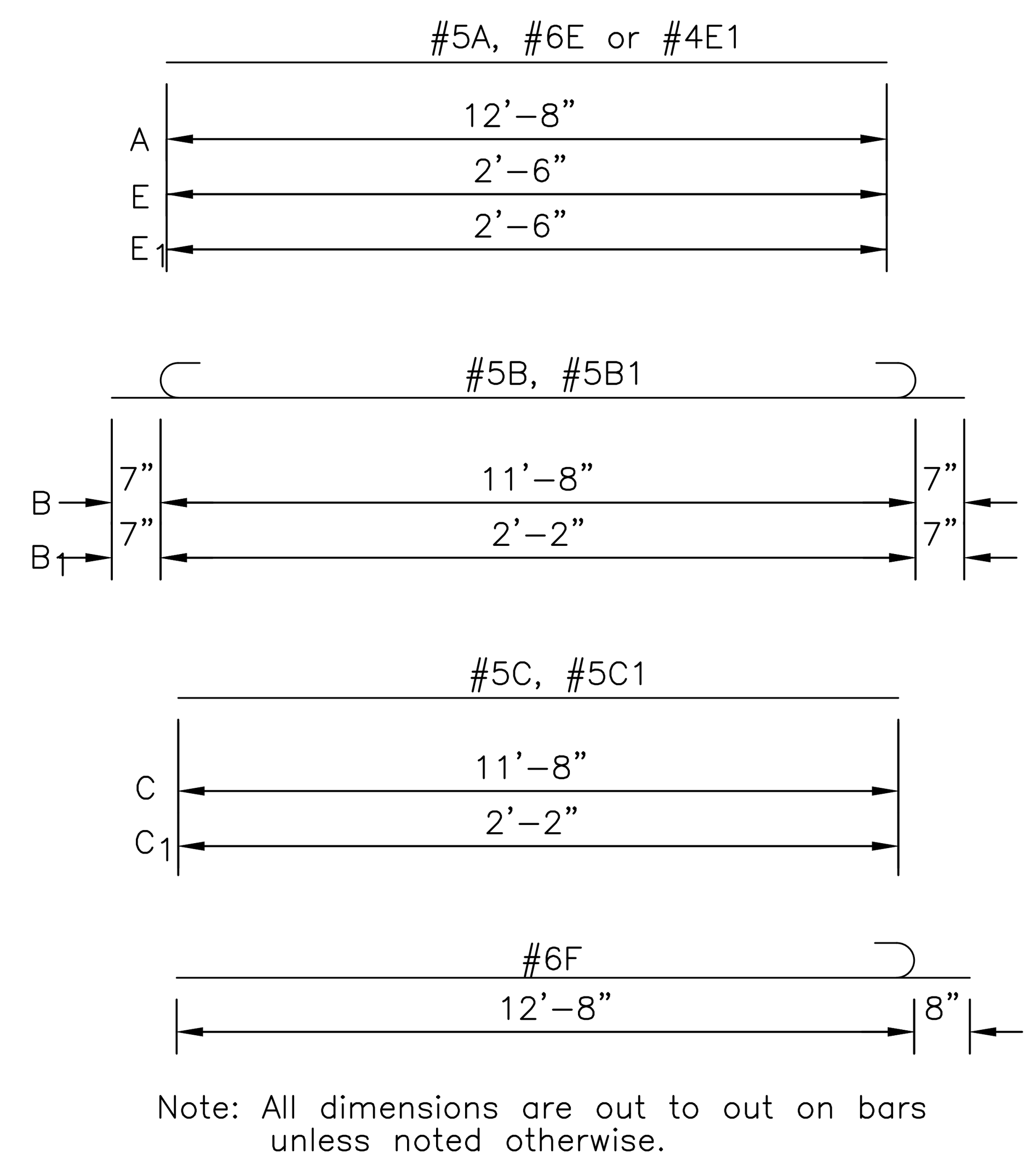
PLAN FOR BRIDGE APPROACH
(No Scale)



LONGITUDINAL SECTION ON CENTER LINE
(No Scale)



TYPICAL HALF SECTION
(No Scale)



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

BENDING DIAGRAMS
(No Scale)

BILL OF REINFORCING STEEL
(Grade 60, Epoxy Coated)

	Straight Bars				Bent Bars			
	Mark	Size	No.	Length	Mark	Size	No.	Length
APPROACH SLAB	A	#5	32	12'–8"	f	#6	58	13'–4"
	C	#5	18	11'–8"	B	#5	26	12'–10"
	C1	#5	18	2'–2"	B1	#5	26	3'–4"
	E	#6	6	2'–6"				
	E1	#4	12	2'–6"				

WEST APPROACH SLAB POINTS

POINT #	NORTHING	EASTING	ELEVATION
1	1820796.26	1620649.29	1429.94
2	1820781.76	1620649.39	1430.23
3	1820767.26	1620649.48	1429.94
4	1820767.35	1620662.48	1429.73
5	1820781.85	1620662.38	1429.96
6	1820795.35	1620662.29	1429.73

EAST APPROACH SLAB POINTS

POINT #	NORTHING	EASTING	ELEVATION
1	1820797.25	1620797.78	1427.47
2	1820782.75	1620797.88	1427.76
3	1820768.25	1620797.98	1427.47
4	1820768.16	1620784.98	1727.66
5	1820782.66	1620784.88	1427.89
6	1820797.16	1620784.78	1427.66

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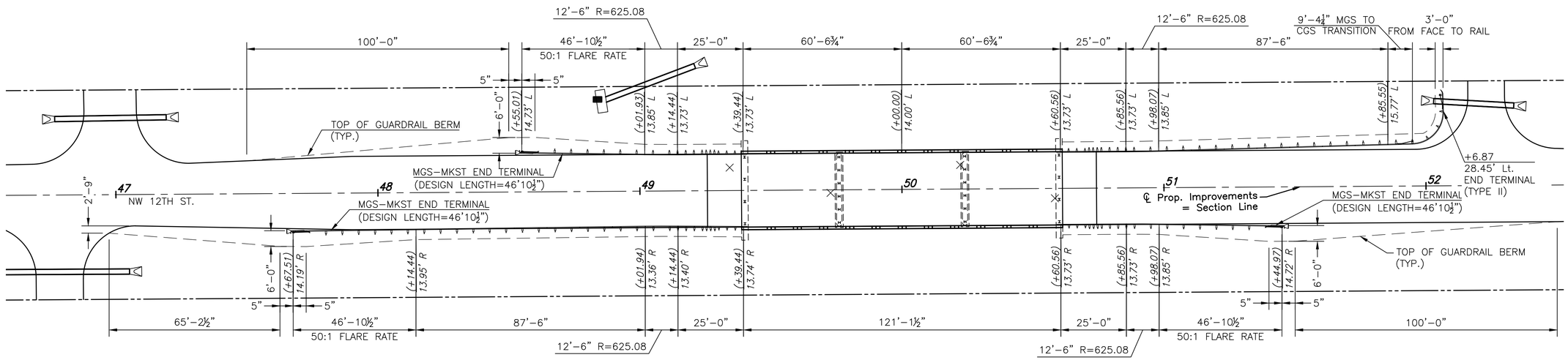
BRIDGE REPLACEMENT FOR
BRIDGE K-15.9
HARVEY COUNTY, KANSAS

CONCRETE BRIDGE APPROACH PAVEMENT

PROJECT NO. 1401010084
SCALE NTS

DRAWN	DESIGNED	CHECKED
LWG	DJL	DMU

NO.	REVISION	DATE



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DAKOTA JAMES LICENSED 30161 11/06/2025 KANSAS PROFESSIONAL ENGINEER

BRIDGE REPLACEMENT FOR

BRIDGE K-15.9

HARVEY COUNTY, KANSAS

GUARDRAIL LAYOUT

PROJECT NO.	
	1401010084
SCALE	
	1" = 20'

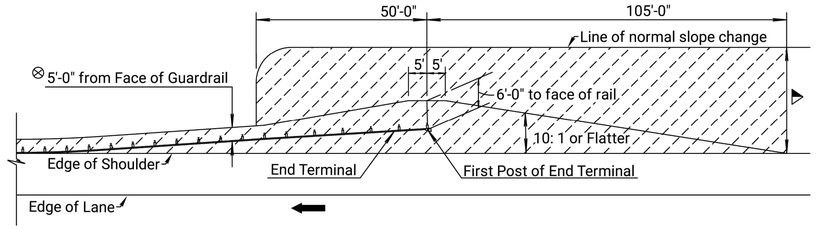
DRAWN	DESIGNED	CHECKED
LWG	DJL	DMU

NO.	REVISION	DATE

SHEET NO.
10 OF 61

GUARDRAIL CLEAR AREA

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



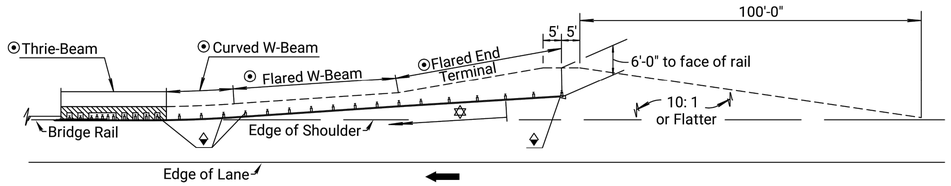
Keep Area Free of Stockpiled Material, Equipment, or Other Obstacles, Such as Temporary Signs, Regardless of Crash Worthiness. This Clear Area Extends 105 Feet in Advance of and 50 Feet behind the First Post of the Guardrail End Terminal and Then, in Order to Maintain Full Post Spacing, Continues 5 Feet 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

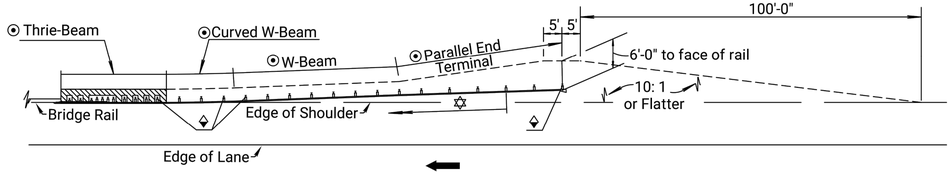
FLARED GUARDRAIL DETAIL

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)

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	11	61

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.

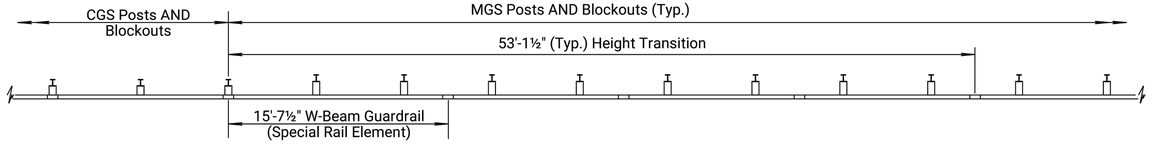
Lap w-beam and thrie-beam guardrail splices, in the direction of permanent traffic, even where temporary traffic may be carried in the opposite direction of the final traffic configuration. Lap end terminal splices per the Manufacturer's Installation Manual in the direction of permanent traffic, even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

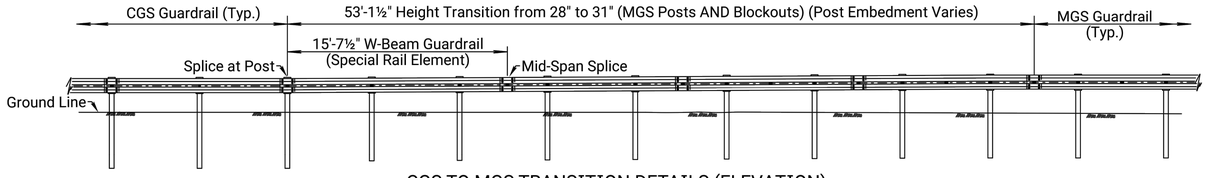
Where pavement with a thickness less than or equal to 8" is encountered during installation, use the details shown on KDOT's 'Guardrail Post Details' Standard Drawings to provide openings in the pavement for the guardrail posts. Where pavement with a thickness greater than 8" or geologic rock is encountered 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.

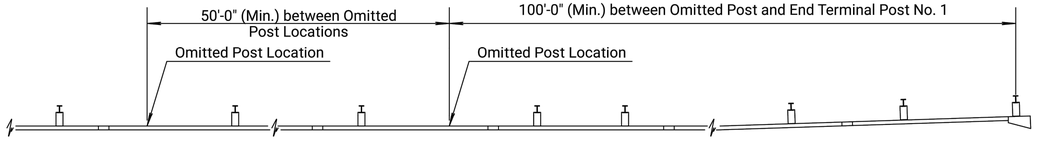
All work and materials required for guardrail end terminal installations are paid for under the bid item for the selected guardrail end terminal. See the table on this sheet for the appropriate end terminal bid item information.



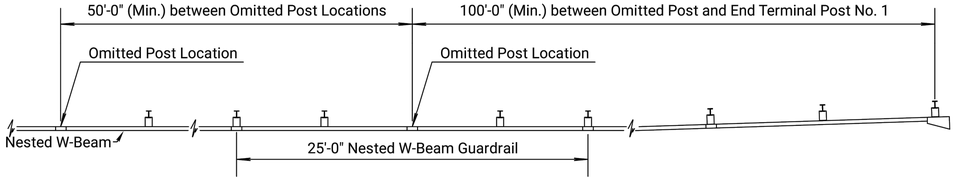
CGS TO MGS TRANSITION DETAILS (PLAN)



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"

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

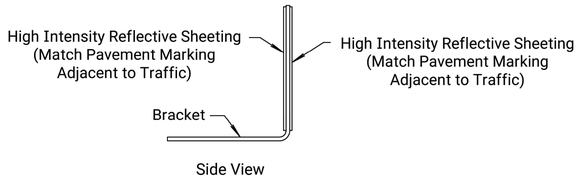
GUARDRAIL AUXILIARY DETAILS

RD606

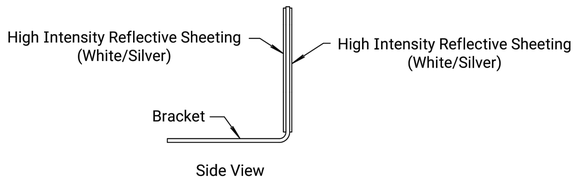
FHWA APPROVAL	09-25-18	APP'D.	Scott W. King
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	12	61

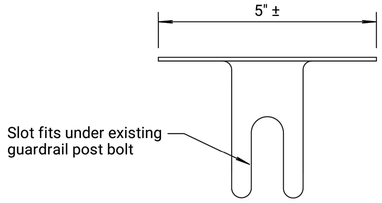
Flexible Marker
One-Way Traffic

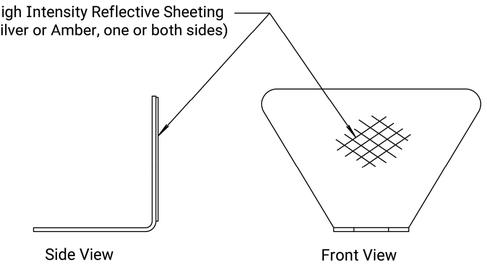


Flexible Marker
Median Locations



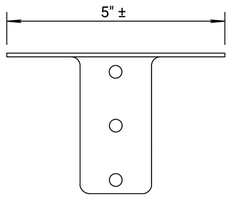
Flexible Marker
Two-Way Traffic



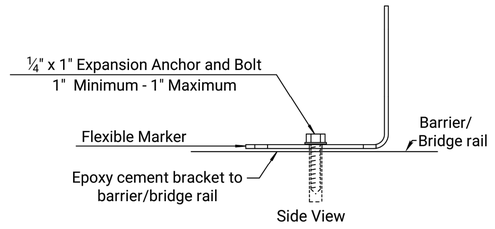


Flexible Guardrail Marker

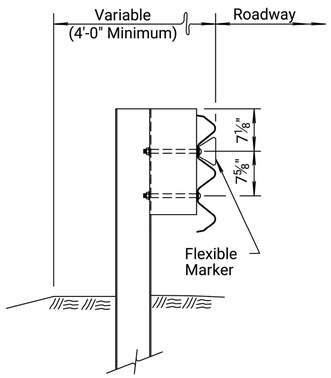
(High Impact Polycarbonate approx. .085" thick, 5¼" x 3")



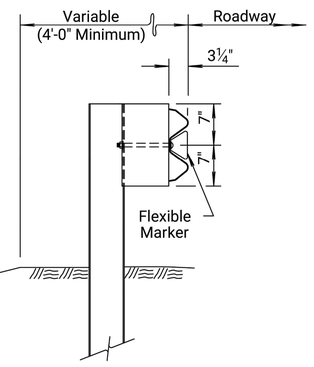
Barrier/Bridge Rail



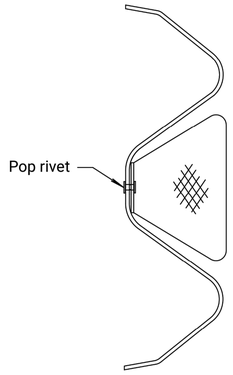
Method of Attaching Flexible
Marker to Barrier/Bridge Rail



THRIE-BEAM GUARDRAIL

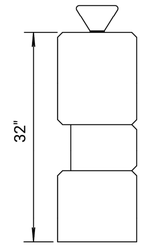


W-BEAM GUARDRAIL

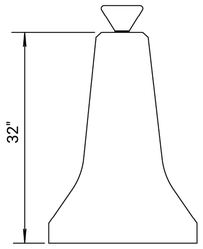


Typical Mounting on W-Beam

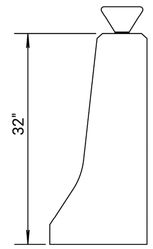
Pop rivet attachment to Guardrail when necessary.



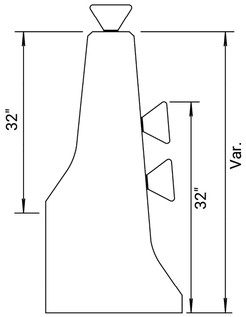
CORRAL RAIL



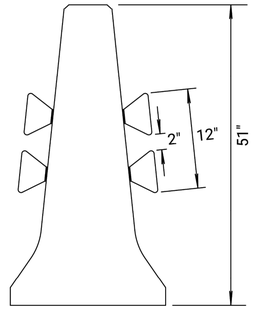
TYPE I CSB



TYPE II CSB or
F-SHAPED BRIDGE RAIL



TYPE III CSB



TYPE IV CSB

TYPICAL BARRIER/BRIDGE RAIL MOUNTING DETAILS

GENERAL NOTES

Install flexible markers on a post behind the guardrail bolt head on the traffic side of guardrail installations at a spacing not to exceed 25'. No marker is installed between the head and post #5 when the guardrail is terminated with a crashworthy end terminal.

Install flexible markers on the top of bridge rails at a spacing not to exceed 50', except for long bridges (greater than 200' long), where spacing may be increased to 100'.

Install flexible markers on the top of concrete safety barrier at a spacing not to exceed 100', except for barrier along a horizontal curve or along ramps and ramp tapers, where spacing is not to exceed 50'.

Where the height of the bridge rail or concrete barrier is greater than 32", mount the flexible markers on the side of the barrier at a height of 32" as shown on this sheet.

For guardrail, bridge rail, or concrete safety barrier located on two-way roadways, use flexible markers with white/silver high intensity reflective sheeting on both sides.

For guardrail located on one-way or divided roadways, use flexible markers with reflective sheeting installed on the approach traffic side of the bracket only. For bridge rail or concrete safety barrier located on the outside edge of one-way or divided roadways, use flexible markers with reflective sheeting installed on the approach traffic side of the bracket only. For bridge rail or concrete safety barrier located in the median, use flexible markers with reflective sheeting installed on both sides of the bracket. Match the color of the marker (yellow/amber or white/silver) to the color of the pavement marking adjacent to the traffic lane.

Use High Impact Polycarbonate Flexible Guardrail Marker with High Intensity Reflective Sheeting or an approved equivalent, see Standard Specifications.

Use zinc or cadmium plated fasteners that comply with Standard Specifications.

Work and materials required for installation of markers on guardrail, bridge rail, or concrete safety barrier are subsidiary to other bid items in the contract.

Install flexible markers for the final (permanent) traffic configuration.

NO.	DATE	REVISIONS	BY	APP'D
09	09-11-17	Rev. Det. Markers, Rev. Gen. Note	A.L.R.	S.W.K.
08	11-15-10	Revised notes	S.W.K.	J.O.B.
07	12-21-08	AKT marker or approved equal	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

MARKER DETAILS FOR GUARDRAIL, BARRIER, AND BRIDGE RAILS

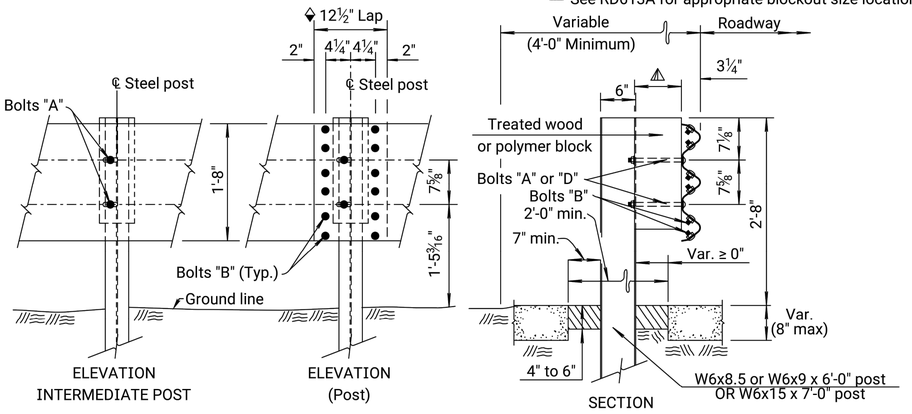
RD610

FHWA APPROVAL	03-15-18	APP'D.	Scott W. King
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

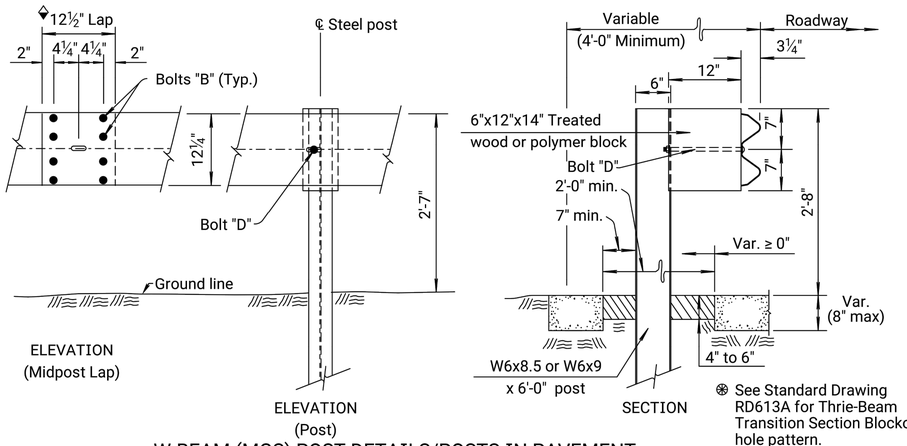
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	13	61

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

⚠ See RD613A for appropriate blockout size location.



THRIE BEAM POST DETAILS/POSTS IN PAVEMENT

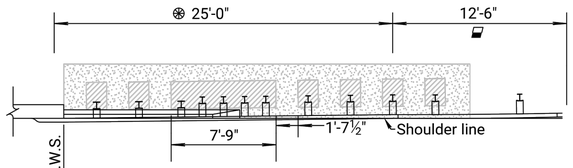


⊛ See Standard Drawing RD613A for Thrie-Beam Transition Section Blockout hole pattern.

✡ Non-Metallic (Polymer) or Treated Wood Block

See Guardrail Layout Sheets for Details.

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



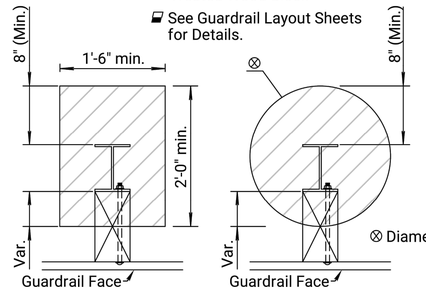
POSTS IN PAVEMENT

(Not to Scale)

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

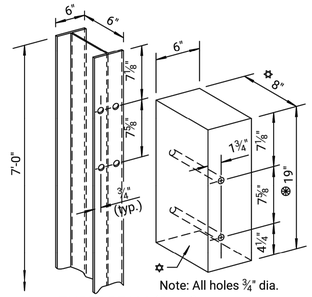
▨ Pavement (Concrete or Asphalt)

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

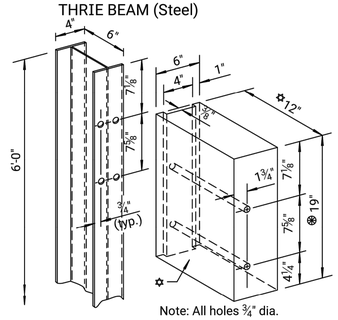


⊗ Diameter may vary from 1'-6" (min.) to 2'-0".

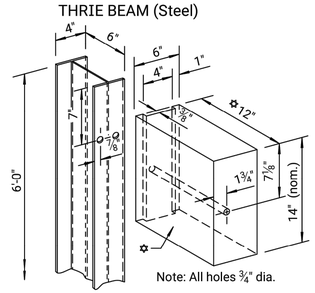
PLAN
(ALTERNATE GEOMETRIES)



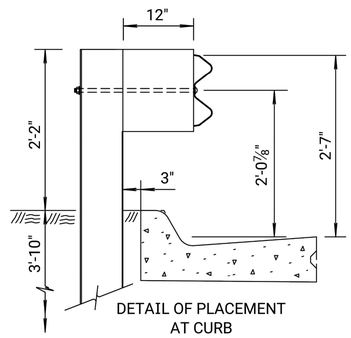
THRIE BEAM (Steel)



THRIE BEAM (Steel)



"W" BEAM (Steel)



DETAIL OF PLACEMENT
AT CURB

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

GENERAL NOTES (Steel Posts)

Use grade of steel for steel posts that meet the requirements of the standard specifications.

Hot dip galvanize the posts after fabrication, see standard specifications.

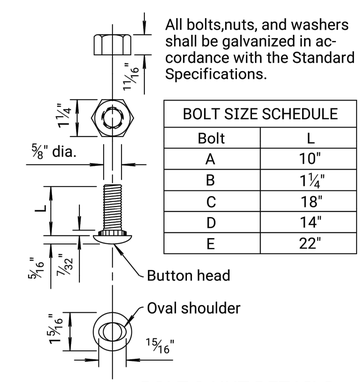
Wood blockouts may be used through the 25'-0" thrie-beam section with wood or polymer blockouts used throughout the remainder of the w-beam installation. The blockout size and material used in the guardrail end terminal may be independent from the remainder of the installation. For wood/polymer blockout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

Use S4S rectangular blockouts for Thrie-Beam/W-Beam installation.

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

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

All dimensions are nominal and are subject to manufacturing tolerances. Excavation including rock, shale, and other materials for erection of Guardrail is subsidiary to various bid items for which payment is made.



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

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

BOLT & NUT DETAILS

NO.	DATE	REVISIONS	BY	APP'D
05	09-24-15	Separated Steel/Wood Post Details	S.W.K.	S.W.K.
04	11-08-12	Revised Detail, Posts in Pavement	S.W.K.	J.O.B.
03	08-01-12	Revised Note to Designer	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL POST (STEEL) (MGS) DETAILS

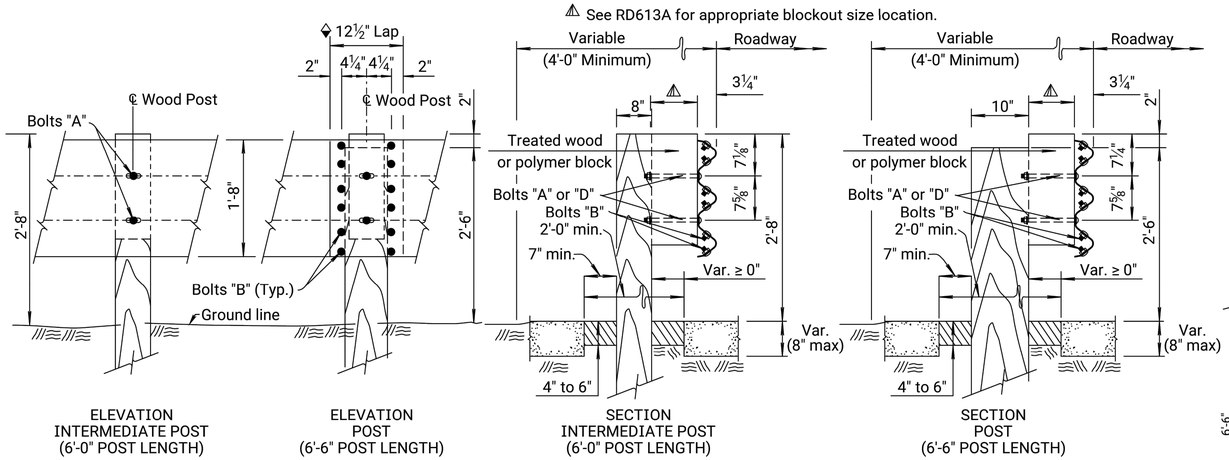
RD611A

FHWA APPROVAL	01-29-16	APP'D.	Scott W. King
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	14	61

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

⚠ See RD613A for appropriate blockout size location.



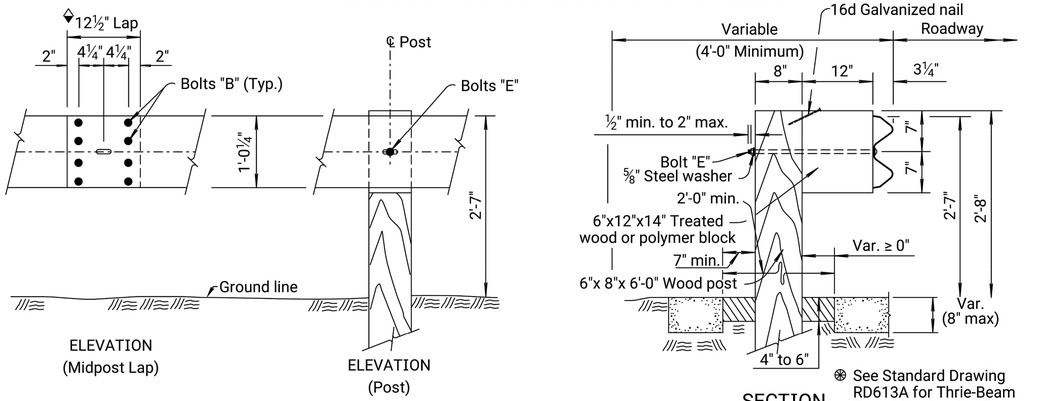
ELEVATION
INTERMEDIATE POST
(6'-0" POST LENGTH)

ELEVATION
POST
(6'-6" POST LENGTH)

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

SECTION
POST
(6'-6" POST LENGTH)

THRIE BEAM POST DETAILS/POSTS IN PAVEMENT



ELEVATION
(Midpost Lap)

ELEVATION
(Post)

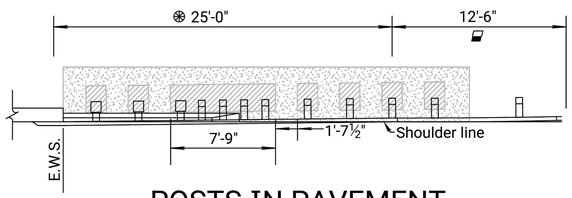
SECTION

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

✡ Non-Metallic (Polymer) or Treated Wood Block

See Guardrail Layout Sheets for Details.

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



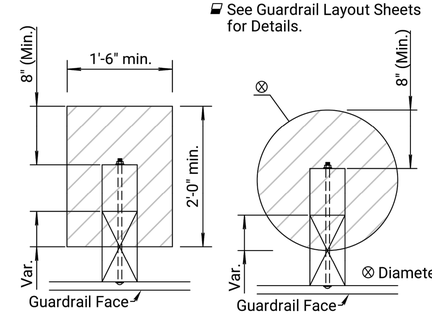
POSTS IN PAVEMENT

(Not to Scale)

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

▨ Pavement (Concrete or Asphalt)

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

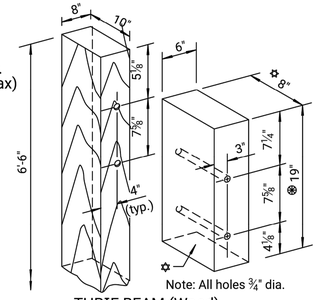


RECTANGULAR GEOMETRY

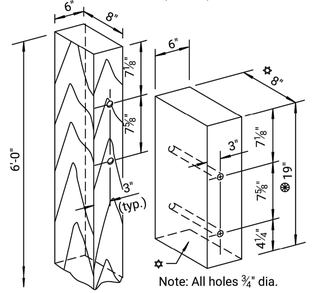
CIRCULAR GEOMETRY

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

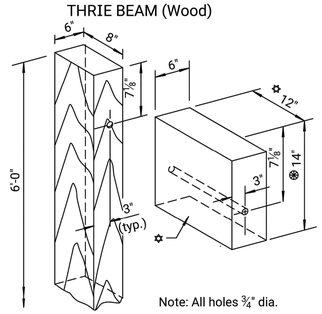
PLAN
(ALTERNATE GEOMETRIES)



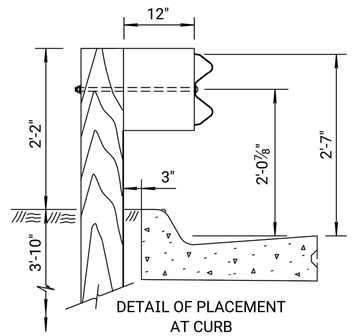
THRIE BEAM (Wood)



THRIE BEAM (Wood)

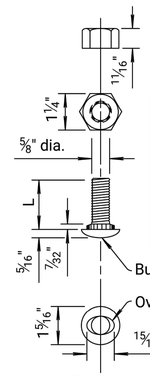


"W" BEAM (Wood)



DETAIL OF PLACEMENT
AT CURB

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



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

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

BOLT & NUT DETAILS

GENERAL NOTES (Wood Posts)

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

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

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

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

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

All dimensions are nominal and are subject to manufacturing tolerances.

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

NO.	DATE	REVISIONS	BY	APP'D
04	09-24-15	Initial Release	T.T.R.	S.W.K.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL POST (WOOD) (MGS) DETAILS

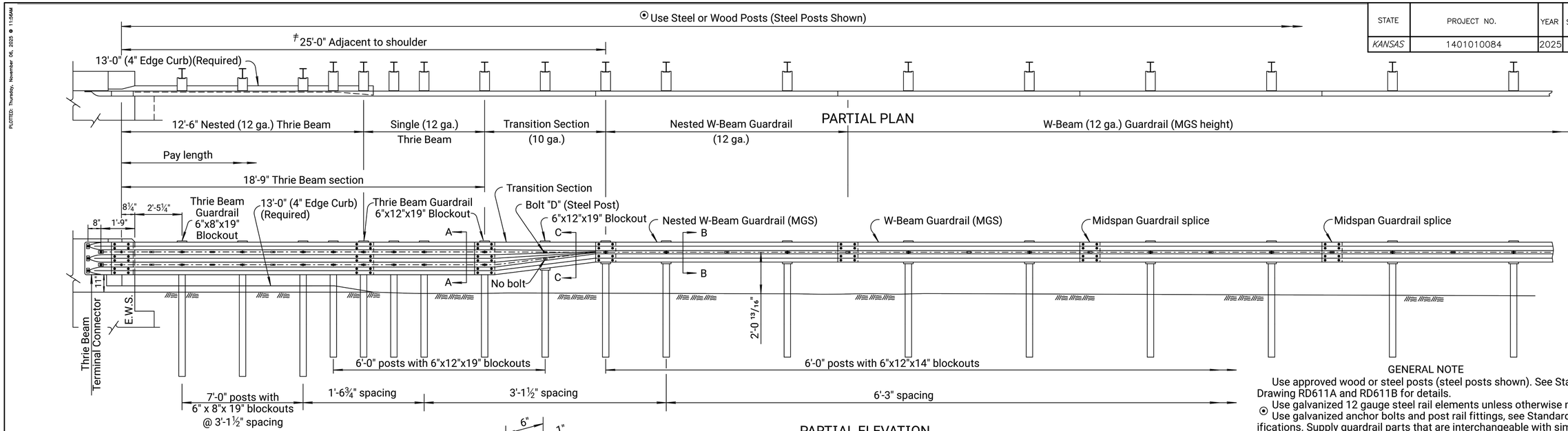
RD611B

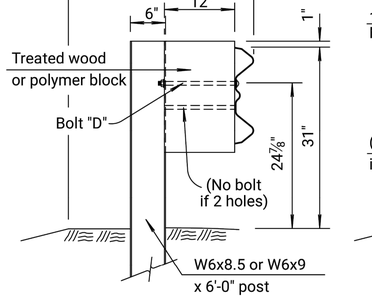
FHWA APPROVAL	01-29-16	APP'D.	Scott W. King
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

Sh. No. 14

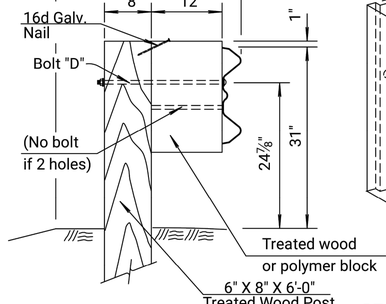
PLOTTED: Thursday, November 06, 2025 @ 11:58AM

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	15	61

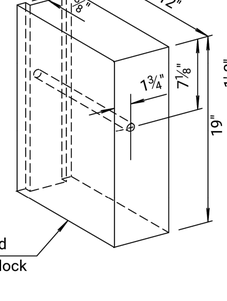




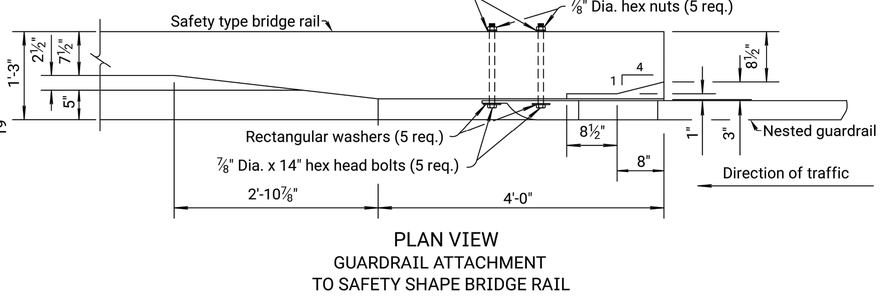
⊙ SECTION C-C (STEEL POST)



⊙ SECTION C-C (WOOD POST)



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



PLAN VIEW
GUARDRAIL ATTACHMENT
TO SAFETY SHAPE BRIDGE RAIL

GENERAL NOTE

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

⊙ Use galvanized 12 gauge steel rail elements unless otherwise noted.

Use galvanized anchor bolts and post rail fittings, see Standard Specifications. Supply guardrail parts that are interchangeable with similar parts regardless of source or manufacturer.

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

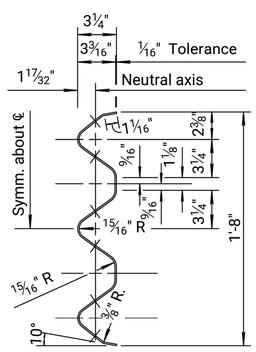
Fabricate Terminal Connector from 10 gauge steel, see Standard Specification. The connector has the same section as thrie beam guardrail. Terminal connector is Subsidiary to the bid item "Guardrail, Steel Plate (MGS)".

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

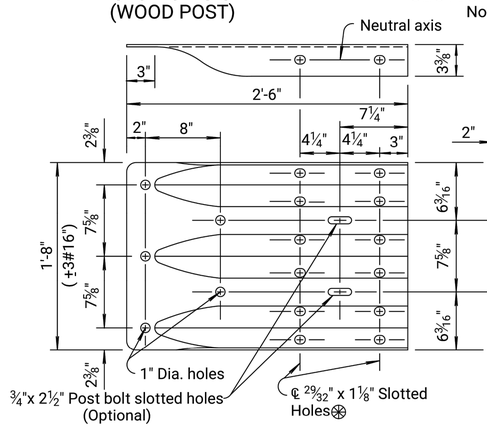
Lap guardrail splices, including terminal connector, in the direction of traffic. Where traffic is temporarily carried in the opposite direction of final configuration, lap rail splices in the direction of permanent traffic.

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

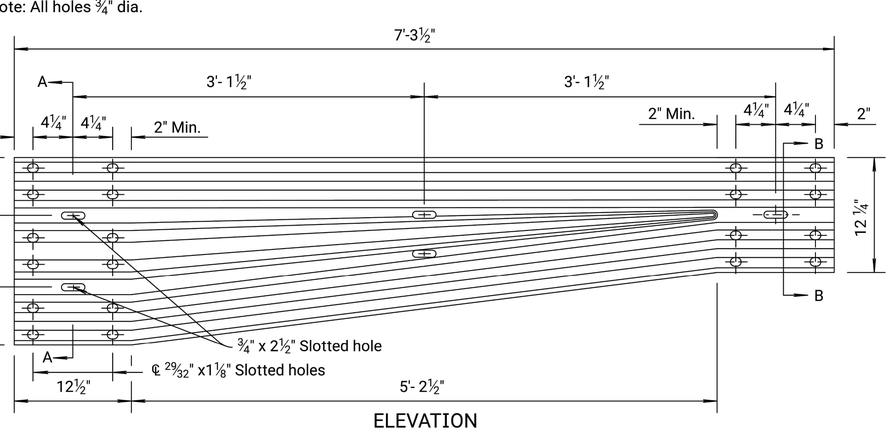
All material and work required for this construction is Subsidiary to the bid item "Guardrail, Steel Plate (MGS)".



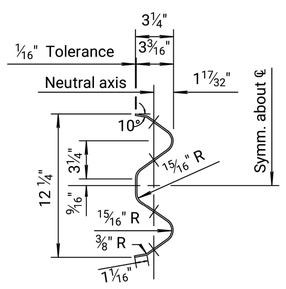
SECTION A-A
THRU RAIL ELEMENT
TYPICAL THRIE BEAM



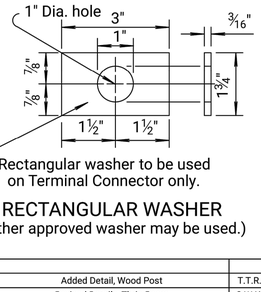
TERMINAL CONNECTOR
⊛ Optional 29/32" x 1¾" Slotted holes Rotated 50° (Typical) (12 req'd.)



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



SECTION B-B
THRU RAIL ELEMENT
TYPICAL W-BEAM



RECTANGULAR WASHER
(Other approved washer may be used.)

NO.	DATE	REVISIONS	BY	APP'D
02	02-10-16	Added Detail, Wood Post	T.T.R.	S.W.K.
01	01-25-12	Revised Details, Thrie-Beam	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

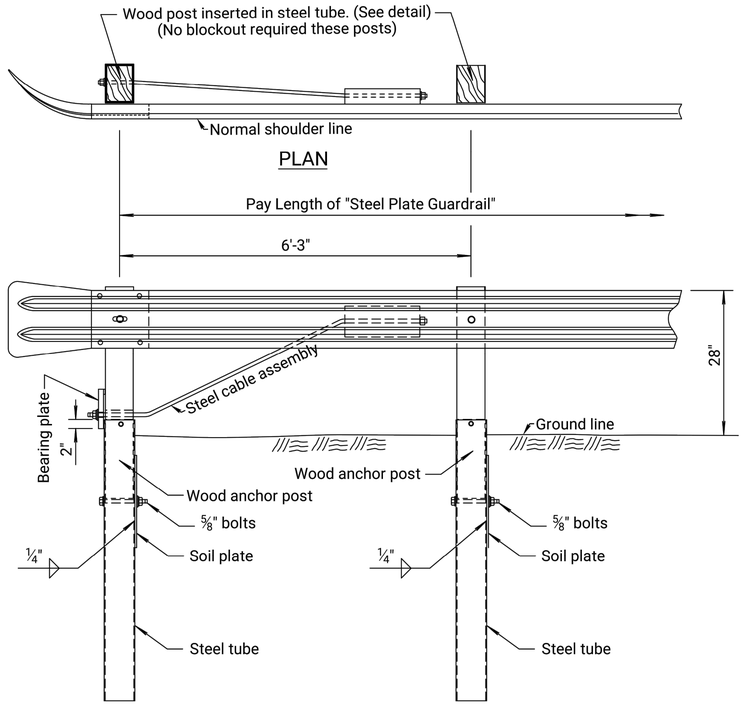
DETAILS OF THRIE BEAM to (MGS) GUARDRAIL TRANSITION

RD613A

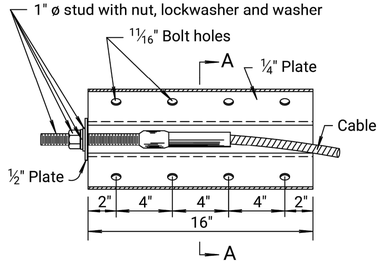
FHWA APPROVAL	04-21-16	APP'D.	Scott W. King
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

J:\PROJECTS\2014\1401010084 - HARVEY COUNTY_GENERAL SERVICES\05-CIVIL\CAD\STD\K-15.9\K15.9_RD613A.DWG

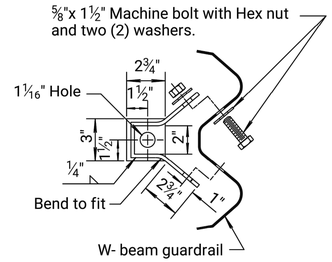
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	16	61



DETAIL OF ANCHOR ASSEMBLY



ANCHOR PLATE



MODIFIED SECTION A-A

GENERAL NOTE

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

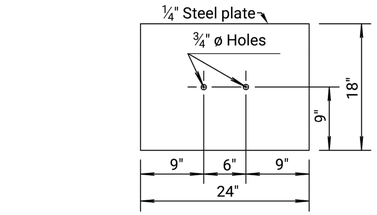
The steel soil tubes may be driven with an approved driving head. Set steel tube and soil plate before installing wood anchor post assembly. Do not drive steel soil tubes with wood post in the tube. Backfill and satisfactorily compact around steel soil tubes placed in drilled holes to prevent tube settlement.

Galvanize all steel parts after fabrication.

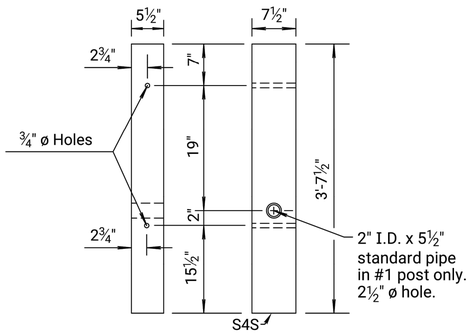
Lap guardrail splices, including terminal connector, in the direction of traffic. Where traffic is temporarily carried in the opposite direction of final configuration, lap rail splices in the direction of the permanent traffic.

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

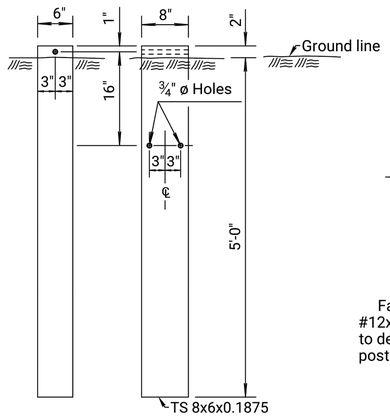
Include Type II end terminal in pay length of "Steel Plate Guardrail".



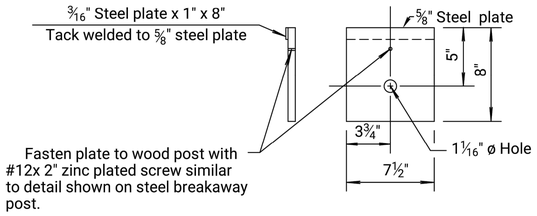
SOIL PLATE



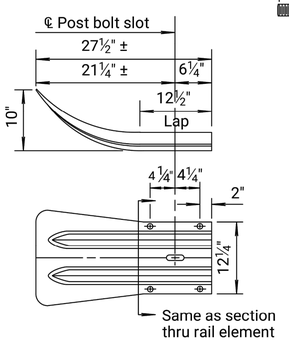
BCT WOOD POST



STEEL TUBE



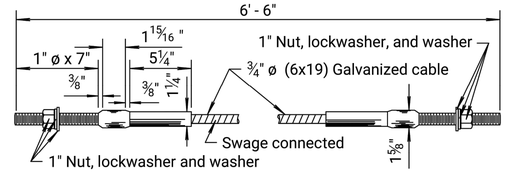
BEARING PLATE



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

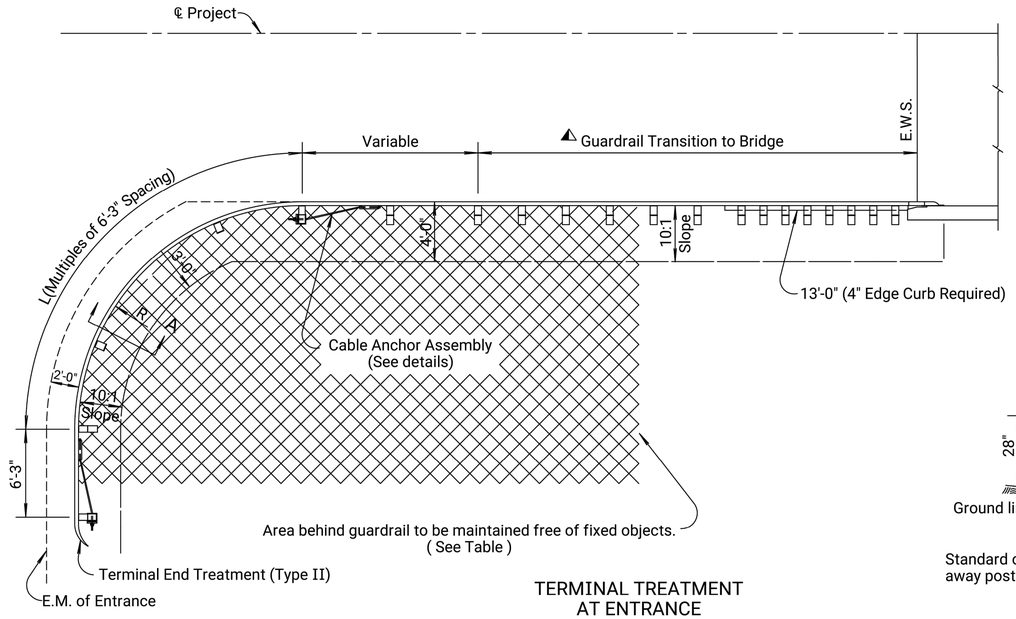
GUARDRAIL END TERMINAL TYPE II

RD618

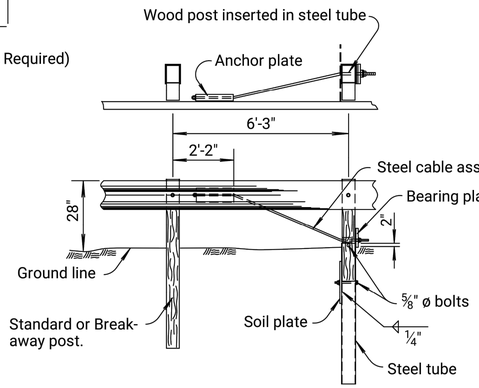
FHWA APPROVAL	01-11-11	APP'D.	James O. Brewer
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

PLOTTED: Thursday, November 06, 2025 @ 11:58AM

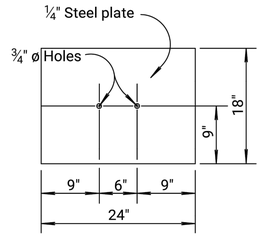
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	17	61



TERMINAL TREATMENT AT ENTRANCE

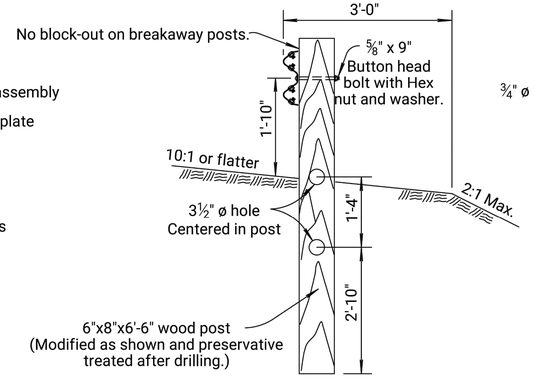


ANCHOR ASSEMBLY



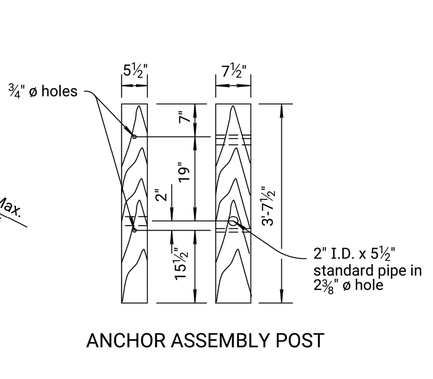
SOIL PLATE

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.

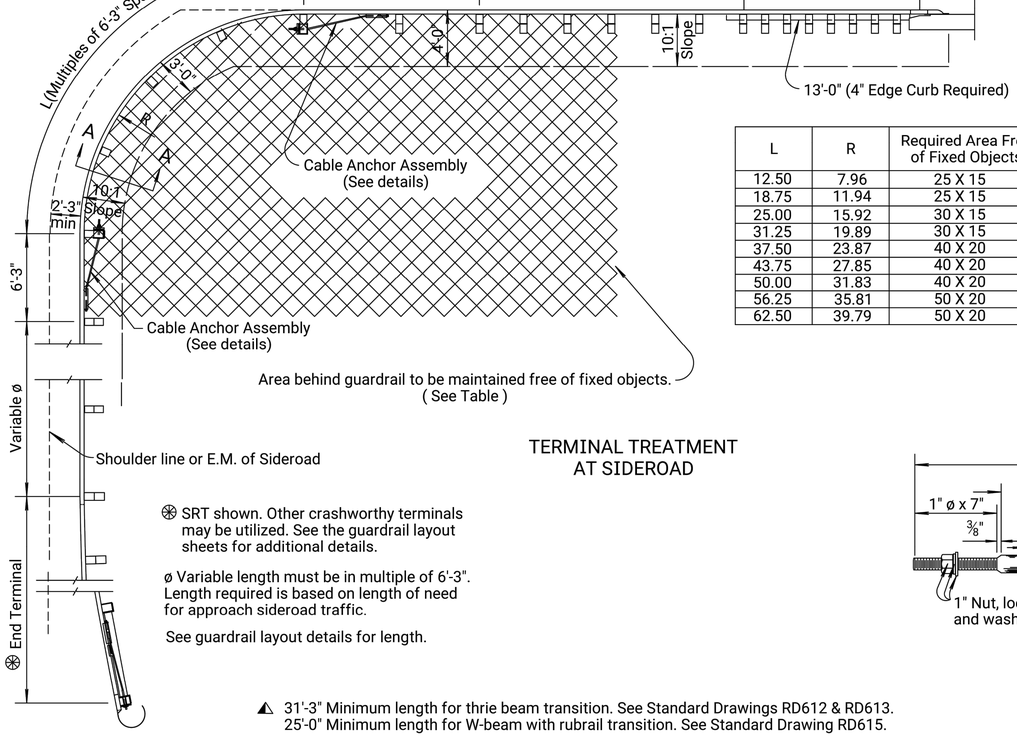


SECTION A-A

(Typical through curved portion of guardrail.)



ANCHOR ASSEMBLY POST



TERMINAL TREATMENT AT SIDEROAD

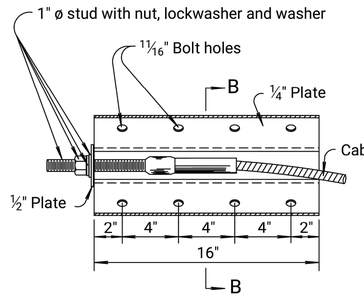
L	R	Required Area Free of Fixed Objects
12.50	7.96	25 X 15
18.75	11.94	25 X 15
25.00	15.92	30 X 15
31.25	19.89	30 X 15
37.50	23.87	40 X 20
43.75	27.85	40 X 20
50.00	31.83	40 X 20
56.25	35.81	50 X 20
62.50	39.79	50 X 20

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

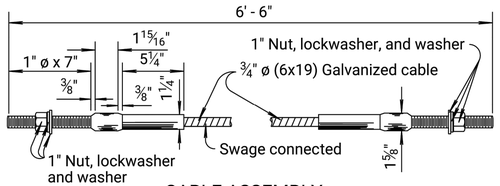
ø Variable length must be in multiple of 6'-3". Length required is based on length of need for approach sideroad traffic.

See guardrail layout details for length.

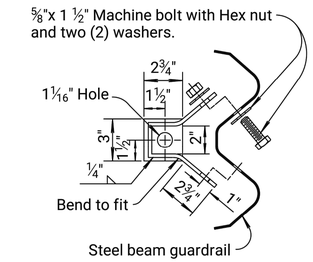
⚠ 31'-3" Minimum length for thrie beam transition. See Standard Drawings RD612 & RD613.
25'-0" Minimum length for W-beam with rubrail transition. See Standard Drawing RD615.



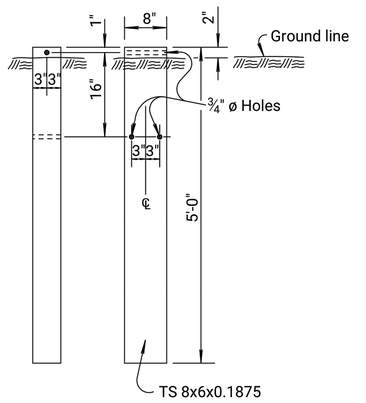
ANCHOR PLATE



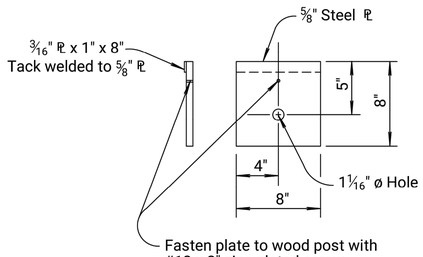
CABLE ASSEMBLY
(40,000 lbs. min. breaking strength)
Tighten cable to taut tension.



MODIFIED SECTION B-B



STEEL TUBE



BEARING PLATE

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

J:\PROJECTS\2014\1401010084 - HARVEY COUNTY_GENERAL SERVICES\05-CIVIL\CAD\STD\K-15.9\K15.9_RD619.DWG

SUMMARY OF QUANTITIES

Item / Location	Class I Excavation (Cu. Yds.)	Class II Excavation (Cu. Yds.)	Concrete (Grade 4.0) (AE)(SW) (Cu. Yds.)	Concrete (Grade 4.0) (AE) (Cu. Yds.)	Reinforcing Steel (Epoxy Coated) (Grade 60) (Lbs.)	Reinforcing Steel (Grade 60) (Lbs.)	Piles (Steel) (HP10x42) (Lin. Ft.)	Cast Steel Pile Points (Each)	Contractor Furnished PDA (Each)	Slope Protection (Light Stone) (200 LB) (Cu. Yds.)	Geotextile Fabric (Sq. Yds.)	Bridge Project Marker (Non Participating) (Each)
Abutment No. 1	52.0		**	–	**	–	182	4	1			
Pier No. 1		69.0	–	44.2	1,280	2,924	240	6	–			
Pier No. 2		69.0	–	44.2	1,280	2,924	250	6	1			
Abutment No. 2	52.0		**	–	**	–	152	4	–			
Substr. Total	104.0	138.0	–	88.4	–	5,848		20	2			
Superstr. Total	–	–	252.0	–	70,918	–						
Total	104.0	138.0	252.0	89.0	70,918	5,848	824 ≠	20	2	995	194	1

** Quantities are included in the Superstructure Total Quantity.

≠ Summary of Piling

Abutment No. 1	3 @ 43', 1 @ 53' for PDA
Pier No. 1	6 @ 40'
Pier No. 2	5 @ 40', 1 @ 50' for PDA
Abutment No. 2	4 @ 38'

INDEX TO BRIDGE DRAWINGS

GENERAL NOTES

PLAN SPECIFICATIONS: "KDOT Standard Specifications for Road and Bridge Construction, 2015 Edition" are referenced for bridge construction. When differences occur between plan notes and these specifications, the plan notes govern.

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

BRIDGE EXCAVATION: Elevation 1413.83 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.

BACKFILL COMPACTION: Compact backfill at the abutments.

PILING: Use the Pile Driving Analyzer (PDA) equipment at the substructure locations chosen by the Engineering representative. Use PDA equipment and methods compliant with KDOT Special Provision. The piling shall remain in place as permanent piling. Drive the piling to the resistance value of Strength I divided by Phi or 128 Tons at the Abutments and 138 Tons at the Piers.

Drive remaining Abutment No. 2 piling to a minimum elevation of 1387.88 and Pier No. 1 piling to a minimum elevation of 1388.73 unless the Engineer directs otherwise based on the PDA results. Driving shall stop when in the opinion of the Engineer additional driving may damage the piling. Drive remaining piling to the Pile Driving Formula Load of:

Abutment No. 1 and 2	82.7 Tons
Pier No. 1 and 2	89.3 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. At any location where problems are experienced, pile damage is suspected, or the Pile Driving Formula Load occurs significantly above the design pile tip elevation, the Engineer may request that the Pile Driving Analyzer (PDA) equipment be used.

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

CONSTRUCTION STAKING: The performance of all necessary construction staking shall be paid for as "Contractor Construction Staking".

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

REMOVAL OF EXISTING STRUCTURE: Removal of existing structure is included in the bid item, "Removal of Existing Structures", Lump Sum. All materials removed from the existing structure shall become the property of the Contractor. Remove this material from the site.

SLOPE PROTECTION (Light Stone)(200 LB): Place Slope Protection (Light Stone)(24") to the limits and thicknesses shown on the plans or as directed by the Engineer.

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, except the spiral bars, shall conform to the requirements of ASTM A615, Grade 60. Spiral bars may meet the requirements of either ASTM A615 (Gr. 40 or 60) or AASHTO M32, and are included in the bid item "Reinforcing Steel (Gr. 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: The construction joints shown are optional with the Contractor. If used, place the construction joints only at locations shown or at locations approved by the Engineer.

FALSEWORK PLANS: A licensed Professional Engineer shall design the falsework details. Details shall bear the seal of a licensed Professional Engineer. See KDOT Bridge Design Manual, Section 16.1 "Review and Approval of Falsework Plans", for a listing of items to be included on the falsework plan. Submit electronic plans conforming to Section 105 of the Standard Specification with details in compliance with KDOT Specifications to the Engineer for review.

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

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 County. "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.

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 concrete, including admixtures, shall be at the Contractor's expense and shall be considered subsidiary to the bid item, "Concrete (Grade 4.0)(AE)". Approval of the Contractor's alternate sequence is required prior to placement of concrete in the deck.

CONSTRUCTION LOADS: Only foot traffic is permitted on the new sub-deck, one-course deck or any concrete overlay during the seven day curing period, keep any exposed deck wet during the 7-day curing period. See KDOT Specifications Section 710 Table. See tables 710-1 and 710-2 for additional information.

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

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

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

BRIDGE DECK FINISH: Tine Finish.

DESIGN DATA

DESIGN SPECIFICATIONS:

AASHTO Specifications, 9th (2020) Edition and 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)(AE):	f'c = 4 k.s.i.
Reinforcing Steel (Grade 60):	f_y = 60 k.s.i.
Steel Piles (ASTM A572, Gr. 50):	f_y = 50 k.s.i.

LRFD DESIGN PILE LOAD:

Design Loading (Tons/Pile)	Strength I	Service I	Phi
Abutments	82.7	53.4	0.65
Piers	89.3	64.3	0.65

LFD & LRFR RATING FACTORS

Truck / Rating Level	Inventory	Operating
HS-20 (36T)	1.57	2.62
Type HET (110T)		1.28
2002 LFD Rating. 17th Edition AASHTO		
HL-93 Loading	1.47	1.91
2018 Manual for Bridge Evaluation		

MKEC
Wichita, KS • 316.684.9600

DAKOTA JAMES LEAH
LICENSED
30161
11/06/2025
KANSAS
PROFESSIONAL ENGINEER

BRIDGE REPLACEMENT FOR
BRIDGE K-15.9
HARVEY COUNTY, KANSAS

BRIDGE GENERAL NOTES AND QUANTITIES

PROJECT NO. 1401010084
SCALE NONE

DRAWN	DESIGNED	CHECKED
LWG	DJL	DMU

NO.	REVISION	DATE

Sta. 50+00.00 Remove Br.
No. 000000000400430,
34'–42'–34' SBMC
(Steel Beam Continuous),
26'–0" Roadway, Category A
Demolition.

Sta. 50+00.00 Construct Br.
No. 00000000040B430
36'–48'–36' R.C.S.H. Bridge,
28'–0" Roadway

VEAZEY FAMILY FARM TRUST
2714 N LAKE RIDGE ST
WICHITA, KS 67205–1663

SE 1/4 SEC. 9, T23S, R1W

+80.00 Temp. Const. Esmt. 100' ℄

+80.00 Temp. Const. Esmt. 60' ℄

+40.00 Temp. Const. Esmt. 40' ℄

Sta. 49+03.01 Install 24"x39' (CMP) Lt.

EX. 30' R/W

TOS/TOC

24" CMP FL=1421.37

30' Water District No. 1 Easement

+20.00 Temp. Const. Esmt. 40' ℄

DIRT FIELD ENTRANCE

Sta. 52+18.47 Install 24"x31' (CMP) Lt.

SCALE: 1"=20'

0 20 40

N

ASPHALT

48 49 50 51 52

CP–11

NW 12TH ST.

SW WEIGHT

STOP AHD

Sta. 29+89.91,
0.0' Rt., S ¼ Cor.
Sec. 12, T24S, R2E

IP FL=1430.36

Sta. 48+00.00
N=1820780.9245
E=1620523.6403

Middle Branch Emma Creek

Sta. 56+59.48, 0.0' Rt.
SE Cor. Sec. 12, T24S, R2E

Sta. 52+00.00
N=1820783.5913
E=1620923.6314

+70.00 Temp. Const. Esmt. 40' ℄

+10.00 Temp. Const. Esmt. 40' ℄

+50.00 Temp. Const. Esmt. 80' ℄

+50.00 Temp. Const. Esmt. 80' ℄

EWY, JENNIFER A; TR
122 ERB ST
HESSTON, KS 67062–9114

NE 1/4 SEC. 16, T23S, R1W

EWY, JENNIFER A; TR
122 ERB ST
HESSTON, KS 67062–9114

UTILITIES

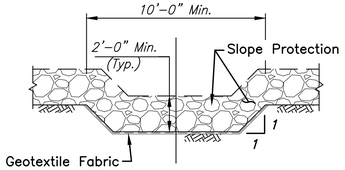
Contractor will be required to provide a minimum advance notice of seventy–two (72) hours to utility companies prior to starting any excavation as follows:

Kansas one–call 1–800–344–7233
The contractor must notify the following in case of emergency.

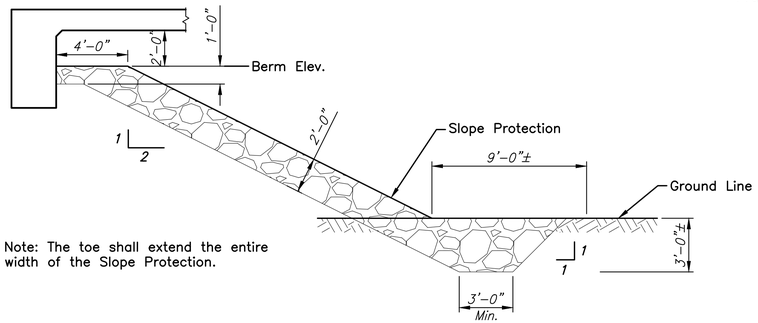
Shannon Brinkmeyer
AT&T
(316) 268–2359

Shane Price
Evergy
(316) 261–6315

Harvey County RWD #1
(620)–837–5634

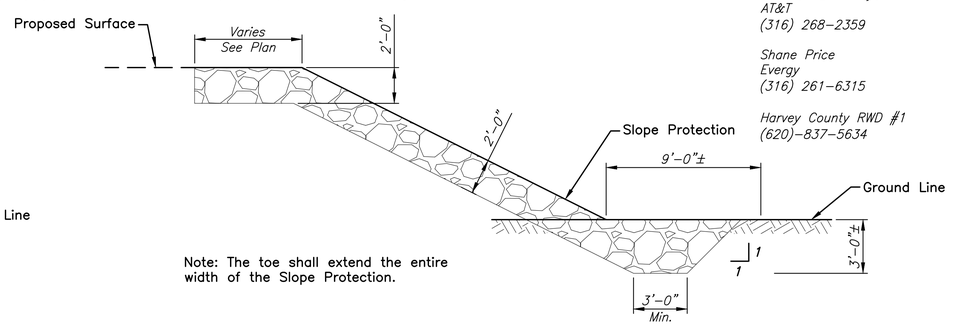


SECTION UNDER
BRIDGE DRIPLINE



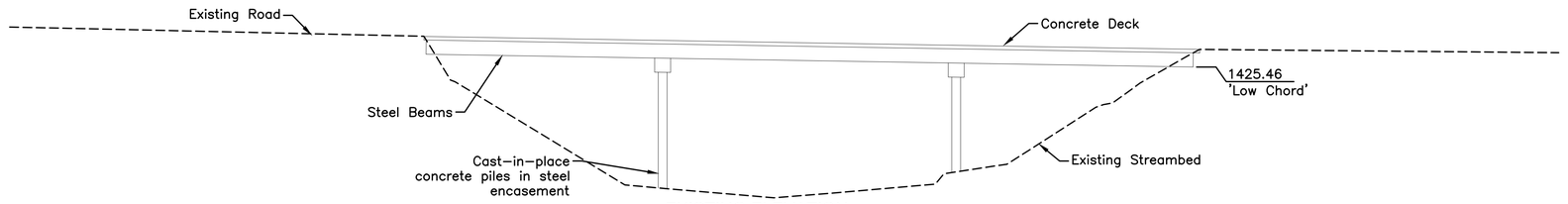
Note: The toe shall extend the entire width of the Slope Protection.

SLOPE PROTECTION SECTION
(Under Bridge)



Note: The toe shall extend the entire width of the Slope Protection.

SLOPE PROTECTION SECTION
(Channel)



EXISTING ELEVATION
(Existing Bridge Waterway Opening Area = 1342.57 s.f.)

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DAKOTA JAMES STEVENS
LICENSED
30161
11/04/2020
KANSAS
PROFESSIONAL ENGINEER

BRIDGE REPLACEMENT FOR

BRIDGE K-15.9

HARVEY COUNTY, KANSAS

CONTOUR MAP

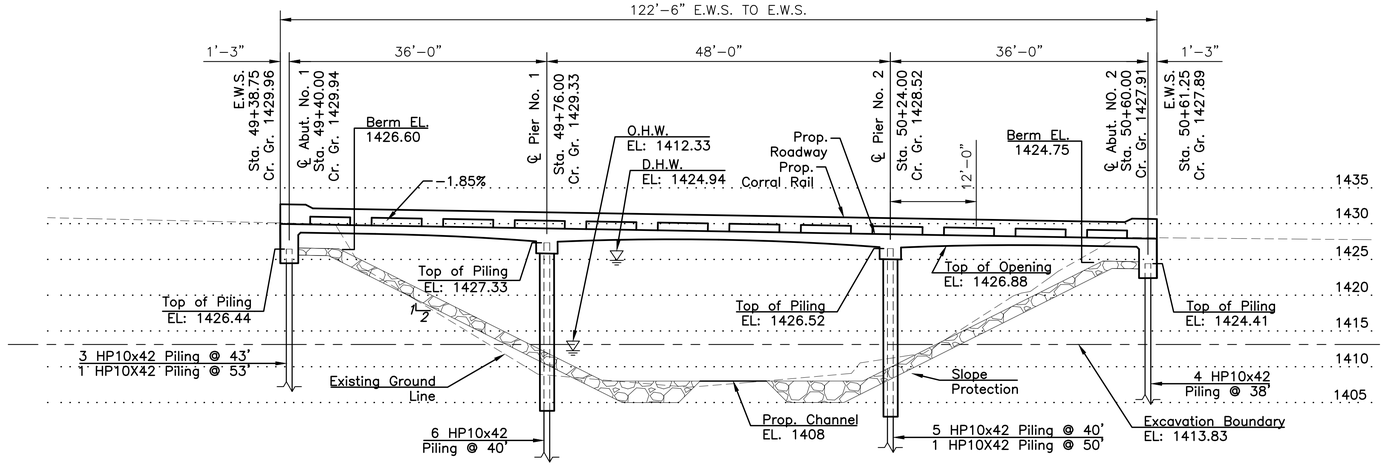
PROJECT NO. 1401010084

SCALE 1" = 20'

DRAWN	DESIGNED	CHECKED
LWG	DJL	DMU

NO.	REVISION	DATE

SHEET NO.
19 OF 61



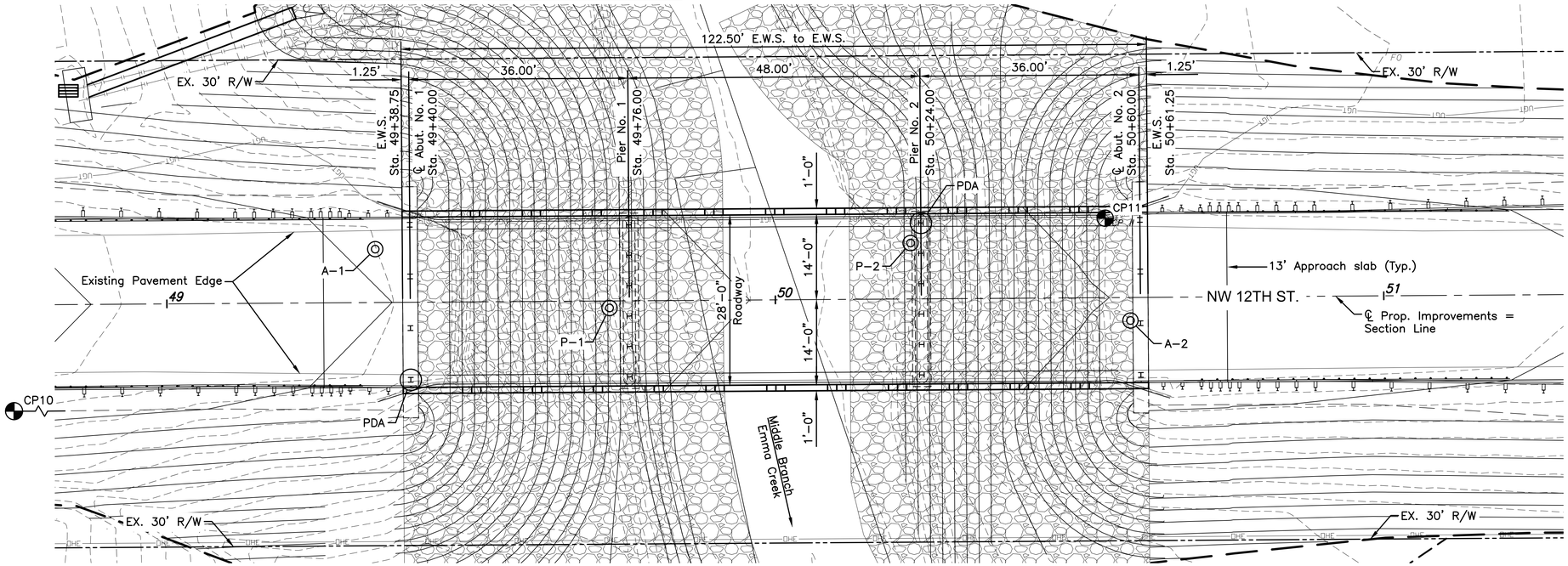
ELEVATION

36'–48'–36' R.C. Haunched Slab Spans
Pile Bent Abutment & Piers 0 deg skew
28'–0" Roadway

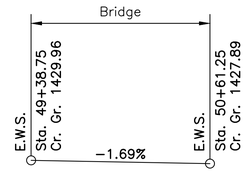
PILING NOTE:
All H–Pile cutoffs to become the property of Harvey County and stockpiled on–site for haul–off by County staff.

DRAINAGE DATA

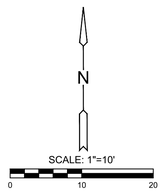
Drainage Area	38.3	Sq. Mi.
Design Frequency	Q_{100}	Years
Design Discharge (Q_{100})	11,500	cfs
Design Velocity	8.38	fps
Design High Water Elevation	1424.94	Ft.
Change in Design Backwater	–1.12	Ft.
Design Backwater Elevation	1424.94	Ft.
Overtopping Elevation	1425.50	Ft.
Overtopping Discharge	12,771	cfs
Overtopping Station	47+32.37	
Overtopping Frequency	>Q_{100}	Years
Discharge at Q_{100}	11,500	cfs
Velocity at Q_{100}	8.38	fps
Change in Backwater at Q_{100}	–1.12	Ft.
Backwater Elevation at Q_{100}	1424.94	Ft.
Historic High Water Elevation	N/A	Ft.
Ordinary High Water Elevation	1412.33	Ft.
Total Waterway Provided	1486	Sq. Ft.
Design Waterway Provided	1486	Sq. Ft.
Estimated Ordinary High Water Discharge	417	cfs



PLAN



CROWN PROFILE GRADE



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BRIDGE REPLACEMENT FOR
BRIDGE K-15.9
HARVEY COUNTY, KANSAS

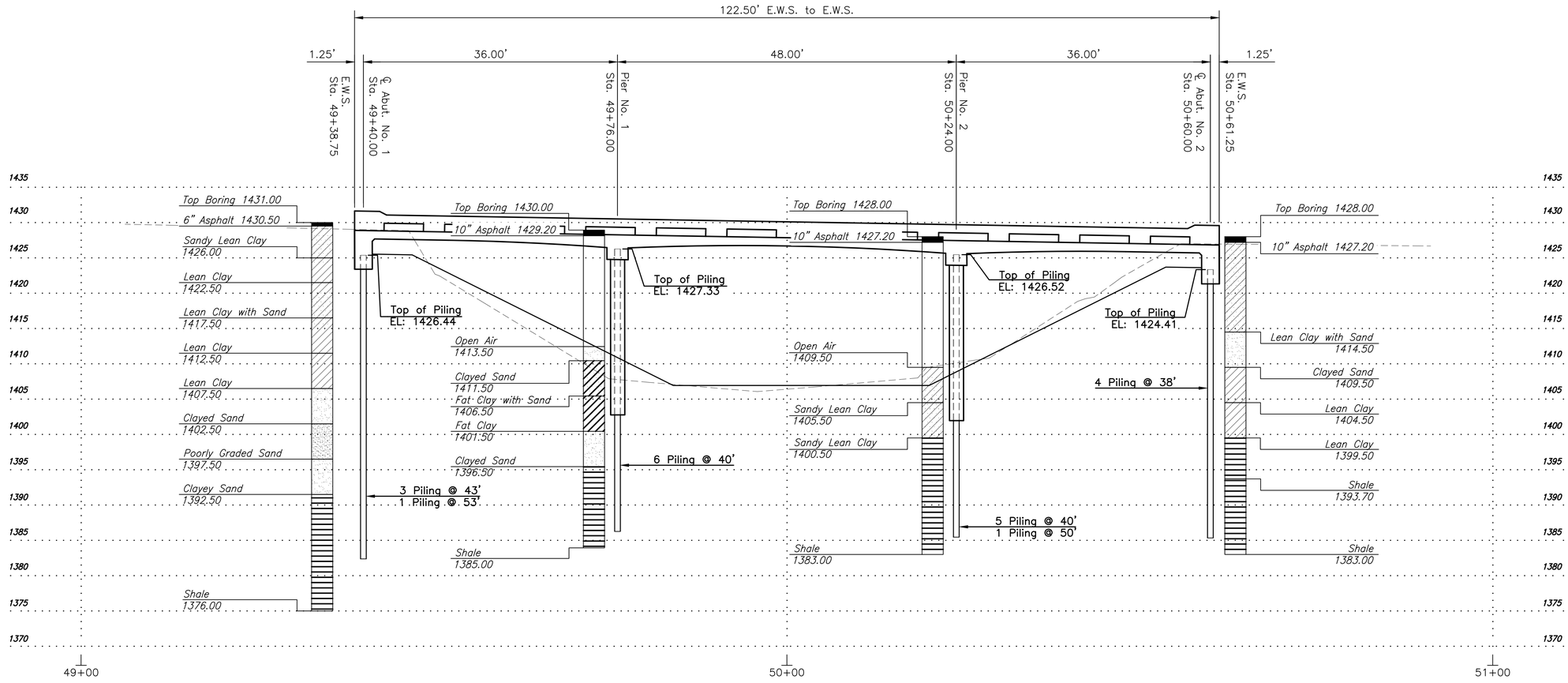
CONSTRUCTION LAYOUT

PROJECT NO.	
	1401010084
SCALE	1" = 10'

DRAWN	DESIGNED	CHECKED
LWG	DJL	DMU

NO.	REVISION	DATE

SHEET NO.
20 OF 61



A-1
≈Sta. 49+34,
8' Lt.

P-1
≈Sta. 49+72,
1' Rt.

P-2
≈Sta. 50+22,
9' Lt.

A-2
≈Sta. 50+58,
4' Rt.

ELEVATION

36'–48'–36' R.C. Haunched Slab Spans
Pile Bent Abutment & Piers
0° Skew
28'–0" Roadway

LEGEND KEY

- Asphalt
- CL
- CL
- CL
- SP
- SC
- CH
- Shale

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BRIDGE REPLACEMENT FOR

BRIDGE K-15.9

HARVEY COUNTY, KANSAS

ENGINEERING GEOLOGY

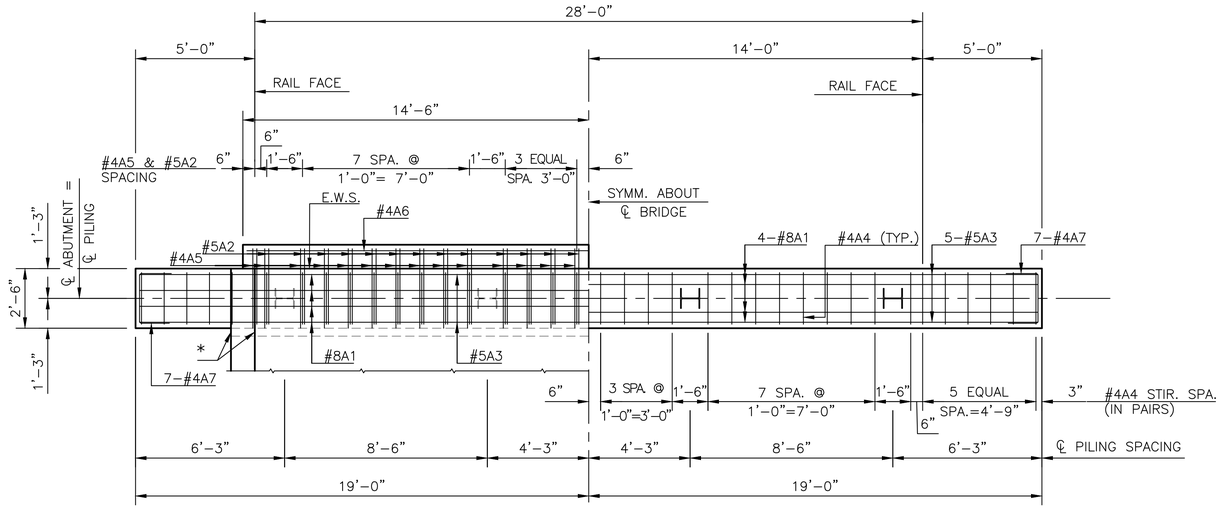
PROJECT NO. 1401010084

SCALE 1" = 8'

DRAWN	DESIGNED	CHECKED
LWG	DJL	DMU

NO.	REVISION	DATE

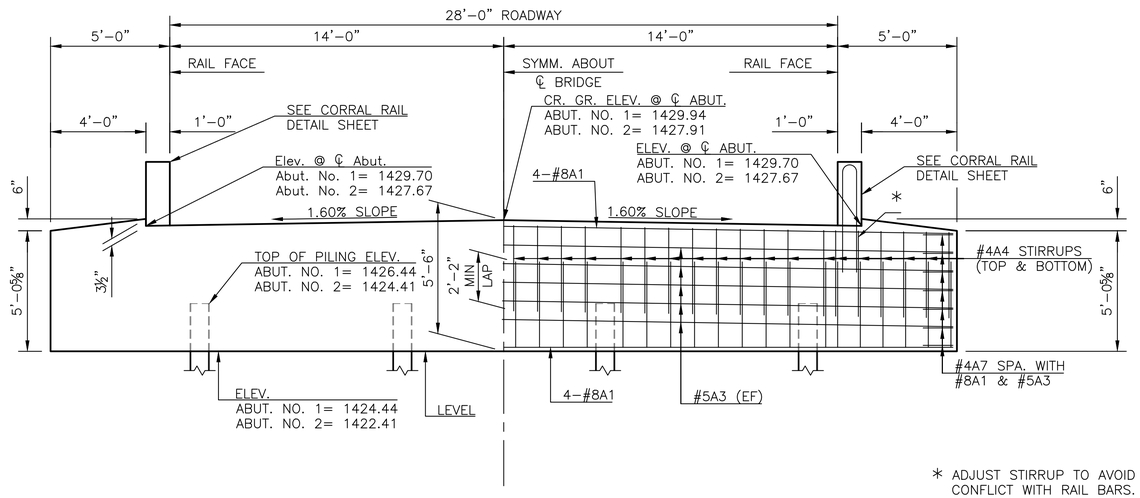
SHEET NO.
21 OF 61



REINFORCING STEEL IN TOP OF ABUTMENT

REINFORCING STEEL IN BOTTOM OF ABUTMENT

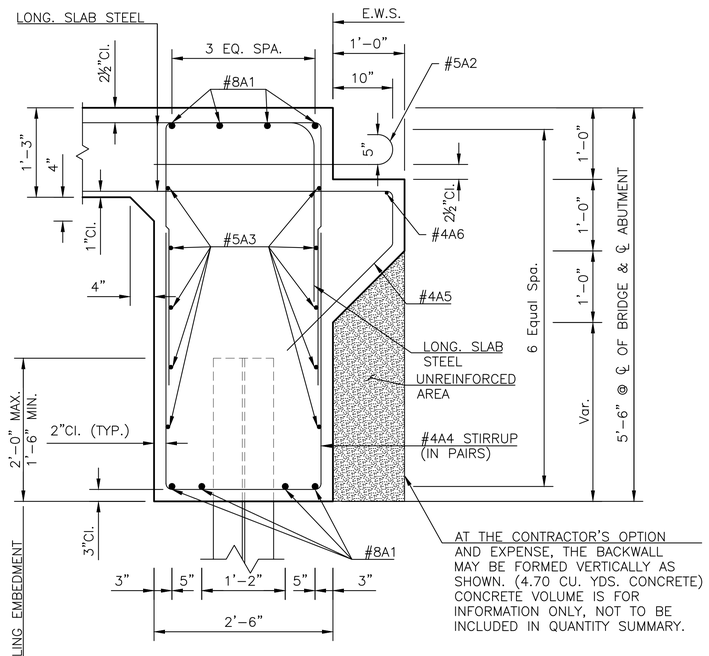
PLAN



ELEVATION
(ALONG ℄ ABUTMENT)

* ADJUST STIRRUP TO AVOID CONFLICT WITH RAIL BARS.

NOTE:
TOP OF PILING ELEVATIONS ARE BASED ON 2'-0" MAXIMUM EMBEDMENT.



AT THE CONTRACTOR'S OPTION AND EXPENSE, THE BACKWALL MAY BE FORMED VERTICALLY AS SHOWN. (4.70 CU. YDS. CONCRETE) CONCRETE VOLUME IS FOR INFORMATION ONLY, NOT TO BE INCLUDED IN QUANTITY SUMMARY.

TYPICAL SECTION

LEGEND

E.F. = EACH FACE

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BRIDGE REPLACEMENT FOR

BRIDGE K-15.9

HARVEY COUNTY, KANSAS

ABUTMENT DETAILS

PROJECT NO. 1401010084

SCALE NTS

DRAWN	DESIGNED	CHECKED
LWG	DJL	DMU

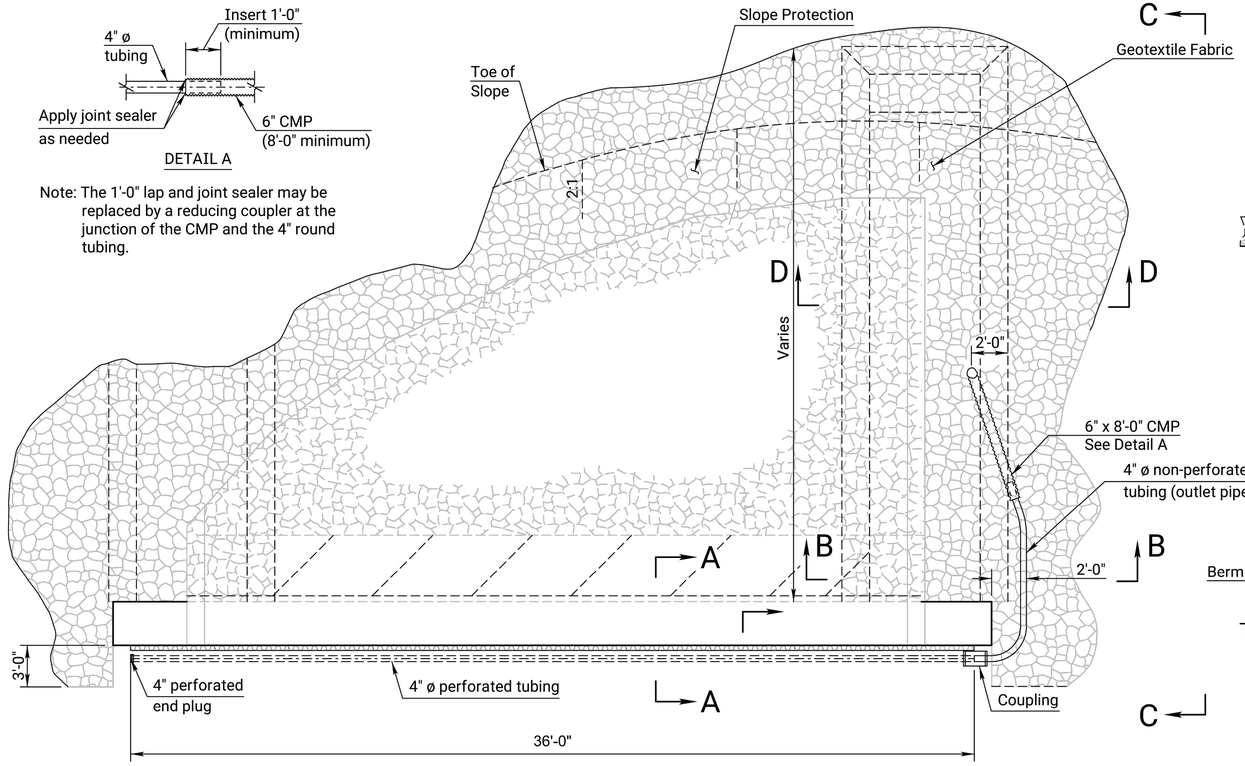
NO.	REVISION	DATE

SHEET NO. 22 OF 61

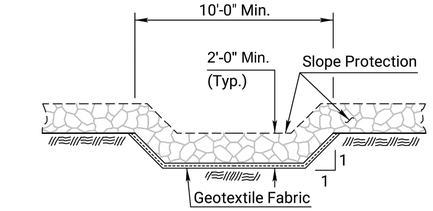
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	23	61

DETAIL A

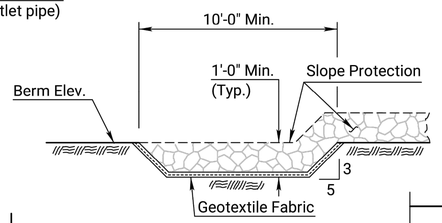
Note: The 1'-0" lap and joint sealer may be replaced by a reducing coupler at the junction of the CMP and the 4" round tubing.



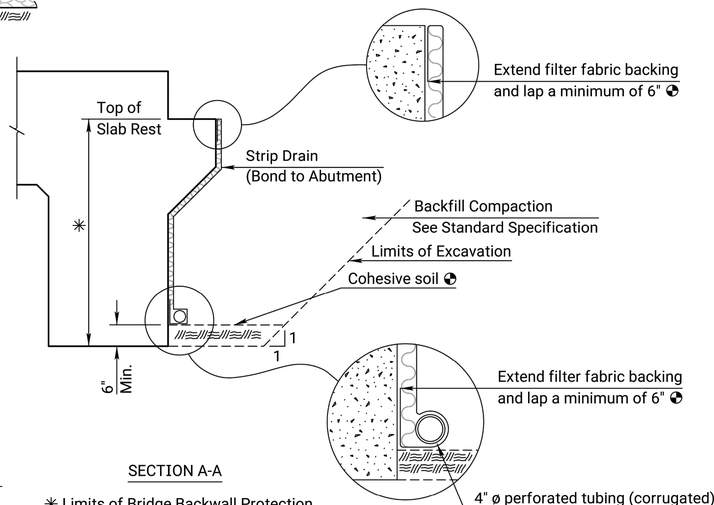
PLAN



SECTION D-D



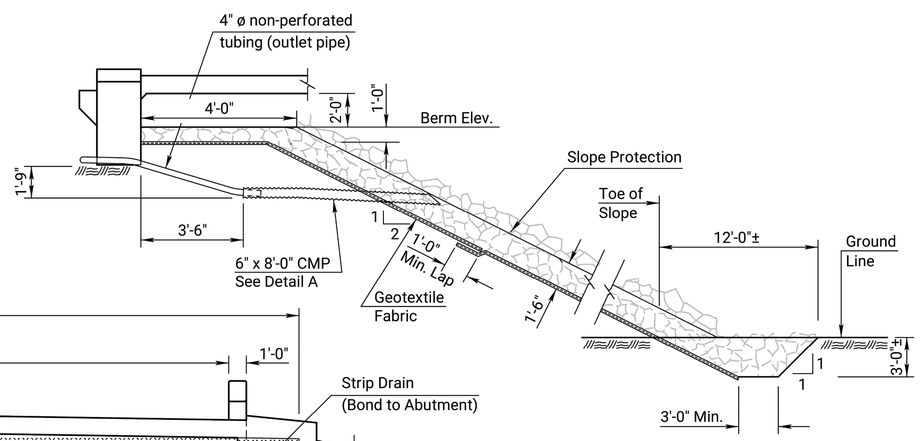
SECTION B-B



SECTION A-A

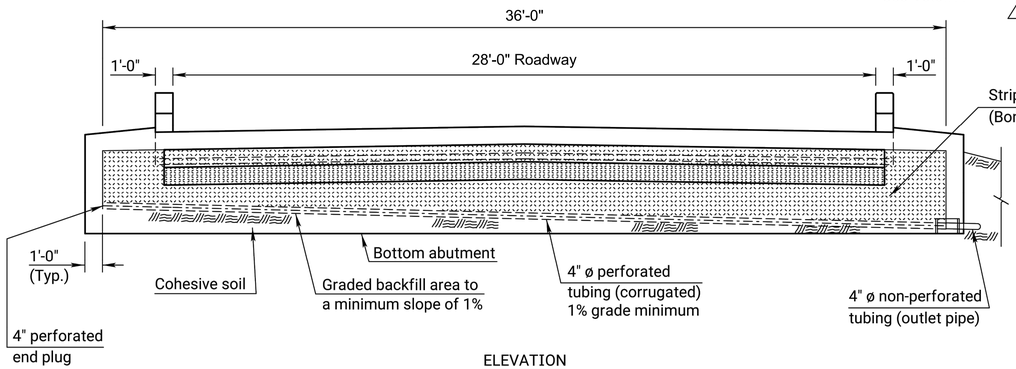
✳ Limits of Bridge Backwall Protection System (by Bridge Contractor)

◒ Subsidiary to the Abutment Strip Drain



SECTION C-C

Note: The toe shall extend the entire width of the Slope Protection.



ELEVATION

GENERAL NOTES

ABUTMENT STRIP DRAIN: The Bridge Contractor shall excavate to the limits shown on the Bridge Excavation sheet, grade the bottom of the backfill area, place the strip drain, and place the perforated pipe, the outlet pipe, the CMP, and the backfill.

BRIDGE BACKWALL PROTECTION SYSTEM: Apply a Bridge Backwall Protection System to the approach side of the abutments and the wings in accordance with KDOT Specifications and the manufacturer's recommendations. Cover the abutments and wings to the limits shown on the details. Prior to backfilling, repair any damage done to the system at no charge to the state.

Place perforated pipe next to the strip drain. Use non-perforated pipe outside the limits of the strip drain. Enclose the perforated pipe with the extension of the filter fabric.

Compact the abutment backfill. See the KDOT Specifications.

Perforated pipe and non-perforated outlet pipe shall be corrugated polyethylene tubing conforming to the KDOT Specifications.

Fit the CMP end section with a ¼" galvanized mesh screen to prevent the entrance of rodents. Seal the joint between the outlet pipe and the end section with a joint sealer.

Place the outlet pipe on the downstream side of structures over streams and as shown or noted on other crossings (See the "Construction Layout" sheet).

COHESIVE SOILS: Grade the bottom surface of the excavated area to drain as shown. Backfill this area with a cohesive type of soil. The soil will have a Unified Soil Classification of CL, CH, ML or MH according to ASTM D2487 Classification System with a minimum plasticity index of 13. Compact the material to Type A, MR-90 specifications. If the plasticity index cannot be met, add and mix Bentonite to the soil prior to placement and compaction so that the PI ≥ 13.

SUMMARY OF QUANTITIES (2 Abutments)	
Abutment Strip Drain	36 Sq. Yds.
Bridge Backwall Protection System	40 Sq. Yds.
Items subsidiary to Strip Drain	
4" ø Perforated Pipe	72 Lin. Ft.
4" ø Outlet Pipe	20 Lin. Ft.
6" ø CMP	16 Lin. Ft.
Items subsidiary to Slope Protection	
Geotextile Fabric	194 Sq. Yds.

NO.	DATE	REVISIONS	BY	APP'D
06	09-01-22	Added Cohesive Soils note	M.L.L.	M.A.H.
05	04-07-14	Current Release	J.P.J.	C.E.R.
04	02-12-14	Added Benchmark	J.P.J.	C.E.R.

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 00000000040B430

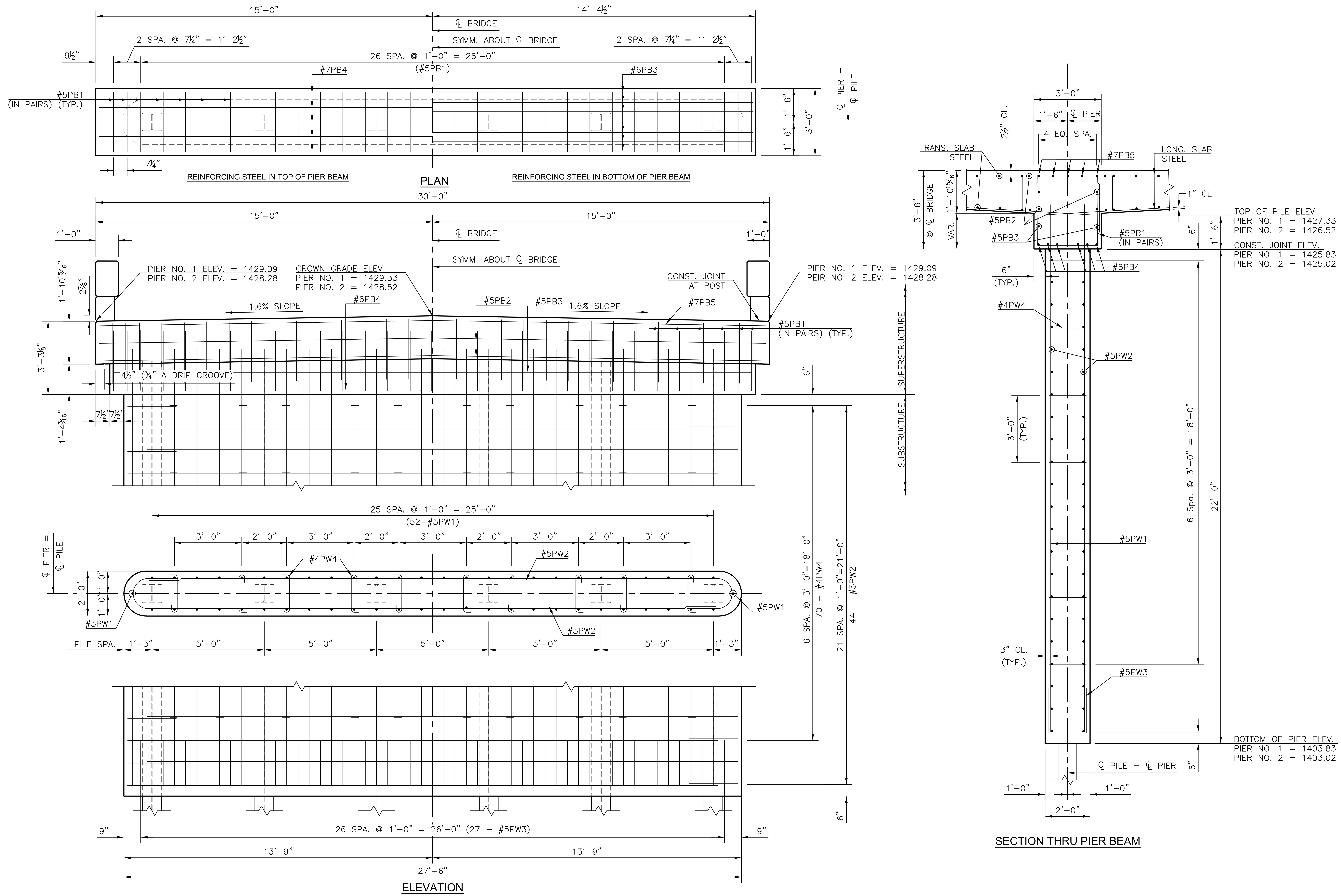
Sta. 49+38.75
Sta.50+61.25

ABUTMENT STRIP DRAIN
(Stream, Drip-Line)

Proj. 1401010084

Harvey Co.

DESIGNED	DETAILED	L.R.R.	QUANTITIES	CADD	B.A.F.
DESIGN CK.	DETAIL CK.		QUAN.CK.	CADD CK.	



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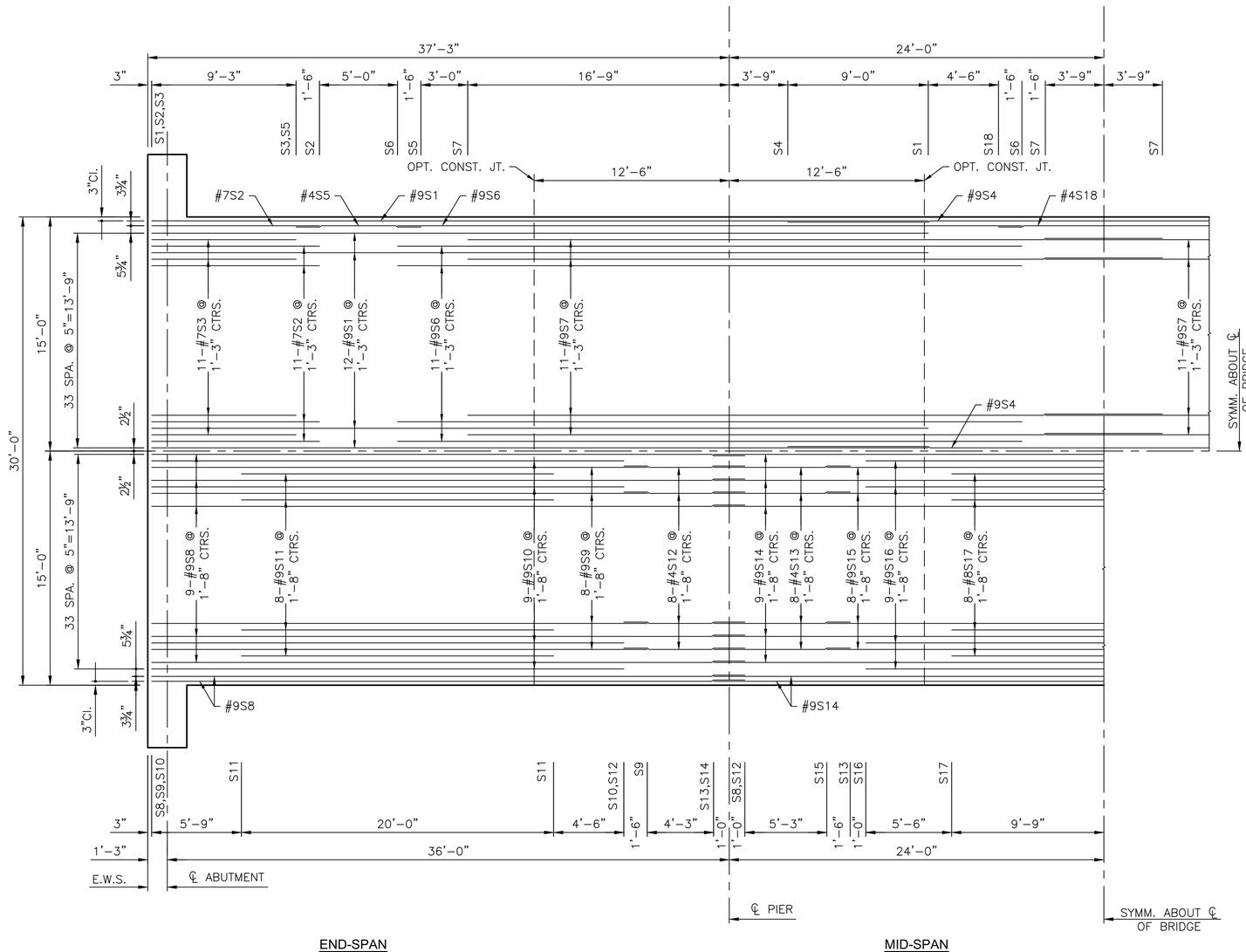
BRIDGE REPLACEMENT FOR
BRIDGE K-15.9
HARVEY COUNTY, KANSAS

PIER DETAILS

PROJECT NO.	1401010084
SCALE	NTS

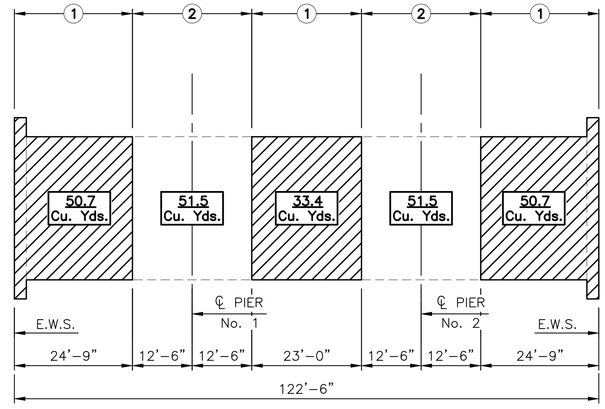
DRAWN	DESIGNED	CHECKED
LWG	DJL	DMU

NO.	REVISION	DATE



HALF PLAN

Notes:
See longitudinal section for transverse reinforcing steel.



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.

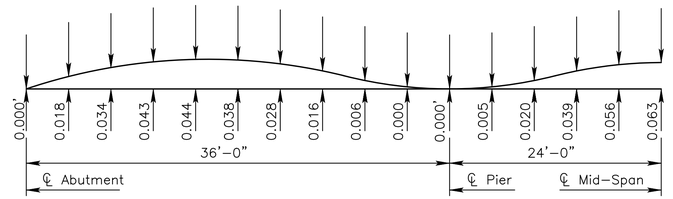
When timber falsework with 12'-0" or less clear span is used, the Contractor, subject to the approval of the Engineer, may use a continuous pour or may discontinue the pour at any construction joint shown.

The Contractor may place the Corral Rail continuously from one end of the bridge to the other.

Quantities shown do not include Corral Rail concrete.

LONGITUDINAL REINF. STEEL IN TOP OF SLAB

LONGITUDINAL REINF. STEEL IN BOTTOM OF SLAB



TYPICAL DEAD LOAD CAMBER DIAGRAM AT TENTH POINTS

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

Notes: 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
1428.71	1428.67	1428.63	1428.57	1428.51	1428.40	1428.26	1428.08	1427.86	1427.62	1427.36	1427.54	1427.69	1427.78	1427.81	1427.76
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	
1427.65	1427.46	1427.20	1426.89	1426.54	1426.69	1426.81	1426.90	1426.96	1426.98	1426.97	1426.91	1426.83	1426.76	1426.68	

Notes: Elevations are taken at Crown Grade.

Notes: The change in elevation from Crown Grade to the Edge of Slab is -0.240'

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11/06/2025
KANSAS
PROFESSIONAL ENGINEER

BRIDGE REPLACEMENT FOR

BRIDGE K-15.9

HARVEY COUNTY, KANSAS

SUPERSTRUCTURE DETAILS

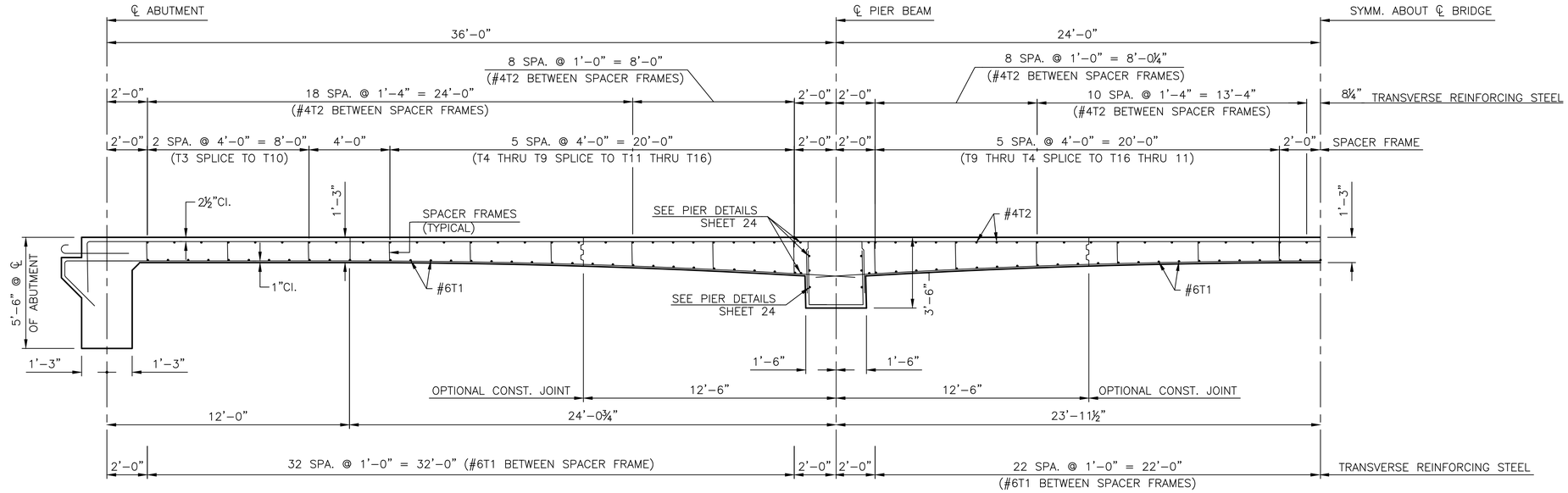
PROJECT NO. 1401010084

SCALE NTS

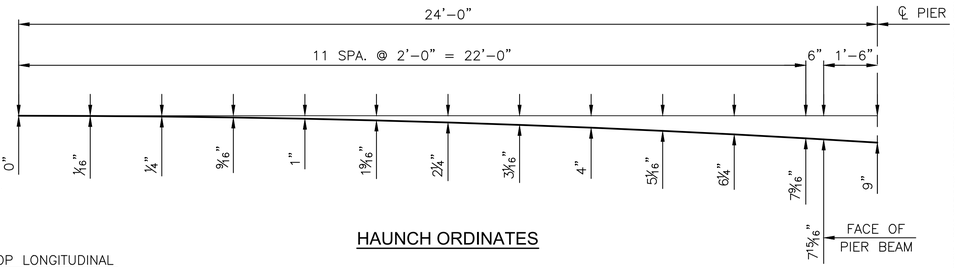
DRAWN	DESIGNED	CHECKED
LWG	DJL	DMU

NO.	REVISION	DATE

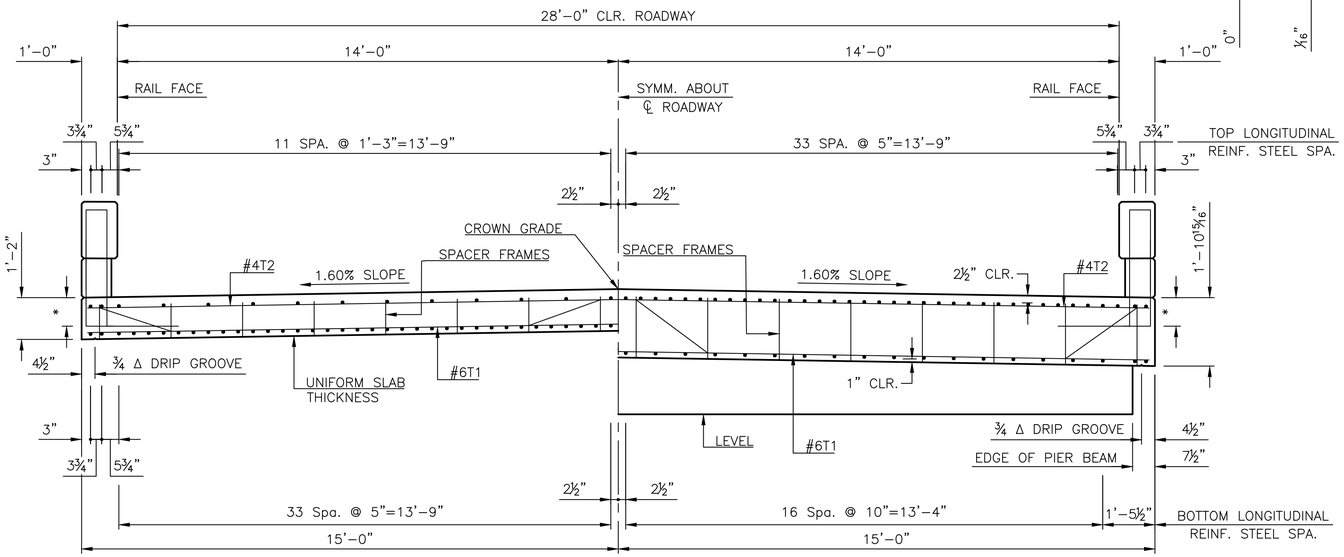
SHEET NO. 25 OF 61



HALF LONGITUDINAL SECTION
(DIMENSIONED ALONG ℄ PROP. IMPROVEMENTS)



HAUNCH ORDINATES

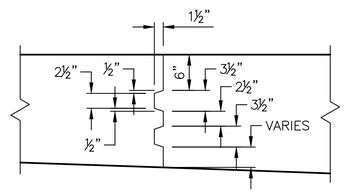


HALF SECTION NEAR MID-SPAN

HALF SECTION AT FACE OF PIER BEAM

TYPICAL SECTION OF SLAB

* SEE CORRAL RAIL DETAIL



TRANSVERSE SLAB CONSTRUCTION JOINT
(OPTIONAL)
(REINFORCING NOT SHOWN FOR CLARITY)

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11/09/2023
KANSAS
PROFESSIONAL ENGINEER

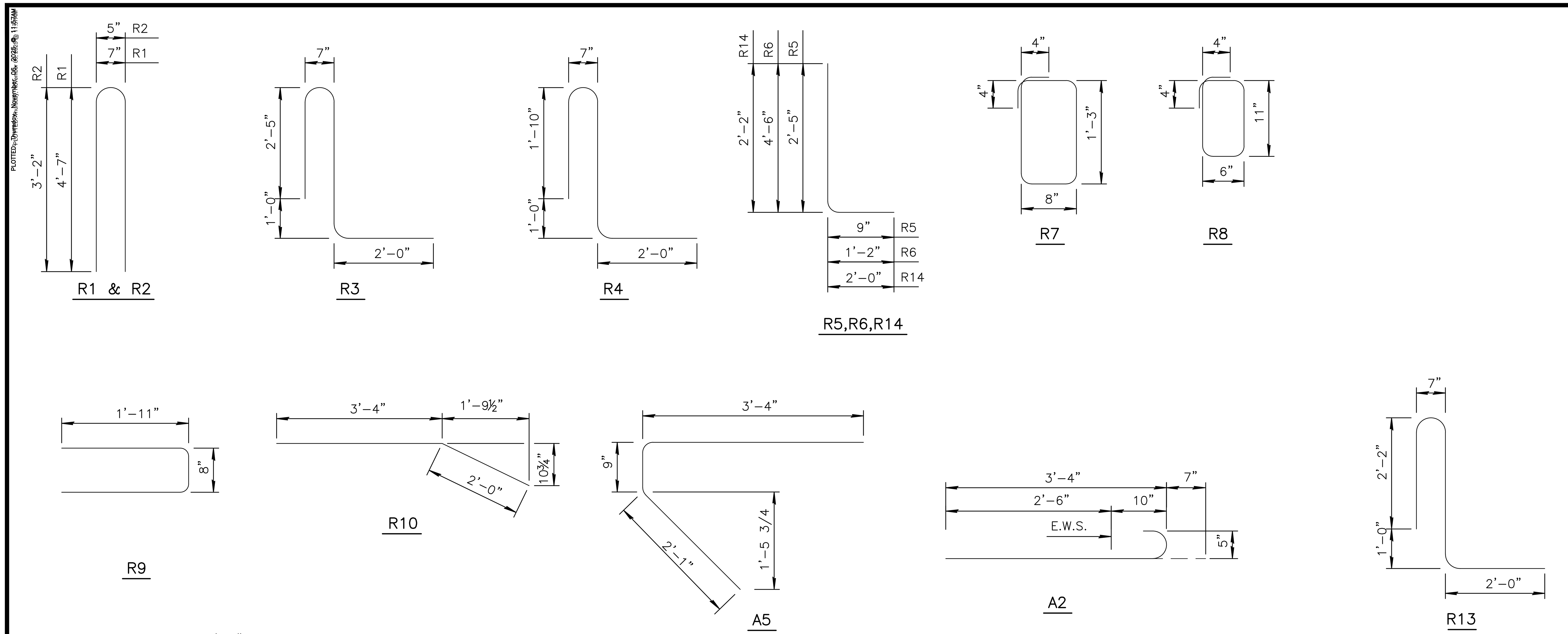
BRIDGE REPLACEMENT FOR
BRIDGE K-15.9
HARVEY COUNTY, KANSAS

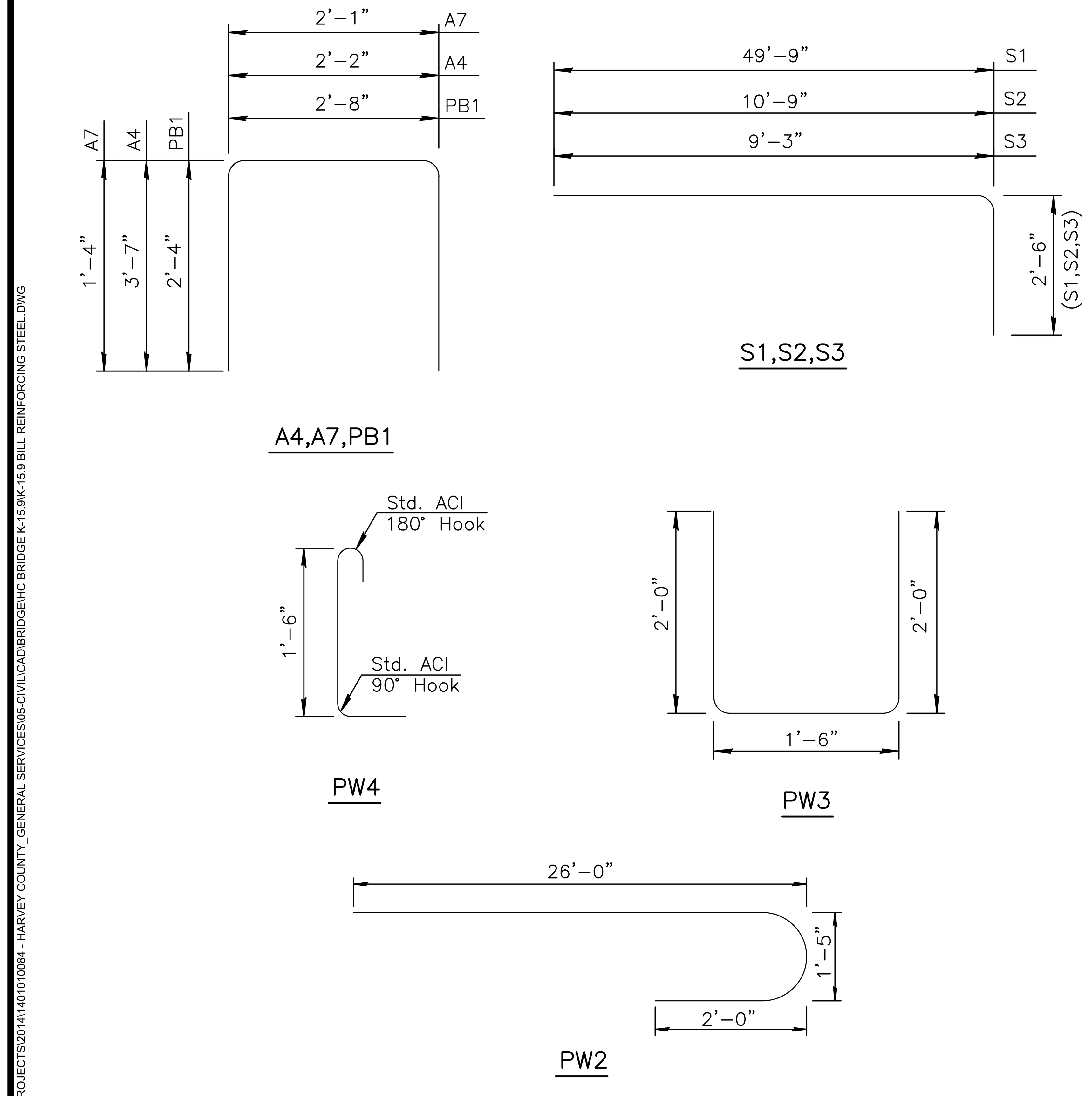
SUPERSTRUCTURE DETAILS

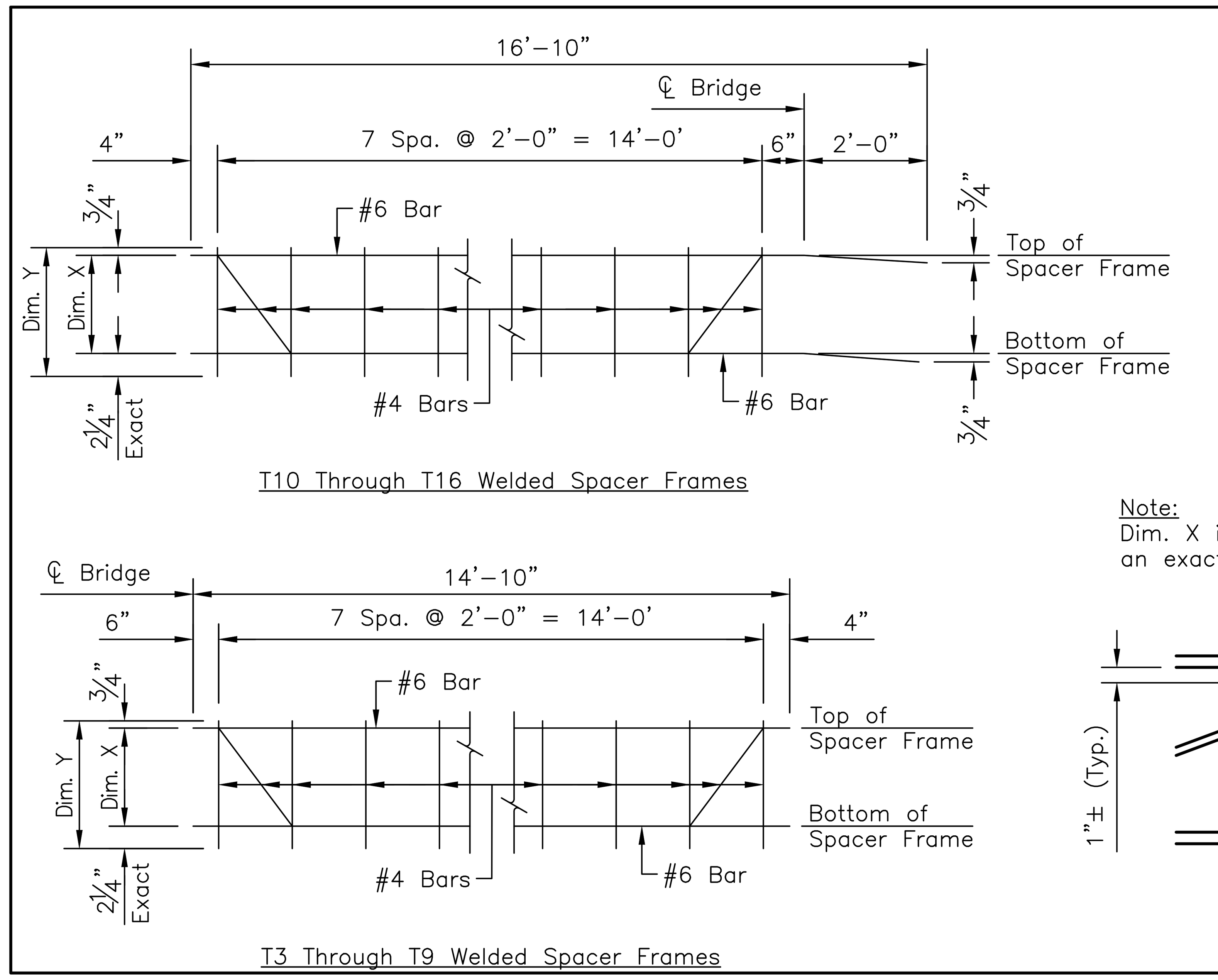
PROJECT NO. 1401010084
SCALE NTS
DRAWN LWG | DESIGNED DJL | CHECKED DMU

NO.	REVISION	DATE

SHEET NO. 26 OF 61



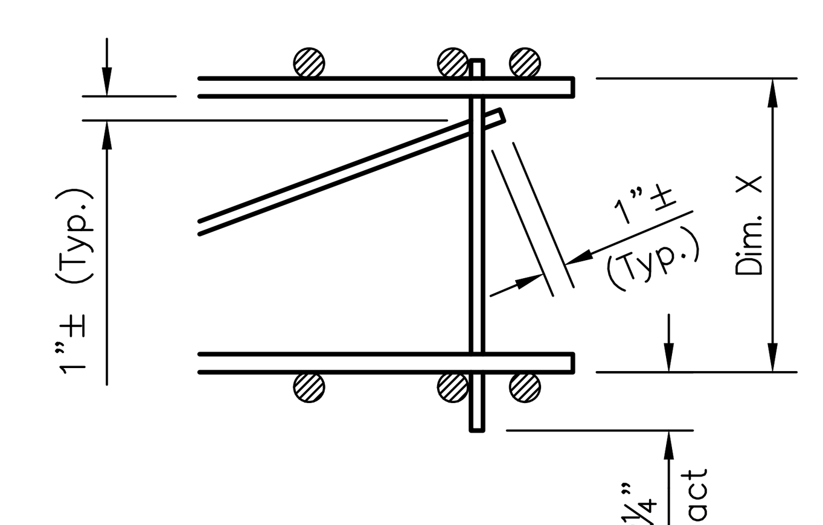




SPACER FRAMES (Epoxy–Coated)			
Mark	No. Ea.	Dim. X	Dim. Y
T3, T10	6	9"	1'–0"
T4, T11	4	9 1/16"	1'–0 1/16"
T5, T12	4	9 9/16"	1'–0 9/16"
T6, T13	4	10 9/16"	1'–1 1/16"
T7, T14	4	1'–0 1/16"	1'–3 1/16"
T8, T15	4	1'–2 1/16"	1'–5 1/16"
T9, T16	4	1'–4 9/16"	1'–7 9/16"

Weight of Spacer Frames included in the weight of Reinforcing Steel.

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



BILL OF REINFORCING STEEL (Grade 60, Non–Epoxy Coated)

		Straight Bars				Bent Bars			
		Mark	Size	No.	Length	Mark	Size	No.	Length
Substructure	Pier Wall	PW1	#5	108	23'–6"	PW2	#5	88	28'–9"
						PW3	#5	54	5'–6"
						PW4	#4	140	2'–8"

BILL OF REINFORCING STEEL (Grade 60, Epoxy Coated)

		Straight Bars				Bent Bars			
		Mark	Size	No.	Length	Mark	Size	No.	Length
Superstructure	Abutment - Deck - Rail	S4	#9	4	40'–6"	S1	#9	52	52'–3"
		S6	#9	48	40'–0"				
		S7	#9	44	44'–6"	R1	#7	24	9'–4"
		S8	#9	44	38'–0"	R3	#7	16	8'–1"
		S9	#9	32	31'–9"	S2	#7	48	13'–3"
		S10	#9	36	30'–3"	S3	#7	44	11'–9"
		S11	#9	32	20'–0"	R4	#7	176	6'–11"
		S14	#9	22	50'–0"	R6	#7	4	5'–8"
		S15	#9	16	35'–6"	R13	#7	4	7'–8"
		S16	#9	18	30'–6"				
						R2	#5	16	6'–6"
		A1	#8	16	37'–8"	A2	#5	56	3'–11"
		S17	#8	16	19'–6"	R10	#5	4	5'–4"
		R11	#6	24	9'–2"	R5	#4	192	3'–2"
		R12	#6	120	9'–8"	A5	#4	56	6'–2"
		T1	#6	81	29'–8"	A4	#4	152	9'–4"
						A7	#4	28	4'–9"
		A3	#5	20	37'–8"	R14	#4	4	4'–2"
		S5	#4	4	8'–0"	R7	#3	44	4'–6"
		S12	#4	32	7'–9"	R8	#3	332	3'–6"
		S13	#4	32	8'–9"	R9	#3	176	4'–6"
		S18	#4	2	13'–6"				
		SC1	#4	66	6'–6"				
		A6	#4	2	28'–8"				
		T2	#4	62	29'–8"				
	Pier Beam	PB5	#7	10	29'–8"	PB1	#5	124	7'–4"
		PB4	#6	12	28'–5"				
		PB2	#5	12	29'–8"				
		PB3	#5	4	28'–5"				

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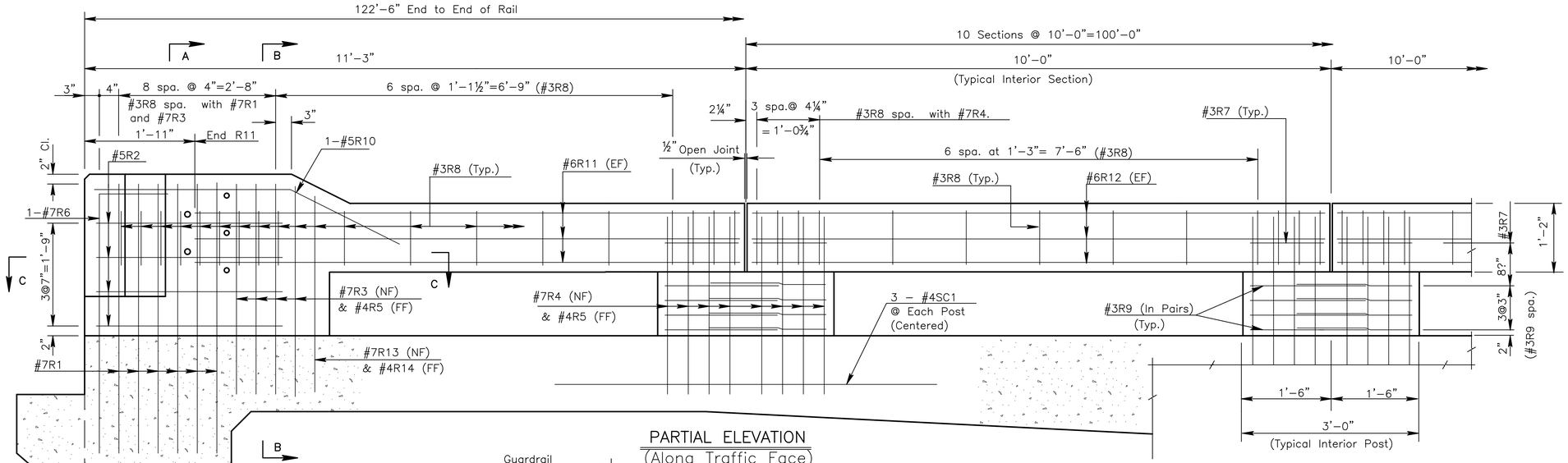
BRIDGE REPLACEMENT FOR
BRIDGE K-15.9
HARVEY COUNTY, KANSAS

BILL OF REINFORCING STEEL AND BENDING DIAGRAMS

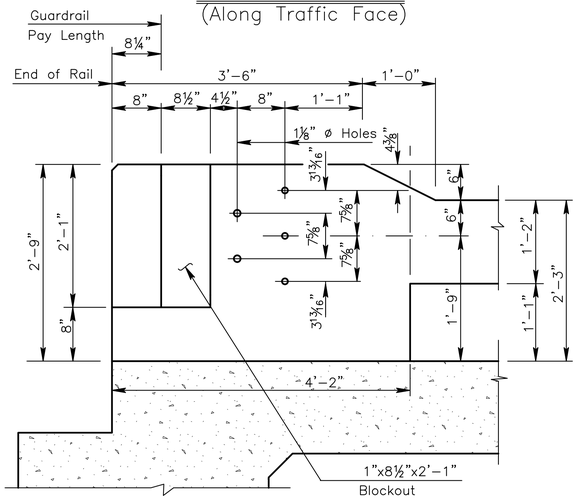
PROJECT NO. 1401010084
SCALE NTS

DRAWN	DESIGNED	CHECKED
LWG	DJL	DMU

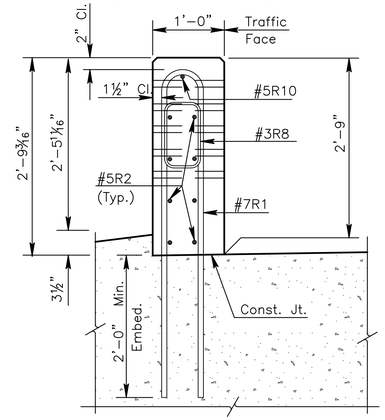
NO.	REVISION	DATE



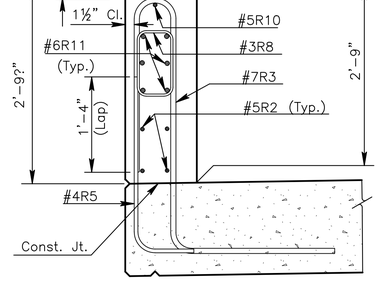
PARTIAL ELEVATION
(Along Traffic Face)



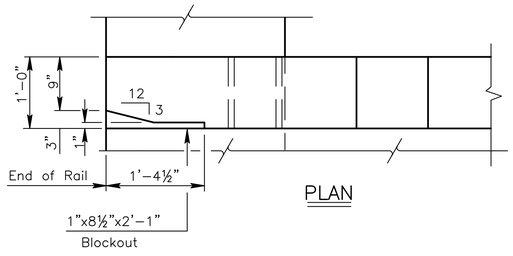
ELEVATION
(Dimensions at traffic face of rail.)



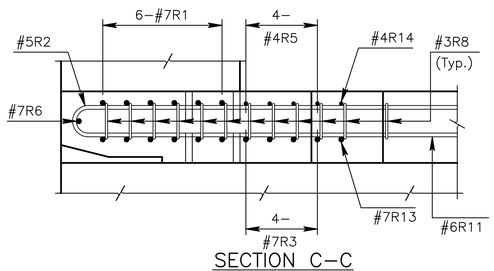
SECTION A–A



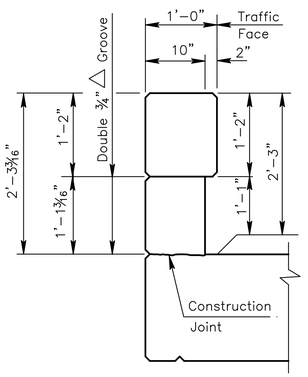
SECTION B–B



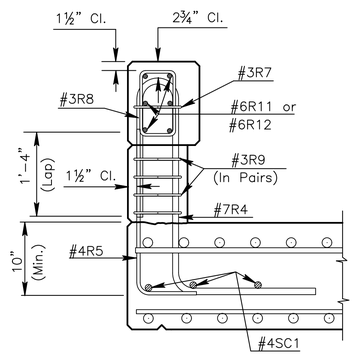
PLAN



SECTION C–C



TYPICAL INTERIOR POST



SECTION THRU POST

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BRIDGE REPLACEMENT FOR

BRIDGE K-15.9

HARVEY COUNTY, KANSAS

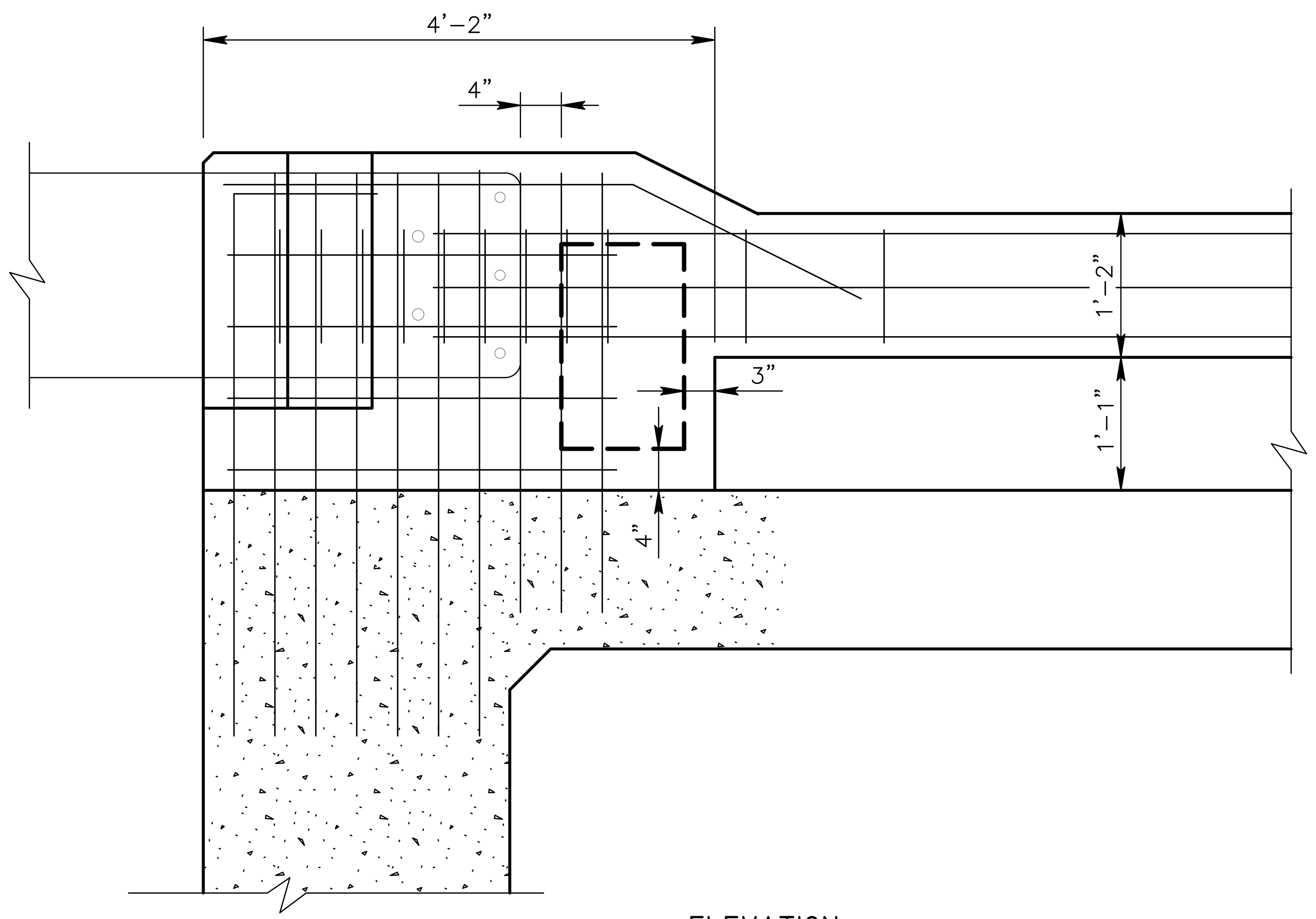
CORRAL RAIL DETAILS

PROJECT NO.	
	1401010084
SCALE	
	NTS

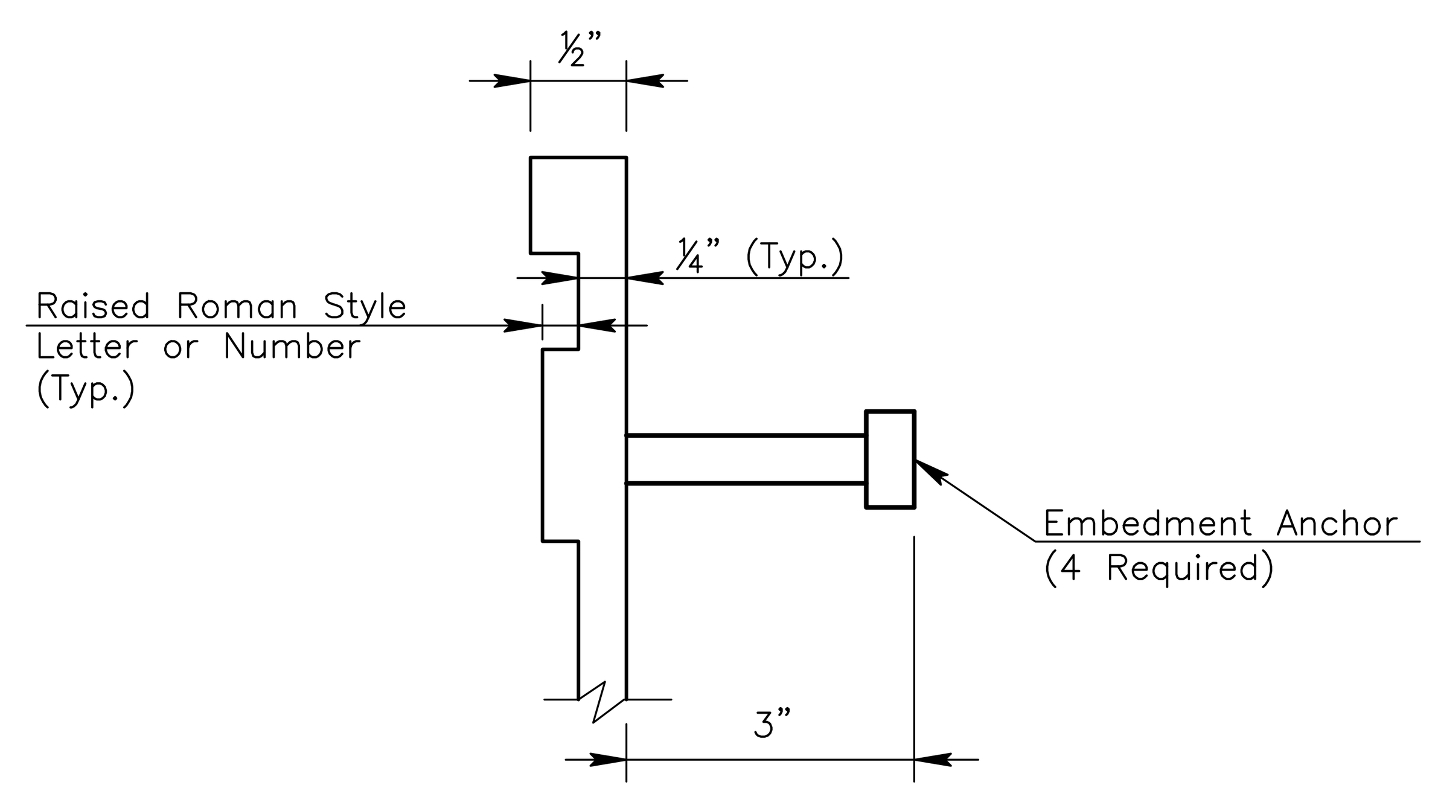
DRAWN	DESIGNED	CHECKED
LWG	DJL	DMU

NO.	REVISION	DATE

SHEET NO.
28 OF 61



ELEVATION
(Along Traffic Face)

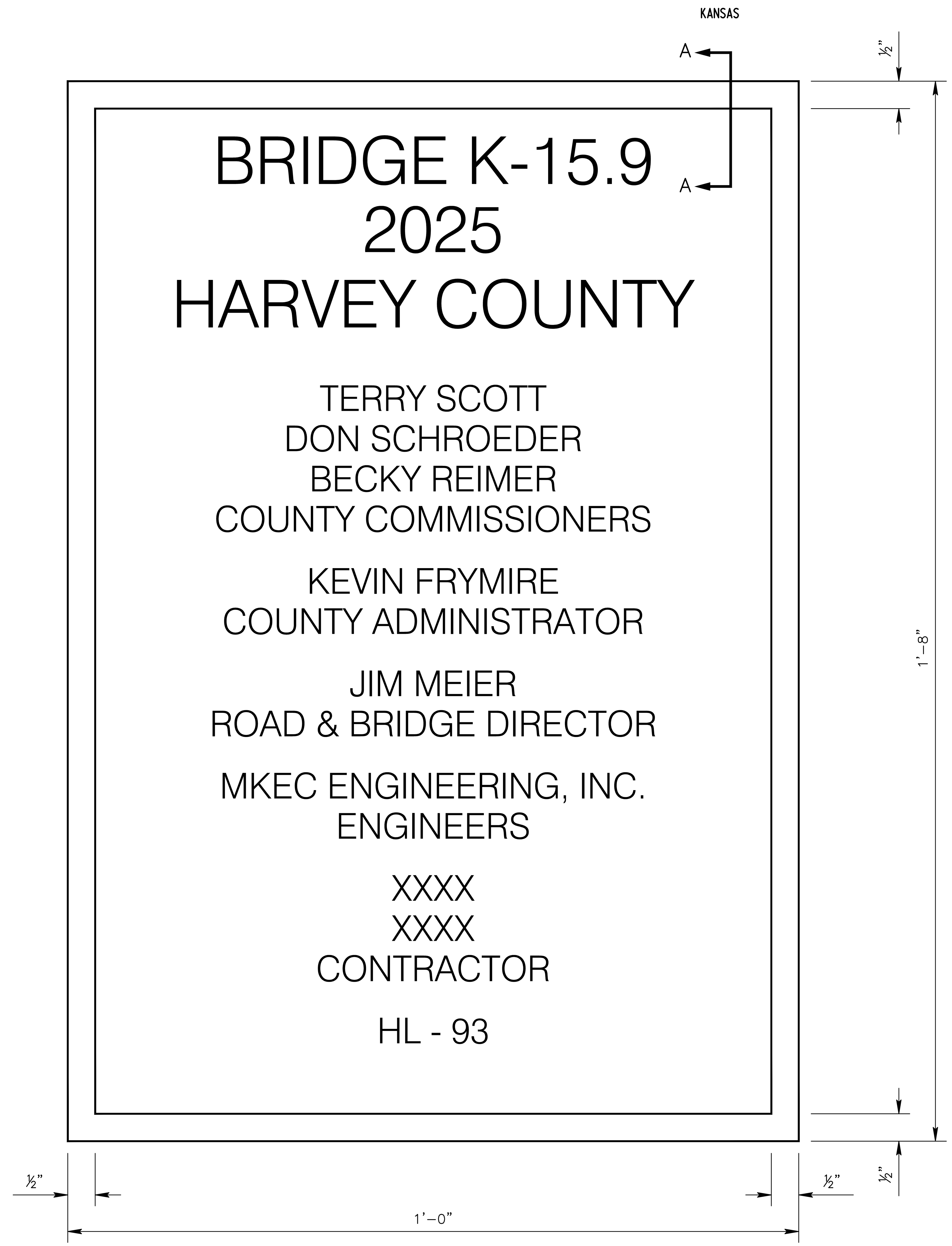


SECTION A-A

BRIDGE PROJECT MARKER
(Northwest Corner)

NOTES:

Variance of dimensions from Section 1625—Standard Specifications, 2015 Edition, Kansas Department of Transportation.



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BRIDGE REPLACEMENT FOR
BRIDGE K-15.9
HARVEY COUNTY, KANSAS

BRIDGE PROJECT MARKER

PROJECT NO.	1401010084
SCALE	NTS

DRAWN	DESIGNED	CHECKED
LWG	DJL	DMU

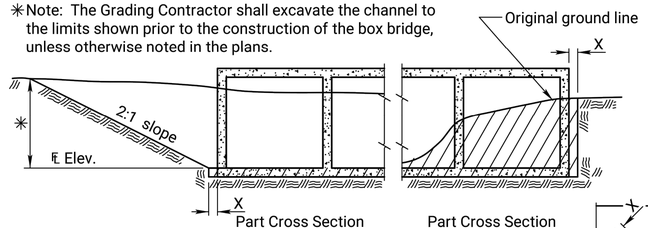
NO.	REVISION	DATE

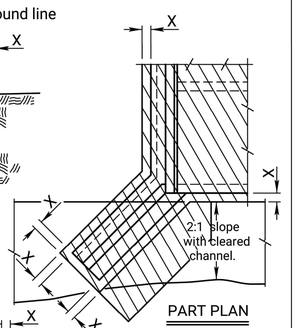
SHEET NO.
29 OF 61

PLOTTED: Thursday, November 06, 2025 @ 11:58AM

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	30	61

✳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.



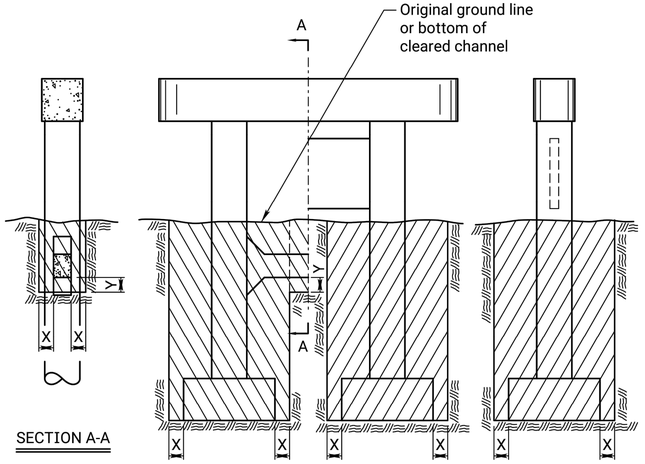


Note: Typical Class III Excavation for box bridges shall be below the "cleared" channel unless otherwise noted on the plans.

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

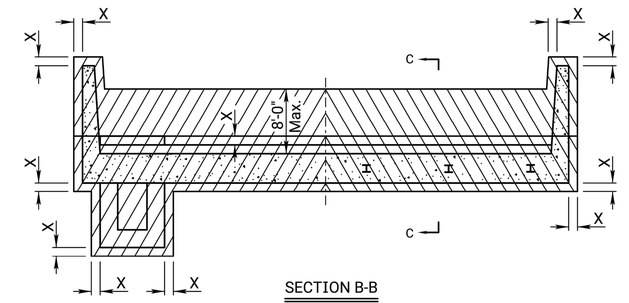
EXCAVATION DETAILS FOR REINFORCED CONCRETE BOX CULVERT

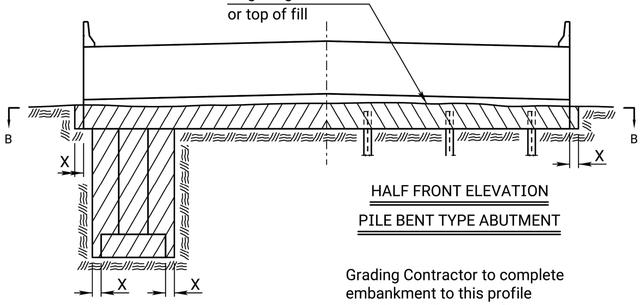
Note: Excavation for culverts less than bridge length and the additional excavation for "Embedded Structures" shall not be paid for as Class III Excavation, but shall be subsidiary to Grade 4.0 Concrete.



EXCAVATION DETAILS FOR TYPICAL PIERS

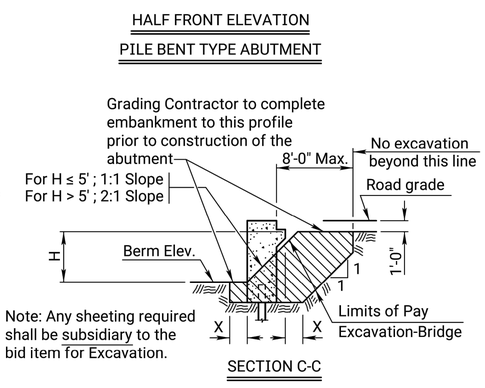
See detail when rock or shale (rock) is encountered. ⊛





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

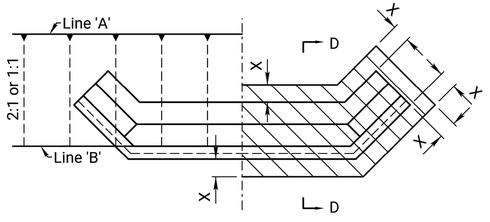
Note: Bridge Contractor shall finish the embankment and berms after the construction of the abutment and dispose of any excess material as approved by the Engineer.

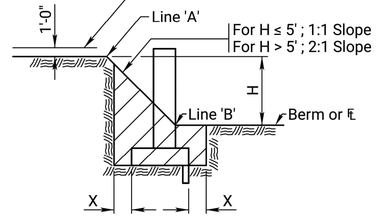


Note: Any sheeting required shall be subsidiary to the bid item for Excavation.

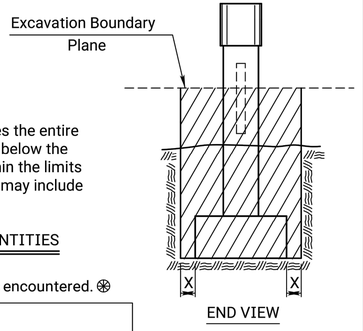
EXCAVATION DETAILS FOR TYPICAL ABUTMENTS

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





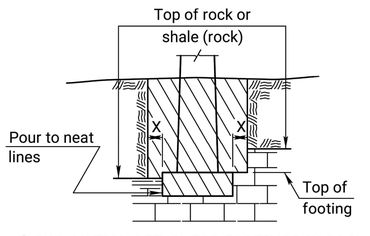
EXCAVATION DETAILS FOR ABUTMENTS WITH FLARED WINGWALLS



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

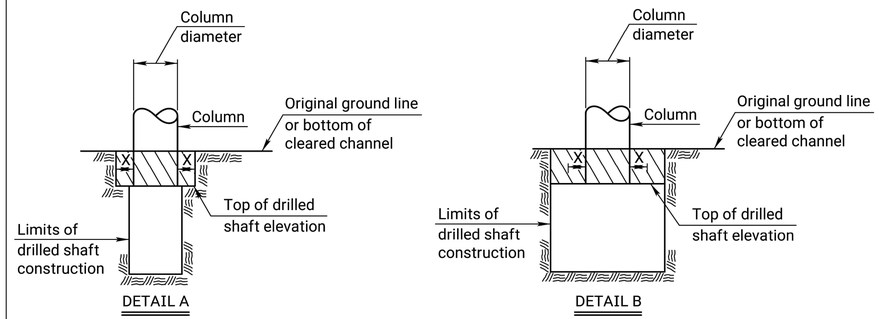
See detail when rock or shale (rock) is encountered. ⊛



⊛ 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)

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.

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.	

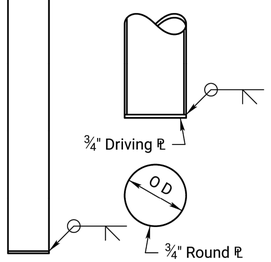
J:\PROJECTS\2014\1401010084 - HARVEY COUNTY_GENERAL SERVICES\05-CIVIL\CADD\STD\K-15.0\K15.0_BR100B.DWG

O D	$10\frac{3}{4}$"	T. = ǂǂ
O D	$12\frac{3}{4}$"	T. = ǂǂ
O D	14"	T. = ǂǂ

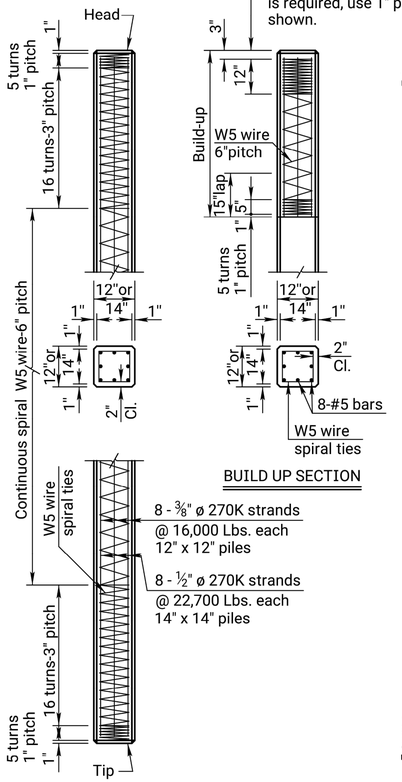
ǂǂ See the Geology Report or "Summary of Quanities" for Pipe Pile wall thickness

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.

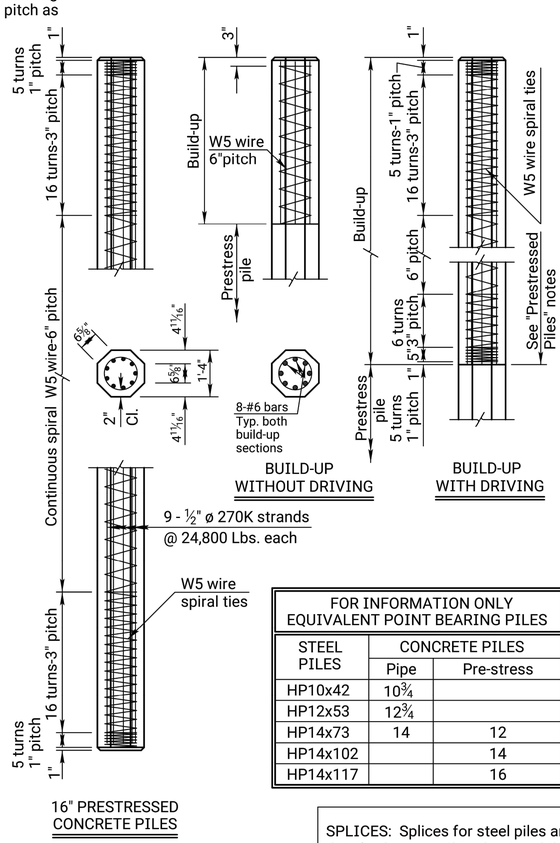


PLAIN ROUND
CAST-IN-PLACE CONCRETE PILES



12" OR 14"
PRESTRESSED
CONCRETE PILES

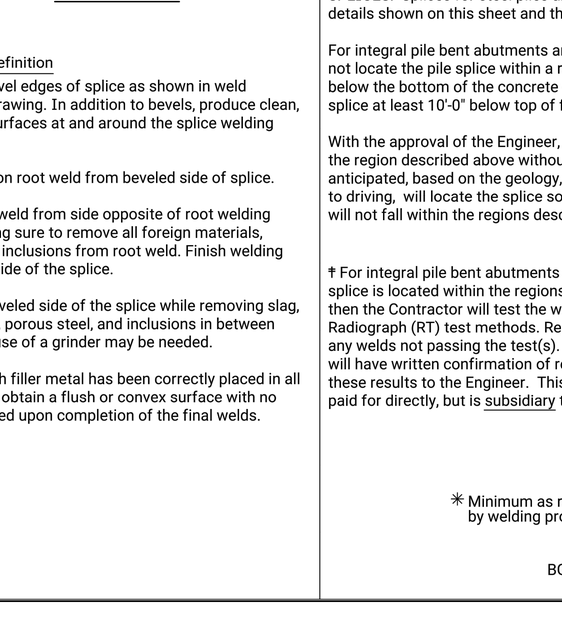
BUILD UP SECTION



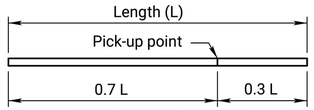
BUILD-UP
WITHOUT DRIVING

BUILD-UP
WITH DRIVING

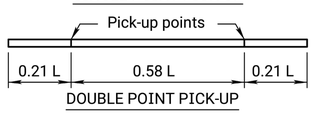
FOR INFORMATION ONLY EQUIVALENT POINT BEARING PILES		
STEEL PILES	CONCRETE PILES	
	Pipe	Pre-stress
HP10x42	$10\frac{3}{4}$	
HP12x53	$12\frac{3}{4}$	
HP14x73	14	12
HP14x102		14
HP14x117		16



16" PRESTRESSED
CONCRETE PILES



SINGLE POINT PICK-UP



DOUBLE POINT PICK-UP

PICK-UP POINTS FOR PRESTRESSED PILING

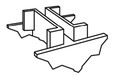
Max. length - 55' single point pick-up
Max. length - 80' double point pick-up

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.

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.

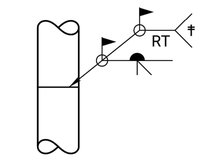
MILL TEST REPORTS: Steel piles test reports and steel shell test reports shall comply with the Standard Specifications.

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

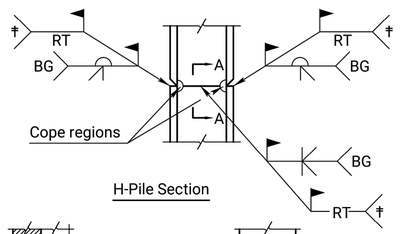
For integral pile bent abutments and piers, if a pile splice is required, do not locate the pile splice within a region extending 2'-0" above and 10'-0" below the bottom of the concrete web wall. For abutments, locate the pile splice at least 10'-0" below top of fill.

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.

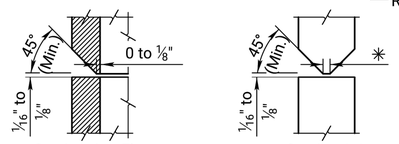
ǂ For integral pile bent abutments and piers, if a splice is located within the regions described above, then the Contractor will test the welds by Radiograph (RT) test methods. Repair and retest any welds not passing the test(s). Each weld tested will have written confirmation of results. Report these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



Pipe Section



H-Pile Section



Section thru Flange

Section A-A
(Thru web)

✳ Minimum as required by welding process.

BG = Backgouge

PILE SPLICE DETAILS

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	31	61

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.

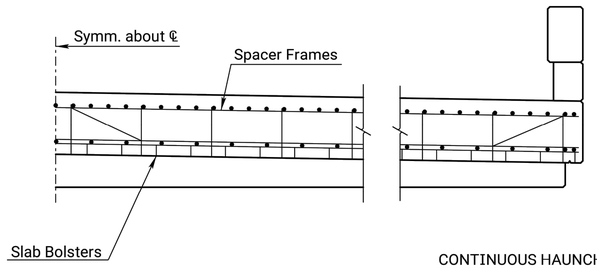
KANSAS DEPARTMENT OF TRANSPORTATION

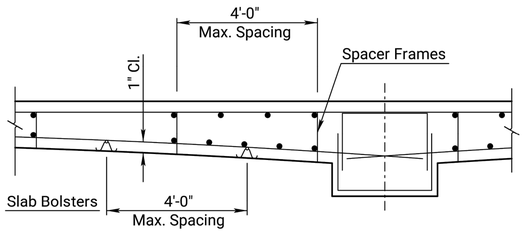
STANDARD PILE DETAILS

BR110

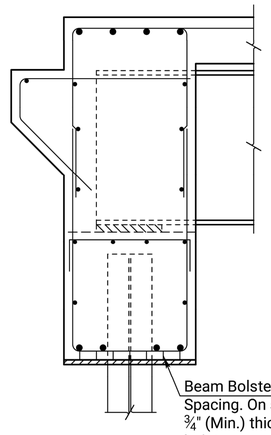
FHWA APPROVAL		10-04-12	APP'D.		Terry L. Fleck
DESIGNED	J.P.J.	DETAILED	QUANTITIES	TRACED	R.A.A.
DESIGN CK.		DETAIL CK.	QUAN.CK.	TRACE CK.	

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	32	61

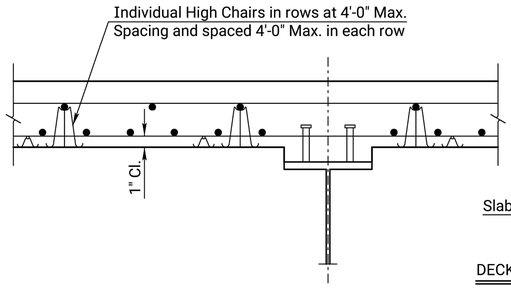


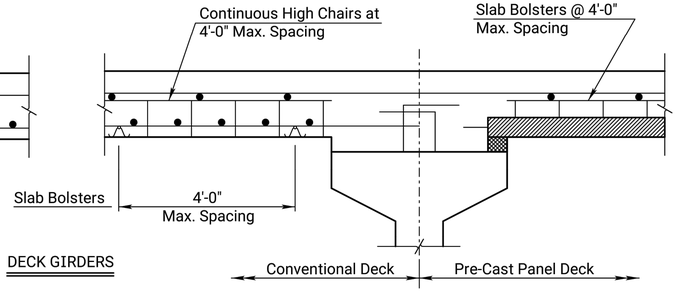


CONTINUOUS HAUNCHED SLAB

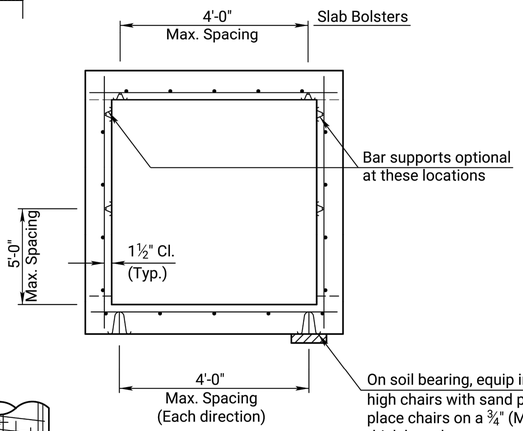


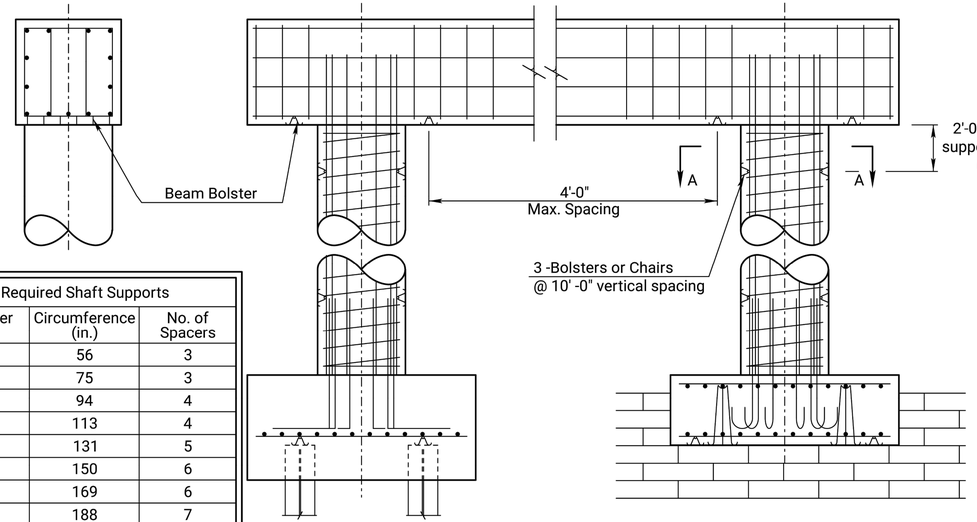
ABUTMENT





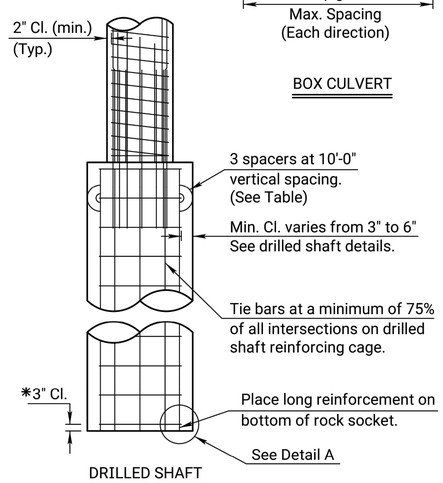
DECK GIRDERS



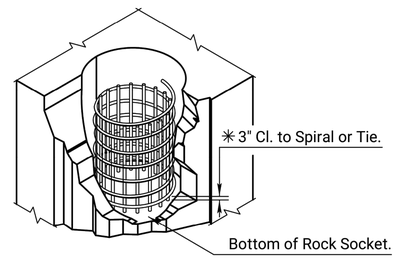


PIER

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

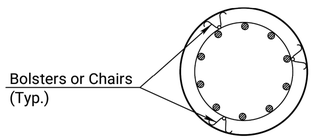


DRILLED SHAFT



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.

EARTHWORK						
Excavation				Compaction	Excavation to be Furnished (cy)	Remarks
Station to Station	Common (cy)	VMF	Rock Excavation (cy)	(Type B) (MR–90) (cy)		
Sta. 46+49.20 to Sta. 49+75.00	454.53	0.85	172.00	613.58	439.33	
Sta. 49+75.00 to Sta. 50+25.00	146.31	0.85		46.02	54.14	*Channel Excavation Subsidiary to Bridge Construction
Sta. 50+25.00 to Sta. 53+34.25	352.93	0.85	162.00	484.99	379.65	
Totals	953.77		334.00	1144.59	873.12	

*Suitable Material Only Shall be used for Compaction

GUARDRAIL SUMMARY					
Location	Side	Guardrail, Steel Plate (Road) (L.F.)	End Terminal		Remarks
			Flared		
			MGS MSKT ALT. 1	MGS SOFTSTOP ALT. 2	
Sta. 48+14.44 to Sta. 49+39.44	Rt.	125*	1		
Sta. 49+01.93 to Sta. 49+39.44	Lt.	37.5*	1		
Sta. 50+60.56 to Sta. 50+98.07	Rt.	37.5*	1		
Sta. 50+60.56 to Sta. 51+85.55	Lt.	161.5*			TYPE II END TERMINAL SUBSIDARY TO GUARDRAIL LENGTH
Totals		361.5	3	0	

*Does not include end terminal

PIPE CULVERT SUMMARY									
Routing Sequencing Mark No.		Station	Offset	Type		Inflow (FL Elev.)	Outflow (FL Elev.)	Pipe Length	Pipe Slope	End Section (24")(CS) (Each)
From	To			Size	Material					
1		46+50.78	29.32' Lt.	24"	CMP	1431.46		50	–2.22%	1
	2	47+09.67	29.41' Lt.				1430.64			1
3		46+72.16	28.98' Rt.	24"	CMP	1431.32		43	–1.54%	1
	4	47+24.03	29.47' Rt.				1430.64			1
5		48+87.34	34.69' Rt.	24"	CMP	1421.49		39	–3.91%	0
	6	49+25.58	49.30' Rt.				1420.00			1
7		51+98.48	32.37' Rt.	24"	CMP	1421.20		31	1.90%	1
	8	52+38.34	30.20' Rt.				1421.78			1

Routing Sequencing marks are located at the end of pipe end sections.

REMOVAL OF EXISTING STRUCTURES (FOR INFORMATION ONLY)			
Location	Offset	Items	Remarks
Sta. 46+80.22	29.36' Rt.	24" CMP	
Sta. 46+97.92	29.19' Lt.	24" STP	
Sta. 47+32.02	16.87' Rt.	W3–1a Sign	
Sta. 48+36.81	14.33' Rt.	R12–5 Sign	
Sta. 49+36.13	13.75' Rt.	OM–3 Sign	
Sta. 50+00.00	0.0'	Existing Bridge Structure	
Sta. 50+63.16	13.84' Lt.	OM–3 Sign	
Sta. 51+33.25	15.46' Lt.	R12–5 Sign	
Sta. 48+78.70 to Sta. 49+32.09	13.72' Rt.	Guardrail	
Sta. 48+78.77 to Sta. 49+32.40	13.67' Lt.	Guardrail	
Sta. 50+67.02 to Sta. 51+20.61	13.77' Lt.	Guardrail	
Sta. 50+67.33 to Sta. 50+20.70	13.80' Rt.	Guardrail	
Sta. 52+20.85	30.67' Lt.	24" CMP	

RECAPITULATION OF QUANTITIES		
BID ITEMS DESCRIPTION	QUANTITY	UNIT
ROAD QUANTITIES		
Contractor Construction Staking	1	LS
Mobilization	1	LS
Field Office and Laboratory (Type C)	1	LS
Removal of Existing Structures	1	LS
Clearing and Grubbing	1	LS
Rock Excavation	334	CY
Common Excavation (Rural Small)	954	CY
Common Excavation (Contractor Furnished)	874	CY
Compaction of Earthwork (Type B)(MR 90)	1,145	CY
Water (Grading)(Set Price)	1	MGAL
Guardrail, Steel Plate (MGS)	362	LF
Guardrail End Terminal (Parallel)(MGS–MSKT)	3	Each
Signing Object Marker (Type 3)	4	Each
Concrete Pavement (10" Uniform)(AE)(BR App)	84	SY
Milling	1,235	SY
HMA Commercial Grade (Class A)(6")	547	Tons
HMA Commercial Grade (Class A)(2")	141	Tons
Tack Oil	149	GAL
Aggregate Base (AB–3)(6")	1,677	SY
Aggregate Base (AB–1)(4")	204	SY
Water (Base)(Set Price)	1	MGAL
Curing Environmanet	1	LS
Bridge Quantities		
Class I Excavation	104	CY
Class II Excavation	138	CY
Concrete (Grade 4.0)(AE)(SW)	252	CY
Concrete (Grade 4.0)(AE)	89	CY
Reinforcing Steel (Gr. 60)	5,848	LB
Reinforcing Steel (Gr. 60)(Epoxy–Coated)	70,918	LB
Contractor Furnished PDA	2	Each
Piles (Steel)(HP10x42)	824	LF
Cast Steel Pile Points	20	Each
Slope Protection (Light Stone)(200 LB)	995	CY
Abutment Strip Drain	36	SY
Bridge Backwall Protection System	40	SY
Bridge Project Marker (Non–Participating)	1	Each
Drainage Quantities		
End Section (24")(CS)	7	Each
Entrance Pipe (24")(CSP)	163	LF
Erosion & Seeding Quantities		
Temporary Erosion Control	1	LS
Seeding	1	LS
Traffic Quantites		
Traffic Control	1	LS

For Summary of Object Markers see sheet 42.
For Summary of Bridge Quantities see sheet 18.
For Summary of Surfacing Quantities see sheet 34.
For Summary of Erosion Control Quantities see sheet 37.
For Summary of Seeding Quantities see sheet 41.
For Summary of Traffic Control Quantities see sheet 51.

MKEC
Wichita, KS • 316.684.9600

DAKOTA JAMES HEIM
LICENSED
30161
11/06/2023
KANSAS
PROFESSIONAL ENGINEER

BRIDGE REPLACEMENT FOR
BRIDGE K-15.9
HARVEY COUNTY, KANSAS

SUMMARY AND RECAPITULATION OF QUANTITIES

PROJECT NO. 1401010084

SCALE NONE

DRAWN	DESIGNED	CHECKED
LWG	DJL	DMU

NO.	REVISION	DATE

SHEET NO.
33 OF 61

GENERAL NOTE:

Surfacing Material (AB-1) shall be used for surfacing roadways and house entrances at a rate of 140lbs/cu. ft.

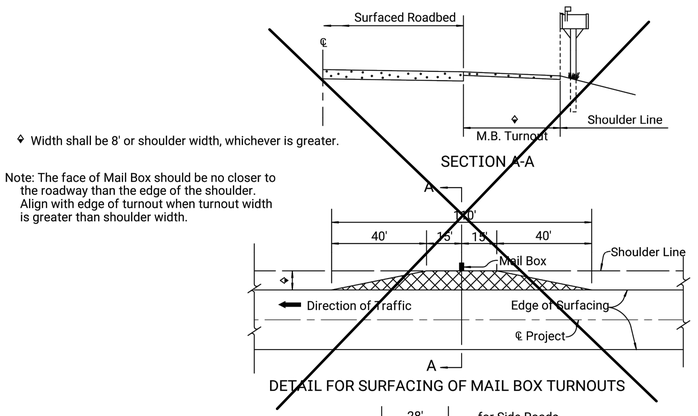
The base course shall be constructed to the plan thickness as shown.

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.

SUMMARY OF QUANTITIES

ITEM	MAINLINE	DRIVES				TOTAL	UNIT
ASPHALT SURFACING							
Surfacing Material (HMA)(6")	520	27				547	TONS
Surfacing Material (HMA)(2")	141					141	TONS
Surfacing Material (AB-1)(4")		204				204	SQ.YDS.
Aggregate Base (AB-3)(6")	1595	82				1677	SQ.YDS.

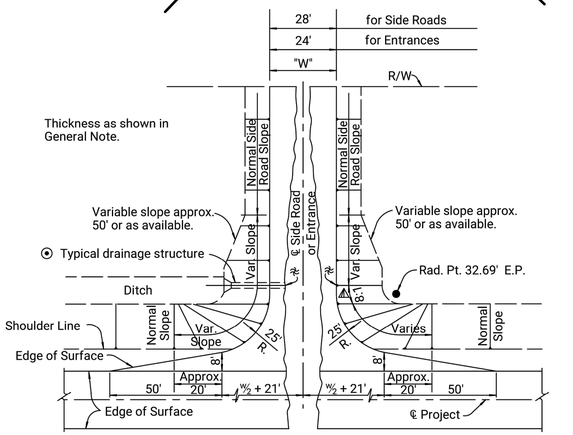
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	34	61



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

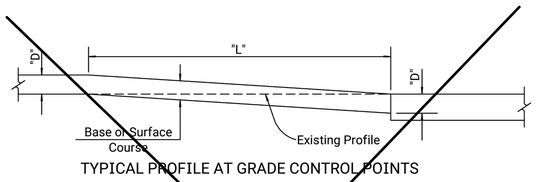
Note: The face of Mail Box should be no closer to the roadway than the edge of the shoulder. Align with edge of turnout when turnout width is greater than shoulder width.

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	UNIT	ITEM		

† Computed at the rate of

†† Computed at the rate of

RECAPITULATION OF QUANTITIES

ITEM				TOTAL	UNIT
Surfacing Material (HMA)				688	TONS
Surfacing Material (AB-1)(4")				204	SQ.YDS.
Aggregate Base (AB-3)(6")				1677	SQ.YDS.
Milling				1235	SQ.YDS.
Water (Aggregate Base) (Set Price)				1	MGAL.

⚠ 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.

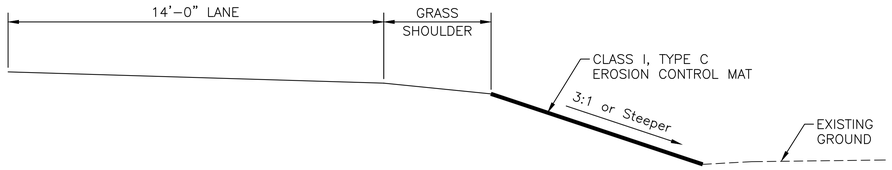
NO.	DATE	REVISIONS	BY	APP'D
12	01-10-07	Changed bituminous to asphalt	S.W.K.	J.O.B.
11	08-30-06	Changed tack type/rate	S.W.K.	J.O.B.
10	03-24-05	Revised compaction, tack type/rate	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

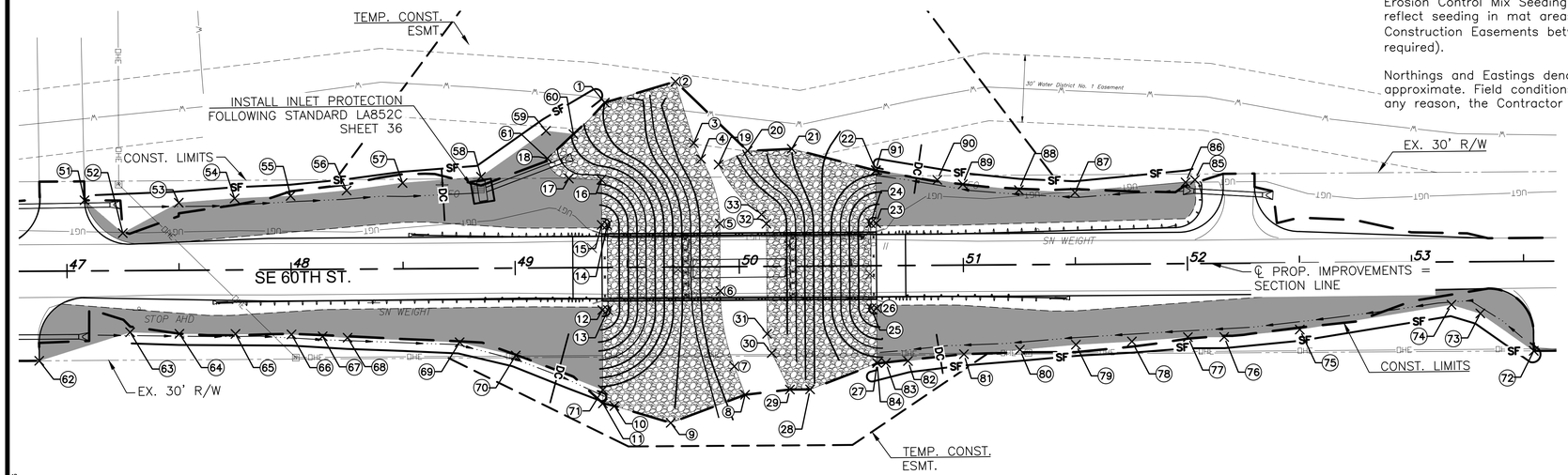
SUMMARY OF QUANTITIES (Surfacing)

~~RD051~~

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



TYPICAL SECTION
(EROSION CONTROL MAT LIMITS)



EROSION CONTROL NOTES

This project will disturb more than 1.0 acres.

Refer to the KDOT standards for BMP installation, inspection and maintenance details and specifications.

Cost for each erosion and sediment control item shall include maintenance, inspection and eventual removal. Besides keeping each device in working order, maintenance shall include, at a minimum, sediment removal before 50% of the device's capacity is reached.

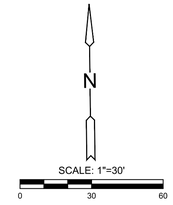
Contractor shall adjust erosion and sediment control plans to conform to actual construction operations.

Install Class I, Type C erosion control mat on all slopes 3:1 or steeper as shown.

Stockpiling of excavated material on the project site is generally prohibited. Small and interim stock piles not immediately hauled off–site should be enclosed and protected with silt barrier around the entire circumference of the stock pile. Installing and maintaining this fence shall be considered Subsidiary to the bid item "BMP, Silt Fence".

Erosion Control Mix Seeding shall be performed prior to placing erosion control mat. Quantities reflect seeding in mat areas and in all unsurfaced areas within the Right–Of–Way and Temporary Construction Easements between project start and end stations. (No seeding in channel bottom required).

Northings and Eastings denoted for edges of slope protection and erosion control mat are approximate. Field conditions govern over locations noted. If construction limits are extended for any reason, the Contractor shall provide erosion control materials to cover new extents.



LEGEND

- SLOPE PROTECTION (LIGHT STONE)(24")
- CLASS I, TYPE C EROSION CONTROL MAT
- DC — TEMPORARY DITCH CHECK (ROCK)
- SF — SILT FENCE
- CONST. LIMITS

SLOPE PROTECTION POINTS		
Point #	Northing	Easting
1	1820855.51	1620663.66
2	1820864.90	1620695.17
3	1820837.43	1620703.36
4	1820830.33	1620706.57
5	1820801.50	1620714.96
6	1820771.36	1620715.16
7	1820737.69	1620721.43
8	1820725.01	1620726.23
9	1820712.46	1620693.05
10	1820719.99	1620667.92
11	1820721.17	1620662.79
12	1820762.85	1620662.51
13	1820762.87	1620665.01
14	1820800.87	1620664.76
15	1820800.85	1620662.26

SLOPE PROTECTION POINTS		
Point #	Northing	Easting
16	1820821.02	1620662.13
17	1820821.58	1620647.60
18	1820830.52	1620637.99
19	1820827.83	1620714.42
20	1820833.91	1620727.39
21	1820834.83	1620747.07
22	1820825.14	1620784.60
23	1820801.67	1620784.76
24	1820801.65	1620782.26
25	1820763.65	1620782.51
26	1820763.67	1620785.01
27	1820739.20	1620785.17
28	1820727.41	1620755.25
29	1820727.35	1620746.25
30	1820743.65	1620738.14

SLOPE PROTECTION POINTS		
Point #	Northing	Easting
31	1820752.23	1620736.09
32	1820801.40	1620735.76
33	1820805.52	1620733.55

EROSION CONTROL MAT POINTS		
Point #	Northing	Easting
51	1820811.87	1620431.45
52	1820797.21	1620448.53
53	1820810.78	1620473.52
54	1820812.67	1620498.43
55	1820813.80	1620523.42
56	1820816.22	1620548.41
57	1820819.58	1620573.38
58	1820822.36	1620608.37
59	1820842.87	1620637.38
60	1820841.41	1620649.65
61	1820830.52	1620637.99
62	1820740.17	1620411.27
63	1820752.94	1620451.81
64	1820752.25	1620473.82
65	1820752.20	1620498.83

EROSION CONTROL MAT POINTS		
Point #	Northing	Easting
66	1820751.97	1620523.83
67	1820751.12	1620537.73
68	1820750.48	1620548.84
69	1820748.46	1620598.86
70	1820742.54	1620623.90
71	1820727.26	1620662.75
72	1820744.62	1621078.20
73	1820761.34	1621054.34
74	1820765.24	1621041.47
75	1820754.14	1620973.76
76	1820750.81	1620940.03
77	1820750.76	1620923.85
78	1820748.82	1620898.86
79	1820747.38	1620873.87
80	1820745.15	1620848.89

EROSION CONTROL MAT POINTS		
Point #	Northing	Easting
81	1820743.14	1620823.90
82	1820740.09	1620798.92
83	1820739.23	1620789.06
84	1820739.20	1620785.17
85	1820820.97	1620926.97
86	1820819.89	1620922.81
87	1820815.34	1620873.42
88	1820816.43	1620848.41
89	1820819.00	1620823.39
90	1820820.98	1620812.03
91	1820825.38	1620784.60

NOTE:
SEE SHEET 5 FOR CONTROL INFORMATION.

MKEC
Wichita, KS • 316.684.9600

DAKOTA JAMES LEWIS
LICENSED
30161
11/01/2023
KANSAS
PROFESSIONAL ENGINEER

BRIDGE REPLACEMENT FOR
BRIDGE K-15.9
HARVEY COUNTY, KANSAS

EROSION CONTROL AND ROADSIDE IMPROVEMENTS PLAN

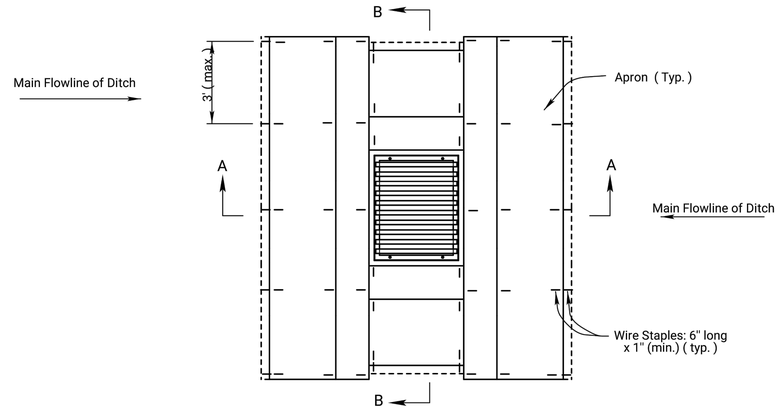
PROJECT NO. 1401010084
SCALE 1" = 30'
DRAWN LWG | DESIGNED DJL | CHECKED JRA

NO.	REVISION	DATE

SHEET NO. 35 OF 61

PLOTTED: Thursday, November 06, 2025 @ 11:59AM

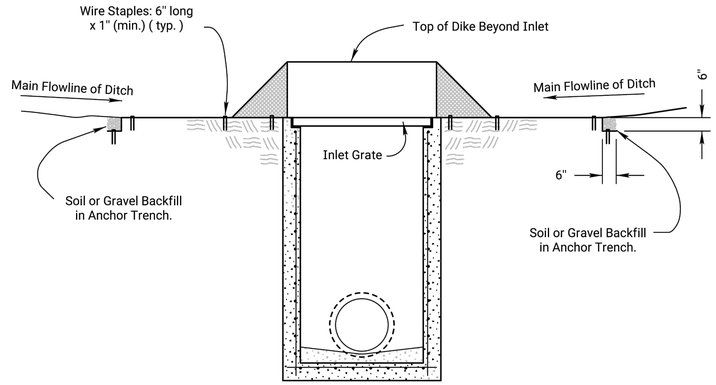
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	36	61



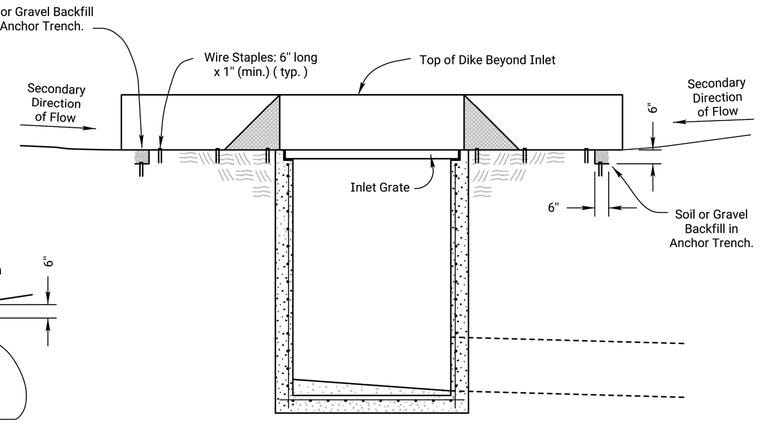
PLAN

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

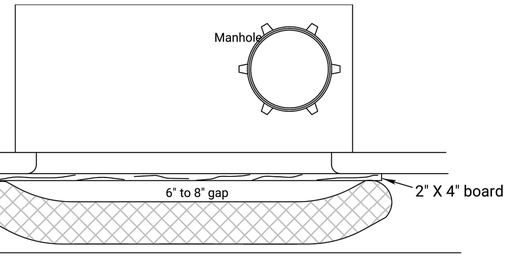
NO SCALE



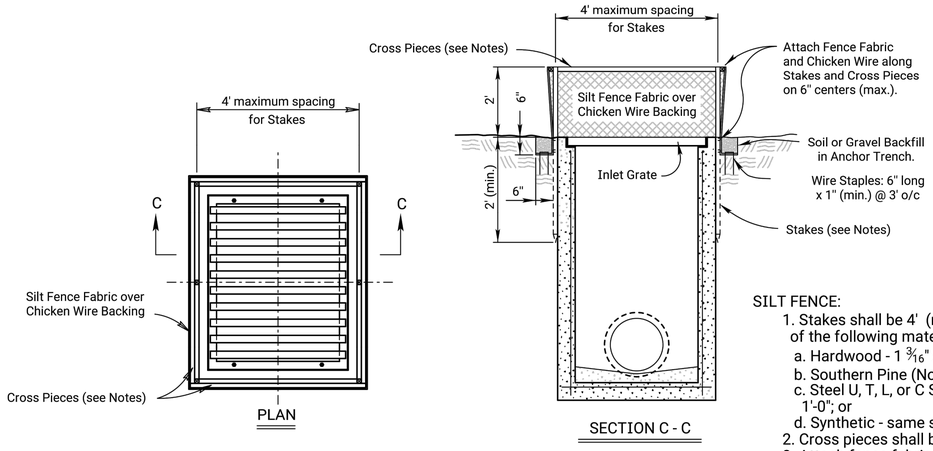
SECTION A - A



SECTION B - B



CURB INLET PROTECTION



PLAN

SECTION C - C

TEMPORARY I NLET SEDI MENT BARRI ER
(SI LT FENCE METHOD)

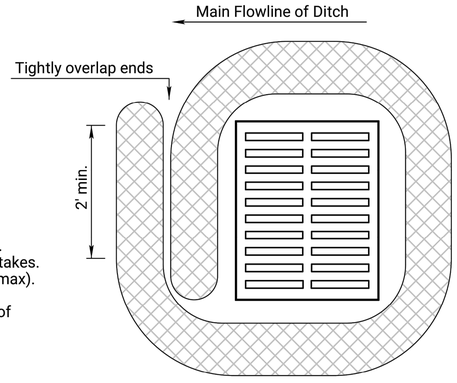
NO SCALE

SILT FENCE:

1. Stakes shall be 4' (min.) long and of one of the following materials:
   a. Hardwood - 1 $\frac{3}{16}$" x 1 $\frac{3}{16}$";
   b. Southern Pine (No. 2) - 2 $\frac{5}{8}$" x 2 $\frac{5}{8}$";
   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.

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

Rock = approximately 1" to 2" diameter



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

BIODEGRADABLE LOG/FILTER SOCK
DROP INLET PROTECTION

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

Stake every 4'

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.

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

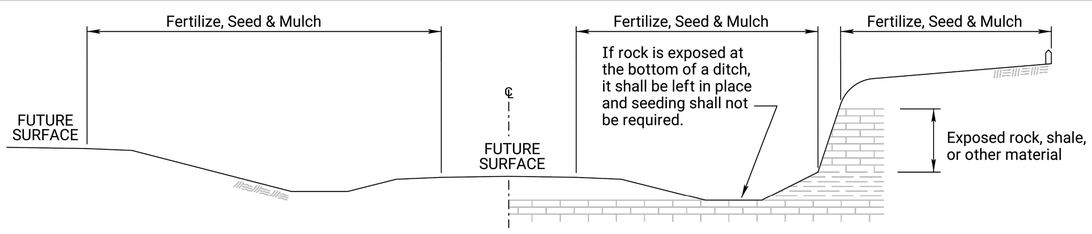
TEMPORARY EROSION AND POLLUTION CONTROL, TEMPORARY INLET SEDIMENT BARRIER (SILT FENCE) TEMP. INLET SEDIMENT BARRIER (T.S.D.)

LA852C

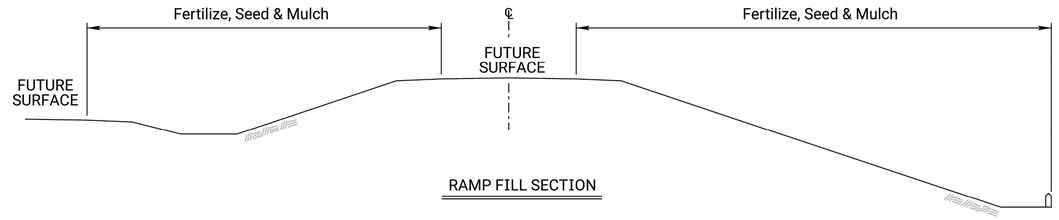
FHWA APPROVAL			03-10-15	APP'D.	Scott H. Shields
DESIGNED	R.A.	DETAILED	R.A.	QUANTITIES	TRACED
DESIGN CK.	S.H.S.	DETAIL CK.	S.H.S.	QUAN.CK.	TRACE CK.

J:\PROJECTS\2014\1401010084 - HARVEY COUNTY_GENERAL SERVICES\05-CIVIL\CAD\STD\K-15.9\K15.9_LA852C.DWG

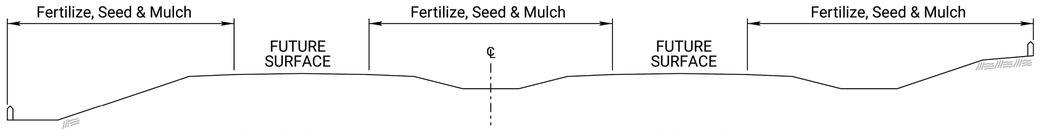
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	37	61



RAMP CUT SECTION



RAMP FILL SECTION



FILL SECTION CUT SECTION

TYPICAL SECTION - DUAL PAVEMENT

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		0.4	Temporary Fertilizer # (16 - 20 - 0)	60	LB
				Temporary Seed (Canada Wildrye)		LB
				Temporary Seed (Grain Oats)		LB
				Temporary Seed (Sterile Wheatgrass)		LB
	109.9		0.4	Soil Erosion Mix #	44.1	LB
				Erosion Control (Class 1, Type C) #	1704	SQ YD
				Erosion Control (Class 2, Type Y)		SQ YD
				Sediment Removal (Set Price)		CU YD
				Synthetic Sediment Barrier		LF
				Temporary Berm (Set Price)		LF
				Temporary Ditch Check (Rock) #	51	CU YD
				Temporary Inlet Sediment Barrier		EACH
				Temporary Sediment Basin		CU YD
				Temporary Slope Drain		LF
				Temporary Stream Crossing		EACH
				Biodegradable Log (9")		LF
				Biodegradable Log (12")		LF
				Biodegradable Log (20")		LF
				Filter Sock (✳✳✳✳)		LF
				Geotextile (Erosion Control)		SQ YD
				Silt Fence #	935	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
				Temporary Erosion Control	1	LS

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.

For Information Only. Subsidiary to "Temporary Erosion Control"

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	Blue Grama (Lovington)	0.2
4.5	Buffalograss (Treated)	1.8
45	Perennial Ryegrass	18.0
2.6	Prairie Junegrass	1.1
6.3	Side Oats Grama (El Reno)	2.6
45	Tall Fescue (Endophyte Free)	18.0
6	Western Wheat (Barton)	2.4
109.9	Total (lb)	44.1

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.

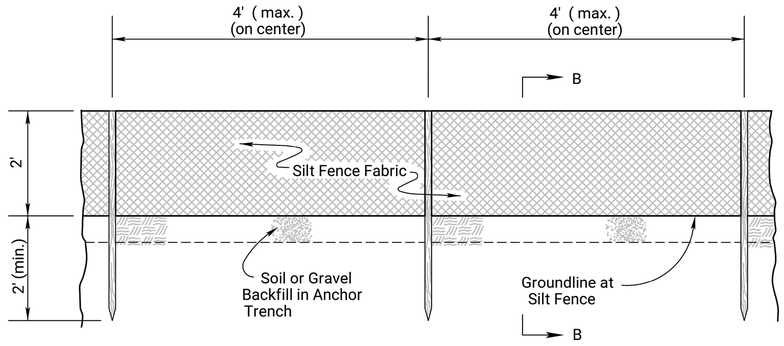
KANSAS DEPARTMENT OF TRANSPORTATION

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.

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	38	61



TYPICAL ELEVATION

SILT FENCE BARRIER

NO SCALE

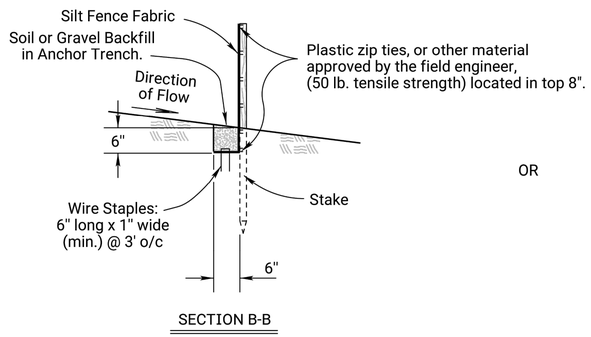
INSTALLATION NOTES

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.

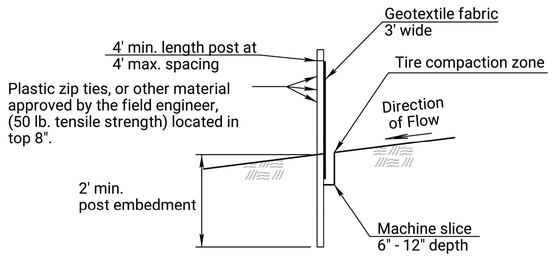
BIODEGRADABLE LOG OR FILTER SOCK

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.



SECTION B-B

OR



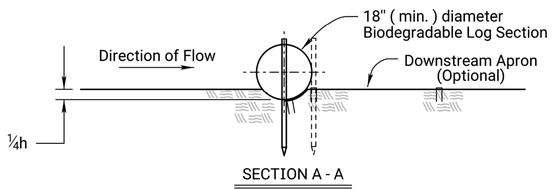
SECTION B-B

Biodegradable Log or Filter Sock Slope Interruptions

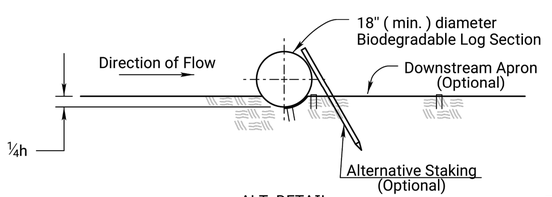
		PRODUCT		
		9" Sediment Log or 8" Filter Sock (ft)	12" Sediment Log or 12" Filter Sock (ft)	20" Sediment Log or 18" Filter Sock (ft)
Slope Gradient	≤4H:1V	40	60	80
	3H:1V	30	45	60

Deviations should be approved by the Field Engineer.

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

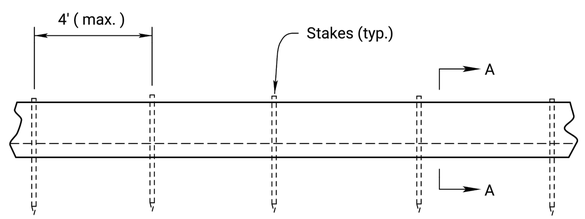


SECTION A - A



ALT. DETAIL

OPTIONAL



TYPICAL ELEVATION

BIODEGRADABLE LOG SLOPE INTERRUPTIONS

OR Filter Sock

GENERAL NOTES

1) Slope interruptions shall be placed along contour lines, with a short section turned upgrade at each end of the barrier.

2) The maximum length of the slope interruptions shall not exceed 250 feet, and the barrier ends need to be staggered.

3) Interruptions damaged by Contractor's negligence, including improper maintenance or lack of maintenance, shall be repaired immediately by Contractor at no additional cost to KDOT.

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

NO.	DATE	REVISIONS	BY	APP'D
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

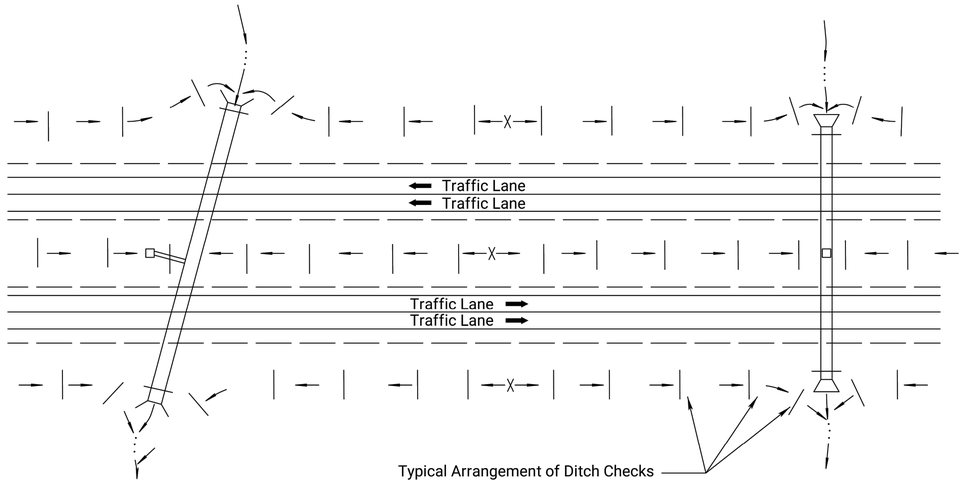
TEMPORARY EROSION AND POLLUTION CONTROL SLOPE INTERRUPTIONS BIODEGRADABLE LOG / SILT FENCE

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.	

PLOTTED: Thursday, November 06, 2025 @ 11:59AM

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	39	61



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.

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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.

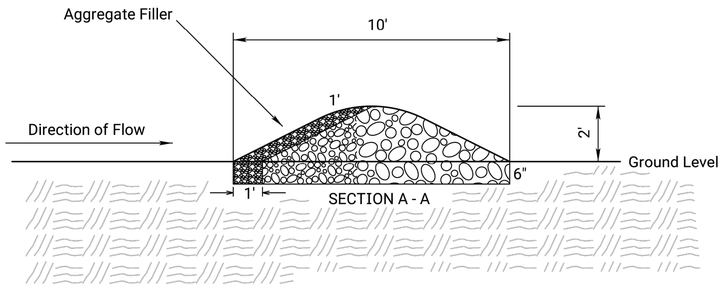
KANSAS DEPARTMENT OF TRANSPORTATION

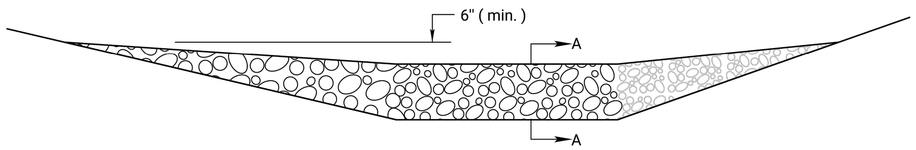
TEMPORARY EROSION AND POLLUTION CONTROL DITCH CHECKS

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.

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	40	61





TYPICAL ELEVATION

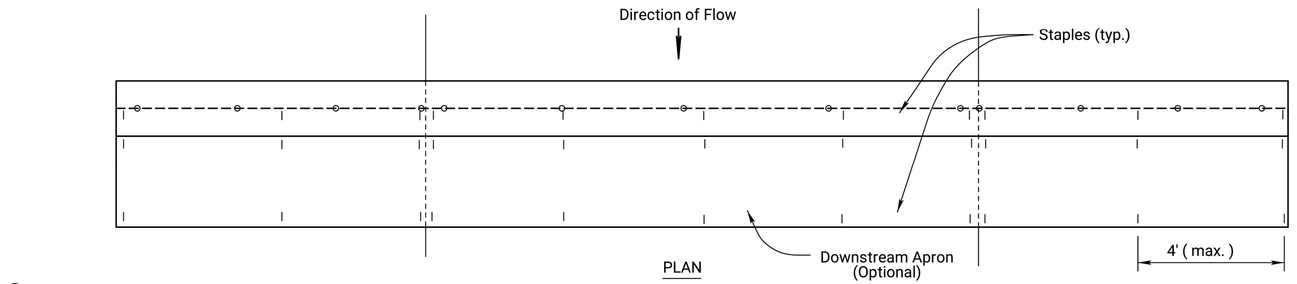
ROCK DITCH CHECK

NO SCALE

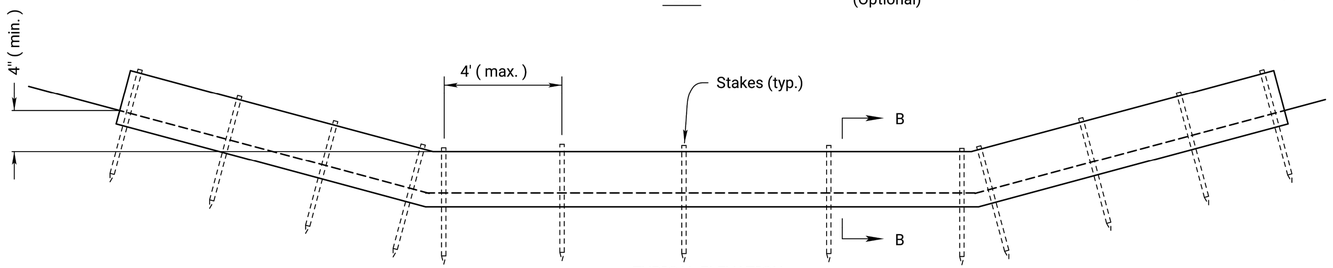
TEMPORARY ROCK DITCH CHECK SPACING	
DITCH ℄ SLOPE (%)	SPACING INTERVAL (FEET)
5.0	60
6.0	50
7.0	43
8.0	36
9.0	33
10.0	29
NOTE: Use this spacing for Rock Ditch Checks only.	

ROCK DITCH CHECK NOTES

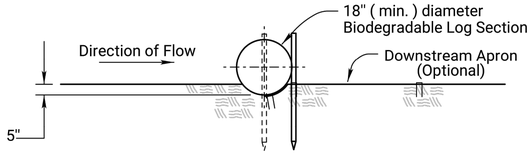
1. Rock shall be clean aggregate, D50-6" and aggregate filler.
2. Place rock in such manner that water will flow over, not around ditch check.
3. Do not use rock ditch checks in clear zone.
4. Excavation: The ditch area shall be reshaped to fill any eroded areas. Prior to placement of the rock, the ditch 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.



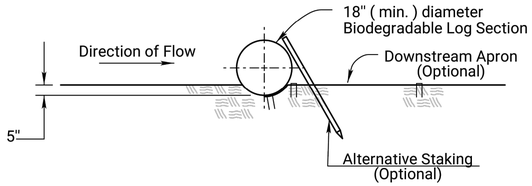
PLAN



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

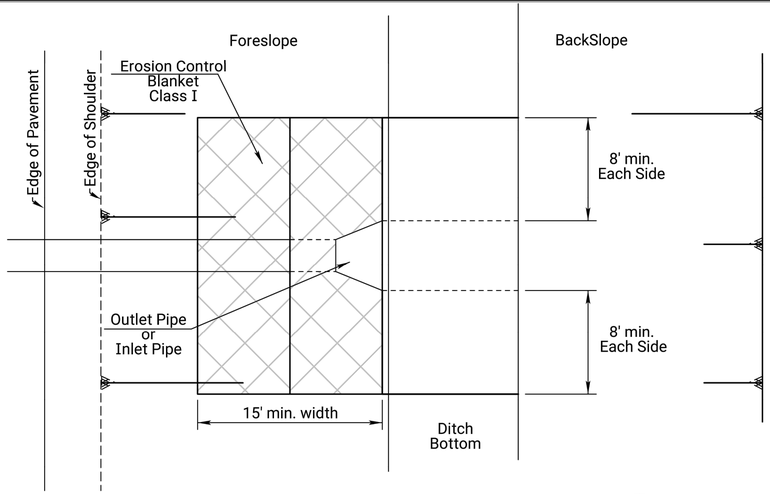
TEMPORARY EROSION AND POLLUTION CONTROL
ROCK DITCH CHECKS
BIODEGRADABLE LOG DITCH CHECKS

LA852G

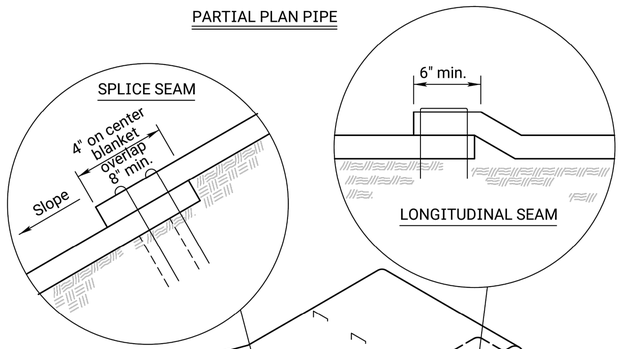
FHWA APPROVAL				11-19-20	APP'D.		Mervin Lare
DESIGNED	M.L.	DETAILED	D.K.		QUANTITIES	TRACED	R.A.A.
DESIGN CK.	M.L.	DETAIL CK.	M.L.		QUAN.CK.	TRACE CK.	R.A.A.

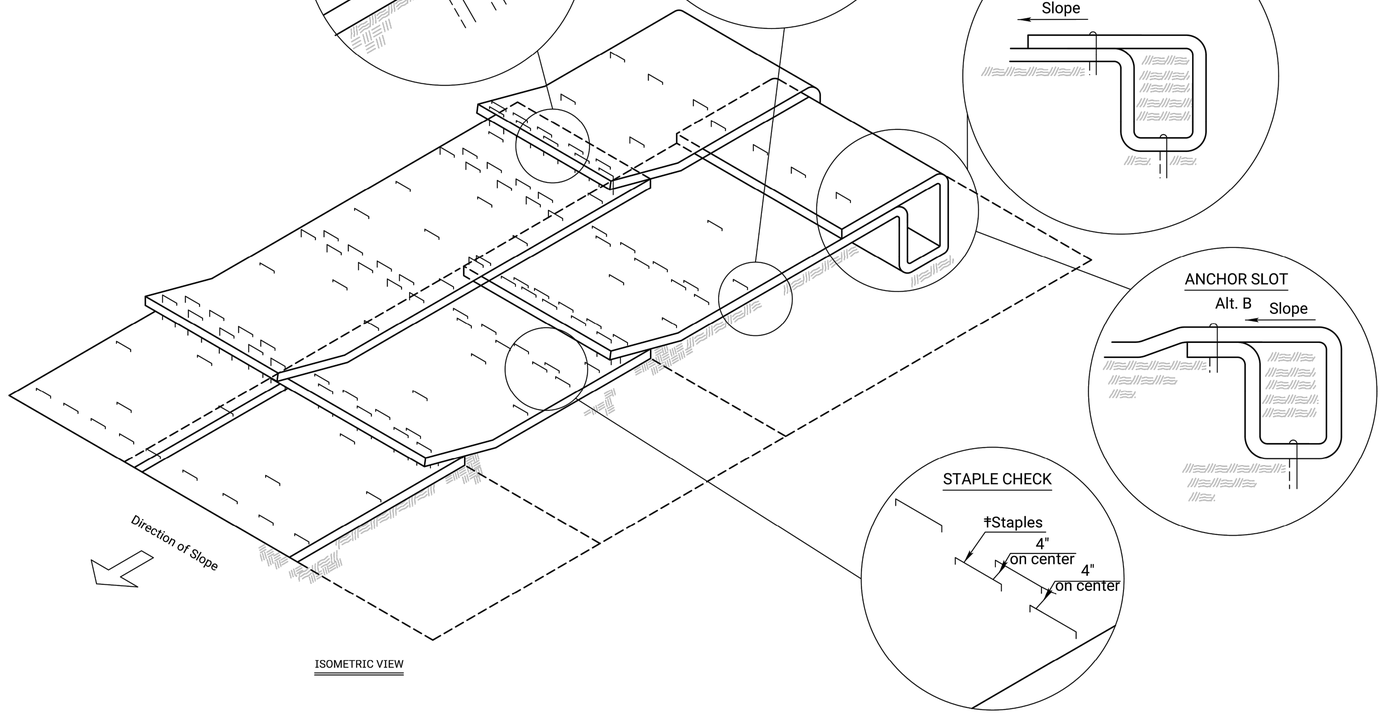
PLOTTED: Thursday, November 06, 2025 @ 11:59AM

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	41	61

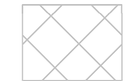


PARTIAL PLAN PIPE

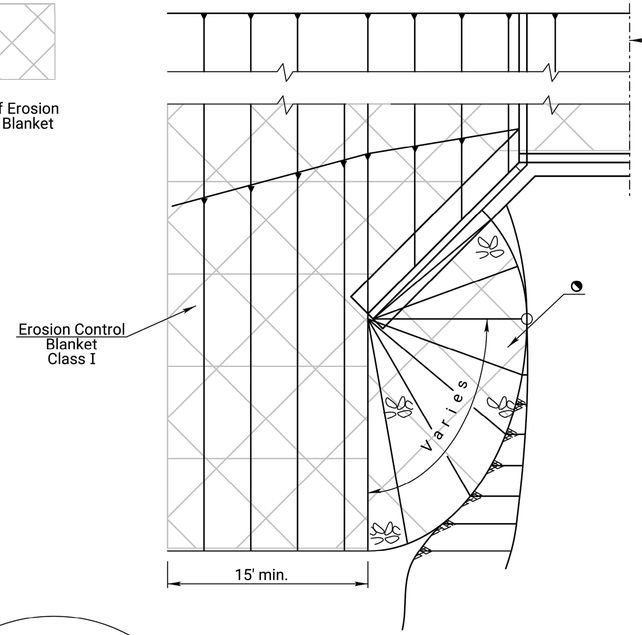




ISOMETRIC VIEW



Limits of Erosion Control Blanket



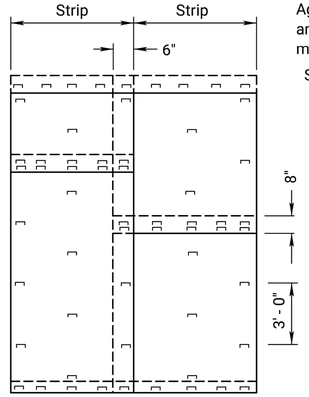
PARTIAL PLAN BOX CULVERT

◔ 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.

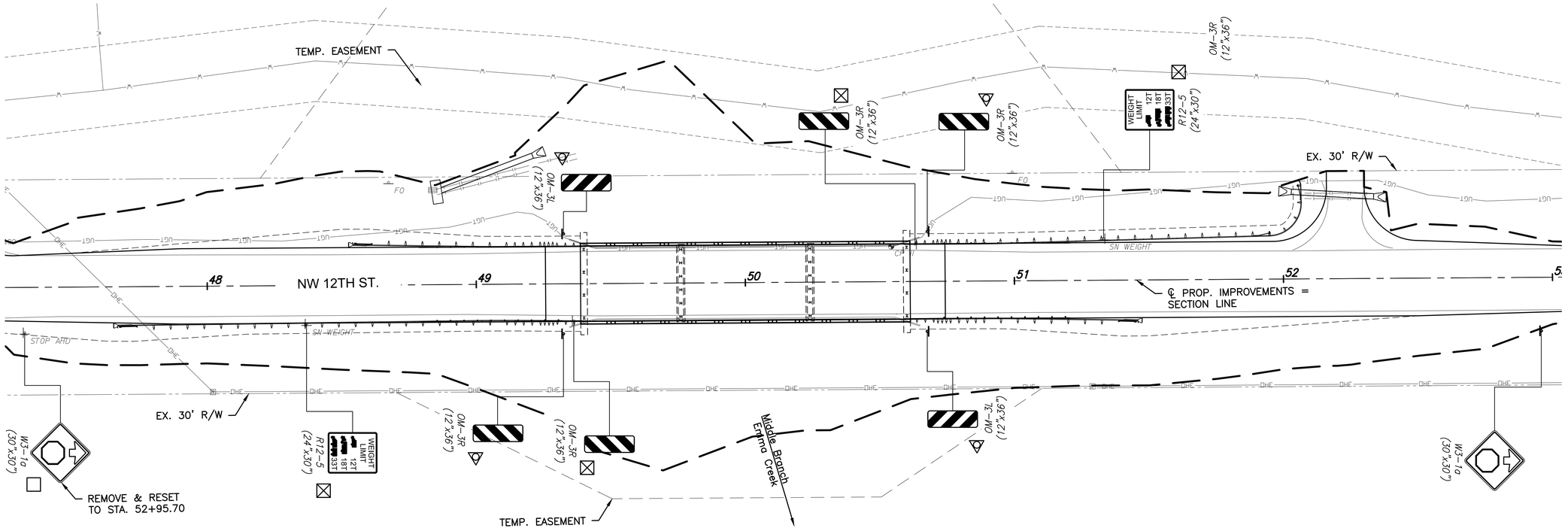
KANSAS DEPARTMENT OF TRANSPORTATION

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.	

J:\PROJECTS\2014\1401010084 - HARVEY COUNTY_GENERAL SERVICES\05-CIVIL\CAD\STD\K-15.9\K15.9_LA855.DWG



SUMMARY OF OBJECT MARKERS AND SIGNS

STATION TO STATION	SIDE	TYPE OF STRUCT.	TYPE OF SIGN	OBJECT MARKER TYPE	OBJECT MARKER NO.	REMARKS
49+33.00	LT.			OM-3L	1	
49+33.00	RT.			OM-3R	1	
50+68.00	LT.			OM-3R	1	
50+68.00	RT.			OM-3L	1	
Ø As you face bridge end from approach						
*Back-to-Back [Sign(s) on Both Sides of Post]						

SIGNING LEGEND

- New sign and post
- Remove sign, post, & return to owner
- Traffic Sign
- Remove and reset

MKEC
Wichita, KS • 316.684.9600

DAKOTA JAMES LICENSED 30161 11/06/2025 KANSAS PROFESSIONAL ENGINEER

BRIDGE REPLACEMENT FOR

BRIDGE K-15.9

HARVEY COUNTY, KANSAS

SIGNING PLAN

PROJECT NO. 1401010084

SCALE 1"= 20'

DRAWN	DESIGNED	CHECKED
LWG	DJL	JRA

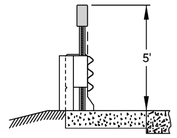
NO.	REVISION	DATE

SHEET NO. 42 OF 61

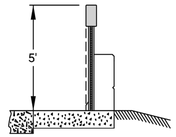
PLOTTED: Thursday, November 06, 2025 @ 11:56AM
J:\PROJECTS\2014\1401010084 - HARVEY COUNTY_GENERAL SERVICES\05-CIVIL\CAD\TRAFFIC\BRIDGE K-15.9\140084_SIGNING PLAN.DWG

PLOTTED: Thursday, November 06, 2025 @ 12:00PM

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	43	61

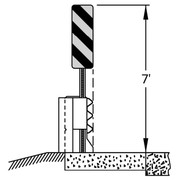


WITH GUARDRAIL

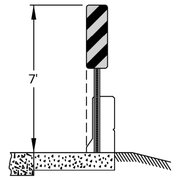


WITHOUT GUARDRAIL

SHOULDER WIDTH 6 FEET OR GREATER (TYPE 2 OBJECT MARKER)



WITH GUARDRAIL

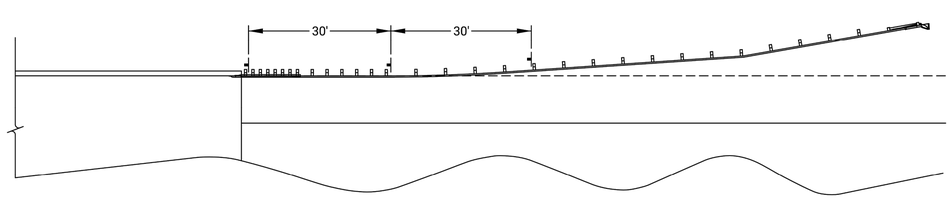


WITHOUT GUARDRAIL

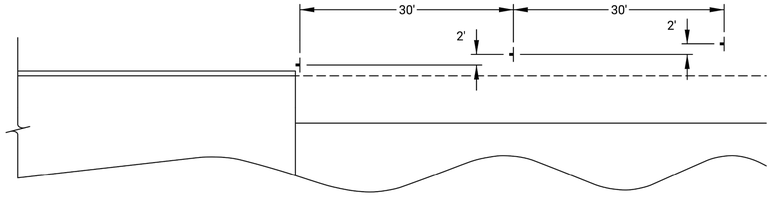
SHOULDER WIDTH LESS THAN 6 FEET (TYPE 3 OBJECT MARKER)

NOTE:
The longitudinal location of the object markers from the structure end shall be a maximum spacing of 42".

END OF STRUCTURE

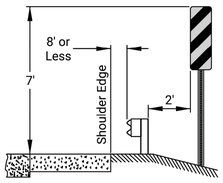


LONGITUDINAL PLACEMENT

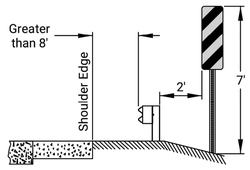


LONGITUDINAL PLACEMENT

NOTE:
The lateral offset is measured from the centerline of the object markers.

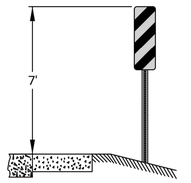


GUARDRAIL 8' OR LESS FROM SHOULDER EDGE



GUARDRAIL GREATER THAN 8' FROM SHOULDER EDGE

STRUCTURE APPROACH GUARDRAIL WITHOUT MARKERS



STRUCTURE APPROACH WITHOUT GUARDRAIL

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

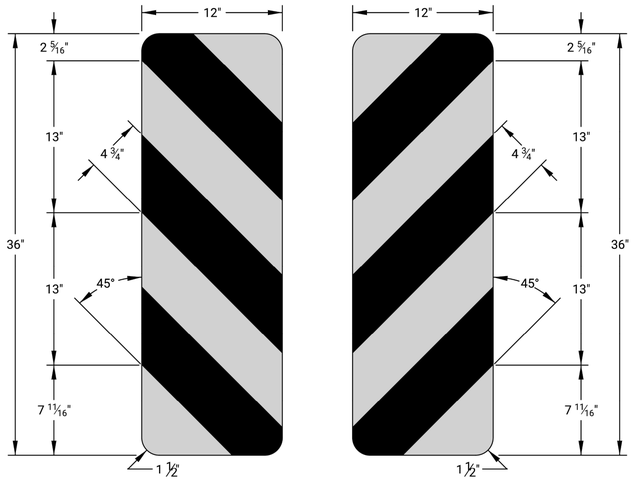
DESIGN DETAILS FOR OBJECT MARKERS (TYPE 2 & 3) FOR STRUCTURES WITH PARAPETS

TE415 10-01-19

FHWA APPROVAL			10-01-19	APP'D.		Eric W. Nichol	
DESIGNED	D.D.G.	DETAILED	D.D.G.	QUANTITIES		TRACED	
DESIGN CK.	E.W.N.	DETAIL CK.	E.W.N.	QUAN.CK.		TRACE CK.	

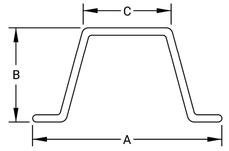
J:\PROJECTS\2014\1401010084 - HARVEY COUNTY_GENERAL SERVICES\05-CIVIL\CAD\STD\K-15.9\K15.9_TE415.DWG

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	44	61



OM3-L

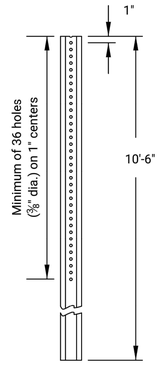
OM3-R



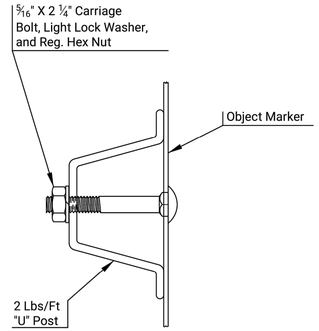
DIMENSIONS	
A	3 1/8
B	1 17/32
C	1 1/4

(Dimensions are nominal)

2 lb/ft "U" POST



PUNCHING DETAILS



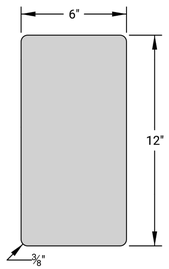
MOUNTING DETAILS

COLORS:
Yellow Background (Reflective)
Black Stripes (Non-reflective)

TYPE 3 OBJECT MARKER

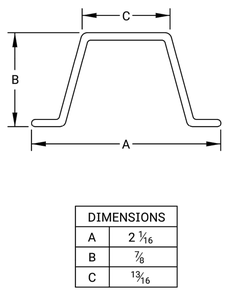
GENERAL NOTE:
See flat sheet sign blank standard sheets for the 6" x 12" and 12" x 36" sign blank details.

The object markers shall be covered with Type XI High Intensity yellow retroreflective sheeting.



OM2

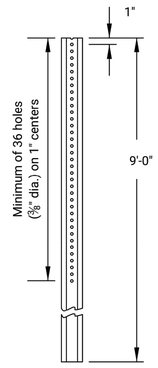
COLOR:
Yellow Background (Reflective)



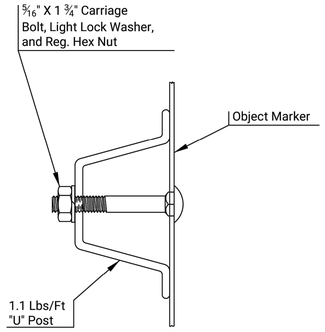
DIMENSIONS	
A	2 1/16
B	7/8
C	13/16

(Dimensions are nominal)

DELINEATOR POST
(1.1 lb/ft "U" Post)



PUNCHING DETAILS



MOUNTING DETAILS

TYPE 2 OBJECT MARKER

All dimensions are in inches unless otherwise noted.
See standard plan sheet TE590 for detailed specifications.

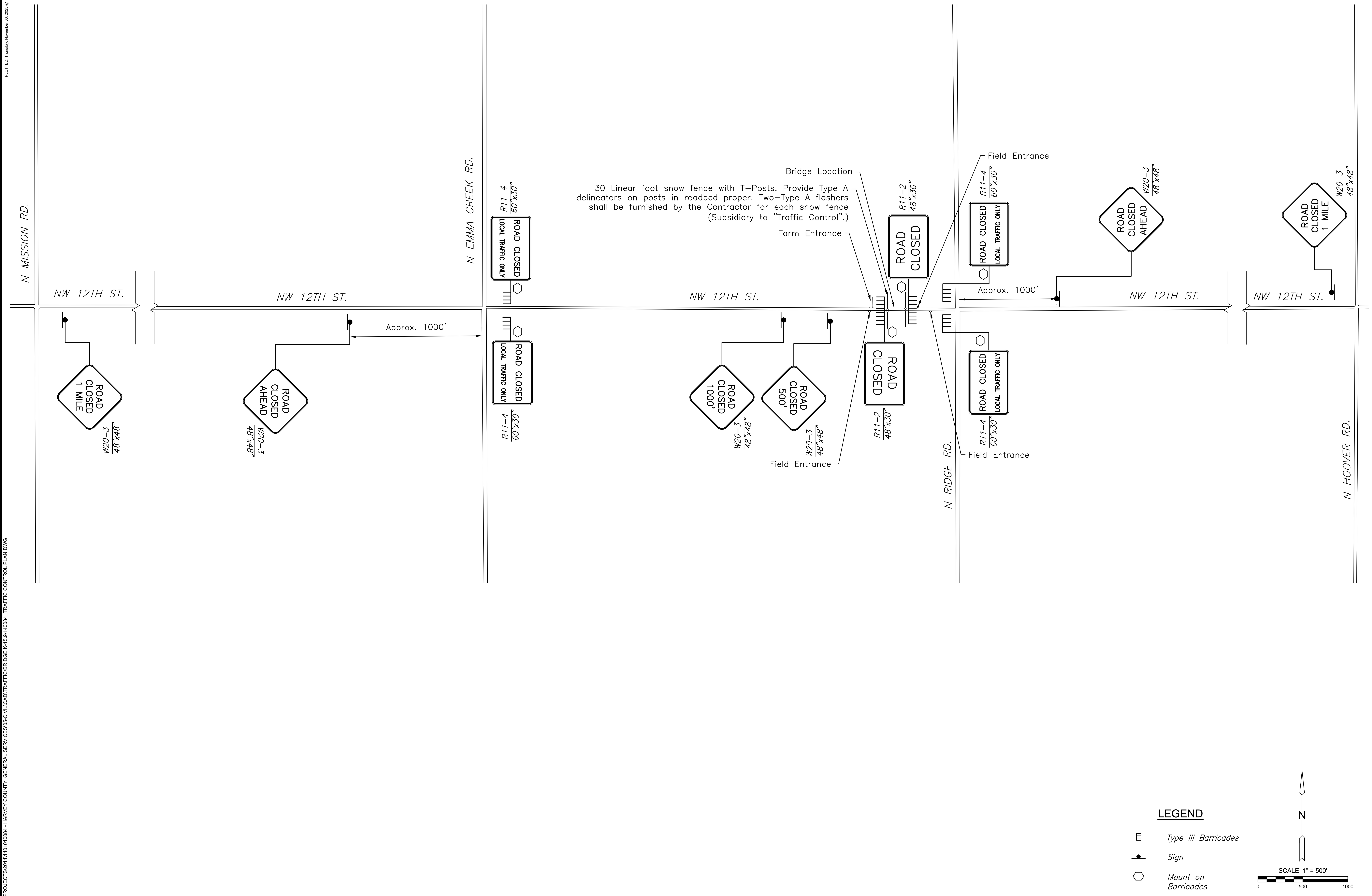
NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

DESIGN DETAILS FOR OBJECT MARKERS TYPE 2 AND TYPE 3

TE416 10-01-19

FHWA APPROVAL			10-01-19	APP'D.		Eric W. Nichol	
DESIGNED	D.D.G.	DETAILED	D.D.G.	QUANTITIES		TRACED	
DESIGN CK.	E.W.N.	DETAIL CK.	E.W.N.	QUAN.CK.		TRACE CK.	



MKEC

Wichita, KS • 316.684.9600

DAKOTA JAMES LEATH
LICENSED
30161
11/06/2025
KANSAS
PROFESSIONAL ENGINEER

BRIDGE REPLACEMENT FOR

BRIDGE K-15.9

HARVEY COUNTY, KANSAS

TRAFFIC CONTROL PLAN

PROJECT NO.	
	1401010084
SCALE	1" = 500'

DRAWN	DESIGNED	CHECKED
LWG	DJL	JRA

NO.	REVISION	DATE

SHEET NO.
45 OF 61

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.

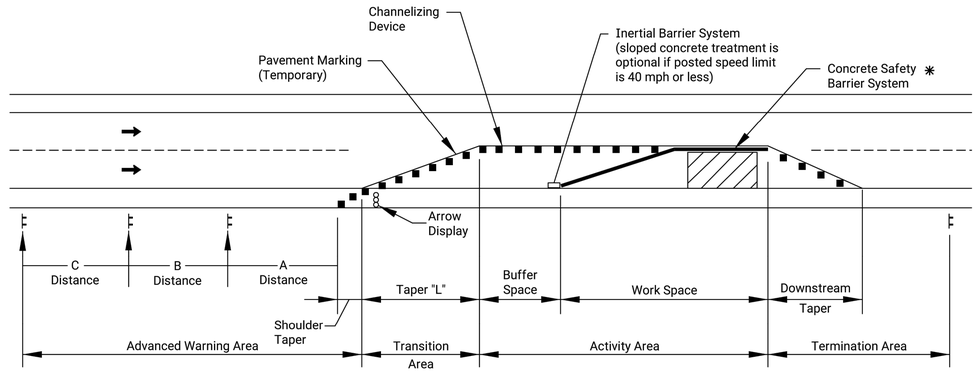
3) Consideration should be made to separate pedestrian and, if needed, bicycle movements from both work site activity and vehicular traffic. Unless a reasonable safe route that does not involve crossing the roadway can be provided, pedestrians should be appropriately directed with advance signing that 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.

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	46	61



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 = Numerical 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

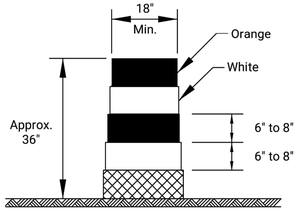
TRAFFIC CONTROL GENERAL NOTES

TE700

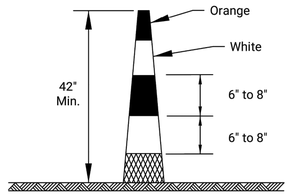
FHWA APPROVAL		03-13-18	APP'D.		Eric Kocher
DESIGNED	B.A.H.	DETAILED R.W.B.	QUANTITIES	TRACED	
DESIGN CK.		DETAIL CK.	QUAN.CK.	TRACE CK.	

PLOTTED: Thursday, November 06, 2025 @ 12:00PM

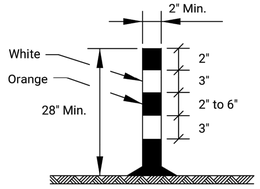
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	47	61



DRUM

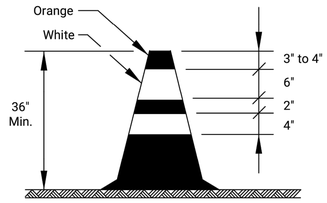


CONICAL DELINEATOR

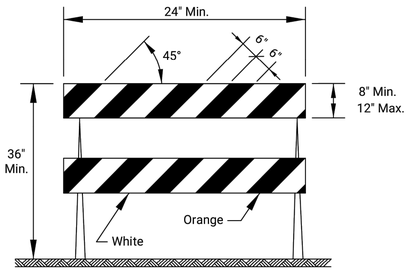


TUBULAR MARKER

Striping as shown for up to 42".

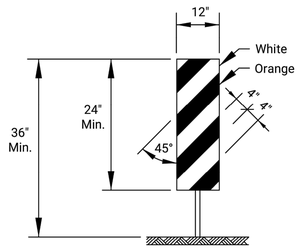


TRAFFIC CONE



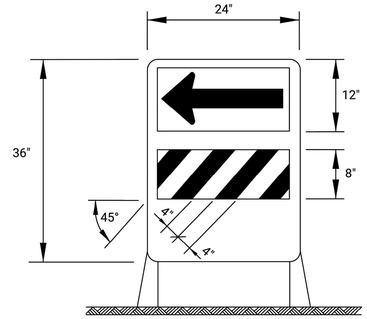
TYPE 2 BARRICADE

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



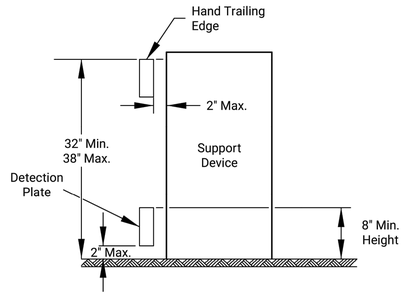
VERTICAL PANEL

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.

J:\PROJECTS\2014\1401010084 - HARVEY COUNTY_GENERAL SERVICES\05-CIVIL\CAD\STD\K-15.9\K15_9_TE702.DWG

PLOTTED: Thursday, November 06, 2025 @ 12:00PM

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	48	61

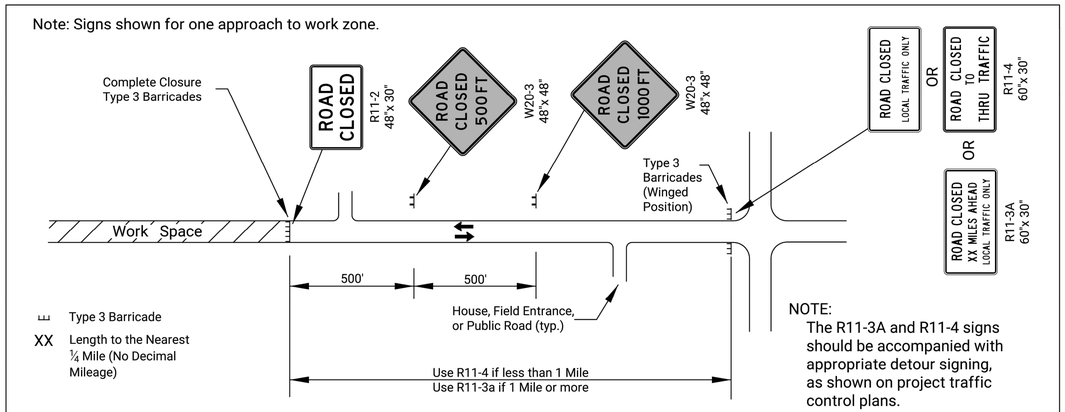


FIGURE 1: TYPICAL SIGNING FOR ROAD CLOSURE (MAINLINE OR SIDE ROAD)

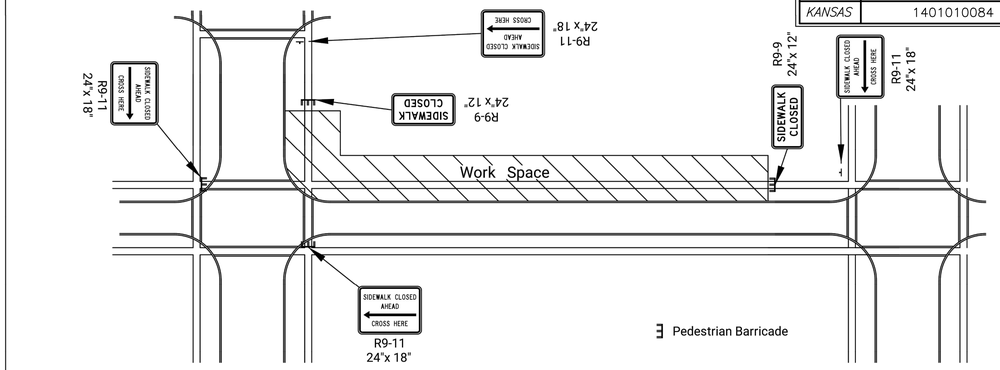


FIGURE 4: TYPICAL SIGNING FOR SIDEWALK CLOSED WITH OPPOSITE SIDEWALK AVAILABLE

FIGURE 2: TYPICAL SIGNING FOR SIDE ROAD OPEN

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

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.

J:\PROJECTS\2014\1401010084 - HARVEY COUNTY_GENERAL SERVICES\05-CIVIL\CAD\STD\K-15.9\K15.9_TE704.DWG

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"

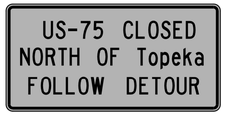
W8-17P
(Optional)

Std. Size Expwy/Freeway
30"x 24"

SP-01
(Special Sign)

Std. Size
6" C

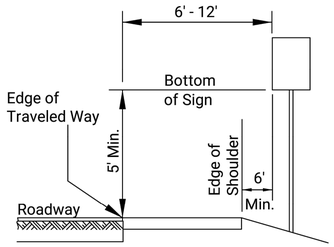
Expwy/Freeway
10" D



SP-02
(Special Sign)

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

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

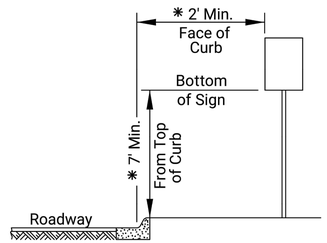


RURAL

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.

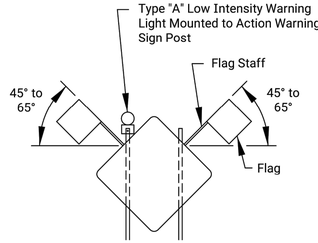
2) Neither portable nor permanent sign supports should be located on sidewalks or areas designated for pedestrian or bicycle traffic.

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.

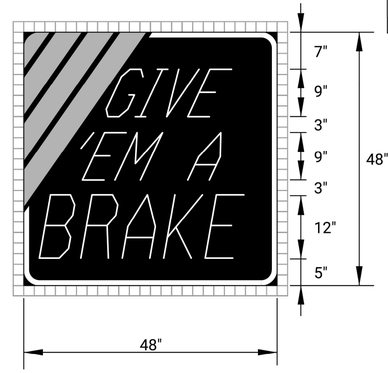
5) Large signs having an area exceeding 50 square feet installed on multiple breakaway posts shall be mounted a minimum of 7' above the ground.

* 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.



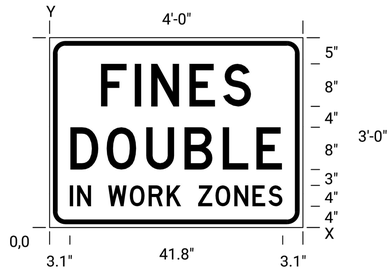
When the sign width is equal to or greater than 9', three or more wood posts may be used with a minimum of 4' between the centerline of each post. All signs less than 9' in width shall use a maximum of two wood posts.

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																HT LEN
	LETTER SPACINGS															
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.

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	49	61

NO.	DATE	REVISIONS	BY	APP'D

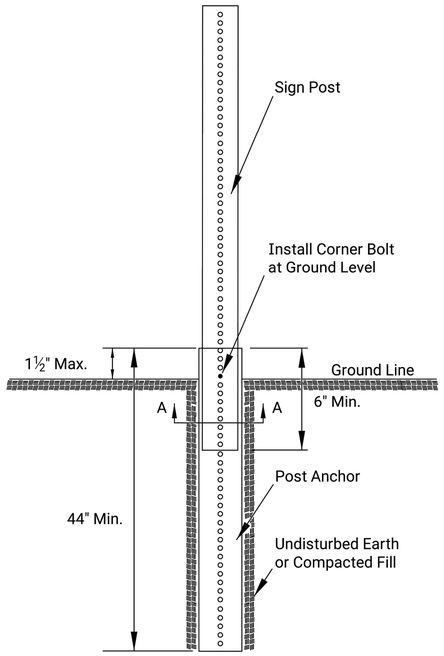
KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL SIGN INFORMATION

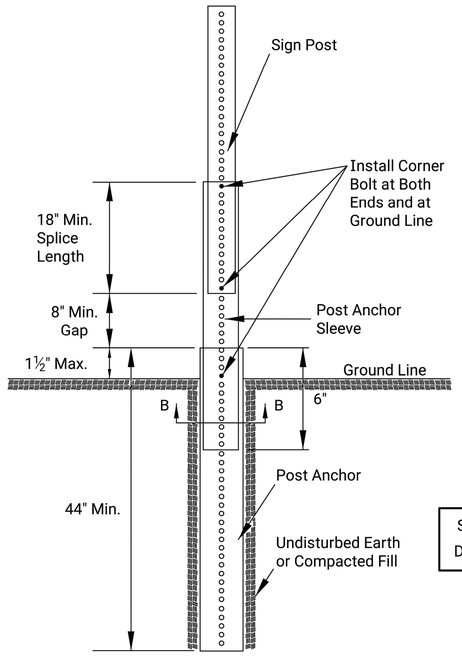
TE710

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.

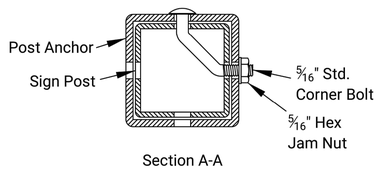
PERFORATED SQUARE STEEL TUBE (P.S.S.T.) POST SETUP



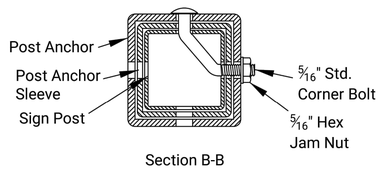
P.S.S.T. Detail



Telescoping P.S.S.T. Detail



Section A-A

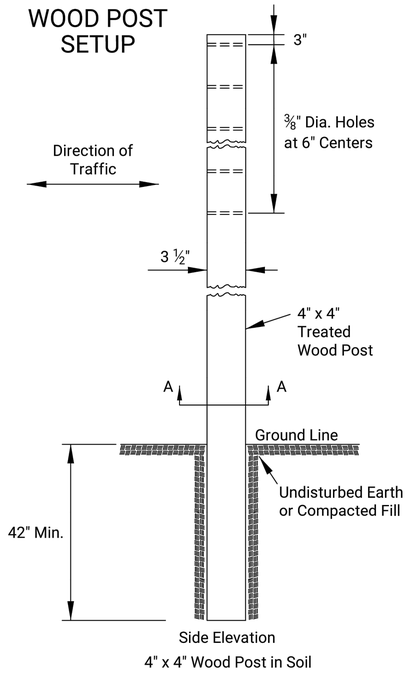


Section B-B

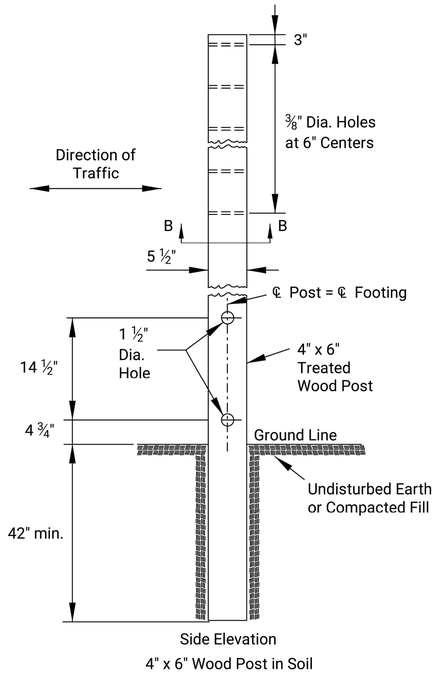
Details for 2", 2 ¼", or 2 ½" sign posts

Place bolts in the same corner along each sign post.

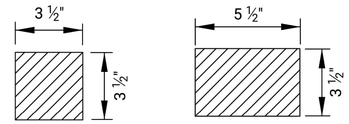
WOOD POST SETUP

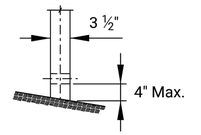


Side Elevation
4" x 4" Wood Post in Soil



Side Elevation
4" x 6" Wood Post in Soil

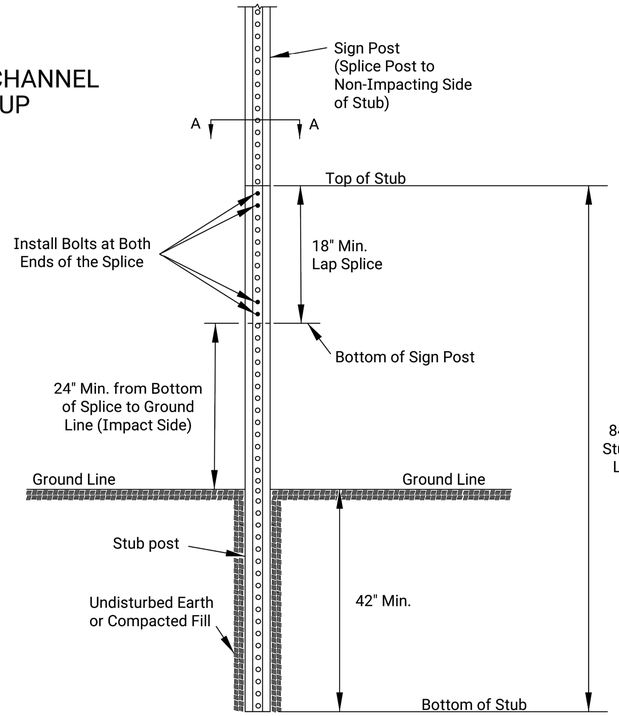




Front Elevation

See TE710 for Additional Details and Requirements

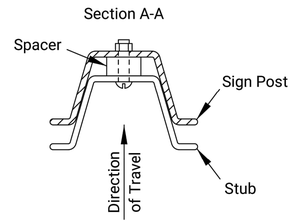
3 LB/F U-CHANNEL SETUP



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.



STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	50	61

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.	

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	51	61

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
W20-3		6	
R11-2		2	
R11-4		4	

Barricades ✳		Channelizing Devices ✳		
Type 3 (4' to 12')	Pedestrian	Fixed	Portable	Pedestrian
10				

Lighted Devices ✳	
Work Zone Warning Light (Type "A" Low Intensity)	12
Work Zone Warning Light (Red Type "B" High Intensity)	
Arrow Display	
Portable Changeable Message Sign	

Recapitulation of Quantities		
Item	Quantity	Unit
Work Zone Signs (0 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
Rigid Raised Pavement Marker (Type I)		Each
Rigid Raised Pavement Marker (Type II)		Each
Traffic Signal Installation (Temporary)		Lump Sum
Traffic Control (Initial Set Up)		Lump Sum
Traffic Control	1	Lump Sum
Flagger (Set Price)	1	Hour

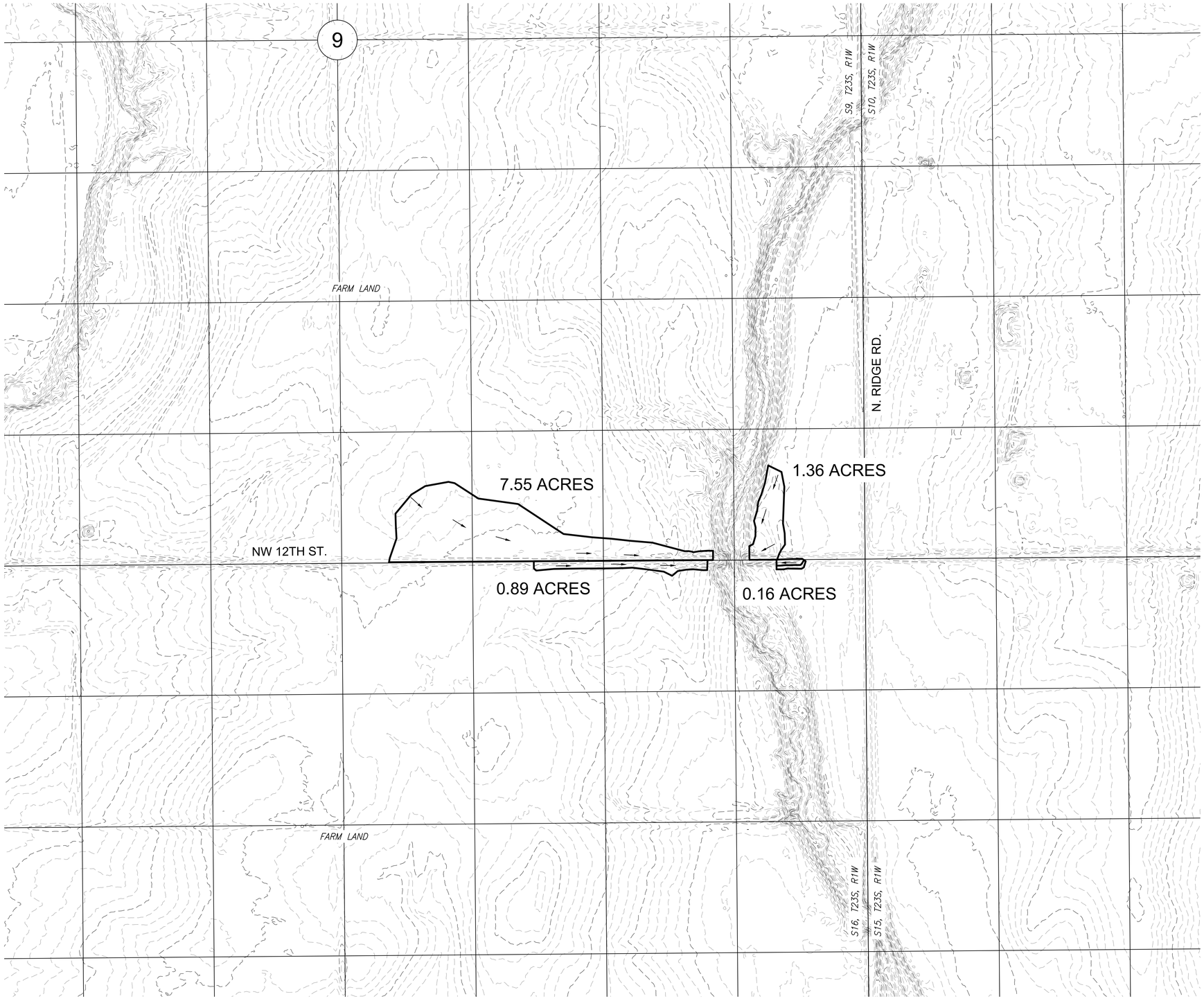
NO.	DATE	REVISIONS	BY	APP'D

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.



N

SCALE: 1" = 250'

0 250 500

LEGEND

= Drainage Boundary

= Direction of Flow

MKEC
Wichita, KS • 316.684.9600

DAKOTA JAMES LICENSED 30161 11/06/2025 KANSAS PROFESSIONAL ENGINEER

BRIDGE REPLACEMENT FOR

BRIDGE K-15.9

HARVEY COUNTY, KANSAS

DRAINAGE MAP

PROJECT NO. 1401010084

SCALE 1" = 250'

DRAWN	DESIGNED	CHECKED
LWG	DJL	JRA

NO.	REVISION	DATE

SHEET NO. 52 OF 61

PLOTTED: Thursday, November 06, 2025 @ 12:02PM

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	53	61

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80

1445 1440 1435 1430

ROW ROW

℄ NW 12th
1434.79

-10.00%

E.G. = 1435.02

47+00.00
C/L DRIVE

Cut = 33.73 Sq.Ft. 36.54 Cu.Yd.
Fill = 0.00 Sq.Ft. 0.16 Cu.Yd.

47+00.00
C/L DRIVE

1445 1440 1435 1430

ROW ROW

℄ NW 12th
1435.30

-10.00%

E.G. = 1435.42

46+75.00
C/L DRIVE

Cut = 45.19 Sq.Ft. 33.44 Cu.Yd.
Fill = 0.35 Sq.Ft. 0.18 Cu.Yd.

46+75.00
C/L DRIVE

1445 1440 1435 1430

ROW ROW

℄ NW 12th
1435.80

-10.00:1 -10.00:1

E.G. = 1435.81

46+50.00

Cut = 26.05 Sq.Ft. 0.00 Cu.Yd.
Fill = 0.00 Sq.Ft. 0.00 Cu.Yd.

46+50.00

1445 1440 1435 1430

ROW ROW

℄ NW 12th
1435.82

-10.00:1 -10.00:1

E.G. = 1435.82

46+49.20
BEGIN PROJECT

46+49.20
BEGIN PROJECT

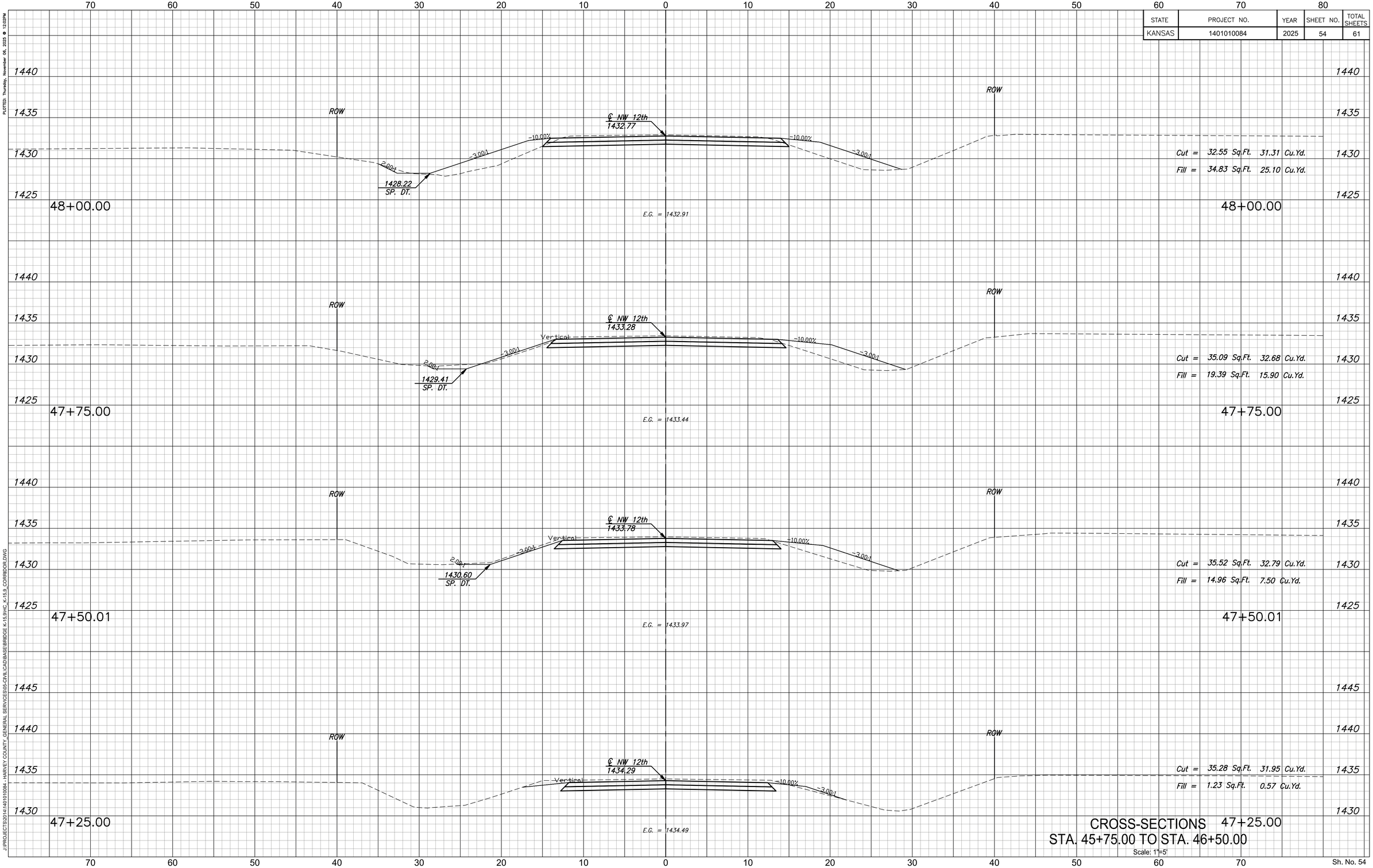
70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

CROSS-SECTIONS
STA. 44+95.48 TO STA. 45+50.00

Scale: 1"=5'

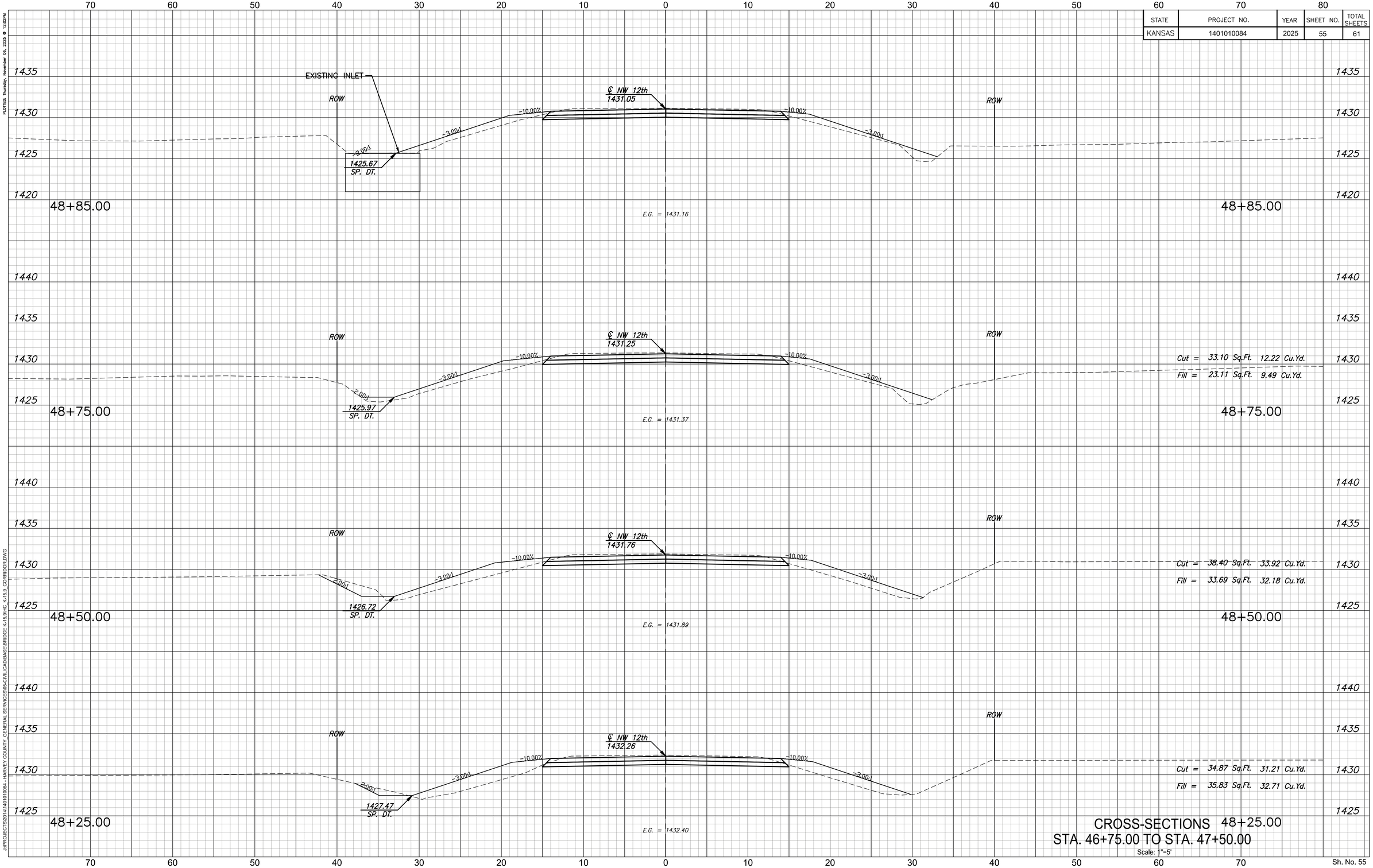
J:\PROJECTS\2014\1401010084 - HARVEY COUNTY_GENERAL SERVICES\05-CIVIL\CAD\BASE\BRIDGE K-15.9\HC_K-15.9_CORRIDOR.DWG

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	54	61



CROSS-SECTIONS
STA. 45+75.00 TO STA. 46+50.00
Scale: 1"=5'

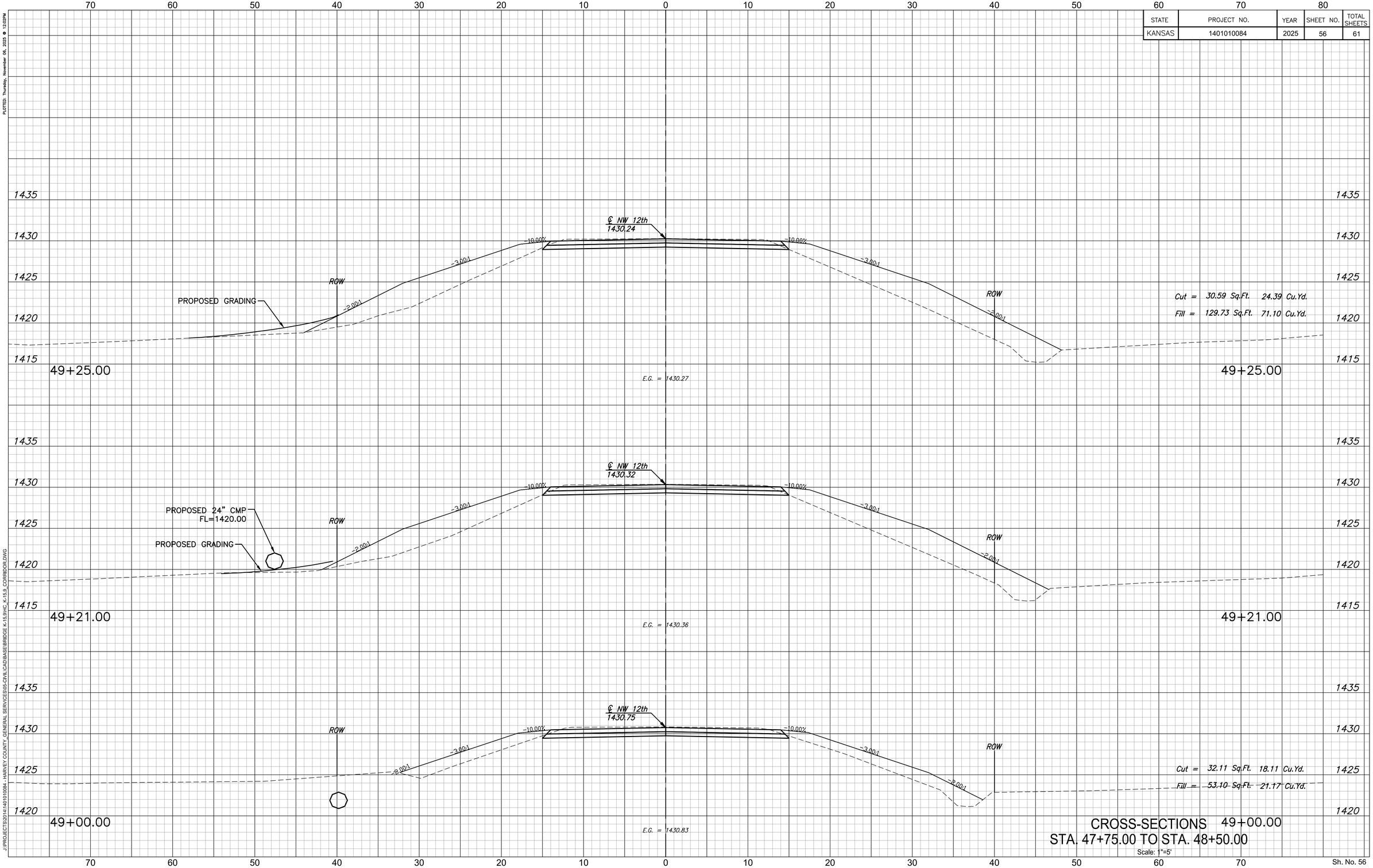
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	55	61



CROSS-SECTIONS 48+25.00
STA. 46+75.00 TO STA. 47+50.00

Scale: 1"=5'

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	56	61



CROSS-SECTIONS 49+00.00
STA. 47+75.00 TO STA. 48+50.00
Scale: 1"=5'

Sh. No. 56

PLOTTED: Thursday, November 06, 2025 @ 12:02PM

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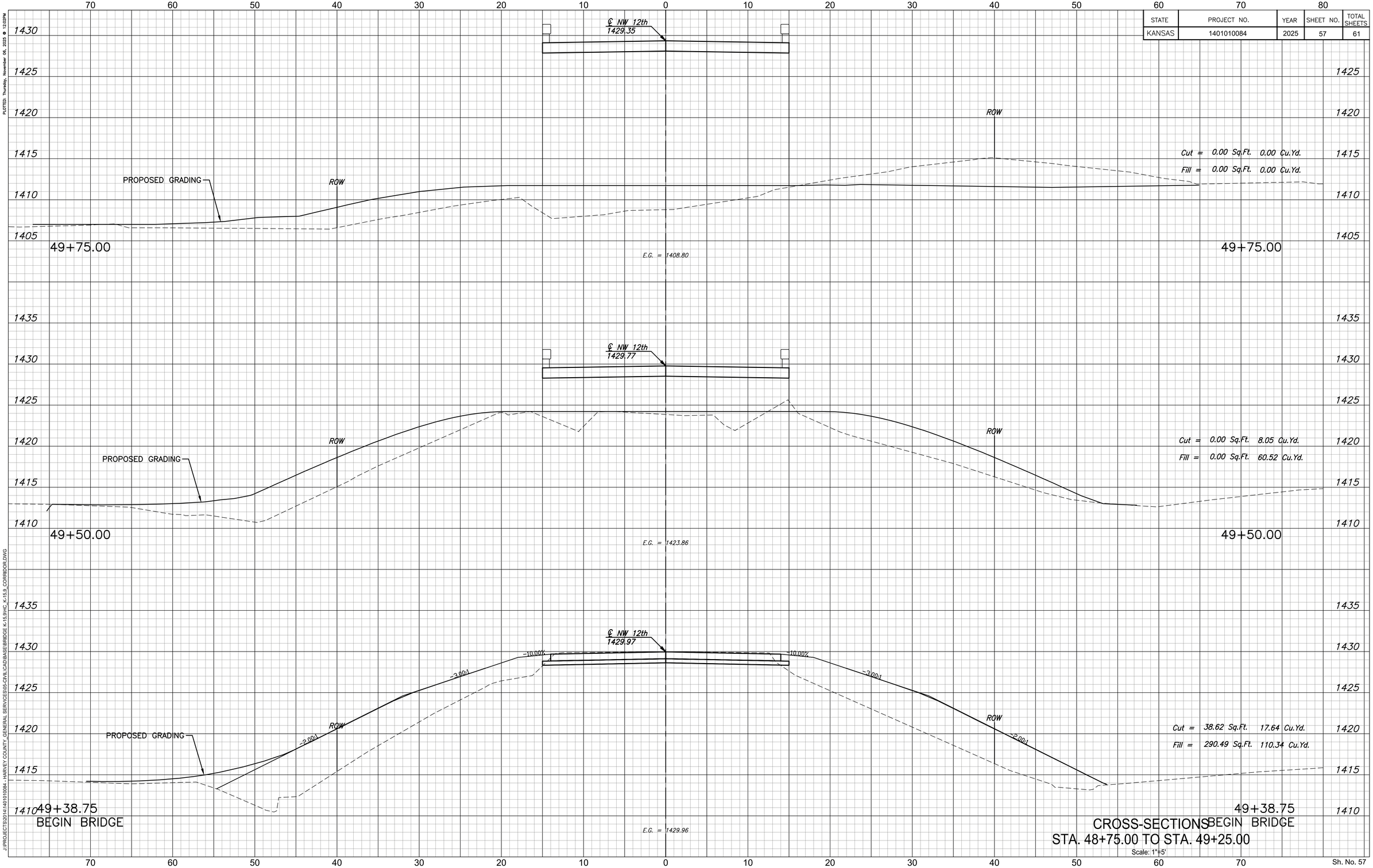
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	57	61



CROSS-SECTIONS
STA. 48+75.00 TO STA. 49+25.00

Scale: 1"=5'

PLOTTED: Thursday, November 06, 2025 @ 12:02PM

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	58	61

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80

1430 1425 1420 1415 1410

℄ NW 12th
1428.08

PROPOSED GRADING

ROW

ROW

Cut = 0.00 Sq.Ft. 0.00 Cu.Yd.
Fill = 0.00 Sq.Ft. 0.00 Cu.Yd.

50+50.00

E.G. = 1424.65

50+50.00

1430 1425 1420 1415 1410

℄ NW 12th
1428.51

1415 1410 1405

ROW

PROPOSED GRADING

ROW

Cut = 0.00 Sq.Ft. 0.00 Cu.Yd.
Fill = 0.00 Sq.Ft. 0.00 Cu.Yd.

50+25.00

E.G. = 1411.20

50+25.00

1430 1425 1420 1415 1410

℄ NW 12th
1428.93

1415 1410 1405

ROW

PROPOSED GRADING

ROW

Cut = 0.00 Sq.Ft. 0.00 Cu.Yd.
Fill = 0.00 Sq.Ft. 0.00 Cu.Yd.

50+00.00

E.G. = 1407.33

50+00.00

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

CROSS-SECTIONS
STA. 49+38.75 TO STA. 49+75.00

Scale: 1"=5'

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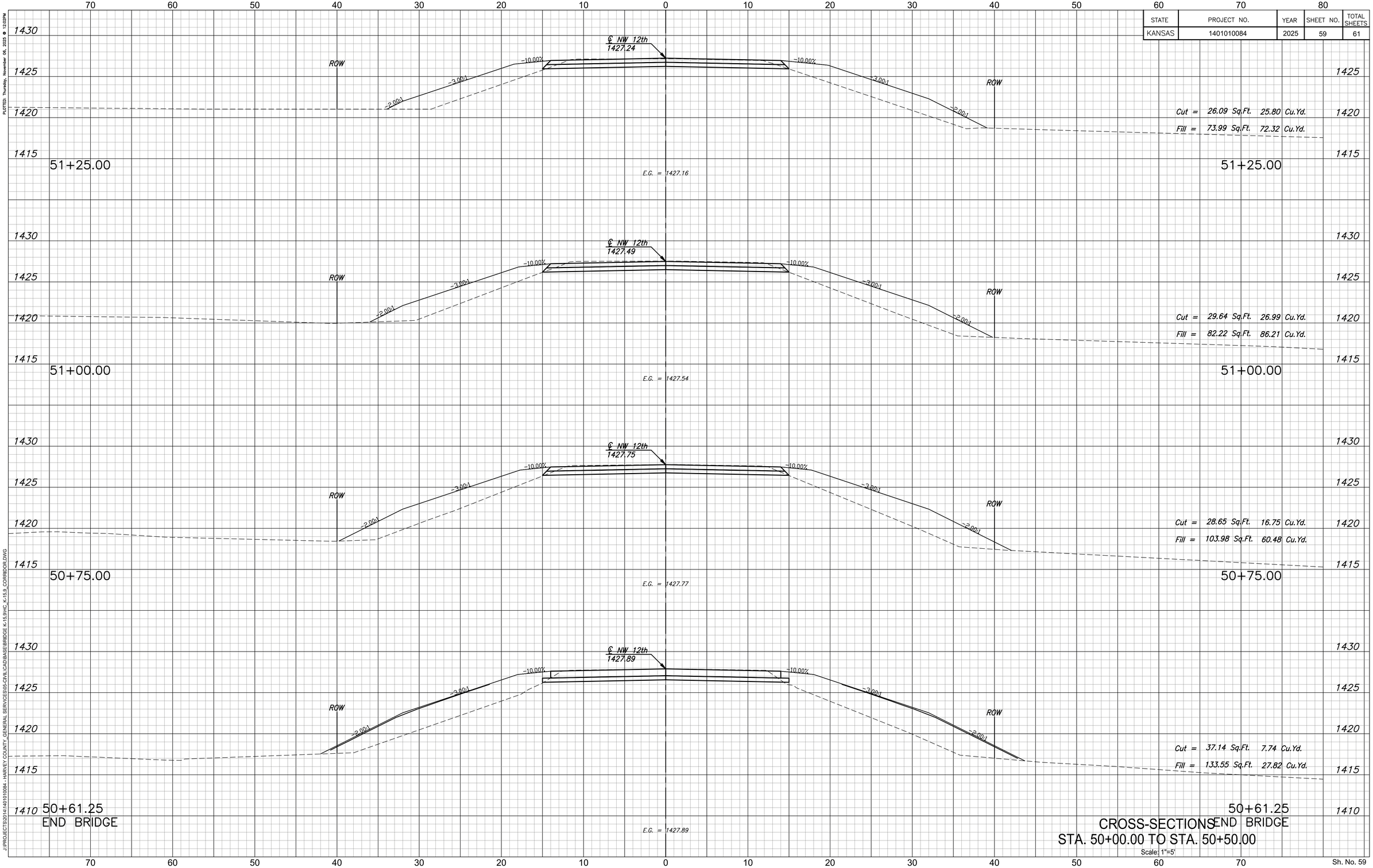
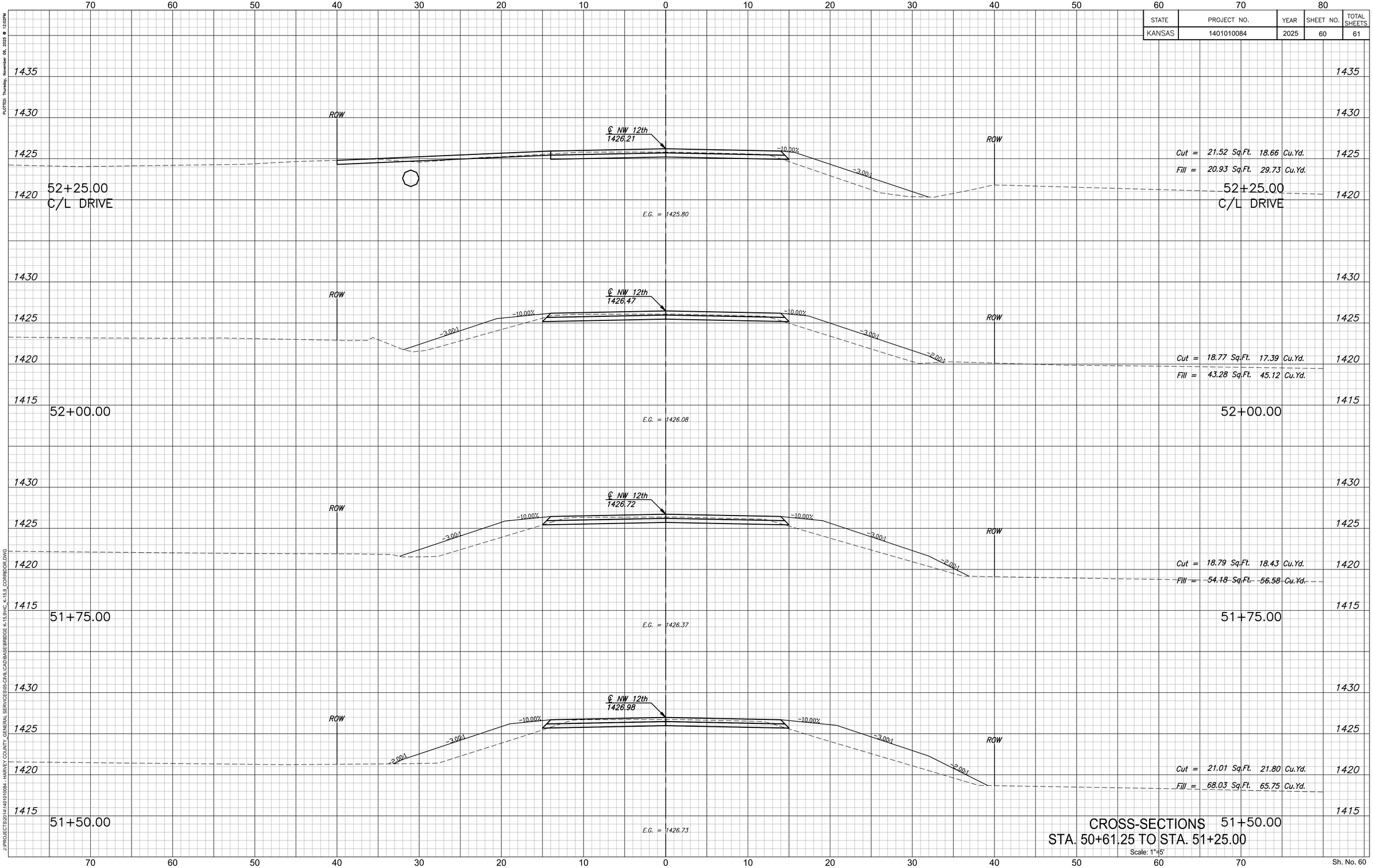
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	59	61



CROSS-SECTIONS
STA. 50+00.00 TO STA. 50+50.00

Scale: 1"=5'

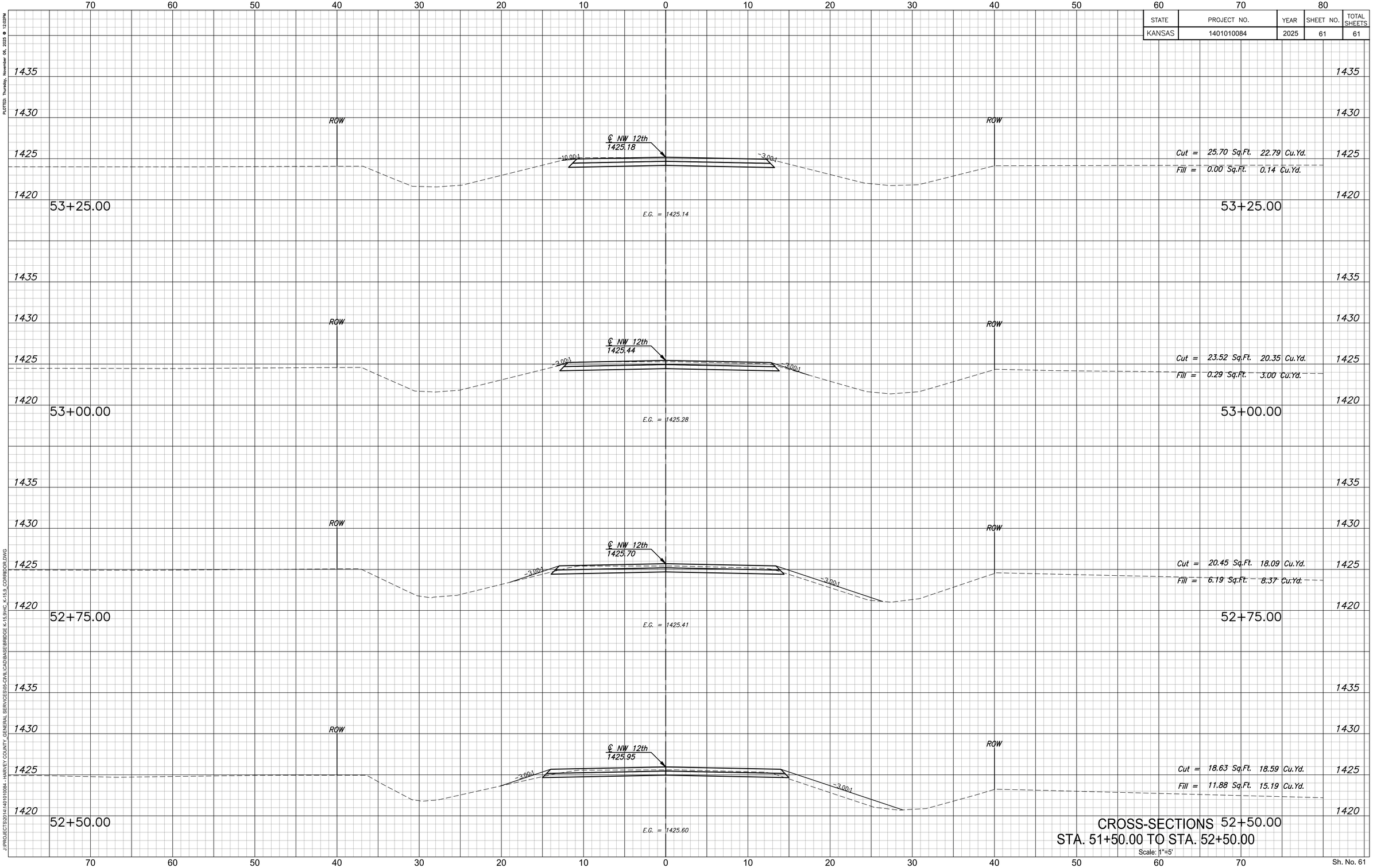
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	60	61



CROSS-SECTIONS
STA. 50+61.25 TO STA. 51+25.00

Scale: 1"=5'

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	1401010084	2025	61	61



CROSS-SECTIONS 52+50.00 STA. 51+50.00 TO STA. 52+50.00

Scale: 1"=5'