July 16, 2024

MEMORANDUM TO: Jason Van Nice, P.E., Chief
Bureau of Construction & Materials

We are handing you Final Plans for the project noted below for the August 2024 letting.

Stephen Bass/Peter Tobaben
Design Squad

281-71 KA-6020-01 ACNHP-A602(001)	Osborne	3.453 miles
Project Number	County	Length

REMARKS:

Grading, Surfacing (Asphalt), Bridges, Seeding, Signing, and Pavement Marking

This project is located on US-281 from the north US-24/US-281 junction north to the south city limits of Portis. The project includes reconstruction and adding shoulders along US-281, including replacement of the North Fork Solomon River Bridge (036).

APPROVED:

Deborah D Ty

For: CHIEF, BUREAU OF ROAD DESIGN

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	1	293

KDOT Proj. No. 281-71 KA-6020-01
Federal Aid Proj. No. ACNHP-A602(001)

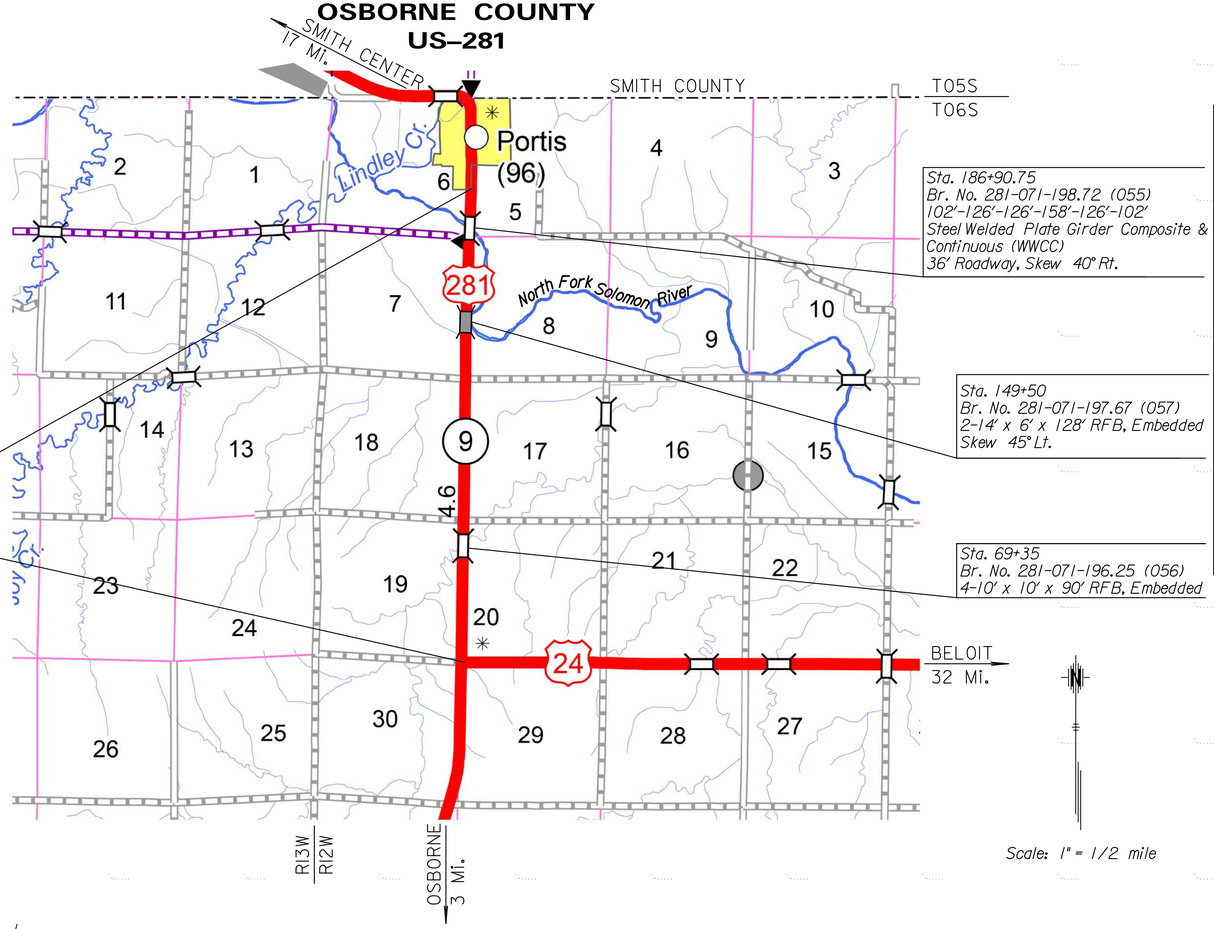
GRADING AND SURFACING (ASPHALT)
BRIDGES
SEEDING
SIGNING AND PAVEMENT MARKING

STATE OF KANSAS
DEPARTMENT OF TRANSPORTATION

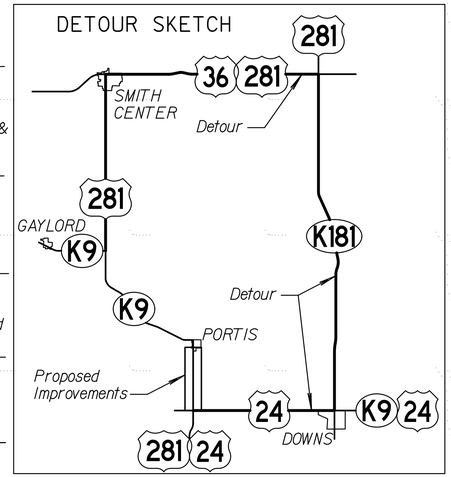
PLAN AND PROFILE OF PROPOSED
STATE HIGHWAY
FEDERAL AID PROJECT
OSBORNE COUNTY
US-281

INDEX OF SHEETS

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Scale: 1" = 1/2 mile



Traffic to be carried around construction on a state route detour as shown on detour sketch. Simplify per Design Manual. The detour shall be on US-24, K-181, and US-36.

DESIGN DESIGNATION

AADT (2024)	1400 vpd
AADT (2044)	1650 vpd
DHV	10%
D	60%
T	17.5%
V	70 mph
C of A	None
Clear Zone	32 FT.

FOR TURNING MOVEMENTS SEE SH. NO. 23-27

CONVENTIONAL SIGNS

COUNTY LINE		CENTER LINE OF PROJECT	50 1
CITY LIMITS		TERRACE	
STATE OR NATIONAL LINE		CULVERTS	
TOWNSHIP, SECTION or GRANT LINE		DROP INLET & STORM SEWER	
PROPERTY LINE	℄	ACCESS CONTROL	
HIGHWAY FENCE		POWER POLE	
EXISTING FENCE		TELEPHONE POLE	
GUARDRAIL	A A	MARSH	
CONSTRUCTION LIMITS		HEDGE	
RIGHT OF WAY LINE		TREES	
TRAVELED WAY		PROFILE ELEVATION	1172.18
RAILROADS		STREAM or CREEK	

GROSS LENGTH OF PROJECT (US-281)	18,231.56 FT. (Includes Equations)	
EXCEPTIONS	0.00 FT.	
NET LENGTH OF PROJECT (US-281)	18,231.56 FT.	3.453 MILES
NET LENGTH OF BRIDGES (US-281)	750.22 FT.	0.142 MILES
NET LENGTH OF ROAD (US-281)	17,481.34 FT.	3.311 MILES

HDR

PLANS PREPARED AND SUBMITTED BY
HDR ENGINEERING, INC.

Approved Jul 16, 2024
Date

State Transportation Engineer

By:
Chief, Bureau of Road Design

KANSAS DEPARTMENT OF TRANSPORTATION

KDOT Graphics Certified 05-08-2024

Sh. No. 1

KDOT Graphics Certified

	BY	DATE
SURVEY	M. LONG - Cook, Flatt & Strobel	2021
CADD TECHNICIAN	M. DELEON - HDR Engineering, Inc.	4/2024
DESIGNERS	K. SCHOMAKER (ROAD) / K. GRIBBLE (BRIDGE) - HDR	4/2024
SQUAD	S. BASS (ROAD) / P. TOBABEN (BRIDGE)	4/2024

Drawn By : MDELEON
Plotted : 07-11-24
File : c:\pwworking\central01\d2274982\ka602001rti-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	2	293



Name: Kyle Schomaker
Co. Name: HDR Engineering, Inc.
Plan Section: Sh. No.1 - 57 & 138 - 293



Name: Kevin Gribble
Co. Name: HDR Engineering, Inc.
Plan Section: Sh. No. 58 - 137

NO.	DATE	REVISIONS	BY	APP'D
01	01-24-18	Initial Release	A.L.R.	S.W.K.

KANSAS DEPARTMENT OF TRANSPORTATION

Signature Seal Sheet

RD048

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

KDOT Graphics Certified 04-18-2022

Sh. No. 2

KDOT Graphics Certified

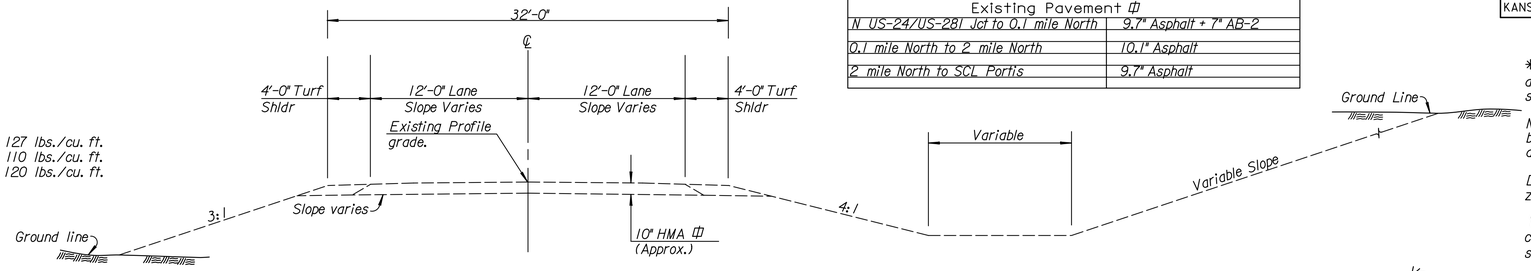
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File : c:\pwworking\central01\d2274982\ka602001rd48.dgn
Plotted :07/11/2024

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-01	2024	3	293

◆ *For the purpose of estimating plan quantities, the volume of millings used in the SUBGRADE MODIFICATION has been calculated using a total thickness of 4 inches. The volume of soil used in the SUBGRADE MODIFICATION has been calculated using 42.86% of the volume of millings. The quantity of cement and water has been calculated at 5.5% and 10% respectively, by weight of the combined millings and soil.*

Density (Millings) = 127 lbs./cu. ft.
Density (Soil) = 110 lbs./cu. ft.
Combined Density for SUBGRADE MODIFICATION (Millings + soil) = 120 lbs./cu. ft.

It should be noted that adding 3 inches of soil to the 4 inches of millings, when the two materials are combined and mixed together, does not increase the volume of the SUBGRADE MODIFICATION. The soil acts to fill the voids in the millings and increases the density of the SUBGRADE MODIFICATION, resulting in a final SUBGRADE MODIFICATION thickness of 6 inches.



Existing Pavement ⏀	
N US-24/US-281 Jct to 0.1 mile North	9.7" Asphalt + 7" AB-2
0.1 mile North to 2 mile North	10.1" Asphalt
2 mile North to SCL Portis	9.7" Asphalt

EXISTING TYPICAL SECTION

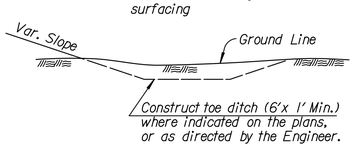
FOR INFORMATION ONLY

✱ *Dimensions and slopes for standard ditches and fills. See plan and cross-sections for variations.*

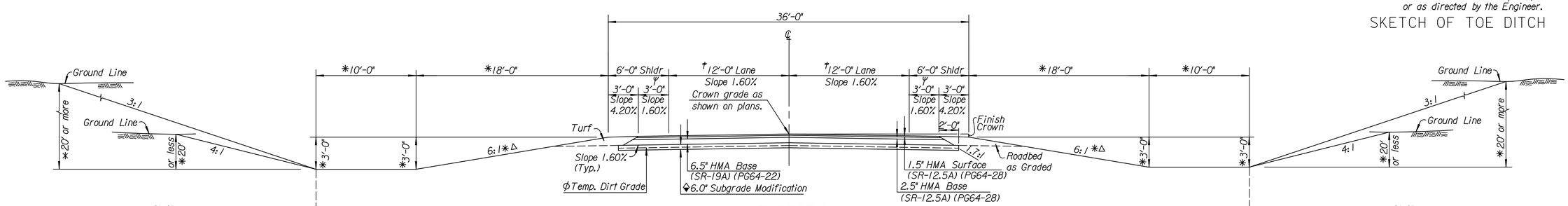
Note: Intersection of all slope lines shall be softened and rounded for pleasing appearance.

Ditch Plugs within the appropriate clear zone shall have side slopes of 10:1 or flatter.

Ψ *The asphalt portion of the shoulder shall be constructed in conjunction with the roadway surfacing*



SKETCH OF TOE DITCH



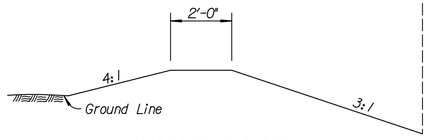
CUT SECTION

ϕ *Note: The excavation required to reach the Temporary Dirt Grade is included in the Common Excavation quantities.*

△ *Foreslope 4:1, STA. 112+00.00 TO STA. 118+00.00 Rt.*
STA. 208+50.00 TO STA. 210+40.00 Lt. & Rt.

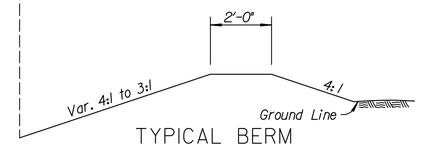
† *Width Varies STA. 208+50.00 TO STA. 210+40.00*
12'-0" to 8'-3" Lt. and 12'-0" to 15'-2" Rt.

See Plans and Intersection Details for Variations in Width



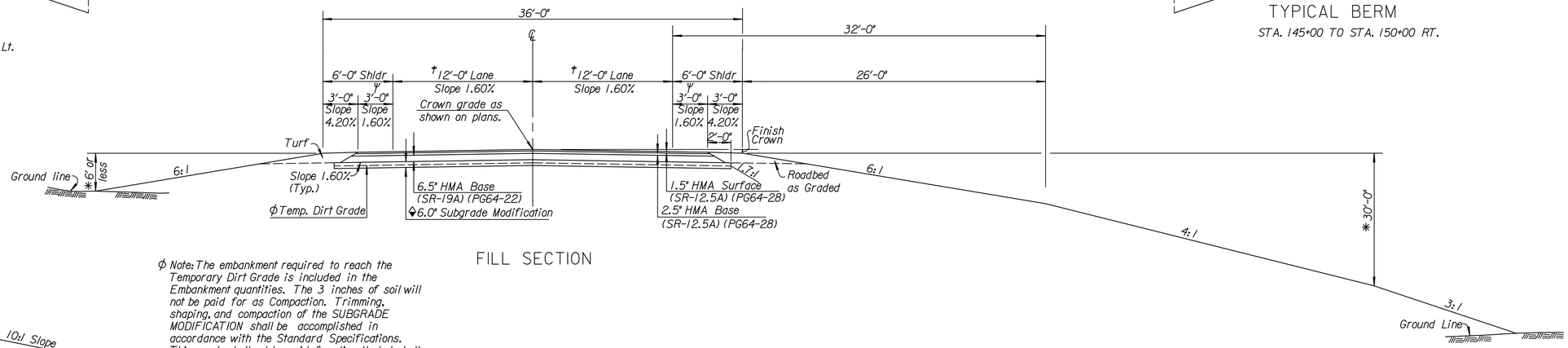
TYPICAL BERM

STA. 122+90 TO STA. 124+69 Lt.



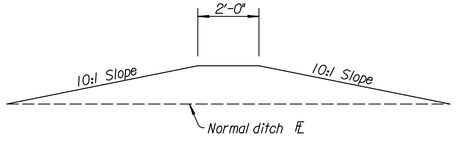
TYPICAL BERM

STA. 145+00 TO STA. 150+00 RT.



FILL SECTION

ϕ *Note: The embankment required to reach the Temporary Dirt Grade is included in the Embankment quantities. The 3 inches of soil will not be paid for as Compaction. Trimming, shaping, and compaction of the SUBGRADE MODIFICATION shall be accomplished in accordance with the Standard Specifications. This work shall not be paid for directly but shall be SUBSIDIARY to the bid item "Manipulation for Aggregate Subgrade Modification (Millings) (Cement)."*



SKETCH OF DITCH PLUG

Sta. P.I. Curve	Radius	Design Speed	Super %	Transition - (Lin.Ft.) L	A	B	L_1	L_2
Sta. 130+40.68	85,943.67'	70 mph	NC					
Sta. 150+11.86	28,647.90'	70 mph	NC					
Sta. 207+07.22	28,647.90'	70 mph	NC					

KANSAS DEPARTMENT OF TRANSPORTATION

TYPICAL SECTION

US-281

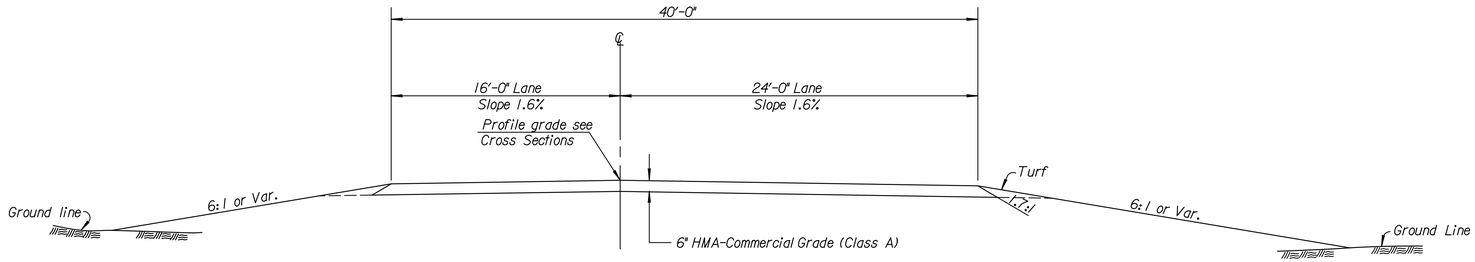
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KDOT Graphics Certified 05-24-2024

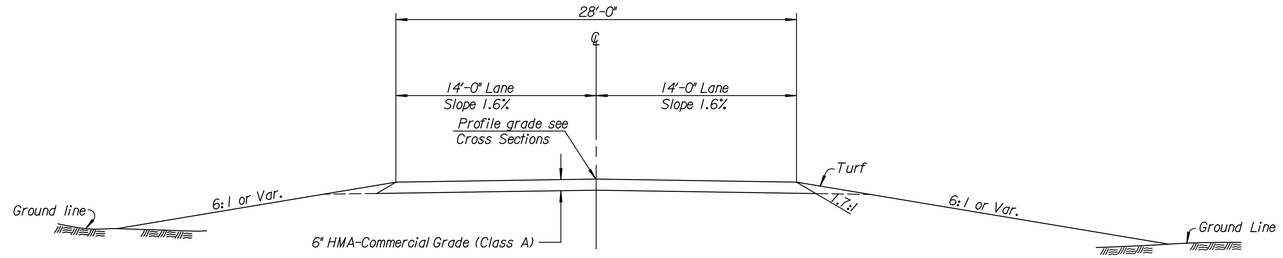
KDOT Graphics Certified

Sh. No. 3

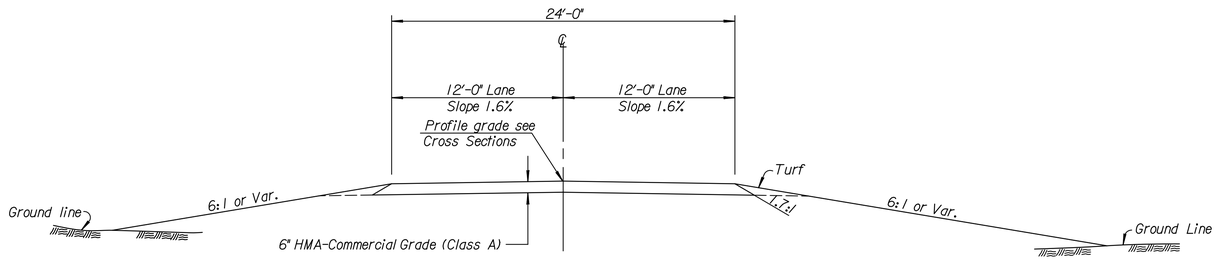
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	4	293



CO. RD. 362 SECTION



SIDEROAD SECTION



ENTRANCE SECTION

Drawn By : MDELEON Plotted : 07-11-24
File : c:\pwworking\central01\d2274982\ka602001rts-02.dgn

KANSAS DEPARTMENT OF TRANSPORTATION

TYPICAL SECTION

CO. RD. 362, SIDEROADS AND ENTRANCES

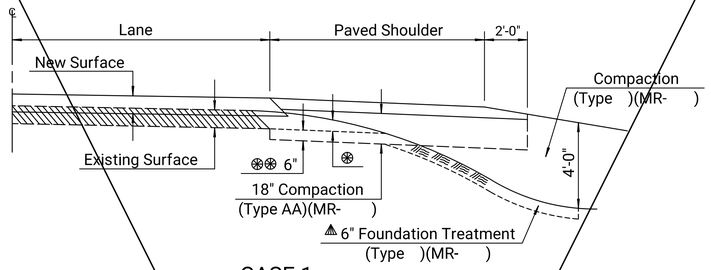
KDOT Graphics Certified 05-08-2024

KDOT Graphics Certified

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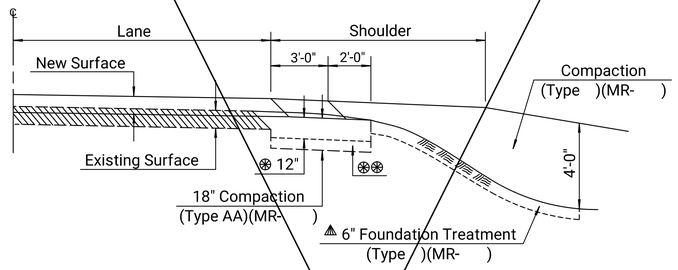
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KANSAS	28I-07I KA-6020-01	2024	5	293

REHABILITATION



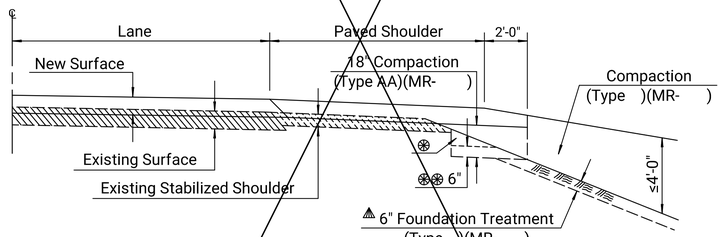
CASE 1

Overlay with Paved Shoulder



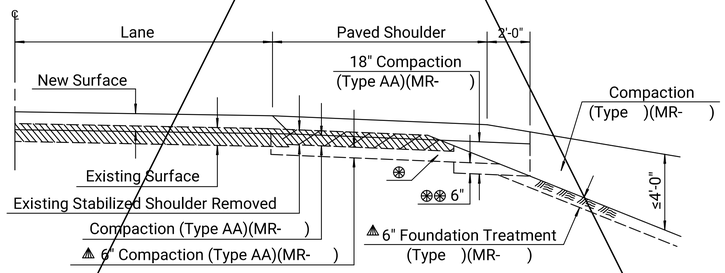
CASE 2

Overlay with Composite Shoulder



CASE 3

Overlay with Existing Paved Shoulder



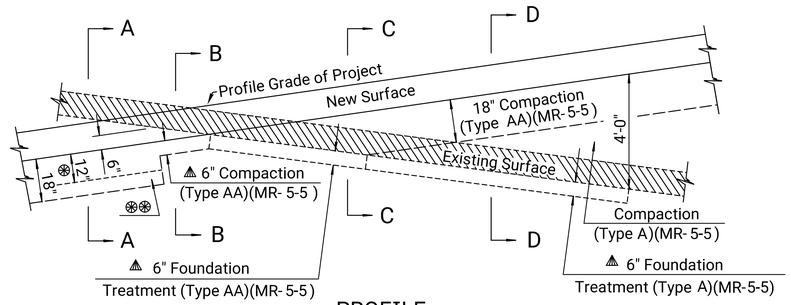
CASE 4

Overlay with Shoulder Replacement

⊛ Excavation thru Cuts not Subgraded
⊛⊛ The lower 6" of Compaction is subsidiary.
⚠ Compaction of this material shall be subsidiary.

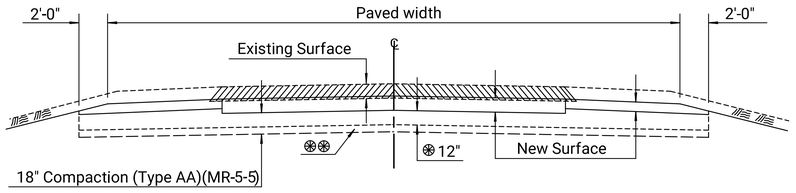
Note: These are 4 general cases. Specific compaction requirements are determined on a project-by-project basis.

RECONSTRUCTION

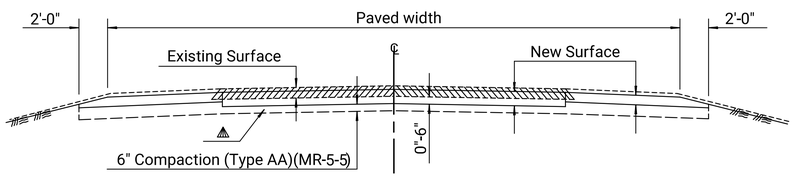


PROFILE

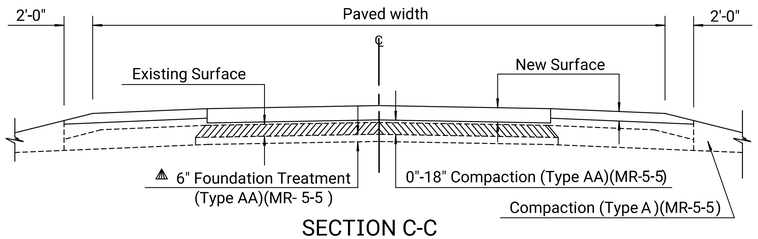
⊛ Excavation thru Cuts not Subgraded
⊛⊛ The lower 6" of Compaction is subsidiary.
⚠ Compaction of this material shall be subsidiary.



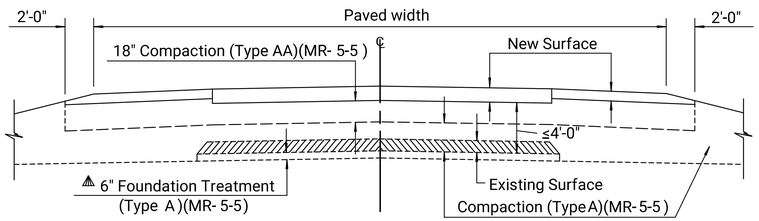
SECTION A-A



SECTION B-B

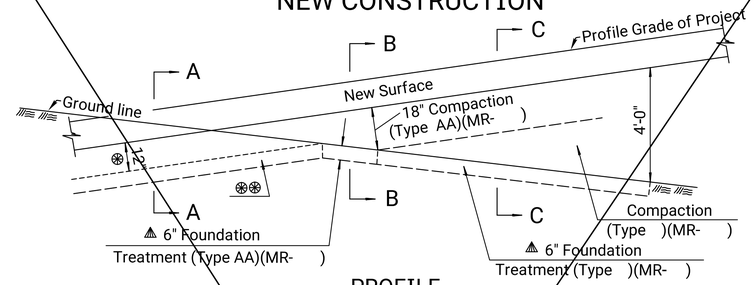


SECTION C-C



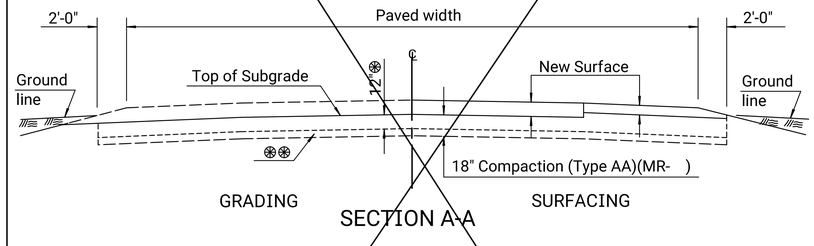
SECTION D-D

NEW CONSTRUCTION

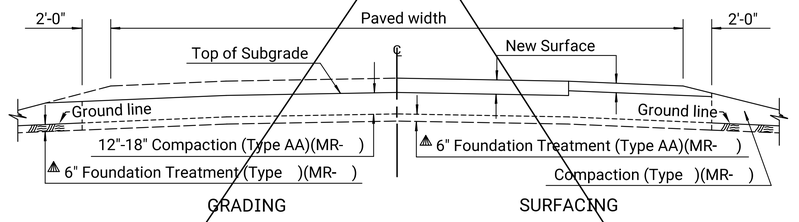


PROFILE

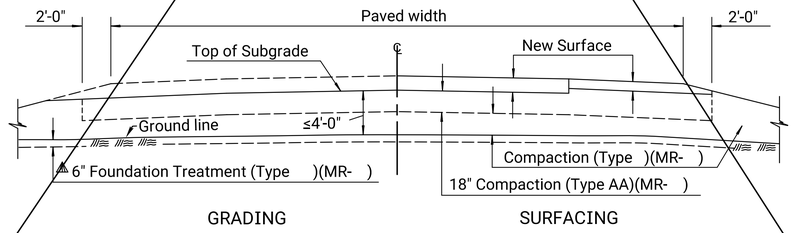
⊛ Excavation thru Cuts not Subgraded
⊛⊛ The lower 6" of Compaction is subsidiary.
⚠ Compaction of this material shall be subsidiary.



SECTION A-A



SECTION B-B



SECTION C-C

General Note

~~For materials designated to be subgraded, compaction of soils, including shales, designated for backfill refer to Standard Drawing RD605A for details.~~

Unless otherwise noted on the Plans, compact all embankment, including side roads and entrances.

NO.	DATE	REVISIONS	BY	APP'D
5	10-17-1 1	Revised General Note	S.W.K.	J.O.B.
4	1-05-1 0	Added additional subsidiary comp.	S.W.K.	J.O.B.
3	2-16-05	Redrawn, Rev. Recon. Sec. C-C & D-D	S.W.K.	J.O.B.
2	5-29-98	Revised Reconstruction Section B-B	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

FOUNDATION TREATMENT & COMPACTION OF EARTHWORK

~~RD605~~

FHWA APPROVAL 12-5-1 1		APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. King

KDOT Graphics Certified 11-17-2023

Sh. No. 5

KDOT Graphics Certified

Drawn By : MDELEON
File : c:\pwworking\central01\d2274982\ka602001rss605-01.dgn
Plotted :07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-01	2024	6	293

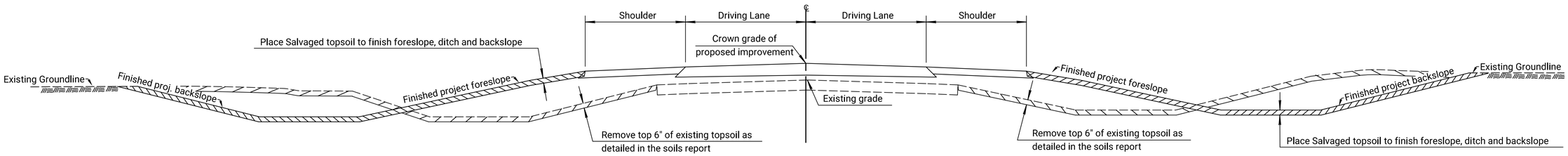
GENERAL NOTE

Adjust the cut and fill sections to accommodate the placement of the salvaged topsoil such that after placement the cross section will be at the final grade as shown on the plans.

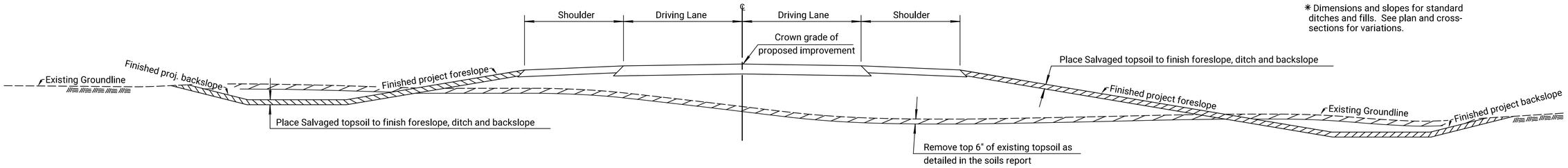
Salvaging, Stockpiling and Placing Topsoil bid as "Salvaged Topsoil" in Square Yards. See KDOT Standard Specifications for details.

Soften and round the intersection of all slope lines for pleasing appearance.

Note to Designer: Acceptable Topsoil locations on a project will be detailed in the Soils Report. The locations will be used in conjunction with the plans to measure a horizontal area in Sq. Yds of "Salvaged Topsoil" within the R/W limits.



RECONSTRUCTION/REHABILITATION OF EXISTING ROADWAY
(Removal and Placement of Salvaged Topsoil)



✳ Dimensions and slopes for standard ditches and fills. See plan and cross-sections for variations.

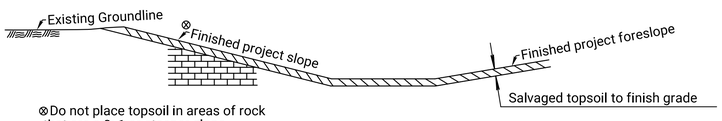
LEGEND

Topsoil to be Salvaged

Placement of Salvaged Topsoil

NEW ROADWAY ALIGNMENT
(Removal and Placement of Salvaged Topsoil)

Note: Method of showing backslope thru shallow rock or shale cuts at locations where rock protrudes a short height above the bottom of the ditch.



⊗Do not place topsoil in areas of rock that are a 3: 1 or steeper slope.

CUT SECTION

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1	12-16-09	Initial Release	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

SALVAGED TOPSOIL

RD599A

FHWA APPROVAL 12-16-09		APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED B.N.B.
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. S.W.K.

KDOT Graphics Certified 03-28-2018

Sh. No. 6

KDOT Graphics Certified

Drawn By : MDELEON Plotted :07-11-24
File : c:\pwworking\central01\d2274982\ka602001rss599a-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	7	293

DATE	BY	REFERENCES NOTED	REFERENCES CHECKED
6/2021	M. DELEON	B. HORNER	
7/2021			

GENERAL NOTE

THE GEOLOGICAL INFORMATION SHOWN ON THESE PLANS IS FROM STUDIES MADE IN THE FIELD AND REPRESENTS THE BEST INFORMATION AVAILABLE TO THE KANSAS DEPARTMENT OF TRANSPORTATION.

SOIL FOR EMBANKMENT: ALL SOIL USED IN THE TOP 18 INCHES OF THE EMBANKMENT SHALL CONFORM TO THE FOLLOWING REQUIREMENTS: $7 \leq PI \leq 30$ AND $20 \leq LL \leq 50$. SOILS WHICH CONTAIN SUBSTANTIAL ORGANIC MATTER, SUCH ASTHOSE CLASSIFIED AS OL OR OH ACCORDING TO THE UNIFIED SOILS CLASSIFICATION SYSTEM (ASTM D2487) SHOULD NOT BE USED TO CONSTRUCT THE EMBANKMENT OR SUBGRADE. THE ORGANIC MATERIAL MAY BE USED AS SELECT SOIL TO CAP THE SIDESLOPES OF THE EMBANKMENT.

A GROSS VMF OF 0.81 WAS USED TO COMPUTE EARTHWORK QUANTITIES FOR THIS PROJECT. THIS FACTOR INCLUDES QUANTITIES FOR INITIAL CONSOLIDATION AND SETTLEMENT.

ALL 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.

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.

ALL BORROW/WASTE LOCATIONS SHALL BE SUBMITTED FOR CLEARANCE FROM THE KANSAS HISTORICAL SOCIETY AND THE KANSAS DEPARTMENT OF WILDLIFE AND PARKS PRIOR TO ANY EXCAVATION OR WASTING OF MATERIAL. THE CONTRACTOR IS RESPONSIBLE FOR ACQUIRING ANY PERMITS AND OTHER CLEARANCES THAT ARE REQUIRED.

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.

CHANNELS SHALL BE CUT AT BOX CULVERTS (UNLESS OTHERWISE NOTED) TO FLOW LINE ELEVATIONS AND TO A WIDTH OF ONE FOOT OUTSIDE OF EACH OUTSIDE WALL AND WITH SLOPES 2 TO 1 PRIOR TO CONSTRUCTION OF THE CULVERT.

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.

INFORMATION SHOWN IN THE PLANS CONCERNING TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE THE TYPE AND LOCATION OF UNDERGROUND UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGES THERETO. ALL KDOT OWNED UTILITIES ARE TO BE LOCATED BY THE CONTRACTOR.

AT LOCATIONS WHERE NEW ASPHALT MEETS EXISTING ASPHALT AND/OR CONCRETE, OR WHERE EXISTING ASPHALT IS TO BE REMOVED, THE EXISTING PAVEMENT IS TO BE SAW CUT TO FULL DEPTH ALONG A STRAIGHT LINE. ALL SAW CUTS SHALL BE FULL DEPTH AND SHALL NOT BE PAID FOR DIRECTLY, BUT SHALL BE CONSIDERED SUBSIDIARY TO OTHER ITEMS IN THE CONTRACT.

A PORTION OF THE EXISTING PAVEMENT WILL BE MILLED BY THE CONTRACTOR. THE MILLINGS WILL BE USED AS PART OF THE SUBGRADE MODIFICATION. THE REMAINING EXISTING PAVEMENT WILL BE PAID FOR AS COMMON EXCAVATION TO BE WASTED BY THE CONTRACTOR.

THE EXISTING GUARDRAIL AND PIPES WILL BE REMOVED AND BECOME THE PROPERTY OF THE CONTRACTOR.

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN ACCESS TO ALL PROPERTIES DURING THE CONSTRUCTION OF THE PROJECT.

PROJECT SURVEY CONTROL

Horizontal Datum: KRCS Coordinates System
Zone 05 Great Bend.

Vertical Datum: NAVD 88 (Geoid 12A)

Benchmarks from Project 24-71 K-6372-01 dated 2004 were converted from NGVD29 to NAVD88.

Datum Benchmark (M-161) is a Bench Mark Disk stamped M 161 193 set in a wall at Portis 150 feet north of Missouri Pacific RR. track, in SW corner of Chevrolet Sales Stone Building, 10 feet S of large window. NAVD 88 Elev. = 1,548.01 Ft.

Utility Owners

Telephone: --------
Nextech
145 N Main
Lenora, KS 67645
Phone - 785-567-4281

Water: — — — —
Osborne Co RWD 1A
2763 W 50th Drive
Alton, KS 67623
Phone - 785-476-7590
Phone - 785-994-3031

Overhead Power: ■
Prairie Land Electric Coop
223 W 5th St
Concordia, KS 66901
Phone - 785-243-1750

Water: — — — —
City of Portis Water Dept. (Jay Meyers)
PO Box 15
Portis, KS 67434
Phone - 785-454-1988

US-281 ALIGNMENT

P.O.T. CL Sta. 13+99.99
N 730,884.265 E 5,492,474.315
1. Set 5/8" Rebar (0.4' Deep)
2. Spike & Washer in Light Marker Pole 87.76' SW
3. Fence Line to East Extended 5.0' N
4. Spike & Washer in Top Fence Corner Post 71.08' NE
5. Spike & Washer in Power Pole 62.00' E
6. House Entrance East 100.00' S

P.O.T. ℄ Sta. 21+14.32
N 731,598.392 E 5,492,491.218
1. Set 5/8" Rebar (0.3' Deep)
2. Spike & Washer in Power Pole 113.60' NE
3. 5/8" Rebar 2" Alum Cap 119.57' SE
4. Spike & Washer in UGT Marker 165.16' SSW
5. Traveled Way Hwy 281 0.8' E

P.I. ℄ Sta. 26+00.00
Δ = 00°29'51.80" Lt. (No Curve)
N 732,083.935 E 5,492,502.711
1. Found 5/8" Rebar (0.6' Deep)
2. 1" Rebar in Headwall 75.02' NW
3. Centerline South End 24" CMP 117.88' WSW
4. West Corner Area Inlet 80.54' SE
5. Chiseled 'X' T/C Island 65.25' E
6. Top N. End 15" CMP 69.05' NE

P.O.T. ℄ Sta. 31+08.03
N 732,591.908 E 5,492,510.321
1. Set 5/8" Rebar (0.3' Deep)
2. Alum Capped R/W Marker 106.30' SE
3. Spike & Washer in Power Pole 103.33' ESE
4. Alum Capped R/W Marker 77.90' NW

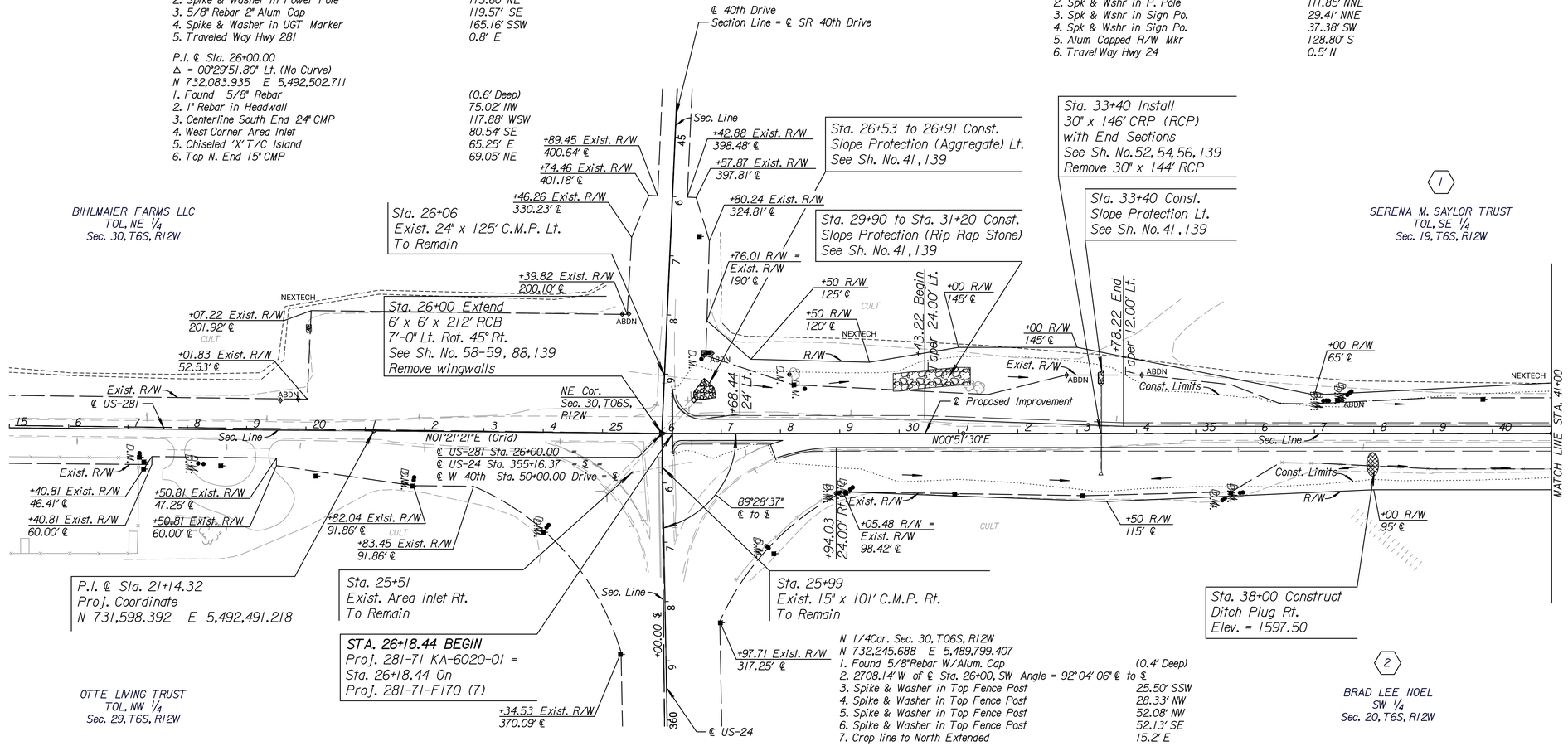
US-24 / 40TH DRIVE ALIGNMENT

P.O.T. ℄ Sta. 22+91.86 SR 40th Drive
N 732,245.688 E 5,489,799.407
1. N 1/4 Corner, Section 30 T6S R12E

P.I. ℄ Sta. 50+00.00 SR 40th Drive =
P.I. ℄ Sta. 355+16.37 US-24
Delta = 03°37'07" Lt. (No Curve)
N 732,083.935 E 5,492,502.711
1. NE Corner, Section 30 T6S R12E

P.O.T. ℄ Sta. 369+88.94 US-24
N 732,088.934 E 5,493,975.272
1. Found 1/2" Rebar (0.0' Deep)
2. Spk & Wshr in P. Pole 111.85' NNE
3. Spk & Wshr in Sign Po. 29.41' NNE
4. Spk & Wshr in Sign Po. 37.38' SW
5. Alum Capped R/W Mkr 128.80' S
6. Travel Way Hwy 24 0.5' N

SCALE
100' 0 100' 200'
PLAN: Lat. & Long.
PROFILE: Horiz. same as above
Vert.
10' 0



1

N 1/4Cor. Sec. 30, T06S, R12W
N 732,245.688 E 5,489,799.407
1. Found 5/8"Rebar W/Alum. Cap (0.4' Deep)
2. 2708.14' W of ℄ Sta. 26+00, SW Angle = 92°04'06" ℄ to ℄
3. Spike & Washer in Top Fence Post 25.50' SSW
4. Spike & Washer in Top Fence Post 28.33' NW
5. Spike & Washer in Top Fence Post 52.08' NW
6. Spike & Washer in Top Fence Post 52.13' SE
7. Crop line to North Extended 15.2' E

2

E 1/4 Cor. Sec. 30, T06S, R12W
N 729,438.212 E 5,492,431.025
1. Found 5/8"Rebar W/Alum. Cap (0.4' Deep)
2. 2646.69' S of ℄ Sta. 26+00, SW Angle = 00°11'46" ℄ to ℄
3. Spike & Washer in Telephone Stub Pole 60.78' WSW
4. Travel Way Hwy 281 9.87' E
5. Spike & Washer in Power Pole 71.07' E
6. Travel Way Field Ent. To E 10.5' S
7. ℄ Top 0.3' x 0.3' R/W Marker 51.00' W

NE Cor. Sec. 30, T06S, R12W
N 732,083.935 E 5,492,502.711
1. Found 5/8"Rebar W/Alum. Cap (0.6' Deep)
2. ℄ Sta. 26+00
3. 1"Rebar in Top Headwall RCB 75.02' NW
4. ℄ Top South End 24"CMP 117.88' WSW
5. W Corner Area Inlet 80.54' SE
6. Chiseled 'X' Top of Curb Traffic Island 65.25' E
7. ℄ Top N End 15"CMP 69.05' NE

N 1/4 Cor. Sec. 29, T06S, R12W
N 732,068.486 E 5,495,141.826
1. Found 5/8" Rebar W/Alum. Cap (0.8' Deep)
2. 2639.16' E of CL Sta. 26+00, NE Angle = 89°28'37" ℄ to ℄
3. 5/8" Rebar W/Alum. Capped R/W Marker 99.95' SW
4. 5/8" Rebar W/Alum. Capped R/W Marker 73.07' S
5. Chiseled 'X' CL E Headwall RCB 26.40' SSE
6. Travel Way Hwy 24 24.9' N
7. Mag Nail & Washer Edge of Mat Hwy 24 20.25' NE
8. Mag Nail & Washer Edge of Mat Hwy 24 20.21' NW

BM10 - "□" cut NW Cor Inlet
65.17' Rt. ℄ US-281 Sta. 25+53.56 Elev. 1607.01

BM11 - "T" post driven flush with surface 1' W. of N-S Barbwire fence
52.90' Rt. ℄ US-281 Sta. 37+78.55 Elev. 1598.99

KANSAS DEPARTMENT OF TRANSPORTATION

PLAN

STA. 26+18.44 TO STA. 41+00

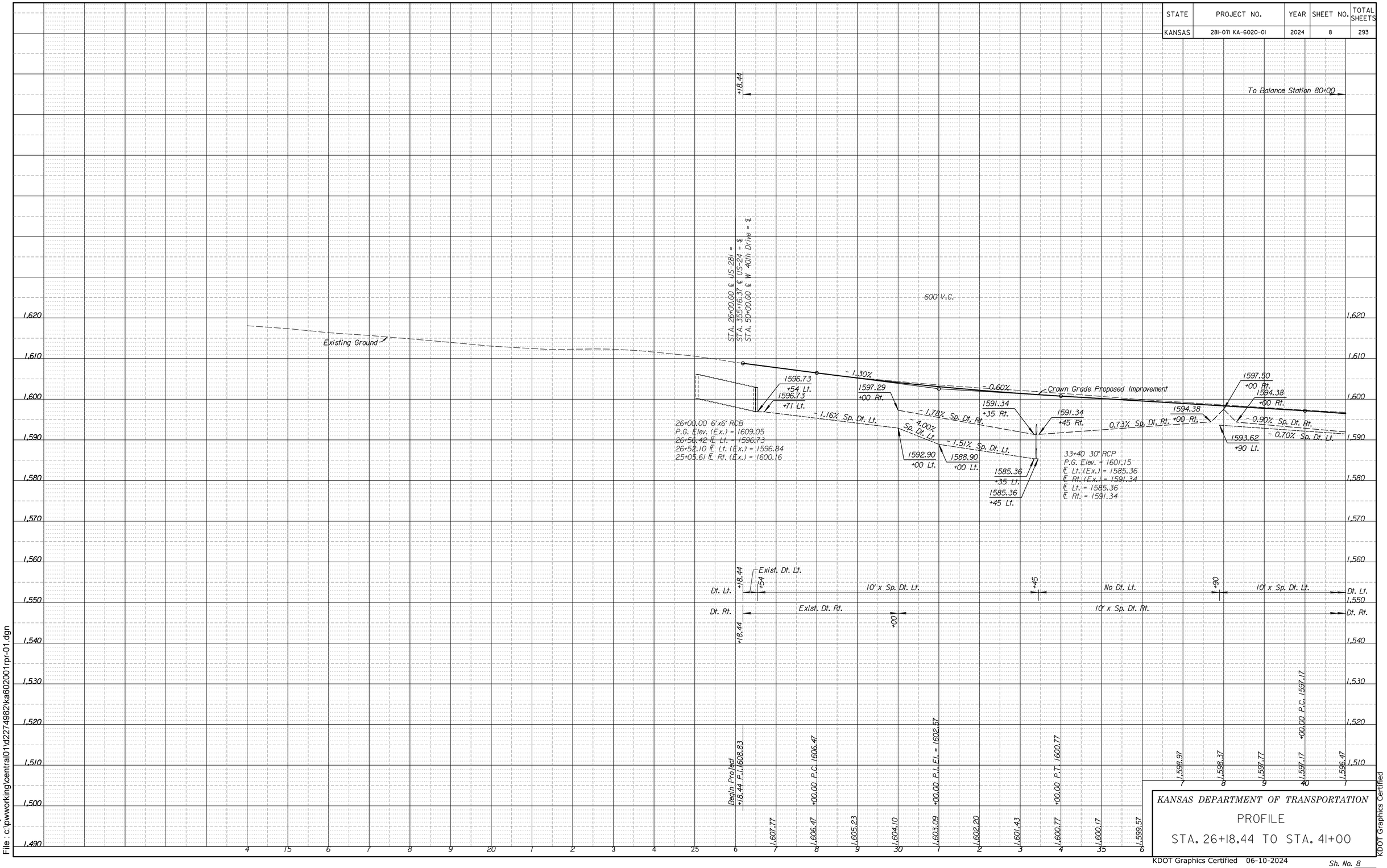
KDOT Graphics Certified 07-10-2024

Sh. No. 7

Drawn By : MDELEON Plotted : 07-11-24
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KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	8	293



Drawn By : MDELEON Plotted : 07-11-24
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KANSAS DEPARTMENT OF TRANSPORTATION

PROFILE

STA. 26+18.44 TO STA. 41+00

KDOT Graphics Certified 06-10-2024

KDOT Graphics Certified

Sh. No. 8

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	9	293

DATE	BY	
6/2021	M. DELEON	REFERENCES NOTED
7/2021	B. HORNER	REFERENCES CHECKED

US-281 ALIGNMENT

P.O.T. ℄ Sta. 41+00.00
N 733,583.767 E 5,492,525.179

1. Set 5/8" Rebar	(0.3' deep)
2. Spike & Washer in "T" Post	60.25' E
3. Spike & Washer in "T" Post	66.15' NE
4. Spike & Washer in Tap Fnc Po	121.86' SE
5. Spike & Washer in Power Pole	128.81' SW

P.O.T. ℄ Sta. 52+99.89
N 734,783.522 E 5,492,543.151

1. Set 5/8" Rebar	(0.3' deep)
2. Spike & Washer in Yield Sign	23.62' E
3. Spike & Washer in Top Fence Post	63.60' WNW
4. Spike & Washer in Fence Corner Post	67.11' WSW
5. Spike & Washer in UGT Marker Post	103.12' SW

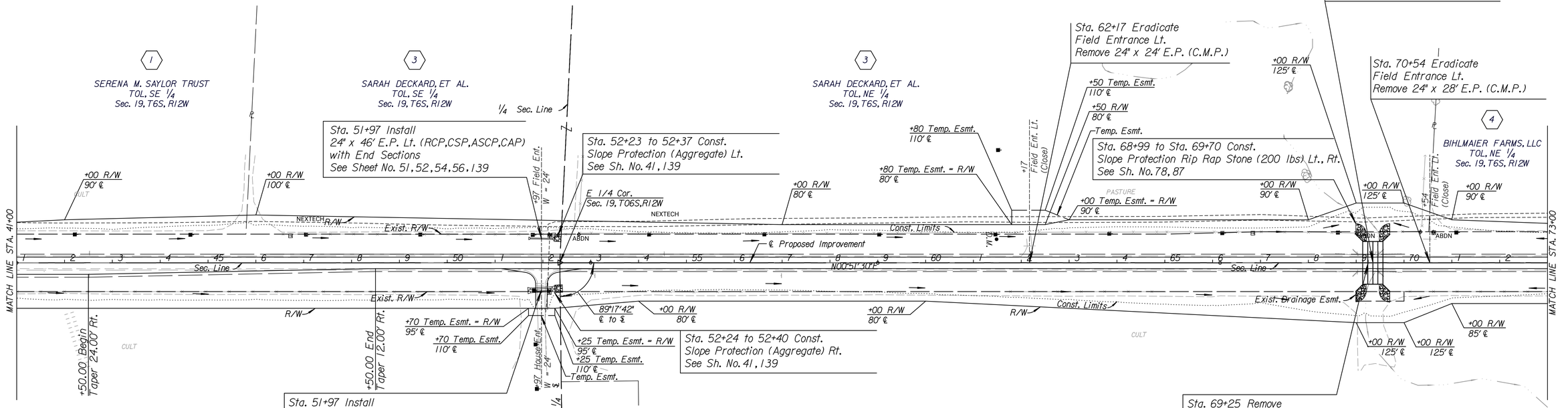
P.O.T. ℄ Sta. 59+00.00
N 735,383.565 E 5,492,552.140

1. Set 5/8" Rebar	(0.3' deep)
2. Spike & Washer Top Fence Post	69.32' ENE
3. Spike & Washer Top Fence Post	69.25' WSW
4. Spike & Washer in Power Pole	59.15' W
5. Top 36" T. Post (BM#13)	68.68' WNW

P.O.T. ℄ Sta. 66+15.47
N 736,098.955 E 5,492,562.857

1. Set 5/8" Rebar	(0.3' deep)
2. 0.3' x 0.3' Concrete R/W Marker	59.88' E
3. Centerline Top Telephone Ped.	92.89' NW
4. Spike & Washer Top Fence Post	79.70' NE
5. Spike & Washer in Power Pole	62.32' W

SCALE
100' 0 100' 200'
PLAN: Lat. & Long.



Center Sec. 19, T06S, R12W
N 734,890.932 E 5,489,866.716

1. Reset 5/8" Rebar W/Cap. C/F&S CLS-80	(At Grade)
2. Spike & Washer in 40" Tree	11.41' N
3. Spike & Washer Top Fence Corner Post	28.63' NW
4. Crop Line to South Extended	4.5' W
5. Crop Line to South North-South	3.5' E
6. Fence Line to North Extended	8.4' W

E 1/4 Cor. Sec. 19, T06S, R12W
N 734,718.938 E 5,492,541.778

1. Found 5/8"Rebar W/Alum. Cap	(0.9' Deep)
2. 0.41' W of CL Sta. 52+35.28, SW Angle = 89°17'42" ℄ to ℄	
3. Travel Way House Entrance to East	39.0' S
4. Spike & KDOT Washer in Power Pole	80.60' SW
5. Spike & Washer in Top Brace Post	73.46' NW
6. UGT Marker Post	61.22' WSW
7. Travel Way Hwy 281	0.5' E
8. Spike & Washer in Power Pole	78.72' SE

E 1/4 Cor. Sec. 20, T06S, R12W
N 734,704.847 E 5,497,803.677

1. Found 5/8"Rebar W/Alum. Cap	(0.7' Deep)
2. 5261.49' E of CL Sta. 52+35.28, NE Angle = 89°17'42" ℄ to ℄	
3. Travel Way N-S Gravel Road	11.4' E
4. Crop Line East and West	0.0' N
5. N.O.R.A	

Utilities
Telephone: Nextech
Overhead Power: Prairie Land Electric Coop

BM12 - "T" post driven flush with surface 1' W. of N. End N-S Barbwire fence
59.01' Rt. ℄ US-281 Sta. 50+37.66 Elev. 1576.94

BM13 - "T" post driven flush with surface 1' E. of N-S Barbwire fence
60.87' Lt. ℄ US-281 Sta. 59+31.78 Elev. 1565.77

BM14 - "□" cut SE Cor E. Headwall 10' x 9' x 4 RCB
18.16' Rt. ℄ US-281 Sta. 69+02.82 Elev. 1562.99

KANSAS DEPARTMENT OF TRANSPORTATION
PLAN
STA. 41+00 TO STA. 73+00

KDOT Graphics Certified 07-10-2024

Sh. No. 9

Drawn By : MDELEON
File : c:\pwworking\central01\d2274982\ka602001rpl-02.dgn
Plotted : 07-11-24

KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-01	2024	10	293

Balance Area 1

* 23,048 cu. yds. Common Excavation (VMF = 0.81)
1,891 cu. yds. Common Excavation (VMF = 1.00)(To Be Wasted) - See General Note
4,317 cu. yds. Common Excavation (Contractor Furnished) (VMF = 0.81)
22,166 cu. yds. Embankment

* Includes:
15 cu. yds. 51+97.00 Lt. & Rt. Ent. W=24'
3 cu. yds. 78+71.00 Rt. Sideroad (W 30th Drive) W=28'
2 cu. yds. 78+81.00 Lt. Sideroad (W 30th Drive) W=28'

Includes:
117 cu. yds. 51+97.00 Lt. & Rt. Ent. W=24'
264 cu. yds. 78+71.00 Rt. Sideroad (W 30th Drive) W=28'
57 cu. yds. 78+81.00 Lt. Sideroad (W 30th Drive) W=28'

From Balance Station 26+18.44

To Balance Station 80+00

1,620 1,610 1,600 1,590 1,580 1,570 1,560 1,550 1,540 1,530 1,520 1,510 1,500 1,490 1,480 1,470 1,460 1,450

Dt. Lt.
Dt. Rt.

- 0.60%
1591.95 +00 Rt. Sp. Dt. Lt.
- 0.70%
1590.05 +00 Lt.
- 1.80% Sp. Dt. Lt.
- 1.60% Sp. Dt. Rt.
800' V.C.
SSD = 1074'
- 2.20%
1581.05 +00 Lt.
1583.96 +00 Rt.
- 2.30% Sp. Dt. Rt.
- 2.20% Sp. Dt. Lt.
1572.45 +00 Rt.
1572.89 +70 Lt.
- 1.80% Sp. Dt. Lt.
STA. 52+12 Underground Telephone
- 2.20%
1571.90 +25 Lt.
- 1.40% Sp. Dt. Lt.
- 1.15% Sp. Dt. Rt.
600' V.C.
1567.85 +00 Rt.
- 0.40%
- 1.00% Sp. Dt. Rt.
- 0.60% Sp. Dt. Lt.
1563.85 +00 Lt.
10' x Sp. Dt. Lt.
10' x Sp. Dt. Rt.
1561.45 +00 Lt.
Existing Ground
3.00% Sp. Dt. Lt.
1558.45 +00 Lt.
- 0.30% Sp. Dt. Lt.
Exist. Stream Bed Lt.
1555.85 +00 Rt.
Crown Grade Proposed Improvement
1556.95 +00 Lt.
OHW (1553.0)
5.24% Sp. Dt. Lt.
2.13% Sp. Dt. Rt.
1551.71 +00 Lt.
1551.59 +00 Rt.
DHW (1560.2)
6.05% Sp. Dt. Lt.
4.50% Sp. Dt. Rt.
1551.71 +70 Lt.
1551.59 +70 Rt.
1557.76 +70 Lt.
1557.44 +00 Rt.
- 0.40%
0.30% Sp. Dt. Lt.
0.30% Sp. Dt. Rt.
Exist. Stream Bed Rt.
Sta. 69+35
4 - 10' x 10' RFB
P.G. Elev. = 1564.83
fl. Lt. (Ex.) = 1551.71
fl. Rt. (Ex.) = 1551.59
Floor Elev. Lt. = 1550.71
fl. Lt. = 1551.71
Floor Elev. Rt. = 1550.59
fl. Rt. = 1551.59

+00.00 P.I. El. = 1594.17
+00.00 P.T. 1585.97
+00.00 P.C. 1577.17
+00.00 P.I. El. = 1570.57
+00.00 P.T. 1569.37
+50.00 P.C. 1564.37

1 1595.57
2 1594.47
3 1593.17
4 1591.67
45 1589.97
6 1588.07
7 1585.97
8 1583.77
9 1581.57
50 1579.37
1 1577.17
2 1575.12
3 1573.37
4 1571.92
55 1570.77
6 1569.92
7 1569.37
8 1568.97
9 1568.57
60 1568.17
1 1567.77
2 1567.37
3 1566.97
4 1566.57
65 1566.17
6 1565.77
7 1565.37
8 1564.97
9 1564.57
70 1564.19
1 1563.91
2 1563.76
3

Drawn By : MDELEON
File : c:\pwworking\central01\d2274982\ka6020001rpr-02.dgn
Plotted : 07-11-24

KANSAS DEPARTMENT OF TRANSPORTATION

PROFILE

STA. 41+00 TO STA. 73+00

KDOT Graphics Certified 07-10-2024

KDOT Graphics Certified

Sh. No. 10

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	11	293

SCALE
100' 0 100' 200'
PLAN: Lat. & Long.

BY	DATE
REFERENCES NOTED M. DELEON	6/2021
REFERENCES CHECKED B. HORNER	7/2021

US-281 ALIGNMENT

P.O.T. ℄ Sta. 78+00.00
N 737,283.352 E 5,492,580.599

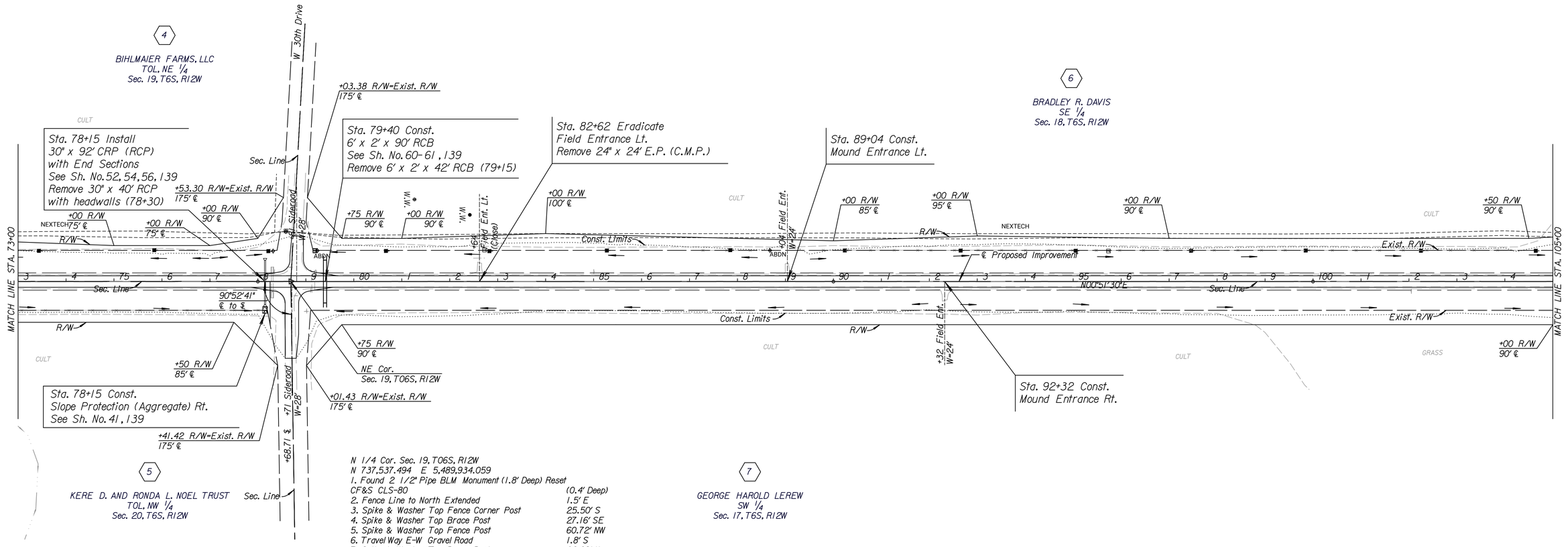
1. Set 5/8" Rebar	(0.3' deep)
2. Spike & Washer Top Fence Post KDOT	60.65' E
3. Spike & Washer in Power Pole	66.85' WNW
4. Chiseled "X" North End Headwall	38.92' SW
5. Chiseled "X" South End Headwall	33.31' NW
6. Travel Way Hwy 281	0.3' E

P.O.T. ℄ Sta. 90+00.00
N 738,483.217 E 5,492,598.574

1. Set 5/8" Rebar	(0.3' deep)
2. Centerline Top "T" Post (BM#16)	106.40' NE
3. Centerline Field Entrance to East	100.00' S
4. Spike & Washer in Power Pole	68.95' WNW
5. Spike & Washer in Telephone Marker Post	146.82' SSW

P.O.T. ℄ Sta. 100+00.00
N 739,483.105 E 5,492,613.552

1. Set 5/8" Rebar	(0.3' deep)
2. Centerline Top "T" Post (BM #17)	114.45' NE
3. Spike & Washer in "T" Post	75.98' NW
4. Spike & Washer in Power Pole	66.16' WSW
5. Spike & Washer in "T" Post	101.00' SW



N 1/4 Cor. Sec. 19, T06S, R12W
N 737,537.494 E 5,489,934.059

1. Found 2 1/2" Pipe BLM Monument (1.8' Deep) Reset CF&S CLS-80	(0.4' Deep)
2. Fence Line to North Extended	1.5' E
3. Spike & Washer Top Fence Corner Post	25.50' S
4. Spike & Washer Top Brace Post	27.16' SE
5. Spike & Washer Top Fence Post	60.72' NW
6. Travel Way E-W Gravel Road	1.8' S
7. Spike & Washer Top Brace Post	36.09' N

NE Cor. Sec. 19, T06S, R12W
N 737,352.086 E 5,492,581.281

1. Found 5/8" Rebar W/Alum. Cap	(0.5' Deep)
2. 0.35' W of ℄ Sta. 78+68.71, NW Angle = 90°52'41" ℄ to ℄	
3. KDOT Rivet & Washer Centerline W Headwall RCB	51.15' NNW
4. Chiseled 'X' NE Cor. E Hub Guard RCB	54.86' NNE
5. Spike & Washer Power Pole	77.81' SW
6. ℄ Top 0.3' x 0.3' Concrete R/W Marker	79.35' NW
7. Travel Way Hwy 281	0.0' E
8. Travel Way Side Road to West	0.0' N

N 1/4 Cor. Sec. 20, T06S, R12W
N 737,352.990 E 5,495,205.311

1. Reset 5/8" Rebar W/Cap CF&S CLS-80	(0.4' Deep)
2. 2623.68' E of ℄ Sta. 78+68.71, SE Angle = 90°52'41" ℄ to ℄	
3. Spike & Washer in Top of Fence Post	31.26' S
4. Fence Line to South Extended	1.5' W
5. Travel Way E-W Gravel Road	4.0' N
6. BLM Reference Mark 45.7'	48.18' NW

Utilities
Telephone: Nextech
Overhead Power: Prairie Land Electric Coop

BM15 - '□' cut NE Cor E. Headwall 6'x2' RCB
22.74' Rt. ℄ US-281 Sta. 79+18.54 Elev. 1561.57

BM16 - 'T' post driven flush with surface 1' W. of Steel "U" Post
57.93' Rt. ℄ US-281 Sta. 90+89.30 Elev. 1567.68

BM17 - 'T' post driven flush with surface
56.18' Rt. ℄ US-281 Sta. 100+99.70 Elev. 1554.24

KANSAS DEPARTMENT OF TRANSPORTATION
PLAN
STA. 73+00 TO STA. 105+00

KDOT Graphics Certified 07-10-2024

Sh. No. 11

KDOT Graphics Certified

Drawn By : MDELEON Plotted : 07-11-24
File : c:\pwworking\central01\d2274982\ka6020001rpl-03.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	12	293

From Balance Station 26+18.44

80+00.00

To Balance Station 132+00

800' V.C.

STA. 78+68.74 ℄ US-281 = ℄ W 30th Drive

+ 0.60%

0.30% Sp. Dt. Lt.

- 0.22% Sp. Dt. Rt.

1558.04 +00 Rt.

- 1.62% Sp. Dt. Lt.

1559.68 +00 Lt.

1557.90 +10 Lt.

1556.90 +10 Rt.

78+15 30" RCP
P.G. Elev. = 1564.97
℄ Lt. (Ex.) = 1557.87
℄ Rt. (Ex.) = 1556.97
℄ Lt. = 1557.90
℄ Rt. = 1556.90

1557.90 +30 Lt.

1557.90 +20 Lt.

1556.90 +20 Rt.

1557.90 +50 Lt.

0.83% Sp. Dt. Rt.

1557.50 +50 Rt.

1557.50 +30 Rt.

79+40 6' x 2' RCB
P.G. Elev. = 1565.71
℄ Lt. (Ex.) = 1557.83
℄ Rt. (Ex.) = 1557.64
℄ Lt. = 1557.90
℄ Rt. = 1557.50

Existing Ground

1.45% Sp. Dt. Rt.

1558.74 +00 Rt.

1563.10 +00 Rt.

Profile Grade
Proposed
Improvement

0.87% Sp. Dt. Lt.

0.31% Sp. Dt. Rt.

1565.77 +50 Lt.

1566.20 +50 Lt.

1565.62 +00 Rt.

1564.99 +70 Rt.

1,200' V.C.
SSD = 1061'

-0.90% Sp. Dt. Rt.

- 0.85% Sp. Dt. Lt.

1562.92 +00 Rt.

1559.83 +00 Lt.

- 1.70%

- 1.80% Sp. Dt. Lt.

-1.85% Sp. Dt. Rt.

10' x Sp. Dt. Lt.

10' x Sp. Dt. Rt.

Sideroad +20 +30

Entrance +50 +50

Entrance +00 +70

Dt. Lt.

Dt. Rt.

1,620 1,610 1,600 1,590 1,580 1,570 1,560 1,550 1,540 1,530 1,520 1,510 1,500 1,490 1,480 1,470 1,460 1,450

+50.00 P.I. El. = 1562.77

+50.00 P.T. 1565.17

+00.00 P.C. 1569.67

+00.00 P.I. El. = 1573.27

+00.00 P.T. 1563.07

3 4 75 6 7 8 9 80 1 2 3 4 85 6 7 8 9 90 1 2 3 4 95 6 7 8 9 100 1 2 3 4 105

1563.74 1563.84 1564.06 1564.41 1564.89 1565.47 1566.07 1566.67 1567.27 1567.87 1568.47 1569.07 1569.67 1570.17 1570.49 1570.61 1570.54 1570.27 1569.82 1569.17 1568.34 1567.31 1566.09 1564.67 1563.07 1561.37 1559.67 1557.97 1556.27 1554.57 1552.87 1551.17

Drawn By : MDELEON
File : c:\pwworking\central01\d2274982\ka602001rpr-03.dgn
Plotted : 07-11-24

KANSAS DEPARTMENT OF TRANSPORTATION

PROFILE

STA. 73+00 TO STA. 105+00

KDOT Graphics Certified 05-23-2024

Sh. No. 12

KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	13	293

DATE	BY	
6/2021	M. DELEON	REFERENCES NOTED
7/2021	B. HORNER	REFERENCES CHECKED

SCALE
100' 0 100' 200'
PLAN: Lat. & Long.

US-281 ALIGNMENT

P.O.T. ℄ Sta. 109+21.40
N 740,404.401 E 5,492,627.353
1. Set 5/8" Rebar (0.3' deep)
2. 0.3' X 0.3' R/W Marker 59.40' E
3. Base "U" Post Mile Marker 197 77.75' NE
4. Spike & Washer in Sign Post 101.64' SSE
5. Spike & Washer in Power Pole 66.85' WNW
6. At Travel Way

P.I. Sta. 130+40.68 (Bk.) =
P.I. Sta. 130+40.67 (Ahd.)
N 742,523.453 E 5,492,658.414
1. 1/2" Rebar w/Alum Cap (0.6' deep)
2. Spike & Washer in Power Pole 68.65' ENE
3. Chiseled "X" East End Headwall RCB 46.52' WSW
4. Chiseled "X" East End Headwall RCB 46.36' WNW
5. SW Cor. Chiseled "□" NEC. Headwall 30.65' NE
6. Spike & Washer UGT Marker Po. 92.18' ESE

P.O.T. ℄ Sta. 121+00.18
N 741,583.049 E 5,492,645.010
1. Set 5/8" Rebar (0.3' deep)
2. Spike & Washer in UGT Marker Post 88 88.86' NW
3. Spike & Washer in Power Pole 76.28' WNW
4. Centerline Top T. Ped. 105.30' SW

P.T. ℄ Sta. 135+85.82
N 743,068.577 E 5,492,662.652
1. Not Set

P.O.T. ℄ Sta. 135+90.55
N 743,073.306 E 5,492,662.673
1. 1/2" Rebar Found (0.8' deep)
2. 0.3' X 0.3' R/W Marker 82.68' NE
3. Spike & Washer in Power Pole 67.75' W
4. Travel Way Hwy 281 0.3' E
5. ℄ Irrigation Well 144.70' NE

P.C. ℄ Sta. 126+95.53
N 742,178.330 E 5,492,653.927
1. Set 5/8" Rebar (0.3' deep)
2. Spike & Washer in Power Pole 95.25' SW
3. Spike & Washer in UGT Marker Post 133.50' SSW
4. Mag Nail & Washer East EM 11.50' E
5. Alum Capped Rebar 28.00' ENE

Sta. 117+49 Install
2 - 30" x 46' E. P. (RCP,CSP,ACSP,CAP) Lt.
with End Sections
See Sheet No.51,52,54-56,139
Remove 2 - 30" x 24' E.P. (C.M.P.)

(8) SARAH DECKARD, ET AL.
TOL, NE 1/4
Sec. 18, T6S, R12W

Sta. 117+76 to 117+92 Const.
Slope Protection (Aggregate) Lt.
See Sh. No.41,139

Sta. 122+90 to Sta. 124+69 Const.
Berm Lt.
See Typical & Cross Sections

(9) ROY DEBEY, ET AL.
TOL, NE 1/4
Sec. 18, T6S, R12W

Sta. 124+35 Remove
House and Foundation, Lt.

Sta. 124+81, 66' Lt. Const.
2 - 9' x 4' x 44' RFB Culv. No. 546
with Apron (N) See Sh. No. 67-69,139
Remove 2- 6' x 2' x 26.5' RCB
Culv. No. 531

Sta. 130+95 to Sta. 131+86 Const.
Slope Protection (Rip Rap Stone)(200 lb) Lt.
See Sh. No. 87,139
Sta. 130+82 to Sta. 131+16 Const.
Slope Protection (Rip Rap Stone)(200 lb) Lt.
See Sh. No. 41,139

Sta. 131+41, 70' Lt. Const.
2 - 9' x 6' x 52' RFB, Embedded
Culv. No. 549
with Apron
See Sh. No. 70, 73-75, 87,139
Remove 2 - 6' x 2' x 34.5' RCB Culv. No. 533

(11) FAYE MONROE DEETER TRUST
SE 1/4
Sec. 07, T6S, R12W

Sta. 123+00 Const.
7' x 3' x 90' RFB
See Sh. No.62-63,139
Remove 7' x 2' x 34' RCB

Sta. 117+73 to Sta. 117+89 Const.
Slope Protection (Aggregate) Rt.
See Sh. No.41,139

Sta. 117+45 Install
2 - 36" x 46' E. P. (RCP,CSP, ACSP, CAP) Rt.
with End Sections
See Sheet No.51,52,54-56,139
Remove 2 - 30" x 24' E.P. (C.M.P.)

(10) GWEN M. DAVIS
NW 1/4
Sec. 17, T6S, R12W

Sta. 130+75 Const.
2 - 6' x 2' x 90' RFB Culv. No. 547
See Sh. No.70-72,139
Remove 2 - 6' x 2' x 36.5' RCB Culv. No. 532

Sta. 130+74
Plug (Water) Well Rt.
Remove Pump
and Propane Tank

Sta. 132+80
Plug (Water) Well Rt.

Sta. 131+40 Remove
8' x 2' x 59' RCB
(12) CAROL J. NOEL TRUST
SW 1/4
Sec. 08, T6S, R12W

W 1/4 Cor. Sec. 18, T06S, R12W
N 740,345.490 E 5,487,177.644
1. Reset 5/8" Rebar W/Cap CF&S CLS-80 (0.4' Deep)
2. BLM RM 54.3' 54.30' NW
3. Spike & Washer in Top Fence Corner Post 19.80' W
4. Spike & Washer in Power Pole 21.36' W
5. Fence Line to West Extended 4.1' N
6. Travel Way N-S Gravel Road 6.5' E
7. SW Corner Concrete Slab 34.89' SE

E 1/4 Cor. Sec. 18, T06S, R12W
N 739,993.173 E 5,492,620.995
1. Found 1/2" Rebar No Cap (0.7' Deep)
2. 0.20' W of ℄ Sta. 105+10.08, SW Angle = 89°02'43" ℄ to ℄
3. BLM RM 77.8' 77.6' NE
4. Spike & Washer in Power Pole 78.28' SW
5. Spike & Washer in UGT Marker Post 63.05' W
6. Spike & Washer in Top Fence Corner Post 60.88' E
7. Crop line to West 1.0' N
8. Fence Line to East 0.0' S

E 1/4 Cor. Sec. 17, T06S, R12W
N 740,001.994 E 5,497,871.355
1. Found 2 1/2" Pipe BLM Monument (0.4' Deep)
2. 5250.16' E of ℄ P.I. Sta. 105+10.08, NE Angle = 89°02'43" ℄ to ℄
3. Spike & Washer in Top Fence Corner Post 35.47' E-NE
4. 2 Nails & Washer in Top Fence Post 53.75' SE
5. Spike & Washer in Power Pole 76.09' N-NE
6. Fence Line to East Extended 15.7' N
7. Travel Way N-S Gravel Road 1.3' E
8. Overhead Power N-S 35.0' E

N 1/4 Cor. Sec. 18, T06S, R12W
N 742,805.171 E 5,490,014.621
1. Found 1/2" Rebar W/Cap LS-1276 over 2 1/2" Pipe
BLM Monument (0.5' Deep)
2. 2652.19' W of ℄ P.I. Sta. 131+40.68 BK = 131+40.67 AH. SW Angle = 93°04'15" ℄ Back Tangent to ℄
3. Spike & Washer in Power Pole 29.37' S
4. Spike & Washer in Side of Brace Post 46.99' N
5. Centerline Top SW guard Post Irrigation 54.50' NW
6. Mag Nail in Top West end CMP 29.00' NE
7. Travel Way Gravel Road E-W 2.1' S
8. Overhead Power Line to N 0.0' E

NE Cor. Sec. 18, T06S, R12W
N 742,623.431 E 5,492,660.595
1. Found 1/2" Rebar W/Alum. Cap LS-414 (0.6' Deep)
2. Spike & Washer in Power Pole 68.85' ENE
3. Chiseled "X" ℄E. End Hdwl. RCB 46.52' WSW
4. Chiseled "X" ℄E. End Hdwl. RCB 46.36' WNW
5. SW Cor. Chiseled Sq. NE Cor. Hdwl. RCB 30.65' NE
6. Spike & Washer in UGT Marker Post 92.18' ESE

N 1/4 Cor. Sec. 17, T06S, R12W
N 742,625.118 E 5,495,273.580
1. Found 2 1/2" Pipe BLM Monument (1.8' Deep) Set 5/8"x 24" Rebar W/Cap
CF&S CLS-80 to (0.4' Deep) over Monument
2. 2612.99' E of ℄ Sta. 131+40.68 BK = 131+40.67 AH. SE Angle = 90°53'43" ℄ Back Tangent to ℄
3. West Face of House North Extended 1.7' E
4. Travel Way E-W Gravel Road 0.7' S
5. Centerline Top Telephone Pedestal 83.64' ENE
6. Nail & Bottle Cap in 80"Tree 28.18' NNW
7. Spike & Washer in UGT Marker Post 52.25' WSW
8. Spike & Washer in Top Lone Fence Post 112.21' WNW

Curve Data
P.I. Sta. 130+40.68 (Bk.) =
P.I. Sta. 130+40.67 (Ahd.) =
1.15' Rt. ℄Sta. 130+40.67
Δ= 00°35'37" Lt.
D = 00°04'
L = 890.29'
T = 445.15'
R = 85,943.67'
E = 1.15'
Super = NC

Utilities
Telephone: Nextech
Overhead Power: Prairie Land Electric Coop

BM18 - 'T' post driven flush with surface
58.84' Rt. ℄ US-281 Sta. 111+32.01 Elev. 1538.23

BM19 - '□' cut SW Cor W. Headwall 7'x2'- RCB
18.24' Lt. ℄ US-281 Sta. 122+96.11 Elev. 1530.32

BM20 - '□' cut NE Cor N. Headwall 8'x2'- RCB
25.86' Rt. ℄ US-281 Sta. 131+59.10 Elev. 1528.74

KANSAS DEPARTMENT OF TRANSPORTATION
PLAN
STA. 105+00 TO STA. 137+00

KDOT Graphics Certified 07-10-2024

Sh. No. 13

Drawn By : MDELEON Plotted : 07-11-24
File : c:\pwworking\central01\d2274982\ka6020001rpl-04.dgn

KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	14	293

Balance Area 2

* 17,802 cu. yds. Common Excavation (VMF = 0.81)
1,741 cu. yds. Common Excavation (VMF = 1.00)(To Be Wasted) - See General Note
5,230 cu. yds. Common Excavation (Contractor Furnished) (VMF = 0.81)
\# 18,656 cu. yds. Embankment

* Includes:
7 cu. yds. 117+45.00 Rt. House Ent. W=24'
2 cu. yds. 124+81.00 Lt. House Ent. W=24'
2 cu. yds. 131+39.00 Rt. Sideroad (W 20th Drive) W=28'
2 cu. yds. 131+41.00 Lt. Sideroad (W 20th Drive) W=28'

\# Includes:
41 cu. yds. 89+04.00 Lt. Field Ent. W=24'
5 cu. yds. 92+32.00 Rt. Field Ent. W=24'
12 cu. yds. 117+45.00 Rt. House Ent. W=24'
77 cu. yds. 117+49.00 Lt. Field Ent. W=24'
76 cu. yds. 124+81.00 Lt. Field Ent. W=24'
64 cu. yds. 131+39.00 Rt. Sideroad (W 20th Drive) W=28'
121 cu. yds. 131+41.00 Lt. Sideroad (W 20th Drive) W=28'

From Balance Station 80+00

To Balance Station 183+15.64

132400

600' V.C.

-1.85% Sp. Dt. Rt.
-1.80% Sp. Dt. Lt.
-1.20% Sp. Dt. Rt.
-1.23% Sp. Dt. Lt.
-1.70%
-0.20%
Existing Ground
-0.30% Sp. Dt. Lt.
-0.31% Sp. Dt. Rt.
-0.82% Sp. Dt. Lt.
-0.17% Sp. Dt. Rt.
-0.25% Sp. Dt. Lt.
Crown Grade
Proposed
Improvement
-0.25% Sp. Dt. Rt.
-0.19% Sp. Dt. Lt.

1538.87 +00 Rt.
1528.09 +25 Lt.
1528.05 +00 Rt.
1528.09 +25 Lt.
1526.40 +90 Lt.
1526.25 +90 Rt.
1526.40 +10 Lt.
1526.25 +10 Rt.
1524.80 +05 Lt.
1525.00 +65 Rt.
1525.00 +95 Rt.
1523.30 +15 Lt.
1525.00 +00 Rt.
1522.80 +67 Lt.

123+00 71 x 3' RFB
P.G. Elev. = 1533.02
℄ Lt. (Ex.) = 1526.40
℄ Rt. (Ex.) = 1526.25
℄ Lt. = 1526.40
℄ Rt. = 1526.25

130+75 2 - 6' x 2' RFB
P.G. Elev. = 1531.47
℄ Lt. (Ex.) = 1525.09
℄ Rt. (Ex.) = 1525.07
℄ Lt. = 1525.00
℄ Rt. = 1525.00

STA. 131+40.74 ℄ US-281 = ℄ W 20th Drive = ℄

10' x Sp. Dt. Lt.
10' x Sp. Dt. Rt.
Dt. Trans.
20' x Sp. Dt. Lt.
Sideroad
10' x Sp. Dt. Rt.

+70.00 P.C. 1539.78
+70.00 P.I. El. = 1534.68
+70.00 P.T. 1534.08

1,620 1,610 1,600 1,590 1,580 1,570 1,560 1,550 1,540 1,530 1,520 1,510 1,500 1,490 1,480 1,470 1,460 1,450

Dt. Lt.
Dt. Rt.

105 6 7 8 9 110 2 3 4 115 6 7 8 9 120 2 3 4 125 6 7 8 9 130 1 2 3 4 135 6 7

1,549.47 1,547.77 1,546.07 1,544.37 1,542.67 1,540.97 1,539.28 1,537.78 1,536.53 1,535.53 1,534.78 1,534.28 1,534.02 1,533.82 1,533.62 1,533.42 1,533.22 1,533.02 1,532.82 1,532.62 1,532.42 1,532.22 1,532.02 1,531.82 1,531.62 1,531.42 1,531.22 1,531.02 1,530.82 1,530.62 1,530.42 1,530.22

KANSAS DEPARTMENT OF TRANSPORTATION

PROFILE

STA. 105+00 TO STA. 137+00

KDOT Graphics Certified 07-10-2024

Sh. No. 14

KDOT Graphics Certified

Drawn By : MDELEON Plotted : 07-11-24
File : c:\pwworking\central01\d2274982\ka6020001rpr-04.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	15	293

SCALE
100' 0 100' 200'
PLAN: Lat. & Long.

DATE	BY
6/2021	M. DELEON
7/2021	B. HORNER

REFERENCES NOTED
REFERENCES CHECKED

US-281 ALIGNMENT

P.C. ℄ Sta. 145+21.29
N 744,004.038 E 5,492,666.974
1. Set 5/8" Rebar (0.3' deep)
2. 5/8" Capped CFS Control (1.20) 58.78' NW
3. Spike & Washer in Power Pole 71.41' WNW
4. 'X' Cut ℄ E. End Headwall RCB 67.20' SW
5. ℄ Top 1 1/4" Metal Fence Post 74.90 E

P.I. Sta. 150+11.86 (Bk.) = 150+11.76 (Ahd.)
N 744,494.600 E 5,492,669.240
1. Set 5/8" Rebar (0.3' deep)
2. Spike & Washer in Power Pole 49.70' WNW
3. KDOT Rivet S. End RCB 83.58' NNE
4. Spike & Washer in 70" Tree 94.00' NE
5. Spike & Washer in 70" Tree 86.80' E
6. Travel Way Hwy 281 3.7' E

P.T. ℄ Sta. 155+02.33
N 744,984.797 E 5,492,688.301
1. Set 5/8" Rebar (0.3' deep)
2. Spike & Washer in top Guard Fence Post 32.28' NE
3. Spike & Washer in top Guard Fence Post 17.38' E
4. Spike & Washer in top Guard Fence Post 33.51' SE
5. Spike & Washer in Power Pole 64.20' W
6. At Travel Way Hwy 281

Curve Data
P.I. Sta. 150+11.86 (Bk.) =
P.I. Sta. 150+11.76 (Ahd.) =
4.20' Lt. ℄Sta. 150+11.81
Δ= 01°57'43" Rt.
D = 00°12'
L = 981.04'
T = 490.57'
R = 28,647.90'
E = 4.20'
Super = NC

P.O.T. ℄ Sta. 167+00.00
N 746,181.562 E 5,492,734.836
1. Set 5/8" Rebar (0.3' deep)
2. Spike & Washer Top Fence Post 74.83' E
3. Spike & Washer Top Fence Post 87.55' NE
4. ℄ Top T. Pedestal 116.50' NW
5. Travel Way Hwy 281 0.5' E
6. Spike & Washer in Power Pole 106.53' W

Sta. 149+50
Br. No. 281-71-197.67 (057)
2-14' x 6' x 128' RFB, Embedded
Skew 45° Lt.
See Sh. No. 80 - 84, 87, 139

Sta. 148+52 to Sta. 149+31 Const.
Slope Protection (Rip Rap Stone)(200 lb) Lt.
See Sh. No. 82, 87

11
FAYE MONROE DEETER TRUST
SE 1/4
Sec. 07, T6S, R12W

Sta. 144+57 Eradicate
Entrance Lt.
Remove 2 - 6' x 3' x 27' RCB
Culv No. 534

Do Not Disturb House or Tree

Sta. 150+87 Remove
Culvert No. (535)
2 - 6' x 3' x 198' RCB
45° Rotated Lt.

Sta. 151+07 Const.
Ho. Ent. Lt.

Sta. 152+67 Eradicate
Entrance Lt.
Remove 24" x 70' C.M.P.
with Headwalls

1/4 Sec. Line

Sta. 155+00 to Sta. 156+10 Const.
Aggregate Ditch Lining (6") Lt.
See Sh. No. 42, 139

Sta. 155+00 Const.
4' x 4' x 190' RCB Brokenback
Rotate 10° Rt.
See Sh. No. 64-66, 139
Remove 3' x 3' x 206' RCB (155+2.3)

13
BIHLMAIER FARMS, LLC
SE 1/4, NE 1/4
Sec. 07, T6S, R12W

+40 Temp. Esmt. 95' ℄
+40 Temp. Esmt. = Exist. R/W 80' ℄
+20 R/W=Exist. R/W 80' ℄
+70.74 R/W=Exist. R/W=Temp. Esmt. 80' ℄
+70 Temp. Esmt. 95' ℄
Temp. Esmt.
+00 R/W 80' ℄
+00 R/W 130' ℄
+70 R/W 145' ℄
+25 R/W 150' ℄
+00 R/W 115' ℄
+00 R/W=Exist. R/W 101.01' ℄
+00 R/W 115' ℄
E 1/4 Cor. Sec. 7, T06S, R12W
+07 House Ent. W=24'
+67 Field Ent Lt. (Close)
Exist. R/W
℄ Proposed Improvement
PT +02.33
92°27'21" ℄ to ℄
NEXTECH
ABDN
CULT
TIMBER
R/W
Const. Limits
Sec. Line
MATCH LINE STA. 137+00
MATCH LINE STA. 169+00
N00°15'53"E
N02°13'36"E

Sta. 148+00 Install
36" x 60' E.P. (RCP, CSP, ACSP, CAP) Rt.
with End Sections
See Sh. No. 51, 52, 54, 56, 139

+70 Temp. Esmt. = R/W 104.62' ℄
+70 Temp. Esmt. 120' ℄
+30 Temp. Esmt. = R/W 104.87' ℄
+30 Temp. Esmt. 120' ℄
+00 House Ent. W=24'
+00 R/W 105' ℄
+00 R/W 250' ℄
+00 R/W 250' ℄
+00 R/W 160' ℄
+00 R/W 160' ℄
+75 R/W 240' ℄
+85 R/W 240' ℄
+00 R/W 115' ℄
Exist. Drainage Esmt.
North Fork Solomon River

12
CAROL J. NOEL TRUST
SW 1/4
Sec. 08, T6S, R12W

14
ARLENE B. WOLTERS TRUST
NW 1/4
Sec. 08, T6S, R12W

Sta. 137+16
Plug (Water) Well Rt.
Remove Pump and Propane Tank

Sta. 145+00 to Sta. 150+00 Const
Berm Rt.
See Typical & Cross Sections

Sta. 150+70 Remove
6' x 2' x 36' RCB Rt.
Eradicate Entrance Rt.

Sta. 149+00 to Sta. 156+60 Const.
Articulated Concrete Block Spillway &
River Bank Stabilization Rt.
See Sh. No. 32-40

Sta. 160+65 Exist.
Monument Rt.
To be Relocated
(by others)

E 1/4 Cor. Sec. 7, T06S, R12W
N 745,272.397 E 5,492,667.281
1. Found 2 1/2" Pipe BLM Monument at Surface
2. 32.21' W of ℄ Sta. 157+90.27, NW Angle = 92°27'21" ℄ to ℄
3. Travel Way Hwy 281 32.9' E
4. Spike & Washer in Historical Marker sign 58.57' ENE
5. Spike & Washer in Top Fence Post 58.30' NW
6. Spike & Washer in Top Fence Post 49.10' W
7. Spike & Washer in Power Pole 61.37' SW
8. Spike & Washer in 30" Tree 101.63' SSW

Center Sec. 8, T06S, R12W
N 745,283.009 E 5,495,319.379
1. Found 5/8" Rebar W/Cap NE441-KS894 (0.2' Above Grade)
2. 2619.89' E of ℄ Sta. 157+90.27, SE Angle = 92°27'21" ℄ to ℄
3. Spike & Washer in W face 100" Cottonwood 25.68' NW
4. Spike & Washer in W face 20" Hackberry 27.68' NE
5. Spike & Washer in W face 50" Tree 29.23' E
6. Spike & Washer in W face 20" Ash 11.21' W

Center Sec. 7, T06S, R12W
N 745,450.881 E 5,489,988.197
1. Found 5/8" Rebar No Cap at Surface
2. Spike & Washer in E Face Railroad Tie Fence Post 4.42' S
3. Spike & Washer in Top Railroad Tie Fence Post 16.87' E
4. Centerline 7" CIP North Leg Irrigation Stop 52.59' S
5. Crop line to East 0.0' N
6. Fence Line to South 0.0' W
7. NORA

Utilities
Telephone: Nextech
Overhead Power: Prairie Land Electric Coop

BM21 - 'T' post driven flush with surface 1' W. of Woven wire fence 70.49' Rt. ℄ US-281 Sta. 141+87.04 Elev. 1527.07

BM22 - Rivet & KDOT Washer in ℄ Top S. 6'x2' RCB 41.48' Rt. ℄ US-281 Sta. 150+81.91 Elev. 1526.31

BM23 - 'T' post driven flush with surface 1' W. of Barb wire fence 84.81' Rt. ℄ US-281 Sta. 161+01.06 Elev. 1508.80

KANSAS DEPARTMENT OF TRANSPORTATION
PLAN
STA. 137+00 TO STA. 169+00

KDOT Graphics Certified 07-10-2024

Sh. No. 15

Drawn By : MDELEON Plotted : 07-11-24
File : c:\pwworking\central01\d2274982\ka602001rpl-05.dgn

KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-01	2024	16	293

Balance Area 3

×	27,018	cu. yds.	Common Excavation (VMF = 0.81)
	1,589	cu. yds.	Common Excavation (VMF = 1.00)(To Be Wasted) - See General Note
	49,978	cu. yds.	Common Excavation (Contractor Furnished) (VMF = 0.81)
#	65,188	cu. yds.	Embankment

× Includes:

4	cu. yds.	148+00.00	Rt. House Ent. W=24'
5.3	cu. yds.	151+07.00	Lt. House Ent. W=24'
6	cu. yds.	170+42.00	Lt. Field Ent. W=24'
1	cu. yds.	170+84.00	Rt. Field Ent. W=24'
7	cu. yds.	179+40.80	Lt. Side Road W=40'

× An Additional:
3,483 cu. yds. to be hauled in from Balance 4 Station 190+65.86 to Station 210+40

Includes:

115	cu. yds.	148+00.00	Rt. House Ent. W=24'
4	cu. yds.	179+40.80	Lt. Side Road W=40'

From Balance Station 132+00

To Balance Station 183+15.64

1,000' V.C.

Existing Ground

Crown Grade Proposed Improvement

- 0.20%

1520.75 +00 Rt. DHW (1526.34)

1526.10 +00 Lt.

1525.74 +90 Lt.

OHW (1520.0)

+0.71% Sp. Dt. Lt.

8.00% Sp. Dt. Lt.

4.00% Sp. Dt. Rt.

-0.25% Sp. Dt. Rt.

- 0.19% Sp. Dt. Lt.

1519.50 +60 Lt.

0.00% Sp. Dt. Lt.

1519.50 +30 Lt.

1517.75 +75 Rt.

0.00% Sp. Dt. Rt.

1517.75 +15 Rt.

-4.17% Sp. Dt. Rt.

1516.00 +57 Rt.

149+50 2 - 14'x 6' RFB
P.G. Elev. = 1527.72
Floor Elev. Lt. = 1518.50
149+05.00 FL Lt. = 1519.50
Floor Elev. Rt. = 1516.75
149+95.00 FL Rt. = 1517.75

1520.80 +55 Lt.

-8.56% Sp. Dt. Lt.

-14.60% Sp. Dt. Lt.

1516.95 +00 Lt.

155+00 4' x 4' RCB
P.G. Elev. = 1526.62
FL Lt. (Ex.) = 1504.86
FL Rt. (Ex.) = 1487.32
155+16.00 FL Lt. = 1504.00
154+81.00 FL Rt. = 1490.00

1504.00 +10 Lt.

1506.80 +70 Lt.

-2.00% Sp. Dt. Lt.

0.00% Sp. Dt. Lt.

1506.50 +00 Lt.

3.57% Sp. Dt. Lt.

1504.00 +30 Lt.

Trans. 20' to 6' Sp. Dt. Lt.

Entrance

Exist. Dt. Lt.

20' x Sp. Dt. Lt.

10' x Sp. Dt. Rt.

6' x Sp. Dt. Lt.

6' x Sp. Dt. Lt.

No Dt. Lt.

No Dt. Rt.

+60 +30 +90 +30 +55 +00

+15 +57

See Spillway Detail

+50.00 P.C. 1524.92

Dt. Lt. 1,480

Dt. Rt. 1,480

1,620 1,610 1,600 1,590 1,580 1,570 1,560 1,550 1,540 1,530 1,520 1,510 1,500 1,490 1,470 1,460 1,450 1,440 1,430 1,420

1,530.02 1,529.82 1,529.62 1,529.42 1,529.22 1,529.02 1,528.82 1,528.62 1,528.42 1,528.22 1,528.02 1,527.82 1,527.62 1,527.42 1,527.22 1,527.02 1,526.82 1,526.62 1,526.42 1,526.22 1,526.02 1,525.82 1,525.62 1,525.42 1,525.22 1,525.02 1,524.83

7 8 9 140 1 2 3 4 145 6 7 8 9 150 1 2 3 4 155 6 7 8 9 160 1 2 3 4

KANSAS DEPARTMENT OF TRANSPORTATION

PROFILE

STA. 137+00 TO STA. 169+00

KDOT Graphics Certified 07-11-2024

Sh. No. 16

KDOT Graphics Certified

Drawn By : MDELEON
File : c:\pwworking\central01\d2274982\ka602001rpr-05.dgn
Plotted : 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	17	293

BY	DATE
M. DELEON	6/2021
B. HORNER	7/2021
REFERENCES NOTED	
REFERENCES CHECKED	

SCALE
100' 0 100' 200'
PLAN: Lat. & Long.

CO. RD. 362 ALIGNMENT

P.O.T. ℄ Sta. 34+99.96
N 748,002.332 E 5,491,538.698
1. Set 5/8" Rebar (0.4' Deep)
2. Spike & Washer Top Fc. Po. 49.74' SSW
3. Spike & Washer Top Fc. Po. 50.46' SSE
4. Spike & Washer Top Fc. Po. 91.04' SE
5. Travel Way C0362 2.8' S

P.C. ℄ Sta. 41+08.95
N 747,962.829 E 5,492,146.399
1. Set 5/8" Rebar
2. Spike & Washer Top Fc. Cor. Po. (0.3' Deep)
3. Spike & Washer Top Fc. Po. 71.79' SW
4. Spike & Washer Top Fc. Po. 52.38' SSW
5. At Travel Way 57.64' SSE

P.I. Sta. 43+98.50 (Bk.) =
Sta. 43+46.61 (Ahd.) =
℄Sta. 43+72.55, 76.08' Lt.
N 747,944.046 E 5,492,435.344
1. Set 5/8" Rebar (1.0' Deep)
2. N.O.R.A.

P.T. ℄ Sta. 46+36.16
N 747,686.961 E 5,492,568.571
1. Set 5/8" Rebar (0.3' Deep)
2. Spike & Washer Top Fc. Po. P.I. 54.12' SW
3. Spike & Washer Top Fc. Po. P.I. 71.96' W
4. Spike & Washer Top Fc. Po. P.I. 59.79' S
5. Spike & Washer UGT Stub Pole 76.85' NE

P.C. ℄ Sta. 48+77.18
N 747,472.966 E 5,492,679.468
1. Not Set

P.I. Sta. 49+31.79 (Bk.) =
Sta. 49+21.50 (Ahd.) =
℄ Sta. 49+26.64, 14.73' Rt.
N 747,424.479 E 5,492,704.595
1. Set 5/8" Rebar (0.3' Deep)
2. 1-3/4" x 1-3/4" Sign Post @ Base 60.54' NE
3. Spike & Washer Stop Sign 54.29' ESE
4. Spike & Washer Top Fc. Po. 71.91' WSW
5. Spike & Washer UGT Mkr. Po. 94.65' SW

P.T. ℄ Sta. 49+76.10
N 747,422.357 E 5,492,759.165
1. Not Set

P.O.E. ℄ Sta. 50+00.00 =
US 281 ℄Sta. 179+40.80
N 747,421.429 E 5,492,783.042
1. Not Set

Curve Data (CO. RD. 362)
P.I. Sta. 49+31.79 (Bk.) =
P.I. Sta. 49+21.50 (Ahd.) =
14.73' Rt. ℄ Sta. 49+26.64
Δ= 60°22'45" Lt.
D = 61°02'15"
L = 98.92'
T = 54.61'
R = 93.87'
E = 14.73'
Super = NC

US-281 ALIGNMENT

P.O.T. ℄ Sta. 170+00.00
N 746,481.335 E 5,492,746.493
1. 5/8" Rebar Set
2. Spike & Washer in Sign Post (0.3' Deep)
3. 5/8" Capped CFS Control (125) 34.62' WNW
4. Spike & Washer in Sign Post 27.28' W
5. 2" x 2" Street Sign @ Base 22.05' ESE
84.20' NNW

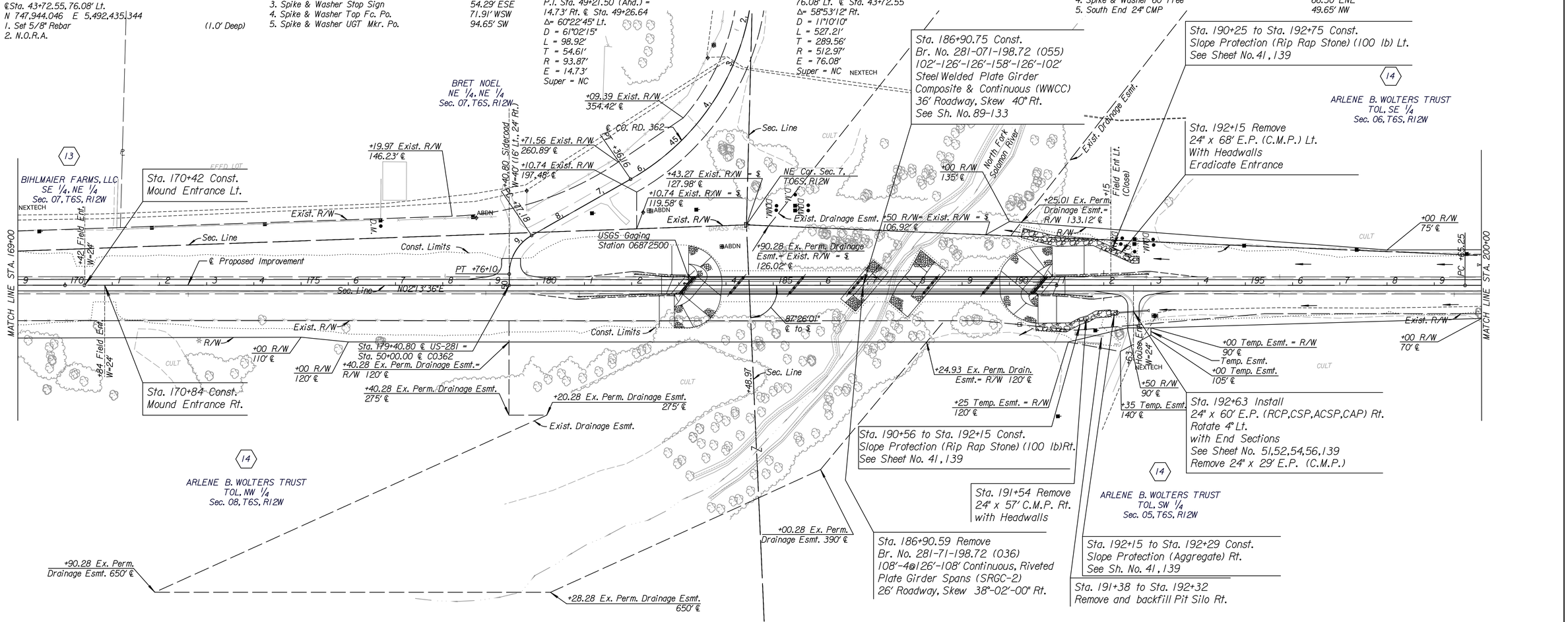
P.O.T. ℄ Sta. 170+40.80
N 746,522.104 E 5,492,748.078
1. 5/8" Rebar Set
2. 2" x 2" Street Sign @ Base (0.3' Deep)
3. Spike & Washer in Sign Post 48.75' NW
4. 5/8" Capped CFS Control (125) 42.81' SW
5. Spike & Washer in Sign Post 53.67' SSW
53.11' SSE

Curve Data (CO. RD. 362)
P.I. Sta. 43+98.50 (Bk.) =
P.I. Sta. 43+46.61 (Ahd.) =
76.08' Lt. ℄ Sta. 43+72.55
Δ= 58°53'12" Rt.
D = 11°10'10"
L = 527.21'
T = 289.56'
R = 512.97'
E = 76.08'
Super = NC

P.O.T. ℄ Sta. 191+00.00
N 748,579.749 E 5,492,828.088
1. Set 5/8" Rebar (0.3' Deep)
2. Spike & Washer Top Fence Post 18.58' E
3. Spike & Washer Top Fence End Post 31.82' NE
4. Spike & Washer Top Fence End Post 59.61' NW
5. Std Tablet Gaging Sta. 50.51' SSE

P.C. ℄ Sta. 199+65.25
N 749,444.341 E 5,492,861.707
1. Not Set

P.O.S.T. ℄ Sta. 199+65.38
N 749,444.476 E 5,492,861.713
1. Set 5/8" Rebar (0.3' Deep)
2. Spike & Washer in Power Pole 66.75' W
3. 0.3' x 0.3' R/W Marker 87.55' NE
4. Spike & Washer 60" Tree 66.30' ENE
5. South End 24" CMP 49.65' NW



N 1/4 Cor. Sec. 7, T06S, R12W
N 748,104.528 E 5,489,966.559
1. Found 1/2" Rebar W/Alum. Cap over 2 1/2" Pipe BLM Monument (0.5' Deep)
2. Travel Way Road E-W Gravel Road 2.0' S
3. Travel Way Field Entrance N 14.7' E
4. Mag Nail & Washer in West End 24" CMP 29.08' SSE
5. Mag Nail & Washer in East End 24"CMP 39.29' NE
6. Southeast Corner E Leg Irrigation Stop 44.95' NW
7. Travel Way Field Entrance to S 24.5' E
8. Spike & Washer in UGT Marker Post 92.68' ESE

NE Cor. Sec. 7, T06S, R12W
N 747,928.488 E 5,492,674.691
1. Found 2 1/2" Pipe BLM Monument (At Grade)
2. 128.10' W of ℄ Sta. 184+48.97, SW Angle = 87°26'01" ℄ to ℄
3. Spike and Washer W 'H' Pole 108.13' NNW
4. Spike and Washer S face 3-120" Cottonwood 81.74' W
5. Spike and Washer E face Power Pole 110.15' SSW
6. Spike and Washer UGT Marker Post 68.78' SE
7. W Face Column Bridge 115.35' E
8. 1/2" Lag Bolt in SE Face 40" Tree 94.55' NNE

N 1/4 Cor. Sec. 8, T06S, R12W
N 747,944.362 E 5,495,350.870
1. Found 2 1/2" Pipe BLM Monument (0.3' Deep)
2. 2548.08' E of ℄ Sta. 184+48.97, NE Angle = 87°26'01" ℄ to ℄
3. Travel Way N-S 17.6' E
4. Travel Way Road to E Extended 14.8' S
5. 1 3/4" x 1 3/4" Sign Post Base 51.84' SE
6. Travel Way MOC of Curve 37.9' NE
7. Spike & Washer UGT Marker Post 70.25' NE

Utilities
Telephone: Nextech
Overhead Power: Prairie Land Electric Coop

BM24 - 'T' post driven flush with surface +/- 1' W. of Barb wire fence
71.85' Rt. ℄ US-281 Sta. 172+18.82 Elev. 1513.98

BM25 - ' ' cut Top S. End SW Conc. Hubguard BR #036
17.79' Lt. ℄ US-281 Sta. 183+27.55 Elev. 1533.23

BM26 - Top 3.5" Brass Disk (USGS) near N. End NE Conc. Hubguard
17.19' Rt. ℄ US-281 Sta. 190+52.54 Elev. 1533.33

KANSAS DEPARTMENT OF TRANSPORTATION

PLAN

STA. 169+00 TO STA. 200+00

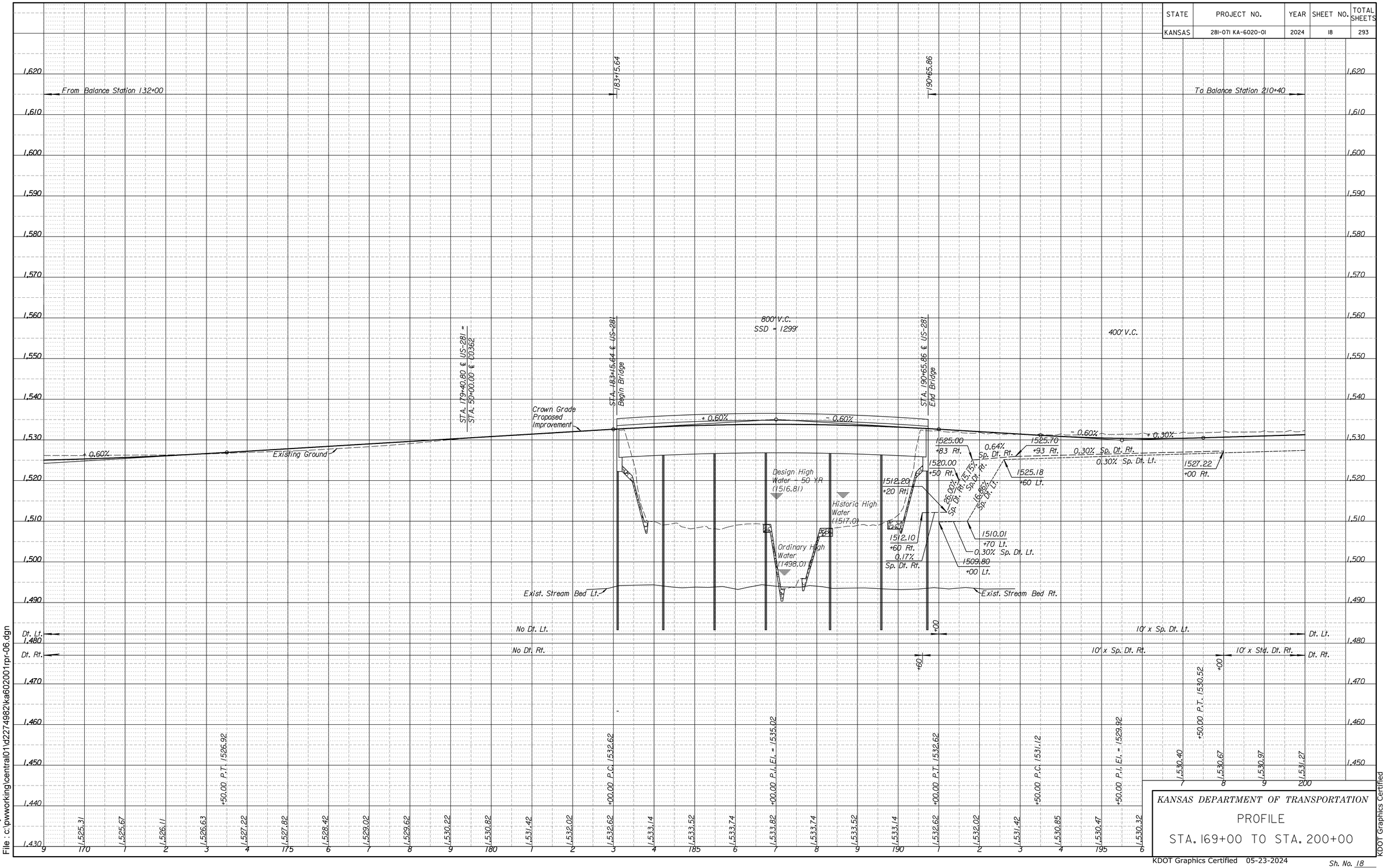
KDOT Graphics Certified 07-10-2024

Sh. No. 17

Drawn By : MDELEON
File : c:\pwworking\central01\d2274982\ka602001rpl-06.dgn
Plotted : 07-11-24

KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	18	293



Drawn By : MDELEON Plotted : 07-11-24
File : c:\pwworking\central01\d2274982\ka6020011pr-06.dgn

KANSAS DEPARTMENT OF TRANSPORTATION

PROFILE

STA. 169+00 TO STA. 200+00

KDOT Graphics Certified 05-23-2024

KDOT Graphics Certified

Sh. No. 18

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	19	293

SCALE
100' 0 100' 200'
PLAN: Lat. & Long.

US-281 ALIGNMENT

P.I. Sta. 207+07.22 (Bk.) =
P.I. Sta. 207+06.89 (Ahd.)
N 750,185.760 E 5,492,890.537

1. Set 5/8" Rebar	(0.3' deep)
2. ℄ Top T. Ped	26.05' SE
3. Travel Way Hwy 281	9.70' W
4. Spike & Washer in UGT Marker Po.	49.80' SW
5. SE Corner 609 Market (Porch)	67.60' WNW
6. Spike & Washer in Power Pole	82.62' NW

P.O.S.T. ℄ Sta. 210+99.97
N 750,578.786 E 5,492,883.333

1. Set 5/8" Rebar	(0.3' deep)
2. NW Corner Hbg'd RCB	32.78' ESE
3. NE Corner 601 Market	75.60' SW
4. KDOT Spike & Washer in Power Pole	40.24' WNW
5. Spike & Washer in Guy Pole	36.88' ENE
6. Travel Way Hwy 281 (Market)	0.5' E

P.T. ℄ Sta. 214+48.87
N 750,927.677 E 5,492,880.948

1. Set 5/8" Rebar	(0.3' deep)
2. Spike & Washer in Light Pole	45.92' ENE
3. ℄ Top T. Ped.	54.50' SE
4. ℄ Top Operating Nut F. Hyd.	49.82' NW
5. Chiseled 'X' T/C @ Return	56.95' SW

P.O.T. ℄ Sta. 220+00.00
N 751,478.759 E 5,492,873.826

1. Set 5/8" Rebar	(0.3' deep)
2. Spike & Washer in Stub Pole	54.08' NE
3. Northwesterly Monitor Well	58.95' ENE
℄ R/R Grade SE	14.00' S
℄ Top Operating Nut F. Hyd.	159.40' NNW

TEMPORARY EASEMENT & R/W POINTS			
POINT	℄ STA.	DESCRIPTION	OFFSET
LEFT			
L1	205+35	Temp. Esmt. = R/W	63.23' ℄
L2	205+75	Temp. Esmt.	68' ℄
L3	207+20	Temp. Esmt.	60' ℄
L4	207+30	Temp. Esmt. = Exist. R/W	52.37' ℄
L5	206+14.29	R/W = Exist. R/W	59.88' ℄
RIGHT			
R1	201+60	Temp. Esmt. = R/W	69.89' ℄
R2	201+60	Temp. Esmt.	85' ℄
R3	202+20	Temp. Esmt.	85' ℄
R4	202+20	Temp. Esmt. = R/W	69.63' ℄
R5	208+00	Temp. Esmt. = R/W	65' ℄
R6	210+00	Temp. Esmt.	65' ℄
R7	210+40	Temp. Esmt. = R/W = Exist. R/W	46.88' ℄
R8	209+00	R/W	50' ℄
R9	210+00	R/W	50' ℄

Sta. 200+12 Install
3.0 SF x 34' E. P. (RCPHE) Lt.
with End Sections
See Sheet No. 53, 54, 56, 139
Remove 24" x 28' E.P. (C.M.P.)

Sta. 205+98 Install
3.0 SF x 36' E. P. (RCPHE) Lt.
with End Sections
See Sheet No. 53, 54, 56, 139
Remove 24" x 28' E.P. (C.M.P.)

STA. 208+50.00 END
Proj. 281-71 KA-6020-01 =
Sta. 227+09.63 On
Proj. 281-71-FAI70 (5)

Sta. 206+99 Install
3.0 SF x 38' E. P. (RCPHE) Lt.
with End Sections
See Sheet No. 53, 54, 56, 139
Remove 24" x 28' E.P. (C.M.P.)

Sta. 210+40.00
END CONSTRUCTION

Sta. 200+42 Install
3.0 SF x 34' E. P. (RCPHE) Rt.
with End Sections
See Sheet No. 53, 54, 56, 139
Remove 24" x 28' E.P. (C.M.P.)

Sta. 203+46 Remove
24" x 53' E.P. (C.M.P.) Rt.
with End Sections
Eradicate Entrance

Sta. 205+38
Plug Water Well Rt.

Sta. 205+38 Remove
24" x 56' E.P. (C.M.P.) Rt.
with End Sections,
Remove Brick Building
and Appurtenances
Eradicate Entrance

Sta. 209+37 Install
3.0 SF x 42' E. P. (RCPHE) Rt.
with End Sections
See Sheet No. 53, 54, 56, 139
Remove 24" x 28' E.P. (C.M.P.)

Sta. 201+85 Install
3.0 SF x 36' E. P. (RCPHE) Rt.
with End Sections
See Sheet No. 53, 54, 56, 139
Remove 24" x 42' E.P. (C.M.P.)

W 1/4 Cor. Sec. 6, T06S, R12W
N 750,735.710 E 5,487,486.995

1. Found 2 1/2" Pipe BLM Monument	(1.0' Deep)
2. S40I.98'W of CL TAN Sta. 210+71.17, NW Angle = 87°17'22" ℄ TAN to ℄	
3. Crop line to East	19.4' N
4. Travel Way Field Road to S	8.0' W
5. West Edge of Timber to N	0.0' W
6. Spike & Washer in 40" Tree	56.65' NE
7. N.O.R.A	

NE Cor. Sec. 6, T06S, R12W
N 753,081.341 E 5,492,851.991

1. Found 2 1/2" Pipe BLM Monument	(1.5' Deep)
2. 1/2" Rebar Unknown Origin	6.58' NW
3. Spike & Washer in NE Face Power Pole	57.15' SE
4. Chiseled 'X' Top 1.5' x 1.5' Concrete Footing	89.88' NW
5. Centerline Top Telephone Pedestal	56.12' NE
6. Travel Way Gravel Roads N and E	0.0' N
7. Spike & Washer in Telco Marker Post	48.20' ENE

Utilities
Telephone: Nextech
Overhead Power: Prairie Land Electric Coop
Water: City of Portis Water Dept.

Curve Data
P.I. Sta. 207+07.22 (Bk.) =
P.I. Sta. 207+06.89 (Ahd.) =
9.61' Rt. ℄ Sta. 207+07.06
Δ= 02°58'02" Lt.
D = 00°12'
L = 1,483.63'
T = 741.98'
R = 28,647.90'
E = 9.61'
Super = NC

E 1/4 Cor. Sec. 6, T06S, R12W
N 750,550.009 E 5,492,885.927

1. Found 5/8" Rebar W/Alum Cap	(0.4' Deep)
2. 0.10' E of ℄ TAN Sta. 210+71.17, SE Angle = 87°17'22" ℄ TAN to ℄	
3. 0.99' N of ℄ TAN Sta. 210+70.19, NW Angle = 5°20'50" ℄ TAN to ℄	
4. BLM RM 57.3'	57.32' NW
5. BLM RM 58.6'	58.41' NE
6. Spike & KDOT Washer in Power Pole	56.60' NW
7. Chiseled 'X' Top Hub Guard RCB near NE Cor. RCB	39.74' NE
8. NE Cor. Foundation (601 Market)	59.98' WSW
9. Spike & Washer in Power Pole	49.64' SE

Center Sec. 5, T06S, R12W
N 750,589.398 E 5,495,429.735

1. Found L.S. 0.2" x 0.4" x 1.0" At Surface Set 5/8" Rebar W/Cap	
CLS-80 on South side as Witness	
2. Fence Line to North	0.0' W
3. Fence Line to West	0.0' N
4. Spike & Washer in Fence Post	5.34' N
5. Spike & Washer in Fence Post	22.76' W
6. Travel Way field road to West	14.5' S
7. Overhead power Line to South Extended	0.0' W

BM27 - Top 4"x4" Conc. R/W Marker
59.83' Rt. ℄ US-281 Sta. 200+29.09 Elev. 1533.05

BM28 - '□' cut SE Cor S. Headwall 3'x2' Conc. RCB
39.54' Rt. ℄ US-281 Sta. 210+57.95 Elev. 1535.10

KANSAS DEPARTMENT OF TRANSPORTATION
PLAN
STA. 200+00 TO STA. 210+40

KDOT Graphics Certified 07-10-2024

Sh. No. 19

BY	DATE
M. DELEON	6/2021
B. HORNER	7/2021
REFERENCES NOTED	
REFERENCES CHECKED	

Drawn By : MDELEON
File : c:\pwworking\central01\d2274982\ka602001rpl-07.dgn
Plotted : 07-11-24

KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	20	293

Balance Area 4

* 7,328 cu. yds. Common Excavation (VMF = 0.81)
634 cu. yds. Common Excavation (VMF = 1.00)(To Be Wasted) - See General Note
* 2,601 cu. yds. Embankment

From Balance Station 190+65.86 — +40.00

* Includes:
27 cu. yds. 192+63.00 Rt. House Ent. W=24'
34 cu. yds. 200+12.00 Lt. Field Ent. W=24'
24 cu. yds. 200+42.00 Rt. Field Ent. W=24'
46 cu. yds. 201+85.00 Rt. House Ent. W=24'
42 cu. yds. 205+98.00 Lt. House Ent. W=24'
46 cu. yds. 206+99.00 Lt. House Ent. W=24'
17 cu. yds. 209+37.00 Rt. House Ent. W=24'
3,483 cu. yds. to be hauled to Balance 3 Station 132+00 to Station 183+15.64

300' V.C.

STA. 210+71.28 ℄ US-281 = ℄ State Line Road

Crown Grade Proposed Improvement
0.68% Sp. Dt. Lt.
+ 0.30%
+ 0.80%
Existing Ground
0.50% Sp. Dt. Lt.
0.30% Sp. Dt. Lt.
1528.90 +00 Lt.
1530.00 +20 Lt.
1532.00 +80 Lt.
3.33% Sp. Dt. Lt.
1531.33 +60 Rt.
2.31% Sp. Dt. Rt.
1533.18 +40 Rt.
1533.78 +40 Lt.

Dt. Trans. to Match Exist.
10' x Sp. Dt. Lt.
Dt. Lt.
Dt. Trans.
+00
+50
4' x Sp. Dt. Lt.
Dt. Lt.
+00
+40
Dt. Rt.
10' x Std. Dt. Rt.
Dt. Trans.
4' x Std. Dt. Rt.
Dt. Rt.
+60
+40
Dt. Trans. to Match Exist.

+00.00 P.C. 1533.37
+50.00 P.I. El. = 1533.82
End Project
+00.00 P.T. 1535.02
End Construction
+40.00 P.I. 1535.34

1,620	1,610	1,600	1,590	1,580	1,570	1,560	1,550	1,540	1,530	1,520	1,510	1,500	1,490	1,480	1,470	1,460	1,450

1,531.27	1,531.57	1,531.87	1,532.17	1,532.47	1,532.77	1,533.07	1,533.37	1,533.75	1,534.30	1,535.02
200	1	2	3	4	205	6	7	8	9	210

KANSAS DEPARTMENT OF TRANSPORTATION

PROFILE

STA. 200+00 TO STA. 210+40

KDOT Graphics Certified 07-11-2024

Sh. No. 20

KDOT Graphics Certified

Drawn By : MDELEON Plotted : 07-11-24
File : c:\pwworking\central01\d2274982\ka6020001rpr-07.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	2I	293

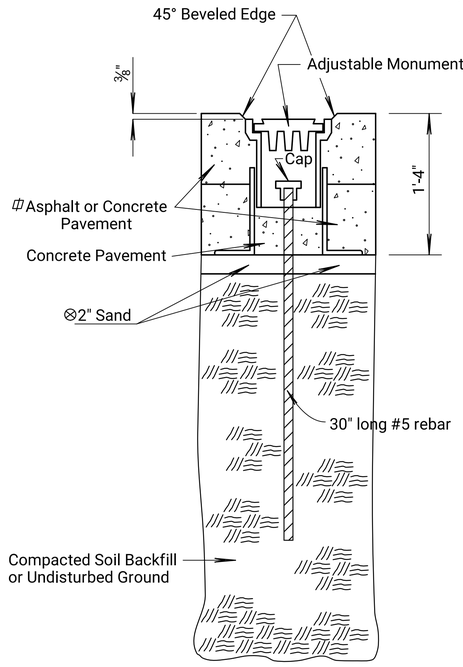
EXHIBIT

2" DIA. PRE-STAMPED ALUMINUM CAPS

KS DEPT OF TRANS / DISTRICT ONE	KS DEPT OF TRANS / DISTRICT TWO	KS DEPT OF TRANS / DISTRICT THREE
KDOT - DISTRICT 1	KDOT - DISTRICT 2	KDOT - DISTRICT 3
KS DEPT OF TRANS / DISTRICT FOUR	KS DEPT OF TRANS / DISTRICT FIVE	KS DEPT OF TRANS / DISTRICT SIX
KDOT - DISTRICT 4	KDOT - DISTRICT 5	KDOT - DISTRICT 6
K D O T	ABC SURVEY CO / CPS 999	JOHN DOE / PS 9999
KDOT STATE SURVEY CREW BUREAU OF RIGHT OF WAY	SURVEY COMPANY WITH A VALID CORPORATION LICENSE	INDEPENDENT SURVEYOR OR SOLE PROPRIETOR COMPANY

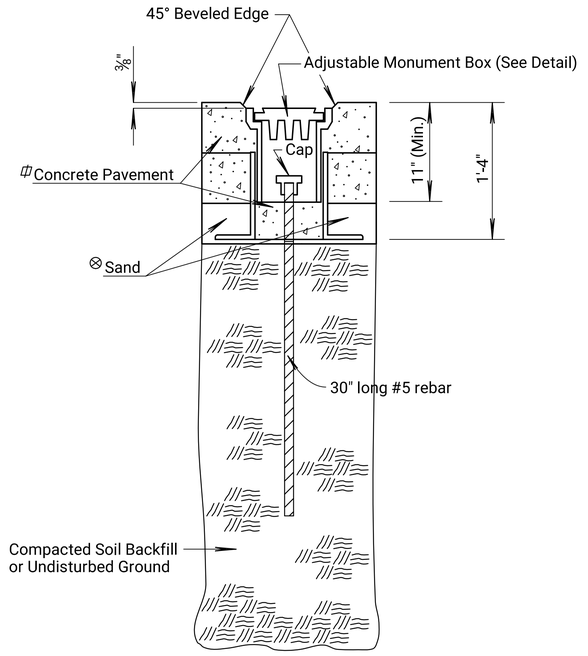
⊗ Hand tamp sand to achieve Type B compaction.

⏍ Built in two equal lifts



TYPE A-1

(Standard Land Corner Monument Box)



TYPE A-2

(Standard Land Corner Monument Box)

GENERAL NOTES

Use the proper identification cap for the party installing the monument, as shown on the exhibit.

Make all stampings, forgings, and impressions legible. The stampings, forgings, and impressions will properly identify the location of the monument within the Public Land Survey System (PLSS).

A "System of Marking" is available in the current "Manual of SURVEYING INSTRUCTION", which is published by the United States Department of the Interior, Bureau of Land Management.

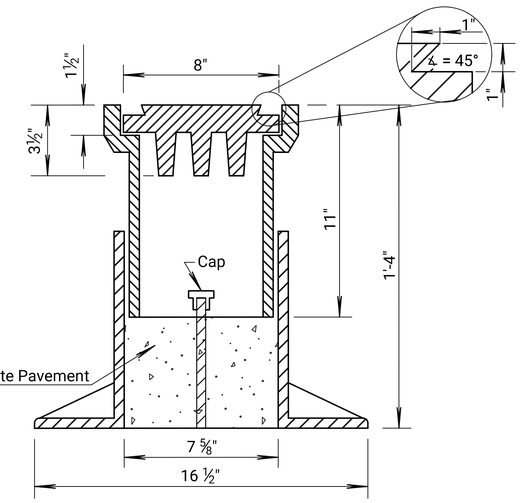
Reset all PLSS corners in accordance with KDOT's Standard Specifications.

In addition to monumentation of the PLSS corner, the Engineer may direct or select specific locations for offset monumentation, as shown.

Use Type A-1 or Type A-2 monuments as directed by the Surveyor or the Engineer.

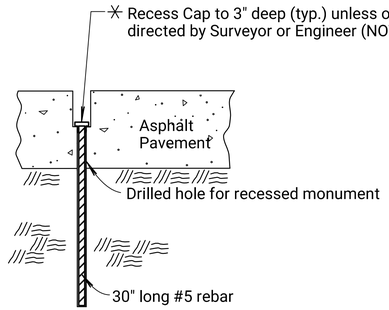
Type A monumentation may be used on a project as specified in the plans or as directed by the Engineer. Typically, Type A monuments are used on high traffic volume roadways, in urban areas, or as required by local governmental codes. Otherwise, use Types B-D monumentation. Avoid installing monument boxes in vehicle wheelpaths where practicable.

All work and materials required to install the Type A-1 and Type A-2 monument boxes will be paid under the bid item "Monument Box (Each)" and will be included in the plan quantities. All work and materials required to install Types B-D monumentation will be subsidiary to the bid item "Contractor Construction Staking (Lump Sum)". See KDOT's Standard Specifications for details.



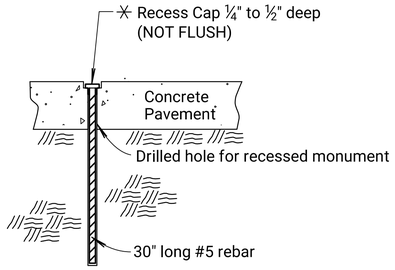
ADJUSTABLE MONUMENT BOX DETAIL

(Neenah R-1968 Type 36-B or approved equivalent)



Type B

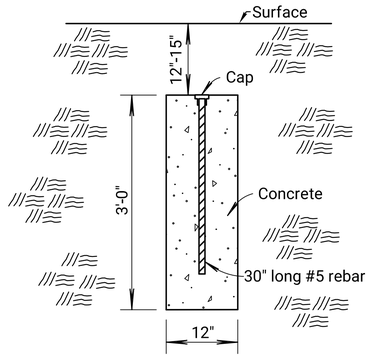
(Recessed Bar)



Type C

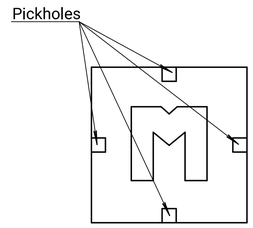
(Drilled Hole)

✳No Surface Monuments Allowed in Pavement



Type D

(Shoulder/Ditch Subsurface Monument)



MONUMENT BOX LID (PLAN VIEW)

Not to Scale

NO.	DATE	REVISIONS	BY	APP'D
04	08-24-18	Rev. Det. Mon. Box AND Rev. Gen. Note	A.L.R.	T.T.R.
03	01-15-16	Add. Det., Retrofit & Rev. Gen. Note	T.T.R.	S.W.K.
02	10-17-13	Revised Detail, Recessed Bar	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

SECTION CORNER MONUMENTATION DETAIL SHEET

RD990

FHWA APPROVAL	08-07-19	APP'D.	Scott W. King
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 05-18-2022

Sh. No. 2I

KDOT Graphics Certified

Drawn By : MDELEON
File : c:\pwworking\central01\d2274982\ka6020001rd990.dgn
Plotted : 07/11/2024

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	22	293

EXHIBIT

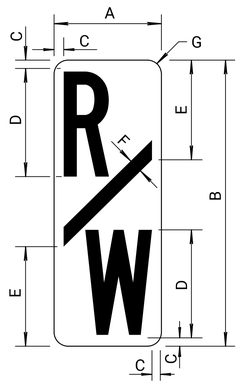
2" DIA. PRE-STAMPED ALUMINUM CAPS

KS DEPT OF TRANS KA-XXXX-XX R/W DISTRICT ONE	KS DEPT OF TRANS KA-XXXX-XX R/W DISTRICT TWO	KS DEPT OF TRANS KA-XXXX-XX R/W DISTRICT THREE
KDOT - DISTRICT 1	KDOT - DISTRICT 2	KDOT - DISTRICT 3
KS DEPT OF TRANS KA-XXXX-XX R/W DISTRICT FOUR	KS DEPT OF TRANS KA-XXXX-XX R/W DISTRICT FIVE	KS DEPT OF TRANS KA-XXXX-XX R/W DISTRICT SIX
KDOT - DISTRICT 4	KDOT - DISTRICT 5	KDOT - DISTRICT 6
K D O T KA-XXXX-XX R/W	ABC SURVEY CO KA-XXXX-XX R/W CLS 999	JOHN DOE KA-XXXX-XX R/W LS 9999
KDOT STATE SURVEY CREW BUREAU OF RIGHT-OF-WAY	SURVEY COMPANY WITH A VALID CORPORATION LICENSE	INDEPENDENT SURVEYOR OR SOLE PROPRIETOR COMPANY

NOTES:

KA-XXXX-XX is the KDOT Project number
All stampings, forgings, and impressions shall be in accordance with the standard specifications and as shown on this drawing.

KI-107

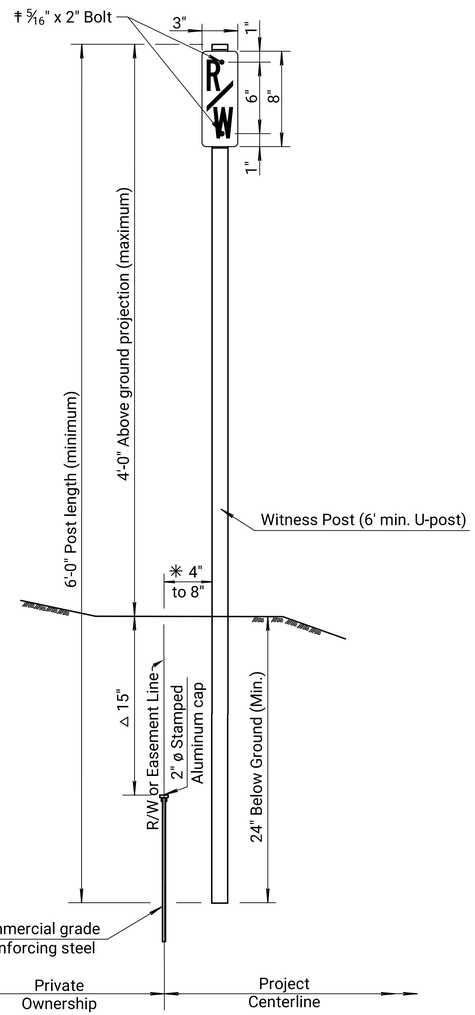


COLORS:

BACKGROUND - WHITE (REFLECTIVE)
LEGEND - BLACK (NON-REFLECTIVE)
LEGEND SERIES - 'B'

A	B	C	D	E	F	G
3"	8"	1/4"	3"	2 3/4"	3/8"	3/8"

R/W SIGN DETAIL



PLAN VIEW

NOTES

✳ 4" (Min.) to 8" (Max.) from rebar to witness post. (USE CAUTION, DO NOT DISTURB THE REBAR WHEN SETTING A POST). The witness post shall be set radial or perpendicular to the project centerline from the rebar. The "open face" of the U-post shall face the project centerline with the sign attached to the "open face". This exhibit is a side view, except for the sign, which is shown as turned for the purpose of illustrating content only. (See Sign Detail).

‡ Drill or punch holes. Attach 2 flat washers, 1 lock washer, and 1 nut per bolt.

△ Or as directed by the Engineer.

GENERAL NOTE

The post shall be U-shaped (6' minimum length) and factory painted the color of persian red (KDOT Orange) by an electronically powder-coated oven-baked process.

All installations shall have proper identification cap for the party installing it (See Exhibit). Monument(s) shall be set in accordance with the standard specifications and as shown on this drawing.

Removal and disposal of existing concrete R/W markers shall not be paid for directly but shall be Subsidiary to other items of the contract.

In an urban area, the witness post may be omitted as directed by the Engineer.

The R/W survey monuments shall be paid for under the bid item "Right-of-Way Survey Monuments (Each)" and be included in the plan quantities. ✡The table shown on this sheet is intended for additional monuments set in the field and will be filled out by the contracted survey company.

Mount R/W survey monument signs facing the road.

✡ Additional R/W Survey Monuments set by Contractor			
Station	Offset (Lt./Rt.)	Northing	Easting

✡ Additional R/W Survey Monuments set by Contractor			
Station	Offset (Lt./Rt.)	Northing	Easting

NO.	DATE	REVISIONS	BY	APP'D
04	01-06-16	Revised Notes	T.T.R.	S.W.K.
03	05-24-13	Revised General Note	S.W.K.	J.O.B.
02	02-07-07	Removed dual cap note	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

R/W SURVEY MONUMENT INSTALLATION DETAIL SHEET

RD995

FHWA APPROVAL		03-16-16	APP'D.	Scott W. King
DESIGNED	DETAILED		QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.		QUAN.CK.	TRACE CK.

KDOT Graphics Certified 07-27-2022

Sh. No. 22

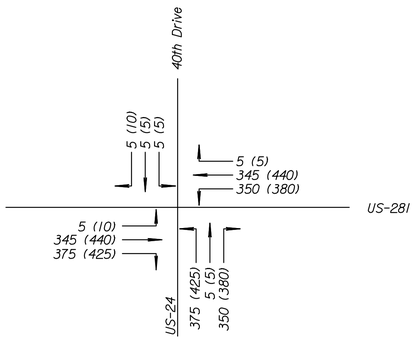
KDOT Graphics Certified

Drawn By : MDELEON Plotted : 07/11/2024
File : c:\pwworking\central01\d2274982\ka602001rd995.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	23	293

SCALE

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



TRAFFIC FLOW DIAGRAM

2024 ADT (2044 ADT)

Legend

Paved Surfacing

KANSAS DEPARTMENT OF TRANSPORTATION

INTERSECTION DETAIL

US-281 AND US-24

KDOT Graphics Certified 07-11-2024

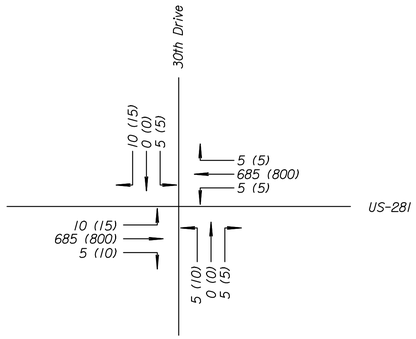
Sh. No. 23

KDOT Graphics Certified

Drawn By : MDELEON Plotted : 07-11-24

File : c:\pwworking\central01\d2274982\ka6020001rid-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	24	293

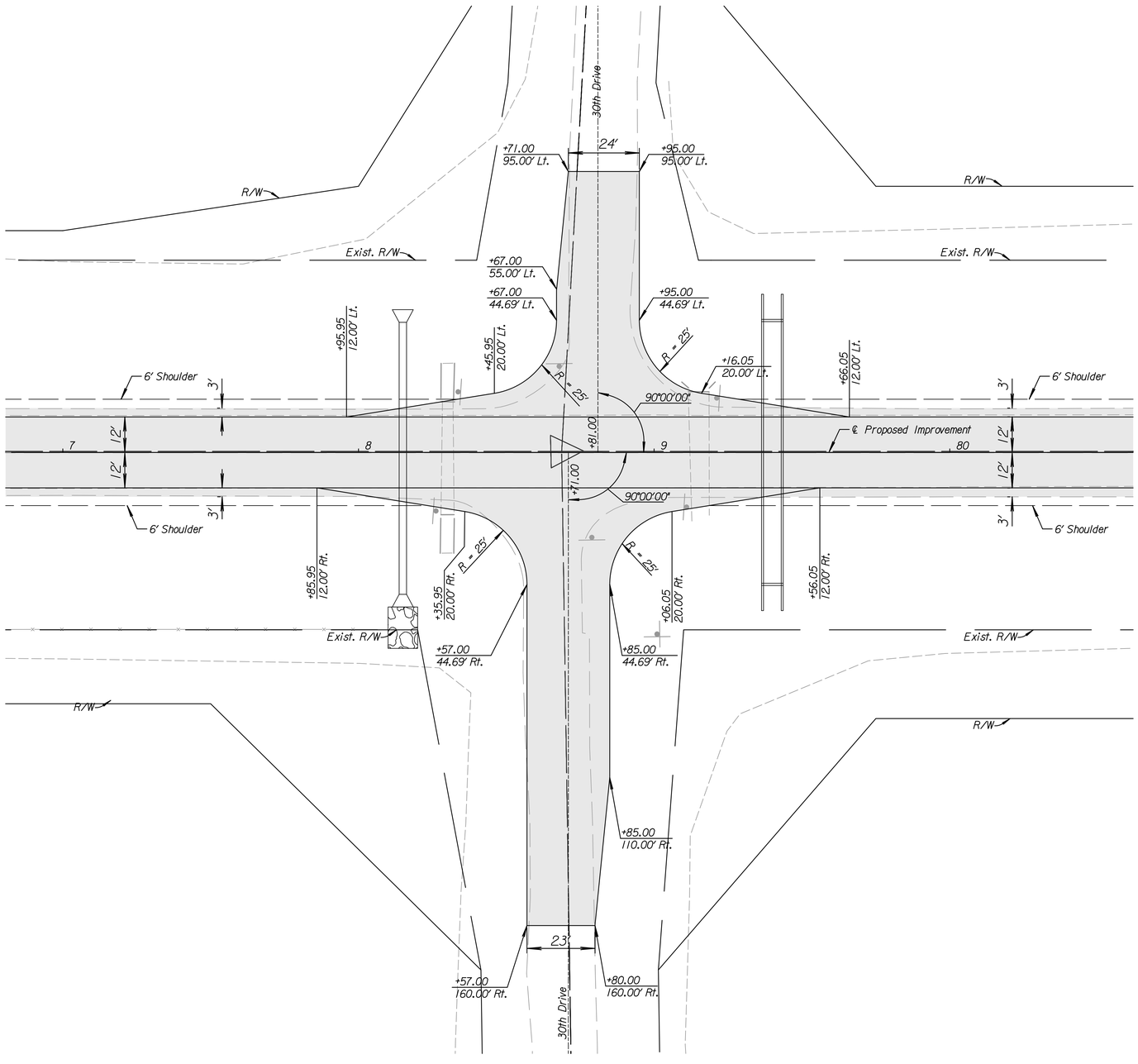


TRAFFIC FLOW DIAGRAM

2024 ADT (2044 ADT)

SCALE

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



Legend

Paved Surfacing

KANSAS DEPARTMENT OF TRANSPORTATION

INTERSECTION DETAIL

US-281 AND 30TH DRIVE

Drawn By : MDELEON Plotted : 07-11-24

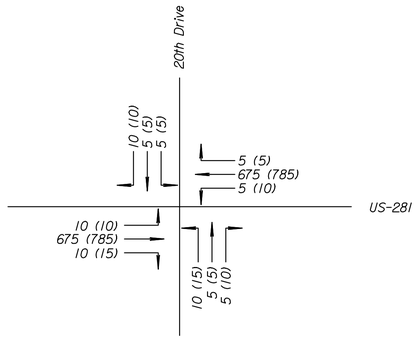
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KDOT Graphics Certified 06-07-2024

KDOT Graphics Certified

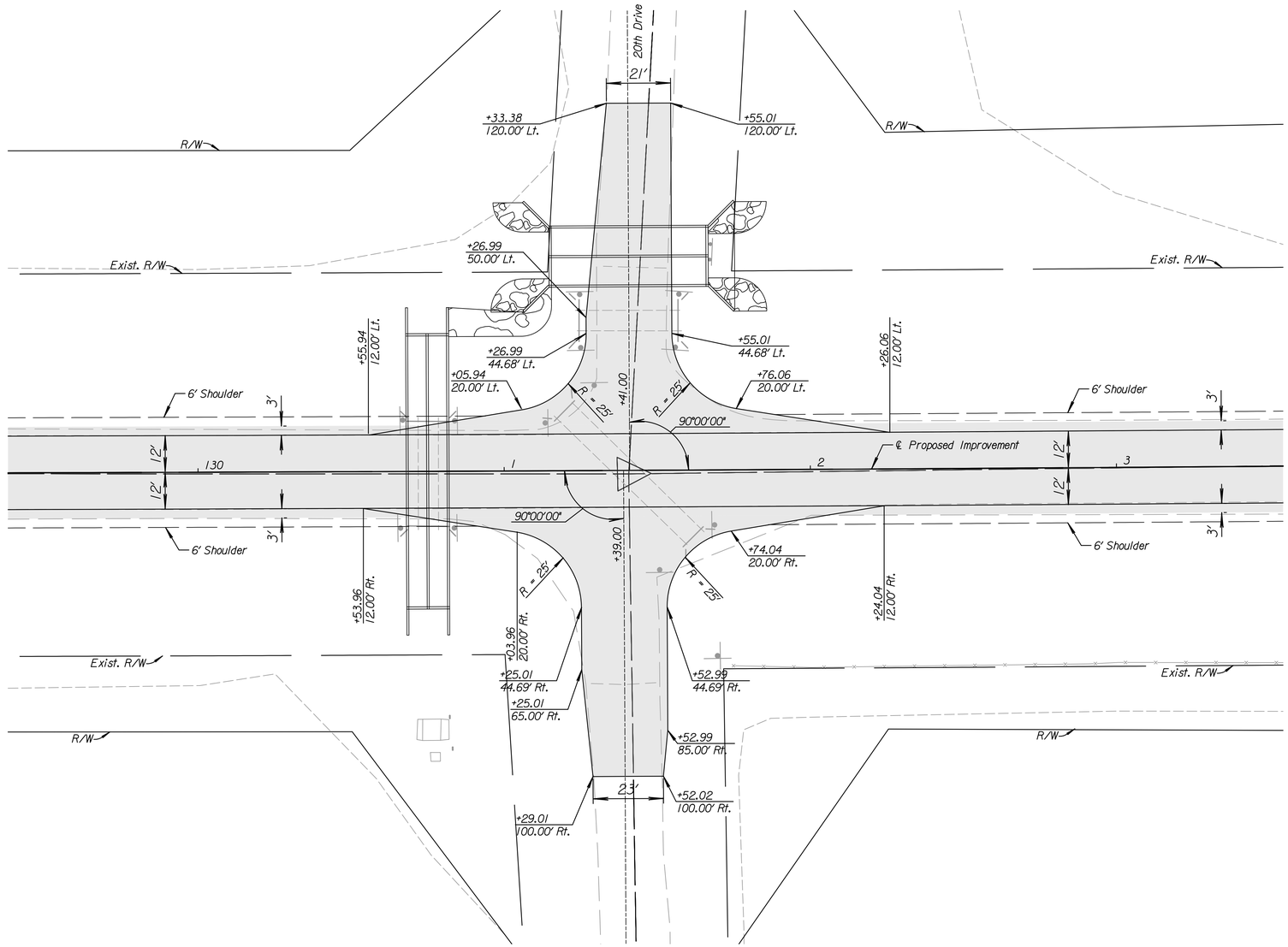
Sh. No. 24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	25	293



TRAFFIC FLOW DIAGRAM
2024 ADT (2044 ADT)

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



Legend
Paved Surfacing

KANSAS DEPARTMENT OF TRANSPORTATION
INTERSECTION DETAIL
US-281 AND 20TH DRIVE

KDOT Graphics Certified 06-04-2024

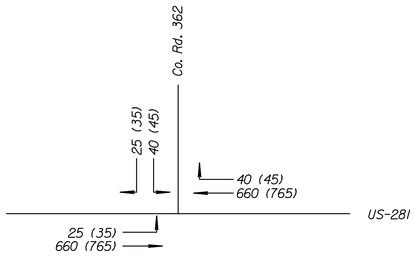
Sh. No. 25

KDOT Graphics Certified

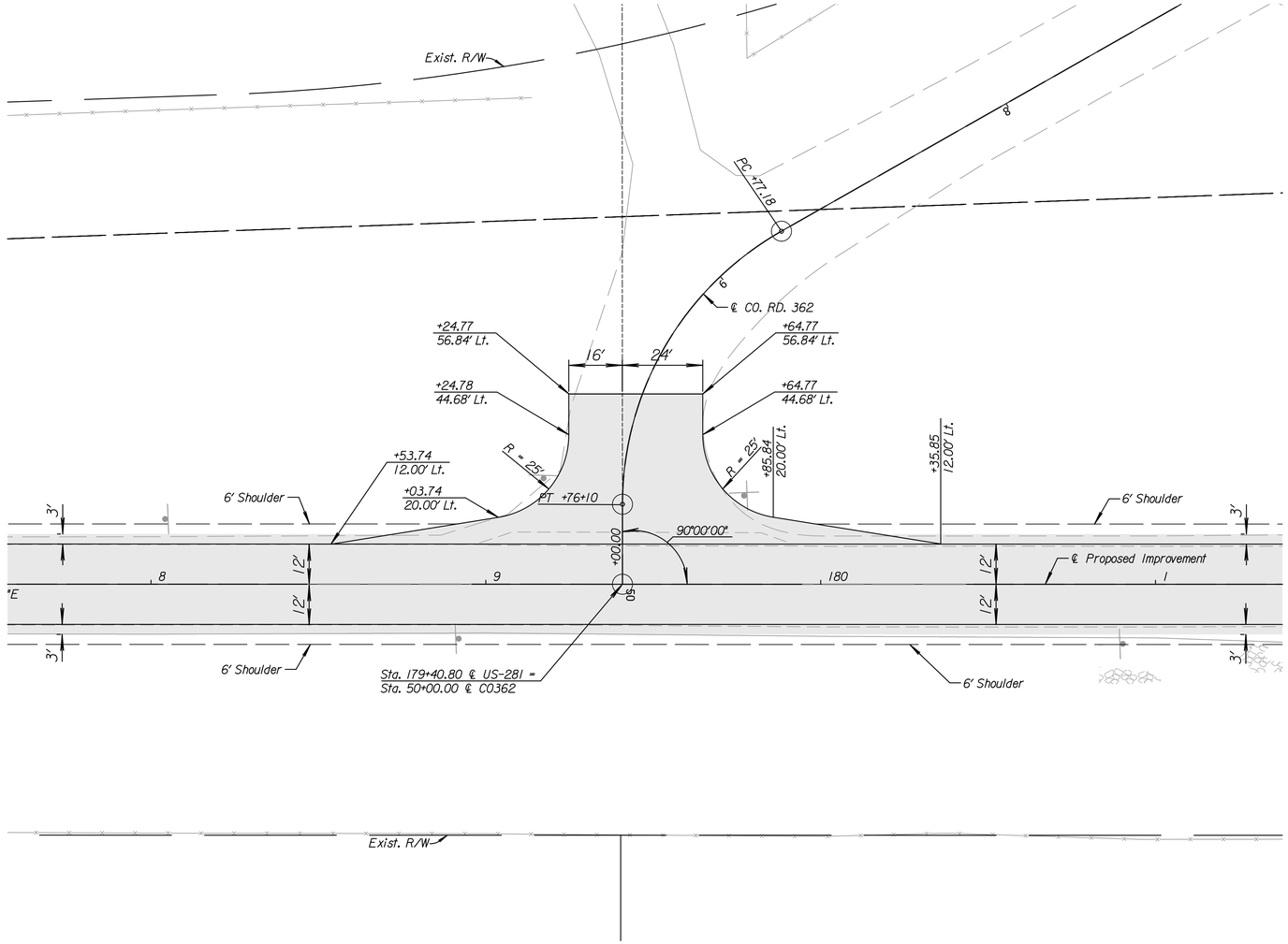
Drawn By : MDELEON Plotted : 07-11-24
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STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	26	293

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



TRAFFIC FLOW DIAGRAM
2024 ADT (2044 ADT)



Legend
Paved Surfacing

KANSAS DEPARTMENT OF TRANSPORTATION
INTERSECTION DETAIL
US-281 AND CO. RD. 362

KDOT Graphics Certified 02-04-2022
Sh. No. 26

KDOT Graphics Certified

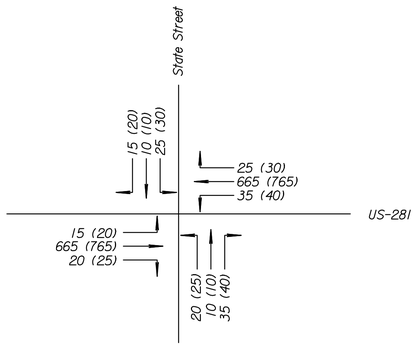
Drawn By : MDELEON
Plotted : 07-11-24
File : c:\pwworking\central01\d2274982\ka6020001rid-04.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	27	293

SCALE

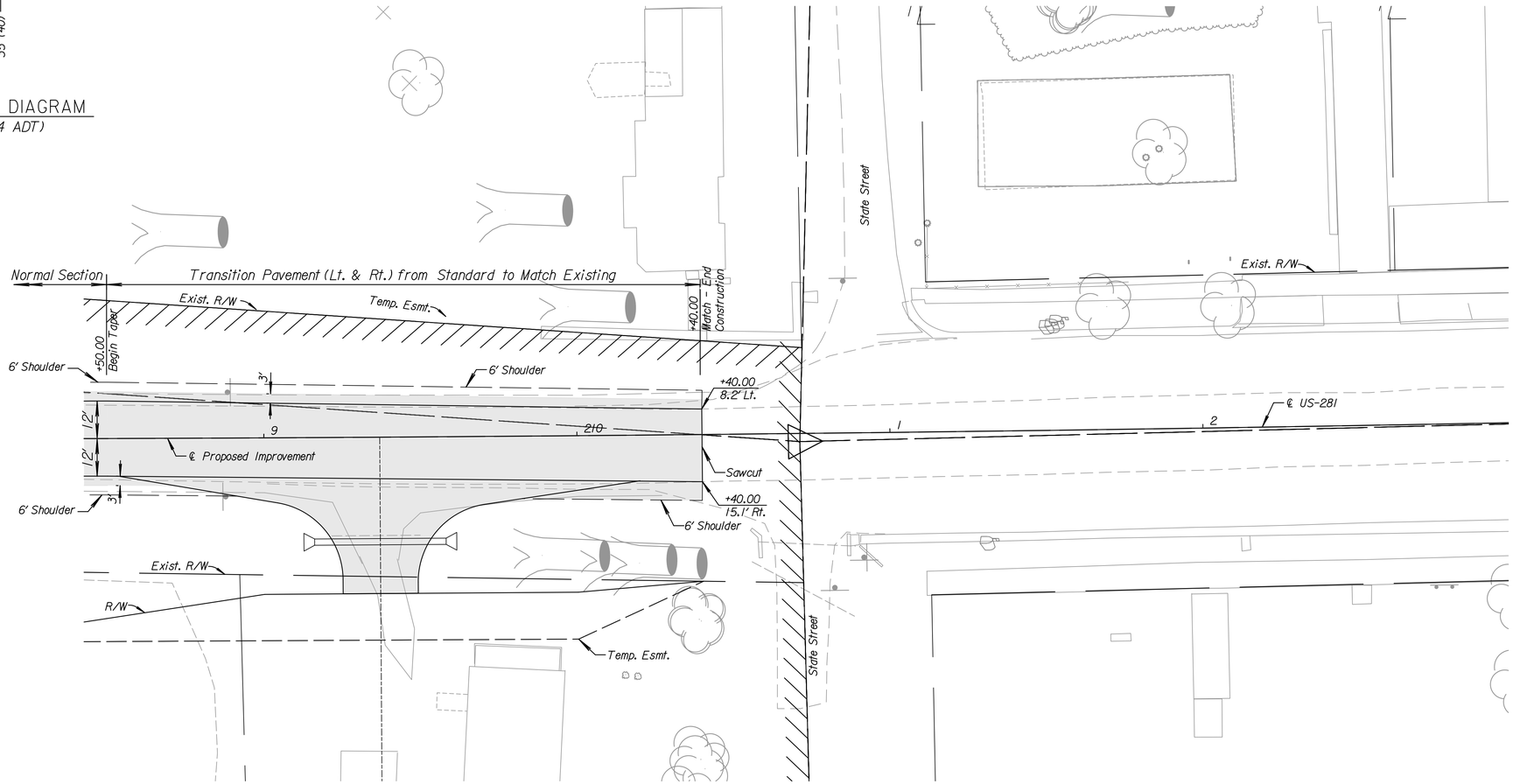
20' 0 20' 40'

PLAN: Lat. & Long.



TRAFFIC FLOW DIAGRAM

2024 ADT (2044 ADT)



Legend

Paved Surfacing

KANSAS DEPARTMENT OF TRANSPORTATION

INTERSECTION DETAIL

US-281 AND STATE STREET

KDOT Graphics Certified 02-04-2022

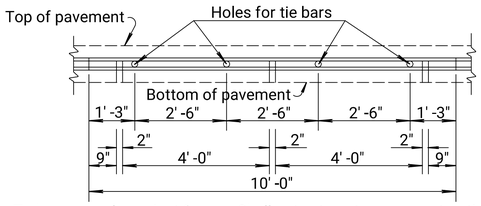
Sh. No. 27

KDOT Graphics Certified

Drawn By : MDELEON Plotted : 07-11-24

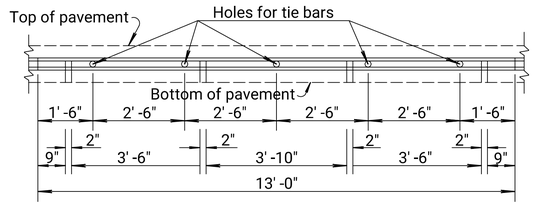
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STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	28	293



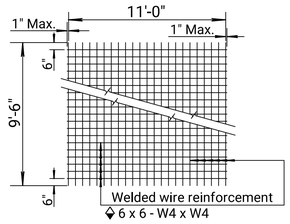
To be used only against forms. Shall not extend through contraction joints.

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



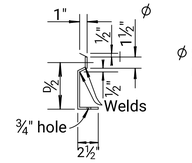
To be used only against forms. Shall not extend through contraction joints.

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



TYPICAL SHEET OF WELDED WIRE REINFORCEMENT
FOR SPECIAL BRIDGE APPROACH PAVEMENT

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



SECTION OF RECESSED
FORM LEG

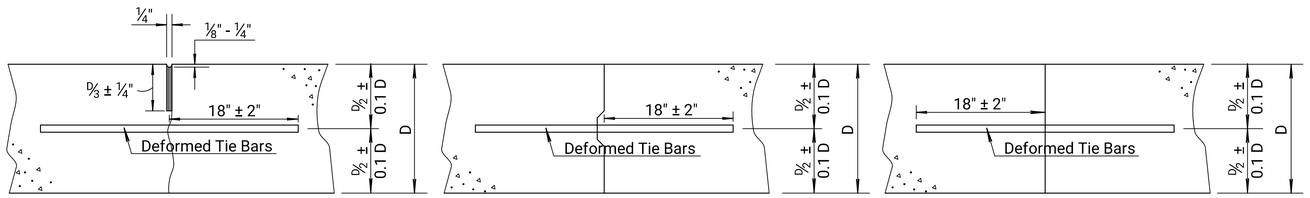
ϕ Snap-in leg or other approved designs may be used in lieu of welded leg.



DETAIL OF LAP FOR WELDED WIRE REINFORCEMENT

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

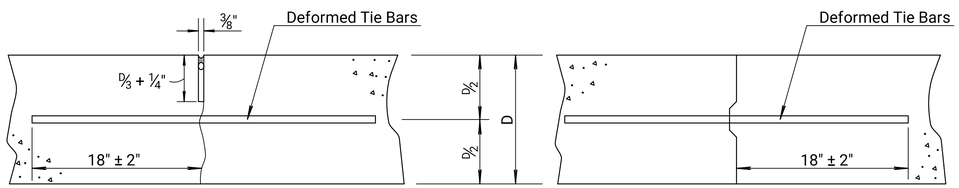
The sheet shall be wired securely at the edges and at intervals not to exceed 2'-6" for the full width of the sheet. Approximate weight of welded wire reinforcement = 58 lbs. per 100 sq. ft. Other methods for fastening the sheets of welded wire reinforcement at the laps may be used with the approval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



Tied Non-Keyed | Tied Keyed Construction | Tied Butt Construction

LONGITUDINAL JOINTS

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



Monolithic Pour | Construction Joint

TRANSVERSE JOINTS

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

GENERAL NOTES

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

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

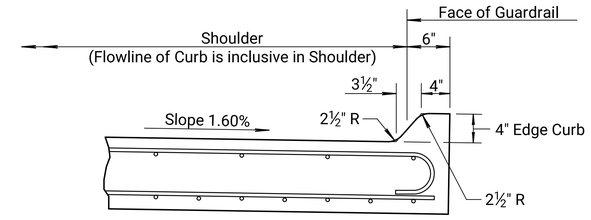
At each planned transverse joint location, a 4 to 6 inch wide strip of the pavement surface shall be protected from the texturing operation to provide a transverse textureless surface centered over the joint sawcut.

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

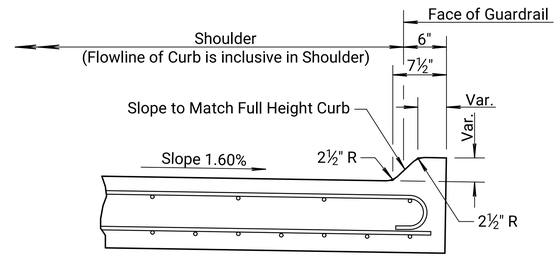
The 4 inch edge curb shall be constructed integral with the approach slab shoulder.

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

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

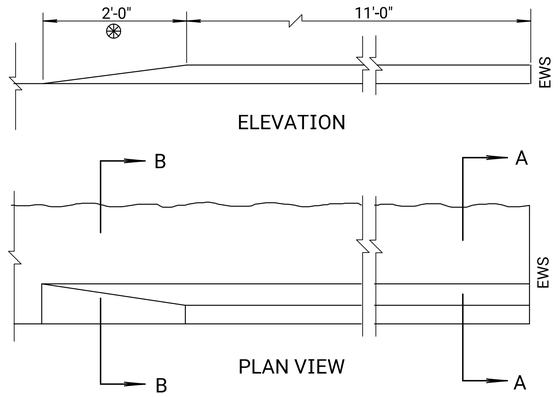


SECTION A-A



SECTION B-B

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



4" EDGE CURB DETAIL

NO.	DATE	REVISIONS	BY	APP'D
13	05-17-13	Revised Note, Longitudinal Joints	S.W.K.	J.O.B.
12	05-14-09	Pres. Relief Jt. to RD712/tie bar lab.	S.W.K.	J.O.B.
11	10-23-08	Revised Sec. A-A and Sec. B-B	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

MISCELLANEOUS DETAILS
FOR CONCRETE
BRIDGE APPROACH PAVEMENT

RD711

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

KDOT Graphics Certified 07-18-2022

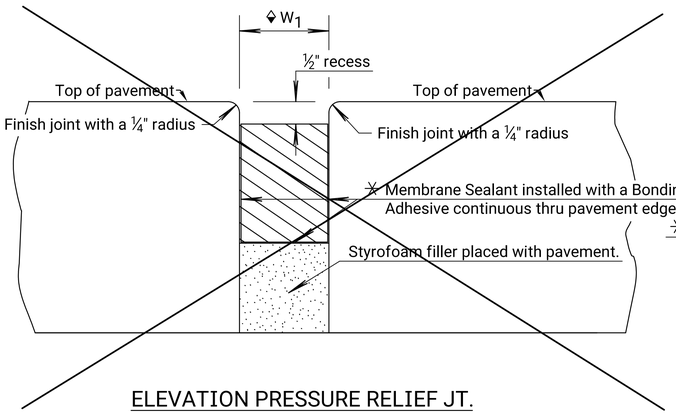
Sh. No. 28

KDOT Graphics Certified

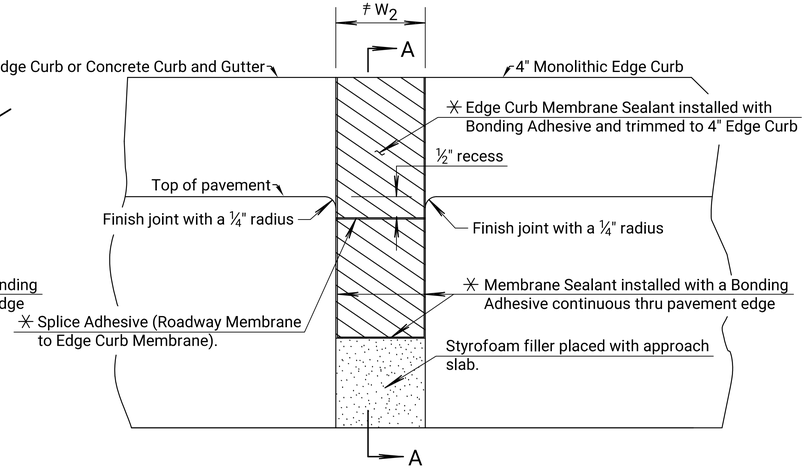
Drawn By : MDELEON
File : c:\pwworking\central01\d2274982\ka6020001rd711.dgn
Plotted :07/11/2024

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-071 KA-6020-01	2024	29	293

Note to Designer: For Membrane Sealant Expansion Joint on Non-skewed Bridges the maximum length of expansion is: 380' for Steel Bridges, 410' for Concrete Bridges.



ELEVATION PRESSURE RELIEF JT.



ELEVATION EXPANSION JT.

GENERAL NOTES

EXPANSION/PRESSURE RELIEF JOINTS

See Concrete Bridge Approach Pavement standard drawings for location of expansion and pressure relief joints.

Form the joint opening prior to placement of the pavement approach. Remove the material used to form the joint after the pavement approach has been in place for a minimum of 6 days.

Clean and construct the joint only after the concrete in the approach slab has cured for a minimum of 7 days.

Thoroughly clean the joint by sandblasting and by high pressure air blast to remove all laitance and contaminants from the joint. When any joint is shaped by saw cutting in lieu of forming, blast the joint with water prior to sandblasting and air cleaning.

Accomplish sandblasting in two passes to clean each face of the joint (one pass for each face). Hold the nozzle 1 to 2 inches from the joint face at an angle to the joint face.

Remove any contaminants such as oil, curing compound, etc. by sandblasting to the satisfaction of the Engineer. Solvents, wire brushing, or grinding are not permitted.

Air blast the joint just prior to installing the Membrane Sealant. Equip the air compressor used to clean the joint with trap devices capable of providing moisture-free and oil-free air at a recommended pressure of 90 psi. Spot check the joint to verify any residual dust or dirt has been removed. The Engineer is required to inspect the joint immediately prior to installing the joint material.

⚹ See KDOT Standard Specifications for Membrane Sealant, Bonding Adhesive and Splice Adhesive. The width of the membrane sealant is 4 inches (nominal).

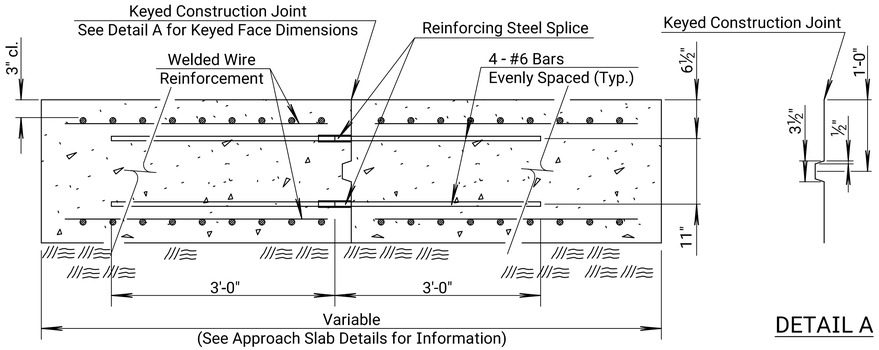
Do not allow traffic on the joint for a minimum of 3 hours unless otherwise directed by the Engineer.

Use splice materials and methods recommended by the Manufacturer.

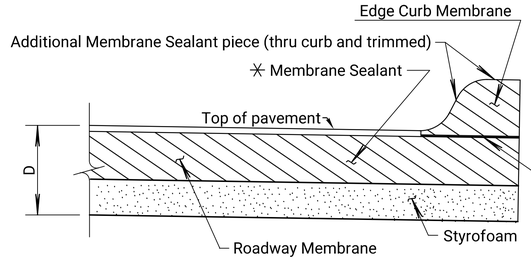
All work and materials for the preparation, construction, and installation of the joint will be subsidiary to the concrete approach pavement.

BRIDGE APPROACH SLAB FOOTING

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



DETAIL A



SECTION A-A

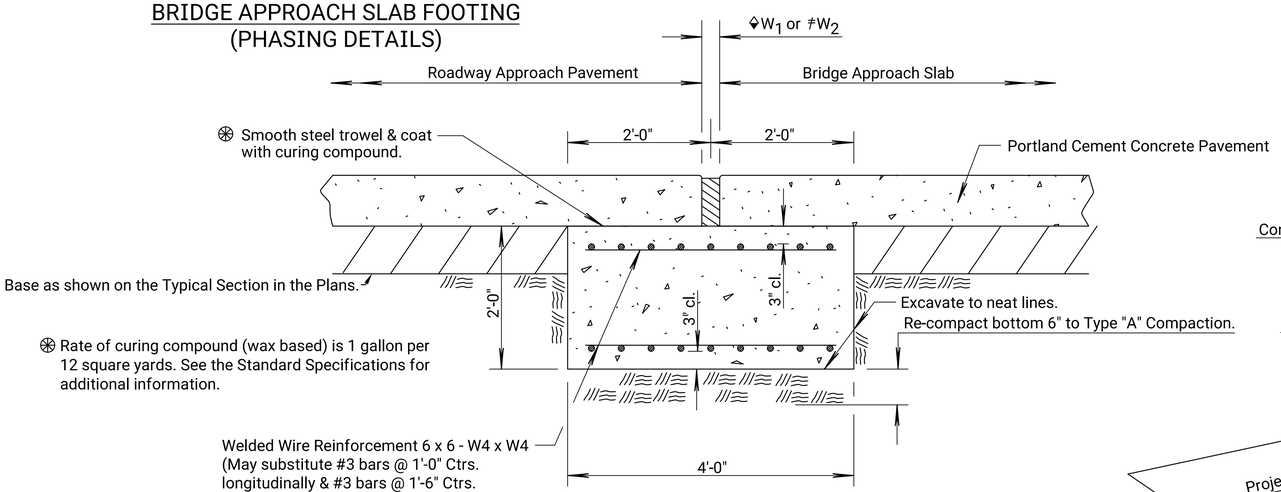
(See Std. Drawing RD711 for details of 4" Edge Curb.)

◆ PRESSURE RELIEF JOINT WIDTH DETAILS (W_1)							
℉ Temperature (F°)	40°	50°	60°	70°	80°	90°	100°
Formed Concrete Opening Size	4.0"	3¾"	3½"	3¼"	3.0"	2¾"	2½"

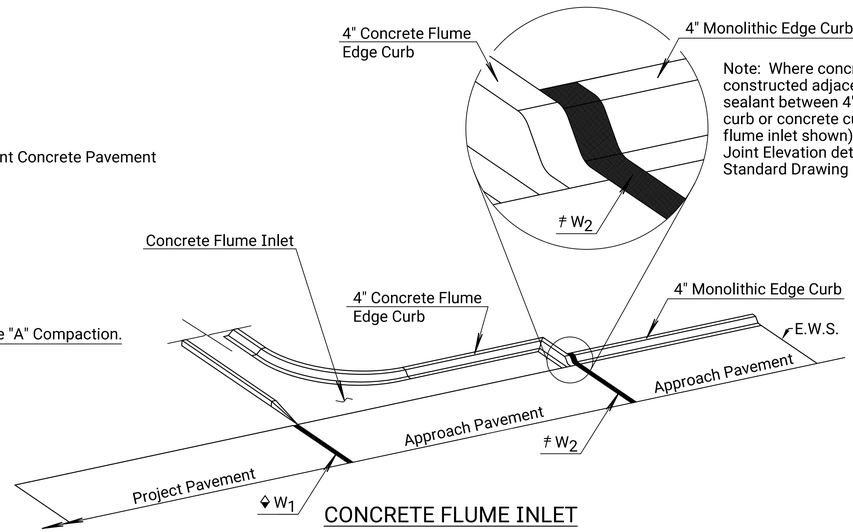
℉ Average Ambient Temperature over previous 24 hours.

≠ EXPANSION JOINT WIDTH DETAILS (W_2)
See bridge construction layout sheet for details.

BRIDGE APPROACH SLAB FOOTING
(PHASING DETAILS)



BRIDGE APPROACH SLAB FOOTING



CONCRETE FLUME INLET

(Membrane Sealant Placed Through Edge Curb Detail)

Note: Where concrete flume inlets or concrete curb and gutter are constructed adjacent to bridge approach slab pavement place membrane sealant between 4" monolithic edge curb and 4" concrete flume inlet edge curb or concrete curb and gutter as shown on this sheet (concrete flume inlet shown). See approach slab Standard Drawings, Expansion Joint Elevation detail this sheet, Standard Drawing RD628, and Standard Drawing RD635 for additional details.

LEGEND

■ Membrane Sealant

NO.	DATE	REVISIONS	BY	APP'D
10	01-22-16	Add. Det., Keyed Joint & Flume Inlet	T.T.R.	S.W.K.
09	10-16-13	Revised General Note	S.W.K.	J.O.B.
08	04-04-13	Rev. Joint Width Det. Table	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

BRIDGE APPROACH SLAB DETAILS EXPANSION/PRESSURE RELIEF JOINT/ BRIDGE APPROACH SLAB FOOTING

RD712

FHWA APPROVAL		02-01-16	APP'D.	Scott W. King
DESIGNED	DETAILED		QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.		QUAN.CK.	TRACE CK.

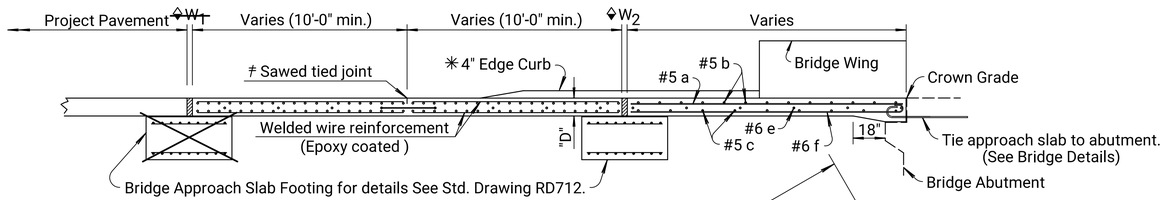
KDOT Graphics Certified 07-18-2022

Sh. No. 29

KDOT Graphics Certified

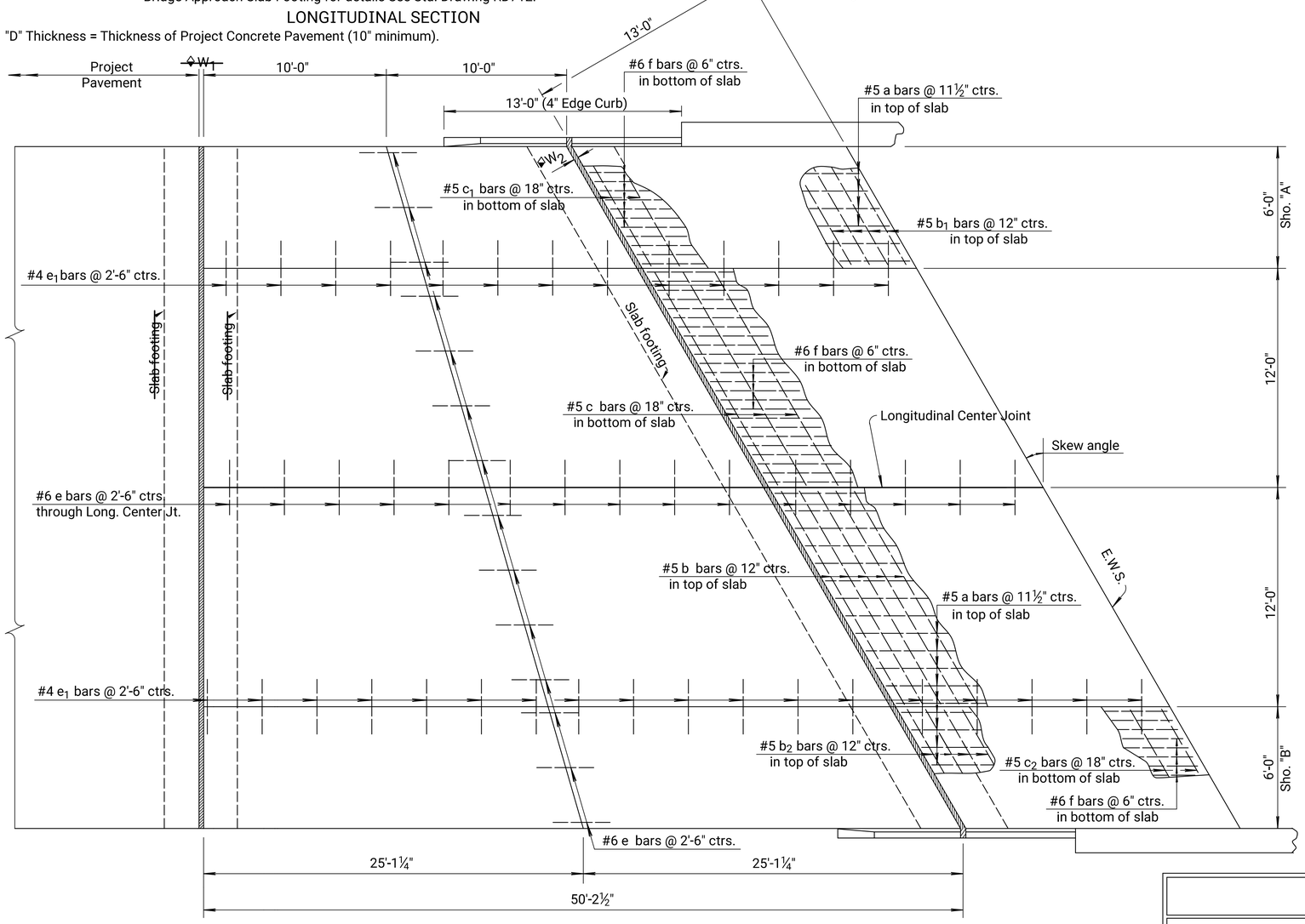
Drawn By : MDELEON Plotted :07/11/2024
File : c:\pwworking\central01\d2274982\ka6020001rd712.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	30	293



LONGITUDINAL SECTION

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



PLAN VIEW

(No Scale)

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

Note: Quantities listed for one approach slab only. Two required per bridge.
Reinforcing steel and joint lengths shown for information only.

⊗ Measured along the Expansion/Pressure Relief Joint.

✳ For details of 4" Edge Curb, See Std. Drawing RD711.

W1 and W2 for Expansion/Pressure Relief Joint width and details. See Standard Drawing RD712.

≠ Contractor has the option of substituting a Tied Keyed Construction Joint.

GENERAL NOTE

Special Concrete Bridge Approach shall be paid for as Sq. Yds. of Concrete Pavement (10.5" Unif.)(AE)(Br. App.) and includes all work and materials required to construct the approach slab as shown on this sheet.

All work and materials required for installation of expansion joints and pressure relief joints shall be subsidiary to this bid item.

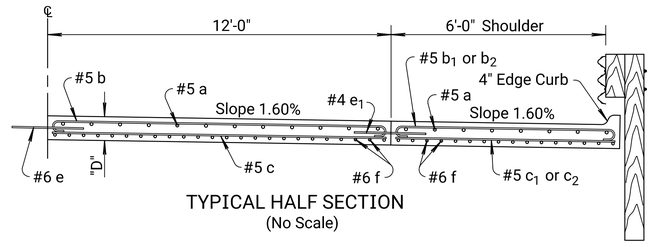
At the Contractor's option #4x3'-0" tie bars @ 15" centers may be substituted for the #6 e bars at 2'-6" centers.

All reinforcing steel shall be epoxy coated.

See Standard Drawing RD711 for details of joints, welded wire reinforcement, and edge curb.

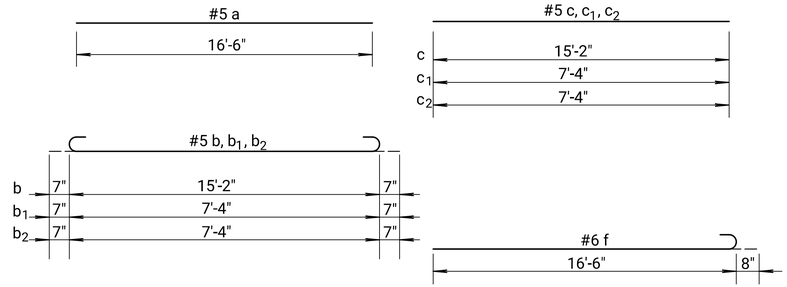
Standard reinforcing bar hooks in accordance with the latest ACI specifications shall be used throughout.

The pressure relief joint shall be omitted when the concrete bridge approach pavement abuts asphalt pavement.



TYPICAL HALF SECTION

(No Scale)



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

BENDING DIAGRAMS

40 ° Skew
BILL OF MATERIALS

Bar Schedule

Bar	a	b	b_1	b_2	c	c_1	c_2	e	e_1	f	
No.	38	34	17	17	24	12	12	36	40	72	
Size	#5	#5	#5	#5	#5	#5	#5	#6	#4	#6	
Length	16'-6"	16'-4"	8'-6"	8'-6"	15'-2"	7'-4"	7'-4"	3'-0"	3'-0"	17'-2"	

Reinforcing Steel (Grade 60) (Epoxy Coated)	4,200 lbs.
Concrete Pavement (10.5" Unif.)(AE)(Br. App.)	209.7 Sq. Yds.
Expansion Joint Membrane Sealant ⊗	48.0 Lin. Ft.
~~Pressure Relief Joint Membrane Sealant~~	~~Lin. Ft.~~

NO.	DATE	REVISIONS	BY	APP'D
12	04-04-13	Rev. Exp./Pr. Relief Joint Dim.	S.W.K.	J.O.B.
11	09-09-09	Revised Reinforcing Steel listing	S.W.K.	J.O.B.
10	05-14-09	Revised pressure relief jt. material	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

CONCRETE BRIDGE APPROACH PAVEMENT SKEWED APPROACH U-TYPE ABUTMENT

~~RD714A~~ 40 ° Skew

FHWA APPROVAL	05-21-13	APP'D.	James O. Brewer
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 07-15-2024

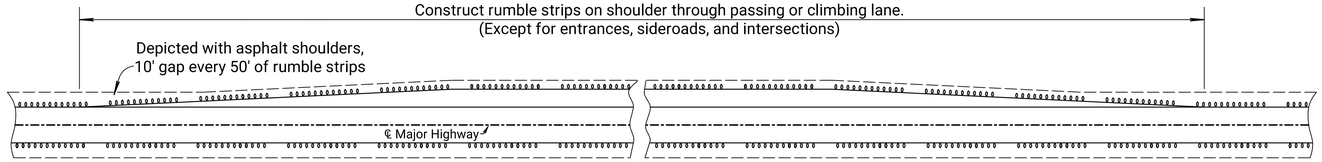
Sh. No. 30

KDOT Graphics Certified

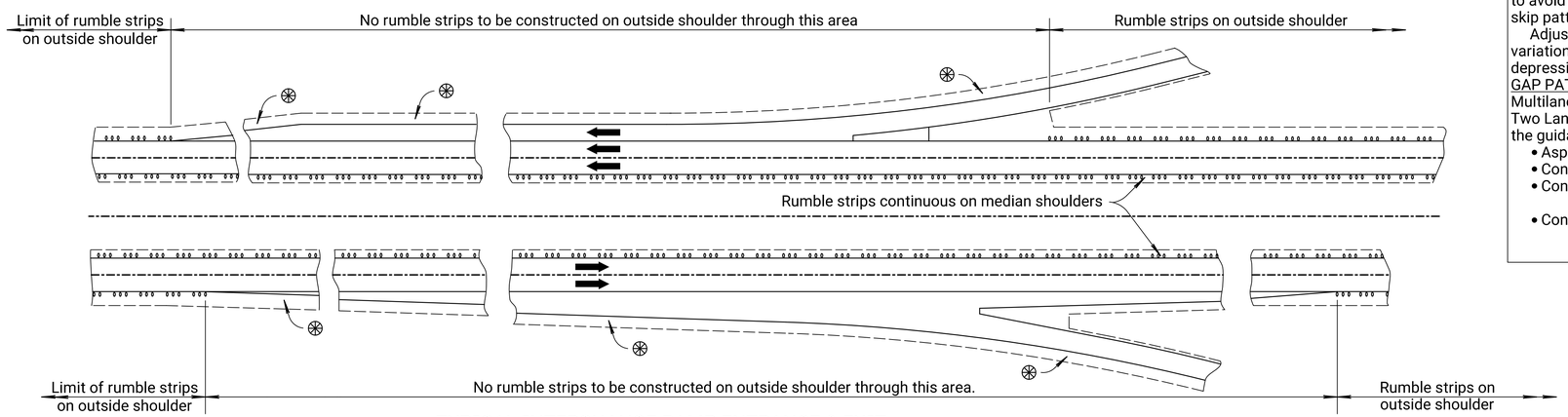
Drawn By : JHOVERSO Plotted : 07/15/24
File : c:\pwworking\central01\d2274982\ka6020001rd714a.dgn

Note to Designer: Construct rumble strips on high speed and/or high traffic volume ramps on directional type interchanges.
Include this KDOT Standard Drawing when rumble strips are part of the project.

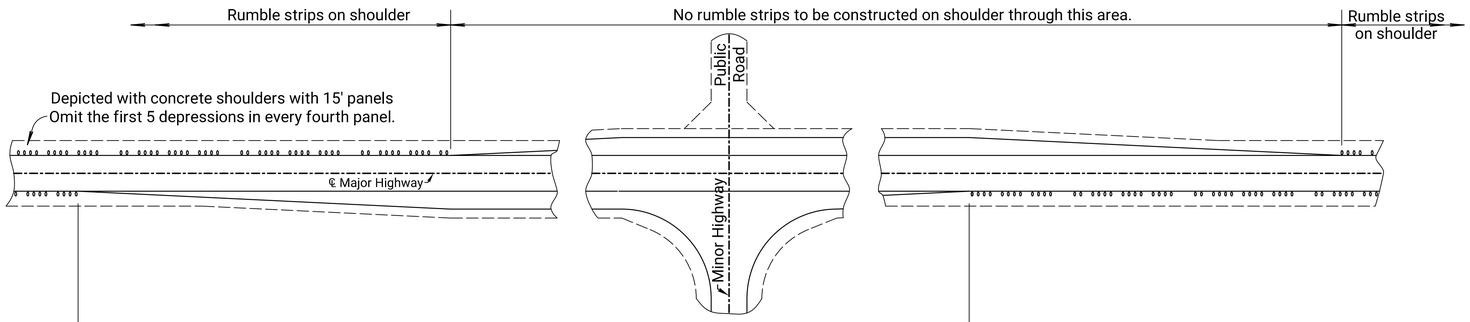
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-01	2024	31	293



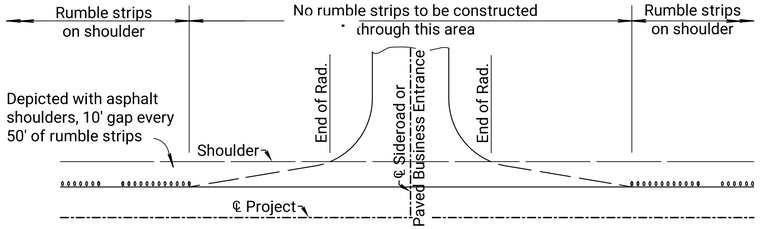
TYPICAL PASSING OR CLIMBING LANES



TYPICAL INTERCHANGE RAMP ENTRANCE & EXIT

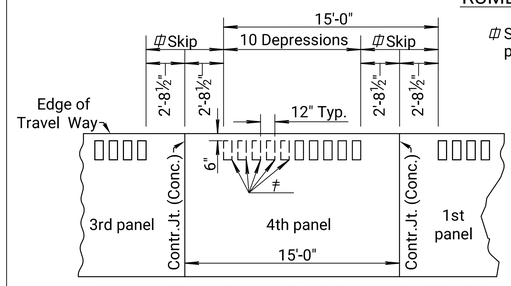


TYPICAL INTERSECTION



MINOR SIDEROAD OR ENTRANCE

RUMBLE STRIP LAYOUTS

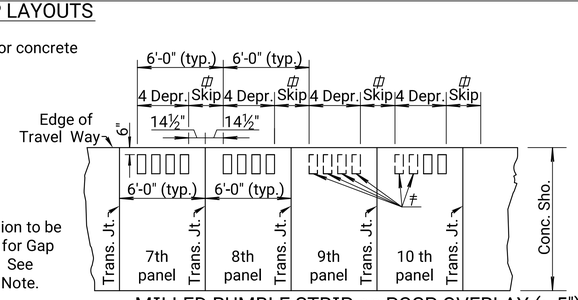


PLAN VIEW-SPACING OF RUMBLE STRIPS

≠See General Note for gap information for bicyclists accomodations.

Skip pattern for concrete pavement.

Depression to be omitted for Gap Pattern. See General Note.



MILLED RUMBLE STRIP on PCCP OVERLAY (≥ 5")

≠See General Note for gap information for bicyclists accomodations.

GENERAL NOTES:

All work and materials required for construction of rumble strips in asphalt or concrete pavement are paid under the bid item "Rumble Strips (Milled)".

See typical sections for other surfacing and shoulder details.

Do not omit rumble strip installations through field entrances, house entrances, or low volume, unpaved business entrances.

Do not construct rumble strips on bridges or concrete bridge approaches.

⊛ Construct rumble strips on directional ramps and tapers.

Either rumble strip shape is acceptable with no mixing of shapes on a project unless approved by the engineer.

SKIP PATTERN:

Rumble strips on asphalt will not have a skip pattern. Rumble strips on concrete shoulders will have a skip pattern to avoid joints. See Rumble Strip Layouts. For asphalt overlays, where the joints will be sawed and sealed, utilize a skip pattern approved by the Engineer.

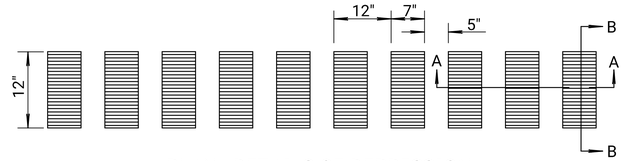
Adjust the number of depressions when concrete pavement contraction joint spacing is less than 15'-0". No variation in spacing between depressions is permitted. Clearance is 2'-0" (min.) to 3'-0" (max.) between the edge of depression and contraction joint. Center each group of depressions between contraction joints.

GAP PATTERN: (Gaps are added to provide break points in the rumbles for bicycles)

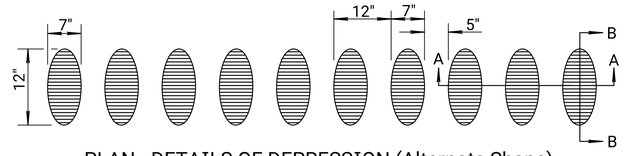
Multilane Divided Higways: Rumble strips will not have a gap pattern.

Two Lane Highways: Rumble strips will have a gap pattern for roadways with 3' or wider paved shoulder. Following the guidance below.

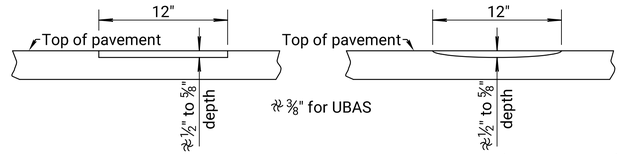
- Asphalt Shoulder: 10' gap provided every 50' of rumble strips
- Concrete Shoulder with 15' Joint Spacing: Omit the first 5 depressions in every fourth panel
- Concrete Shoulder with 6' Joint Spacing: Omit all the depressions in the 9th panel and the first 2 depressions in the 10th panel.
- Concrete Shoulder with other joint spacings or asphalt overlays: A gap pattern providing gaps of 10' to 12' every 40' to 60' of rumble strips should be developed and approved by the Engineer.



PLAN - DETAILS OF DEPRESSION

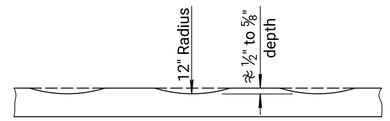


PLAN - DETAILS OF DEPRESSION (Alternate Shape)



SECTION B-B

SECTION B-B (ALT. SHAPE)



SECTION A-A
(Typical for both shapes)

NO.	DATE	REVISIONS	BY	APP'D
08	03-17-21	Gap patterns to accommodate bicyclists	A.L.R.	S.W.K.
07	07-17-17	Revised notes & new sdrd. label	A.L.R.	S.W.K.
06	11-08-12	Revised Detail, Rumble Strip Dim.	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

MILLED RUMBLE STRIPS (CONCRETE/ASPHALT SHOULDER) SHOULDER WIDTH ≥ 2'-0"

RD707

FHWA APPROVAL	04-05-21	APP'D.	Scott W. King
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 03-04-2024

KDOT Graphics Certified

Sh. No. 31

Drawn By : MDELEON Plotted : 07/11/2024
File : c:\pwworking\central01\d2274982\ka6020001rd707.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	32	293

OFFICE LOCATION
BANK STABILIZATION ALIGNMENT

P.C. @ Sta. 10+00.00 =
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2. Not set

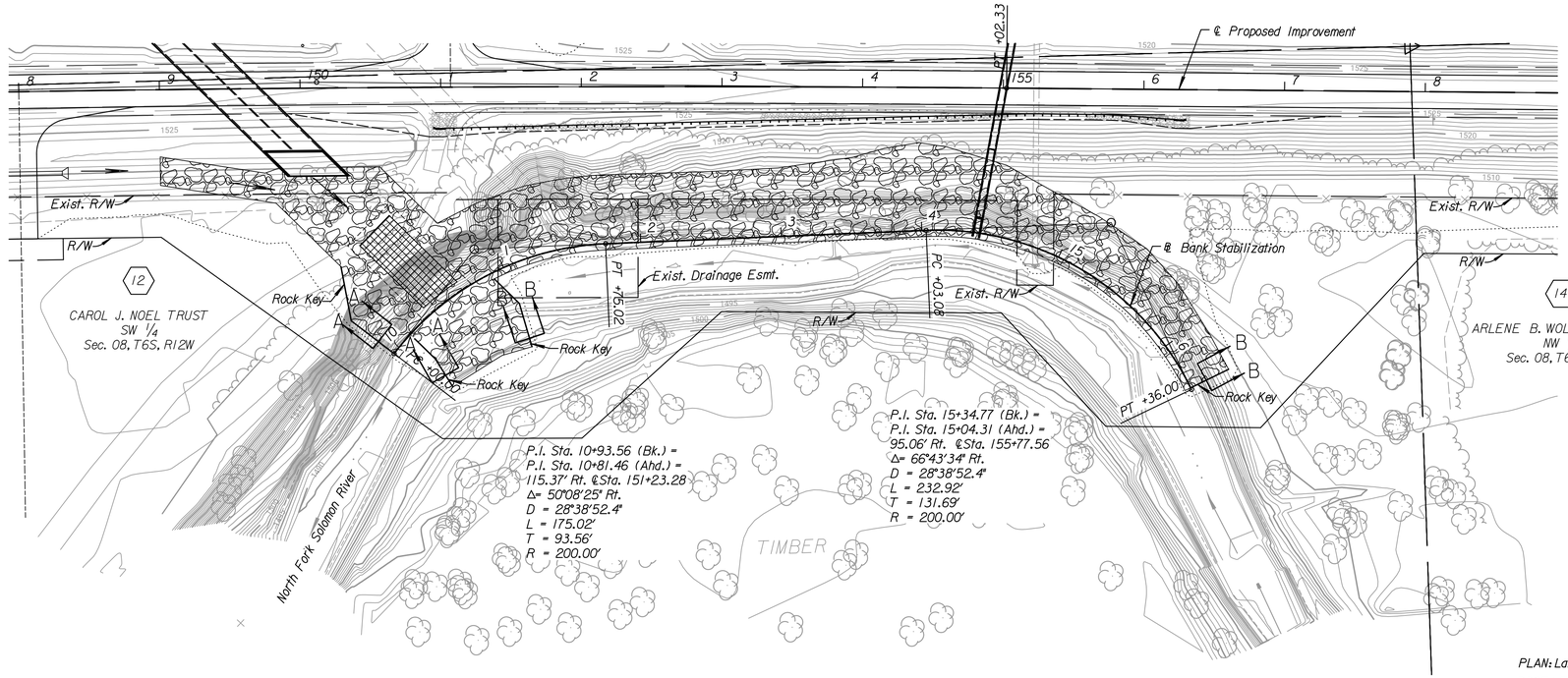
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N 744,602.992 E 5,492,791.408
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2. Not set

P.T. @ Sta. 11+75.02 =
N 744,696.546 E 5,492,790.335
1. 111.74' Rt. US-281 @ Sta. 152+17.15
2. Not set

P.C. @ Sta. 14+03.08 =
N 744,924.591 E 5,492,787.719
1. 101.63' Rt. US-281 @ Sta. 154+45.83
2. Not set

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2. Not set

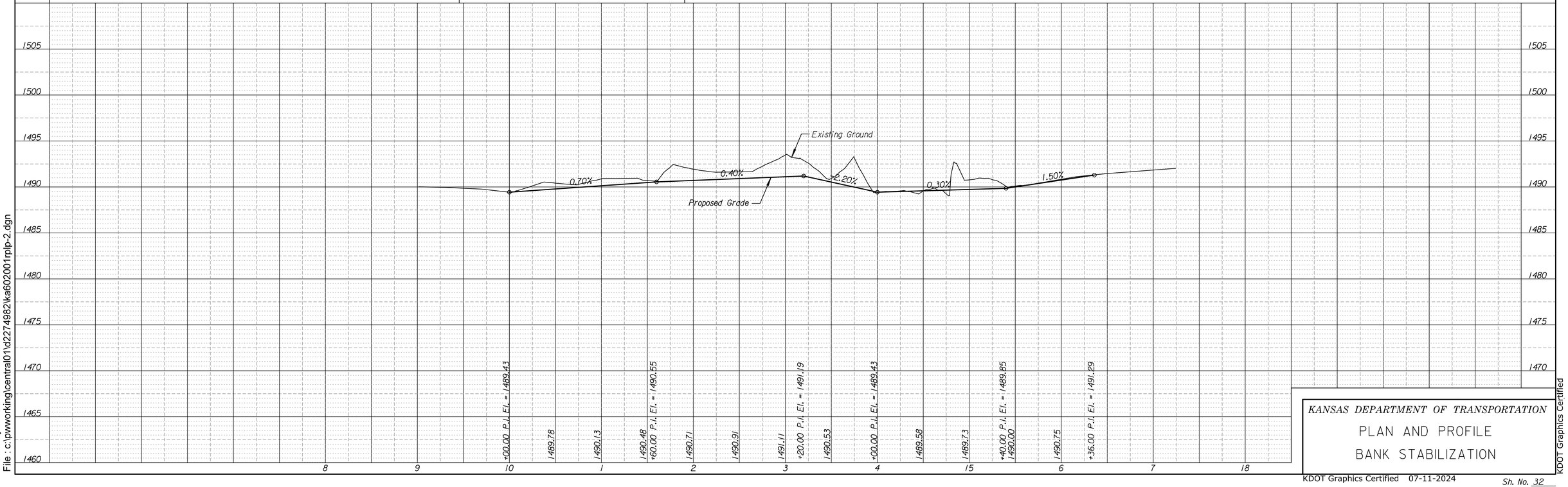
P.T. @ Sta. 16+36.00 =
N 745,109.691 E 5,492,906.578
1. 212.09' Rt. US-281 @ Sta. 156+35.61
2. Not set



SCALE
50' 0 50' 100'
PLAN: Lat. & Long.
PROFILE: Horiz. same as above
Vert.
5'
0

Utilities
Telephone: Nextech
Overhead Power: Prairie Land Electric Coop

BM22 - Rivet & KDOT Washer in ℄ Top S. 6'x2' RCB
41.48' Rt. ℄ US-281 Sta. 150+81.91 Elev. 1526.31



KANSAS DEPARTMENT OF TRANSPORTATION
PLAN AND PROFILE
BANK STABILIZATION

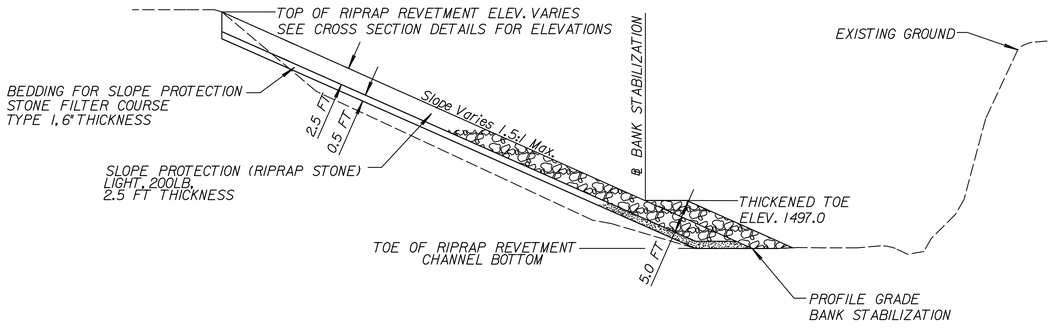
KDOT Graphics Certified 07-11-2024

Sh. No. 32

KDOT Graphics Certified

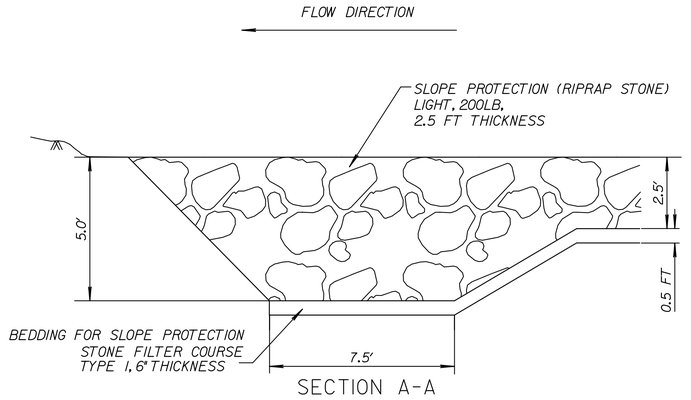
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Plotted : 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	33	293

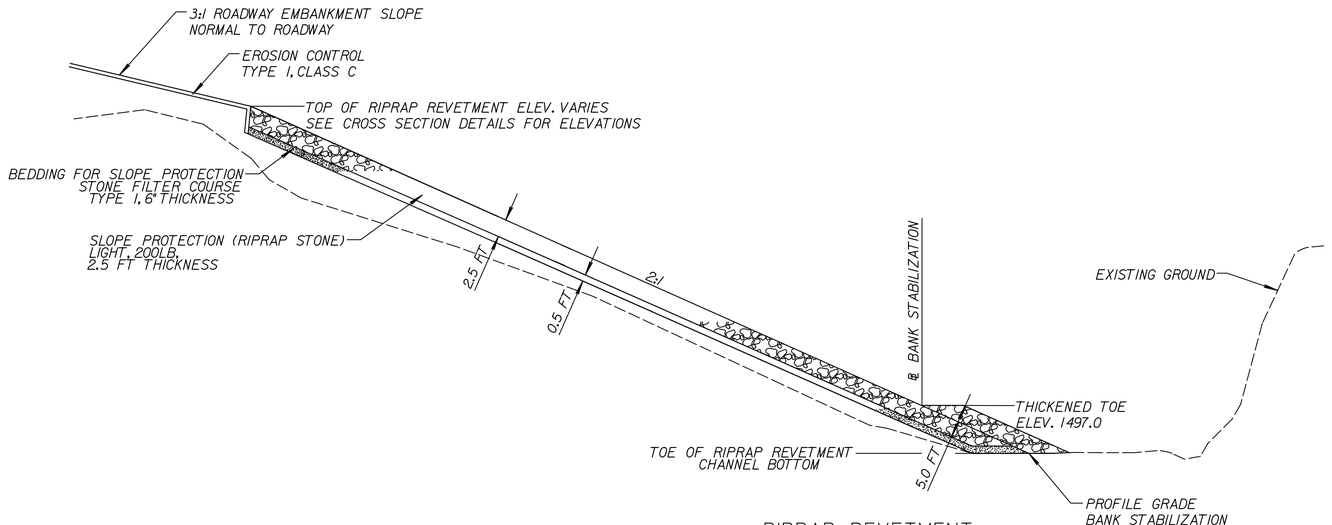


RIPRAP REVETMENT

STA. 10+00 TO SPILLWAY AND
STA. 14+50 TO STA. 16+36.00

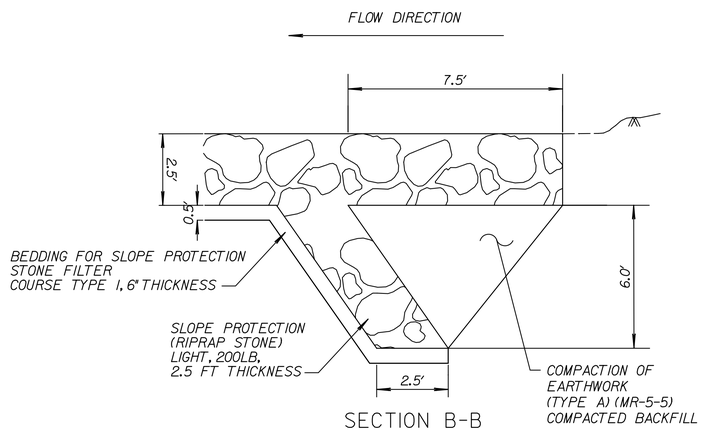


SECTION A-A



RIPRAP REVETMENT

SPILLWAY TO STA. 14+50



SECTION B-B

ROCK KEY DETAILS

NOT TO SCALE

BANK STABILIZATION DETAILS

NOT TO SCALE

Note: Elevations shown are to the NAVD 88 Vertical Datum

KANSAS DEPARTMENT OF TRANSPORTATION

BANK STABILIZATION

DETAIL

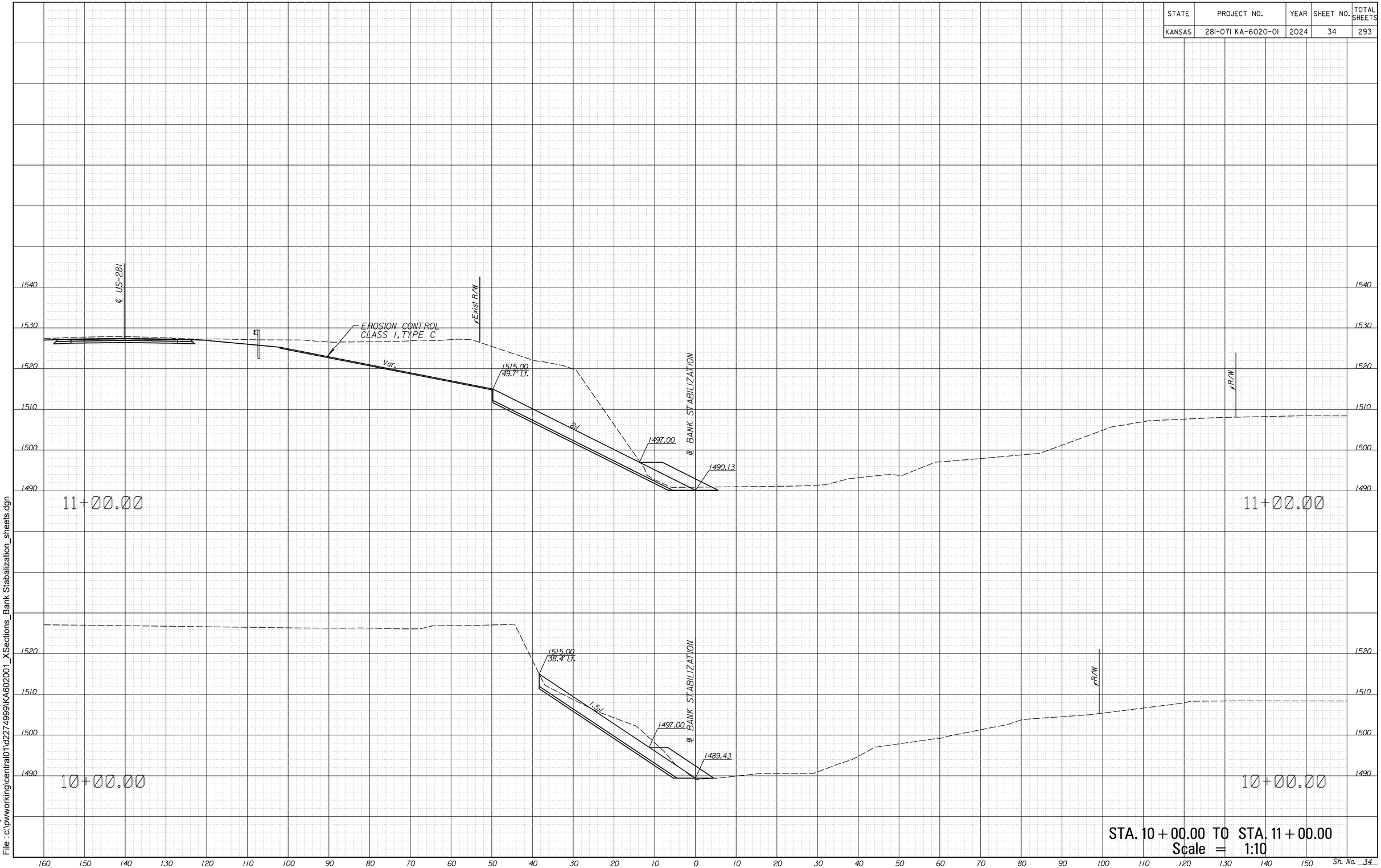
KDOT Graphics Certified 07-11-2024

Sh. No. 33

Drawn By : MDELEON Plotted : 07-11-24
File : c:\pwworking\central01\d2274982\ka602001_rmi-01.dgn

KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	34	293

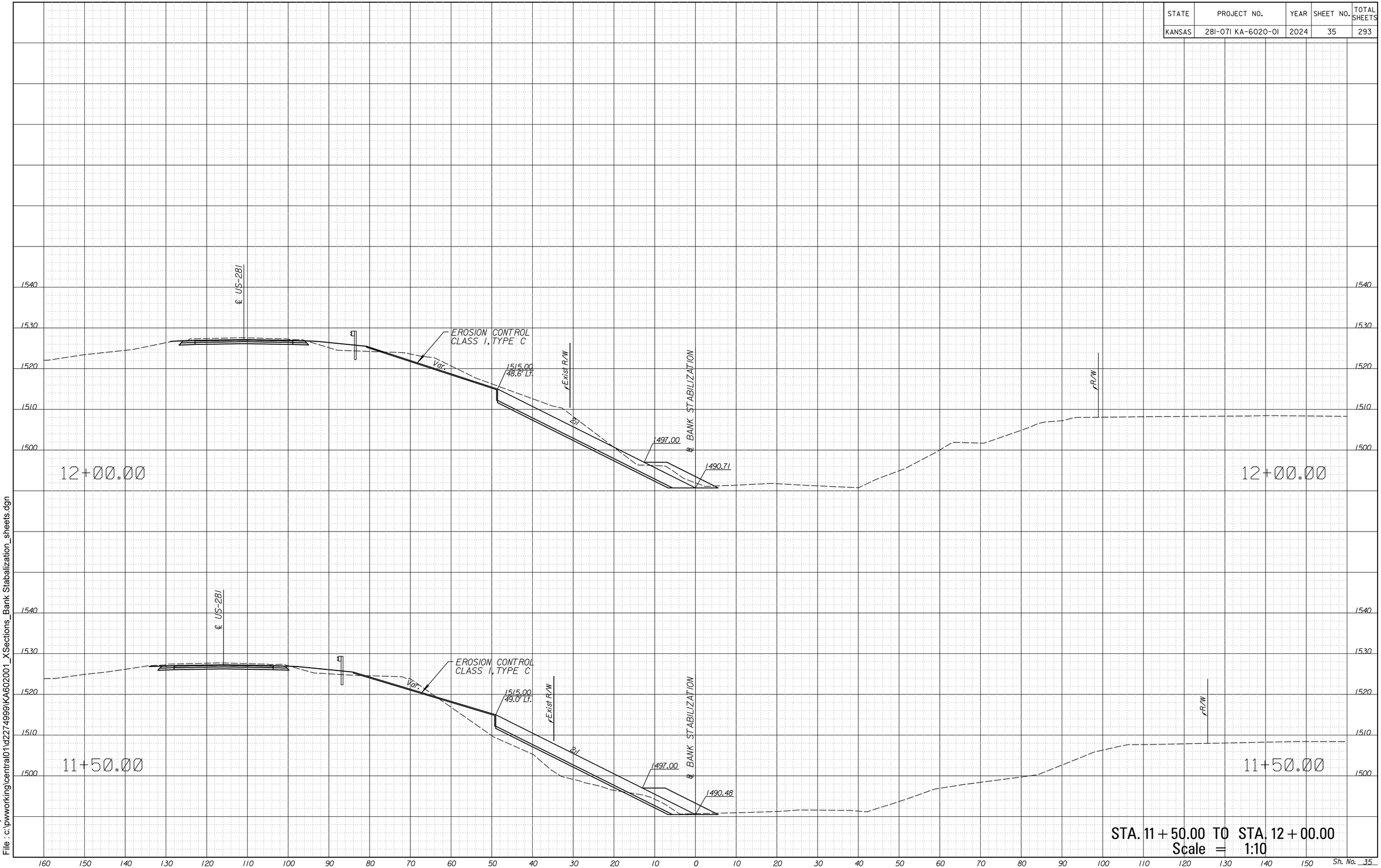


STA. 10+00.00 TO STA. 11+00.00
Scale = 1:10

Drawn By : MDELEON
Plotted : 07-11-24
File : c:\pwworking\central01\d2274999\KA602001_XSections_Bank Stabalization_sheets.dgn

Sh. No. 34

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	35	293



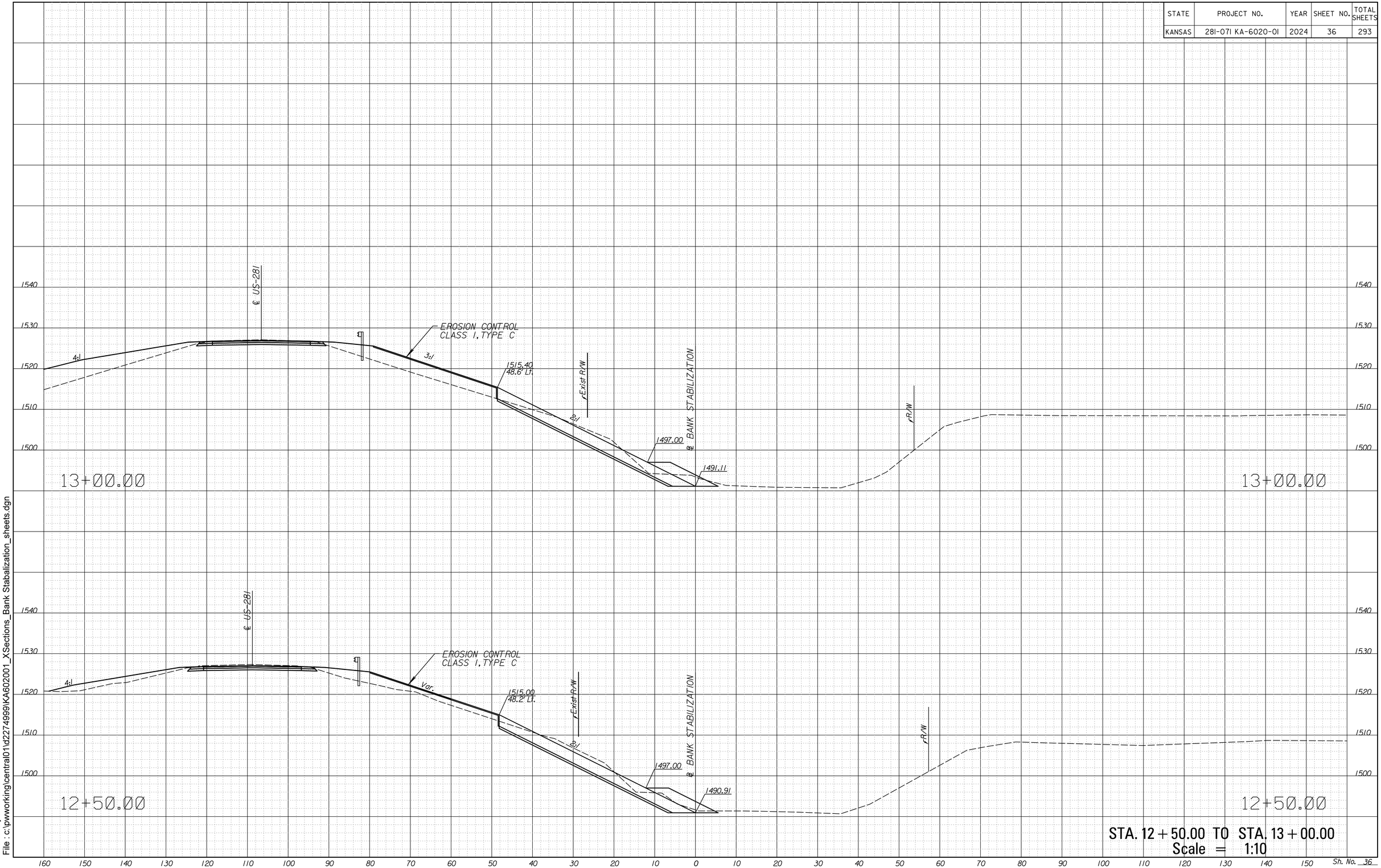
STA. 11 + 50.00 TO STA. 12 + 00.00

Scale = 1:10

Sh. No. 35

Drawn By: MDELEON
Plotted: 07-11-24
File: c:\pwworking\central01\d2274999\KA602001_XSections_Bank Stabalization_sheets.dgn

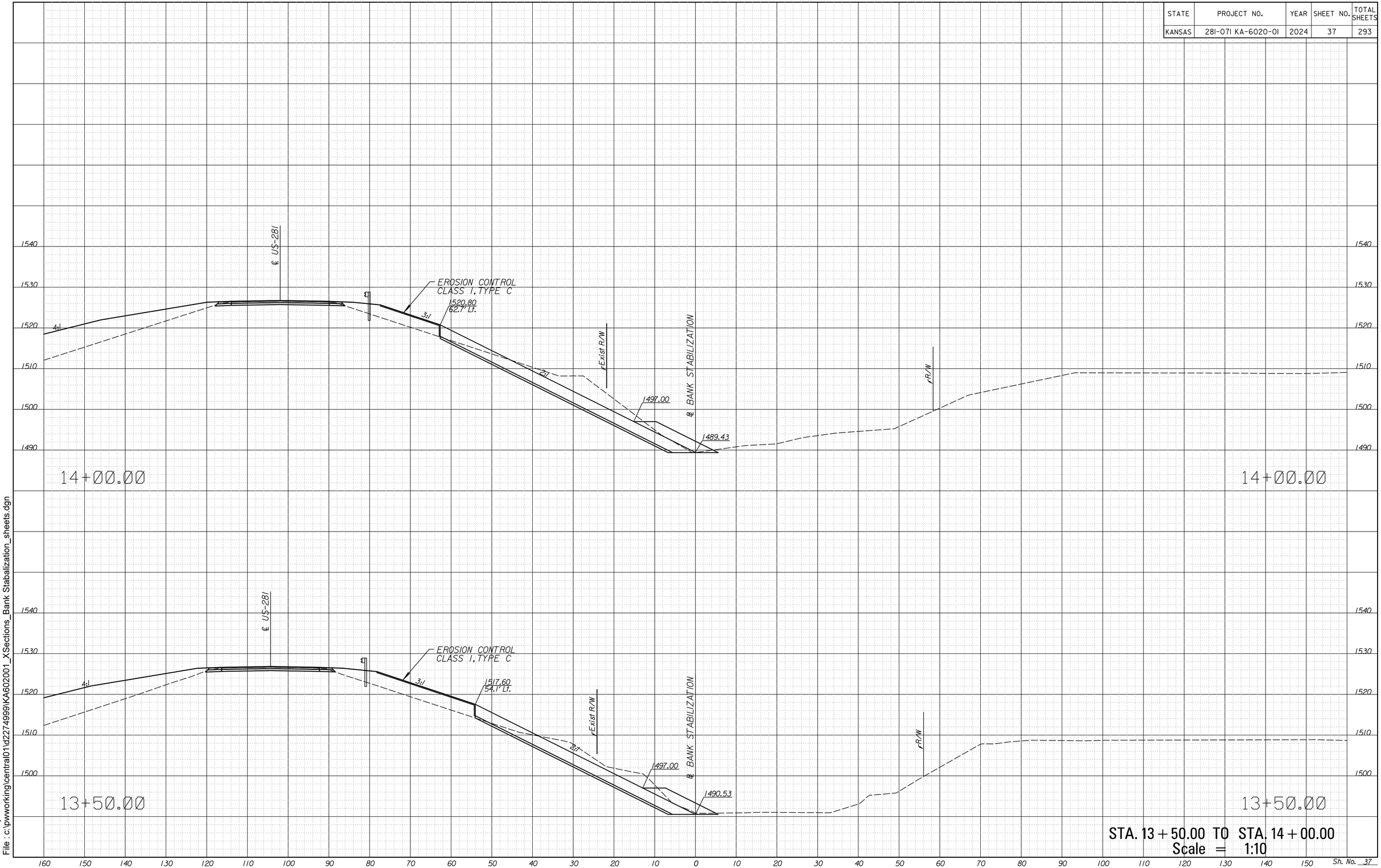
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	36	293



STA. 12 + 50.00 TO STA. 13 + 00.00
Scale = 1:10

Drawn By : MDELEON Plotted : 07-11-24
File : c:\pwworking\central01\d2274999\KA602001_XSections_Bank Stabalization_sheets.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	37	293

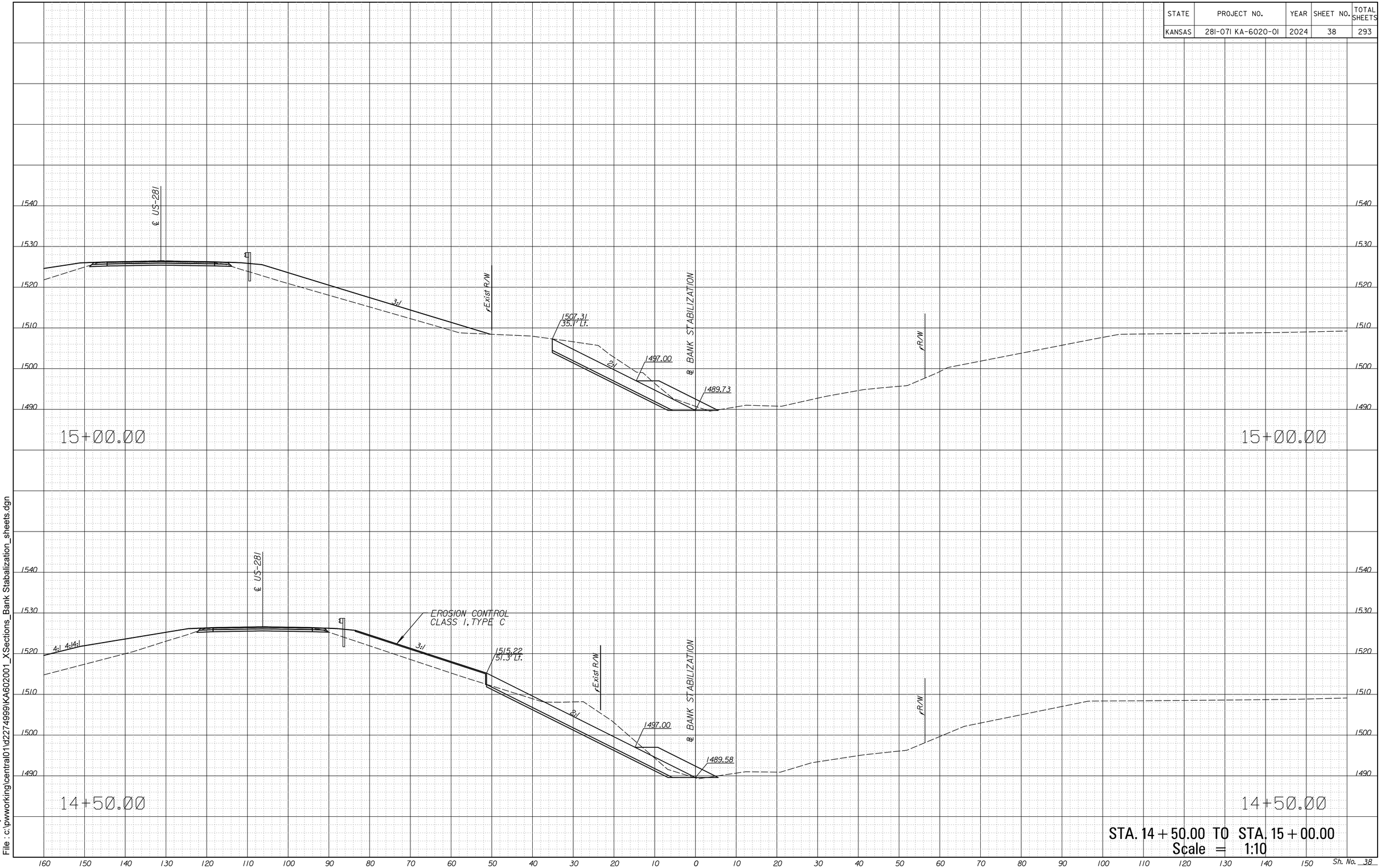


STA. 13 + 50.00 TO STA. 14 + 00.00
Scale = 1:10

Sh. No. 37

Drawn By : MDELEON
Plotted : 07-11-24
File : c:\pwworking\central01\d2274999\KA602001_XSections_Bank Stabalization_sheets.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	38	293



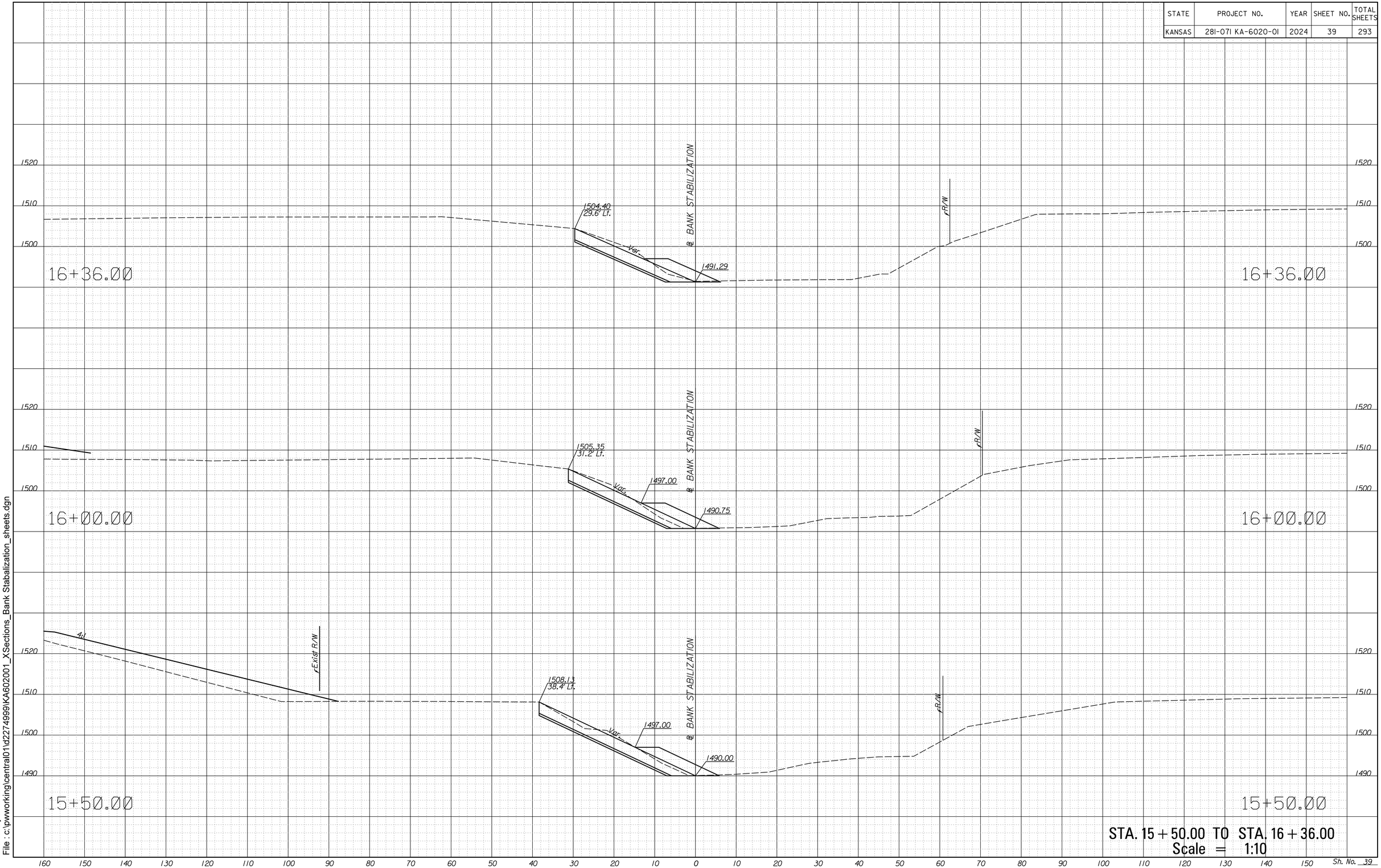
STA. 14 + 50.00 TO STA. 15 + 00.00

Scale = 1:10

Sh. No. 38

Drawn By : MDELEON
Plotted : 07-11-24
File : c:\pwworking\central01\d2274999\KA602001_XSections_Bank Stabalization_sheets.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	39	293

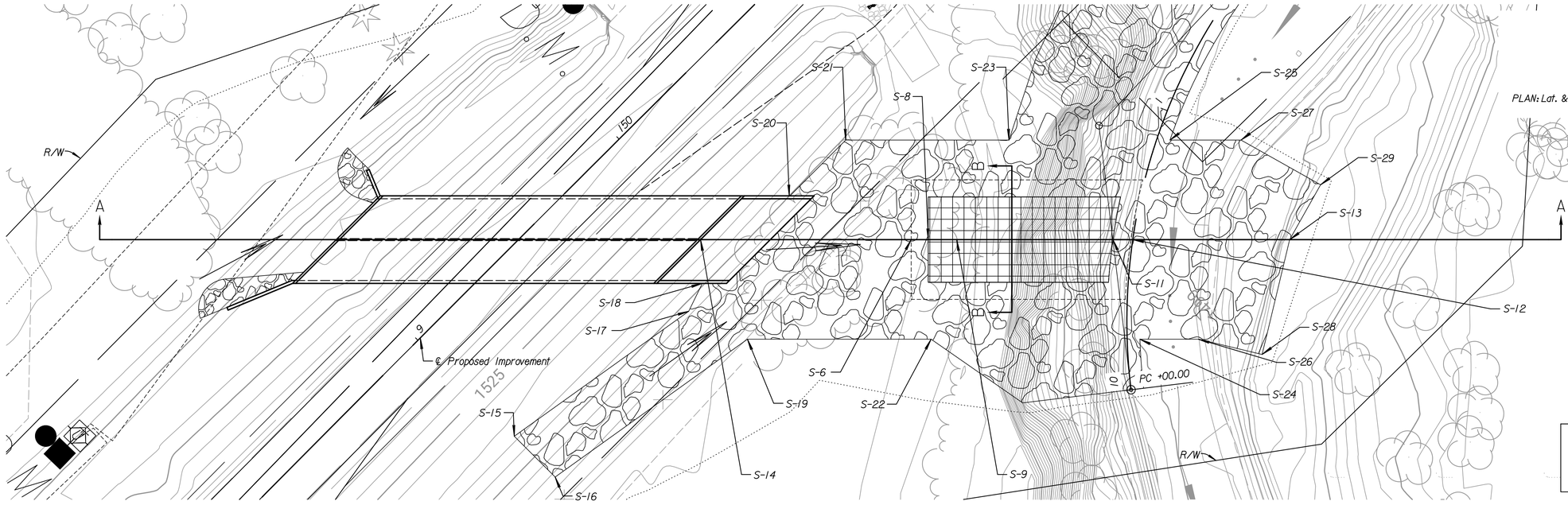


STA. 15 + 50.00 TO STA. 16 + 36.00
Scale = 1:10

Sh. No. 39

Drawn By: MDELEON
Plotted: 07-11-24
File: c:\pwworking\central01\d2274999\KA6020001_XSections_Bank Stabalization_sheets.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	40	293

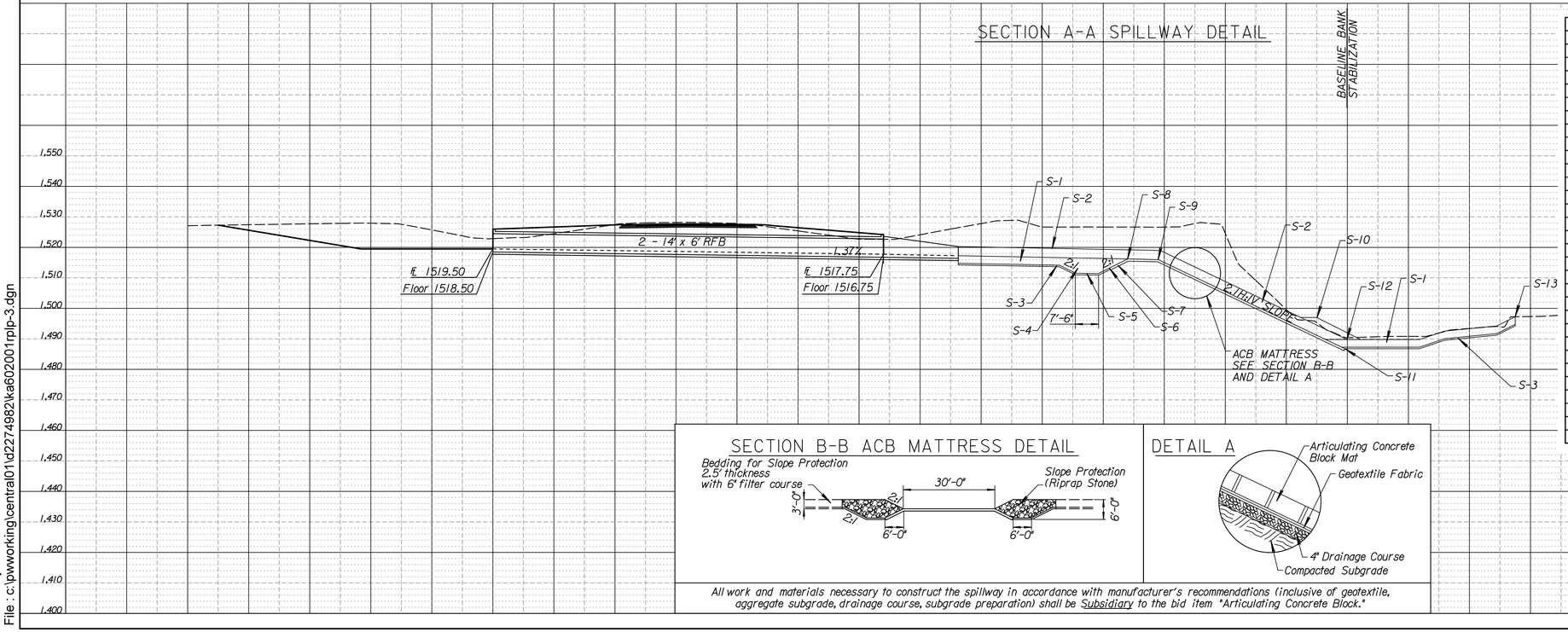


SCALE

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

HYDRAULIC PARAMETERS FOR SPILLWAY	
DESIGN FLOW RATE	1330 cfs
FLOW VELOCITY	36 ft/s
SHEAR STRESS	33 psf

SECTION A-A SPILLWAY DETAIL



SPILLWAY FEATURES	
NO.	DESCRIPTION
S-1	Slope Protection (Riprap Stone); Light 200 LB, 2.5' thickness
S-2	Slope Protection (Riprap Stone) on either side of the ACB Mattress
S-3	Bedding for Slope Protection; Type I, 6" thickness
S-4	Slope Protection (Riprap Stone); Light 200 LB, 5' thickness X 7.5' wide
S-5	Bottom of Riprap Revetment; Elevation 1511.46
S-6	Limits of ACB Mattress Turndown; STA. 150+47.91, 97.41' RT.
S-7	ACB Mattress Turndown
S-8	Limits of ACB Mattress at grade; STA. 150+52.18, 101.64' RT; FL = 1516.2
S-9	ACB Mattress top of bank/break point; STA. 150+59.30, 108.69' RT.; FL = 1516.0
S-10	Riprap Revetment thickened toe on either side of ACB Mattress; Elevation 1497.0
S-11	Limit of ACB Mattress; STA. 151+02.97, 151.76' RT.; Elevation 1486.8
S-12	Bank Stabilization alignment STA. 10+52.94; STA. 151+03.45, 152.23' RT; FL = 1489.8
S-13	Limit of Riprap Revetment; STA. 151+42.91, 190.98' RT.
S-14	RFB Downstream Invert; STA. 149+95.32, 45.22' RT
S-15	Limit of Riprap Revetment; STA. 149+00.00, 47.81' RT.
S-16	Limit of Riprap Revetment; STA. 149+00.00, 68.09' RT.
S-17	Limit of Riprap Revetment; STA. 149+74.53, 60.12' RT.
S-18	Limit of Riprap Revetment; STA. 149+84.87, 56.56' RT.
S-19	Limit of Riprap Revetment; STA. 149+82.23, 81.63' RT.
S-20	Limit of Riprap Revetment; STA. 150+28.32, 56.30' RT.
S-21	Limit of Riprap Revetment; STA. 150+56.27, 56.38' RT.
S-22	Limit of Riprap Revetment; STA. 150+28.12, 127.17' RT.
S-23	Limit of Riprap Revetment; STA. 150+97.12, 96.75' RT.
S-24	Limit of Riprap Revetment; STA. 150+80.47, 178.87' RT.
S-25	Limit of Riprap Revetment; STA. 151+37.52, 136.52' RT.
S-26	Limit of Riprap Revetment; STA. 150+95.19, 193.34' RT.
S-27	Limit of Riprap Revetment; STA. 151+55.39, 154.09' RT.
S-28	Limit of Riprap Revetment; STA. 151+07.39, 212.89' RT.
S-29	Limit of Riprap Revetment; STA. 151+64.31, 184.87' RT.
NOTE: Station/Offset information is referenced to the US-281 Alignment unless otherwise noted.	

SECTION B-B ACB MATTRESS DETAIL

DETAIL A

All work and materials necessary to construct the spillway in accordance with manufacturer's recommendations (inclusive of geotextile, aggregate subgrade, drainage course, subgrade preparation) shall be Subsidiary to the bid item "Articulating Concrete Block."

KANSAS DEPARTMENT OF TRANSPORTATION

RIVER BANK STABILIZATION & SPILLWAY DETAIL

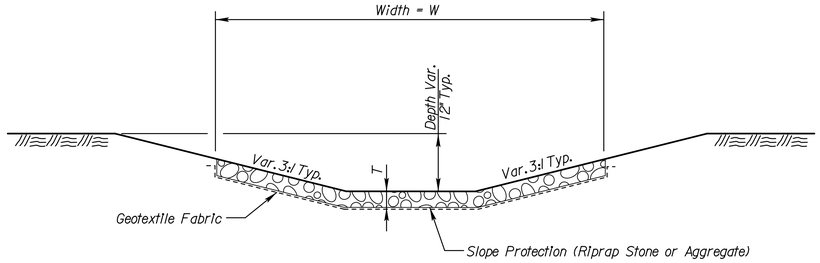
KDOT Graphics Certified 05-07-2024

Sh. No. 40

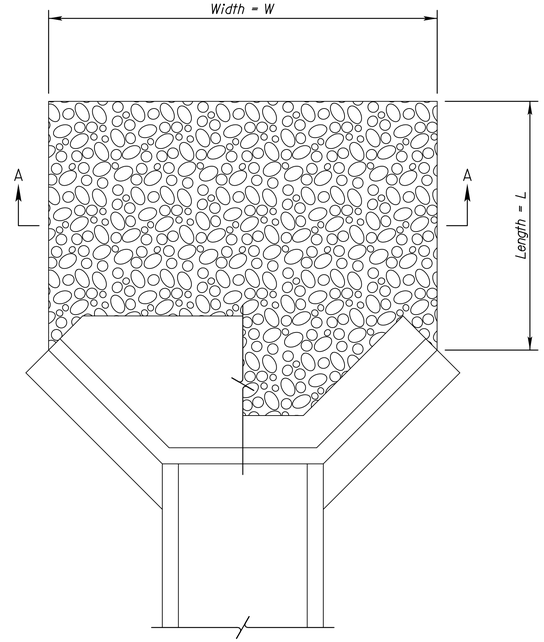
KDOT Graphics Certified

Drawn By : MDELEON Plotted : 07-11-24
File : c:\pwworking\central01\d2274982\ka602001rplp-3.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	4I	293



SECTION A-A
(See Summary of Quantities, Sheet No. 139 for dimensions)



TYPICAL SLOPE PROTECTION PLAN AT CULVERT OUTLET

KANSAS DEPARTMENT OF TRANSPORTATION

CULVERT OUTLET PROTECTION

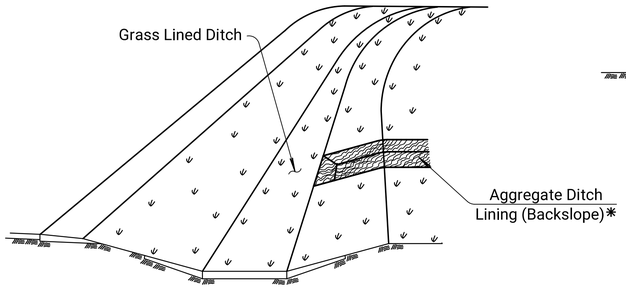
KDOT Graphics Certified 05-07-2024

Sh. No. 4I

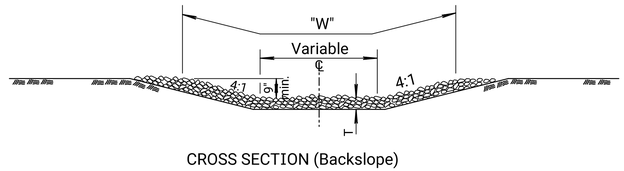
KDOT Graphics Certified

Drawn By : MDELELEON Plotted : 07-11-24
File : c:\pwworking\central01\d2274982\ka602001_rmi-02.dgn

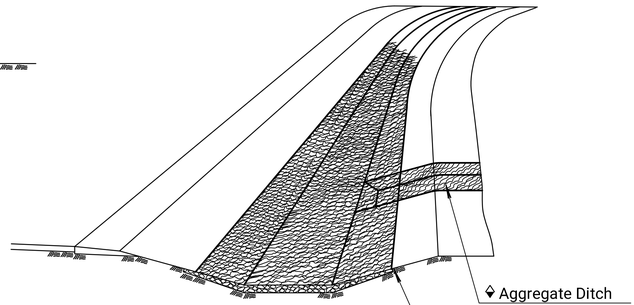
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-01	2024	42	293



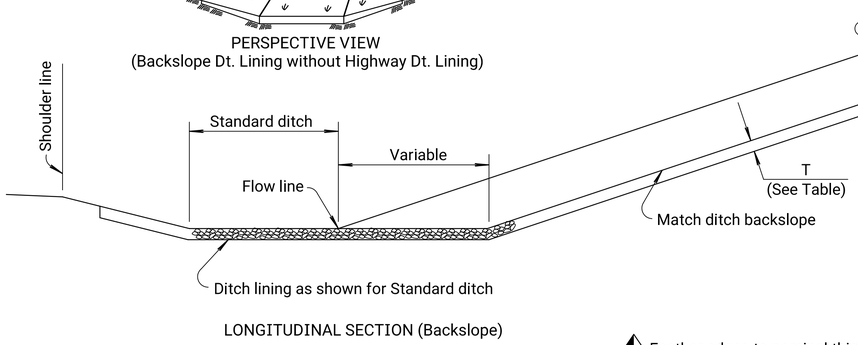
PERSPECTIVE VIEW
(Backslope Dt. Lining without Highway Dt. Lining)



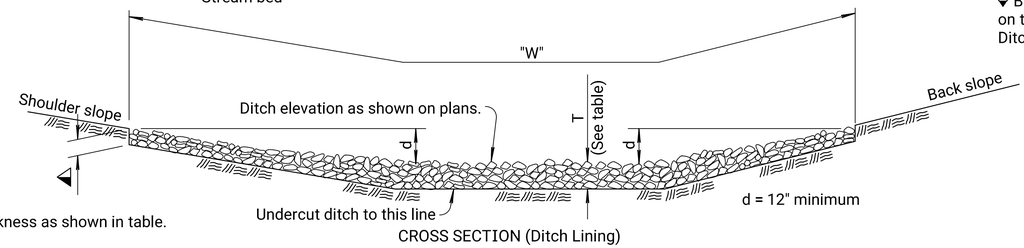
CROSS SECTION (Backslope)



PERSPECTIVE VIEW



LONGITUDINAL SECTION (Backslope)



CROSS SECTION (Ditch Lining)

Feather edges to nominal thickness as shown in table.

GENERAL NOTE

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

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

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

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

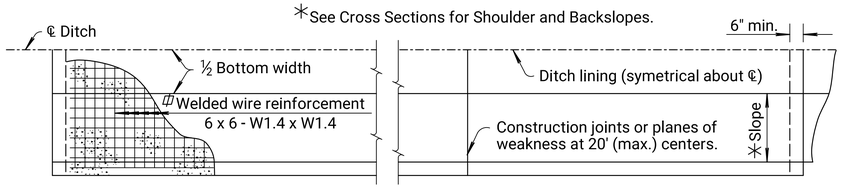
◆ Backslope aggregate ditch lining, constructed as indicated on this sheet, shall be paid for by the ton of "Aggregate Ditch Lining (D_{50})."

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

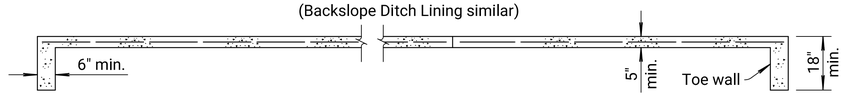
Note: Quantities provided for information only.
◔ Aggregate larger than 4 inches (D_{50}) should not be used within the clear zone.

AGGREGATE DITCH LINING (D_{50})

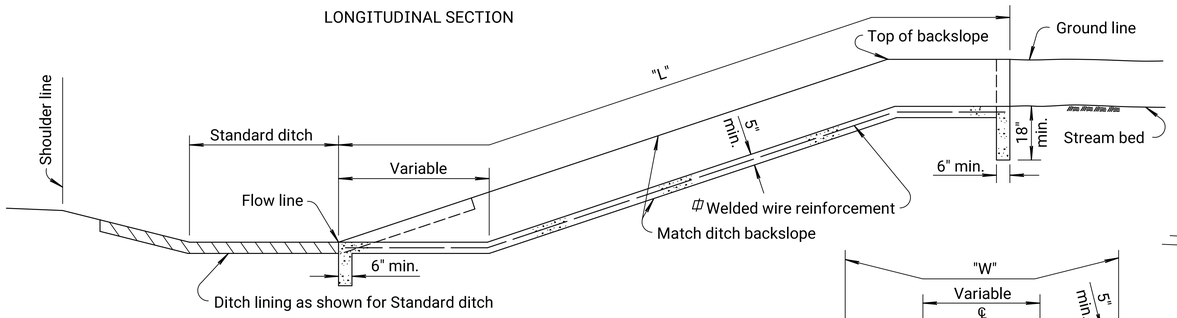
*See Cross Sections for Shoulder and Backslopes.



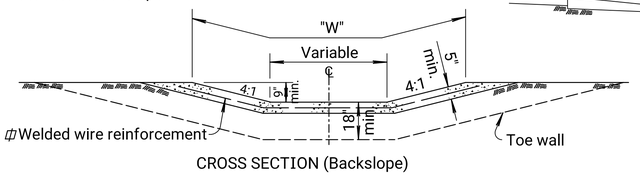
HALF PLAN
(Backslope Ditch Lining similar)



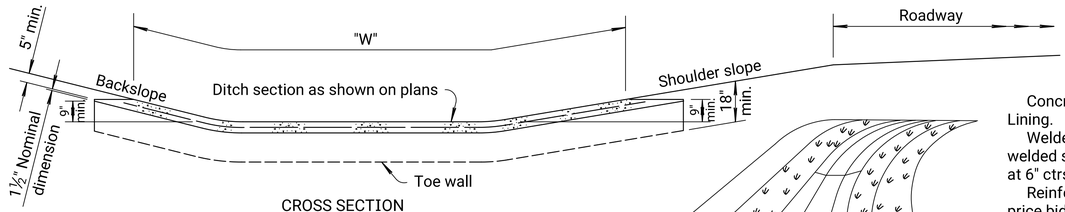
LONGITUDINAL SECTION



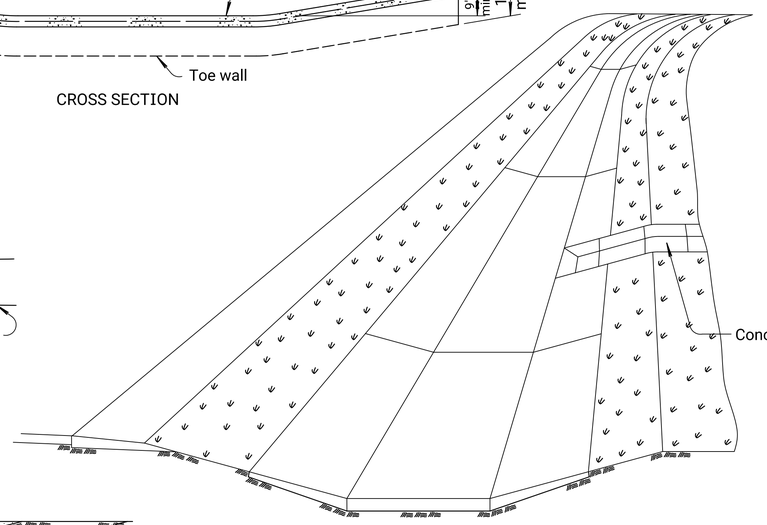
LONGITUDINAL SECTION (Backslope)



CROSS SECTION (Backslope)



CROSS SECTION



PERSPECTIVE VIEW

GENERAL NOTE

Concrete Grade 3.0 shall be used in Concrete Ditch Lining.

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

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

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

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

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

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

CONCRETE DITCH LINING

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

KANSAS DEPARTMENT OF TRANSPORTATION

DITCH LINING

RD502

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

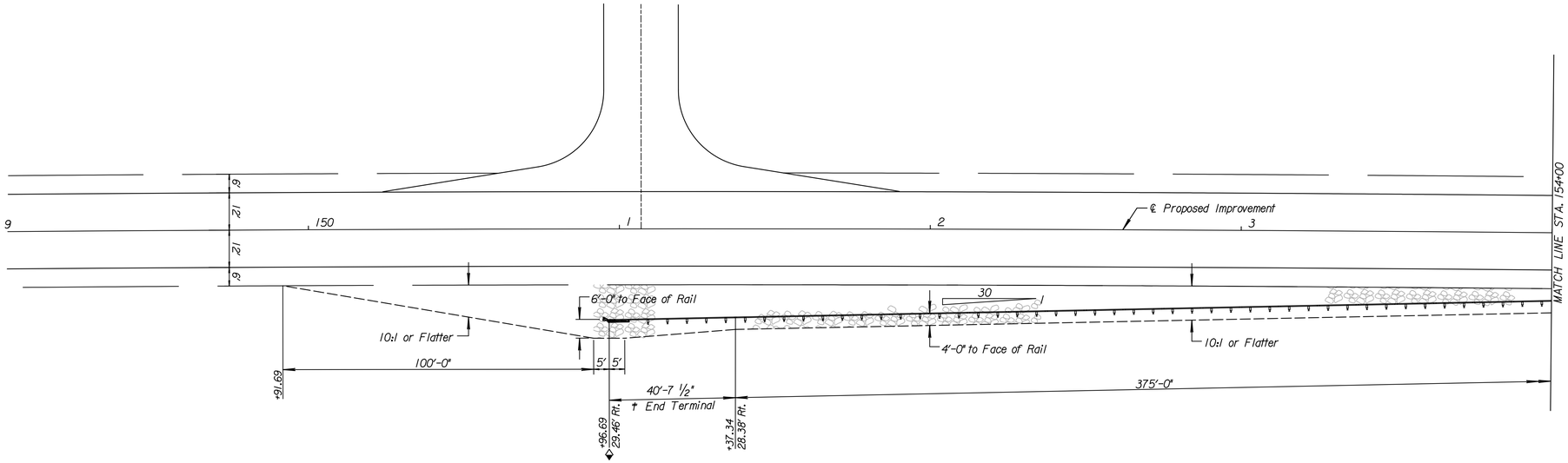
KDOT Graphics Certified 04-18-2022

Sh. No. 42

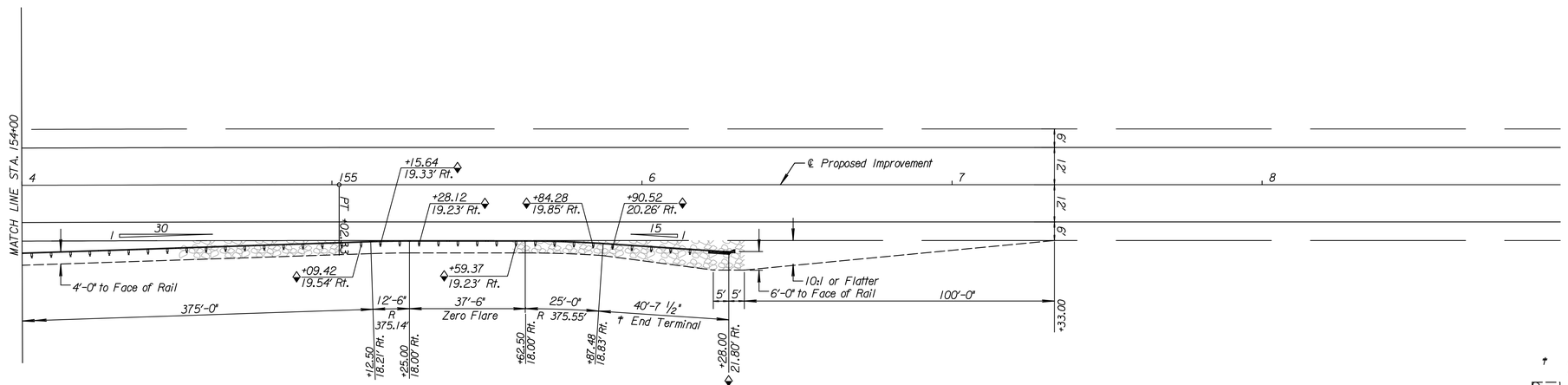
KDOT Graphics Certified

Drawn By : MDELEON
File : c:\pwworking\central01\d2274982\ka6020001rd502.dgn
Plotted :07/11/2024

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	43	293



Scale 1" = 20'



Scale 1" = 20'

Legend

† MGS-FLEAT End Terminal or MGS-SRT End Terminal

Limits of Aggregate Shoulder (AS-1)(4")

Station Offset to Face of Post

Note:
Guardrail Dimensions to Face of Rail unless otherwise noted.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL DETAILS

STA. 150+96.69 TO STA. 156+28.00

KDOT Graphics Certified 06-13-2024

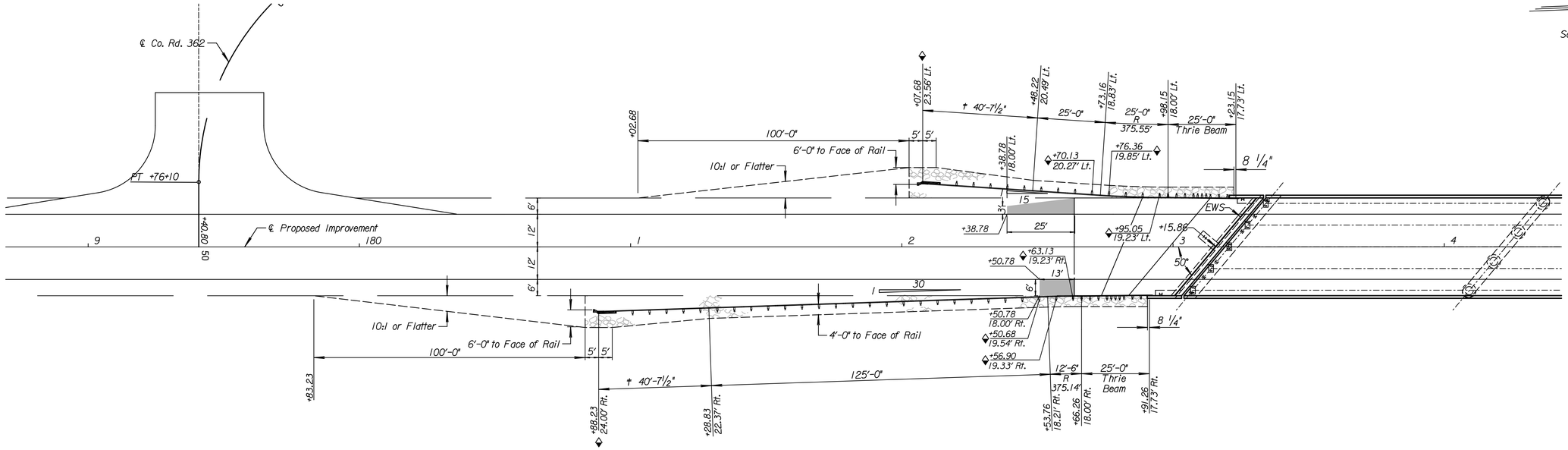
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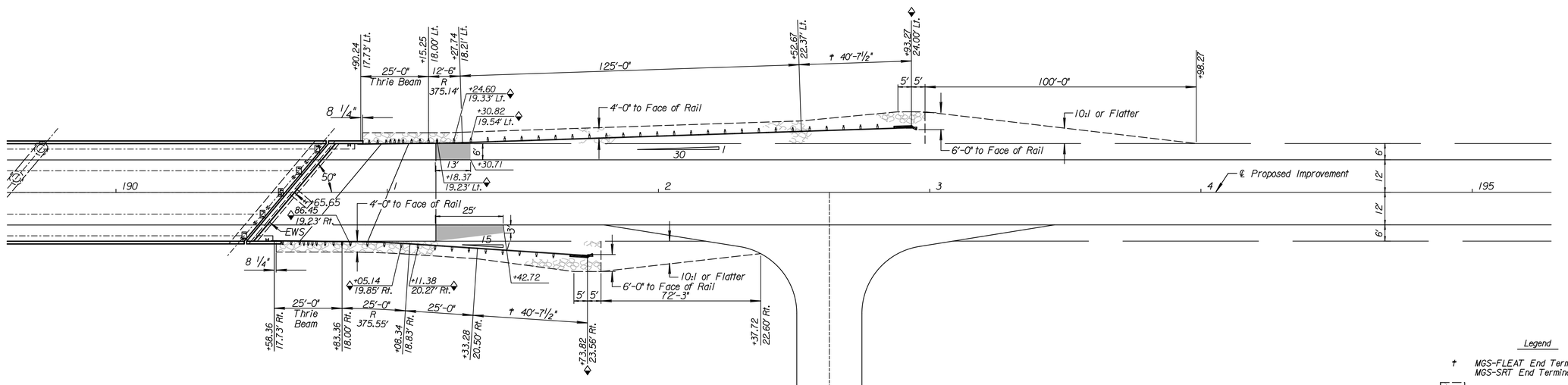
KDOT Graphics Certified

Drawn By : MDELEON
File : c:\pwworking\central01\d2274982\ka602001rgr-01.dgn
Plotted : 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-01	2024	44	293

Scale 1" = 20'





Legend

† MGS-FLEAT End Terminal or MGS-SRT End Terminal

Limits of Aggregate Shoulder (AS-1)(4")

Full Depth Shoulder Pavement

Station Offset to Face of Post

Note:
Guardrail Dimensions to Face of Rail unless otherwise noted.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL DETAILS

BR. NO. 28I-7I-198.72 (055)

NORTH & SOUTH APPROACHES

KDOT Graphics Certified 07-11-2024

Sh. No. 44

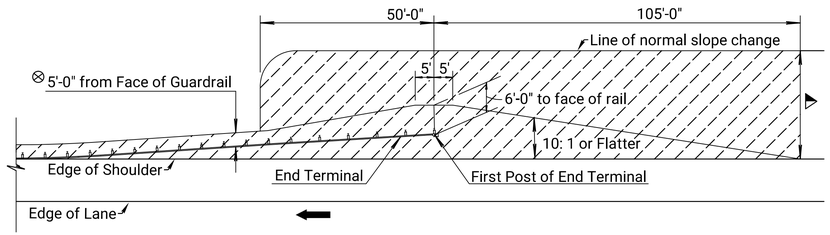
KDOT Graphics Certified

Drawn By : MDELEON
Plotted : 07-11-24
File : c:\pwworking\central01\d2274982\ka602001rgr-02.dgn

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

GUARDRAIL CLEAR AREA

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



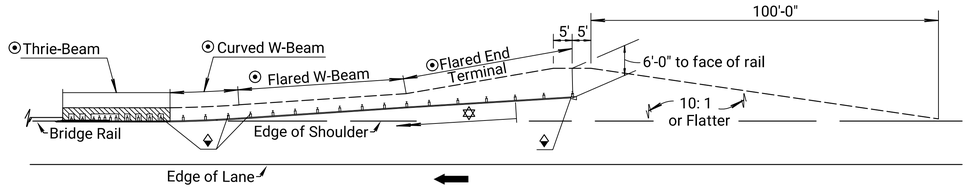
Keep Area Free of Stockpiled Material, Equipment, or Other Obstacles, Such as Temporary Signs, Regardless of Crash Worthiness. This Clear Area Extends 105 Feet in Advance of and 50 Feet behind the First Post of the Guardrail End Terminal and Then, in Order to Maintain Full Post Spacing, Continues 5 Feet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

Normal Project Side Slope.

Deflection Distance for Normal Post Spacing

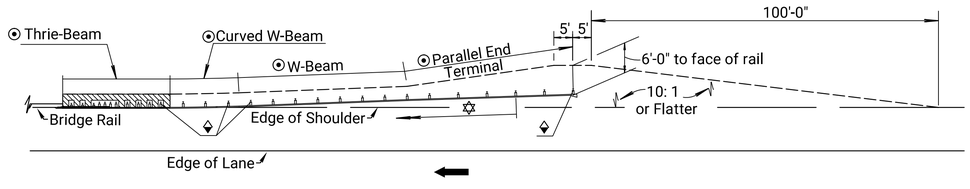
FLARED GUARDRAIL DETAIL

Applies to CGS AND MGS
(MGS Shown)



PARALLEL GUARDRAIL DETAIL

Applies to CGS AND MGS
(MGS Shown)



See Guardrail Layout Sheets for Details

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

Length of Need (Begins at Post 3)

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	45	293

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.

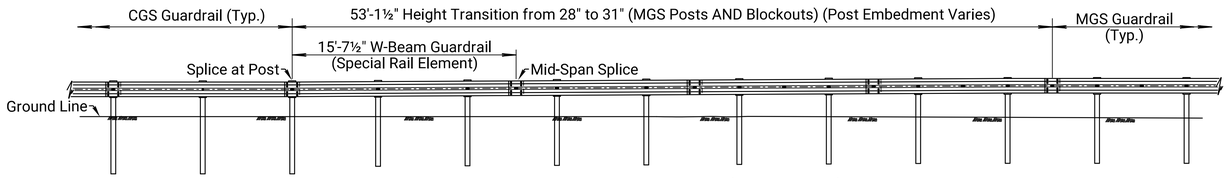
Where pavement with a thickness less than or equal to 8" is encountered during installation, use the details shown on KDOT's 'Guardrail Post Details' Standard Drawings to provide openings in the pavement for the guardrail posts. Where pavement with a thickness greater than 8" or geologic rock is encountered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

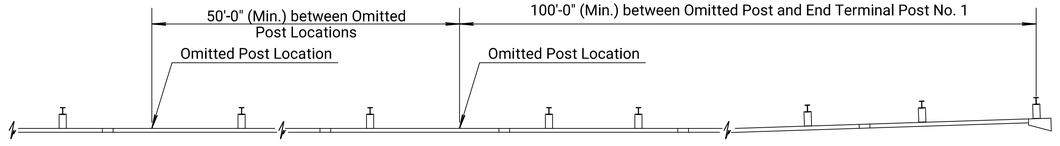
All work and materials required for guardrail end terminal installations are paid for under the bid item for the selected guardrail end terminal. See the table on this sheet for the appropriate end terminal bid item information.



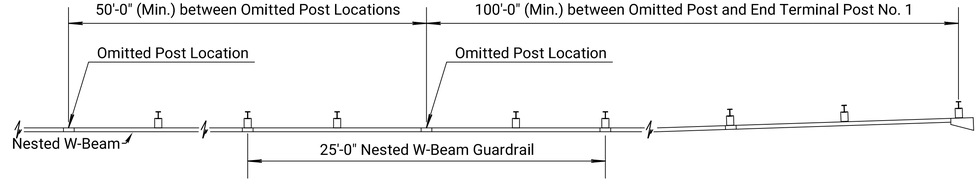
CGS TO MGS TRANSITION DETAILS (PLAN)



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	Trinity Industries	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	Trinity Industries	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	Trinity Industries	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.

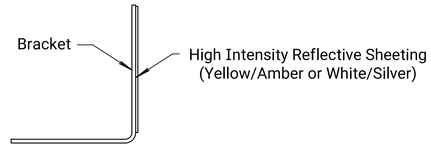
KDOT Graphics Certified 04-25-2022

Sh. No. 45

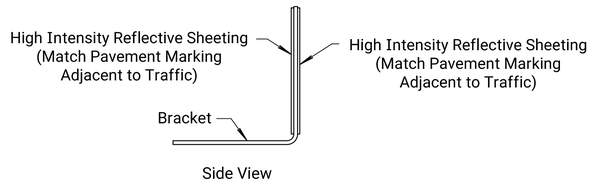
KDOT Graphics Certified

Drawn By : MDELEON
File : c:\pwworking\central01\d2274982\ka6020001rd606.dgn
Plotted : 04/11/2022

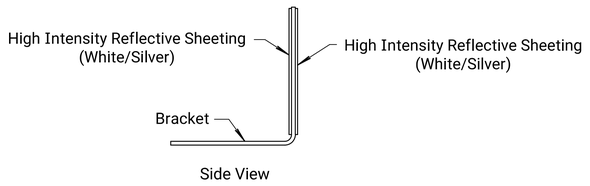
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-01	2024	46	293



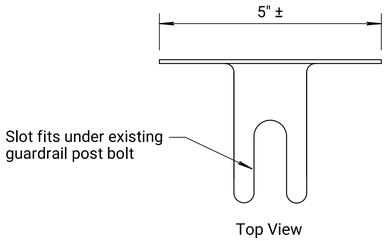
Flexible Marker
One-Way Traffic

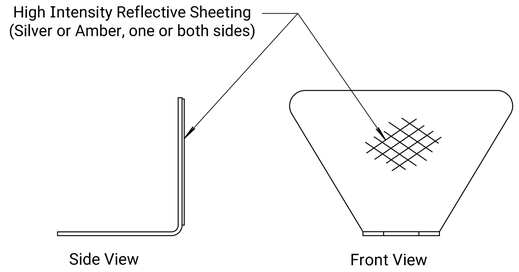


Flexible Marker
Median Locations



Flexible Marker
Two-Way Traffic





Flexible Guardrail Marker

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

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.

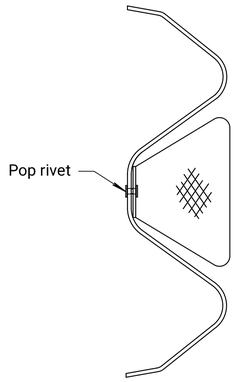
For guardrail located on one-way or divided roadways, use flexible markers with reflective sheeting installed on the approach traffic side of the bracket only. For bridge rail or concrete safety barrier located on the outside edge of one-way or divided roadways, use flexible markers with reflective sheeting 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.

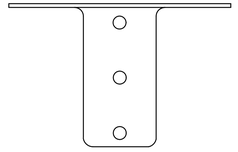
Work and materials required for installation of markers on guardrail, bridge rail, or concrete safety barrier are subsidiary to other bid items in the contract.

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

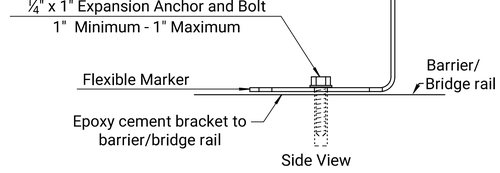


Typical Mounting on W-Beam

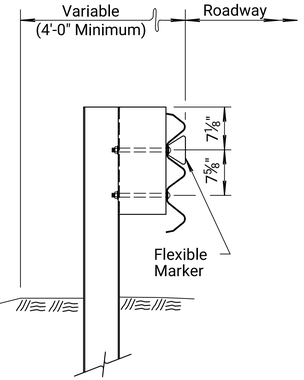
Pop rivet attachment to Guardrail when necessary.



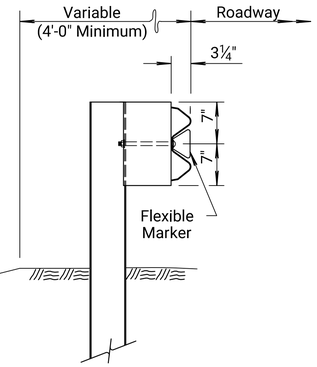
Barrier/Bridge Rail



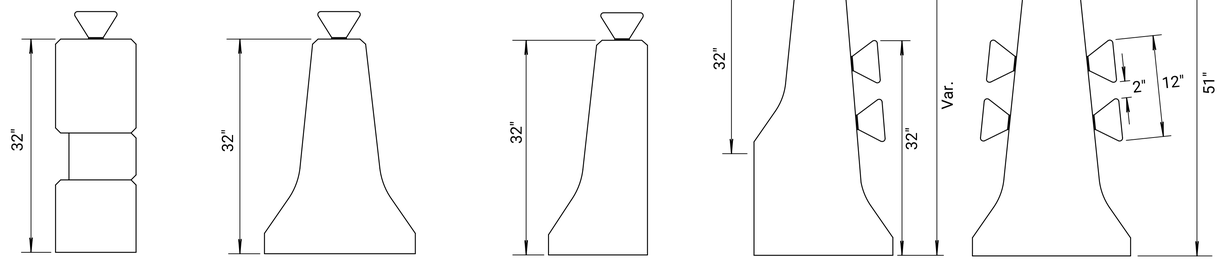
Method of Attaching Flexible
Marker to Barrier/Bridge Rail



THRIE-BEAM GUARDRAIL



W-BEAM GUARDRAIL



TYPICAL BARRIER/BRIDGE RAIL MOUNTING DETAILS

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.

KDOT Graphics Certified 05-11-2022

Sh. No. 46

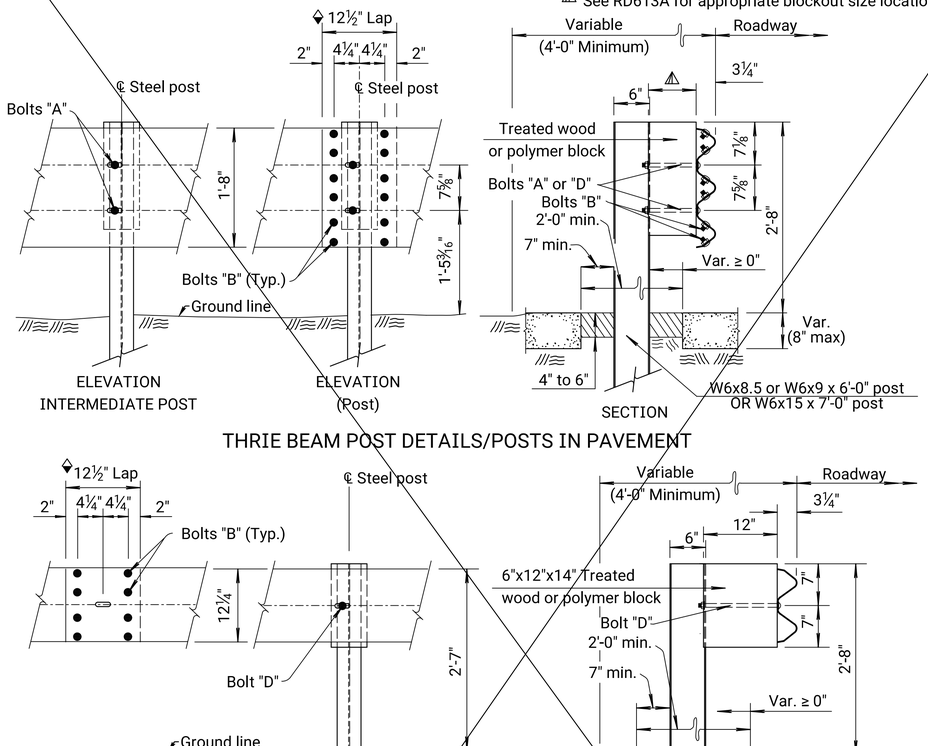
KDOT Graphics Certified

Drawn By : MDELEON Plotted : 07/11/2024
File : c:\pwworking\central01\d2274982\ka6020001rd610.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	47	293

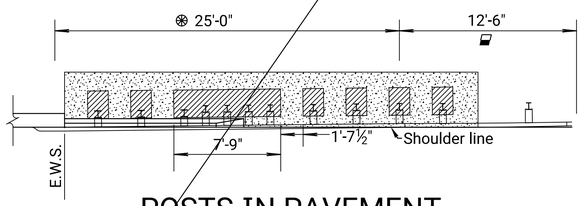
♦ Lap guardrail splices, including terminal connector, in the direction of traffic. Where traffic is temporarily carried in the opposite direction of final configuration, lap rail splices in the direction of permanent traffic.

⚠ See RD613A for appropriate blockout size location.



THRIE BEAM POST DETAILS/POSTS IN PAVEMENT

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



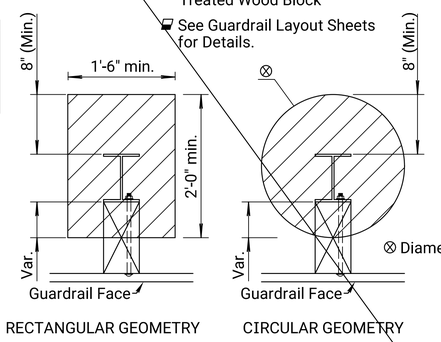
POSTS IN PAVEMENT

(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.



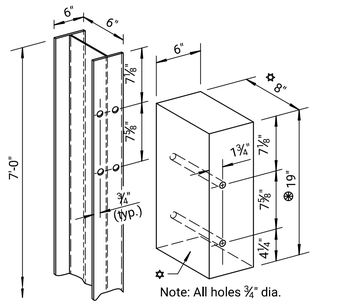
PLAN
(ALTERNATE GEOMETRIES)

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

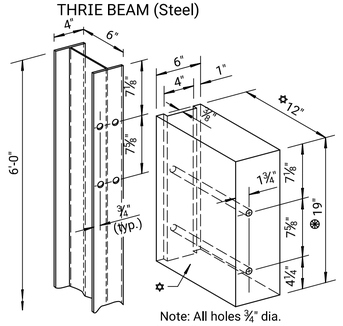
✡ Non-Metallic (Polymer) or Treated Wood Block

▭ See Guardrail Layout Sheets for Details.

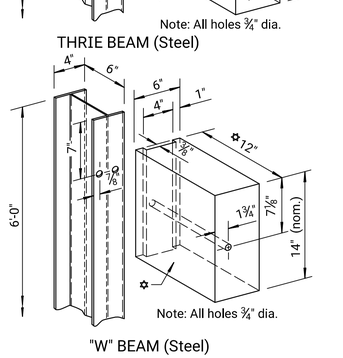
⊗ Diameter may vary from 1'-6" (min.) to 2'-0".



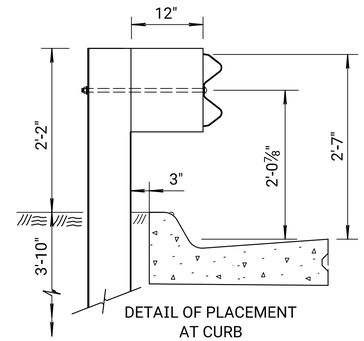
THRIE BEAM (Steel)



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.

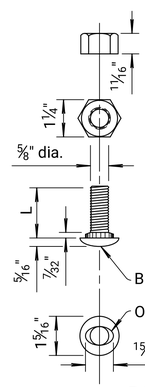
Set guardrail posts by digging or by driving. Use post caps to protect the post from crushing during driving operations.

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.

KDOT Graphics Certified 05-11-2022

Sh. No. 47

KDOT Graphics Certified

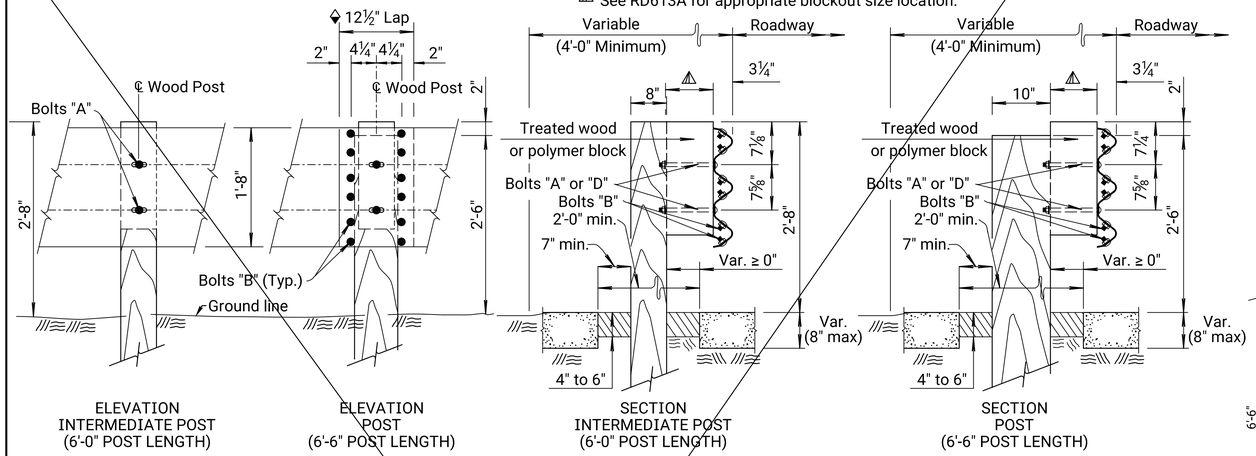
Notes to Designer: For posts installed in pavement thicker than 8" or posts installed in rock formations refer to AASHTO's Roadside Design Guide for details then revise this drawing and all supporting drawings appropriately.

Drawn By : MDELEON Plotted : 07/11/2024
File : c:\pwworking\central01\d2274982\ka602001rd611a.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	48	293

◈ 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.



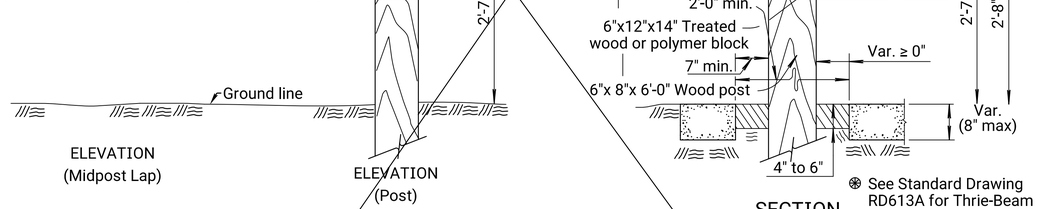
ELEVATION INTERMEDIATE POST (6'-0" POST LENGTH)

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)

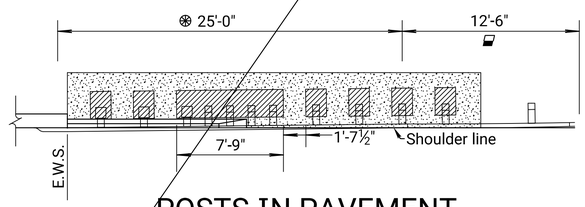
SECTION

⊛ 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



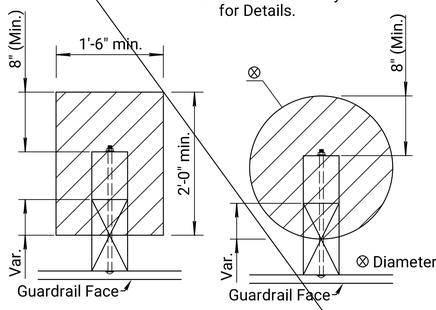
POSTS IN PAVEMENT

(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.

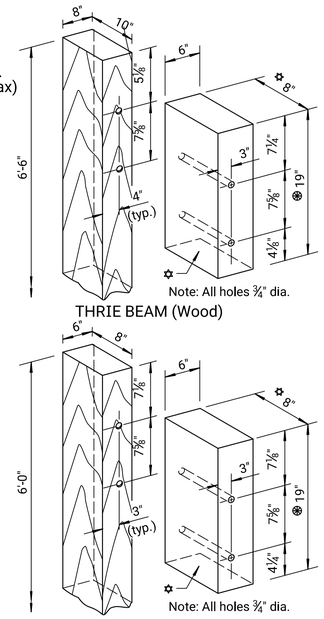


RECTANGULAR GEOMETRY

CIRCULAR GEOMETRY

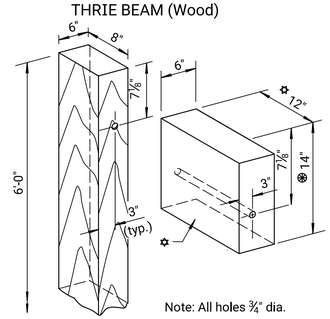
⊗ Diameter may vary from 1'-6" (min.) to 2'-0".

PLAN (ALTERNATE GEOMETRIES)

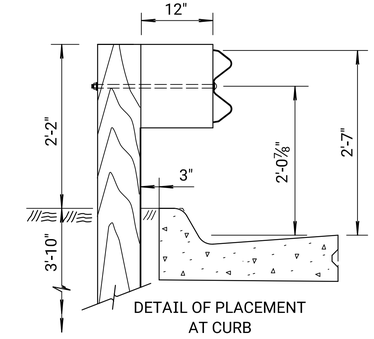


THRIE BEAM (Wood)

THRIE BEAM (Wood)

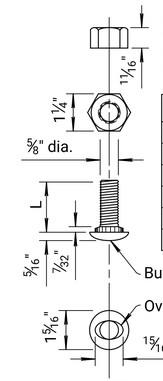


"W" BEAM (Wood)



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.

KDOT Graphics Certified 05-11-2022

Sh. No. 48

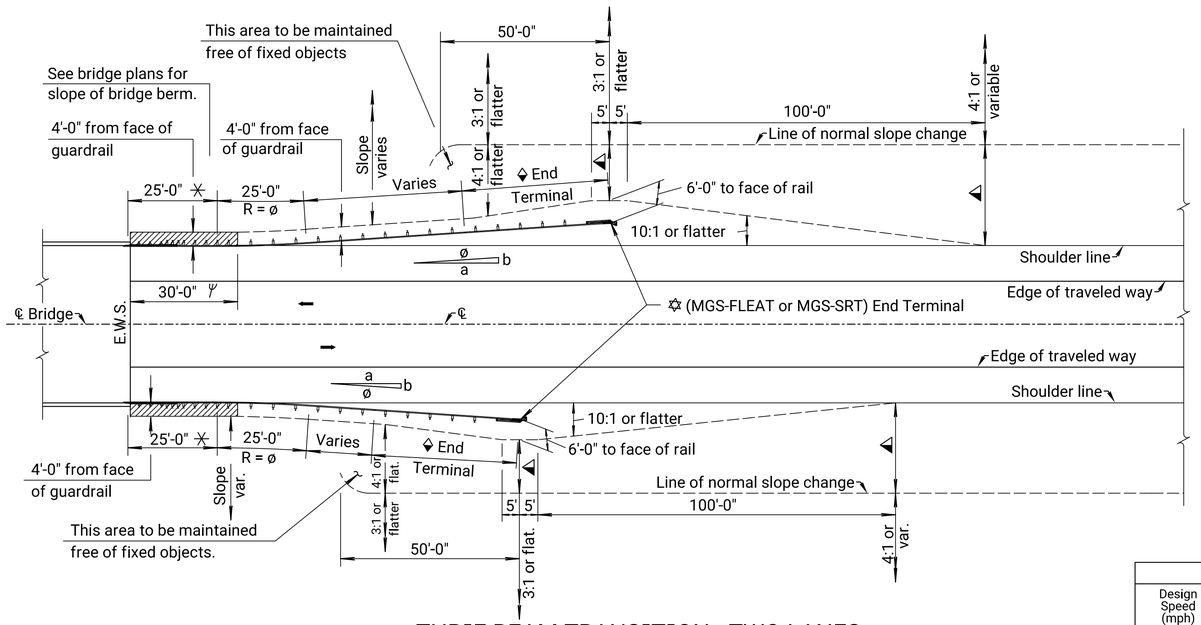
KDOT Graphics Certified

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

Drawn By : MDELEON Plotted : 07/11/2024

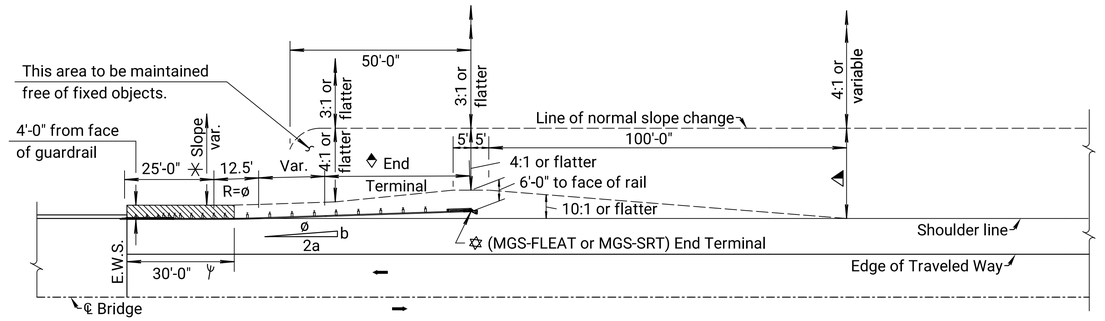
File : c:\pwworking\central01\d2274982\ka6020001rd611b.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	49	293



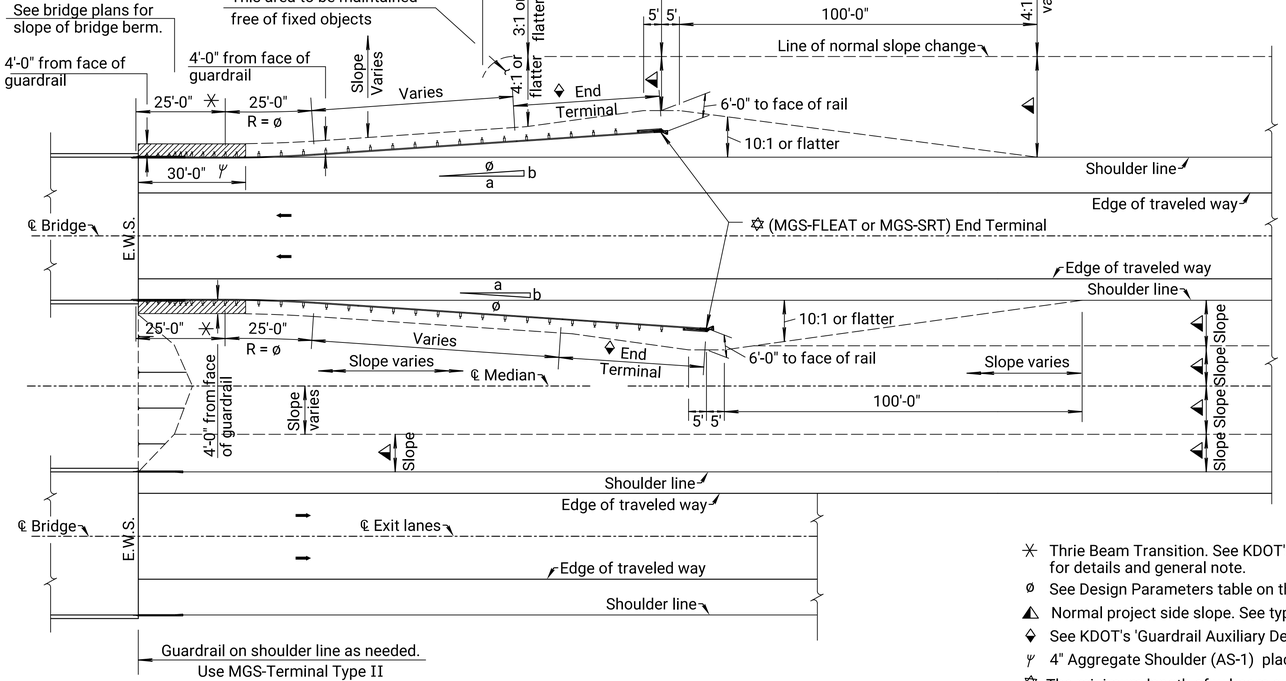
THRIE BEAM TRANSITION - TWO LANES

Note: Use flare rate of a:b and curve length of 25'-0" when guardrail is beyond shyline. Use flare rate of 2a:b and curve length of 12'-6" when guardrail is located inside the shy line.



ALTERNATE TREATMENT - TWO LANES (Flare Rate = 2a:b)

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



THRIE BEAM TRANSITION - FOUR LANES (DIVIDED)

- Thrie Beam Transition. See KDOT's 'Thrie Beam Guardrail Transition Details' Standard Drawings for details and general note.
- ø See Design Parameters table on this sheet for radius, length of curve and flare rate information.
- ◭ Normal project side slope. See typical sections.
- ⧫ See KDOT's 'Guardrail Auxiliary Details' Standard Drawing.
- ℽ 4" Aggregate Shoulder (AS-1) placed on 4'-0" embankment widening.
- ✡ The minimum length of w-beam guardrail required between the guardrail end terminal and any transition section, including the thrie-beam transition, is 12'-6".

Notes to Designer: Determine guardrail length of need using either KDOT's Length of Need Equation or a graphic design approach with an L_1 distance measured from the edge of the area of concern to the P.I. of the curved guardrail section. Combine materials for asphalt widening in the plan quantities.

Optional: If approach side is within the shyline, use a flare rate of 2a:b for all quadrants.

Drawn By : MDELEON Plotted :07/11/2024
File : c:\pwworking\central01\d2274982\ka6020001rd612c.dgn

NO.	DATE	REVISIONS	BY	APP'D
04	06-05-18	Removed Flare-beyong-the-Flare	A.L.R.	T.T.R.
03	05-15-17	Removed X-LITE	A.L.R.	S.W.K.
02	06-07-12	Revised Note to Designer	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

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

~~RD612C~~

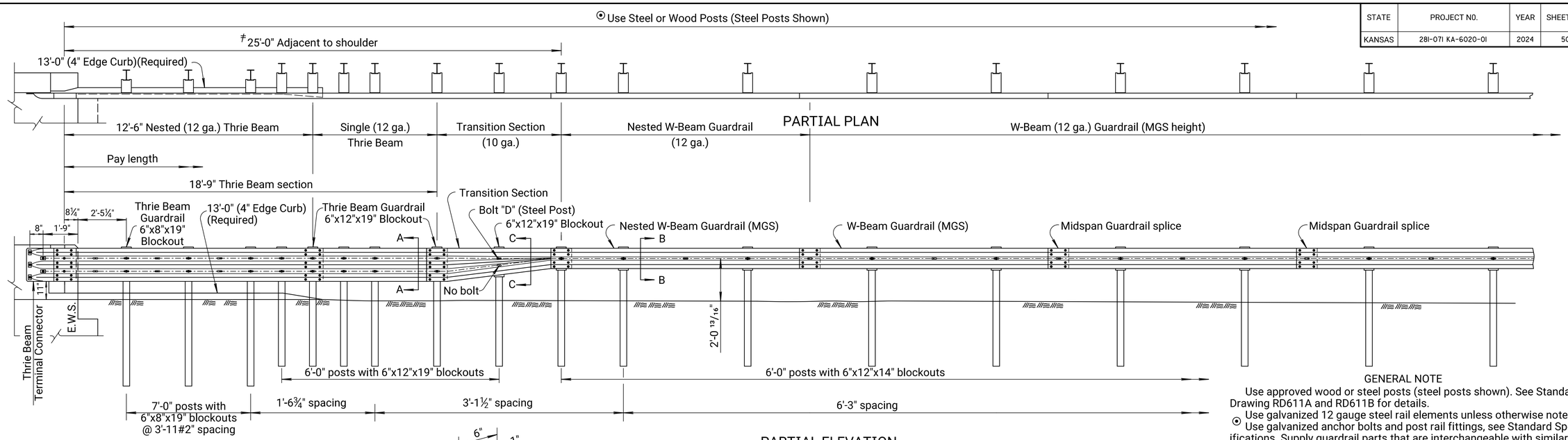
FHWA APPROVAL	06-19-18	APP'D.	Scott. W. King
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 08-21-2022

KDOT Graphics Certified

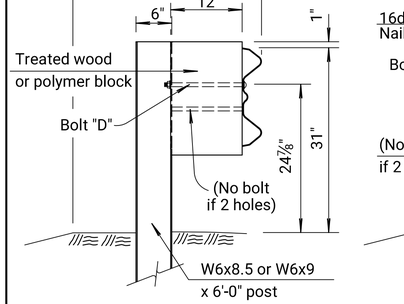
Sh. No. 49

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	50	293

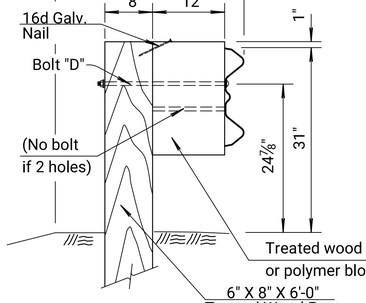


PARTIAL PLAN

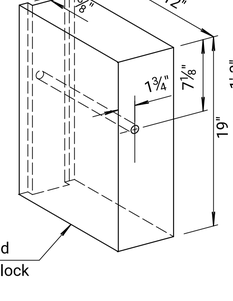
PARTIAL ELEVATION



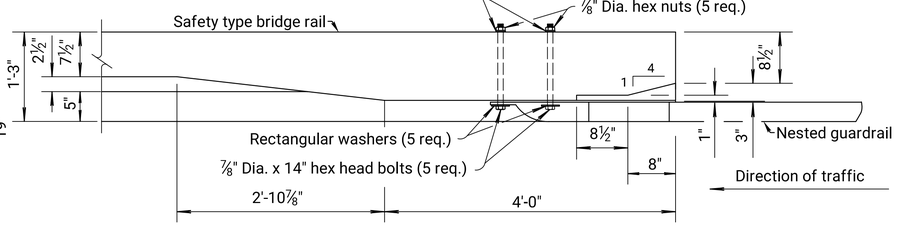
⊙ SECTION C-C (STEEL POST)



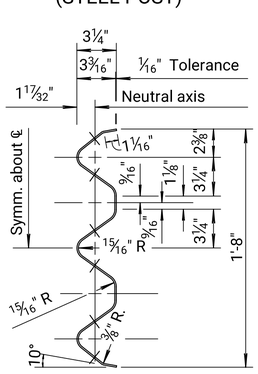
⊙ SECTION C-C (WOOD POST)



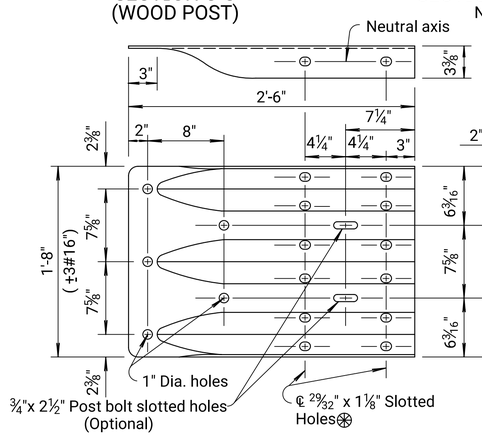
SECTION C-C (BLOCKOUTS)
Note: All holes ¾" dia.



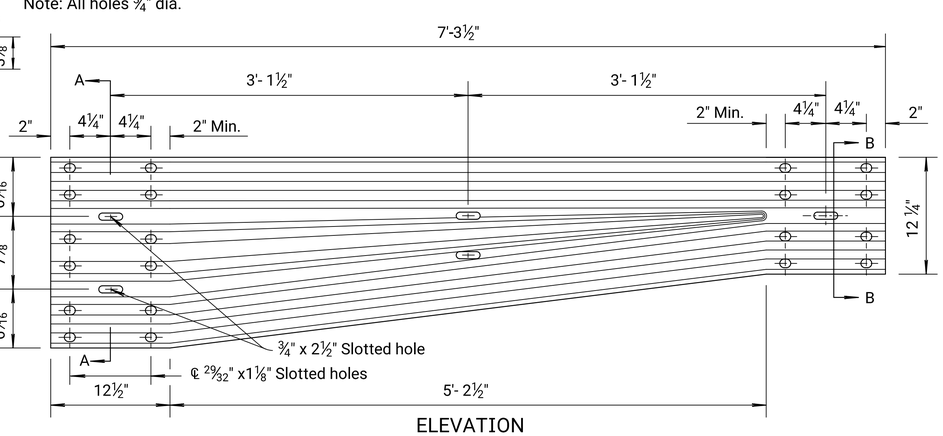
PLAN VIEW
GUARDRAIL ATTACHMENT
TO SAFETY SHAPE BRIDGE RAIL



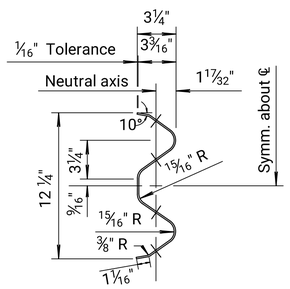
SECTION A-A
THRU RAIL ELEMENT
TYPICAL THRIE BEAM



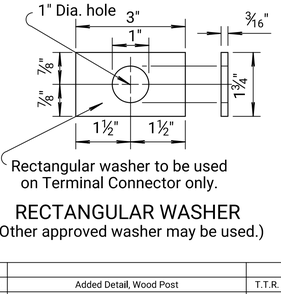
TERMINAL CONNECTOR
⊛ Optional 29⁄32" x 1¾" Slotted holes Rotated 50° (Typical) (12 req'd.)



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



SECTION B-B
THRU RAIL ELEMENT
TYPICAL W-BEAM



RECTANGULAR WASHER
(Other approved washer may be used.)

GENERAL NOTE

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

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

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

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

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

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

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

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

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

NO.	DATE	REVISIONS	BY	APP'D
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.

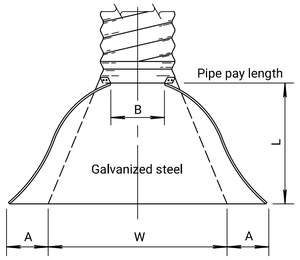
KDOT Graphics Certified 11-18-2022

Sh. No. 50

KDOT Graphics Certified

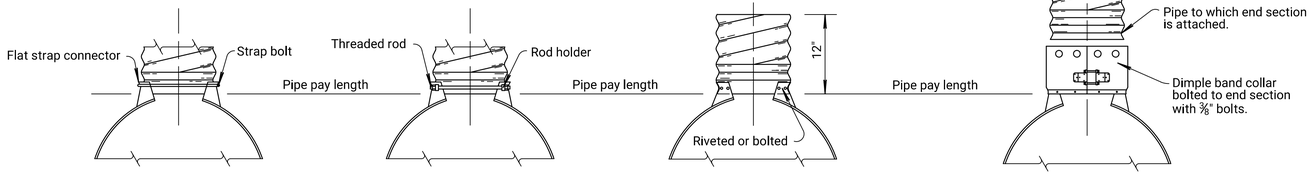
Drawn By : MDELEON
File : c:\pwworking\central01\d2274982\ka6020001rd613a.dgn
Plotted :07/11/12 2:44

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	5I	293



PLAN

(Illustrated with Type #3 Connection)



TYPE 1

Available in sizes 12" through 24" only.

TYPE 2

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

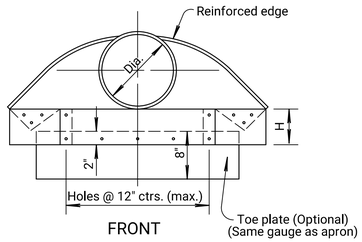
TYPE 3

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

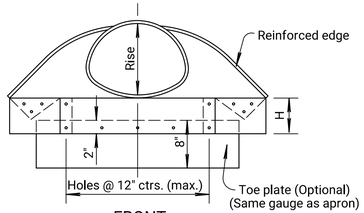
TYPE 5

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

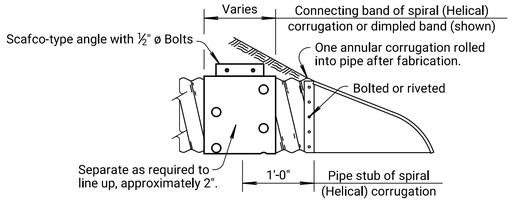
Note: Type 3 connection may be furnished instead of Type 1 or Type 2 for smaller round or arch pipe.



FRONT



FRONT



SPIRAL (HELICAL) CORRUGATION

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

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

Pipe Dia. (In.)	CS, ACS or CA Gauge	Dimensions in Inches					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.

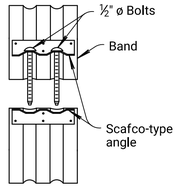
W + 10" for 12" to 30" diameter pipes inclusive.
W + 20" for 36" to 84" diameter pipes inclusive.
W + 10" for pipe-arches with a rise of 13" to 29" inclusive.
W + 20" for pipe-arches with a rise of 33" to 59" inclusive.

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.

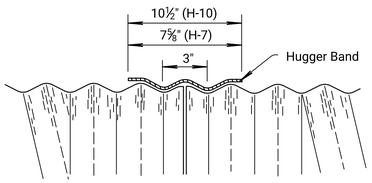
Other approved designs may be used in lieu of type shown.

Connection of end sections by welding will not be permitted.

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



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")

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	

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.

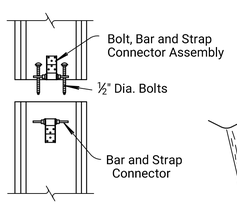
There shall be no payment for gain in pipe length due to fit of pipe at connecting band.

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.

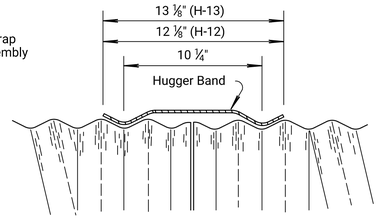
⊛ Pipe gauge listed in the tables on this sheet are minimum for E'=750 p.s.i. soil. Pipe gauge will be determined for each site based on the Design Manual Volume I- Part C Fill Height Tables and shall shall be listed in the Pipe Culvert Summary. Gauges shown on this Standard Drawing are KDOT minimum 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.

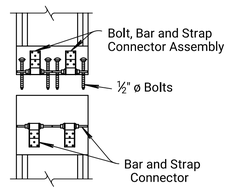
Aluminum or aluminized pipes or end sections shall be coated with an asphaltic paint when in contact with fresh concrete in accordance with the Standard Specifications.



CONNECTION DETAIL
SINGLE HARNESS



UNIVERSAL REFORMED END with
HUGGER BAND



CONNECTION DETAIL
DOUBLE HARNESS

DETAILS FOR H-12 or H-13 HUGGER BAND

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

KANSAS DEPARTMENT OF TRANSPORTATION

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

RD660

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

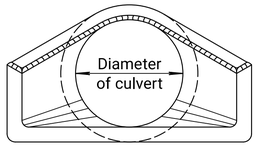
KDOT Graphics Certified 06-24-2022

Sh. No. 5I

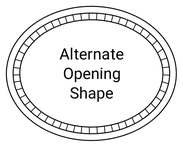
KDOT Graphics Certified

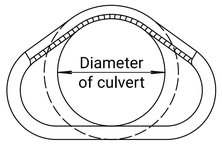
Drawn By : JHOVERSO Plotted : 07/15/2024
File : c:\pwworking\central01\d2274982\ka6020001rd660.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	52	293



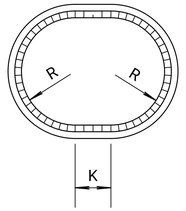
END ELEVATION (TYPE I)



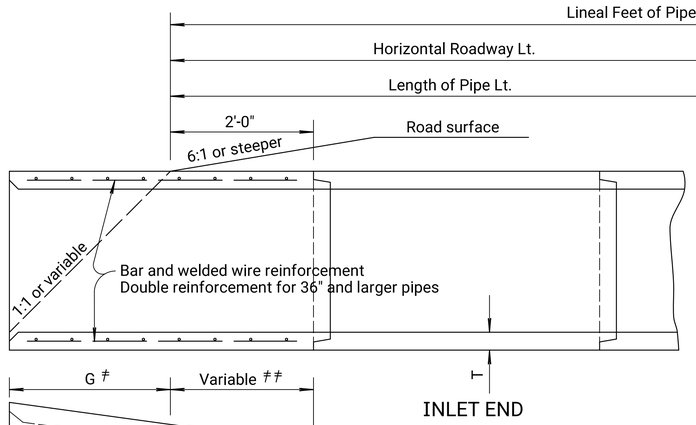


SECTION A-A

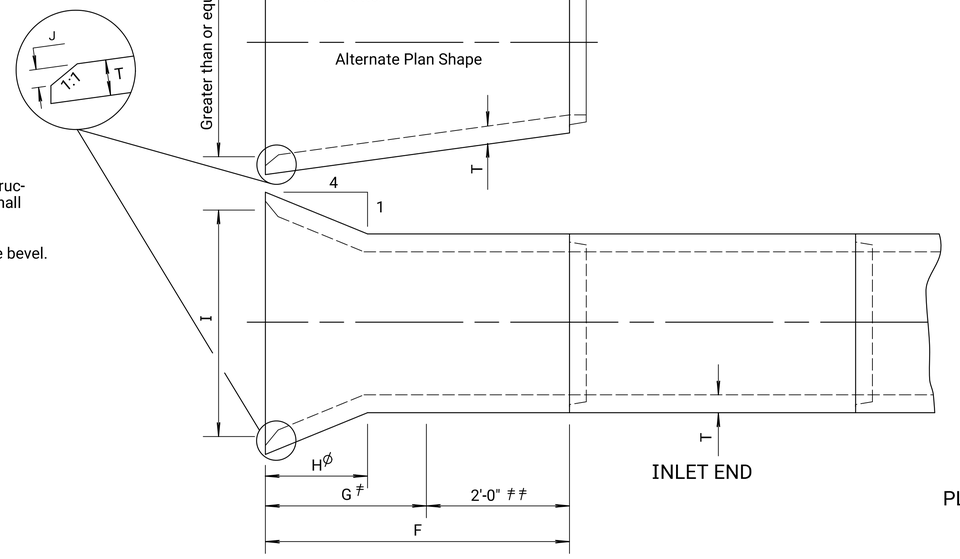
Showing rounding of inside edge of end section.

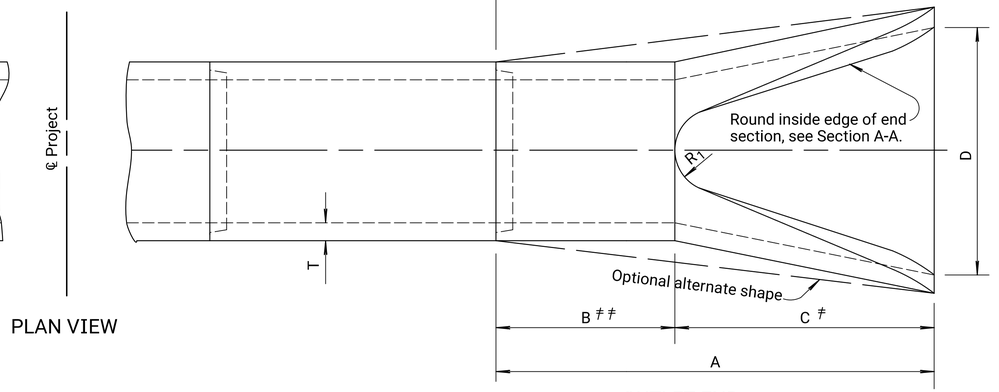


END ELEVATION (TYPE III)



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





∅ Transition to round pipe.

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

≠≠ Included in pay length of pipe.

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

END SECTION (TYPE I) NOMINAL DIMENSIONS

Diam.	A	B≠≠	C≠	D	E	R_I	Slope	T
12"	6'-0 ⅞"	4'-0 ⅞"	2'-0"	2'-0"	4"	9	3:1	2"
15"	6'-1"	3'-10"	2'-3"	2'-6"	6"	11	3:1	2 ¼"
18"	6'-1"	3'-10"	2'-3"	3'-0"	9"	12	3:1	2 ½"
24"	6'-1 ½"	2'-6"	3'-7 ½"	4'-0"	9 ½"	14	3:1	3"
30"	6'-1 ¾"	1'-7 ¾"	4'-6"	5'-0"	1'-0"	15	3:1	3 ½"
36"	8'-1 ¾"	2'-10¾"	5'-3"	6'-0"	1'-3"	20	3:1	4"
42"	8'-2"	2'-11"	5'-3"	6'-6"	1'-9"	22	3:1	4 ½"
48"	8'-2"	2'-2"	6'-0"	7'-0"	2'-0"	22	3:1	5"
54"	8'-2 ¼"	2'-9 ¼"	5'-5"	7'-6"	2'-3"	24	2.4:1	5 ½"
60"	8'-3"	3'-3"	5'-0"	8'-0"	2'-11"	24	21	6"
72"	8'-3"	1'-9"	6'-6"	9'-0"	3'-0"	24	1.86:1	7"
84"	9'-3 ½"	1'-9"	7'-6 ½"	10-0"	3'-0"	24	1.6:1	8"

SIDE TAPERED INLET SECTION (TYPE III)-NOMINAL DIMENSIONS

Diam.	Min. W.W.⚹ Area Sq. Ft.	F	G	H	I	J	K	R	T
24"	4.5	4'-3"	2'-3"	1'-5 ⅛"	2'-8"	1 ½"	8"	1'-0"	3"
30"	7.0	4'-9 ½"	2'-9 ½"	1'-9 ½"	3'-4"	2"	10"	1'-3"	3 ½"
36"	10.1	5'-4"	3'-4"	2'-1 ½"	4'-0"	2"	1'-0"	1'-6"	4"
42"	13.7	5'-10 ½"	3'-10 ½"	2'-5 ⅞"	4'-8"	2 ½"	1'-2"	1'-9"	4 ½"
48"	17.9	6'-5"	4'-5"	2'-10 ⅛"	5'-4"	3"	1'-4"	2'-0"	5"
54"	22.7	6'-11 ½"	4'-11 ½"	3'-2 ½"	6'-0"	3 ½"	1'-6"	2'-3"	5 ½"
60"	28.0	7'-6"	5'-6"	3'-6 ⅞"	6'-8"	4"	1'-8"	2'-6"	6"
72"	40.3	8'-7"	6'-7"	4'-3 ⅝"	8'-0"	5"	2'-0"	3'-0"	7"
84"	54.8	9'-8"	7'-8"	5'-0 ⅜"	9'-4"	6"	2'-4"	3'-6"	8"

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

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

KANSAS DEPARTMENT OF TRANSPORTATION

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

RD662

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

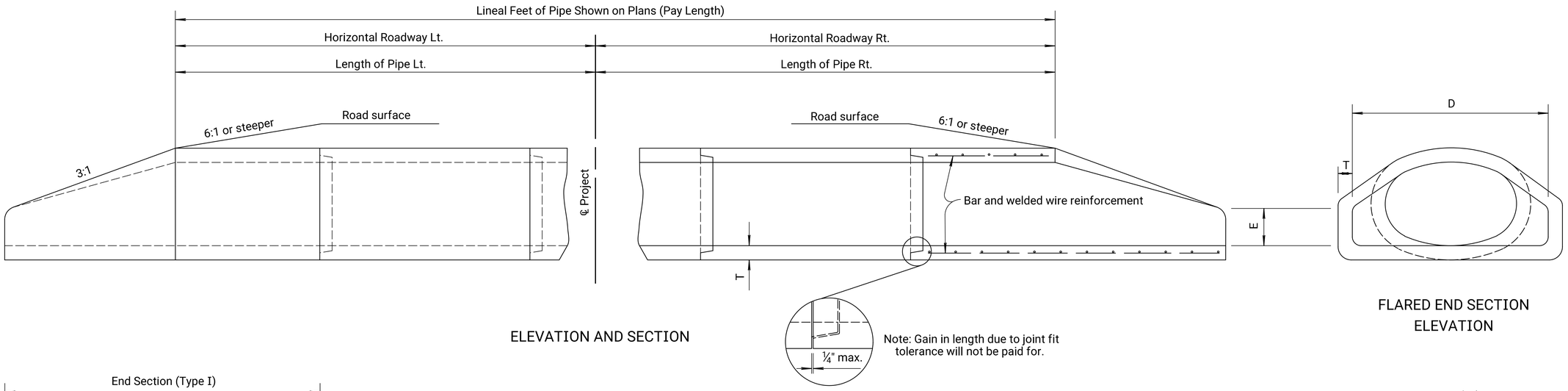
KDOT Graphics Certified 05-16-2022

Sh. No. 52

KDOT Graphics Certified

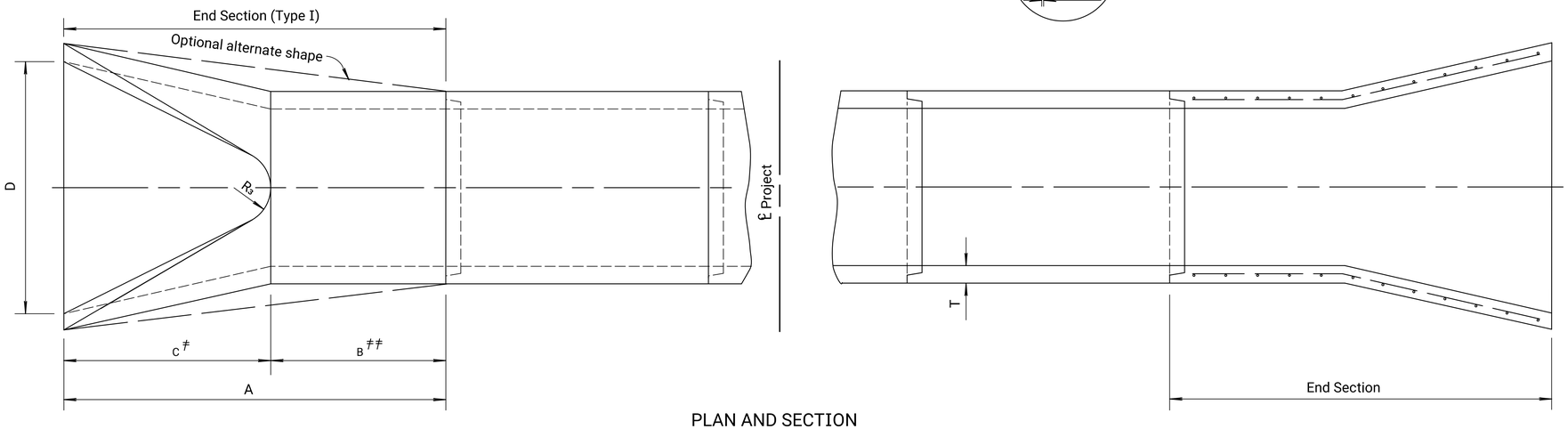
Drawn By : JHOVERSO Plotted : 07/15/2024
File : c:\pwworking\central01\d2274982\ka6020001rd662.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	53	293

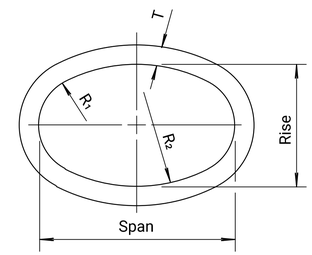


ELEVATION AND SECTION

FLARED END SECTION ELEVATION



PLAN AND SECTION



END ELEVATION

END SECTION (TYPE I) NOMINAL DIMENSIONS													
Bid Designation Sq. Ft.	Equiv. Dia. (in.)	Min. W.W. Area Sq. Ft.	Span	Rise	Overall Length A	Barrel Length B ≠≠	C≠	D	E	R_1	R_2	R_3	T
1.0 or 1.5	18"	1.8	23"	14"	6'-0"	3'-9"	2'-3"	3'-0"	8"	6"	20"	6"	2¾"
2.0, 2.5 or 3.0	24"	3.3	30"	19"	6'-0"	2'-9"	3'-3"	4'-0"	8½"	8¼"	26¼"	7"	3¼"
4.0	27"	4.1	34"	22"	6'-0"	2'-2"	3'-10"	4'-6"	9"	9¼"	29 17/32"	8"	3½"
5.0	30"	5.1	38"	24"	6'-0"	1'-6"	4'-6"	5'-0"	9½"	10¼"	32¾"	9"	3¾"
6.0	33"	6.3	42"	27"	6'-0"	1'-3"	4'-9"	5'-6"	10⅜"	11 7/16"	36 3/16"	10½"	3¾"
7.0	36"	7.4	45"	29"	8'-0"	3'-0"	5'-0"	6'-0"	11¼"	12¼"	39¼"	12"	4½"
8.5	39"	8.8	49"	32"	8'-0"	3'-0"	5'-0"	6'-3"	12"	13 3/16"	42 21/32"	12½"	4¾"
10.0	42"	10.2	53"	34"	8'-0"	3'-0"	5'-0"	6'-6"	15¾"	14¾"	46"	13"	5"
11.0 or 12.5	48"	12.9	60"	38"	8'-0"	3'-0"	5'-0"	7'-0"	21"	16½"	51¾"	14"	5½"
14.0 or 16.5	54"	16.6	68"	43"	8'-0"	3'-0"	5'-0"	7'-6"	25½"	18 21/32"	58 13/32"	16"	6"

≠ Paid for as separate item of "End Sections".

≠≠ Included in pay length of pipe.

Design of end section shall conform to standard reinforced concrete horizontal elliptical pipe. Slight variations in the dimensions specified will be allowed.

Note: Reinforced concrete pipe extensions are based on the surveyed end of pipe. Replacement of any additional pipe length required due to the removal of the existing end section will not be paid for directly, but will be subsidiary to the bid item "Removal of Existing Structures".

NO.	DATE	REVISIONS	BY	APP'D
04	05-17-13	Added Note, Pipe Extenstions Subsidiary	S.W.K.	J.O.B.
03	04-18-08	Added ref. to KDOT Pipe Policy	S.W.K.	J.O.B.
02	04-06-05	Revised reinforcement callout	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

CONCRETE END SECTION FOR REINFORCED CONCRETE HORIZONTAL ELLIPTICAL PIPE TYPE I

RD663

FHWA APPROVAL	09-04-14	APP'D.	Jame O. Brewer
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 05-16-2022

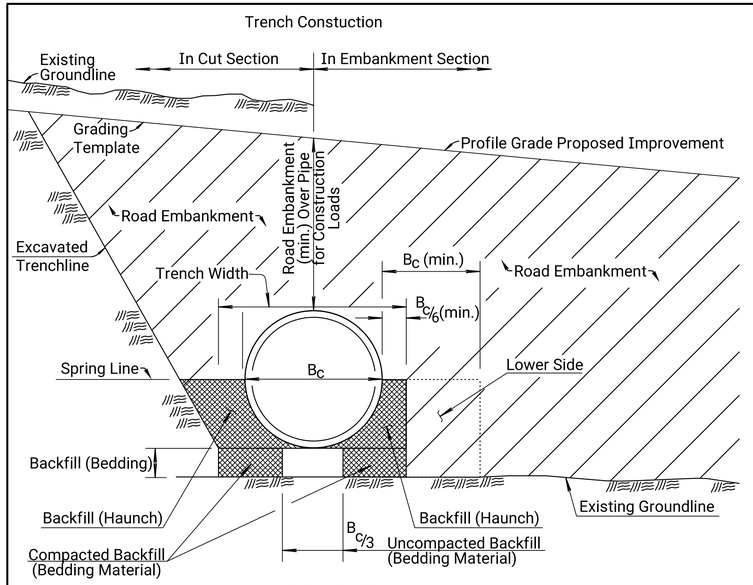
Sh. No. 53

KDOT Graphics Certified

Drawn By : JHOVERSO Plotted : 07/15/2024
File : c:\pwworking\central01\d2274982\ka6020001rd663.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	54	293

REINFORCED CONCRETE PIPE



Backfill (Bedding) Thickness: When over soil, use $B_C/_{24"}$ (min. of 4" & max of 24") of PB-2 or PB-3.
When over rock, excavate $B_C/_{12"}$ (min. of 6") below the bottom of the pipe and replace with PB-3.

Backfill Material: See KDOT's Standard Specifications, Aggregates for Backfill in Division 1100.

Compacted Backfill Material: Use Type B compaction in the haunch areas shown above. Use Type A compaction Backfill (Bedding), unless otherwise specified in the Contract Documents.

Road Embankment: For compaction See KDOT Road Standard Drawing, Foundation Treatment & Compaction of Earthwork.

Trench Width: The minimum required trench width is the greater of:
$1.33 \times B_C$ or $B_C + 24"$

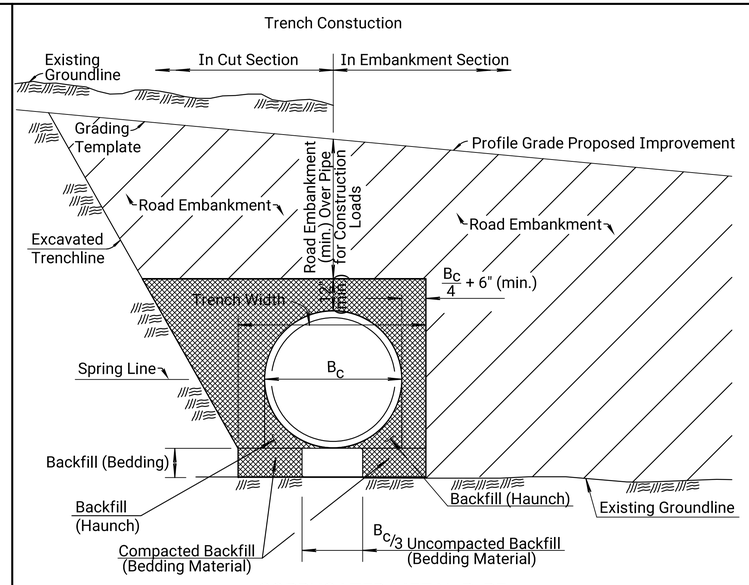
B_C: Outside Pipe Diameter

Minimum Road Embankment for Construction Loads				
Pipe Dia. (Inside Diameter)	Axle Load (Tons)			
	<25	25-37.5	37.5-55	55-75
≤ 15"	2'-0"	3'-0"	4'-6"	6'-0"
18"	2'-0"	3'-0"	4'-0"	6'-0"
21" - 24"	1'-6"	2'-6"	4'-0"	6'-0"
27"	1'-6"	2'-6"	4'-0"	5'-6"
30"	1'-0"	2'-6"	4'-0"	5'-6"
33"	1'-0"	2'-0"	4'-0"	5'-6"
36"	1'-0"	1'-6"	4'-0"	5'-6"
42"	1'-0"	1'-6"	3'-6"	5'-6"
48" - 54"	1'-0"	1'-6"	2'-6"	5'-6"
60" - 66"	1'-0"	2'-0"	2'-6"	5'-6"

Minimum Road Embankment for Construction Loads				
Pipe Dia. (Inside Diameter)	Axle Load (Tons)			
	<25	25-37.5	37.5-55	55-75
72"	1'-0"	2'-0"	3'-6"	4'-0"
66" - 84"	1'-0"	2'-0"	3'-0"	4'-0"
90"	1'-0"	2'-0"	3'-6"	4'-6"
96"	1'-0"	2'-6"	3'-6"	4'-6"
102"	0'-6"	2'-6"	3'-6"	5'-0"
108"	0'-6"	2'-0"	3'-6"	5'-0"
114"	0'-6"	2'-0"	4'-0"	5'-0"
120" - 132"	0'-6"	2'-0"	4'-0"	5'-6"
144"	1'-0"	2'-6"	4'-6"	5'-6"

Minimum Road Embankment height should be no less than the value in the provided table or the manufacturer's specification.

CORRUGATED METAL PIPE



Backfill (Bedding) Thickness: When over soil, use ½ in./ft. of fill over pipe (min. of 4" & max. of 24") of PB-2 or PB-3.
When over rock, excavate 6" below the bottom of the pipe and replace with PB-2 or PB-3.

Backfill Material: See KDOT's Standard Specifications, Aggregates for Backfill in Division 1100.

Compacted Backfill Material: See KDOT's Standard Specifications and Pipe Manufacturer's Installation Guidelines.

Compaction: Use Type B compaction in the haunch areas shown above. Use Type A compaction Backfill (Bedding), unless otherwise specified in the Contract Documents.

Road Embankment: For compaction See KDOT Road Standard Drawing, Foundation Treatment & Compaction of Earthwork

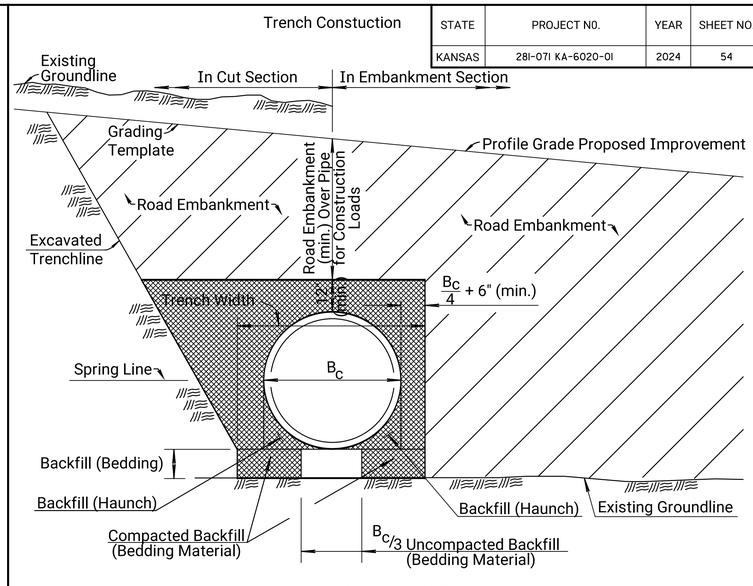
Trench Width: The minimum required trench width is the greater of:
$1.50 \times B_C + 12"$ or $B_C + 16"$

B_C: Outside Pipe Diameter

Corrugated Metal pipe: Minimum Road Embankment for Construction Loads				
Pipe Dia. (Inside Diameter)	Axle Load (Tons)			
	<25	25-37.5	37.5-55	55-75
< 42"	2'-0"	2'-6"	3'-0"	3'-0"
48" - 72"	3'-0"	3'-0"	3'-6"	4'-0"
78" - 120"	3'-0"	3'-6"	4'-0"	4'-0"
126" - 144"	3'-6"	4'-0"	4'-4"	4'-4"

Minimum Road Embankment height should be no less than the value in the provided table or the manufacturer's specification.

THERMOPLASTIC PIPE



Backfill (Bedding) Thickness: When over soil, use ½ in./ft. of fill over pipe (min. of 4" & max. of 24") of PB-2 or PB-3.
When over rock, excavate 6" below the bottom of the pipe and replace with PB-2 or PB-3.

Backfill Material: See KDOT's Standard Specifications, Aggregates for Backfill in Division 1100.

Compacted Backfill Material: Use Type B compaction.

Compaction: Hand-held or walk behind compaction equipment is permitted when compacting fill directly above the pipe only when the fill over the pipe is greater than or equal to 12". The use of ride-on compaction equipment is permitted for compacting fill directly above the pipe only when the fill over the pipe is greater than or equal to 36". A prime goal of pipe installation is to manipulate and compact embedment material under the pipe haunches, to achieve full contact of the material with the pipe bottom and fill voids under the pipe.

Road Embankment: For compaction See KDOT Road Standard Drawing, Foundation Treatment & Compaction of Earthwork.

Trench Width: The minimum required trench width is $1.50 \times B_C + 12"$
The maximum trench width is $1.575 \times B_C + 12\frac{1}{2}"$

B_C: Outside Pipe Diameter

Thermoplastic Pipe: Minimum Road Embankment for Construction Loads				
Pipe Dia. (Inside Diameter)	Axle Load (Tons)			
	<25	25-37.5	37.5-55	55-75
< 36"	2'-0"	2'-6"	3'-0"	3'-0"
42" - 48"	3'-0"	3'-0"	3'-6"	4'-0"
54" - 60"	3'-0"	3'-0"	3'-6"	4'-0"

Minimum Road Embankment height should be no less than the value in the provided table or the manufacturer's specification.

GENERAL NOTES

Do not drop, drag or otherwise handle pipe sections in a manner which may cause damage. Inspect the line and grade before and during placement of compacted backfill and uncompacted backfill materials.

For trench installations place pipe in the center of the excavated trench.

When installing pipe, place the uncompacted backfill and compacted backfill material in the bedding area to grade, install pipe to grade, place and compact the haunch area up to the spring line of the pipe and complete the backfill as specified in KDOT's Standard Specifications unless otherwise noted in the contract documents.

B_C for horizontal elliptical pipe, vertical elliptical pipe, arch pipe, and non bridge-sized concrete box structures will be measured along the horizontal axis; similar to the dimension shown for circular pipe on this sheet.

The spring line is a line along the side of the culvert where the tangent to the culvert wall is vertical. It occurs at the widest point in the culvert.

Material used for the roadway embankment may be used in lieu of compacted backfill material as approved by the Engineer.

The backfill load transmitted to the pipe is directly dependent on the trench width. Where maximum trench widths are not indicated in any of the contract documents, trench widths should be as a narrow as possible with side clearance adequate enough to ensure proper compaction of backfill material at the sides of the pipe. The trench width formulas provided can be used as a general guide.

NO.	DATE	REVISIONS	BY	APP'D
01	05-09-22	Initial Release	A.L.R.	T.T.R.

KANSAS DEPARTMENT OF TRANSPORTATION

PIPE INSTALLATION DETAILS

RD658

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

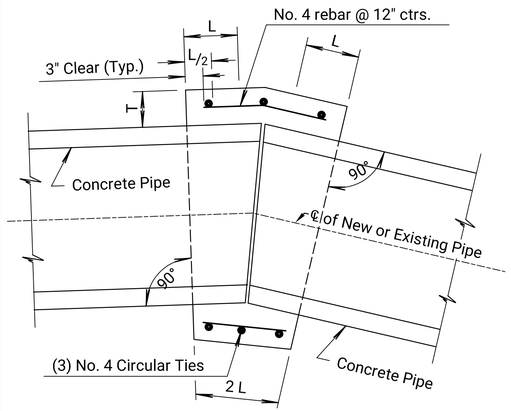
KDOT Graphics Certified 06-10-2022

Sh. No. 54

KDOT Graphics Certified

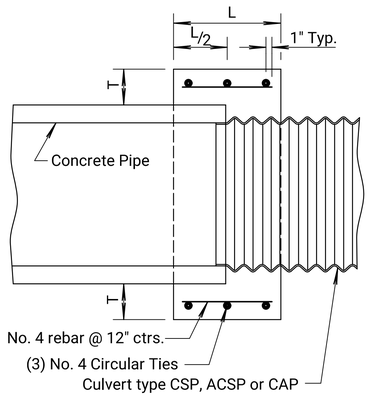
Drawn By : MDELEON
File : c:\pwworking\central01\d2274982\ka6020001rd658.dgn
Plotted : 07/11/2024

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-071 KA-6020-01	2024	55	293



PIPE COLLAR AT CHANGE IN ALIGNMENT

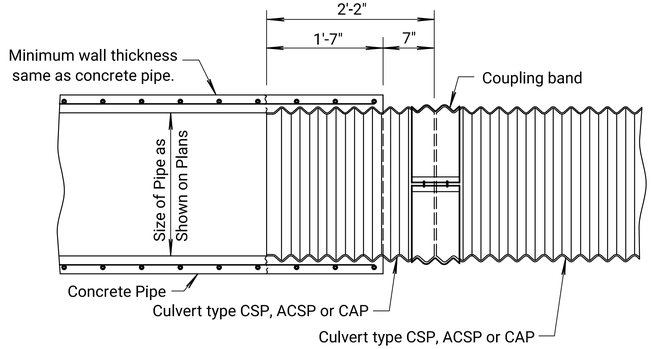
TYPE A COLLAR



PIPE COLLAR AT CHANGE IN PIPE MATERIAL

TYPE B COLLAR

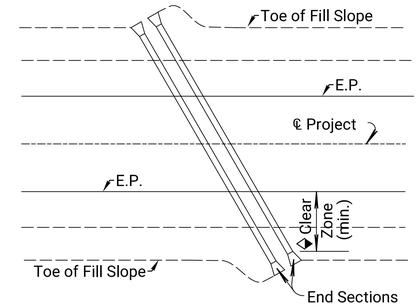
CONCRETE PIPE COLLAR		
Pipe Dia.	L	T
18"	1'-0"	6"
24"	1'-0"	6"
36"	1'-6"	8"
48"	1'-6"	10"
60"	1'-9"	11"



(CONCRETE PIPE CONNECTED TO CORRUGATED METAL PIPE)

TYPE C COLLAR ⚠

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



PLACEMENT OF ROTATED PIPES
RELATIVE TO FILL SLOPE
AND CLEAR ZONE

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

General Notes:

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

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

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

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

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

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

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

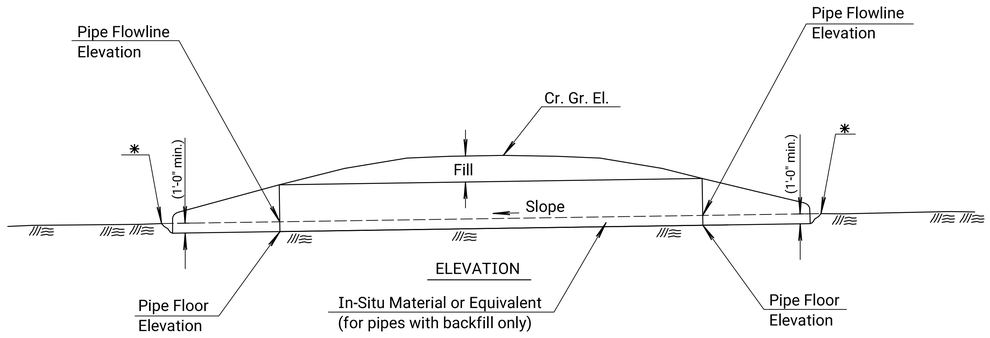
PIPE COLLARS

GENERAL NOTE

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

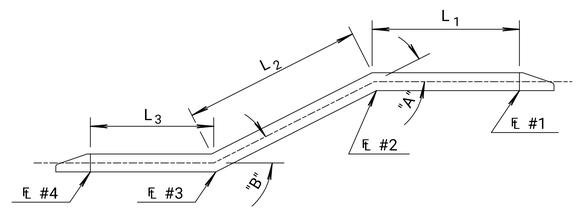
For pipes where the height or rise is less than or equal to 4'-0" install the pipe such that embedment will occur through natural sedimentation. See Pipe Embedment detail shown on this sheet.

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



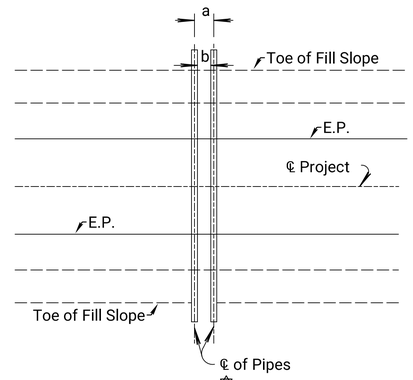
PIPE EMBEDMENT

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



Sketch Along ℄ Pipe
Broken-Back

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



a = Face width of end section ✡ + 1'.

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

Type I Concrete = D
Type III Concrete = I
Type I CM = W+ 2A
Type III CM = G
Type IV = W+ 2A

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

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

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

MULTIPLE PIPE SPACING

NO.	DATE	REVISIONS	BY	APP'D
06	01-21-16	Added Details, Pipe Embedment	T.T.R.	S.W.K.
05	05-17-13	Rev. Dimension, Type B Collar	S.W.K.	J.O.B.
04	04-18-08	Added asphaltic paint note	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

MISCELLANEOUS PIPE CULVERT DETAILS

RD668

FHWA APPROVAL	03-16-16	APP'D.	Scott W. King
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 02-29-2024

Sh. No. 55

KDOT Graphics Certified

Drawn By : MDELEON Plotted :07/11/2024
File : c:\pwworking\central01\d0274982\ka6020001rd668.dgn

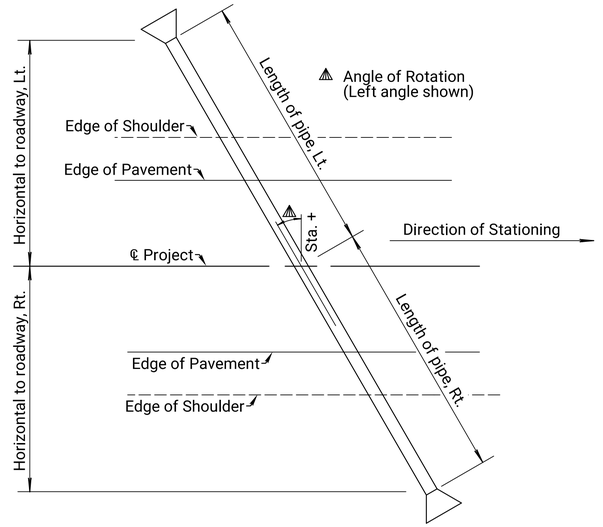
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	56	293

PIPE CULVERT SUMMARY

Station	Type	Size or Bid Designation Sq. Ft.	Crown Grade Elev.	Flow Line		Floor Elev.		Horizontal Roadway		Degree of Rotation	Length of Pipe		Lin. Ft. of Pipe	Fill Height. (FT.)	Concrete Pipe AASHTO Class No.	Pipe Gauge ◔		Pipe Corrugations ◔		Remarks
				Lt.	Rt.	Lt.	Rt.	Lt.	Rt.		Lt.	Rt.				Steel	Alum.	Steel	Alum.	
US-281 33+40.00	CRP	30"	1601.15	1585.36	1591.34			80.00	66.00	0	80.0	66.0	146.0	9.2	II					
US-281 (RT Ent) 51+97.00	EP	2-36"	1576.00	1571.08	1571.61			22.95	22.95	3.5° LT	23.0	23.0	46.0	1.0	III					
US-281 (LT Ent) 51+97.00	EP	24"	1576.00	1572.82	1571.99			23.00	23.00	0	23.0	23.0	46.0	1.4	III	14	16	2-2/3x1/2 in.	2-2/3x1/2 in.	
US-281 78+15.00	CRP	30"	1565.05	1557.90	1556.90			44.00	48.00	0	44.0	48.0	92.0	3.7	II					
US-281 (RT Ent) 117+45.00	EP	2-36"	1532.29	1527.84	1527.98			23.00	23.00	0	23.0	23.0	46.0	1.0	III					
US-281 (LT Ent) 117+49.00	EP	2-30"	1532.39	1528.09	1527.95			23.00	23.00	0	23.0	23.0	46.0	1.4	IV	14	14	2-2/3x1/2 in.	2-2/3x1/2 in.	
US-281 (RT Ent) 148+00.00	EP	36"	1526.83	1520.92	1521.07			30.00	30.00	0	30.0	30.0	60.0	3.4	II	14	14	2-2/3x1/2 in.	2-2/3x1/2 in.	
US-281 (RT Ent) 192+63.00	EP	24"	1530.75	1525.69	1525.31			29.78	29.92	4° LT	30.0	30.0	60.0	2.7	II	14	16	2-2/3x1/2 in.	2-2/3x1/2 in.	
US-281 (LT Ent) 200+12.00	EP	3.0 SF	1530.56	1527.39	1527.49			17.00	17.00	0	17.0	17.0	34.0	1.3	IV					
US-281 (RT Ent) 200+42.00	EP	3.0 SF	1531.00	1528.08	1527.98			17.00	17.00	0	17.0	17.0	34.0	1.1	IV					
US-281 (RT Ent) 201+85.00	EP	3.0 SF	1531.41	1528.51	1528.40			18.00	18.00	0	18.0	18.0	36.0	1.1	IV					
US-281 (LT Ent) 205+98.00	EP	3.0 SF	1532.38	1529.30	1529.48			18.00	18.00	0	18.0	18.0	36.0	1.1	IV					
US-281 (LT Ent) 206+99.00	EP	3.0 SF	1533.08	1529.87	1530.00			19.00	19.00	0	19.0	19.0	38.0	1.2	IV					
US-281 (RT Ent) 209+37.00	EP	3.0 SF	1534.15	1531.33	1531.04			21.00	21.00	0	21.0	21.0	42.0	1.1	IV					

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

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



PLAN
(Showing Rotation about ℄)

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

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

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

When inside diameter of pipe is 60" or less.

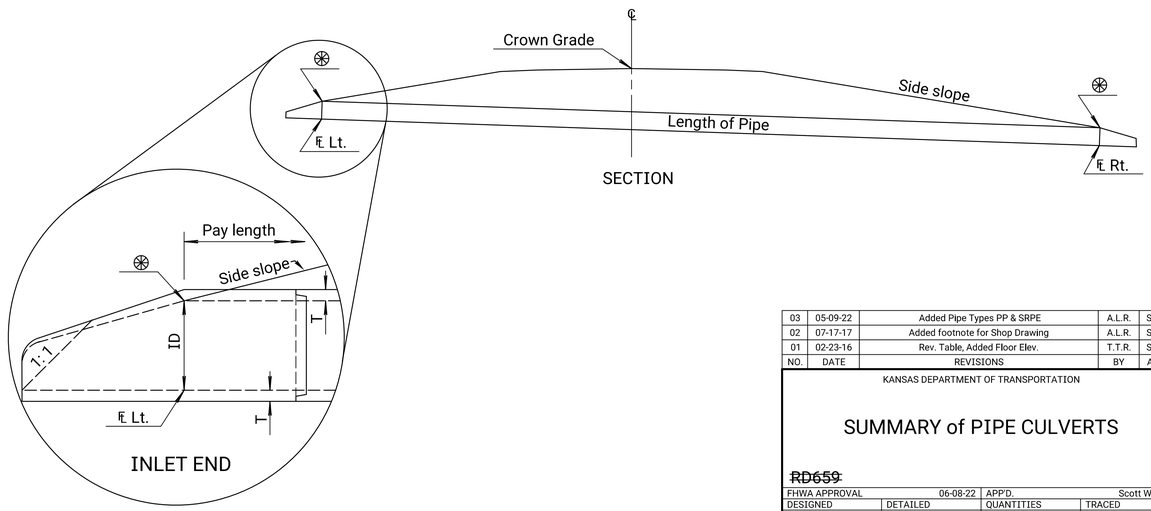
For inside diameter: ≥ 30"

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

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

⸙ Submit Shop Drawing of connection for review

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



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

KANSAS DEPARTMENT OF TRANSPORTATION

SUMMARY of PIPE CULVERTS

~~RD659~~

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

KDOT Graphics Certified 06-24-2022

Sh. No. 56

KDOT Graphics Certified

Drawn By : JHOVERSO Plotted : 07/15/2024
File : c:\pwworking\central01\d2274982\ka6020001rd659.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-01	2024	57	293

SITE DATA							HYDROLOGY						HYDRAULICS	
DRAINAGE STRUCTURE NUMBER (KDOT)	LOCATION STATION	DRAINAGE AREA NUMBER	DRAINAGE AREA ACREAGE	Recurrence Interval Years	A. H. W. ELEVATION (Ft.)	REMARKS	METHOD	DATA					H.W. Elevation (Ft.)	REMARKS
								TC (min)	C	I (in/hr)	Q (cfs)			
1	US-281 26+00	4C	131	25	1607.43	A.H.W. Based on Subgrade at Sta. 26+00	Rational	36.0	0.63	3.49	288		1606.67	Extend 6' x 6' RCB
2	US-281 33+40	4B	26	25	1599.71	A.H.W. Based on Subgrade at Sta. 33+40	Rational	23.3	0.65	4.67	78		1595.60	Install 30" RCP
3	Drive @ US-281 51+97 Rt	3	43	10	1575.92	A.H.W. Based on Subgrade at Sta. 52+00	Rational	25.1	0.50	3.59	77		1574.80	Install 2 - 36" E.P. (RCP), Overflows Driveway
4 (056)	US-281 69+35	4A, 4B & 4C	4352	25	1563.57	A.H.W. Based on Subgrade at Sta. 69+35	USGS Rural Regression (SIR 2017-5063)	n/a			1,910		1560.20	Install 4 -10' x 10' RFB, 1' embedded
5	US-281 78+15	5	8.6	25	1563.70	A.H.W. Based on Subgrade at Sta. 78+15	Rational	18.7	0.63	4.9	27		1560.78	Install 30" RCP
6	US-281 79+40	6	20	25	1564.45	A.H.W. Based on Subgrade at Sta. 79+40	Rational	17.0	0.63	5.17	66		1559.86	Install 6' x 2' RFB
7	Drive @ US-281 117+45 Rt	7	35	10	1532.88	A.H.W. Based on Subgrade at Sta. 117+49	Rational	25.4	0.50	3.59	63		1530.77	Install 2 - 36" E.P. (RCP), Overflows Driveway
8	Drive @ US-281 117+49 Lt	13D	65	10	1532.86	A.H.W. Based on Subgrade at Sta. 117+49	Rational	37.1	0.50	2.88	93		1531.75	Install 2 - 30" E.P. (RCP, CSP,ASCP,CAP), Overflows Driveway
9	US-281 123+00	13D & 13C	945	25	1531.76	A.H.W. Based on Subgrade at Sta. 123+00	Lateral Structure Calculation in HEC-RAS	n/a			145		1530.95	Install 7' x 3' RFB - Equalization Structure, Majority of Flow Continues North in West Side Ditch
10 (546)	Drive @ US-281 124+81 Lt	13D & 13C	945	10	1531.39	A.H.W. Based on Subgrade at Sta. 124+81	Three-Variable Regression	n/a			465		1529.67	Install 2 - 9' x 4' RFB, Overflows Driveway
11 (547)	US-281 130+75	13D, 13C & 13B	1565	25	1530.21	A.H.W. Based on Subgrade at Sta. 130+75	Lateral Structure Calculation in HEC-RAS	n/a			200		1529.98	Install 2 - 6' x 2' RFB - Equalization Structure, Majority of Flow Continues North in West Side Ditch
12 (549)	W 20th Dr @ US-281 131+41 Lt	13D, 13C & 13B	1565	10	1530.08	A.H.W. Based on Subgrade at Sta. 131+40	Three-Variable Regression	n/a			535		1528.42	Install 2 - 9' x 6' RFB, 1' embedded, Overflows W. 20th Drive
13 (057)	US-281 149+50	13D, 13C, 13B & 13A	2066	25	1526.36	A.H.W. Based on Subgrade at Sta. 150+00	Three-Variable Regression	n/a			1,330		1526.34	Install 2 - 14' x 6' RFB, 1' embedded Overflows Driveway
14	Drive @ US-281 148+00 Rt	14	4.1	10	1526.77	A.H.W. Based on Subgrade at Sta. 148+00	Rational	33.2	0.60	3.08	7		1522.42	Install 36" E.P. (RCP, CSP, ASCP, CAP)
15	US-281 155+00	15	63	25	1525.36	A.H.W. Based on Subgrade at Sta. 155+00	Rational	38.9	0.63	3.33	135		1509.31	Install 4' x 4' RFB (Broken-Back Layout)

Drawn By : MDELEON Plotted :07-11-24
File : c:\pwworking\central01\d2274982\ka602001rss653-01.dgn

NO.	DATE	REVISIONS	BY	APP'D
2	10-8-90	Detailed on CADD, no change	R.J.S.	J.O.B.
1	5-29-80	Assigned standard number	W.L.H.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

DRAINAGE DATA SHEET

RD653

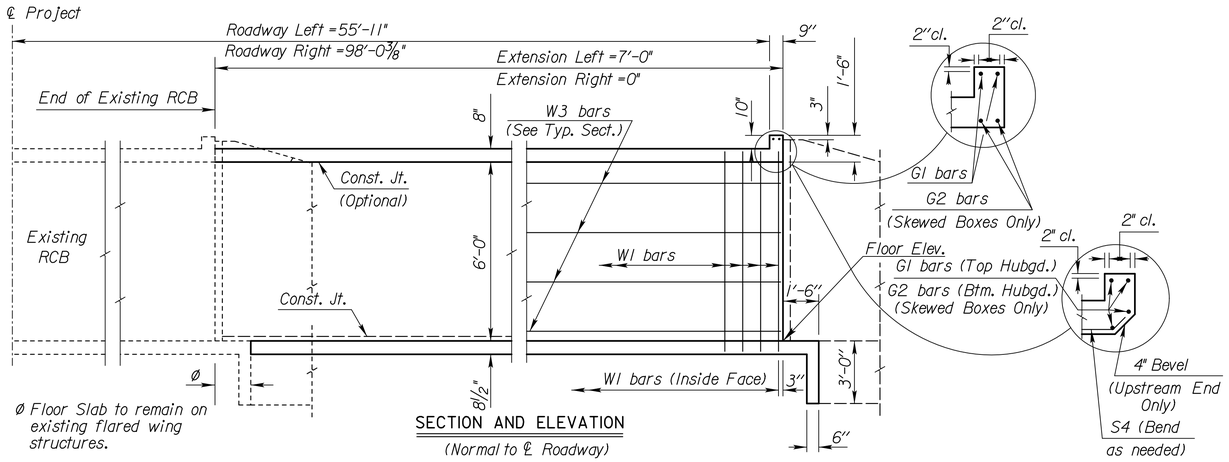
FHWA APPROVAL 01-17-91		APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED B.N.B.
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. R.J.S.

KDOT Graphics Certified 05-07-2024

Sh. No. 57

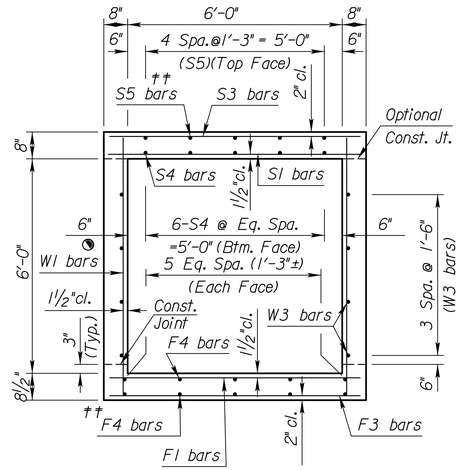
KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	58	293



SECTION AND ELEVATION

(Normal to ℄ Roadway)



TYPICAL SECTION

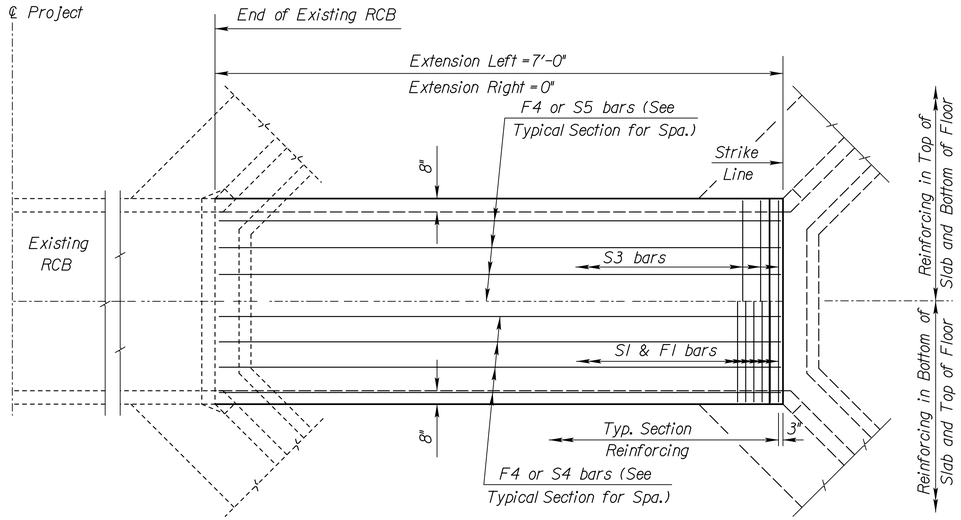
See RCB Auxiliary Details for Optional Splice.

Note:
S3 bars omitted unless grade box or slab thickness is greater than or equal to 12".

Note:
F3 bars omitted unless floor thickness is greater than or equal to 12.".

†† Omit S5 bars when S3 bars are omitted and omit the bottom layer of F4 bars when F3 bars are omitted.

See Standard No. RD 080 for additional details.



PLAN

△ For design purposes ONLY. Do NOT use for Construction

CULVERT SUMMARY

◔ includes any welded wire fabric

	Floor Elev.	Crown Gr. Elev.	△Design Fill Ht.	Skew	Wings	Scour Apron	Soil Saver	Concrete Barrel (Cu.Yds.)	Concrete Wings (Cu.Yds.)	Concrete Total (Cu.Yds.)	Reinf. Steel (Gr. 60) Barrel (Lbs.)	Reinf. Steel (Gr. 60) ◔Wings (Lbs.)	Reinf. Steel (Gr. 60) Total (Lbs.)	LRFR RATING FACTORS HL-93 Loading Inventory	LRFR RATING FACTORS HL-93 Loading Operating
Ext.Lt.	1596.73	1609.05	2	0	Flared	No	No	4.67	8.69	13.36	545	1013	1557	1.16	1.51
Ext.Rt.	1600.16				None			0.00	0.00	0.00	0	0	0		

BAR SCHEDULE

	F1 Size	F1 Spa.	F1 No.	F1 Length		F3 Size	F3 Spa.	F3 No.	F3 Length		F4 Size	F4 No.	F4 Length		S1 Size	S1 Spa.	S1 No.	S1 Length		S3 Size	S3 Spa.	S3 No.	S3 Length		S4 Size	S4 No.	S4 Length		S5 Size	S5 No.	S5 Length
Ext.Lt.	6	7"	13	7'-0"		N/A	N/A	N/A	N/A		N/A	N/A	N/A	7'-0"	4	6	5'-8"	6	7"	14	7'-0"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7'-0"	5	6	6'-8"	4	N/A	6'-8"
Ext.Rt.	N/A	N/A	N/A	N/A		N/A	N/A	N/A	N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		N/A	N/A	N/A	N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

	K1 Size	K1 Spa.	K1 No.	K1 Length		K2 Size	K2 Spa.	K2 No.	K2 Length		W1 Size	W1 Spa.	W1 No.	W1 Length		W3 Size	W3 No.	W3 Length		G1 Size	G1 Spa.	G1 No.	G1 Length		G2 Size	G2 No.	G2 Length
Ext.Lt.	N/A	N/A	N/A			N/A	N/A	N/A			5	9"	20	7'-0"		4	8	6'-8"		N/A	N/A	N/A	N/A		5	2	7'-0"
Ext.Rt.	N/A	N/A	N/A			N/A	N/A	N/A			N/A	N/A	N/A	N/A		N/A	N/A	N/A		N/A	N/A	N/A	N/A		N/A	N/A	N/A

	G2 Size	G2 Spa.	G2 No.	G2 Length
Ext.Lt.	N/A	N/A	N/A	
Ext.Rt.	N/A	N/A	N/A	

Minimum Splice Lengths	
#4	1'-5"
#5	1'-9"

SUMMARY OF QUANTITIES

Concrete (Grade 4.0)(RCB)	13.4 C.Y.
Concrete (Grade 4.0)(AE)(RCB)	0.0 C.Y.
Bridge Backwall Protection System	S.Y.
Reinforcing Steel (Gr. 60)	1560 Lbs.
Reinforcing Steel (Gr. 60)(Epoxy Coated)	0 Lbs.
Class III Excavation	C.Y.
Foundation Stabilization	5 C.Y.
Concrete for Seal Course (Set)	1 C.Y.
Granular Backfill (Wingwalls)	27 C.Y.

GENERAL NOTES

DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
UNIT STRESSES: Grade 4.0 Concrete f'c = 4,000 p.s.i.
Reinforcing Steel fy = 60,000 p.s.i.

FILL HEIGHT: Unless otherwise noted, the Design Fill Height is measured from the riding surface at the culvert and includes the surfacing.

CONCRETE: Use concrete conforming to Grade 4.0 Concrete. Bevel all exposed edges with a ¾" triangular molding. Where Grade 4.0(AE) is specified, place this concrete in the top slab above the Construction Joint.

REINFORCING: Use reinforcing steel conforming to ASTM A615, Grade 60. All dimensions relative to reinforcing steel are to the centerline of the bar unless otherwise noted.

EXCAVATION: Excavation for culverts less than bridge length shall not be paid for directly but shall be subsidiary to Grade 4.0 Concrete. Excavation for RCB bridges shall be paid for as Class III Excavation.

SEAL COURSE: The Engineer may require a seal course. The seal course shall be unreinforced Concrete(Commercial Grade) with a minimum depth of 3 inches or as determined by the Engineer. Concrete for the seal course shall be paid for at the unit price set for Concrete for Seal Course.

FOUNDATION STABILIZATION: The Foundation Stabilization quantity has been calculated to the limits shown on the "RCB Auxiliary Details" sheet. The depth may be increased by the Engineer. The Contractor may underrun Foundation Stabilization under the barrel if founded on firm material and with the Engineer's approval. Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.

QUANTITIES: The quantities shown in the Culvert Summary include apron and/or soil saver quantities when they are required by the plans. Payment for additional quantities that result from including a seal course and/or a floating apron, as a change in the original plans, shall be made at the unit price bid for the various items involved.

GRANULAR BACKFILL (WINGWALLS):
See the "Auxiliary Details" sheet.

STRIKE LINE: Construct the wingwalls and that portion of the RCB outside the Strike Line level. Construct the wingwall footings with the culvert floor. See the wingwall detail sheets.

BRIDGE BACKWALL PROTECTION SYSTEM: For structures with this bid item in the Summary of Quantities. See the "Auxiliary Details" sheet.

NO.	DATE	REVISIONS	BY	APP'D
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Sta. 26+00

SINGLE 6 ft x 6 ft RCB (45° ROT. RT.)
7.0 ft EXT. LT.

BR I.6.6 P Osborne Co.

FHWA APPROVAL			10-20-10	APP'D		Terry L. Fleck			
DESIGNED	SPW	DETAILED	KBK	QUANTITIES	SPW	CADD	KBK		
DESIGN CK.	KG	DETAIL CK.	KG	QUAN. CK.	KG	CADD CK.	KG		

KDOT Graphics Certified 07-11-2024

Sheet No. 58

KDOT Graphics Certified

SYSTEM PART	VERSION/ID
CADD V8A	12/6/2020
DATABASE	5/4/2020
RCB PROGRAM	7.1.22
KBOX MODEL ID	1363
CELL LIBRARY	2/8/2022

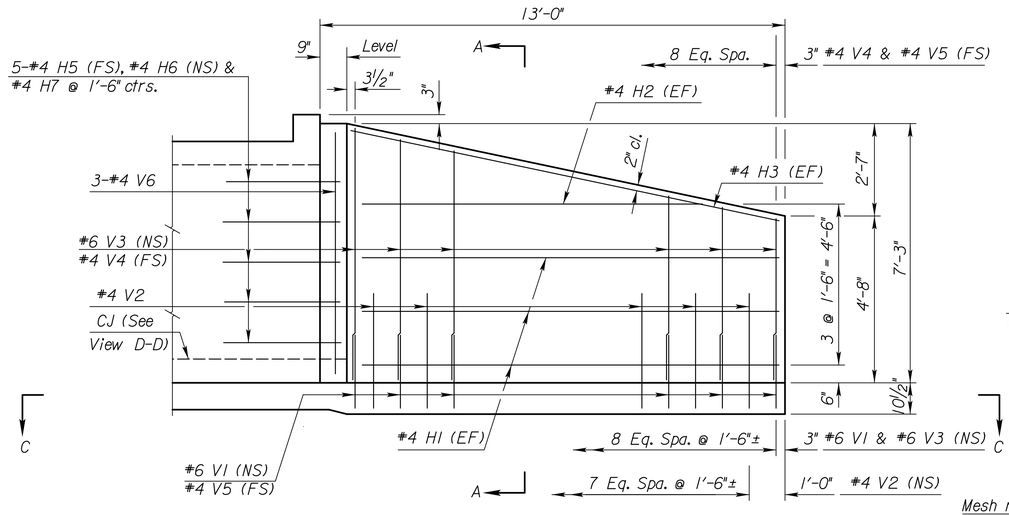
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Plotted By: KKATHRIN Plot Location:
File: c:\pwworking\central01\d2597941\kb602001\brSta2600-1.dgn
Plot Date: 07-11-24

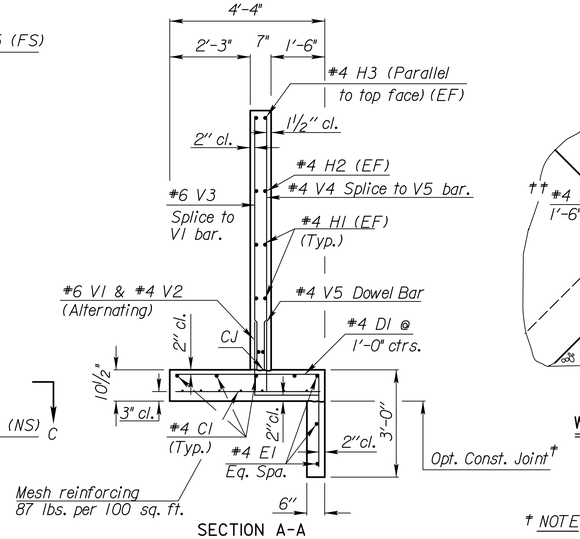
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	59	293

GENERAL NOTES

DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
UNIT STRESSES: Grade 4.0 Concrete; f'c = 4,000 p.s.i.
Reinforcing Steel; fy = 60,000 p.s.i.
CONCRETE: Grade 4.0 Concrete shall be used throughout. Bevel all exposed edges with a ¾" triangular moulding.
REINFORCING: All reinforcing shall conform to ASTM A615, Grade 60. Welded Wire Reinforcement shall conform to ASTM A185. All dimensions relative to reinforcing steel shall be to centerline of bar unless otherwise noted. Welded Wire Reinforcement shall be classified as pounds of reinforcing and included in the total quantity for the bid item Reinforcing Steel (Gr. 60).
QUANTITIES: Wingwall Quantities include all quantities outside the neat lines of the box, excluding the hubguard.
APRON: A 5" concrete slab shall be constructed between the downstream wings in locations subject to scour only when specified on the plans or by the Engineer.
BACKFILL MATERIAL: Use Granular Backfill material meeting the requirements of SB-1, SB-2, SCA-1, SCA-2.
Backfill all wings to limits shown on the "RCB Auxiliary Sheet".
FILTER FABRIC: Separate in-situ material from granular backfill with approved filter fabric complying with Section 1710.
Filter Fabric is subsidiary to "Granular Backfill".
FOUNDATION STABILIZATION: Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.



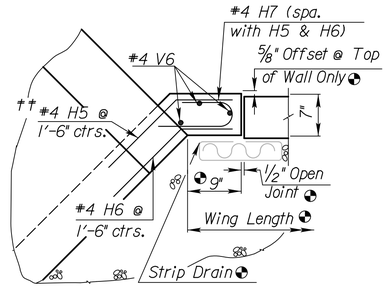
ELEVATION OF WINGWALL
(Backface Shown)



SECTION A-A

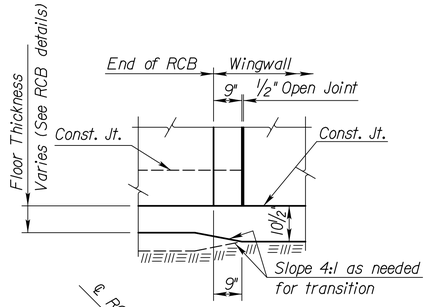
See "RCB Aux. Details" sheet for additional requirements.

Typical both wings

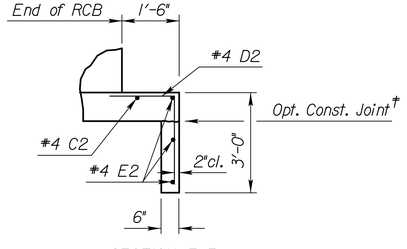


WINGWALL JOINT DETAIL
(Plan View)

† NOTE: Const. Jt. may be used at Contractor's option when approved by the Engineer. D1 bars or mesh may be spliced thus: ⌐ Minimum overlap shall be 1'-3". No increase in quantities or cost shall be allowed when Contractor elects this option.

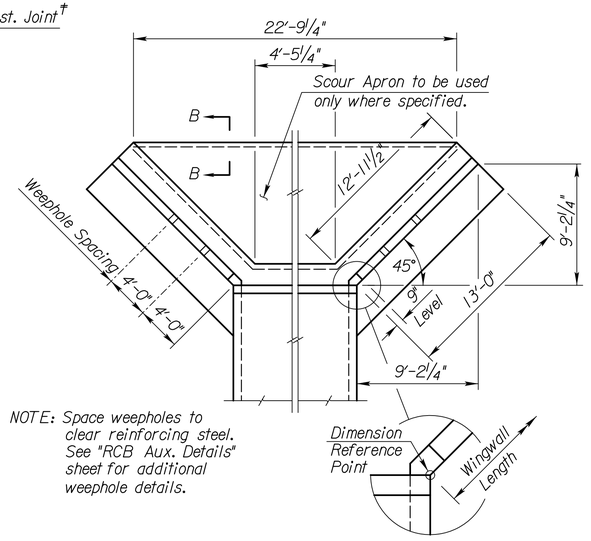


VIEW D-D



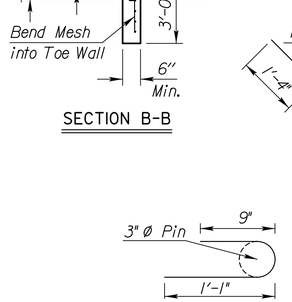
SECTION E-E

NOTE:
EF = Each Face
NS = Near Side
FS = Far Side
CJ = Const. Joint

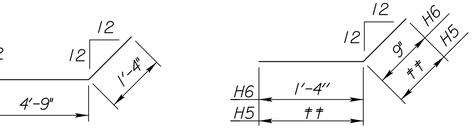


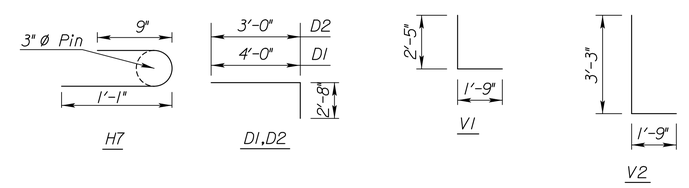
NOTE: Space weepholes to clear reinforcing steel. See "RCB Aux. Details" sheet for additional weephole details.

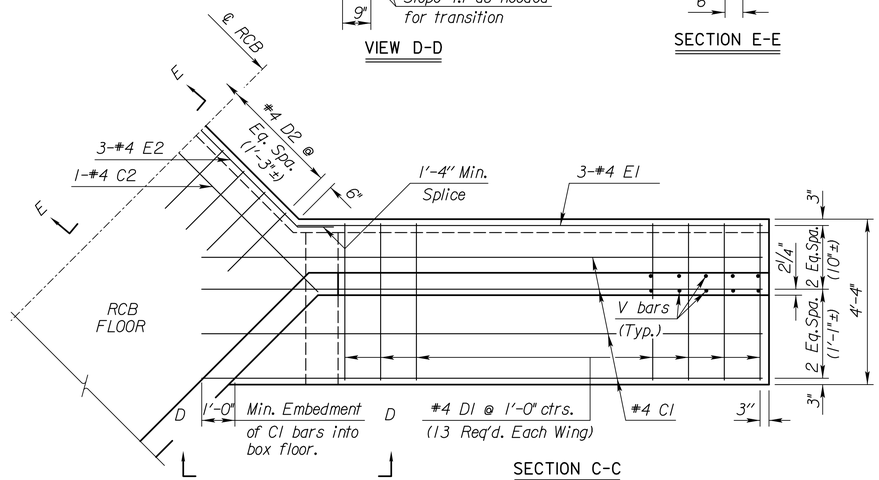
WING DIMENSIONS FOR NORMAL BOX
(3½:1 Embankment Slope)



SECTION B-B







SECTION C-C
(Plan of Footing)

Quantities listed below are included in the Summary of Quantities shown on the RCB details.

WINGWALL QUANTITIES (One End Only)				
	Foundation Stabilization		Concrete (Gr. 4.0)	
Wingwalls	3.11	(C.Y.)	8.69	(C.Y.)
Apron	0.00	(C.Y.)	0.00	(C.Y.)
Soil Saver	0.00	(C.Y.)	0.00	(C.Y.)
Reinforcing Steel (Gr. 60)			915	Lbs.
Welded Wire Fabric (Wings)			98	Lbs.
Welded Wire Fabric (Apron)			0	Lbs.
Granular Backfill (Wingwalls)			27.00	C.Y.
Filter Fabric (subsidiary)			32.00	S.Y.

BENDING DIAGRAM
(All dimensions are out to out of bars.)
†† Bend in Field

NOTE: Reinforcing Bar List is for both wings at one end of box only.

✳ See Bending Diagram

	Mark	#4C1	#4D1	#4E1	#4C2	#4D2	#4E2	#6V1	#4V2	#6V3	#4H1	#4H2	#4H3	#4H5	#4H6	#4H7	#4V4	#4V5	#4V6
0° Skew	Number	8	26✳	6	1	4 ✳	3✳	18✳	16✳	18	12	4	4	10 ✳	10 ✳	10 ✳	18	18	6
	Length	15'-7"	6'-8"	12'-9"	7'-0"	5'-8"	7'-5"	4'-2"	5'-0"	✳	11'-10"	9'-7"	12'-1"	1'-10"	2'-1"	1'-11"	✳	2'-2"	7'-0"

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Sta. 26+00
FLARED WINGWALLS
6 ft Rise (0° SKEW)

BR 10.00.06 Osborne Co.

FHWA APPROVAL			10-20-10	APP'D		Terry L. Fleck
DESIGNED	SPW	DETAILED	KBK	QUANTITIES	SPW	CADD KBK
DESIGN CK.	KG	DETAIL CK.	KG	QUAN. CK.	KG	CADD CK. KG

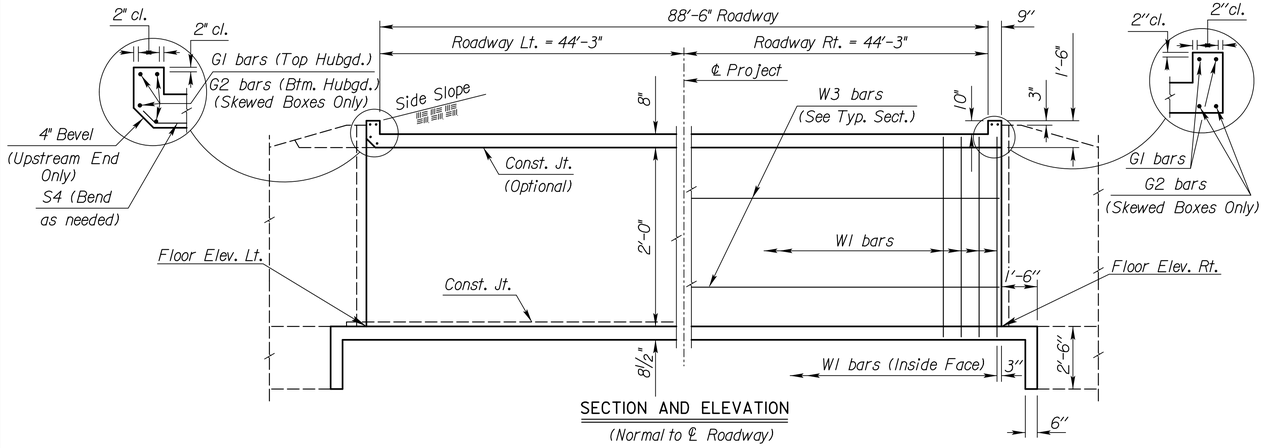
KDOT Graphics Certified 07-11-2024

Sheet No. 59

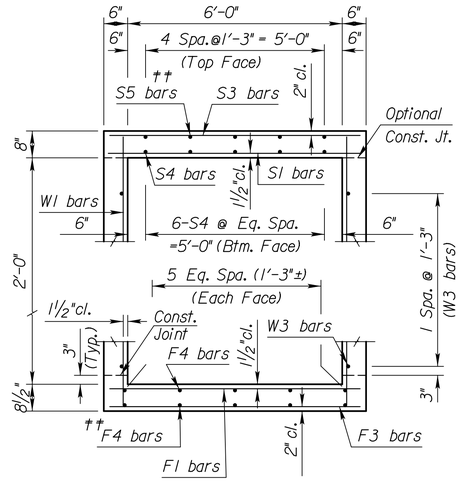
KDOT Graphics Certified

Plotted By: KKATHRIN | Plot Location:
File: c:\pwworking\central01\d2597941\kx602001\bbrSta2600-2.dgn
Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	60	293



SECTION AND ELEVATION
(Normal to ℄ Roadway)

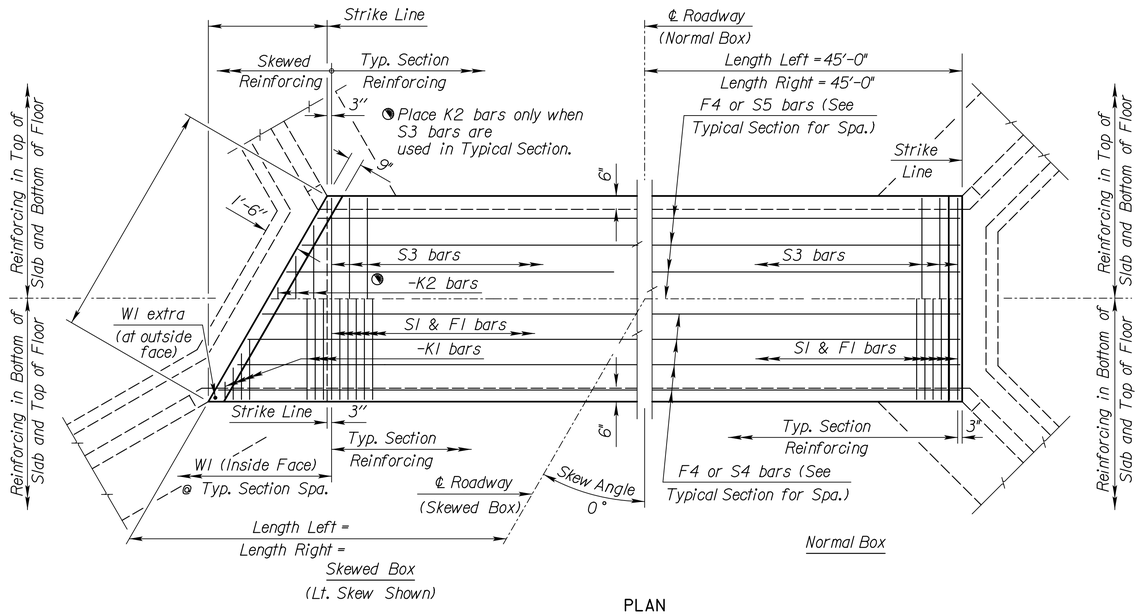


TYPICAL SECTION

Note:
S3 bars omitted unless grade box or slab thickness is greater than or equal to 12".

Note:
F3 bars omitted unless floor thickness is greater than or equal to 12.".

†† Omit S5 bars when S3 bars are omitted and omit the bottom layer of F4 bars when F3 bars are omitted.



PLAN

△For design purposes ONLY. Do NOT use for Construction					CULVERT SUMMARY ◔ includes any welded wire fabric									LRFR RATING FACTORS	
									Concrete			Reinf. Steel (Gr. 60)			HL-93 Loading	
Floor Elev. Lt.	Floor Elev. Rt.	Crown Gr. Elev.	△Design Fill Ht.	Skew	Left Wings	Right Wings	Scour Apron	Soil Saver	Barrel (Cu.Yds.)	Wings (Cu.Yds.)	Total (Cu.Yds.)	Barrel (Lbs.)	◔Wings (Lbs.)	Total (Lbs.)	Inventory	Operating
1557.90	1557.50	1565.71	2	0	Straight	Straight	No	No	39.06	3.77	42.83	4784	267	5050	1.15	1.49

BAR SCHEDULE

F1				F3				F4			S1				S3				S4			S5			
Size	Spa.	No.	Length	Size	Spa.	No.	Length	Size	Spa.	No.	Length	Size	No.	Length	Size	Spa.	No.	Length	Size	Spa.	No.	Length	Size	No.	Length	Size	No.	Length
6	7"	154	6'-8"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6'-8"	4	18	30'-10"	6	7"	154	6'-8"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

K1				K2				W1				W3				G1			G2						
Size	Spa.	No.	Length	Size	Spa.	No.	Length	Size	Spa.	No.	Length	Size	No.	Length	Size	Spa.	No.	Length	Size	No.	Length	Size	Spa.	No.	Length
N/A	N/A	N/A		N/A	N/A	N/A		4	9"	240	3'-0"	4	12	30'-10"	N/A	N/A	N/A	N/A	5	4	6'-8"	N/A	N/A	N/A	

Minimum Splice Lengths	
#4	1'-5"
#5	1'-9"

SUMMARY OF QUANTITIES

Concrete (Grade 4.0)(RCB)	42.8 C.Y.
Concrete (Grade 4.0)(AE)(RCB)	0.0 C.Y.
Bridge Backwall Protection System	S.Y.
Reinforcing Steel (Gr. 60)	5050 Lbs.
Reinforcing Steel (Gr. 60)(Epoxy Coated)	0 Lbs.
Class III Excavation	C.Y.
Foundation Stabilization	22 C.Y.
Concrete for Seal Course (Set)	1 C.Y.
Granular Backfill (Wingwalls)	0 C.Y.

GENERAL NOTES

DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
UNIT STRESSES: Grade 4.0 Concrete f'c = 4,000 p.s.i.
Reinforcing Steel fy = 60,000 p.s.i.

FILL HEIGHT: Unless otherwise noted, the Design Fill Height is measured from the riding surface at the culvert and includes the surfacing.

CONCRETE: Use concrete conforming to Grade 4.0 Concrete. Bevel all exposed edges with a ¾" triangular molding. Where Grade 4.0(AE) is specified, place this concrete in the top slab above the Construction Joint.

REINFORCING: Use reinforcing steel conforming to ASTM A615, Grade 60. All dimensions relative to reinforcing steel are to the centerline of the bar unless otherwise noted.

EXCAVATION: Excavation for culverts less than bridge length shall not be paid for directly but shall be subsidiary to Grade 4.0 Concrete. Excavation for RCB bridges shall be paid for as Class III Excavation.

SEAL COURSE: The Engineer may require a seal course. The seal course shall be unreinforced Concrete(Commercial Grade) with a minimum depth of 3 inches or as determined by the Engineer. Concrete for the seal course shall be paid for at the unit price set for Concrete for Seal Course.

FOUNDATION STABILIZATION: The Foundation Stabilization quantity has been calculated to the limits shown on the "RCB Auxiliary Details" sheet. The depth may be increased by the Engineer. The Contractor may underrun Foundation Stabilization under the barrel if founded on firm material and with the Engineer's approval. Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.

QUANTITIES: The quantities shown in the Culvert Summary include apron and/or soil saver quantities when they are required by the plans. Payment for additional quantities that result from including a seal course and/or a floating apron, as a change in the original plans, shall be made at the unit price bid for the various items involved.

GRANULAR BACKFILL (WINGWALLS):
See the "Auxiliary Details" sheet.

STRIKE LINE: Construct the wingwalls and that portion of the RCB outside the Strike Line level. Construct the wingwall footings with the culvert floor. See the wingwall detail sheets.

BRIDGE BACKWALL PROTECTION SYSTEM: For structures with this bid item in the Summary of Quantities. See the "Auxiliary Details" sheet.

NO.	DATE	REVISIONS	BY	APP'D
I				

KANSAS DEPARTMENT OF TRANSPORTATION
Sta. 79+40.00
SINGLE 6 ft x 2 ft RCB

BR 1.6.2 P Osborne Co.

FHWA APPROVAL			10-20-10	APP'D		Terry L. Fleck	
DESIGNED	SPW	DETAILED	KBK	QUANTITIES	SPW	CADD	KBK
DESIGN CK.	KG	DETAIL CK.	KG	QUAN. CK.	KG	CADD CK.	KG

KDOT Graphics Certified 07-11-2024

Sheet No. 60

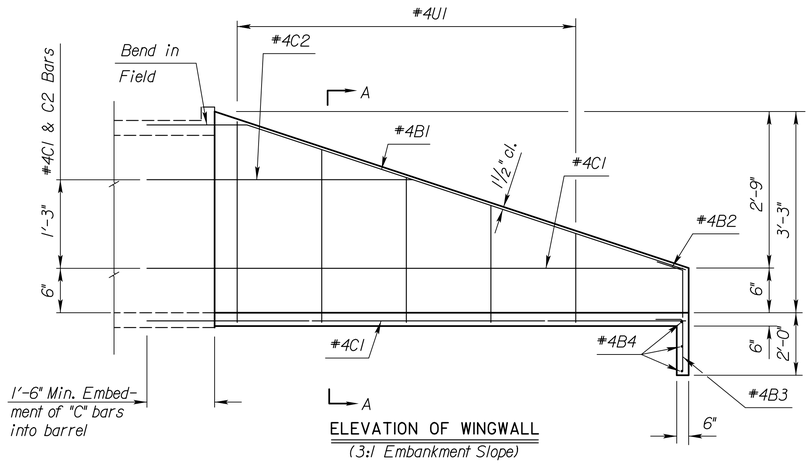
KDOT Graphics Certified

SYSTEM PART	VERSION/ID
CADD V8A	12/6/2000
DATABASE	5/4/2020
RCB PROGRAM	7.1.22
KBOX MODEL ID	1251
CELL LIBRARY	2/8/2022

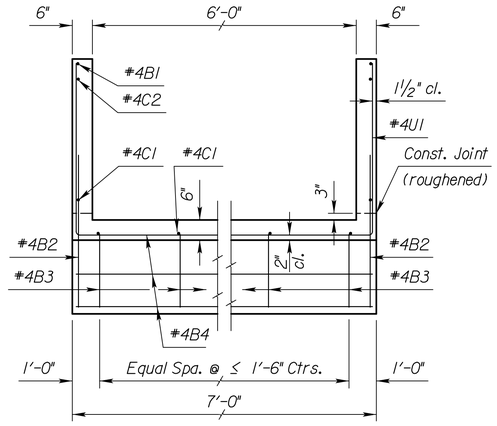
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Plotted By: KKATHRIN
Plot Location:
File: c:\pwworking\central01\d2597941\ka602001\bbrSta7940-1.dgn
Plot Date: 07-11-24

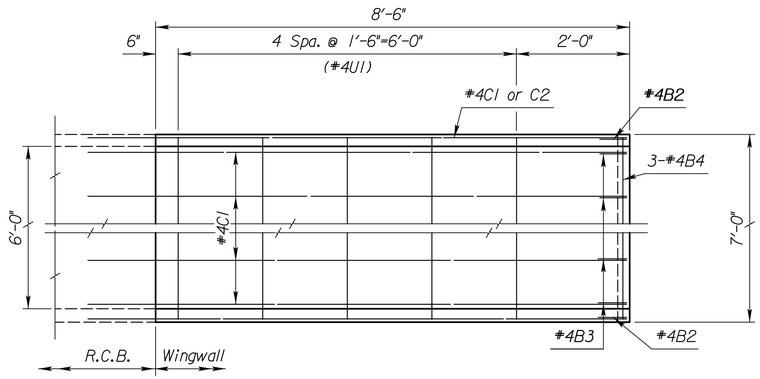
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	61	293



ELEVATION OF WINGWALL
(3:1 Embankment Slope)



Section A-A

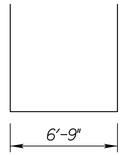


PLAN OF WINGWALLS
(Normal RCB)

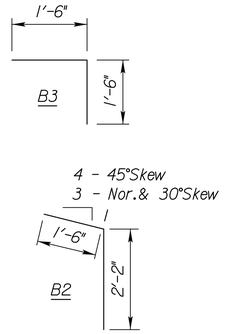
NOTE:
Wingwall floor and toewall shall be constructed with the RCB floor. Wingwalls to be constructed with RCB walls.

GENERAL NOTES

DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
UNIT STRESSES: Grade 4.0 Concrete; f'c = 4,000 p.s.i.
Reinforcing Steel; fy = 60,000 p.s.i.
CONCRETE: Grade 4.0 Concrete shall be used throughout. Bevel all exposed edges with a ¾inch triangular moulding.
REINFORCING: All reinforcing shall conform to ASTM A615, Grade 60. Welded wire fabric shall conform to ASTM A185. Wire fabric shall be electrically welded and shall be composed of 6x6-W1.4xW1.4 welded wire fabric and shall be classified as pounds of reinforcing.
QUANTITIES: Wingwall Quantities include all quantities outside the neat lines of the box, excluding the hubguard.
BACKFILL MATERIAL: Soils judged as high plasticity clays, fat clays, expansive clays, or organic clays are unsuitable for backfill material for wingwalls and will not be used. Where these conditions exist, use Granular Backfill (Wingwalls).
FOUNDATION STABILIZATION: Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.
INTERMEDIATE TOE-WALL: When the length of wingwalls and width of apron both exceed 15'-0", an intermediate toe-wall shall be constructed at mid-length of wing-wall as shown on "Elevation of Wingwall".



SKEW	INCREMENT
0°	6"
30°	5"
45°	4"



BENDING DIAGRAMS
All dimensions are out to out of bars.

NOTE:
Space Weepholes to clear reinforcing steel. See "RCB Auxiliary Details" sheet for additional weephole details.

* See Bending Diagram

NOTE: Reinforcing Bar List is for both wings at one end of box only.	#4 B1		#4 B2 *		#4 B3 *		#4 B4				#4C1		#4C2				#4U1 *					
	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length
°Skew	2	10'-4"	2	3'-8"	5	3'-0"	3	6'-8"		0"	7	9'-10"	2	5'-9"			5	*				

WINGWALL QUANTITIES (One End Only)	
Concrete (Grade 4.0)	1.89 CY.
Reinforcing Steel	133 Lbs.
Foundation Stabilization	1.63 CY.

Quantities listed are included in the Summary of Quantities shown on the RCB.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Sta. 79+40.00
STRAIGHT WINGWALLS
2 ft Rise (0° Skew)
BR 11.00.02 Osborne Co.

FHWA APPROVAL			6-5-91	APP'D	Terry L. Fleck		
DESIGNED	SPW	DETAILED	KBK	QUANTITIES	SPW	CADD	KBK
DESIGN CK.	KG	DETAIL CK.	KG	QUAN. CK.	KG	CADD CK.	KG

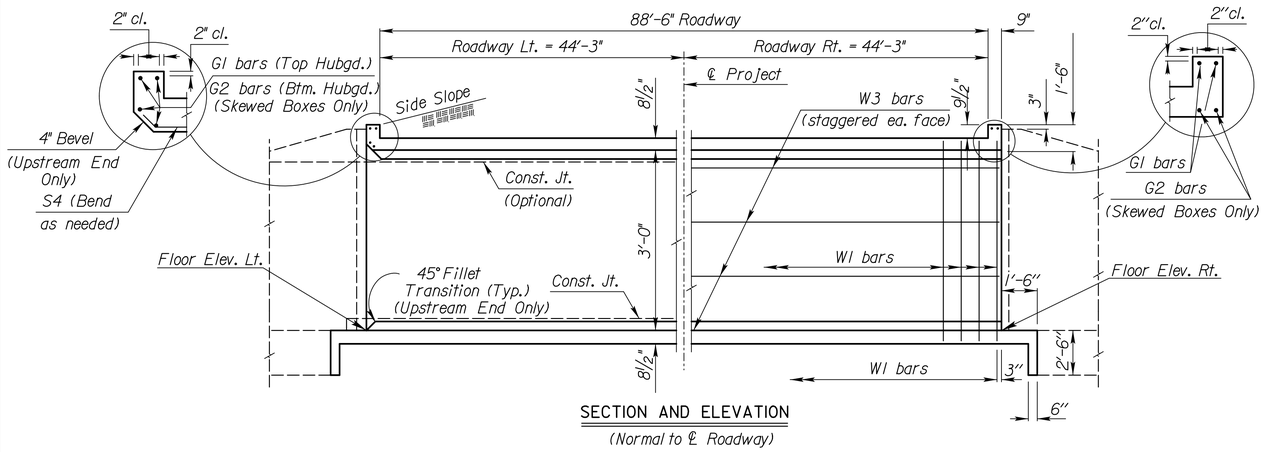
KDOT Graphics Certified 07-11-2024
Sheet No. 61

KDOT Graphics Certified

Plotted By: KKATHRIN Plot Location:
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Plot Date: 07-11-24

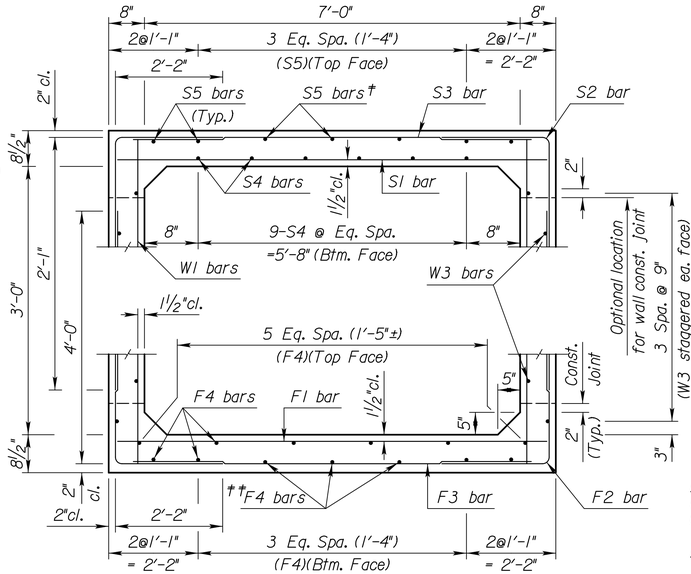
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	62	293

06	SYSTEM PART	VERSION/ID
	CADD V8A	12/6/2010
	DATABASE	5/4/2020
	RCB PROGRAM	7.1.22
	KBOX MODEL ID	1351
	CELL LIBRARY	2/8/2022



SECTION AND ELEVATION

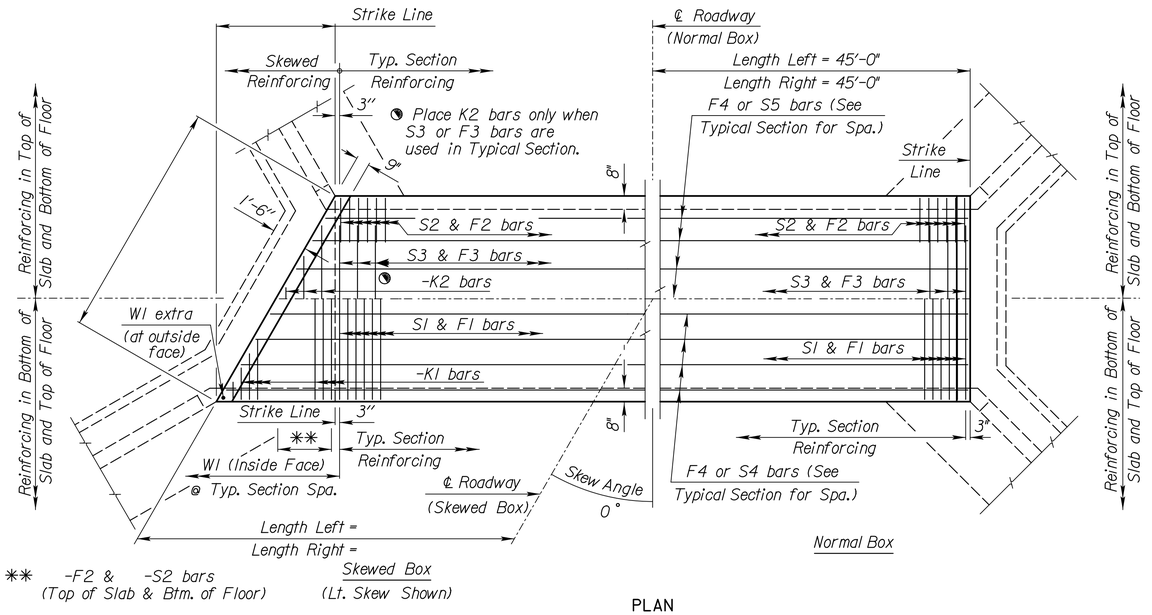
(Normal to ℄ Roadway)



TYPICAL SECTION

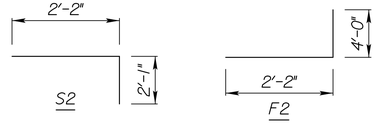
† Omit when S3 bar is omitted

†† Omit when F3 bars are omitted.



** -F2 & -S2 bars (Top of Slab & Btm. of Floor)

PLAN



BENDING DIAGRAM

All Dimensions are out to out of bars.

GENERAL NOTES

DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
UNIT STRESSES: Grade 4.0 Concrete; f'c = 4,000 p.s.i.
Reinforcing Steel; fy = 60,000 p.s.i.

FILL HEIGHT: Unless otherwise noted, the Design Fill Height is measured from the riding surface at the culvert and shall include the surfacing.

CONCRETE: Grade 4.0 Concrete shall be used throughout. Bevel all exposed edges with a ¾inch triangular moulding. Where Grade 4.0 Concrete (AE) is specified, it shall be placed in the top slab above the Construction Joint.

REINFORCING: All reinforcing shall conform to ASTM A615, Grade 60. All dimensions relative to reinforcing steel shall be to centerline of bar unless otherwise noted.

EXCAVATION: Excavation for culverts less than bridge length shall not be paid for directly but shall be subsidiary to Grade 4.0 Concrete. Excavation for RCB Bridges shall be paid for as Class III Excavation.

SEAL COURSE: A Seal Course may be required by the Engineer. The Seal Course shall be unreinforced Concrete (Commercial Grade) to a minimum depth of 3 inches or as determined by the Engineer. Concrete for the seal course shall be paid for at the unit price set for Concrete for Seal Course.

FOUNDATION STABILIZATION: The Foundation Stabilization quantity has been calculated to the limits shown on the "RCB Auxiliary Details" sheet. The depth may be increased by the Engineer. The Contractor may underrun Foundation Stabilization under the barrel if founded on firm material and with the Engineer's approval. Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.

QUANTITIES: The quantities shown in the Culvert Summary include apron and/or soil saver quantities when their construction is required by the plans. Payment for additional quantities that result from including seal course and/or floating apron, as a change in original plans, shall be made at the Unit Price bid for the various items involved.

GRANULAR BACKFILL (WINGWALLS):
See the "Auxiliary Details" sheet.

STRIKE LINE: Wingwalls and that portion of the RCB outside the Strike Line shall be constructed level. Footing for wingwalls shall be constructed with the culvert floor. See wingwall detail sheet.

BRIDGE BACKWALL PROTECTION SYSTEM: For structures with this bid item in the Summary of Quantities. See the "Auxiliary Details" sheet.

△For design purposes ONLY. Do NOT use for Construction

CULVERT SUMMARY

◔ includes any welded wire fabric

Floor Elev. Lt.	Floor Elev. Rt.	Crown Gr. Elev.	△Design Fill Ht.	Skew	Left Wings	Right Wings	Scour Apron	Soil Saver	Concrete Barrel (Cu.Yds.)	Concrete Wings (Cu.Yds.)	Concrete Total (Cu.Yds.)	Reinf. Steel (Gr. 60) Barrel (Lbs.)	Reinf. Steel (Gr. 60) ◔Wings (Lbs.)	Reinf. Steel (Gr. 60) Total (Lbs.)	LRFR RATING FACTORS HL-93 Loading Inventory	LRFR RATING FACTORS HL-93 Loading Operating
1526.40	1526.25	1533.02	0	0	Flared	Flared	No	No	54.19	7.16	61.35	9966	898	10864	2.31	3.03

*See Bending Diagram

BAR SCHEDULE

F1 Size	F1 Spa.	F1 No.	F1 Length	F2 * Size	F2 * Spa.	F2 * No.	F2 * Length	F3 Size	F3 Spa.	F3 No.	F3 Length	F4 Size	F4 No.	F4 Length	S1 Size	S1 Spa.	S1 No.	S1 Length	S2 * Size	S2 * Spa.	S2 * No.	S2 * Length	S3 Size	S3 Spa.	S3 No.	S3 Length	S4 Size	S4 No.	S4 Length	S5 Size	S5 No.	S5 Length
5	5½"	196	8'-0"	5	7½"	288	6'-2"	N/A	N/A	N/A	N/A	4	30	30'-10"	6	5½"	196	8'-0"	4	7½"	288	4'-3"	4	1'-3"	73	8'-0"	5	18	45'-9"	4	18	30'-10"

K1 Size	K1 Spa.	K1 No.	K1 Length	K2 Size	K2 Spa.	K2 No.	K2 Length	W1 Size	W1 Spa.	W1 No.	W1 Length	W2 Size	W2 Spa.	W2 No.	W2 Length	W3 Size	W3 No.	W3 Length	W4 Size	W4 Spa.	W4 No.	W4 Length	G1 Size	G1 No.	G1 Length	G2 Size	G2 No.	G2 Length	Size	Spa.	No.	Length
N/A	N/A	N/A		N/A	N/A	N/A		4	11"	198	4'-1"	N/A	N/A	N/A	N/A	4	24	30'-10"	N/A	N/A	N/A	N/A	5	4	8'-0"	N/A	N/A	N/A				

Minimum Splice Lengths	
#4	1'-5"
#5	1'-9"

SUMMARY OF QUANTITIES

Concrete (Grade 4.0)(RCB)	61.3	C.Y.
Concrete (Grade 4.0)(AE)(RCB)	0.0	C.Y.
Bridge Backwall Protection System		S.Y.
Reinforcing Steel (Gr. 60)	10860	Lbs.
Reinforcing Steel (Gr.60)(Epoxy Coated)	0	Lbs.
Class III Excavation		C.Y.
Foundation Stabilization	24	C.Y.
Concrete for Seal Course (Set)	1	C.Y.
Granular Backfill (Wingwalls)	16	C.Y.

NO.	DATE	REVISIONS	BY	APP'D
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Sta. 123+00

SINGLE 7 ft x 3 ft RFB

BR 1.7.3 F — Osborne Co.

FHWA APPROVAL		10-20-10	APP'D	Terry L. Fleck	
DESIGNED	SPW	DETAILED	KBK	QUANTITIES	SPW	CADD	KBK
DESIGN CK.	KG	DETAIL CK.	KG	QUAN. CK.	KG	CADD CK.	KG

KDOT Graphics Certified 07-11-2024

Sheet No. 62

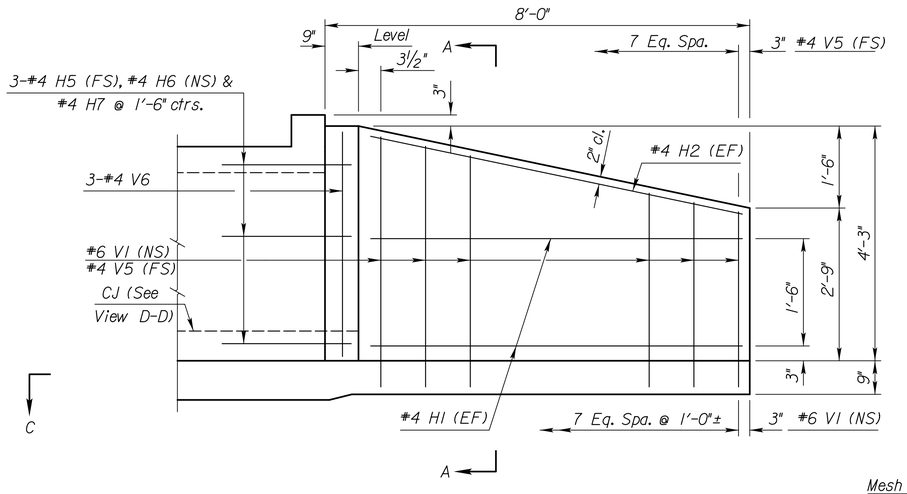
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Plotted By: KKATHRIN
Plot Location:
File: c:\pwworking\central01\d2259794\kb602001bbrSta123.00-1.dgn
Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	63	293

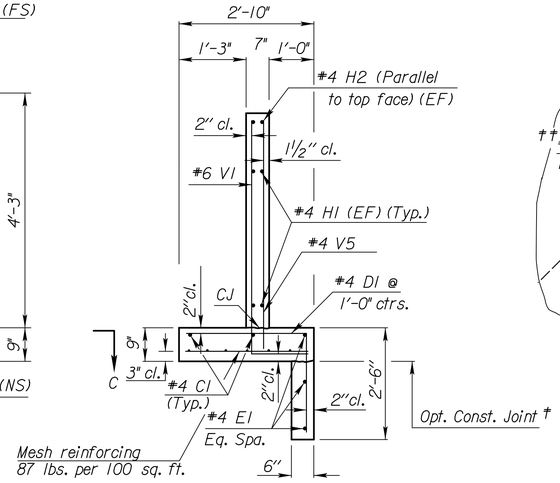
GENERAL NOTES

DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
UNIT STRESSES: Grade 4.0 Concrete; f'c = 4,000 p.s.i.
Reinforcing Steel; fy = 60,000 p.s.i.
CONCRETE: Grade 4.0 Concrete shall be used throughout. Bevel all exposed edges with a ¾" triangular moulding.
REINFORCING: All reinforcing shall conform to ASTM A615, Grade 60. Welded Wire Reinforcement shall conform to ASTM A185. All dimensions relative to reinforcing steel shall be to centerline of bar unless otherwise noted. Welded Wire Reinforcement shall be classified as pounds of reinforcing and included in the total quantity for the bid item Reinforcing Steel (Gr. 60).
QUANTITIES: Wingwall Quantities include all quantities outside the neat lines of the box, excluding the hubguard.
APRON: A 5" concrete slab shall be constructed between the downstream wings in locations subject to scour only when specified on the plans or by the Engineer.
BACKFILL MATERIAL: Use Granular Backfill material meeting the requirements of SB-1, SB-2, SCA-1, SCA-2.
Backfill all wings to limits shown on the "RCB Auxiliary Sheet".
FILTER FABRIC: Separate in-situ material from granular backfill with approved filter fabric complying with Section 1710.
Filter Fabric is subsidiary to "Granular Backfill".
FOUNDATION STABILIZATION: Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.



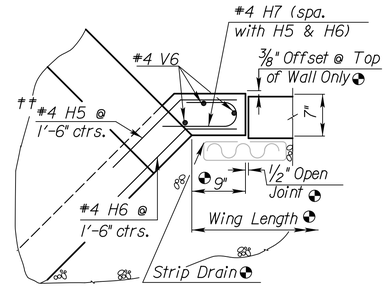
ELEVATION OF WINGWALL
(Backface Shown)

Typical both wings



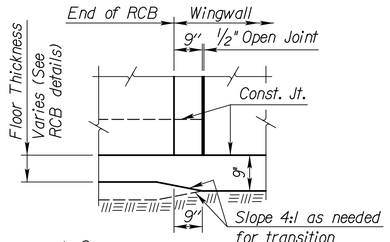
SECTION A-A

See "RCB Aux. Details" sheet for additional requirements.

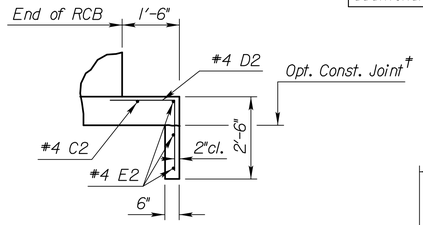


WINGWALL JOINT DETAIL
(Plan View)

† NOTE: Const. Jt. may be used at Contractor's option when approved by the Engineer. D1 bars or mesh may be spliced thus: ⌐ Minimum overlap shall be 1'-3". No increase in quantities or cost shall be allowed when Contractor elects this option.

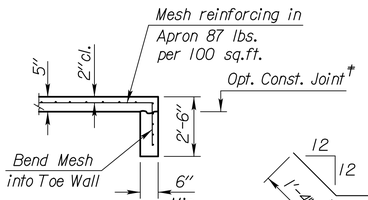


VIEW D-D

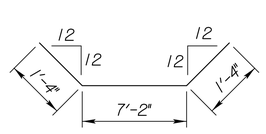


SECTION E-E

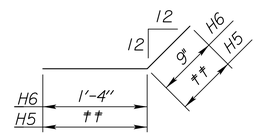
NOTE:
EF = Each Face
NS = Near Side
FS = Far Side
CJ = Const. Joint



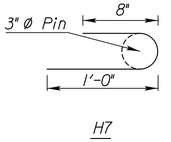
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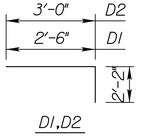
E2



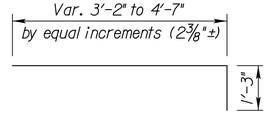
H5, H6



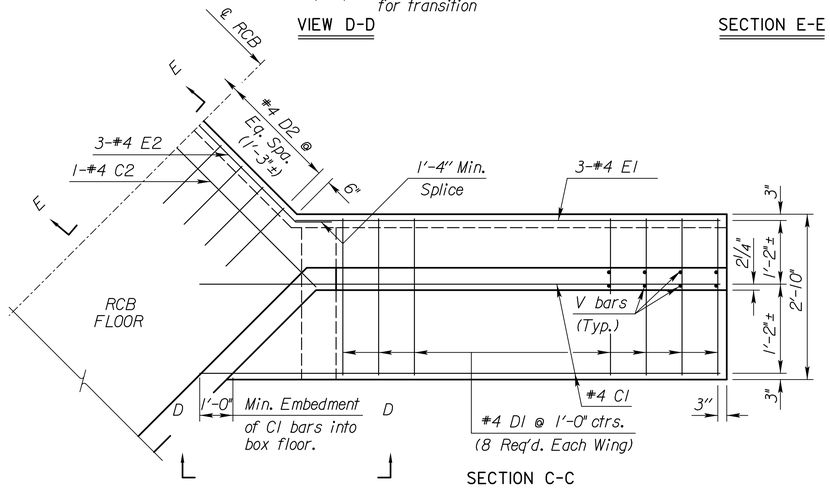
H7



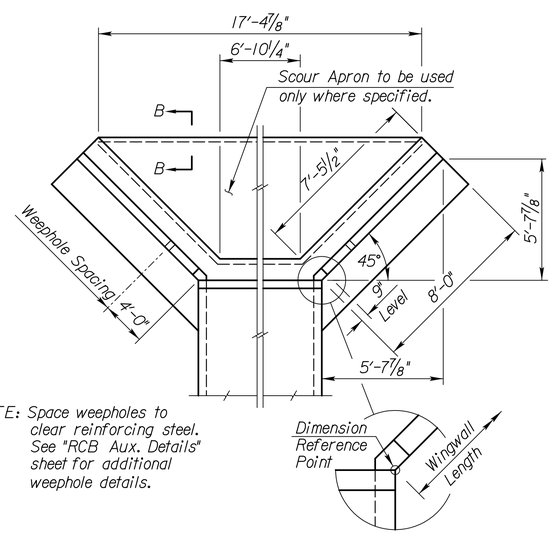
D1,D2



V1
(2 Req'd., each length)



SECTION C-C
(Plan of Footing)



NOTE: Space weepholes to clear reinforcing steel. See "RCB Aux. Details" sheet for additional weephole details.

WING DIMENSIONS FOR NORMAL BOX
(3½:1 Embankment Slope)

NOTE: Reinforcing Bar List is for both wings at one end of box only.

✳ See Bending Diagram

0° Skew		#4C1	#4D1	#4E1	#4C2	#4D2	#4E2	#6V1	#4H1	#4H2	#4H5	#4H6	#4H7	#4V5	#4V6
	No.	4	16✳	6	1	6 ✳	3✳	16	8	4	6✳	6 ✳	6 ✳	16	6
	Length	9'-10"	4'-8"	7'-3"	8'-0"	5'-2"	9'-10"	✳	6'-10"	7'-0"	1'-10"	2'-1"	1'-9"	✳	4'-0"

Quantities listed below are included in the Summary of Quantities shown on the RCB details.

WINGWALL QUANTITIES (One End Only)				
	Foundation Stabilization		Concrete (Gr. 4.0)	
Wingwalls	1.44	(C.Y.)	3.58	(C.Y.)
Apron	0.00	(C.Y.)	0.00	(C.Y.)
Soil Saver	0.00	(C.Y.)	0.00	(C.Y.)
Reinforcing Steel (Gr. 60)			410	Lbs.
Welded Wire Fabric (Wings)			39	Lbs.
Welded Wire Fabric (Apron)			0	Lbs.
Granular Backfill (Wingwalls)			8.00	C.Y.
Filter Fabric (subsidiary)			14.00	S.Y.

BENDING DIAGRAM

(All dimensions are out to out of bars.)

†† Bend in Field

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Sta. 123+00
FLARED WINGWALLS
3 ft Rise (0° SKEW)

BR 10.00.03 Osborne Co.

FHWA APPROVAL			10-20-10	APP'D		Terry L. Fleck
DESIGNED	SPW	DETAILED	KBK	QUANTITIES	SPW	CADD KBK
DESIGN CK.	KG	DETAIL CK.	KG	QUAN. CK.	KG	CADD CK. KG

KDOT Graphics Certified 07-11-2024

Sheet No. 63

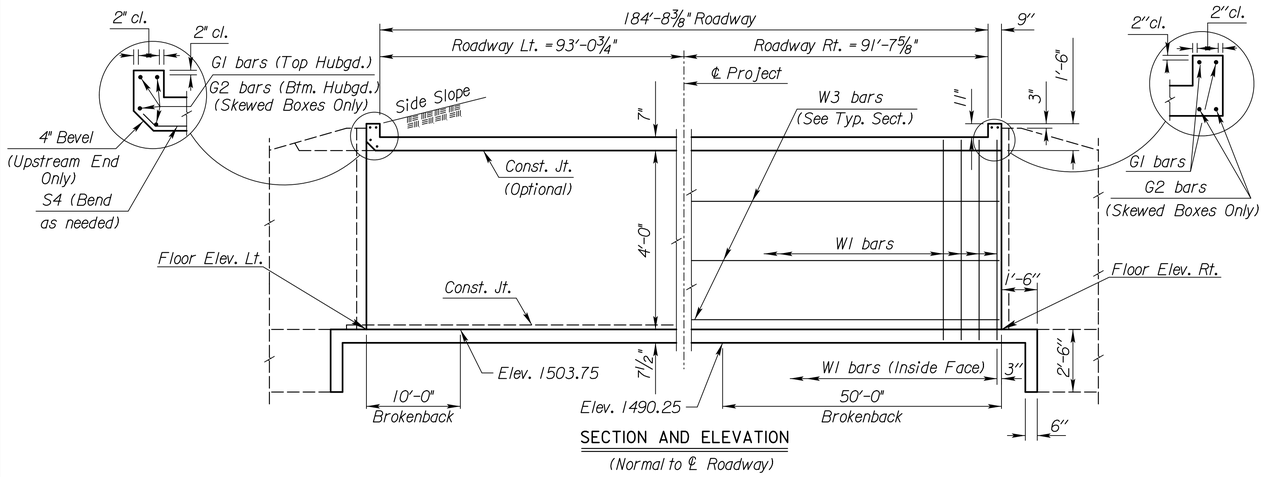
KDOT Graphics Certified

Plotted By: KKATHRIN
Plot Location:
File: c:\pwworkingcentral01\d2259794\kdot2001bbrSta12300-2.dgn
Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	64	293

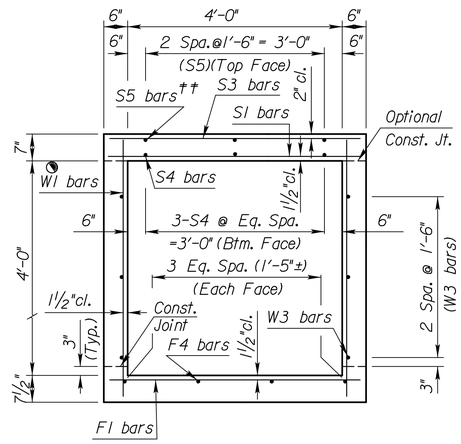
SYSTEM PART	VERSION/ID
CADD VBA	12/6/2000
DATABASE	5/4/2020
RCB PROGRAM	7.1.22
KBOX MODEL ID	59
CELL LIBRARY	2/8/2022

06

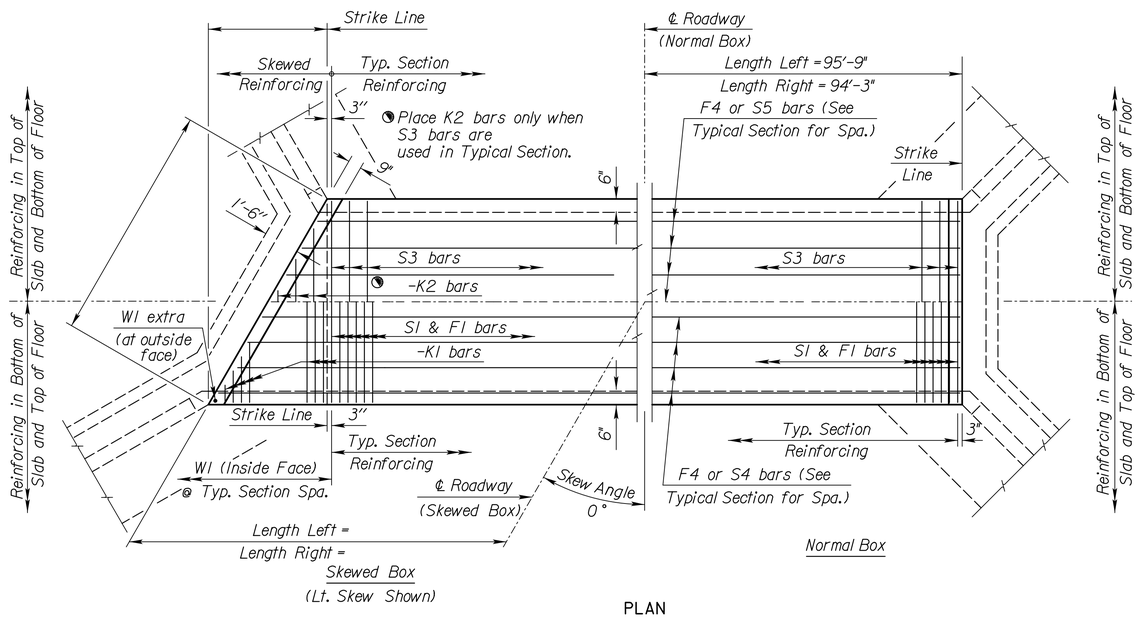


SECTION AND ELEVATION

(Normal to ℄ Roadway)



TYPICAL SECTION



PLAN

△For design purposes ONLY. Do NOT use for Construction	CULVERT SUMMARY	◔ includes any welded wire fabric	LRFR RATING FACTORS

Floor Elev. Lt.	Floor Elev. Rt.	Crown Gr. Elev.	△Design Fill Ht.	Skew	Left Wings	Right Wings	Scour Apron	Soil Saver	Concrete			Reinf. Steel (Gr. 60)			HL-93 Loading	
									Barrel (Cu.Yds.)	Wings (Cu.Yds.)	Total (Cu.Yds.)	Barrel (Lbs.)	◔Wings (Lbs.)	Total (Lbs.)	Inventory	Operating
1504.00	1490.00	1526.62	30	0	Flared	Straight	No	No	70.91	7.26	78.17	8335	779	9114	N/A	N/A

BAR SCHEDULE

F1				F4				S1				S3				S4				S5			
Size	Spa.	No.	Length	Size	No.	Length		Size	Spa.	No.	Length	Size	Spa.	No.	Length	Size	Spa.	No.	Length	Size	No.	Length		Size	No.	Length	
5	6"	380	4'-8"	N/A	N/A	N/A		N/A	N/A	N/A	4'-8"	4	20	39'-1"		6	6"	380	4'-8"	N/A	N/A	N/A		N/A	N/A	N/A	
K1				**K2**				**W1**				**W3**				**G1**				**G2**							
Size	Spa.	No.	Length	Size	Spa.	No.	Length	Size	Spa.	No.	Length	Size	Spa.	No.	Length	Size	No.	Length		Size	No.	Length		Size	Spa.	No.	Length
N/A	N/A	N/A		N/A	N/A	N/A		4	7"	652	4'-10"	N/A	N/A	N/A		4	30	39'-1"		N/A	N/A	N/A		5	4	4'-8"	

N/A	N/A	N/A		N/A	N/A	N/A		4	7"	652	4'-10"	N/A	N/A	N/A		4	30	39'-1"		N/A	N/A	N/A		5	4	4'-8"	

N/A	N/A	N/A		N/A	N/A	N/A		4	7"	652	4'-10"	N/A	N/A	N/A		4	30	39'-1"		N/A	N/A	N/A		5	4	4'-8"	

GI			G2								
Size	No.	Length	Size	No.	Length		Size	Spa.	No.	Length	
N/A	N/A	N/A	N/A	N/A	N/A		N/A	N/A	N/A	N/A	

Minimum Splice Lengths	
#4	1'-5"
#5	1'-9"

SUMMARY OF QUANTITIES

Concrete (Grade 4.0)(RCB)	78.2 C.Y.
Concrete (Grade 4.0)(AE)(RCB)	0.0 C.Y.
Bridge Backwall Protection System	S.Y.
Reinforcing Steel (Gr. 60)	9110 Lbs.
Reinforcing Steel (Gr. 60)(Epoxy Coated)	0 Lbs.
Class III Excavation	C.Y.
Foundation Stabilization	36 C.Y.
Concrete for Seal Course (Set)	1 C.Y.
Granular Backfill (Wingwalls)	12 C.Y.

◔ See RCB Auxiliary Details for Optional Splice.

Note:
S3 bars omitted unless grade box or slab thickness is greater than or equal to 12".

†† Omit S5 bars when S3 bars are omitted

GENERAL NOTES

DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
UNIT STRESSES: Grade 4.0 Concrete f'c = 4,000 p.s.i.
Reinforcing Steel fy = 60,000 p.s.i.

FILL HEIGHT: Unless otherwise noted, the Design Fill Height is measured from the riding surface at the culvert and includes the surfacing.

CONCRETE: Use concrete conforming to Grade 4.0 Concrete. Bevel all exposed edges with a ¾" triangular molding. Where Grade 4.0(AE) is specified, place this concrete in the top slab above the Construction Joint.

REINFORCING: Use reinforcing steel conforming to ASTM A615, Grade 60. All dimensions relative to reinforcing steel are to the centerline of the bar unless otherwise noted.

EXCAVATION: Excavation for culverts less than bridge length shall not be paid for directly but shall be subsidiary to Grade 4.0 Concrete. Excavation for RCB bridges shall be paid for as Class III Excavation.

SEAL COURSE: The Engineer may require a seal course. The seal course shall be unreinforced Concrete(Commercial Grade) with a minimum depth of 3 inches or as determined by the Engineer. Concrete for the seal course shall be paid for at the unit price set for Concrete for Seal Course.

FOUNDATION STABILIZATION: The Foundation Stabilization quantity has been calculated to the limits shown on the "RCB Auxiliary Details" sheet. The depth may be increased by the Engineer. The Contractor may underrun Foundation Stabilization under the barrel if founded on firm material and with the Engineer's approval. Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.

QUANTITIES: The quantities shown in the Culvert Summary include apron and/or soil saver quantities when they are required by the plans. Payment for additional quantities that result from including a seal course and/or a floating apron, as a change in the original plans, shall be made at the unit price bid for the various items involved.

GRANULAR BACKFILL (WINGWALLS):
See the "Auxiliary Details" sheet.

STRIKE LINE: Construct the wingwalls and that portion of the RCB outside the Strike Line level. Construct the wingwall footings with the culvert floor. See the wingwall detail sheets.

BRIDGE BACKWALL PROTECTION SYSTEM: For structures with this bid item in the Summary of Quantities. See the "Auxiliary Details" sheet.

NO.	DATE	REVISIONS	BY	APP'D
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Sta. 155+00

SINGLE 4 ft x 4 ft RCB (10° ROT. LT.)

BR 1.4.4 P — Osborne Co.

FHWA APPROVAL			10-20-10	APP'D		Terry L. Fleck	
DESIGNED	SPW	DETAILED	KBK	QUANTITIES	SPW	CADD	KBK
DESIGN CK.	KG	DETAIL CK.	KG	QUAN. CK.	KG	CADD CK.	KG

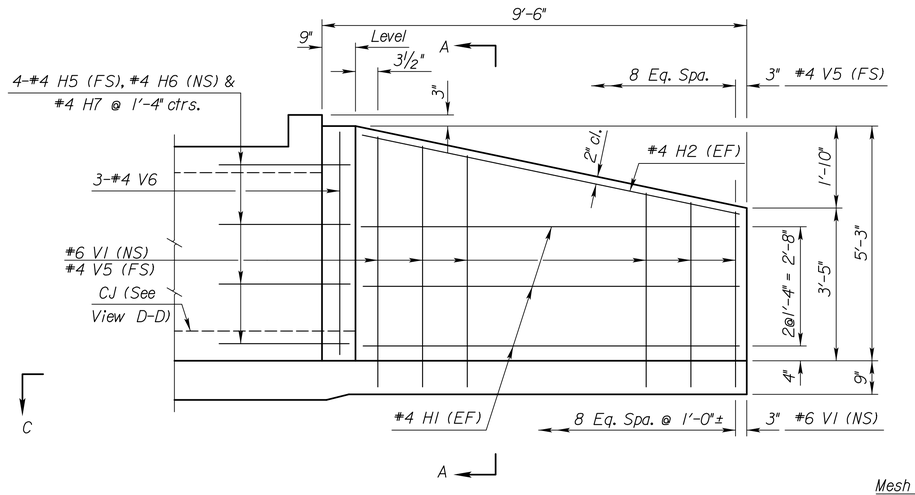
KDOT Graphics Certified 07-11-2024

Sheet No. 64

KDOT Graphics Certified

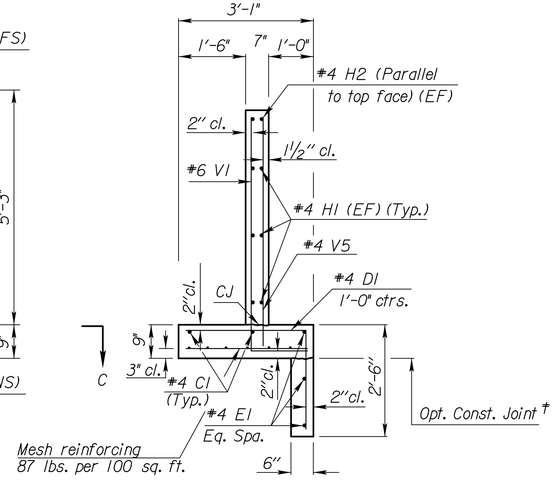
Plotted By: KKATHRIN
Plot Location:
File: c:\pwworking\central01\d2597941\ke602001\bbrSta15500-1.dgn
Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	65	293



ELEVATION OF WINGWALL

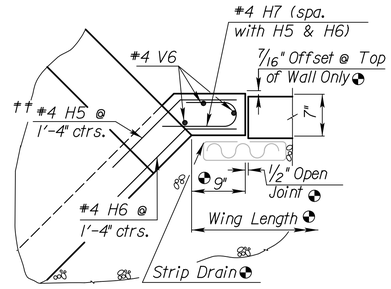
(Backface Shown)



SECTION A-A

See "RCB Aux. Details" sheet for additional requirements.

Typical both wings



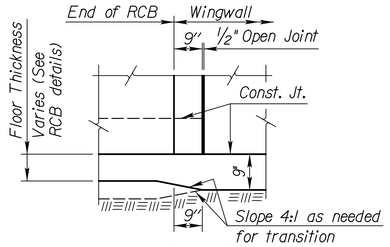
WINGWALL JOINT DETAIL

(Plan View)

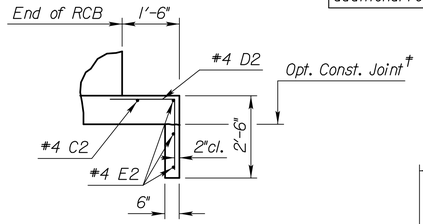
† NOTE: Const. Jt. may be used at Contractor's option when approved by the Engineer. D1 bars or mesh may be spliced thus: ⌐ Minimum overlap shall be 1'-3". No increase in quantities or cost shall be allowed when Contractor elects this option.

GENERAL NOTES

DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
UNIT STRESSES: Grade 4.0 Concrete; f'c = 4,000 p.s.i.
Reinforcing Steel; fy = 60,000 p.s.i.
CONCRETE: Grade 4.0 Concrete shall be used throughout. Bevel all exposed edges with a ¾" triangular moulding.
REINFORCING: All reinforcing shall conform to ASTM A615, Grade 60. Welded Wire Reinforcement shall conform to ASTM A185. All dimensions relative to reinforcing steel shall be to centerline of bar unless otherwise noted. Welded Wire Reinforcement shall be classified as pounds of reinforcing and included in the total quantity for the bid item Reinforcing Steel (Gr. 60).
QUANTITIES: Wingwall Quantities include all quantities outside the neat lines of the box, excluding the hubguard.
APRON: A 5" concrete slab shall be constructed between the downstream wings in locations subject to scour only when specified on the plans or by the Engineer.
BACKFILL MATERIAL: Use Granular Backfill material meeting the requirements of SB-1, SB-2, SCA-1, SCA-2.
Backfill all wings to limits shown on the "RCB Auxiliary Sheet".
FILTER FABRIC: Separate in-situ material from granular backfill with approved filter fabric complying with Section 1710.
Filter Fabric is subsidiary to "Granular Backfill".
FOUNDATION STABILIZATION: Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.

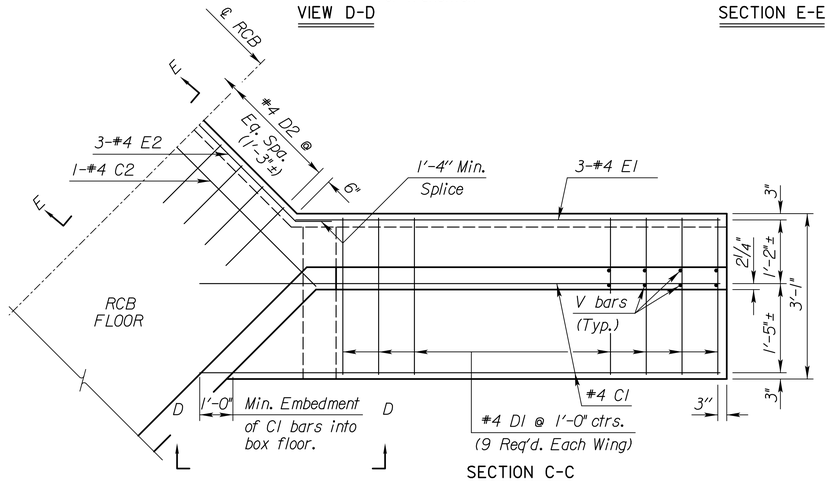


VIEW D-D

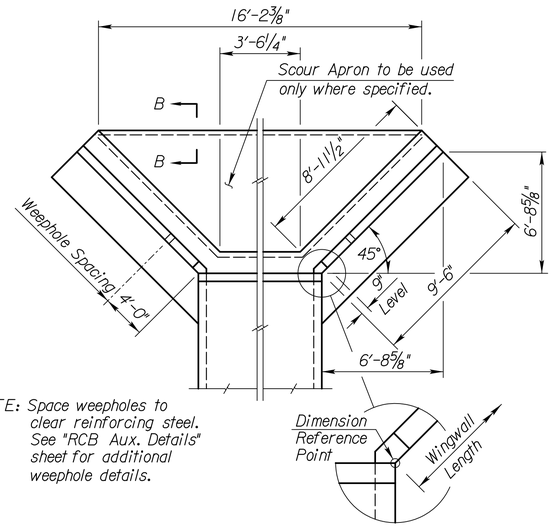


SECTION E-E

NOTE:
EF = Each Face
NS = Near Side
FS = Far Side
CJ = Const. Joint



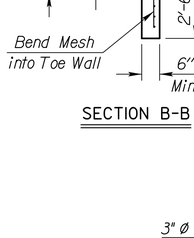
SECTION C-C



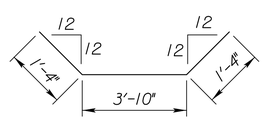
NOTE: Space weepholes to clear reinforcing steel. See "RCB Aux. Details" sheet for additional weephole details.

WING DIMENSIONS FOR NORMAL BOX

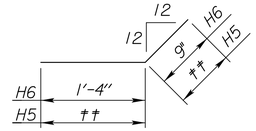
(3½:1 Embankment Slope)



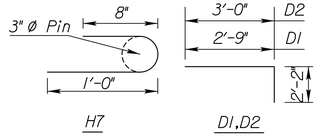
SECTION B-B



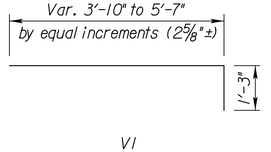
E2



H5, H6



H7 D1,D2



V1

(2 Req'd., each length)

BENDING DIAGRAM

(All dimensions are out to out of bars.)

†† Bend in Field

Quantities listed below are included in the Summary of Quantities shown on the RCB details.

WINGWALL QUANTITIES (One End Only)				
	Foundation Stabilization		Concrete (Gr. 4.0)	
Wingwalls	1.80	(C.Y.)	4.36	(C.Y.)
Apron	0.00	(C.Y.)	0.00	(C.Y.)
Soil Saver	0.00	(C.Y.)	0.00	(C.Y.)
Reinforcing Steel (Gr. 60)			509	Lbs.
Welded Wire Fabric (Wings)			51	Lbs.
Welded Wire Fabric (Apron)			0	Lbs.
Granular Backfill (Wingwalls)			12.00	C.Y.
Filter Fabric (subsidiary)			18.00	S.Y.

NOTE: Reinforcing Bar List is for both wings at one end of box only.

✳ See Bending Diagram

0° Skew		#4C1	#4D1	#4E1	#4C2	#4D2	#4E2	#6V1	#4H1	#4H2	#4H5	#4H6	#4H7	#4V5	#4V6
	No.	4	18✳	6	1	3 ✳	3 ✳	18	12	4	8 ✳	8✳	8✳	18	6
	Length	11'-7"	4'-11"	8'-9"	4'-8"	5'-2"	6'-6"	✳	8'-4"	8'-6"	1'-10"	2'-1"	1'-9"	✳	5'-0"

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Sta. 155+00
FLARED WINGWALLS
4 ft Rise (0° SKEW)

BR 10.00.04 Osborne Co.

FHWA APPROVAL			10-20-10	APP'D			Terry L. Fleck
DESIGNED	SPW	DETAILED	KBK	QUANTITIES	SPW	CADD	KBK
DESIGN CK.	KG	DETAIL CK.	KG	QUAN. CK.	KG	CADD CK.	KG

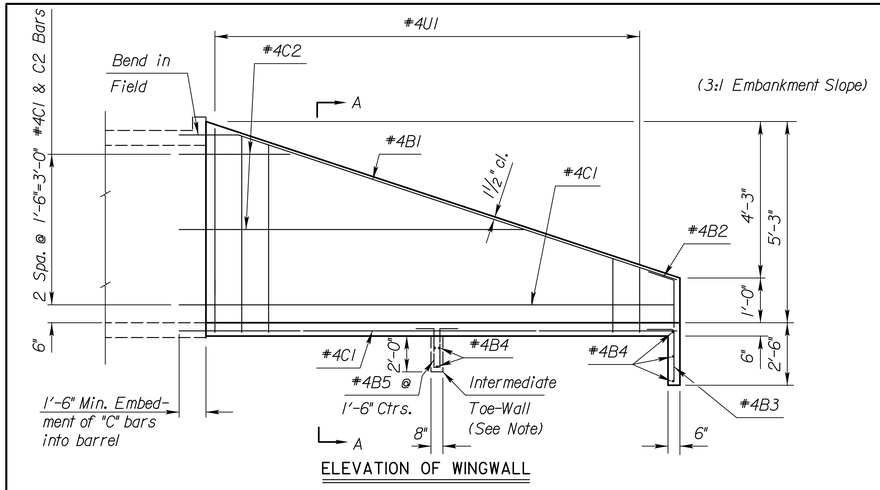
KDOT Graphics Certified 07-11-2024

Sheet No. 65

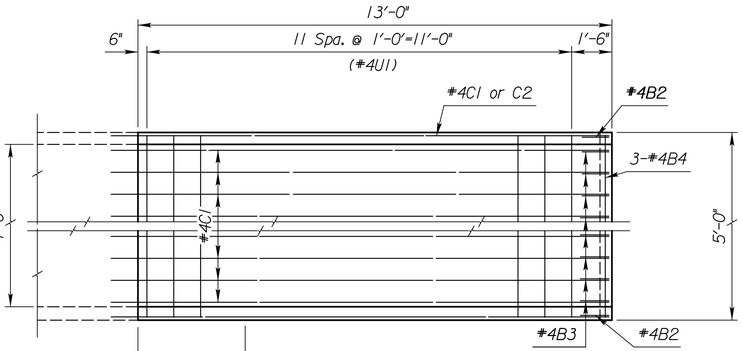
KDOT Graphics Certified

Plotted By: KKATHRIN
Plot Location:
File: c:\pwworkingcentral01\d2259794\kdot2001bbrSta15500-2.dgn
Plot Date: 07-11-24

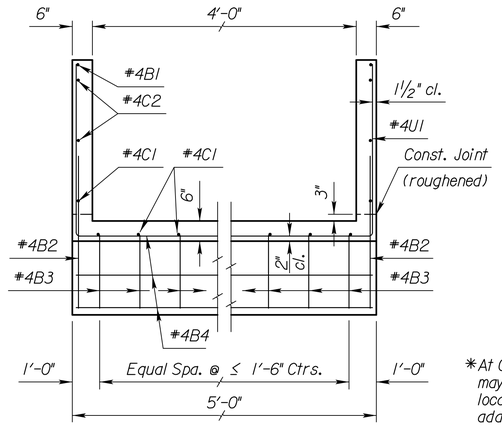
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	66	293



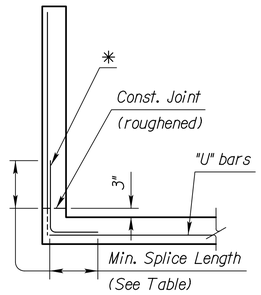
ELEVATION OF WINGWALL



PLAN OF WINGWALLS
(Normal RCB)



Section A-B

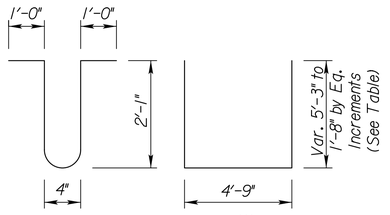


*At Contractors option, straight bars and bent bars may be substituted for "U" bars and spliced at locations shown. No allowance will be made for additional steel required. See table for required lap length.

GENERAL NOTES

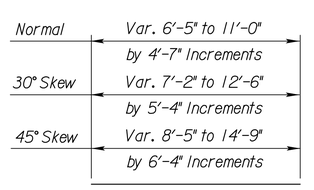
DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
UNIT STRESSES: Grade 4.0 Concrete; f'c = 4,000 p.s.i.
Reinforcing Steel; fy = 60,000 p.s.i.
CONCRETE: Grade 4.0 Concrete shall be used throughout. Bevel all exposed edges with a ¾inch triangular moulding.
REINFORCING: All reinforcing shall conform to ASTM A615, Grade 60. Welded wire fabric shall conform to ASTM A185. Wire fabric shall be electrically welded and shall be composed of 6x6-W1.4xW1.4 welded wire fabric and shall be classified as pounds of reinforcing.
QUANTITIES: Wingwall Quantities include all quantities outside the neat lines of the box, excluding the hubguard.
BACKFILL MATERIAL: Soils judged as high plasticity clays, fat clays, expansive clays, or organic clays are unsuitable for backfill material for wingwalls and will not be used. Where these conditions exist, use Granular Backfill (Wingwalls).
FOUNDATION STABILIZATION: Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.
INTERMEDIATE TOE-WALL: When the length of wingwalls and width of apron both exceed 15'-0", an intermediate toe-wall shall be constructed at mid-length of wingwall as shown on "Elevation of Wingwall".

NOTE:
Wingwall floor and toewall shall be constructed with the RCB floor. Wingwalls to be constructed with RCB walls.

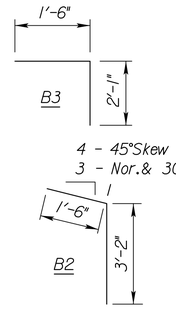


B5 U1

SKEW	INCREMENT
0°	4"
30°	3½"±
45°	3"±



C2
(Cut two each length)



BENDING DIAGRAMS
All dimensions are out to out of bars.

NOTE:
Space Weepholes to clear reinforcing steel. See "RCB Auxiliary Details" sheet for additional weephole details.

* See Bending Diagram

NOTE: Reinforcing Bar List is for both wings at one end of box only.	#4 B1		#4 B2 *		#4 B3 *		#4 B4		#4 B5 *		#4C1		#4C2				#4U1 *					
	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length
0° Skew	2	15'-0"	2	4'-8"	4	3'-7"	3	4'-8"		6'-4"	6	14'-4"	4	*			12	*				

WINGWALL QUANTITIES (One End Only)	
Concrete (Grade 4.0)	2.89 CY.
Reinforcing Steel	219 Lbs.
Foundation Stabilization	2.08 CY.

Quantities listed are included in the Summary of Quantities shown on the RCB.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Sta. 155+00
STRAIGHT WINGWALLS
4 ft Rise (0° Skew)

BR 11.00.04 Osborne Co.

FHWA APPROVAL			10-20-10	APP'D	Terry L. Fleck		
DESIGNED	SPW	DETAILED	KBK	QUANTITIES	SPW	CADD	KBK
DESIGN CK.	KG	DETAIL CK.	KG	QUAN. CK.	KG	CADD CK.	KG

KDOT Graphics Certified 07-11-2024

Sheet No. 66

KDOT Graphics Certified

Plotted By: KKATHRIN Plot Location:
File: c:\pwworking\central01\d2597941\ka6020001\bbrSta15500-3.dgn
Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	67	293

US-281 ALIGNMENT

P.O.T. ℄ Sta. 121+00.18
N 741,583.049 E 5,492,645.010

1. Set 5/8" Rebar	(0.3' deep)
2. Spike & Washer in UGT Marker Post 88	88.86' NW
3. Spike & Washer in Power Pole	76.28' WNW
4. Centerline Top T. Ped.	105.30' SW

P.C. ℄ Sta. 126+95.53
N 742,178.330 E 5,492,653.927

1. Set 5/8" Rebar	(0.3' deep)
2. Spike & Washer in Power Pole	95.25' SW
3. Spike & Washer in UGT Marker Post	133.50' SSW
4. Mag Nail & Washer East EM	11.50' E
5. Alum Capped Rebar	28.00' ENE

E 1/4 Cor. Sec. 18, T06S, R12W
N 739,993.173 E 5,492,620.995

1. Found 1/2" Rebar No Cap	(0.7' Deep)
2. 0.20'W of ℄ Sta. 105+10.08, SW Angle = 89°02'43" ℄ to ℄	
3. BLM RM 77.8'	77.63' NE
4. Spike & Washer in Power Pole	78.28' SW
5. Spike & Washer in UGT Marker Post	63.05' W
6. Spike & Washer in Top Fence Corner Post	60.88' E
7. Crop line to West	1.0' N
8. Fence Line to East	0.0' S

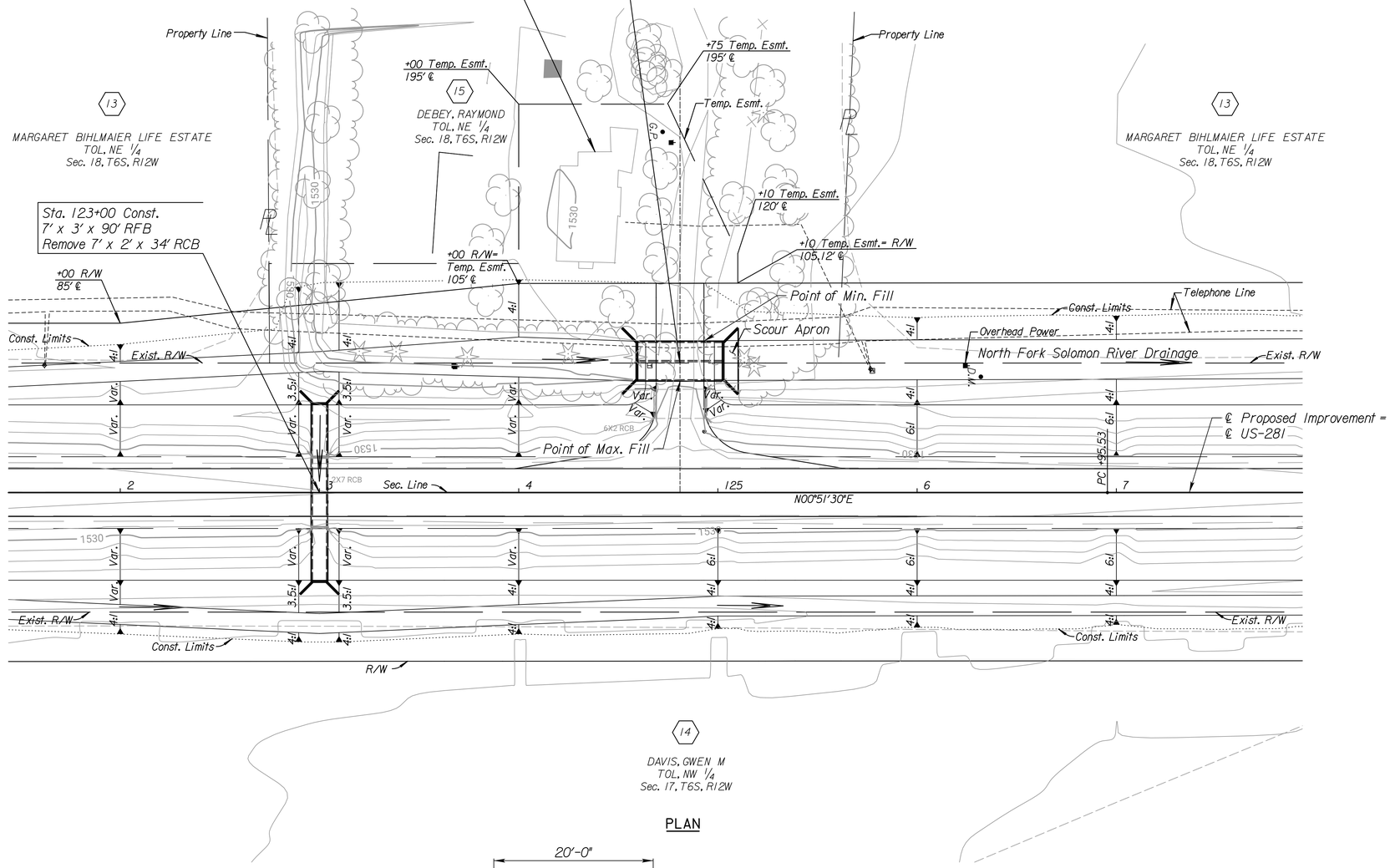
NE Cor. Sec. 18, T06S, R12W
N 742,623.431 E 5,492,660.595

1. Found 1/2" Rebar W/Alum. Cap LS-414	(0.6' Deep)
2. Spike & Washer in Power Pole	68.85' ENE
3. Chiseled "X" ℄E. End Hdwl. RCB	46.52' WSW
4. Chiseled "X" ℄E. End Hdwl. RCB	46.36' WNW
5. SW Cor. Chiseled Sq. NE Cor. Hdwl. RCB	30.65' NE
6. Spike & Washer in UGT Marker Post	92.18' ESE

Sta. 124+81, 66' Lt. Const.
Culv. No. 546
2 - 9' x 4' x 44' RFB
Remove 2 - 6' x 2' x 26.5' RCB
Culv. No. 531

Sta. 124+35 Remove
House and Foundation, Lt.

Sta. 123+00 Const.
7' x 3' x 90' RFB
Remove 7' x 2' x 34' RCB



PLAN

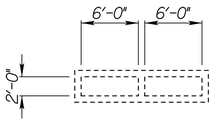
Scale: 1" = 30'-0"

DRAINAGE DATA

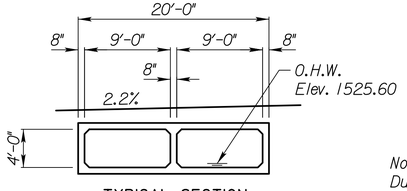
Drainage Area	1.48	Sq. Mi.
Design Frequency	10	Yr.
Design Discharge (Q10)	465	cfs
Overtopping Discharge	1370	cfs
Overtopping Frequency	<100	Yr.
Historic High Water Elevation	N/A	Ft.
Ordinary High Water Elevation	1525.6	Ft.
Estimated Ordinary High Water Discharge	15	cfs

Average Velocity Through the Bridge (Exit of Culvert):

Frequency	2 yr.	10 yr. (Design)	100 yr.
Existing Velocity (fps)	3.1	3.5	4.8
Proposed Velocity (fps)	3.4	6.5	7.6



EXISTING WATERWAY SKETCH
℄ US-281 Sta. 124+81
Waterway Opening = 24 Sq. Ft.
(Looking North)



TYPICAL SECTION
(Looking Downstream)
Min. Fill = 0.96'
Max. Fill = 1.68'

Note:
Due to hot mix asphalt being placed directly on the culvert top slab, substitute the "Bridge Backwall Protection System" with "Pavement Water Proofing" according to KDOT Standard Specifications Section 851. See the "RCB Auxiliary Details" sheet for details.

HISTORIC HIGH WATER
There is no history of US-281 overtopping at this location.

Elevations Shown are to the NAVD 88 Vertical Datum

Utility Owners

Telephone:
Nextech
145 N Main
Lenora, KS 67645
Phone - 785-567-4281

Overhead Power:
Prairie Land Electric Coop
223 W 5th St
Concordia, KS 66901
Phone - 785-243-1750

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Culvert (546) Sta. 124+81.00
CONTOUR MAP
US-281
Proj. No. 281-071 KA-6020-01 Osborne Co.

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

KDOT Graphics Certified 05-08-2024

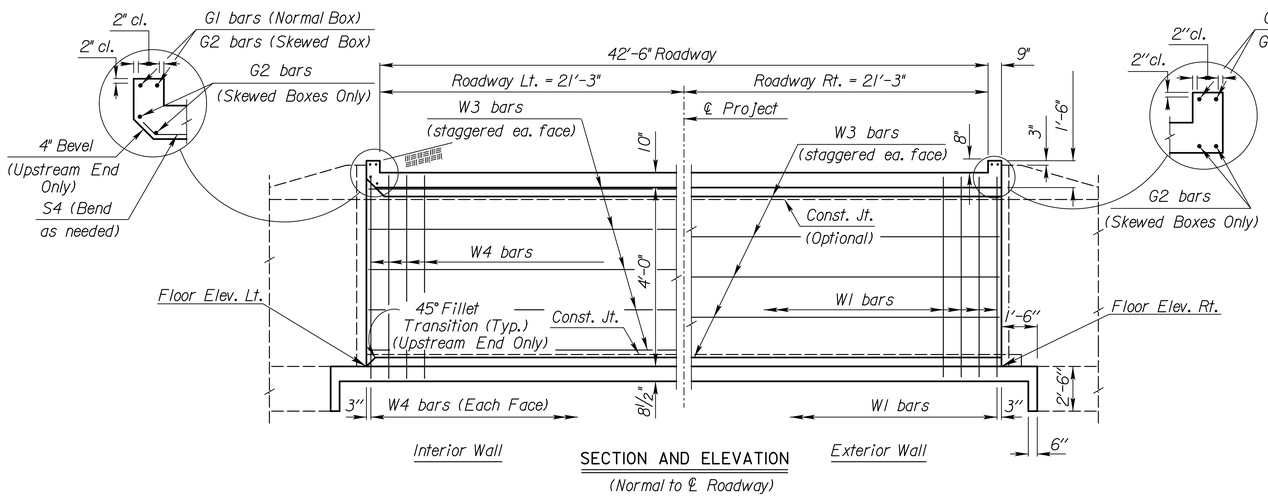
Sheet No. 67

KDOT Graphics Certified

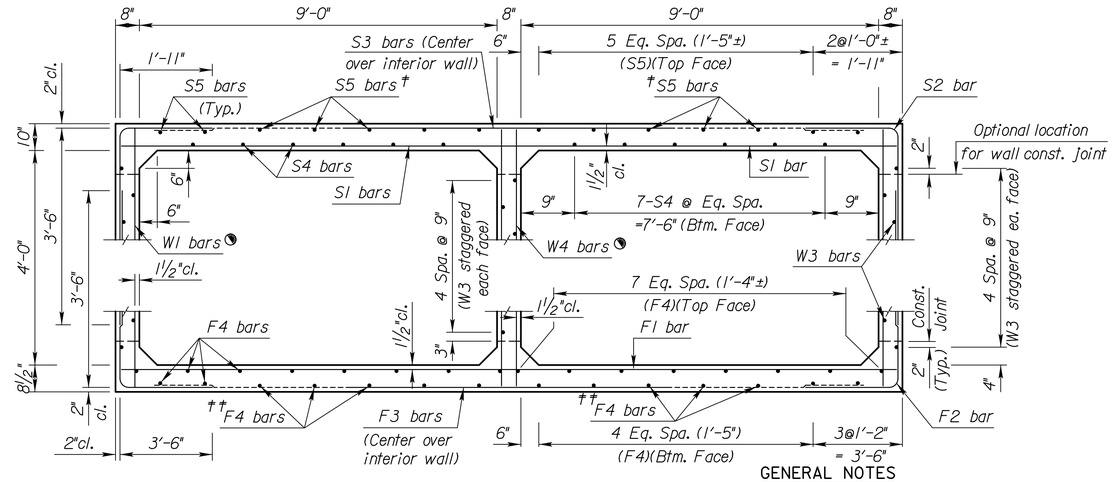
Plotted By: KKATHRIN
Plot Location:
File: c:\pwworking\central01\d2597941\kd602001\bbr0546-CM.dgn
Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	68	293

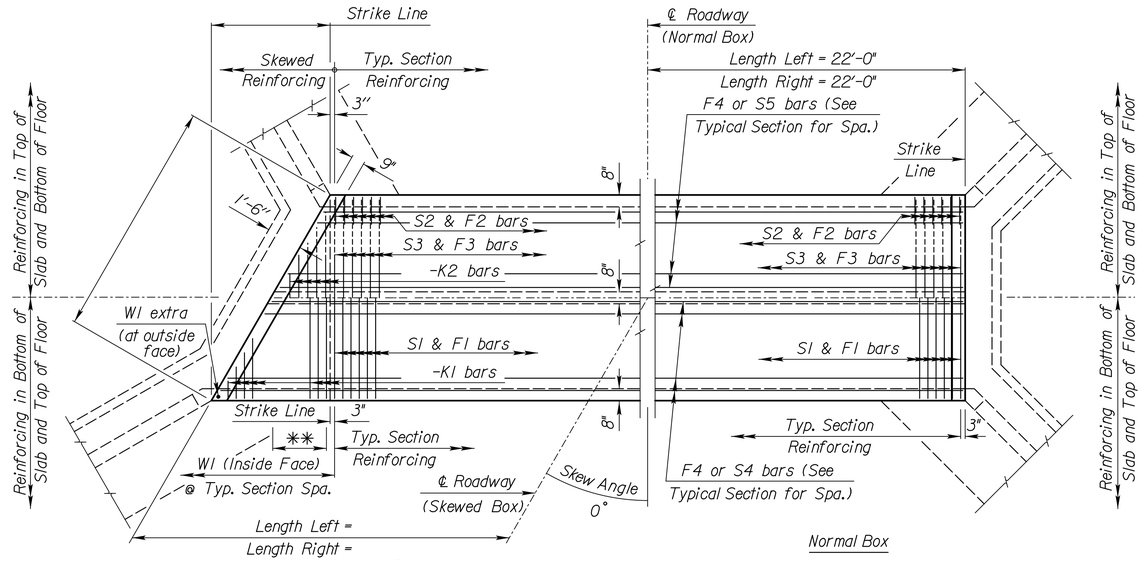
06	SYSTEM PART	VERSION/ID
	CADD V8A	12/6/2000
	DATABASE	5/4/2020
	RCB PROGRAM	7.1.22
	KBOX MODEL ID	1567
	CELL LIBRARY	2/8/2022



SECTION AND ELEVATION
(Normal to ℄ Roadway)



TYPICAL SECTION



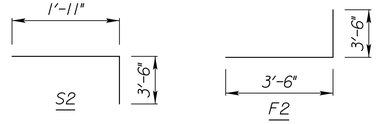
PLAN

◔ See RCB Auxiliary Details for Optional Splice.

† Place when S3 bar extends to exterior walls.

†† Place when F3 bar extends to exterior walls.

Note:
Only cast-in-place boxes may be used at this location.



BENDING DIAGRAM
All Dimensions are out to out of bars.

GENERAL NOTES

DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
UNIT STRESSES: Grade 4.0 Concrete; f'c = 4,000 p.s.i.
Reinforcing Steel; fy = 60,000 p.s.i.

FILL HEIGHT: Unless otherwise noted, the Design Fill Height is measured from the riding surface at the culvert and shall include the surfacing.

CONCRETE: Grade 4.0 Concrete shall be used throughout. Bevel all exposed edges with a ¾inch triangular moulding. Where Grade 4.0 Concrete (AE) is specified, it shall be placed in the top slab above the Construction Joint.

REINFORCING: All reinforcing shall conform to ASTM A615, Grade 60. All dimensions relative to reinforcing steel shall be to centerline of bar unless otherwise noted.

EXCAVATION: Excavation for culverts less than bridge length shall not be paid for directly but shall be subsidiary to Grade 4.0 Concrete. Excavation for RCB Bridges shall be paid for as Class III Excavation.

SEAL COURSE: A Seal Course may be required by the Engineer. The Seal Course shall be unreinforced Concrete (Commercial Grade) to a minimum depth of 3 inches or as determined by the Engineer. Concrete for the seal course shall be paid for at the unit price set for Concrete for Seal Course.

FOUNDATION STABILIZATION: The Foundation Stabilization quantity has been calculated to the limits shown on the "RCB Auxiliary Details" sheet. The depth may be increased by the Engineer. The Contractor may underrun Foundation Stabilization under the barrel if founded on firm material and with the Engineer's approval. Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.

QUANTITIES: The quantities shown in the Culvert Summary include apron and/or soil saver quantities when their construction is required by the plans. Payment for additional quantities that result from including seal course and/or floating apron, as a change in original plans, shall be made at the Unit Price bid for the various items involved.

GRANULAR BACKFILL (WINGWALLS):
See the "Auxiliary Details" sheet.

STRIKE LINE: Wingwalls and that portion of the RCB outside the Strike Line shall be constructed level. Footing for wingwalls shall be constructed with the culvert floor. See wingwall detail sheet.

BRIDGE BACKWALL PROTECTION SYSTEM: For structures with this bid item in the Summary of Quantities. See the "Auxiliary Details" sheet.

△ For design purposes ONLY. Do NOT use for Construction — CULVERT SUMMARY — ◔ includes any welded wire fabric

Floor Elev. Lt.	Floor Elev. Rt.	Crown Gr. Elev.	△Design Fill Ht.	Skew	Left Wings	Right Wings	Scour Apron	Soil Saver	LRFR RATING FACTORS: HL-93 Loading Inventory	HL-93 Loading Operating
1525.10	1524.84	1562.66	2	0	Flared	Flared	Yes	No	1.25	1.61

Concrete: Barrel (Cu.Yds.)	Concrete: Wings (Cu.Yds.)	Concrete: Total (Cu.Yds.)	Reinf. Steel (Gr. 60): Barrel (Lbs.)	Reinf. Steel (Gr. 60): ◔Wings (Lbs.)	Reinf. Steel (Gr. 60): Total (Lbs.)
65.60	14.60	80.21	11880	1488	13368

△ Epoxy Coated Bars
✱ See Bending Diagram

BAR SCHEDULE

△ F1 Size	Spa.	No.	Length	△ F2 ✱ Size	Spa.	No.	Length	△ F3 Size	Spa.	No.	Length	△ F4 Size	No.	Length	△ S1 Size	Spa.	No.	Length
4	6"	88	19'-8"	5	5½"	192	7'-0"	5	5½"	96	7'-6"	4	56	22'-7"	5	6"	88	19'-8"

△ S2 ✱ Size	Spa.	No.	Length	△ S3 Size	Spa.	No.	Length	△ S4 Size	No.	Length	△ S5 Size	No.	Length
4	5½"	192	5'-5"	6	5½"	96	19'-8"	5	14	43'-8"	4	28	22'-7"

△ K1 Size	Spa.	No.	Length	△ K2 Size	Spa.	No.	Length	△ W1 Size	Spa.	No.	Length	△ W2 Size	Spa.	No.	Length	△ W3 Size	No.	Length
N/A	N/A	N/A		N/A	N/A	N/A		5	1'-0"	90	5'-2"	N/A	N/A	N/A	N/A	4	30	22'-7"

△ W4 Size	Spa.	No.	Length	△ G1 Size	No.	Length	△ G2 Size	No.	Length	Size	Spa.	No.	Length
4	1'-0"	90	5'-2"	5	4	19'-8"	N/A	N/A	N/A				

Minimum Splice Lengths	
#4	1'-5"
#5	1'-9"

SUMMARY OF QUANTITIES

Concrete (Grade 4.0)(RCB)	49.4 C.Y.
Concrete (Grade 4.0)(AE)(RCB)	30.8 C.Y.
Bridge Backwall Protection System	104 S.Y.
Reinforcing Steel (Gr. 60)	1490 Lbs.
Reinforcing Steel (Gr.60)(Epoxy Coated)	11880 Lbs.
Class III Excavation	C.Y.
Foundation Stabilization	27 C.Y.
Concrete for Seal Course (Set)	1 C.Y.
Granular Backfill (Wingwalls)	24 C.Y.

NO.	DATE	REVISIONS	BY	APP'D
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Culvert (546) Sta. 124+81.00
DOUBLE 9 ft x 4 ft RFB

BR 2.9.4 F Osborne Co.

FHWA APPROVAL		10-20-10	APP'D	Terry L. Fleck	
DESIGNED	SPW	DETAILED	KBK	QUANTITIES	SPW	CADD	KBK
DESIGN CK.	KG	DETAIL CK.	KG	QUAN. CK.	KG	CADD CK.	KG

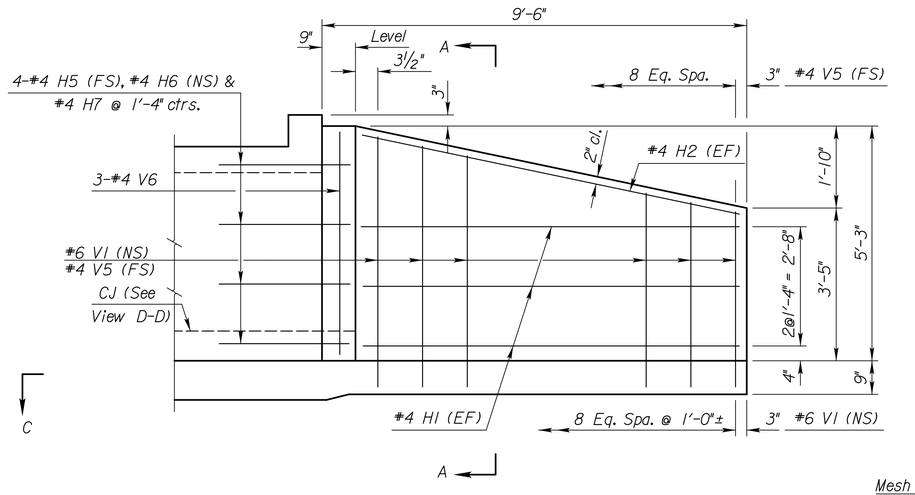
KDOT Graphics Certified 07-11-2024

Sheet No. 68

KDOT Graphics Certified

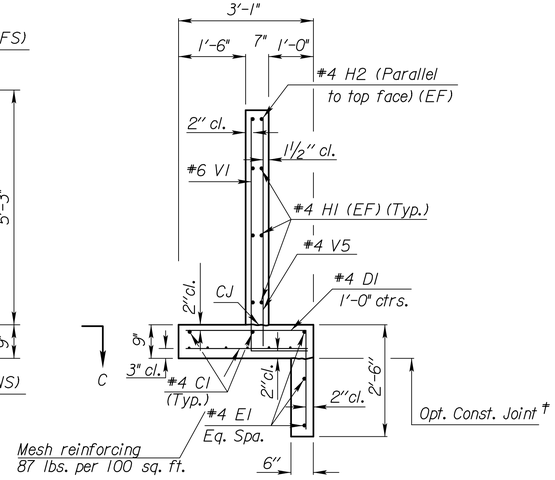
Plotted By: KKATHRIN
File: c:\pwworking\central01\d2597941\kb60200\bbr0546-1.dgn
Plot Date: 07-11-24
Plot Location:

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	69	293



ELEVATION OF WINGWALL

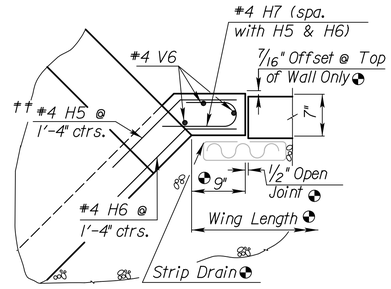
(Backface Shown)



SECTION A-A

See "RCB Aux. Details" sheet for additional requirements.

Typical both wings



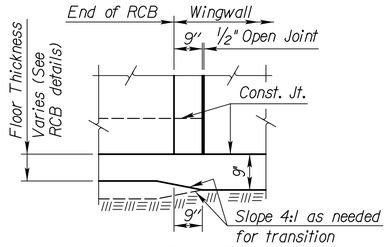
WINGWALL JOINT DETAIL

(Plan View)

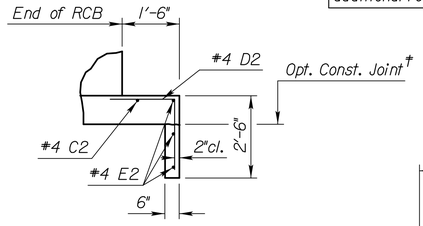
† NOTE: Const. Jt. may be used at Contractor's option when approved by the Engineer. D1 bars or mesh may be spliced thus: ⌐¬ Minimum overlap shall be 1'-3". No increase in quantities or cost shall be allowed when Contractor elects this option.

GENERAL NOTES

DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
UNIT STRESSES: Grade 4.0 Concrete; f'c = 4,000 p.s.i.
Reinforcing Steel; fy = 60,000 p.s.i.
CONCRETE: Grade 4.0 Concrete shall be used throughout. Bevel all exposed edges with a ¾" triangular moulding.
REINFORCING: All reinforcing shall conform to ASTM A615, Grade 60. Welded Wire Reinforcement shall conform to ASTM A185. All dimensions relative to reinforcing steel shall be to centerline of bar unless otherwise noted. Welded Wire Reinforcement shall be classified as pounds of reinforcing and included in the total quantity for the bid item Reinforcing Steel (Gr. 60).
QUANTITIES: Wingwall Quantities include all quantities outside the neat lines of the box, excluding the hubguard.
APRON: A 5" concrete slab shall be constructed between the downstream wings in locations subject to scour only when specified on the plans or by the Engineer.
BACKFILL MATERIAL: Use Granular Backfill material meeting the requirements of SB-1, SB-2, SCA-1, SCA-2.
Backfill all wings to limits shown on the "RCB Auxiliary Sheet".
FILTER FABRIC: Separate in-situ material from granular backfill with approved filter fabric complying with Section 1710.
Filter Fabric is subsidiary to "Granular Backfill".
FOUNDATION STABILIZATION: Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.

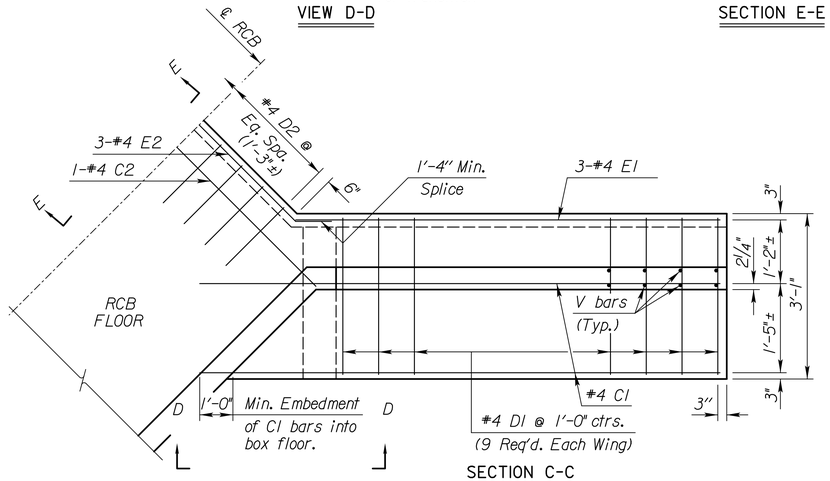


VIEW D-D

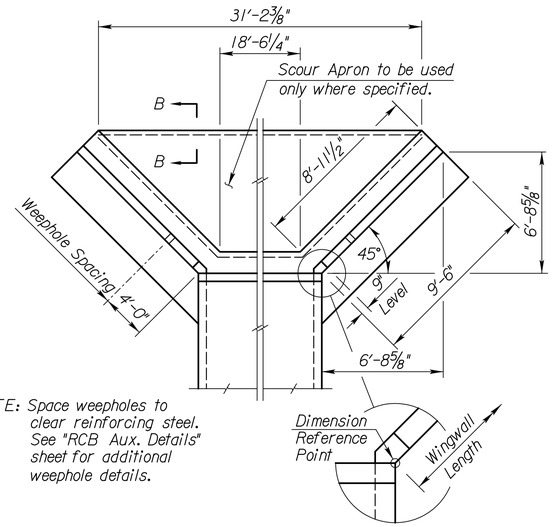


SECTION E-E

NOTE:
EF = Each Face
NS = Near Side
FS = Far Side
CJ = Const. Joint



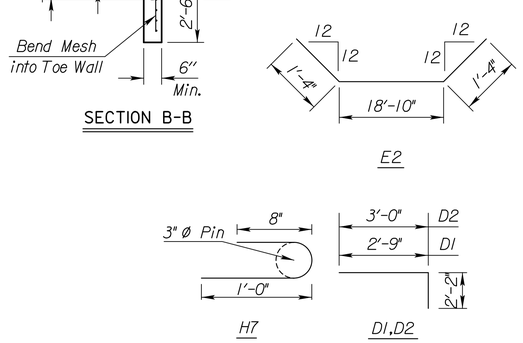
SECTION C-C



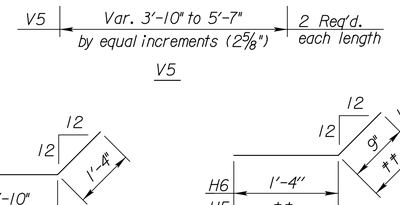
NOTE: Space weepholes to clear reinforcing steel. See "RCB Aux. Details" sheet for additional weephole details.

WING DIMENSIONS FOR NORMAL BOX

(3½:1 Embankment Slope)



SECTION B-B

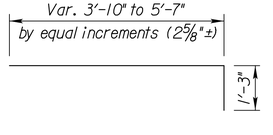


V5

E2

H5, H6

H7 D1,D2



V1

(2 Req'd., each length)

BENDING DIAGRAM

(All dimensions are out to out of bars.)

†† Bend in Field

Quantities listed below are included in the Summary of Quantities shown on the RCB details.

WINGWALL QUANTITIES (One End Only)				
	Foundation Stabilization		Concrete (Gr. 4.0)	
Wingwalls	1.80	(C.Y.)	5.49	(C.Y.)
Apron	2.63	(C.Y.)	3.62	(C.Y.)
Soil Saver	0.00	(C.Y.)	0.00	(C.Y.)
Reinforcing Steel (Gr. 60)			591	Lbs.
Welded Wire Fabric (Wings)			51	Lbs.
Welded Wire Fabric (Apron)			205	Lbs.
Granular Backfill (Wingwalls)			12.00	C.Y.
Filter Fabric (subsidiary)			18.00	S.Y.

NOTE: Reinforcing Bar List is for both wings at one end of box only.

✳ See Bending Diagram

0° Skew		#4C1	#4D1	#4E1	#4C2	#4D2	#4E2	#6V1	#4H1	#4H2	#4H5	#4H6	#4H7	#4V5	#4V6
	No.	4	18✳	6	1	15 ✳	3 ✳	18	12	4	8 ✳	8✳	8✳	18	6
	Length	11'-7"	4'-11"	8'-9"	19'-8"	5'-2"	21'-6"	✳	8'-4"	8'-6"	1'-10"	2'-1"	1'-9"	✳	5'-0"

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Culvert (546) Sta. 124+81.00
FLARED WINGWALLS
4 ft Rise (0° SKEW)
BR 10.00.04 Osborne Co.

FHWA APPROVAL			10-20-10	APP'D			Terry L. Fleck
DESIGNED	SPW	DETAILED	KBK	QUANTITIES	SPW	CADD	KBK
DESIGN CK.	KG	DETAIL CK.	KG	QUAN. CK.	KG	CADD CK.	KG

KDOT Graphics Certified 07-11-2024

Sheet No. 69

KDOT Graphics Certified

Plotted By: KKATHRIN
Plot Location:
File: c:\pwworking\central01\d2597941\kdot2001bbr0546-2.dgn
Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	70	293

US-281 ALIGNMENT

P.C. ℄ Sta. 126+95.53
N 742,178.330 E 5,492,653.927
1. Set 5/8" Rebar (0.3' deep)
2. Spike & Washer in Power Pole 95.25' SW
3. Spike & Washer in UGT Marker Post 133.50' SSW
4. Mag Nail & Washer East EM 11.50' E
5. Alum Capped Rebar 28.00' ENE

P.I. Sta. 130+40.68 (Bk.) =
P.I. Sta. 130+40.67 (Ahd.)
N 742,523.453 E 5,492,658.414
1. 1/2" Rebar w/Alum Cap (0.6' deep)
2. Spike & Washer in Power Pole 68.65' ENE
3. Chiseled "X" East End Headwall RCB 46.52' WSW
4. Chiseled "X" East End Headwall RCB 46.36' WNW
5. SW Cor. Chiseled "□" NEC. Headwall 30.65 NE
6. Spike & Washer UGT Marker Po. 92.18' ESE

P.T. ℄ Sta. 135+85.82
N 743,068.577 E 5,492,662.652
1. Not Set

P.O.T. ℄ Sta. 135+90.55
N 743,073.306 E 5,492,662.673
1. 1/2" Rebar Found (0.8' deep)
2. 0.3' X 0.3' R/W Marker 82.68' NE
3. Spike & Washer in Power Pole 67.75' W
4. Travel Way Hwy 281 0.3' E
5. ℄ Irrigation Well 144.70' NE

E 1/4 Cor. Sec. 18, T06S, R12W
N 739,993.173 E 5,492,620.995
1. Found 1/2" Rebar No Cap (0.7' Deep)
2. 0.20' W of ℄ Sta. 105+10.08, SW Angle = 89°02'43" ℄ to ℄
3. BLM RM 77.8' 77.63' NE
4. Spike & Washer in Power Pole 78.28' SW
5. Spike & Washer in UGT Marker Post 63.05' W
6. Spike & Washer in Top Fence Corner Post 60.88' E
7. Crop line to West 1.0' N
8. Fence Line to East 0.0' S

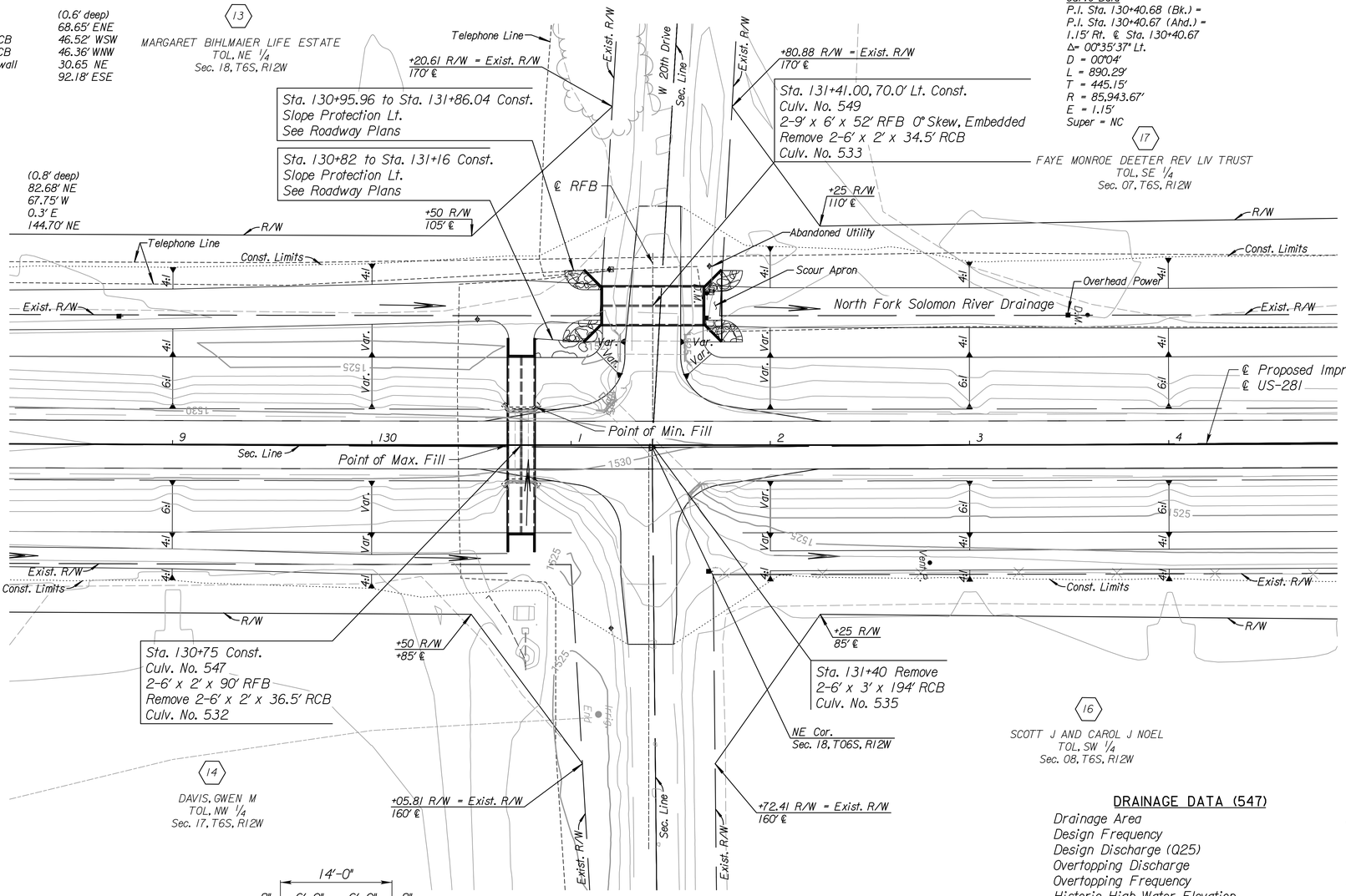
N 1/4 Cor. Sec. 18, T06S, R12W
N 742,805.171 E 5,490,014.621
1. Found 1/2" Rebar W/Cap LS-1276 over 2 1/2" Pipe BLM Monument (0.5' Deep)
2. 2652.19' W of ℄ P.I. Sta. 131+40.68 BK = 131+40.67 AH. SW Angle = 90°04'15" ℄ Back Tangent to ℄
3. Spike & Washer in Power Pole 29.37' S
4. Spike & Washer in Side of Brace Post 46.99' N
5. Centerline Top SW guard Post Irrigation 54.50' NW
6. Mag Nail in Top West end CMP 29.00' NE
7. Travel Way Gravel Road E-W 2.1' S
8. Overhead Power Line to N 0.0' E

NE Cor. Sec. 18, T06S, R12W
N 742,623.431 E 5,492,660.595
1. Found 1/2" Rebar W/Alum. Cap LS-414 (0.6' Deep)
2. Spike & Washer in Power Pole 68.85' ENE
3. Chiseled "X" ℄E. End Hdwl. RCB 46.52' WSW
4. Chiseled "X" ℄E. End Hdwl. RCB 46.36' WNW
5. SW Cor. Chiseled Sq. NE Cor. Hdwl. RCB 30.65' NE
6. Spike & Washer in UGT Marker Post 92.18' ESE

Curve Data
P.I. Sta. 130+40.68 (Bk.) =
P.I. Sta. 130+40.67 (Ahd.) =
1.15' Rt. ℄ Sta. 130+40.67
Δ= 00°35'37" Lt.
D = 00°04'
L = 890.29'
T = 445.15'
R = 85,943.67'
E = 1.15'
Super = NC

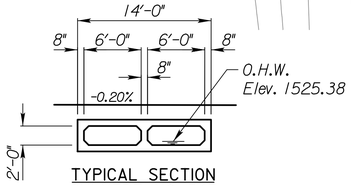
N 1/4 Cor. Sec. 17, T06S, R12W
N 742,625.118 E 5,495,273.580
1. Found 2 1/2" Pipe BLM Monument (1.8' Deep) Set 5/8"x 24" Rebar W/Cap CF&S CLS-80 to (0.4' Deep) over Monument
2. 2612.99' E of ℄ Sta. 131+40.68 BK = 131+40.67 AH. SE Angle = 90°53'43" ℄ Back Tangent to ℄
3. West Face of House North Extended 1.7' E
4. Travel Way E-W Gravel Road 0.7' S
5. Centerline Top Telephone Pedestal 83.64' ENE
6. Nail & Bottle Cap in 80"Tree 28.18' NNW
7. Spike & Washer in UGT Marker Post 52.25' WSW
8. Spike & Washer in Top Lone Fence Post 112.21' WNW

E 1/4 Cor. Sec. 7, T06S, R12W
N 745272.397, E 5492667.281
1. 2 1/2" Pipe BLM Monument at Surface
2. 32.21' W of ℄ Sta. 157+90.27, NW Angle = 92°27'21" ℄ to ℄
3. Travel Way Hwy 281 32.9' E
4. Spike & Washer in Historical Marker sign 58.57' ENE
5. Spike & Washer in Top Fence Post 58.30' NW
6. Spike & Washer in Top Fence Post 49.10' W
7. Spike & Washer in Power Pole 61.37' SW
8. Spike & Washer in 30"Tree 101.63' SSW



PLAN

Scale: 1" = 30'-0"



TYPICAL SECTION
CULVERT NO. 547
(Looking Downstream)
Min. Fill = 3.42'
Max. Fill = 3.82'

EXISTING WATERWAY OPENING SKETCH
CULVERT NO. 532
℄ US-281 Sta. 130+75
Waterway Opening = 24 Sq. Ft.
(Looking East)

EXISTING WATERWAY OPENING SKETCH
CULVERT NO. 533
℄ US-281 Sta. 131+41, 68' Lt.
Waterway Opening = 24 Sq. Ft.
(Looking North)

HISTORIC HIGHWATER
There is no history of US-281 overtopping at this location.

DRAINAGE DATA (547)

Drainage Area	2.45	Sq. Mi.
Design Frequency	25	Yr.
Design Discharge (Q25)	200	cfs
Overtopping Discharge	240	cfs
Overtopping Frequency	>100	Yr.
Historic High Water Elevation	N/A	Ft.
Ordinary High Water Elevation	1525.4	Ft.
Estimated Ordinary High Water Discharge	5	cfs

Average Velocity Through the Bridge (Exit of Culvert):

	2 yr.	25 yr. (Design)	100 yr.
Frequency			
Existing Velocity (fps)	4.5	8.1	9.4
Proposed Velocity (fps)	2.0	8.3	9.2

Elevations Shown are to the NAVD 88 Vertical Datum

Utility Owners

Telephone:
Nextech
145 N Main
Lenora, KS 67645
Phone - 785-567-4281

Water:
Osborne Co RWD 1A
2763 W 50th Drive
Alton, KS 67623
Phone - 785-476-7590
Phone - 785-994-3031

Overhead Power:
Prairie Land Electric Coop
223 W 5th St
Concordia, KS 66901
Phone - 785-243-1750

Water:
City of Portis Water Dept. (Jay Meyers)
PO Box 15
Portis, KS 67434
Phone - 785-454-1988

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Culvert (547) Sta. 130+75.00
Culvert (549) Sta. 131+41.00
CONTOUR MAP
US-281
Proj. No. 281-071 KA-6020-01 Osborne Co.

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

KDOT Graphics Certified 05-08-2024

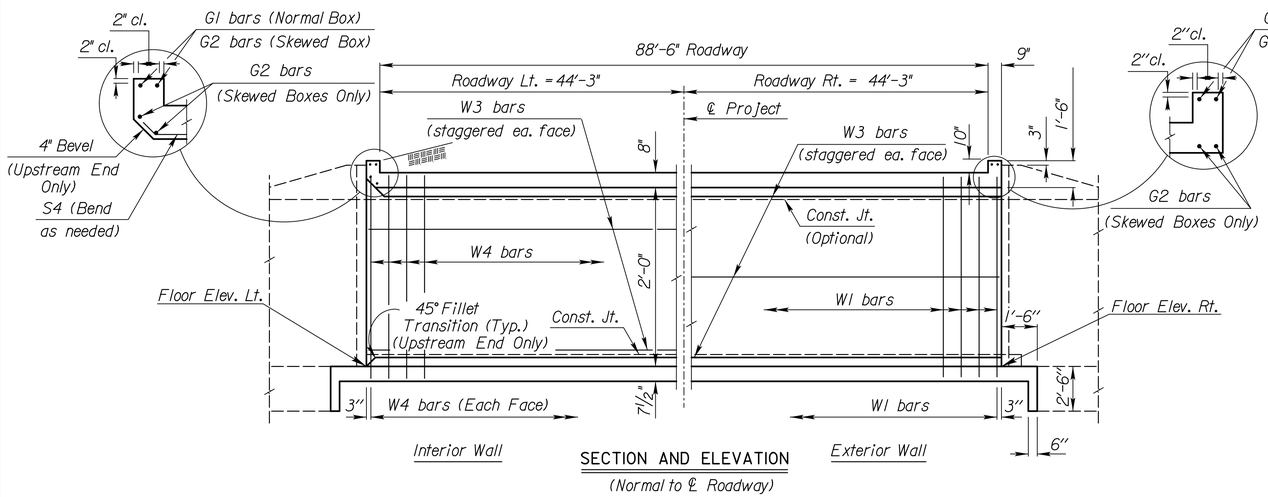
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KDOT Graphics Certified

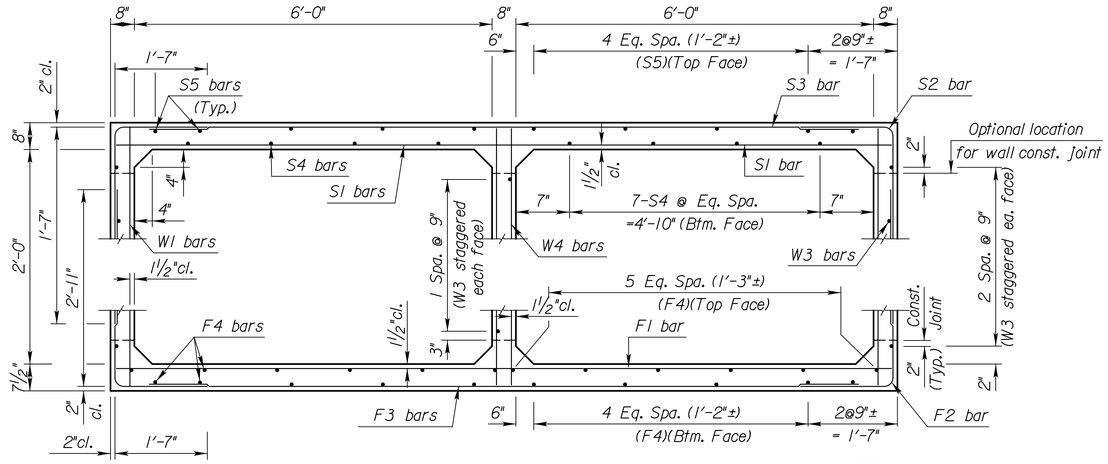
Plotted By: KKATHRIN
Plot Location:
File: c:\pwworking\central01\d2597941\ka602001bbr05478049-CM.dgn
Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	7I	293

06	SYSTEM PART	VERSION/ID
	CADD VBA	12/6/2000
	DATABASE	5/4/2020
	RCB PROGRAM	7.1.22
	KBOX MODEL ID	1480
	CELL LIBRARY	2/8/2022

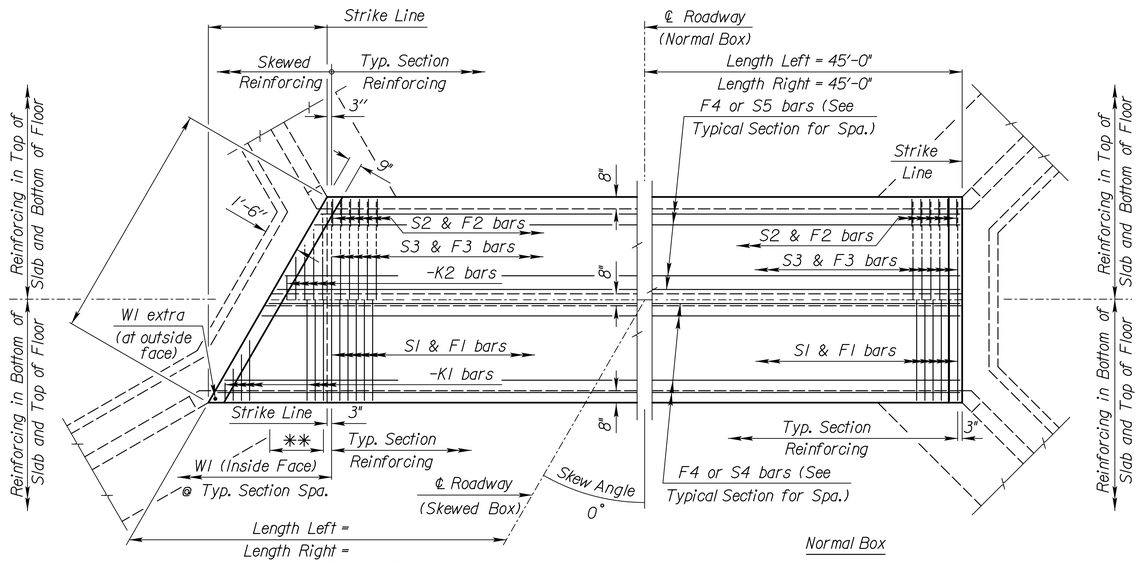


SECTION AND ELEVATION
(Normal to ℄ Roadway)

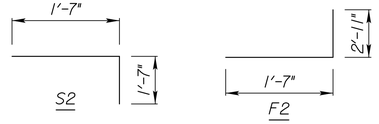


TYPICAL SECTION

Note: Only cast-in-place or double-cell, precast boxes may be used at this location.



PLAN



BENDING DIAGRAM
All Dimensions are out to out of bars.

GENERAL NOTES

DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
UNIT STRESSES: Grade 4.0 Concrete; f'c = 4,000 p.s.i.
Reinforcing Steel; fy = 60,000 p.s.i.
FILL HEIGHT: Unless otherwise noted, the Design Fill Height is measured from the riding surface at the culvert and shall include the surfacing.
CONCRETE: Grade 4.0 Concrete shall be used throughout. Bevel all exposed edges with a ¾inch triangular moulding. Where Grade 4.0 Concrete (AE) is specified, it shall be placed in the top slab above the Construction Joint.
REINFORCING: All reinforcing shall conform to ASTM A615, Grade 60. All dimensions relative to reinforcing steel shall be to centerline of bar unless otherwise noted.
EXCAVATION: Excavation for culverts less than bridge length shall not be paid for directly but shall be subsidiary to Grade 4.0 Concrete. Excavation for RCB Bridges shall be paid for as Class III Excavation.
SEAL COURSE: A Seal Course may be required by the Engineer. The Seal Course shall be unreinforced Concrete (Commercial Grade) to a minimum depth of 3 inches or as determined by the Engineer. Concrete for the seal course shall be paid for at the unit price set for Concrete for Seal Course.
FOUNDATION STABILIZATION: The Foundation Stabilization quantity has been calculated to the limits shown on the "RCB Auxiliary Details" sheet. The depth may be increased by the Engineer. The Contractor may underrun Foundation Stabilization under the barrel if founded on firm material and with the Engineer's approval. Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.
QUANTITIES: The quantities shown in the Culvert Summary include apron and/or soil saver quantities when their construction is required by the plans. Payment for additional quantities that result from including seal course and/or floating apron, as a change in original plans, shall be made at the Unit Price bid for the various items involved.
GRANULAR BACKFILL (WINGWALLS): See the "Auxiliary Details" sheet.
STRIKE LINE: Wingwalls and that portion of the RCB outside the Strike Line shall be constructed level. Footing for wingwalls shall be constructed with the culvert floor. See wingwall detail sheet.
BRIDGE BACKWALL PROTECTION SYSTEM: For structures with this bid item in the Summary of Quantities. See the "Auxiliary Details" sheet.

△For design purposes ONLY. Do NOT use for Construction — CULVERT SUMMARY — ◔ includes any welded wire fabric

Floor Elev. Lt.	Floor Elev. Rt.	Crown Gr. Elev.	△Design Fill Ht.	Skew	Left Wings	Right Wings	Scour Apron	Soil Saver	Concrete Barrel (Cu.Yds.)	Concrete Wings (Cu.Yds.)	Concrete Total (Cu.Yds.)	Reinf. Steel (Gr. 60) Barrel (Lbs.)	Reinf. Steel (Gr. 60) ◔Wings (Lbs.)	Reinf. Steel (Gr. 60) Total (Lbs.)	LRFR RATING FACTORS HL-93 Loading Inventory	HL-93 Loading Operating
1525.00	1525.00	1531.47	0	0	Straight	Straight	No	No	75.71	6.37	82.08	17390	427	17817	2.30	2.96

*See Bending Diagram

BAR SCHEDULE

F1 Size	F1 Spa.	F1 No.	F1 Length	F2 * Size	F2 * Spa.	F2 * No.	F2 * Length	F3 Size	F3 Spa.	F3 No.	F3 Length	F4 Size	F4 No.	F4 Length	S1 Size	S1 Spa.	S1 No.	S1 Length	S2 * Size	S2 * Spa.	S2 * No.	S2 * Length	S3 Size	S3 Spa.	S3 No.	S3 Length	S4 Size	S4 No.	S4 Length	S5 Size	S5 No.	S5 Length
4	6½"	166	13'-8"	5	8"	270	4'-6"	6	8"	135	13'-8"	4	72	30'-10"	6	6½"	166	13'-8"	4	8"	270	3'-2"	6	8"	135	13'-8"	5	28	45'-9"	4	36	30'-10"

K1 Size	K1 Spa.	K1 No.	K1 Length	K2 Size	K2 Spa.	K2 No.	K2 Length	W1 Size	W1 Spa.	W1 No.	W1 Length	W2 Size	W2 Spa.	W2 No.	W2 Length	W3 Size	W3 No.	W3 Length	W4 Size	W4 Spa.	W4 No.	W4 Length	G1 Size	G1 No.	G1 Length	G2 Size	G2 No.	G2 Length	G2 Size	G2 Spa.	G2 No.	G2 Length
N/A	N/A	N/A		N/A	N/A	N/A		4	1'-1"	168	2'-11"	N/A	N/A	N/A	N/A	4	24	30'-10"	4	6½"	332	2'-11"	5	4	13'-8"	N/A	N/A	N/A				

Minimum Splice Lengths	
#4	1'-5"
#5	1'-9"

SUMMARY OF QUANTITIES

Concrete (Grade 4.0)(RCB)	82.1	C.Y.
Concrete (Grade 4.0)(AE)(RCB)	0.0	C.Y.
Bridge Backwall Protection System		S.Y.
Reinforcing Steel (Gr. 60)	17820	Lbs.
Reinforcing Steel (Gr.60)(Epoxy Coated)	0	Lbs.
Class III Excavation		C.Y.
Foundation Stabilization	35	C.Y.
Concrete for Seal Course (Set)	1	C.Y.
Granular Backfill (Wingwalls)	0	C.Y.

NO.	DATE	REVISIONS	BY	APP'D
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Culvert (547) Sta. 130+75.00
DOUBLE 6 ft x 2 ft RFB

BR 2.6.2 F — Osborne Co.

FHWA APPROVAL		10-20-10	APP'D	Terry L. Fleck			
DESIGNED	SPW	DETAILED	KBK	QUANTITIES	SPW	CADD	KBK
DESIGN CK.	KG	DETAIL CK.	KG	QUAN. CK.	KG	CADD CK.	KG

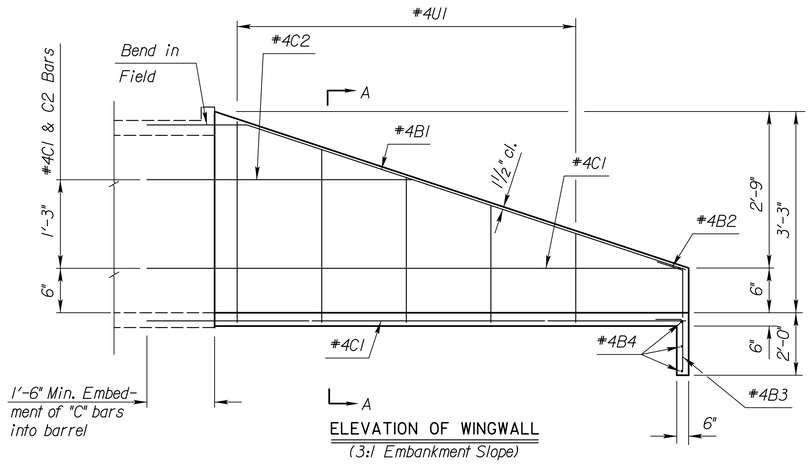
KDOT Graphics Certified 07-11-2024

Sheet No. 71

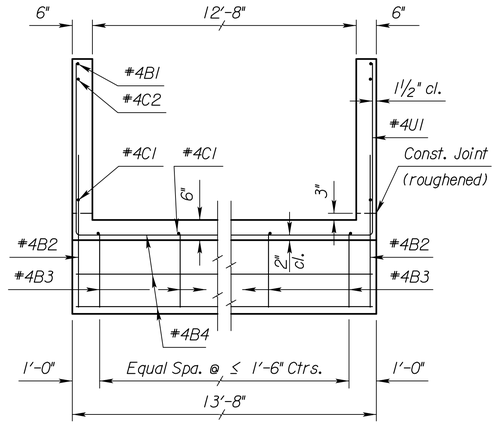
KDOT Graphics Certified

Plotted By: KKATHRIN
File: c:\pwworking\central01\d2597941\kb60200lbbr0547-1.dgn
Plot Date: 07-11-24
Plot Location:

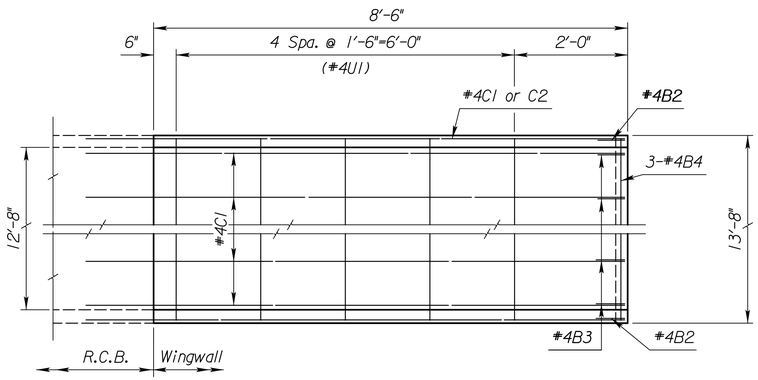
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	72	293



ELEVATION OF WINGWALL
(3:1 Embankment Slope)



Section A-B

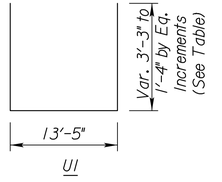


PLAN OF WINGWALLS
(Normal RCB)

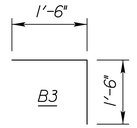
NOTE:
Wingwall floor and toewall shall be constructed with the RCB floor. Wingwalls to be constructed with RCB walls.

GENERAL NOTES

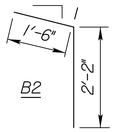
DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
UNIT STRESSES: Grade 4.0 Concrete; f'c = 4,000 p.s.i.
Reinforcing Steel; fy = 60,000 p.s.i.
CONCRETE: Grade 4.0 Concrete shall be used throughout. Bevel all exposed edges with a ¾inch triangular moulding.
REINFORCING: All reinforcing shall conform to ASTM A615, Grade 60. Welded wire fabric shall conform to ASTM A185. Wire fabric shall be electrically welded and shall be composed of 6x6-W1.4xW1.4 welded wire fabric and shall be classified as pounds of reinforcing.
QUANTITIES: Wingwall Quantities include all quantities outside the neat lines of the box, excluding the hubguard.
BACKFILL MATERIAL: Soils judged as high plasticity clays, fat clays, expansive clays, or organic clays are unsuitable for backfill material for wingwalls and will not be used. Where these conditions exist, use Granular Backfill (Wingwalls).
FOUNDATION STABILIZATION: Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.
INTERMEDIATE TOE-WALL: When the length of wingwalls and width of apron both exceed 15'-0", an intermediate toe-wall shall be constructed at mid-length of wing-wall as shown on "Elevation of Wingwall".



SKEW	INCREMENT
0°	6"
30°	5"
45°	4"



4 - 45°Skew
3 - Nor.& 30°Skew



BENDING DIAGRAMS
All dimensions are out to out of bars.

NOTE:
Space Weepholes to clear reinforcing steel. See "RCB Auxiliary Details" sheet for additional weephole details.

* See Bending Diagram

NOTE: Reinforcing Bar List is for both wings at one end of box only.	#4 B1		#4 B2 *		#4 B3 *		#4 B4				#4C1		#4C2				#4U1 *					
	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length
0° Skew	2	10'-4"	2	3'-8"	10	3'-0"	3	13'-8"		0"	12	9'-10"	2	5'-9"			5	*				

WINGWALL QUANTITIES (One End Only)	
Concrete (Grade 4.0)	3.18 CY.
Reinforcing Steel	214 Lbs.
Foundation Stabilization	2.62 CY.

Quantities listed are included in the Summary of Quantities shown on the RCB.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Culvert (547) Sta. 130+75.00
STRAIGHT WINGWALLS
2 ft Rise (0° Skew)
BR 11.00.02 Osborne Co.

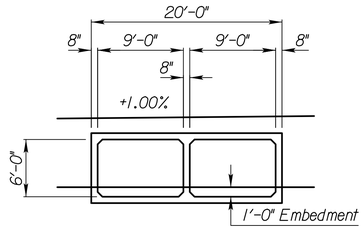
FHWA APPROVAL		6-5-91	APP'D	Terry L. Fleck			
DESIGNED	SPW	DETAILED	KBK	QUANTITIES	SPW	CADD	KBK
DESIGN CK.	KG	DETAIL CK.	KG	QUAN. CK.	KG	CADD CK.	KG

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Sheet No. 72

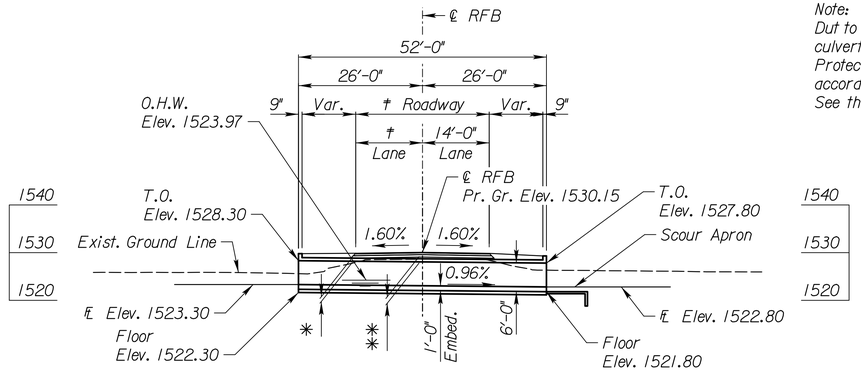
KDOT Graphics Certified

Plotted By: KKATHRIN
Plot Location:
File: c:\pwworking\central01\d2259794\ka602001bbr0547-2.dgn
Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	73	293



TYPICAL SECTION
(Looking North)



* Fill (Min.) = 0.75'
** Fill (Max.) = 1.31'

ELEVATION
Sta. 131+41.00, 70.0' Lt.
Construct 2-9' x 6' x 52' RFB
Embedded 1'-0"

† Roadway varies from 27'-0" to 25'-0". Lane varies from 13'-0" to 11'-0".

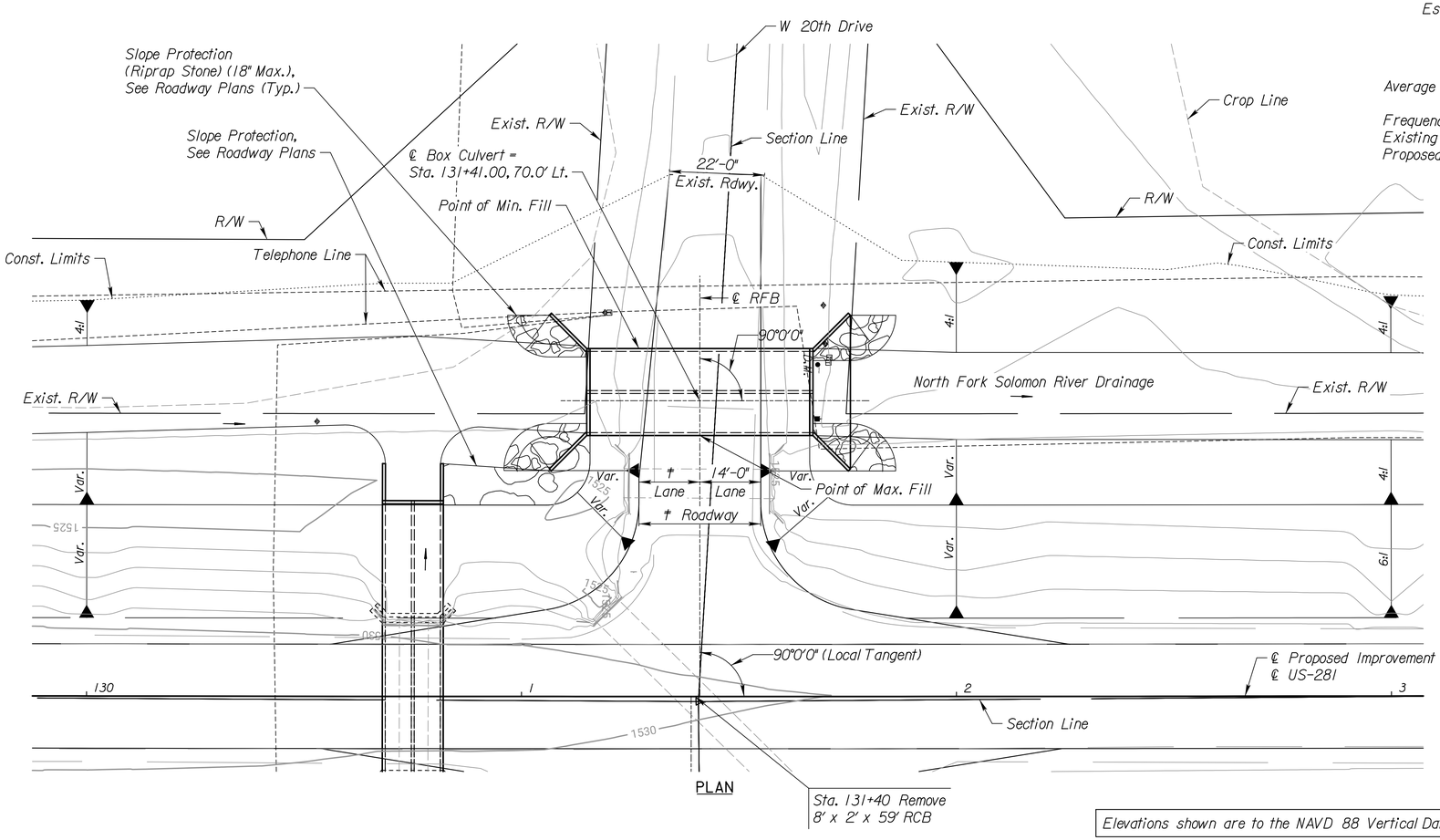
Note:
Dut to hot mix asphalt being placed directly on the culvert top slab, substitute the "Bridge Backwall Protection System" with "Pavement Water Proofing" according to KDOT Standard Specifications Section 851. See the "RCB Auxiliary Details" sheet for details.

See Roadway Cross Section at Sta. 131+41.00 and Typical Section for Profile Information

PROFILE
W 20th Drive

DRAINAGE DATA

Drainage Area	2.5	Sq. Mi.
Design Frequency	10	Yr.
Design Discharge (Q10)	550	cfs
Overtopping Discharge	1745	cfs
Overtopping Frequency	>50	Yr.
Historic High Water Elevation	N/A	Ft.
Ordinary High Water Elevation	1523.97	Ft.
Estimated Ordinary High Water Discharge	30	cfs



PLAN

Average Velocity Through the Bridge (Exit of Culvert):

Frequency	2 yr.	10 yr. (Design)	100 yr.
Existing Velocity (fps)	1.5	0.6	0.5
Proposed Velocity (fps)	3.5	6.0	3.6

Scale: 1" = 15'-0"

Elevations shown are to the NAVD 88 Vertical Datum

BM19 - 'D' cut SW Cor W. Headwall 7'x2'- RCB
18.24' Lt. ℄ US-281 Sta. 122+96.11 Elev. 1530.32

BM20 - 'D' cut NE Cor N. Headwall 8'x2'- RCB
25.86' Rt. ℄ US-281 Sta. 131+59.10 Elev. 1528.74

BM21 - 'T' post driven flush with surface 1' W. of Woven wire fence
70.49' Rt. ℄ US-281 Sta. 141+87.04 Elev. 1527.07

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Culvert (549) Sta. 131+41.00

CONSTRUCTION LAYOUT
US-281

Proj. No. 281-071 KA-6020-01 Osborne Co.

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

KDOT Graphics Certified 05-08-2024

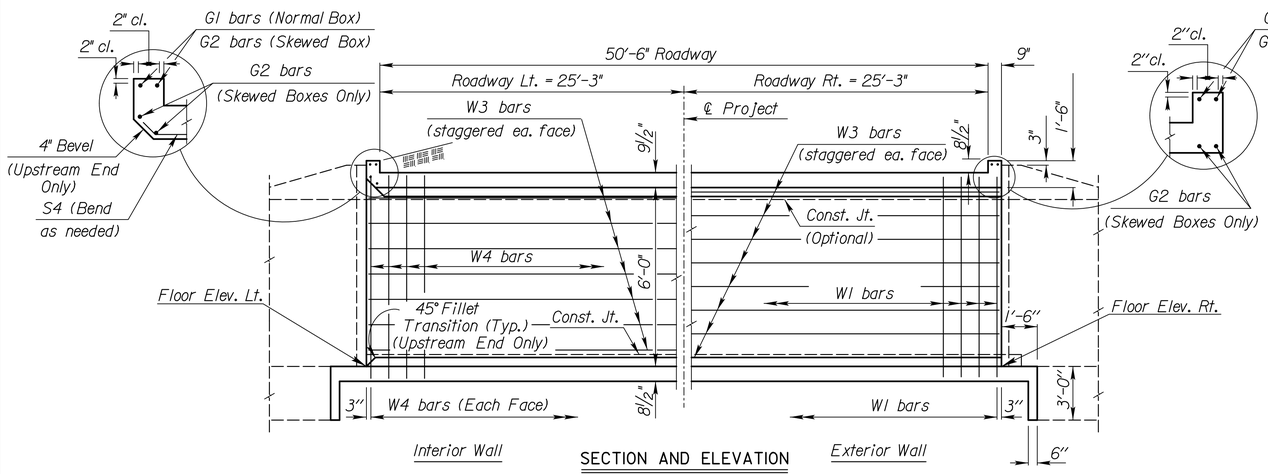
Sheet No. 73

KDOT Graphics Certified

Plotted By: KKATHRIN | Plot Location:
File: c:\pwworking\central01\d2597941\tk602001\bbr0549-CL.dgn
Plot Date: 07-11-24

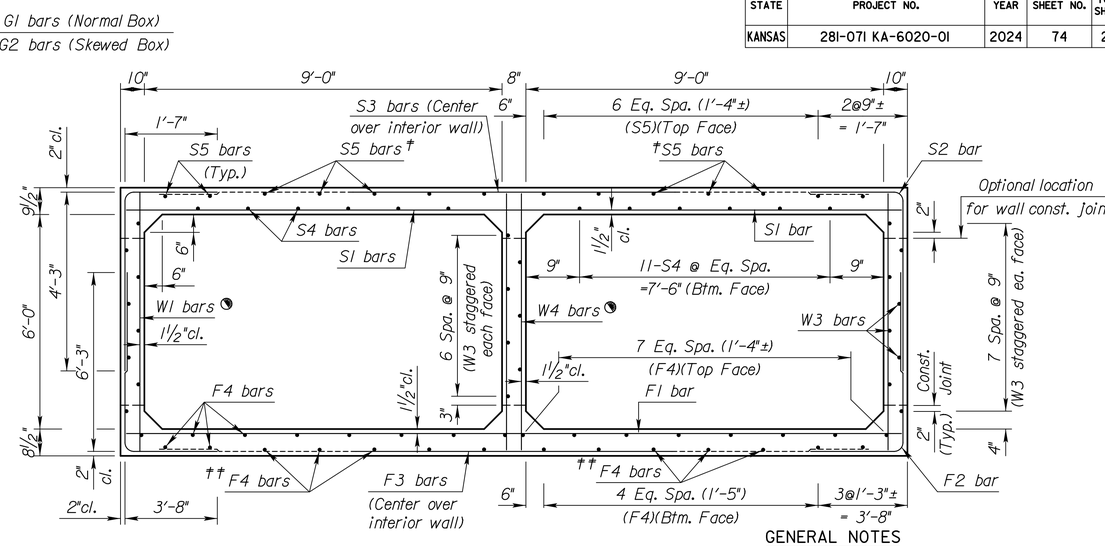
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	74	293

	SYSTEM PART	VERSION/ID
06	CADD VBA	12/6/2000
	DATABASE	5/4/2020
	RCB PROGRAM	7.1.22
	KBOX MODEL ID	15.8
	CELL LIBRARY	2/8/2022

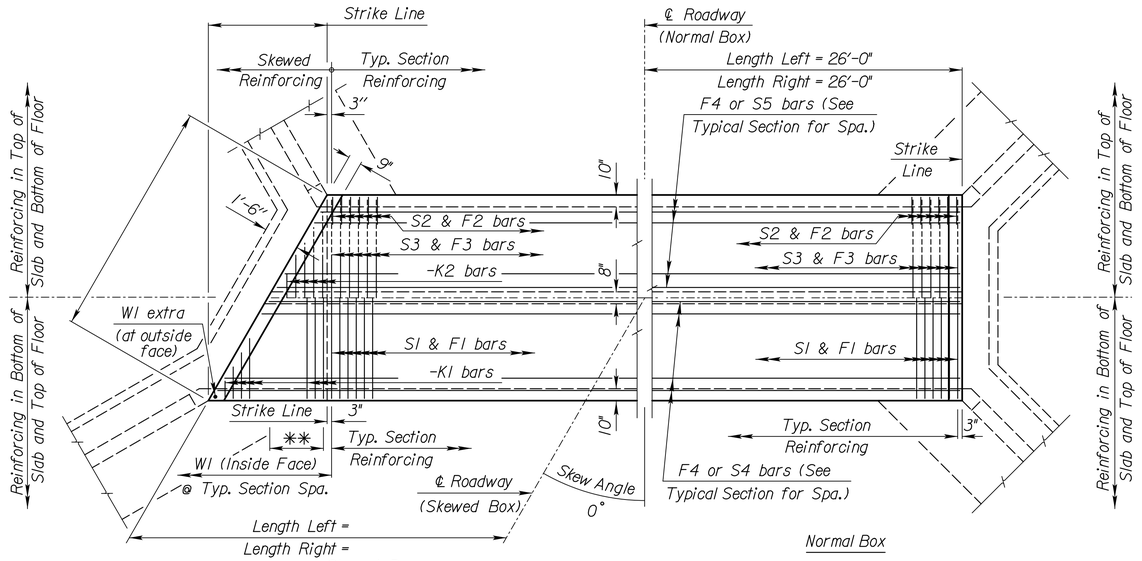


SECTION AND ELEVATION

(Normal to ℄ Roadway)

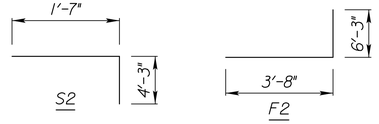


TYPICAL SECTION



PLAN

- See RCB Auxiliary Details for Optional Splice.
- † Place when S3 bar extends to exterior walls.
- †† Place when F3 bar extends to exterior walls.



BENDING DIAGRAM

All Dimensions are out to out of bars.

Minimum Splice Lengths	
#4	1'-5"
#5	1'-9"

△ For design purposes ONLY. Do NOT use for Construction — CULVERT SUMMARY — ◔ includes any welded wire fabric

Floor Elev. Lt.	Floor Elev. Rt.	Crown Gr. Elev.	△Design Fill Ht.	Skew	Left Wings	Right Wings	Scour Apron	Soil Saver	Concrete Barrel (Cu.Yds.)	Concrete Wings (Cu.Yds.)	Concrete Total (Cu.Yds.)	Reinf. Steel (Gr. 60) Barrel (Lbs.)	Reinf. Steel (Gr. 60) ◔Wings (Lbs.)	Reinf. Steel (Gr. 60) Total (Lbs.)	LRFR RATING FACTORS HL-93 Loading Inventory	HL-93 Loading Operating
1522.30	1521.80	1530.15	0	0	Flared	Flared	Yes	No	88.38	24.98	113.36	21095	2476	23572	2.46	3.19

△ Epoxy Coated Bars
✱ See Bending Diagram

BAR SCHEDULE

△ F1 Size	Spa.	No.	Length	△ F2 ✱ Size	Spa.	No.	Length	△ F3 Size	Spa.	No.	Length	△ F4 Size	No.	Length	△ S1 Size	Spa.	No.	Length	△ S2 ✱ Size	Spa.	No.	Length	△ S3 Size	Spa.	No.	Length	△ S4 Size	No.	Length	△ S5 Size	No.	Length
5	5"	125	20'-0"	6	6½"	192	9'-11"	7	6½"	96	8'-6"	4	56	26'-7"	6	5"	125	20'-0"	4	6½"	192	5'-10"	7	6½"	96	20'-0"	5	22	51'-8"	4	32	26'-7"

△ K1 Size	Spa.	No.	Length	△ K2 Size	Spa.	No.	Length	△ W1 Size	Spa.	No.	Length	△ W2 Size	Spa.	No.	Length	△ W3 Size	No.	Length	△ W4 Size	Spa.	No.	Length	△ G1 Size	No.	Length	△ G2 Size	No.	Length	Size	Spa.	No.	Length
N/A	N/A	N/A		N/A	N/A	N/A		5	10"	126	7'-2"	N/A	N/A	N/A	N/A	4	46	26'-7"	5	10"	126	7'-2"	5	4	20'-0"	N/A	N/A	N/A				

SUMMARY OF QUANTITIES	
Concrete (Grade 4.0)(RCB)	77.6 C.Y.
Concrete (Grade 4.0)(AE)(RCB)	35.7 C.Y.
Bridge Backwall Protection System	125 S.Y.
Reinforcing Steel (Gr. 60)	2480 Lbs.
Reinforcing Steel (Gr.60)(Epoxy Coated)	21100 Lbs.
Class III Excavation	C.Y.
Foundation Stabilization	35 C.Y.
Concrete for Seal Course (Set)	1 C.Y.
Granular Backfill (Wingwalls)	54 C.Y.
Slope Protection (Riprap Stone) (200 Lbs)	32 C.Y.

GENERAL NOTES

DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
UNIT STRESSES: Grade 4.0 Concrete; f'c = 4,000 p.s.i.
Reinforcing Steel; fy = 60,000 p.s.i.

FILL HEIGHT: Unless otherwise noted, the Design Fill Height is measured from the riding surface at the culvert and shall include the surfacing.

CONCRETE: Grade 4.0 Concrete shall be used throughout. Bevel all exposed edges with a ¾inch triangular moulding. Where Grade 4.0 Concrete (AE) is specified, it shall be placed in the top slab above the Construction Joint.

REINFORCING: All reinforcing shall conform to ASTM A615, Grade 60. All dimensions relative to reinforcing steel shall be to centerline of bar unless otherwise noted.

EXCAVATION: Excavation for culverts less than bridge length shall not be paid for directly but shall be subsidiary to Grade 4.0 Concrete. Excavation for RCB Bridges shall be paid for as Class III Excavation.

SEAL COURSE: A Seal Course may be required by the Engineer. The Seal Course shall be unreinforced Concrete (Commercial Grade) to a minimum depth of 3 inches or as determined by the Engineer. Concrete for the seal course shall be paid for at the unit price set for Concrete for Seal Course.

FOUNDATION STABILIZATION: The Foundation Stabilization quantity has been calculated to the limits shown on the "RCB Auxiliary Details" sheet. The depth may be increased by the Engineer. The Contractor may underrun Foundation Stabilization under the barrel if founded on firm material and with the Engineer's approval. Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.

QUANTITIES: The quantities shown in the Culvert Summary include apron and/or soil saver quantities when their construction is required by the plans. Payment for additional quantities that result from including seal course and/or floating apron, as a change in original plans, shall be made at the Unit Price bid for the various items involved.

GRANULAR BACKFILL (WINGWALLS):
See the "Auxiliary Details" sheet.

STRIKE LINE: Wingwalls and that portion of the RCB outside the Strike Line shall be constructed level. Footing for wingwalls shall be constructed with the culvert floor. See wingwall detail sheet.

BRIDGE BACKWALL PROTECTION SYSTEM: For structures with this bid item in the Summary of Quantities. See the "Auxiliary Details" sheet.

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION
Culvert (549) Sta. 131+41.00
DOUBLE 9 ft x 6 ft RFB

BR 2.9.6 F — Osborne Co.

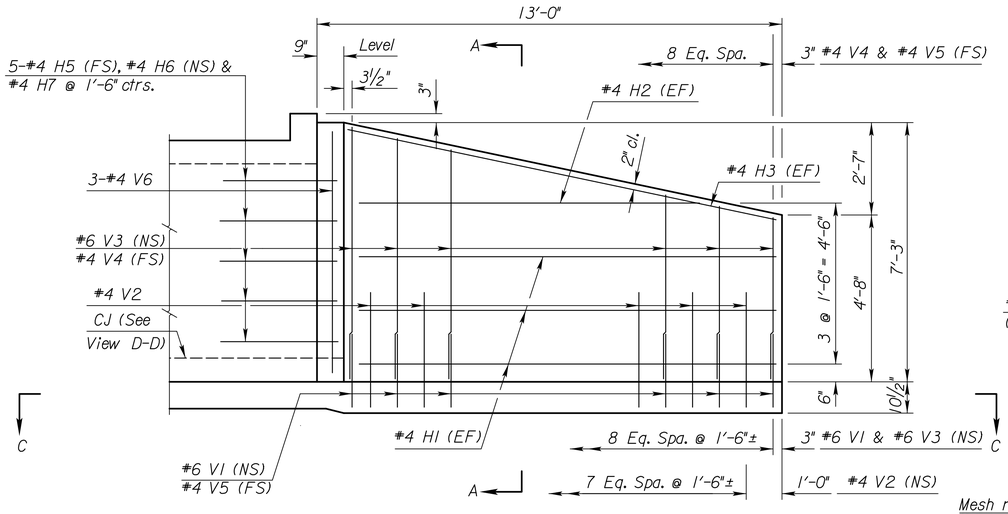
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DESIGNED	SPW	DETAILED	KBK	QUANTITIES	SPW	CADD KBK
DESIGN CK.	KG	DETAIL CK.	KG	QUAN. CK.	KG	CADD CK. KG

KDOT Graphics Certified 07-11-2024

Sheet No. 74

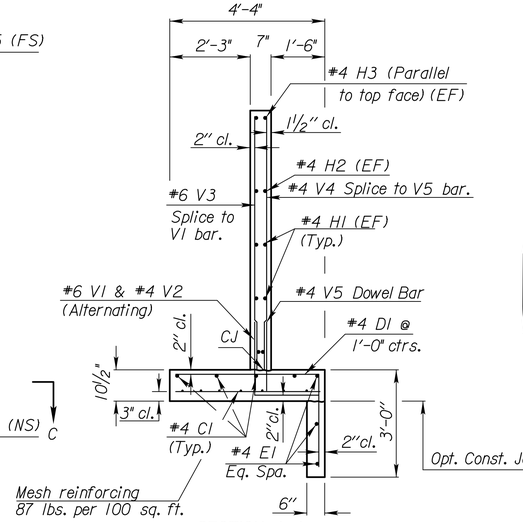
Plotted By: KKATHRIN
Plot Location:
File: c:\pwworking\central01\d2597941\kb60200\bbr0549-1.dgn
Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	75	293



ELEVATION OF WINGWALL

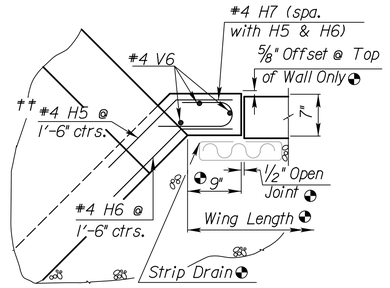
(Backface Shown)



SECTION A-A

See "RCB Aux. Details" sheet for additional requirements.

Typical both wings



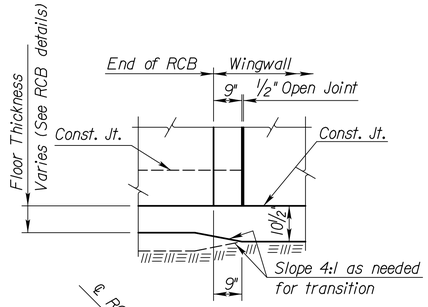
WINGWALL JOINT DETAIL

(Plan View)

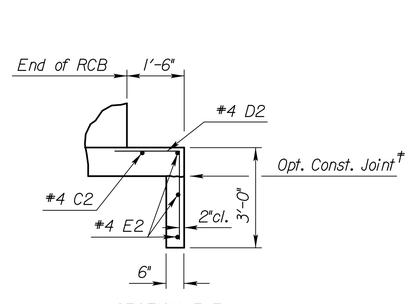
† NOTE: Const. Jt. may be used at Contractor's option when approved by the Engineer. D1 bars or mesh may be spliced thus: ⌐ Minimum overlap shall be 1'-3". No increase in quantities or cost shall be allowed when Contractor elects this option.

GENERAL NOTES

DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
UNIT STRESSES: Grade 4.0 Concrete; f'c = 4,000 p.s.i.
Reinforcing Steel; fy = 60,000 p.s.i.
CONCRETE: Grade 4.0 Concrete shall be used throughout. Bevel all exposed edges with a ¾" triangular moulding.
REINFORCING: All reinforcing shall conform to ASTM A615, Grade 60. Welded Wire Reinforcement shall conform to ASTM A185. All dimensions relative to reinforcing steel shall be to centerline of bar unless otherwise noted. Welded Wire Reinforcement shall be classified as pounds of reinforcing and included in the total quantity for the bid item Reinforcing Steel (Gr. 60).
QUANTITIES: Wingwall Quantities include all quantities outside the neat lines of the box, excluding the hubguard.
APRON: A 5" concrete slab shall be constructed between the downstream wings in locations subject to scour only when specified on the plans or by the Engineer.
BACKFILL MATERIAL: Use Granular Backfill material meeting the requirements of SB-1, SB-2, SCA-1, SCA-2.
Backfill all wings to limits shown on the "RCB Auxiliary Sheet".
FILTER FABRIC: Separate in-situ material from granular backfill with approved filter fabric complying with Section 1710.
Filter Fabric is subsidiary to "Granular Backfill".
FOUNDATION STABILIZATION: Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.

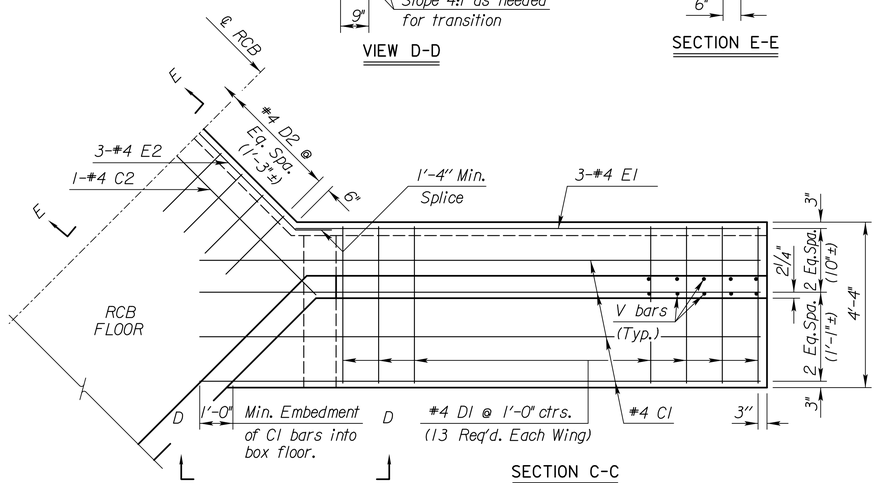


VIEW D-D



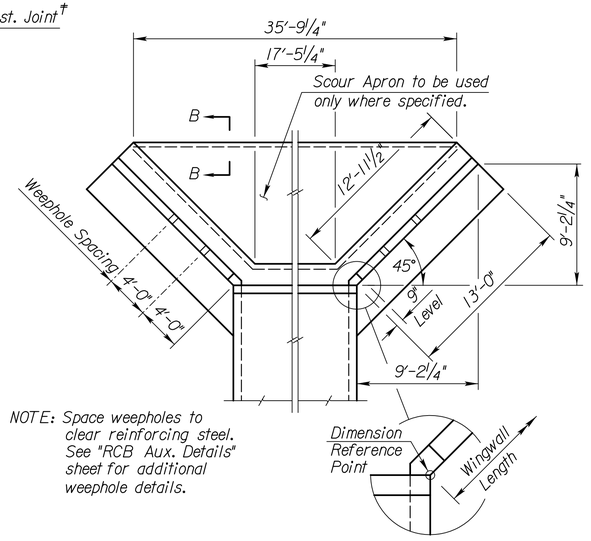
SECTION E-E

NOTE:
EF = Each Face
NS = Near Side
FS = Far Side
CJ = Const. Joint



SECTION C-C

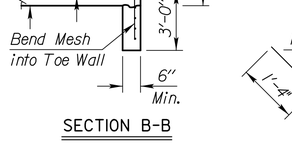
(Plan of Footing)



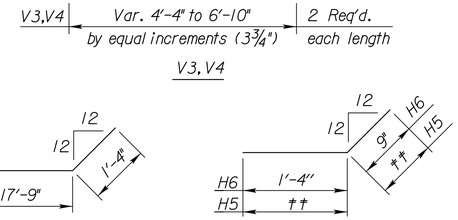
NOTE: Space weepholes to clear reinforcing steel. See "RCB Aux. Details" sheet for additional weephole details.

WING DIMENSIONS FOR NORMAL BOX

(3½:1 Embankment Slope)



SECTION B-B



BENDING DIAGRAM

(All dimensions are out to out of bars.)

†† Bend in Field

Quantities listed below are included in the Summary of Quantities shown on the RCB details.

WINGWALL QUANTITIES (One End Only)				
	Foundation Stabilization		Concrete (Gr. 4.0)	
Wingwalls	3.11	(C.Y.)	9.76	(C.Y.)
Apron	4.19	(C.Y.)	5.45	(C.Y.)
Soil Saver	0.00	(C.Y.)	0.00	(C.Y.)
Reinforcing Steel (Gr. 60)			987	Lbs.
Welded Wire Fabric (Wings)			98	Lbs.
Welded Wire Fabric (Apron)			306	Lbs.
Granular Backfill (Wingwalls)			27.00	C.Y.
Filter Fabric (subsidiary)			32.00	S.Y.

NOTE: Reinforcing Bar List is for both wings at one end of box only.

✳ See Bending Diagram

	Mark	#4C1	#4D1	#4E1	#4C2	#4D2	#4E2	#6V1	#4V2	#6V3	#4H1	#4H2	#4H3	#4H5	#4H6	#4H7	#4V4	#4V5	#4V6
0° Skew	Number	8	26✳	6	1	14 ✳	3✳	18✳	16✳	18	12	4	4	10 ✳	10 ✳	10 ✳	18	18	6
	Length	15'-7"	6'-8"	12'-9"	20'-0"	5'-8"	20'-5"	4'-2"	5'-0"	✳	11'-10"	9'-7"	12'-1"	1'-10"	2'-1"	1'-11"	✳	2'-2"	7'-0"

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Culvert (549) Sta. 131+41.00
FLARED WINGWALLS
6 ft Rise (0° SKEW)
BR 10.00.06 Osborne Co.

FHWA APPROVAL			10-20-10	APP'D		Terry L. Fleck
DESIGNED	SPW	DETAILED	KBK	QUANTITIES	SPW	CADD KBK
DESIGN CK.	KG	DETAIL CK.	KG	QUAN. CK.	KG	CADD CK. KG

KDOT Graphics Certified 07-11-2024

Sheet No. 75

KDOT Graphics Certified

Plotted By: KKATHRIN | Plot Location:
File: c:\pwworking\central01\d2597941\kx602001\bbr0549-2.dgn
Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	76	293

US-281 ALIGNMENT

P.O.T. ℄ Sta. 66+15.47
N 736,098.955 E 5,492,562.857

1. Set 5/8" Rebar	(0.3' deep)
2. 0.3' x 0.3' Concrete R/W Marker	59.88' E
3. Centerline Top Telephone Ped.	92.89' NW
4. Spike & Washer Top Fence Post	79.70' NE
5. Spike & Washer in Power Pole	62.32' W

P.O.T. ℄ Sta. 78+00.00
N 737,283.352 E 5,492,580.599

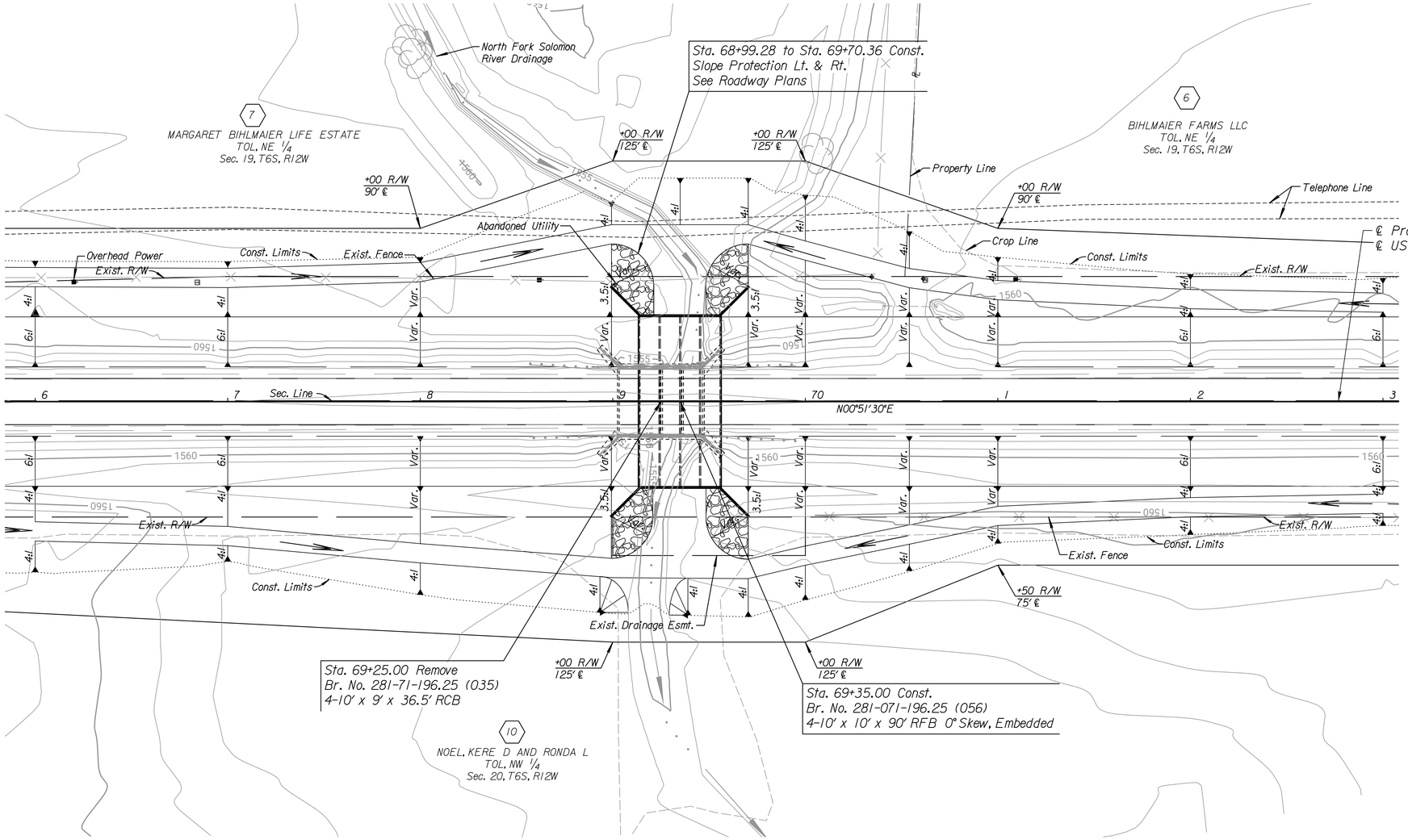
1. Set 5/8" Rebar	(0.3' deep)
2. Spike & Washer Top Fence Post KDOT	60.65' E
3. Spike & Washer in Power Pole	66.85' WNW
4. Chiseled "X" North End Headwall	38.92' SW
5. Chiseled "X" South End Headwall	33.31' NW
6. Travel Way Hwy 281	0.3' E

E 1/4 Cor. Sec. 19, T06S, R12W
N 734,718.938 E 5,492,541.778

1. Found 5/8" Rebar W/Alum. Cap	(0.9' Deep)
2. 0.41' W of CL Sta. 52+35.28, SW Angle = 89°17'42" ℄ to ℄	
3. Travel Way House Entrance to East	39.0' S
4. Spike & KDOT Washer in Power Pole	80.60' SW
5. Spike & Washer in Top Brace Post	73.46' NW
6. UGT Marker Post	61.22' WSW
7. Travel Way Hwy 281	0.5' E
8. Spike & Washer in Power Pole	78.72' SE

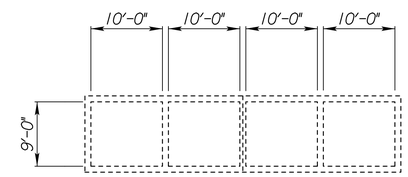
NE Cor. Sec. 19, T06S, R12W
N 737,352.086 E 5,492,581.281

1. Found 5/8" Rebar W/Alum. Cap	(0.5' Deep)
2. 0.35' W of ℄ Sta. 78+68.71, NW Angle = 90°52'41" ℄ to ℄	
3. KDOT Rivet & Washer Centerline W Headwall RCB	51.15' NNW
4. Chiseled 'X' NE Cor. E Hub Guard RCB	54.86' NNE
5. Spike & Washer Power Pole	77.81' SW
6. ℄ Top 0.3' x 0.3' Concrete R/W Marker	79.35' NW
7. Travel Way Hwy 281	0.0' E
8. Travel Way Side Road to West	0.0' N



PLAN

Scale: 1" = 30'-0"



EXISTING WATERWAY OPENING SKETCH
℄ US-281 Sta. 69+25.00
Waterway Opening = 360 Sq. Ft.
(Looking East)

Utility Owners

Telephone:
Nextech
145 N Main
Lenora, KS 67645
Phone - 785-567-4281

Overhead Power:
Prairie Land Electric Coop
223 W 5th St
Concordia, KS 66901
Phone - 785-243-1750

HISTORIC HIGHWATER
There is no history of US-281 overtopping at this location.

Elevations Shown are to the NAVD 88 Vertical Datum

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-071-196.25 (056) Sta. 69+35.00

CONTOUR MAP
US-281

Proj. No. 281-071 KA-6020-01 Osborne Co.

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

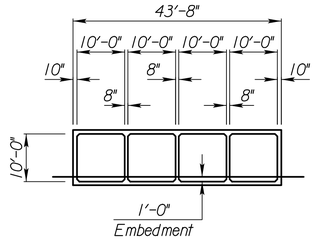
KDOT Graphics Certified 02-01-2023

Sheet No. 76

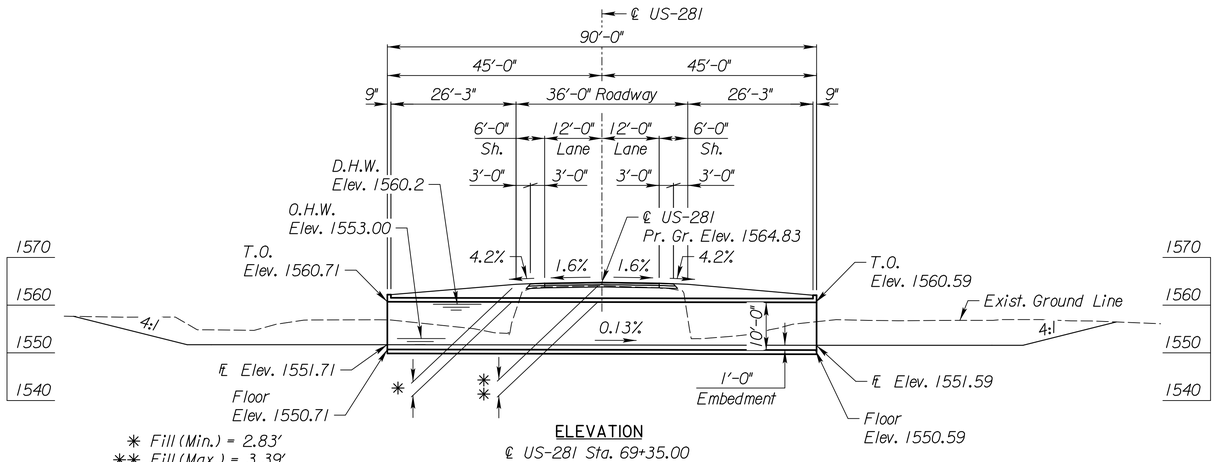
KDOT Graphics Certified

Plotted By: KKATHRIN
Plot Location:
File: c:\pwworking\central01\d2597941\kd602001\br0056-CM.dgn
Plot Date: 07-11-24

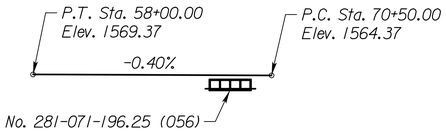
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	77	293



TYPICAL SECTION
(Looking Downstream)



ELEVATION
℄ US-281 Sta. 69+35.00
Construct 4 - 10' x 10' x 90' RFB
Normal to ℄ Roadway, 0° Skew
Embedded 1'-0"



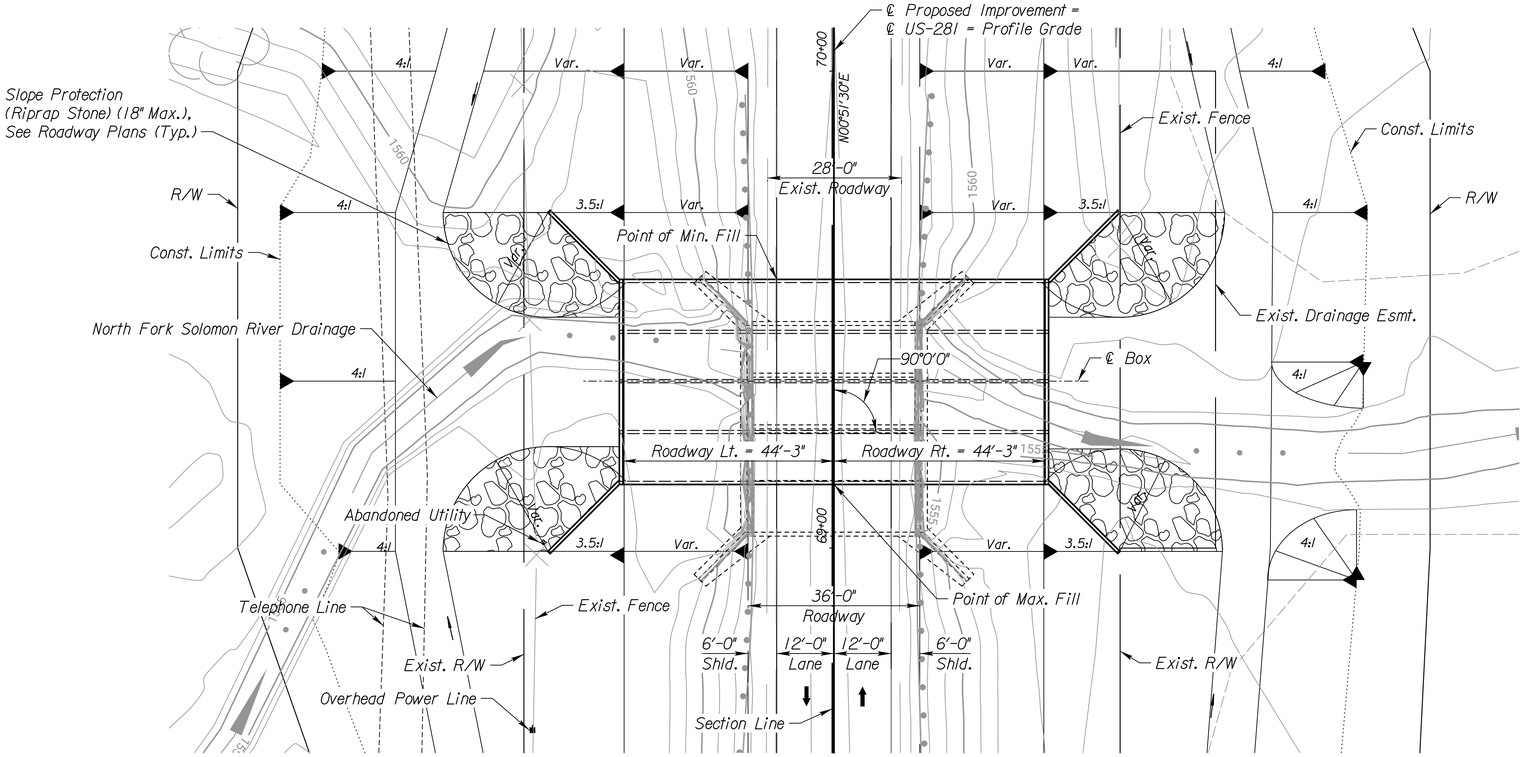
PROFILE
℄ US-281

DRAINAGE DATA

Drainage Area	6.8	Sq. Mi.
Design Frequency	25	Yr.
Design Discharge (Q25)	1,910	cfs
Design High Water Elevation	1560.2	Ft.
Overtopping Elevation (Sta. 69+35)	1563.6	Ft.
Overtopping Discharge	3,210	cfs
Overtopping Frequency	>100	Yr.
Historic High Water Elevation	N/A	Ft.
Ordinary High Water Elevation	1553.0	Ft.
Estimated Ordinary High Water Discharge	55	cfs

Average Velocity Through the Bridge (Exit of Culvert):

Frequency	2 yr.	25 yr. (Design)	100 yr.
Existing Velocity (fps)	2.8	6.3	8.9
Proposed Velocity (fps)	2.7	6.2	8.9





Scale: 1" = 15'-0"

Elevations shown are to the NAVD 88 Vertical Datum

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-071-196.25 (056) Sta. 69+35.00

CONSTRUCTION LAYOUT
US-281

Proj. No. 281-071 KA-6020-01 Osborne Co.

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

KDOT Graphics Certified 02-01-2023

Sheet No. 77

KDOT Graphics Certified

BM13 - 'T' post driven flush with surface 1' E. of N-S Barbwire fence 60.87' Lt. ℄ US-281 Sta. 59+31.78 Elev. 1565.77

BM14 - 'D' cut SE Cor E. Headwall 10' x 9' x 34' RCB 18.16' Rt. ℄ US-281 Sta. 69+02.82 Elev. 1562.99

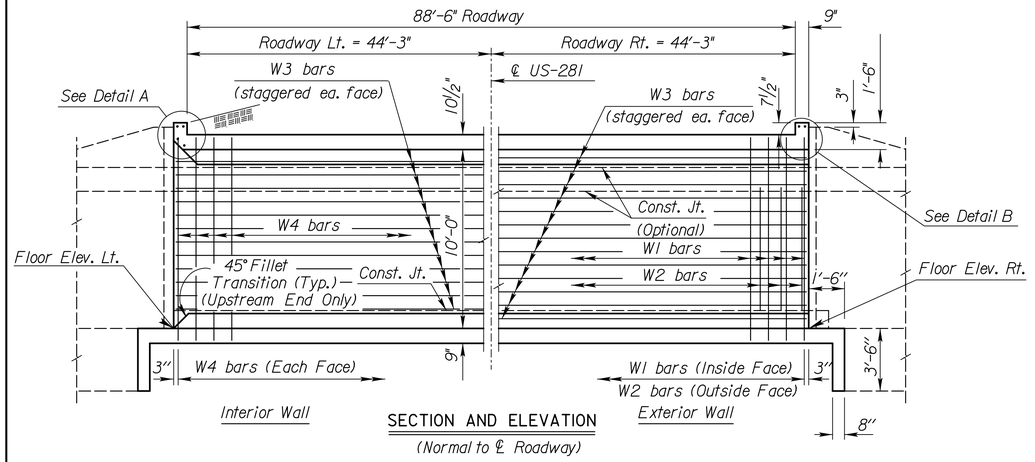
BM15 - 'D' cut NE Cor E. Headwall 6'x2' RCB 22.74' Rt. ℄ US-281 Sta. 79+18.54 Elev. 1561.57

Plotted By: KKATHRIN | Plot Location:
File: c:\pwworking\central01\d2597941\kb602001\tbr0056-CL.dgn
Plot Date: 07-11-24

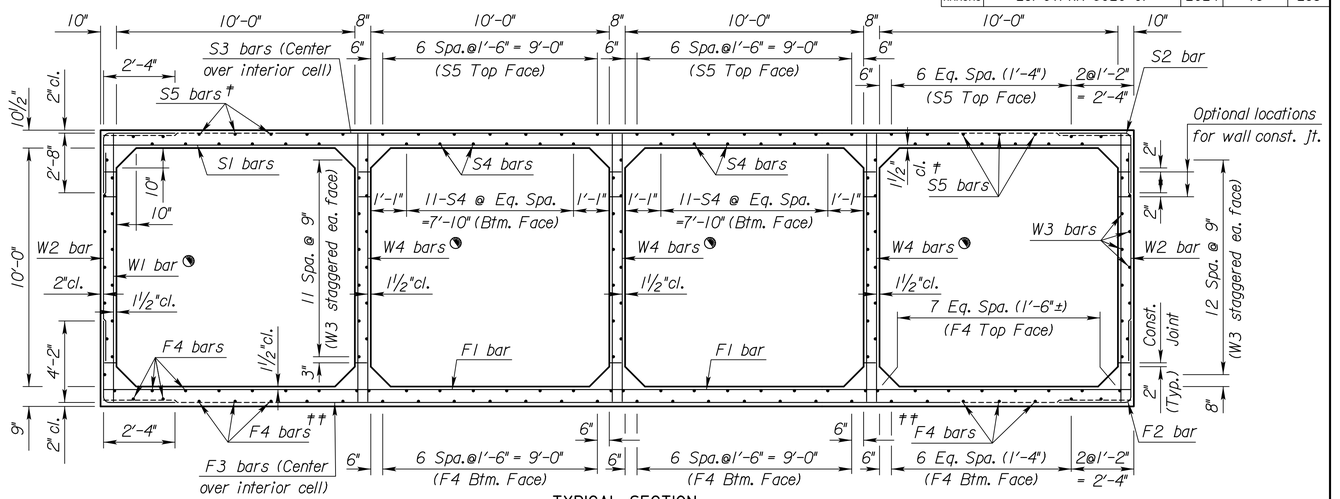
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	78	293

06	SYSTEM PART	VERSION/ID
	CADD VBA	12/6/2010
	DATABASE	5/4/2020
	RCB PROGRAM	7.1.22
	KBOX MODEL ID	1688
	CELL LIBRARY	2/8/2022

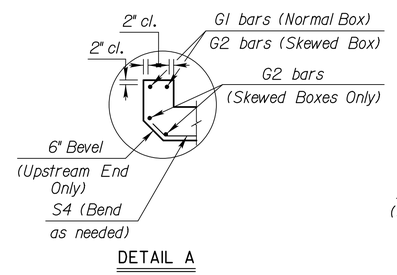
Plotted By: MDELEON | Plot Location:
File: c:\pwworking\central01\d2597941\tk602001\tbr0056-1.dgn
Plot Date: 07-15-24



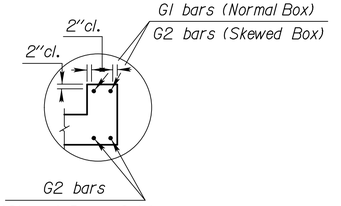
SECTION AND ELEVATION
(Normal to ℄ Roadway)



TYPICAL SECTION



DETAIL A



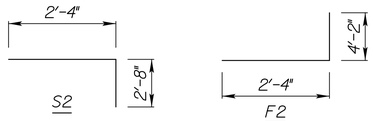
DETAIL B

◔ See RCB Auxiliary Details for Optional Splice.

† Place when S3 bar extends to exterior walls.

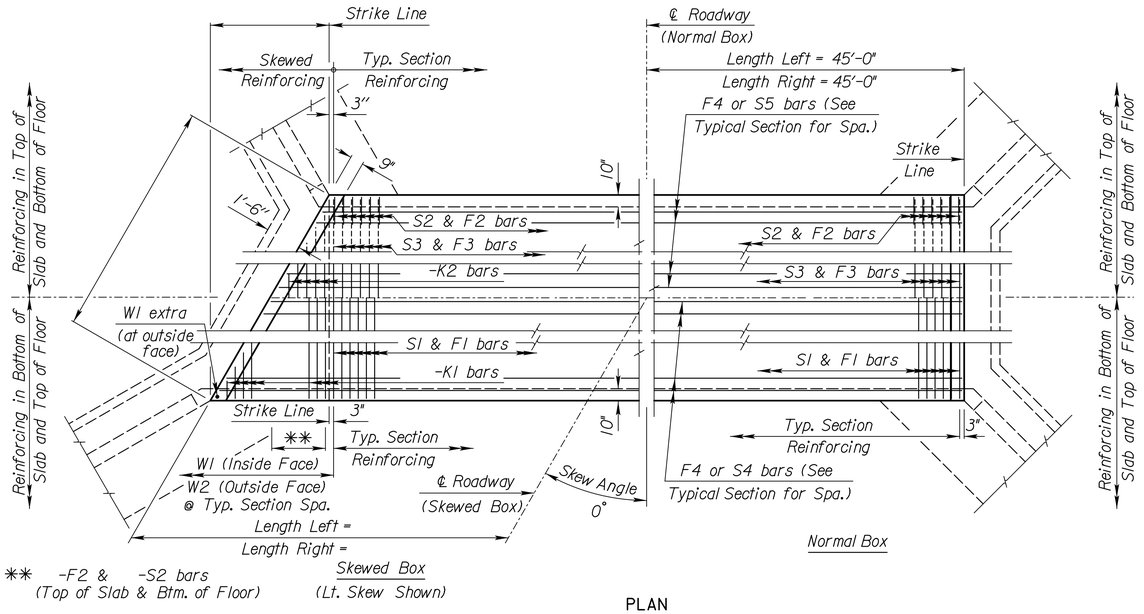
†† Place when F3 bar extends to exterior walls.

Note: Use only cast-in-place construction at this location.



BENDING DIAGRAM

All Dimensions are out to out of bars.



** -F2 & -S2 bars (Top of Slab & Btm. of Floor)

PLAN

△ For design purposes ONLY. Do NOT use for Construction

CULVERT SUMMARY

◔ includes any welded wire fabric

Floor Elev. Lt.	Floor Elev. Rt.	Crown Gr. Elev.	△Design Fill Ht.	Skew	Left Wings	Right Wings	Scour Apron	Soil Saver	Concrete Barrel (Cu.Yds.)	Concrete Wings (Cu.Yds.)	Concrete Total (Cu.Yds.)	Reinf. Steel (Gr. 60) Barrel (Lbs.)	Reinf. Steel (Gr. 60) ◔Wings (Lbs.)	Reinf. Steel (Gr. 60) Total (Lbs.)	LRFR RATING FACTORS HL-93 Loading Inventory	LRFR RATING FACTORS HL-93 Loading Operating
1551.71	1551.59	1564.83	0	0	Flared	Flared	No	No	359.07	58.32	439.59	81850	5660	87520	2.63	3.41

BAR SCHEDULE

F1 Size	F1 Spa.	F1 No.	F1 Length	F2 * Size	F2 * Spa.	F2 * No.	F2 * Length	F3 Size	F3 Spa.	F3 No.	F3 Length	F4 Size	F4 No.	F4 Length	S1 Size	S1 Spa.	S1 No.	S1 Length	S2 * Size	S2 * Spa.	S2 * No.	S2 * Length	S3 Size	S3 Spa.	S3 No.	S3 Length	S4 Size	S4 No.	S4 Length	S5 Size	S5 No.	S5 Length
5	6½"	166	43'-4"	5	5½"	392	6'-6"	6	5½"	196	43'-0"	4	186	30'-10"	7	6½"	166	43'-4"	5	5½"	392	5'-0"	6	5½"	196	43'-4"	5	88	45'-9"	4	90	30'-10"

K1 Size	K1 Spa.	K1 No.	K1 Length	K2 Size	K2 Spa.	K2 No.	K2 Length	W1 Size	W1 Spa.	W1 No.	W1 Length	W2 Size	W2 Spa.	W2 No.	W2 Length	W3 Size	W3 No.	W3 Length	W4 Size	W4 Spa.	W4 No.	W4 Length	G1 Size	G1 No.	G1 Length	G2 Size	G2 No.	G2 Length				
N/A	N/A	N/A		N/A	N/A	N/A		5	1'-1"	168	11'-3"	5	11	198	9'-7"	4	186	30'-10"	5	6½"	996	11'-3"	5	4	43'-4"	N/A	N/A	N/A				

*See Bending Diagram

Minimum Splice Lengths	
#4	1'-5"
#5	1'-9"

GENERAL NOTES

DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
UNIT STRESSES: Grade 4.0 Concrete; f'c = 4,000 p.s.i.
Reinforcing Steel; fy = 60,000 p.s.i.

FILL HEIGHT: Unless otherwise noted, the Design Fill Height is measured from the riding surface at the culvert and shall include the surfacing.

CONCRETE: Grade 4.0 Concrete shall be used throughout. Bevel all exposed edges with a ¾inch triangular moulding. Where Grade 4.0 Concrete (AE) is specified, it shall be placed in the top slab above the Construction Joint.

REINFORCING: All reinforcing shall conform to ASTM A615, Grade 60. All dimensions relative to reinforcing steel shall be to centerline of bar unless otherwise noted.

EXCAVATION: Excavation for culverts less than bridge length shall not be paid for directly but shall be subsidiary to Grade 4.0 Concrete. Excavation for RCB Bridges shall be paid for as Class III Excavation.

SEAL COURSE: A Seal Course may be required by the Engineer. The Seal Course shall be unreinforced Concrete (Commercial Grade) to a minimum depth of 3 inches or as determined by the Engineer. Concrete for the seal course shall be paid for at the unit price set for Concrete for Seal Course.

FOUNDATION STABILIZATION: The Foundation Stabilization quantity has been calculated to the limits shown on the "RCB Auxiliary Details" sheet. The depth may be increased by the Engineer. The Contractor may underrun Foundation Stabilization under the barrel if founded on firm material and with the Engineer's approval. Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.

QUANTITIES: The quantities shown in the Culvert Summary include apron and/or soil saver quantities when their construction is required by the plans. Payment for additional quantities that result from including seal course and/or floating apron, as a change in original plans, shall be made at the Unit Price bid for the various items involved.

GRANULAR BACKFILL (WINGWALLS): See the "Auxiliary Details" sheet.

STRIKE LINE: Wingwalls and that portion of the RCB outside the Strike Line shall be constructed level. Footing for wingwalls shall be constructed with the culvert floor. See wingwall detail sheet.

BRIDGE BACKWALL PROTECTION SYSTEM: For structures with this bid item in the Summary of Quantities. See the "Auxiliary Details" sheet.

SUMMARY OF QUANTITIES

Concrete (Grade 4.0)(RCB BR)	439.59 C.Y.
Concrete (Grade 4.0)(AE)(RCB BR)	0.0 C.Y.
Bridge Backwall Protection System	S.Y.
Reinforcing Steel (Gr. 60)	87510 Lbs.
Reinforcing Steel (Gr.60)(Epoxy Coated)	0 Lbs.
Class III Excavation	C.Y.
Foundation Stabilization	101 C.Y.
Concrete for Seal Course (Set)	1 C.Y.
Granular Backfill (Wingwalls)	178 C.Y.
Slope Protection (Riprap Stone) (200 Lbs)	146 C.Y.

NO.	DATE	REVISIONS	BY	APP'D
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-71-196.25(056) Sta. 69+35.00
4 - 10 ft x 10 ft RFB

~~BR 3.10.10 F~~ Osborne Co.

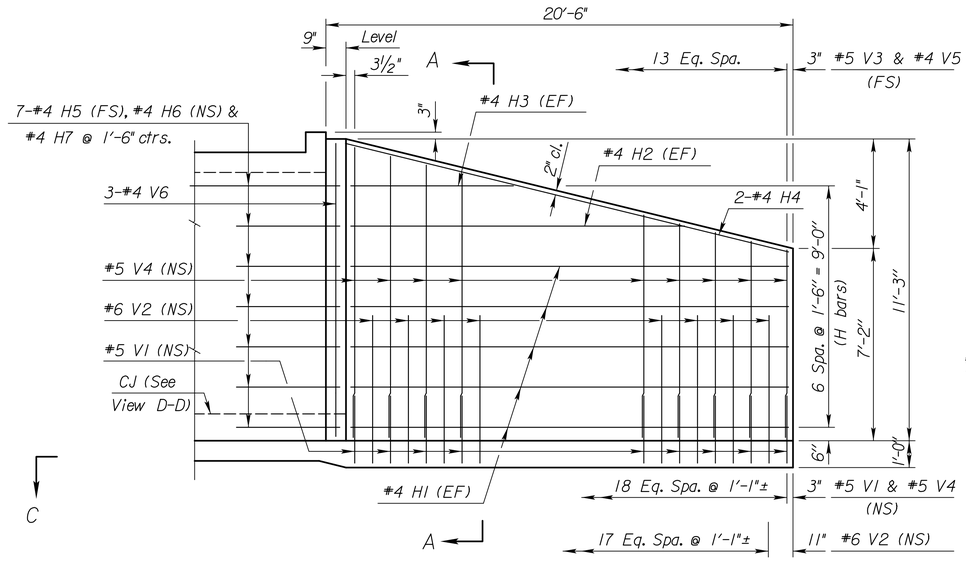
FHWA APPROVAL			10-20-10	APP'D		Terry L. Flack	
DESIGNED	KG	DETAILED	KBK	QUANTITIES	SPW	CADD	KBK
DESIGN CK.	SPW	DETAIL CK.	KG	QUAN. CK.	KG	CADD CK.	KG

KDOT Graphics Certified 07-11-2024

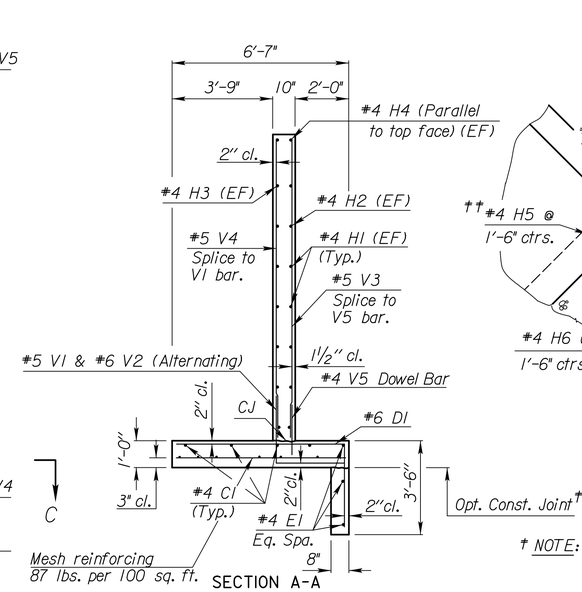
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071KA-6020-01	2024	79	293

GENERAL NOTES

DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
UNIT STRESSES: Grade 4.0 Concrete; f'c = 4,000 p.s.i.
Reinforcing Steel; fy = 60,000 p.s.i.
CONCRETE: Grade 4.0 Concrete shall be used throughout. Bevel all exposed edges with a ¾" triangular moulding.
REINFORCING: All reinforcing shall conform to ASTM A615, Grade 60. Welded Wire Reinforcement shall conform to ASTM A185. All dimensions relative to reinforcing steel shall be to centerline of bar unless otherwise noted. Welded Wire Reinforcement shall be classified as pounds of reinforcing and included in the total quantity for the bid item Reinforcing Steel (Gr. 60).
QUANTITIES: Wingwall Quantities include all quantities outside the neat lines of the box, excluding the hubguard.
APRON: A 5" concrete slab shall be constructed between the downstream wings in locations subject to scour only when specified on the plans or by the Engineer.
BACKFILL MATERIAL: Use Granular Backfill material meeting the requirements of SB-1, SB-2, SCA-1, SCA-2.
Backfill all wings to limits shown on the "RCB Auxiliary Sheet".
FILTER FABRIC: Separate in-situ material from granular backfill with approved filter fabric complying with Section 1710.
Filter Fabric is subsidiary to "Granular Backfill".
FOUNDATION STABILIZATION: Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.

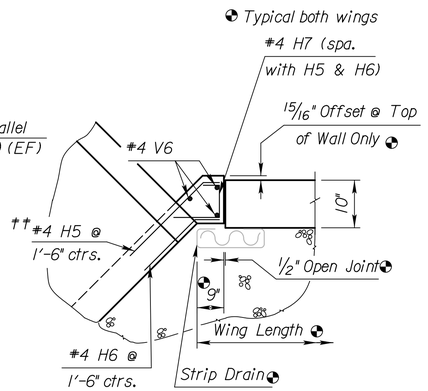


ELEVATION OF WINGWALL
(Backface Shown)



SECTION A-A

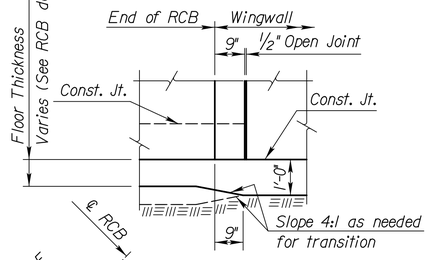
See "RCB Aux. Details" sheet for additional requirements.



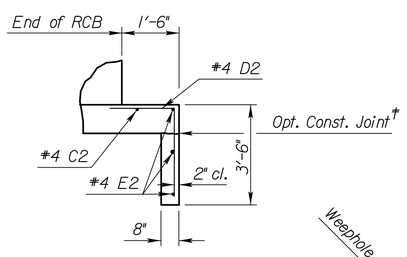
WINGWALL JOINT DETAIL
(Plan View)

† NOTE: Const. Jt. may be used at Contractor's option when approved by the Engineer. D1 bars or mesh may be spliced thus: ⌐¬ Minimum overlap shall be 1'-3". No increase in quantities or cost shall be allowed when Contractor elects this option.

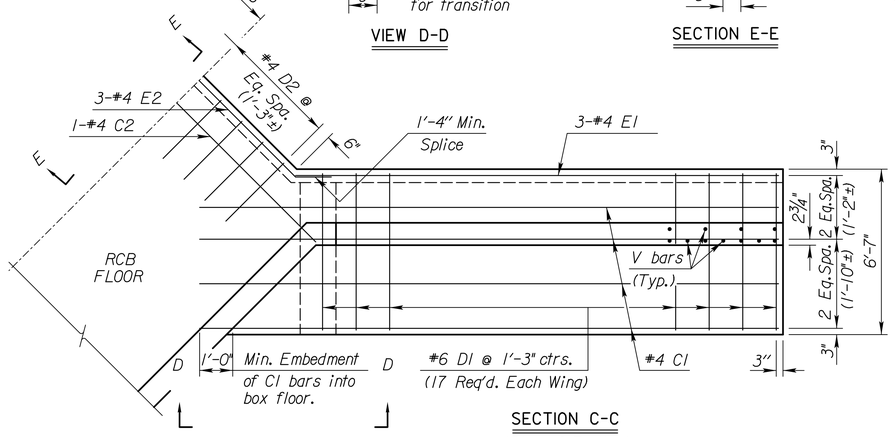
NOTE:
EF = Each Face
NS = Near Side
FS = Far Side
CJ = Const. Joint



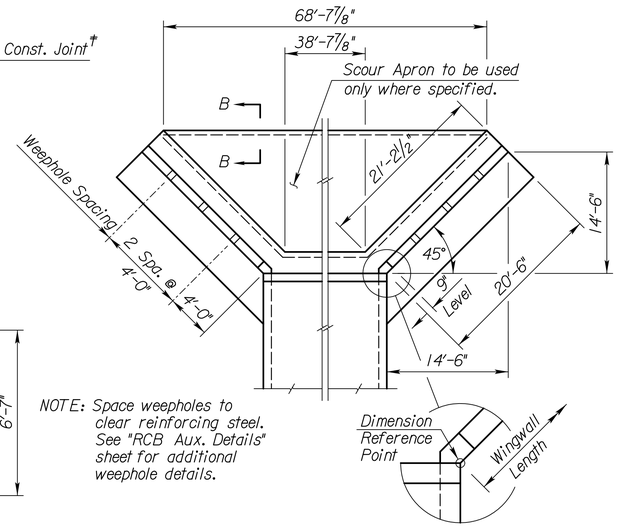
VIEW D-D



SECTION E-E

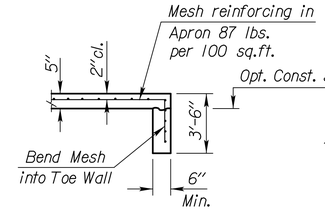


SECTION C-C
(Plan of Footing)



NOTE: Space weepholes to clear reinforcing steel. See "RCB Aux. Details" sheet for additional weephole details.

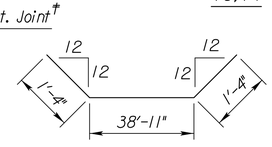
WING DIMENSIONS FOR NORMAL BOX
(3½:1 Embankment Slope)



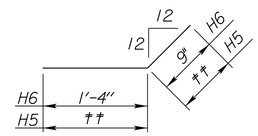
SECTION B-B

V4	Var. 6'-10" to 10'-10" by equal increments (2⅝"±) — 2 Req'd., each length
V3	Var. 6'-10" to 10'-10" by equal increments (3¾"±) — 2 Req'd., each length

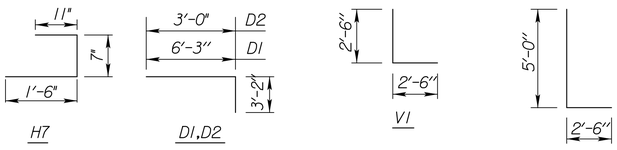
V3, V4



E2



H5, H6



Quantities listed below are included in the Summary of Quantities shown on the RCB details.

WINGWALL QUANTITIES (One End Only)				
	Foundation Stabilization		Concrete (Gr. 4.0)	
Wingwalls	6.62	(C.Y.)	29.16	(C.Y.)
Apron	0.00	(C.Y.)	0.00	(C.Y.)
Soil Saver	0.00	(C.Y.)	0.00	(C.Y.)
Reinforcing Steel (Gr. 60)			2830	Lbs.
Welded Wire Fabric (Wings)			235	Lbs.
Welded Wire Fabric (Apron)			0	Lbs.
Granular Backfill (Wingwalls)			89.00	C.Y.
Filter Fabric (subsidiary)			68.00	S.Y.

BENDING DIAGRAM
(All dimensions are out to out of bars.)
†† Bend in Field

NOTE: Reinforcing Bar List is for both wings at one end of box only.
✳ See Bending Diagram

	Mark	#4C1	#6D1	#4E1	#4C2	#4D2	#4E2	#5V1	#6V2	#5V3	#5V4	#4V5	#4H1	#4H2	#4H3	#4H4	#4H5	#4H6	#4H7	#4V6
0° Skew	Number	8	34✳	6	1	32 ✳	3 ✳	38 ✳	36 ✳	28	38	28	20	4	4	4	14✳	14 ✳	14 ✳	6
	Length	24'-10"	9'-5"	21'-0"	43'-4"	6'-2"	41'-7"	5'-0"	7'-6"	✳	✳	2'-2"	19'-4"	14'-9"	7'-6"	19'-9"	1'-10"	2'-1"	3'-0"	11'-0"

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-71-196.25(056) Sta. 69+35.00
FLARED WINGWALLS
10 ft Rise (0° SKEW)

BR 10.00.10 Osborne Co.

FHWA APPROVAL		10-20-10	APP'D	Terry L. Fleck	
DESIGNED	KG	DETAILED	KBK	QUANTITIES	KBK
DESIGN CK.	SPW	DETAIL CK.	KG	QUAN. CK.	KG
SPW	CADD	KBK	CADD CK.	KG	

KDOT Graphics Certified 07-11-2024
Sheet No. 79

KDOT Graphics Certified

Plotted By: JHOVERSO Plot Location:
File: c:\pwworking\central01\d2597941\ka602001\bbr0056-2.dgn
Plot Date: 07-15-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	80	293

US-281 ALIGNMENT

P.C. ℄ Sta. 145+21.29
N 744,004.038 E 5,492,666.974

1. Set 5/8" Rebar	(0.3' deep)
2. 5/8" Capped CFS Control (1.20)	58.78' NW
3. Spike & Washer in Power Pole	71.41' WNW
4. 'X' Cut ℄ E. End Headwall RCB	67.20' SW
5. ℄ Top 1 1/4" Metal Fence Post	74.90 E

P.I. Sta. 150+11.86 (Bk.) = 150+11.76 (Ahd.)
N 744,494.600 E 5,492,669.240

1. Set 5/8" Rebar	(0.3' deep)
2. Spike & Washer in Power Pole	49.70' WNW
3. KDOT Rivet S. End RCB	83.58' NNE
4. Spike & Washer in 70" Tree	94.00' NE
5. Spike & Washer in 70" Tree	86.80' E
6. Travel Way Hwy 281	3.7' E

P.T. ℄ Sta. 155+02.33
N 744,984.797 E 5,492,688.301

1. Set 5/8" Rebar	
2. Spike & Washer in top Guard Fence Post	(0.3' deep)
3. Spike & Washer in top Guard Fence Post	32.28' NE
4. Spike & Washer in top Guard Fence Post	17.38' E
5. Spike & Washer in Power Pole	33.51' SE
6. At Travel Way Hwy 281	64.20' W

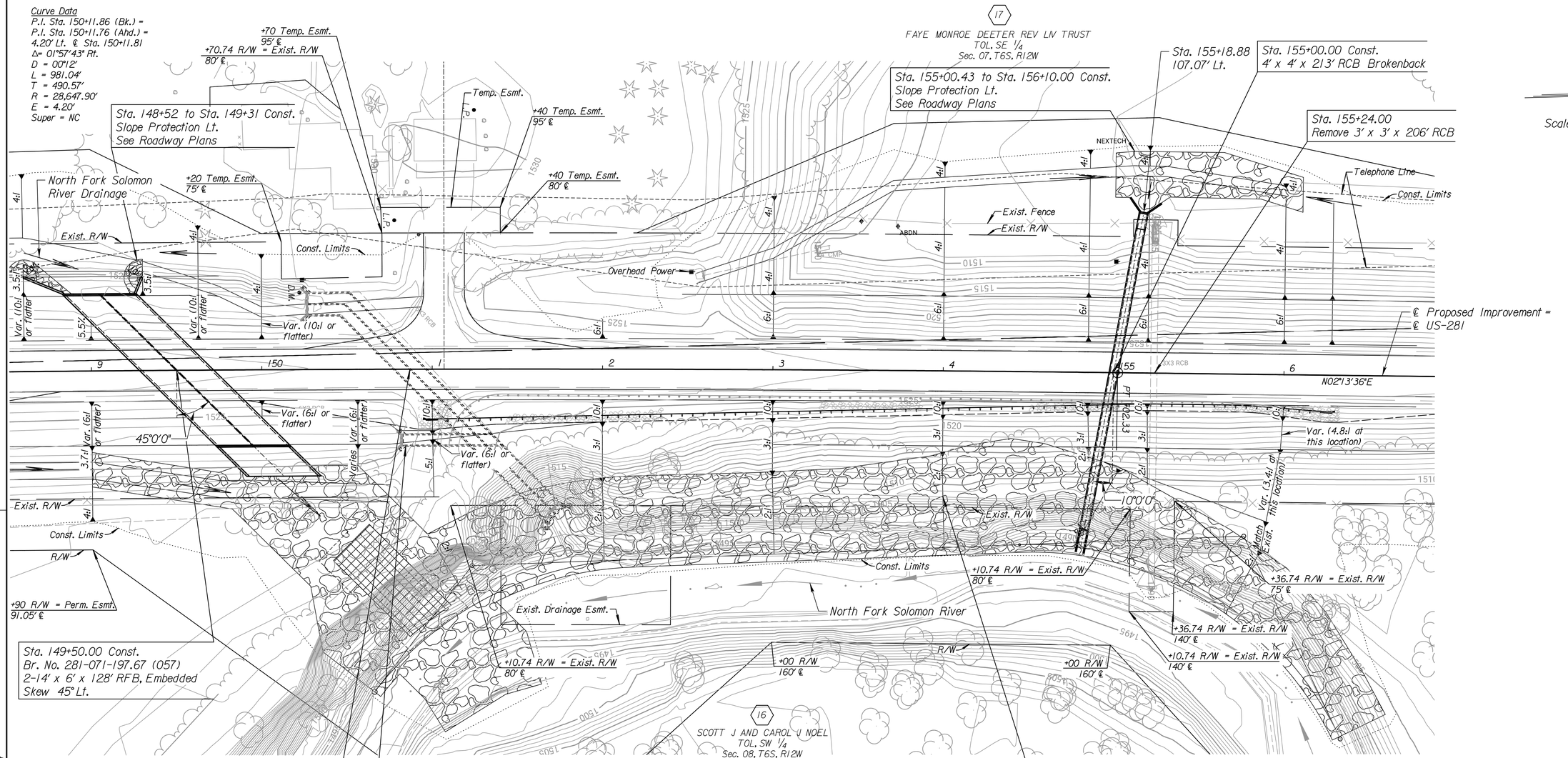
NE Cor. Sec. 18, T06S, R12W
N 742,623.431 E 5,492,660.595

1. Found 1/2" Rebar W/Alum. Cap LS-414	(0.6' Deep)
2. Spike & Washer in Power Pole	68.85' ENE
3. Chiseled "X" ℄E. End Hdwl. RCB	46.52' WSW
4. Chiseled "X" ℄E. End Hdwl. RCB	46.36' WNW
5. SW Cor. Chiseled Sq. NE Cor. Hdwl. RCB	30.65' NE
6. Spike & Washer in UGT Marker Post	92.18' ESE

E 1/4 Cor. Sec. 7, T06S, R12W
N 745,272.397, E 5,492,667.281

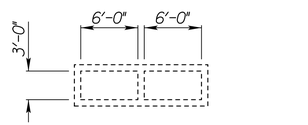
1. 2 1/2" Pipe BLM Monument at Surface	
2. 32.21' W of ℄ Sta. 157+90.27, NW Angle = 92°27'21" ℄ to ℄	
3. Travel Way Hwy 281	32.9' E
4. Spike & Washer in Historical Marker sign	58.57' ENE
5. Spike & Washer in Top Fence Post	58.30' NW
6. Spike & Washer in Top Fence Post	49.10' W
7. Spike & Washer in Power Pole	61.37' SW
8. Spike & Washer in 30" Tree	101.63' SSW

Curve Data
P.I. Sta. 150+11.86 (Bk.) =
P.I. Sta. 150+11.76 (Ahd.) =
4.20' Lt. ℄ Sta. 150+11.81
Δ= 01°57'43" Rt.
D = 00°12'
L = 981.04'
T = 490.57'
R = 28,647.90'
E = 4.20'
Super = NC



PLAN

Scale: 1" = 30'-0"



EXISTING WATERWAY OPENING SKETCH
CULVERT NO. 535
℄ US-281 Sta. 150+87
Waterway Opening = 36 Sq. Ft.
(Looking North)

Utility Owners

Telephone:
Nextech
145 N Main
Lenora, KS 67645
Phone - 785-567-4281

Overhead Power:
Prairie Land Electric Coop
223 W 5th St
Concordia, KS 66901
Phone - 785-243-1750

Elevations Shown are to the NAVD 88 Vertical Datum

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-071-197.67 (057) Sta. 149+50.00

CONTOUR MAP
US-281

Proj. No. 281-071 KA-6020-01 Osborne Co.

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

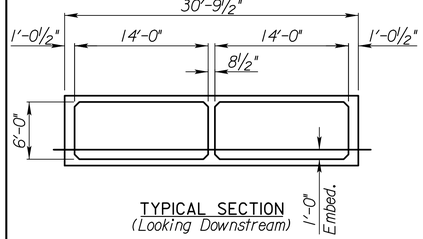
KDOT Graphics Certified 02-23-2023

Sheet No. 80

KDOT Graphics Certified

Plotted By: KKATHRIN
File: c:\pwworking\central01\d2597941\ka602201\bbr057-CM.dgn
Plot Date: 07-11-24
Plot Location:

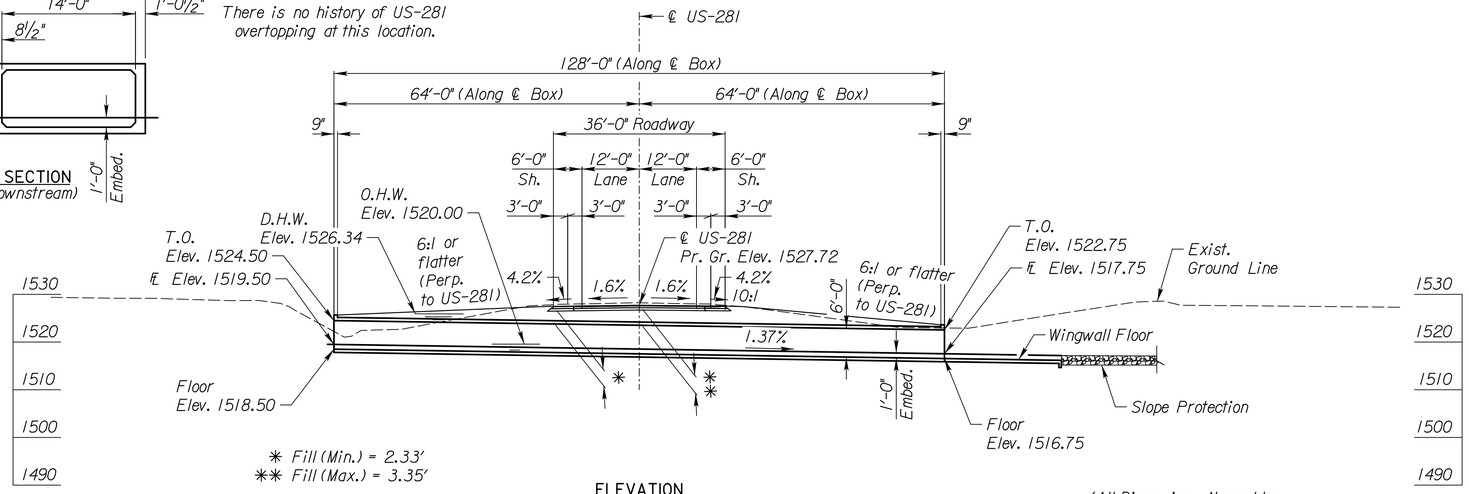
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	81	293



TYPICAL SECTION
(Looking Downstream)

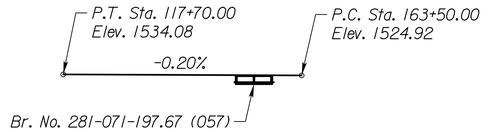
HISTORIC HIGHWATER

There is no history of US-281 overtopping at this location.



ELEVATION
℄ US-281 Sta. 149+50.00 at ℄ Box
Construct 2-14' x 6' x 128' RFB, Skew 45° Lt.
Embedded 1'-0"

(All Dimensions Normal to ℄ US-281 Unless Noted otherwise)



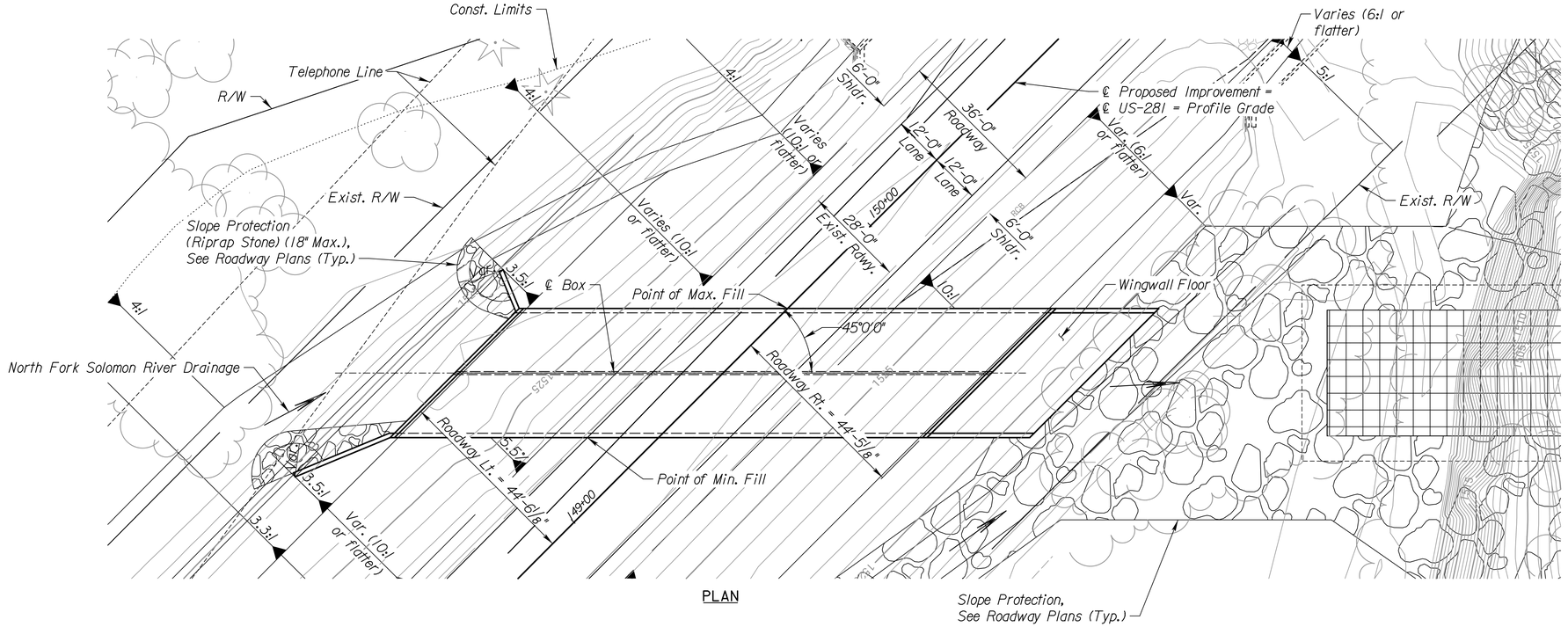
PROFILE
℄ US-281

DRAINAGE DATA

Drainage Area	3.2	Sq. Mi.
Design Frequency	25	Yr.
Design Discharge (Q25)	1330	cfs
Design High Water Elevation	1526.34	Ft.
Overtopping Elevation (Sta. 151+00)	1526.90	Ft.
Overtopping Discharge	1450	cfs
Overtopping Frequency	>25	Yr.
Historic High Water Elevation	N/A	Ft.
Ordinary High Water Elevation	1520.00	Ft.
Estimated Ordinary High Water Discharge	40	cfs

Average Velocity Through the Bridge (Exit of Culvert):

Frequency	2 yr.	25 yr. (Design)	50 yr.
Existing Velocity (fps)	13.9	29.7	30
Proposed Velocity (fps)	6.1	11.7	12.8



PLAN

Scale: 1" = 15'-0"

Note:
See "River Bank Stabilization & Spillway Detail" sheet for stations and offsets of the Slope Protection and ACB Mattress.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-071-197.67 (057) Sta. 149+50.00

CONSTRUCTION LAYOUT
US-281

Proj. No. 281-071 KA-6020-01 Osborne Co.

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

KDOT Graphics Certified 02-23-2023

Sheet No. 81

KDOT Graphics Certified

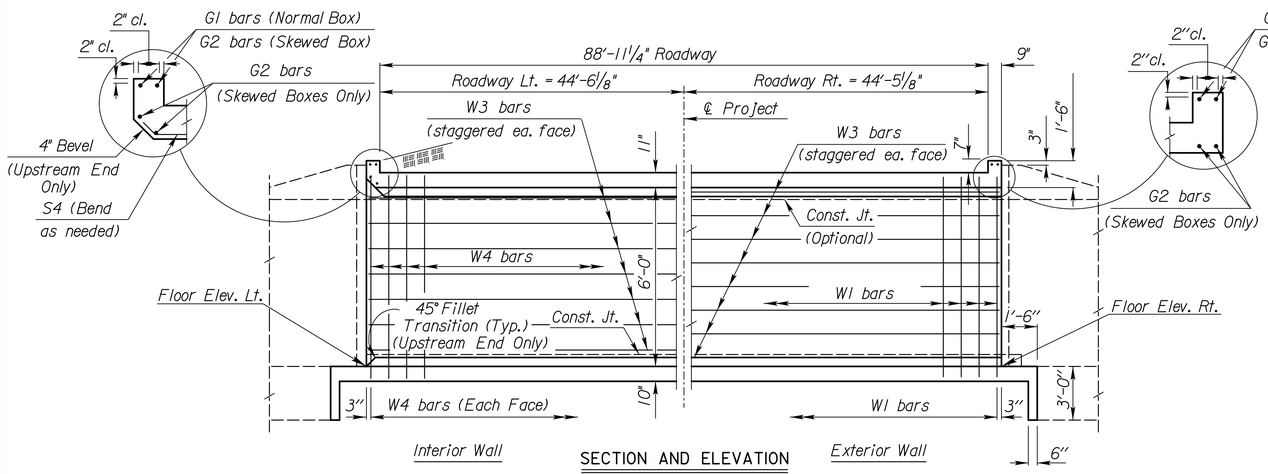
BM21 - 'T' post driven flush with surface l'W. of Woven wire fence 70.49' Rt. ℄ US-281 Sta. 141+87.04 Elev. 1527.07	BM22 - Rivet & KDOT Washer in ℄ Top S. 6'x2' RCB 41.48' Rt. ℄ US-281 Sta. 150+81.91 Elev. 1526.31	BM23 - 'T' post driven flush with surface l'W. of Barb wire fence 84.81' Rt. ℄ US-281 Sta. 161+01.06 Elev. 1508.80

Elevations Shown are to the NAVD 88 Vertical Datum

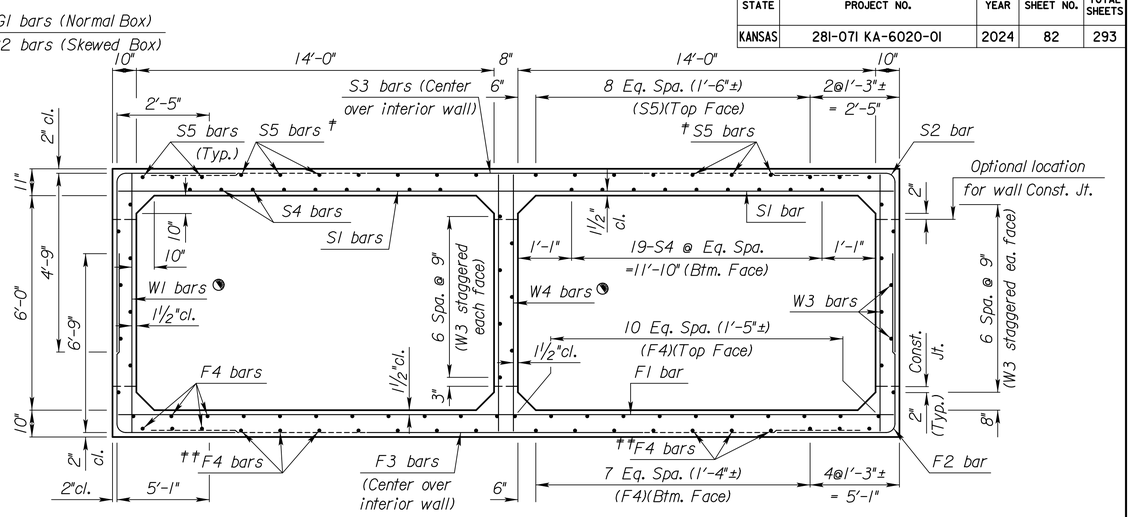
Plotted By: KKATHRIN
File: c:\pwworking\central01\d2597941\kdot6020101bbr0057-CL.dgn
Plot Date: 07-11-24
Plot Location:

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	82	293

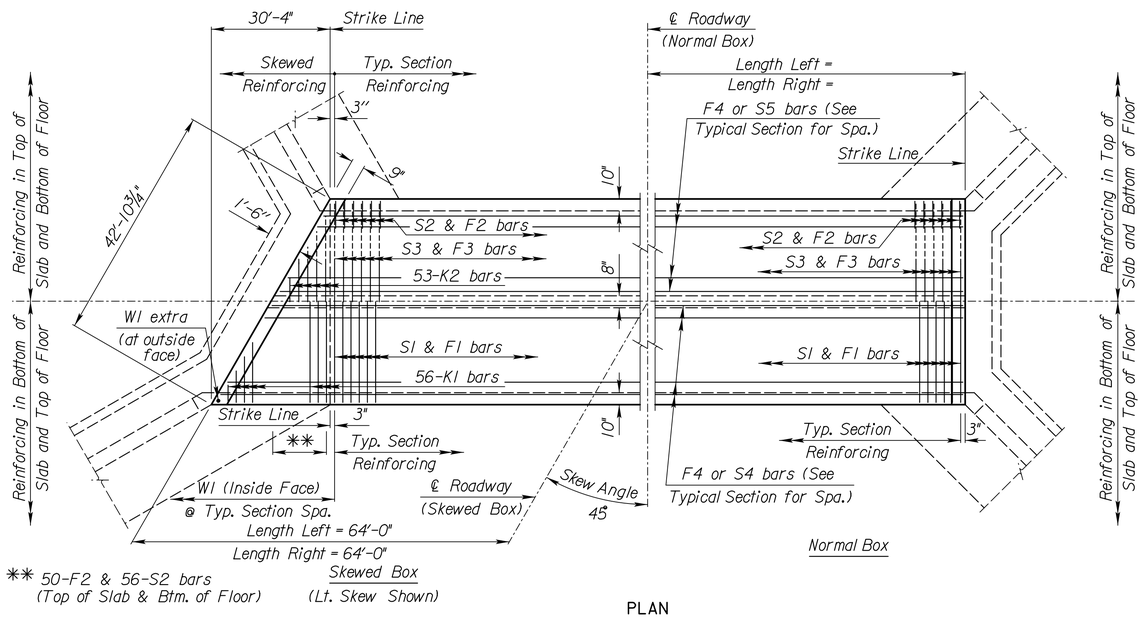
SYSTEM PART	VERSION/ID
CADD V8A	12/6/2000
DATABASE	5/4/2020
RCB PROGRAM	7.1.22
KBOX MODEL ID	179
CELL LIBRARY	2/8/2022
06	



SECTION AND ELEVATION
(Normal to ℄ Roadway)



TYPICAL SECTION

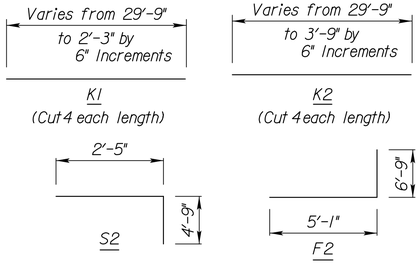


PLAN

◔ See RCB Auxiliary Details for Optional Splice.

† Place when S3 bar extends to exterior walls.

†† Place when F3 bar extends to exterior walls.



BENDING DIAGRAM
All Dimensions are out to out of bars.

GENERAL NOTES

DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
UNIT STRESSES: Grade 4.0 Concrete; f'c = 4,000 p.s.i.
Reinforcing Steel; fy = 60,000 p.s.i.

FILL HEIGHT: Unless otherwise noted, the Design Fill Height is measured from the riding surface at the culvert and shall include the surfacing.

CONCRETE: Grade 4.0 Concrete shall be used throughout. Bevel all exposed edges with a ¾inch triangular moulding. Where Grade 4.0 Concrete (AE) is specified, it shall be placed in the top slab above the Construction Joint.

REINFORCING: All reinforcing shall conform to ASTM A615, Grade 60. All dimensions relative to reinforcing steel shall be to centerline of bar unless otherwise noted.

EXCAVATION: Excavation for culverts less than bridge length shall not be paid for directly but shall be subsidiary to Grade 4.0 Concrete. Excavation for RCB Bridges shall be paid for as Class III Excavation.

SEAL COURSE: A Seal Course may be required by the Engineer. The Seal Course shall be unreinforced Concrete (Commercial Grade) to a minimum depth of 3 inches or as determined by the Engineer. Concrete for the seal course shall be paid for at the unit price set for Concrete for Seal Course.

FOUNDATION STABILIZATION: The Foundation Stabilization quantity has been calculated to the limits shown on the "RCB Auxiliary Details" sheet. The depth may be increased by the Engineer. The Contractor may underrun Foundation Stabilization under the barrel if founded on firm material and with the Engineer's approval. Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.

QUANTITIES: The quantities shown in the Culvert Summary include apron and/or soil saver quantities when their construction is required by the plans. Payment for additional quantities that result from including seal course and/or floating apron, as a change in original plans, shall be made at the Unit Price bid for the various items involved.

GRANULAR BACKFILL (WINGWALLS):
See the "Auxiliary Details" sheet.

STRIKE LINE: Wingwalls and that portion of the RCB outside the Strike Line shall be constructed level. Footing for wingwalls shall be constructed with the culvert floor. See wingwall detail sheet.

BRIDGE BACKWALL PROTECTION SYSTEM: For structures with this bid item in the Summary of Quantities. See the "Auxiliary Details" sheet.

△ For design purposes ONLY. Do NOT use for Construction — CULVERT SUMMARY — ◔ includes any welded wire fabric

Floor Elev. Lt.	Floor Elev. Rt.	Crown Gr. Elev.	△Design Fill Ht.	Skew Lt	Left Wings	Right Wings	Scour Apron	Soil Saver	Concrete Barrel (Cu.Yds.)	Concrete Wings (Cu.Yds.)	Concrete Total (Cu.Yds.)	Reinf. Steel (Gr. 60) Barrel (Lbs.)	Reinf. Steel (Gr. 60) ◔Wings (Lbs.)	Reinf. Steel (Gr. 60) Total (Lbs.)	LRFR RATING FACTORS HL-93 Loading Inventory	HL-93 Loading Operating
1518.50	1516.75	1527.72	0	45	Flared	Straight	No	No	332.44	39.29	371.73	100086	3272	103358	2.39	3.07

*See Bending Diagram

BAR SCHEDULE

F1 Size	Spa.	No.	Length	F2 * Size	Spa.	No.	Length	F3 Size	Spa.	No.	Length	F4 Size	No.	Length	S1 Size	Spa.	No.	Length	S2 * Size	Spa.	No.	Length	S3 Size	Spa.	No.	Length	S4 Size	No.	Length	S5 Size	No.	Length
5	6"	195	30'-0"	7	6"	490	11'-10"	8	6"	195	12'-0"	4	152	33'-0"	8	6"	195	30'-0"	6	6"	502	7'-2"	8	6"	195	30'-0"	5	114	43'-9"	4	80	33'-0"

K1 Size	Spa.	No.	Length	K2 Size	Spa.	No.	Length	W1 Size	Spa.	No.	Length	W2 Size	Spa.	No.	Length	W3 Size	No.	Length	W4 Size	Spa.	No.	Length	G1 Size	No.	Length	G2 Size	No.	Length	S1 Size	Spa.	No.	Length
8	6"	224	*	8	6"	212	*	4	1'-0"	260	7'-5"	N/A	N/A	N/A	N/A	4	84	33'-0"	6	6"	512	7'-5"	8	4	42'-6"	9	4	42'-6"				

Minimum Splice Lengths	
#4	1'-5"
#5	1'-9"

SUMMARY OF QUANTITIES	
Concrete (Grade 4.0)(RCB BR)	371.7 C.Y.
Concrete (Grade 4.0)(AE)(RCB BR)	0.0 C.Y.
Bridge Backwall Protection System	S.Y.
Reinforcing Steel (Gr. 60)	103360 Lbs.
Reinforcing Steel (Gr.60)(Epoxy Coated)	0 Lbs.
Class III Excavation	C.Y.
Foundation Stabilization	102 C.Y.
Concrete for Seal Course (Set)	1 C.Y.
Granular Backfill (Wingwalls)	45 C.Y.
Slope Protection (Riprap Stone) (200 Lbs)	23 C.Y.

NO.	DATE	REVISIONS	BY	APP'D
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-71-197.67(057) Sta. 149+50.00
DOUBLE 14 ft x 6 ft RFB
(45° SKEW LT.)

BR 2.14.6 F — Osborne Co.

FHWA APPROVAL			10-20-10	APP'D	Terry L. Fleck	
DESIGNED	SPW	DETAILED	KBK	QUANTITIES	SPW	CADD KBK
DESIGN CK.	KG	DETAIL CK.	KG	QUAN. CK.	KG	CADD CK. KG

KDOT Graphics Certified 07-11-2024

Sheet No. 82

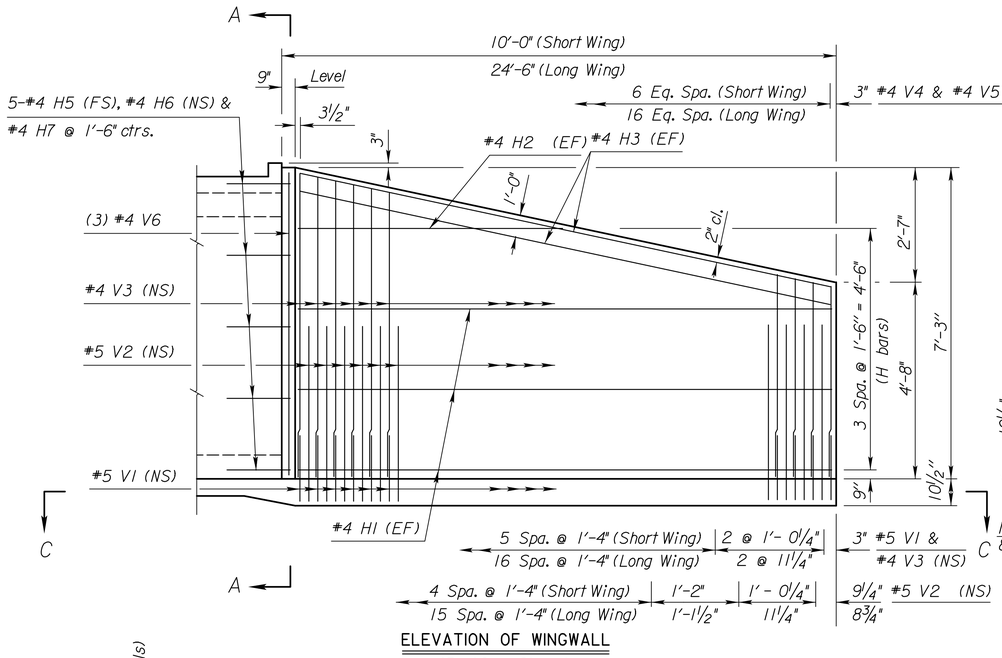
KDOT Graphics Certified

Plotted By: MDELEON
Plot Location:
File: c:\pwworking\central01\d2597941\kb60200lbbr0057-1.dgn
Plot Date: 07-15-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	83	293

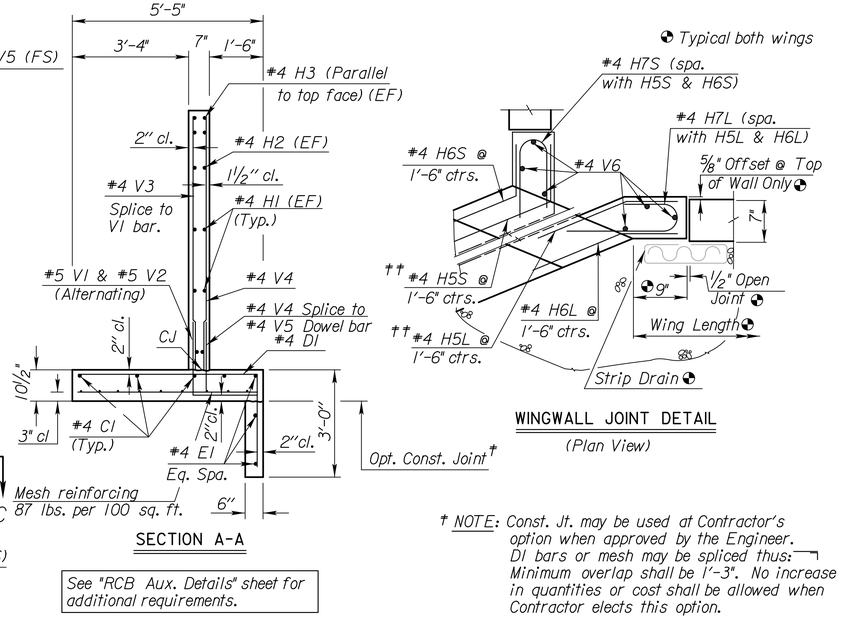
GENERAL NOTES

DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
UNIT STRESSES: Grade 4.0 Concrete; f'c = 4,000 p.s.i.
Reinforcing Steel; fy = 60,000 p.s.i.
CONCRETE: Grade 4.0 Concrete shall be used throughout. Bevel all exposed edges with a ¾" triangular moulding.
REINFORCING: All reinforcing shall conform to ASTM A615, Grade 60. Welded Wire Reinforcement shall conform to ASTM A185. All dimensions relative to reinforcing steel shall be to centerline of bar unless otherwise noted. Welded Wire Reinforcement shall be classified as pounds of reinforcing and included in the total quantity for the bid item Reinforcing Steel (Gr. 60).
QUANTITIES: Wingwall Quantities include all quantities outside the neat lines of the box, excluding the hubguard.
APRON: A 5" concrete slab shall be constructed between the downstream wings in locations subject to scour only when specified on the plans or by the Engineer.
BACKFILL MATERIAL: Use Granular Backfill material meeting the requirements of SB-1, SB-2, SCA-1, SCA-2.
Backfill all wings to limits shown on the "RCB Auxiliary Sheet".
FILTER FABRIC: Separate in-situ material from granular backfill with approved filter fabric complying with Section 1710.
Filter Fabric is subsidiary to "Granular Backfill".
FOUNDATION STABILIZATION: Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.



ELEVATION OF WINGWALL

(Backface Shown)



SECTION A-A

See "RCB Aux. Details" sheet for additional requirements.

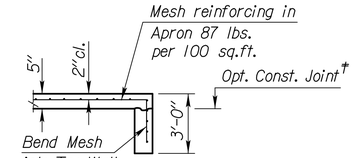
Typical both wings

WINGWALL JOINT DETAIL

(Plan View)

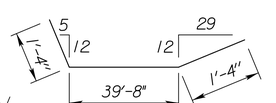
† NOTE: Const. Jt. may be used at Contractor's option when approved by the Engineer. DI bars or mesh may be spliced thus: ⌐ Minimum overlap shall be 1'-3". No increase in quantities or cost shall be allowed when Contractor elects this option.

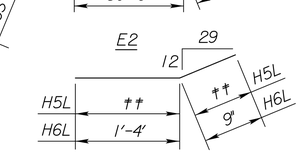
NOTE:
EF = Each Face
NS = Near Side
FS = Far Side
CJ = Const. Joint

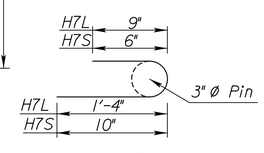


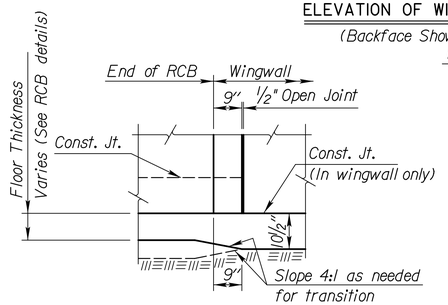
SECTION B-B

Bar	Incrmts.
V3S	4¼"±
V3L	1⅝"±
V4S	5"
V4L	1⅞"

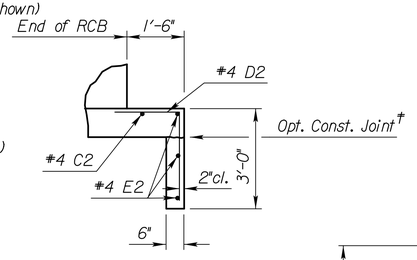




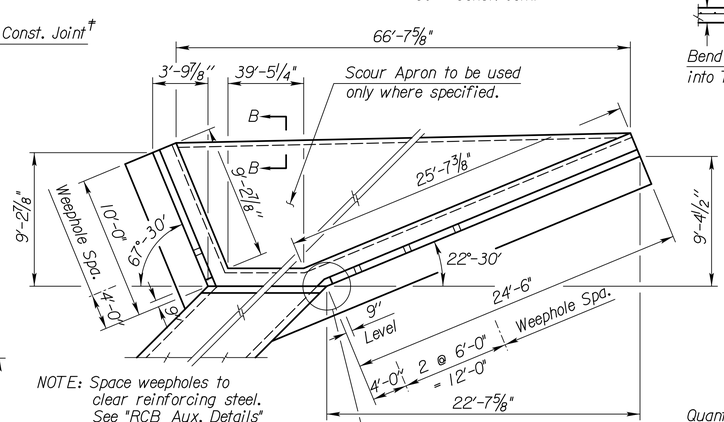




VIEW D-D



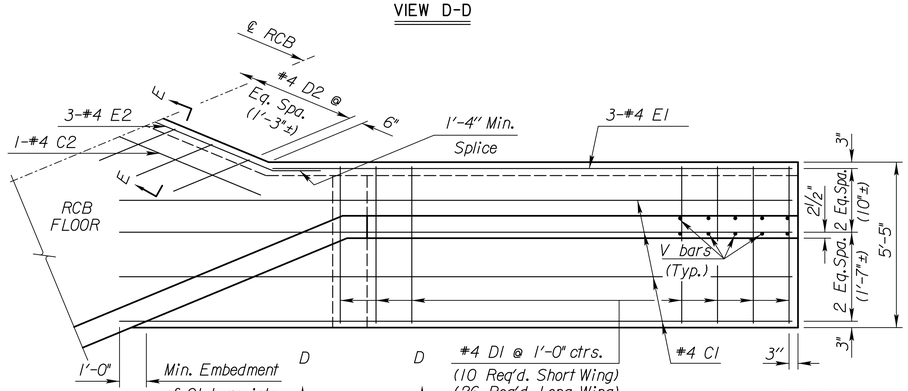
SECTION E-E



NOTE: Space weepholes to clear reinforcing steel. See "RCB Aux. Details" sheet for additional weephole details.

WING DIMENSIONS FOR 45° SKEWED BOX

(3½:1 Embankment Slope)



SECTION C-C

(Plan of Footing)

NOTE: Bars with an 'L' or 'S' designation identifies bars in the long wingwall ('L') or short wingwall ('S'); ie. #4 H2L, #4 H2S, etc.

*See Bending Diagram

NOTE: Reinforcing Bar List is for both wings at one end of box only.

45° Skew	Mark	#4 C1S	#4 C1L	#4 D1	#4 E1S	#4 E1L	#4 C2	#4 D2	#4 E2	#5 V1	#5 V2	#4 V3S	#4 V3L	#4 H1S	#4 H1L	#4 H2S	#4 H2L	#4 H3S	#4 H3L	#4 H5S	#4 H5L	#4 H6S	#4 H6L	#4 H7S	#4 H7L	#4 V4S	#4 V4L	#4 V5	#4 V6		
	Number	4	4	36*	3	3	1	32*	3 *	27*	25*	8	19	6	6	2	2	4	4	5*	5	5*	5*	5 *	5*	7	17	24	6		
	Length	12'-0"	32'-9"	7'-9"	9'-0"	25'-5"	42'-7"	6'-2"	42'-4"	4'-0"	6'-6"	*	*	8'-10"	23'-4"	6'-4"	16'-8"	9'-2"	23'-6"	2'-1"	2'-1"	2'-1"	2'-1"	1'-5"	2'-2"	*	*	2'-2"	7'-0"		

WINGWALL QUANTITIES (One End Only)				
	Foundation Stabilization		Concrete (Gr. 4.0)	
Wingwalls	4.93	(C.Y.)	16.01	(C.Y.)
Apron	0.00	(C.Y.)	0.00	(C.Y.)
Soil Saver	0.00	(C.Y.)	0.00	(C.Y.)
Reinforcing Steel (Gr. 60)			1442	Lbs.
Welded Wire Fabric (Wings)			163	Lbs.
Welded Wire Fabric (Apron)			0	Lbs.
Granular Backfill (Wingwalls)			45.00	C.Y.
Filter Fabric (subsidiary)			44.00	S.Y.

Quantities listed below are included in the Summary of Quantities shown on the RCB details.

BENDING DIAGRAM

(All dimensions are out to out of bars.)

†† Bend in Field

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-71-197.67(057) Sta. 149+50.00
FLARED WINGWALLS
6 ft Rise (45° SKEW)

BR 10.45.06 Osborne Co.

FHWA APPROVAL			10-20-10	APP'D	Terry L. Fleck
DESIGNED	SPW	DETAILED	KBK	QUANTITIES	SPW	CADD	KBK
DESIGN CK.	KG	DETAIL CK.	KG	QUAN. CK.	KG	CADD CK.	KG

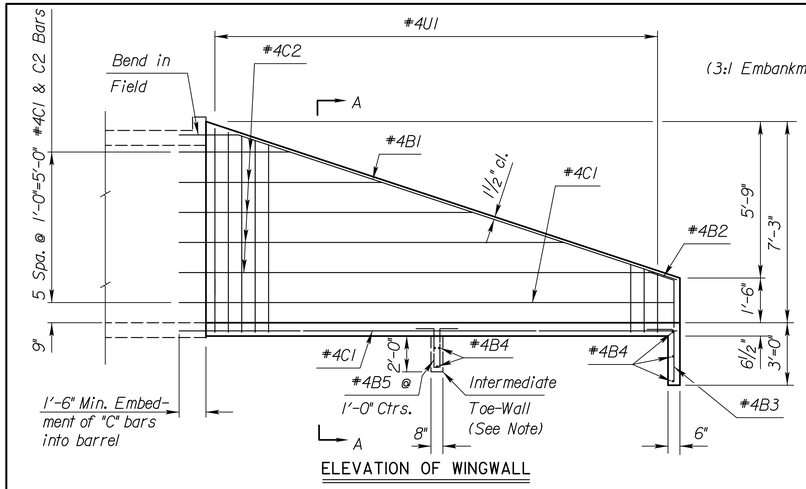
KDOT Graphics Certified 07-11-2024

Sheet No. 83

KDOT Graphics Certified

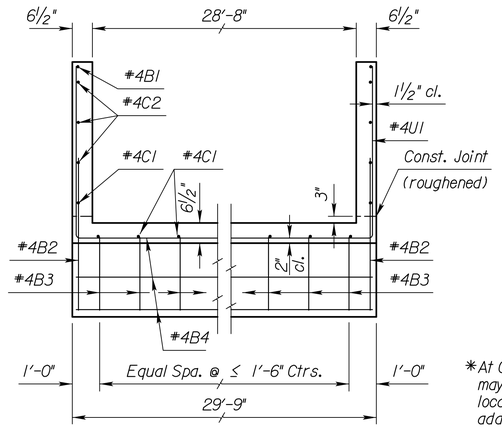
Plotted By: KKATHRIN
Plot Location:
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Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	84	293

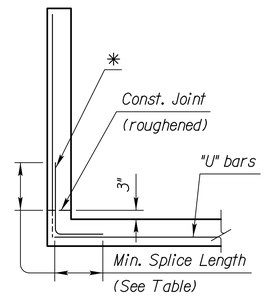


ELEVATION OF WINGWALL

(3:1 Embankment Slope)



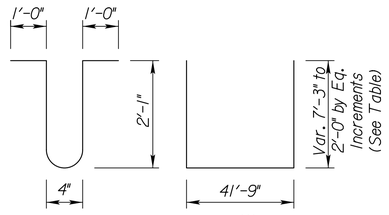
Section A-A



*At Contractors option, straight bars and bent bars may be substituted for "U" bars and spliced at locations shown. No allowance will be made for additional steel required. See table for required lap length.

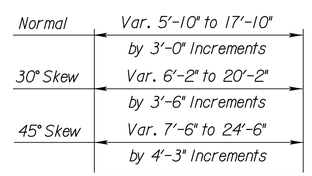
GENERAL NOTES

DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
UNIT STRESSES: Grade 4.0 Concrete; f'c = 4,000 p.s.i.
Reinforcing Steel; fy = 60,000 p.s.i.
CONCRETE: Grade 4.0 Concrete shall be used throughout. Bevel all exposed edges with a ¾inch triangular moulding.
REINFORCING: All reinforcing shall conform to ASTM A615, Grade 60. Welded wire fabric shall conform to ASTM A185. Wire fabric shall be electrically welded and shall be composed of 6x6-W1.4xW1.4 welded wire fabric and shall be classified as pounds of reinforcing.
QUANTITIES: Wingwall Quantities include all quantities outside the neat lines of the box, excluding the hubguard.
BACKFILL MATERIAL: Soils judged as high plasticity clays, fat clays, expansive clays, or organic clays are unsuitable for backfill material for wingwalls and will not be used. Where these conditions exist, use Granular Backfill (Wingwalls).
FOUNDATION STABILIZATION: Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.
INTERMEDIATE TOE-WALL: When the length of wingwalls and width of apron both exceed 15'-0", an intermediate toe-wall shall be constructed at mid-length of wingwall as shown on "Elevation of Wingwall".

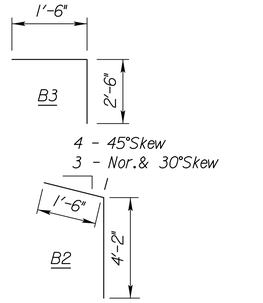


NOTE:
Wingwall floor and toewall shall be constructed with the RCB floor. Wingwalls to be constructed with RCB walls.

SKEW	INCREMENT
0°	4"
30°	3½"±
45°	3"±

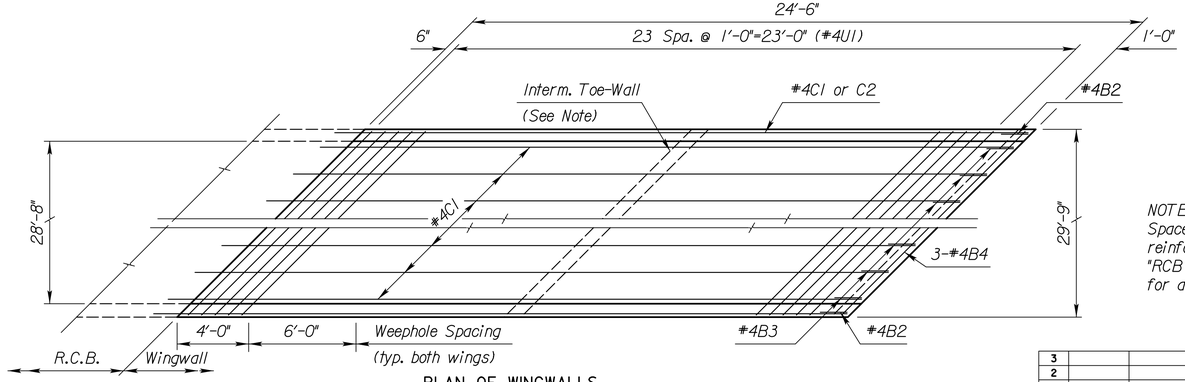


C2
(Cut two each length)



BENDING DIAGRAMS

All dimensions are out to out of bars.



PLAN OF WINGWALLS
(45° Skewed RCB)

NOTE:
Space Weepholes to clear reinforcing steel. See "RCB Auxiliary Details" sheet for additional weephole details.

* See Bending Diagram

NOTE: Reinforcing Bar List is for both wings at one end of box only.	#4 B1		#4 B2 *		#4 B3 *		#4 B4		#4 B5 *		#4C1		#4C2				#4U1 *					
	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length
45° Skew	2	26'-6"	2	5'-8"	20	4'-0"	6	42'-6"	20	6'-4"	22	25'-10"	10	*			24	*				

WINGWALL QUANTITIES (One End Only)	
Concrete (Grade 4.0)	23.28 CY.
Reinforcing Steel	1668 Lbs.
Foundation Stabilization	14.87 CY.

Quantities listed are included in the Summary of Quantities shown on the RCB.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-71-197.67(057) Sta. 149+50.00
STRAIGHT WINGWALLS
6 ft Rise (45° Skew)
BR 11.00.06 Osborne Co.

FHWA APPROVAL			10-20-10	APP'D		Terry L. Fleck	
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DESIGN CK.	KG	DETAIL CK.	KG	QUAN. CK.	KG	CADD CK.	KG

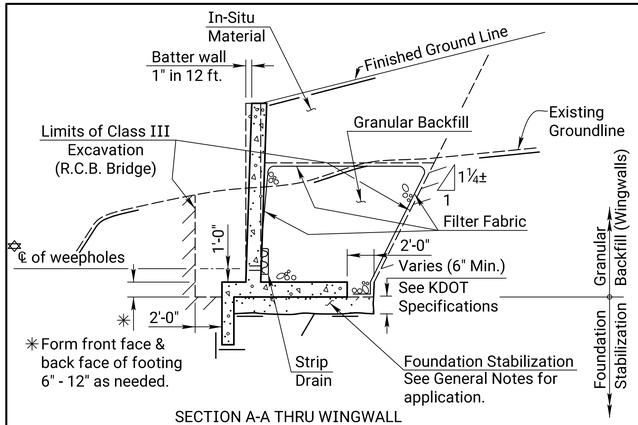
KDOT Graphics Certified 07-11-2024

Sheet No. 84

KDOT Graphics Certified

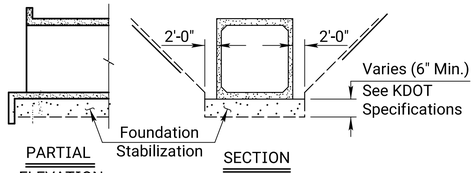
Plotted By: KKATHRIN Plot Location:
File: c:\pwworking\central01\d2259794\ka602001bbr0057-3.dgn
Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	85	293



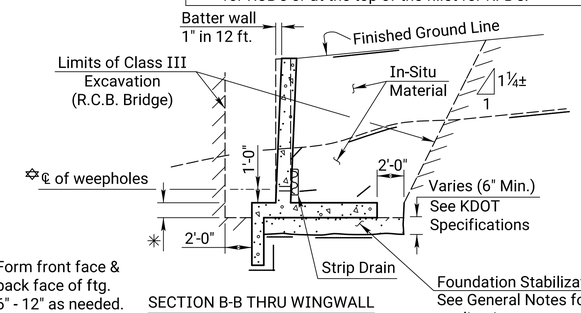
SECTION A-A THRU WINGWALL

Granular Backfill And Foundation Stabilization



PARTIAL ELEVATION

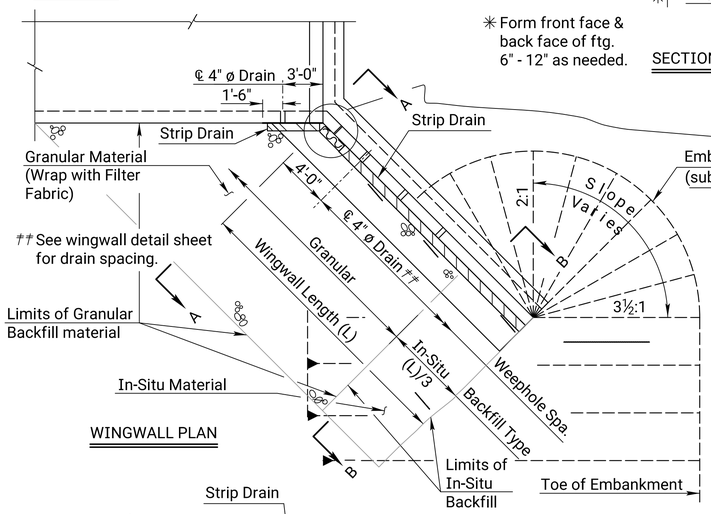
SECTION



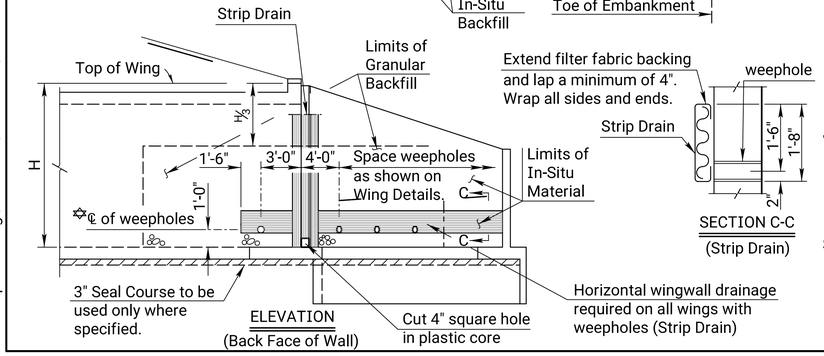
✳Form front face & back face of ftg. 6" - 12" as needed.

SECTION B-B THRU WINGWALL

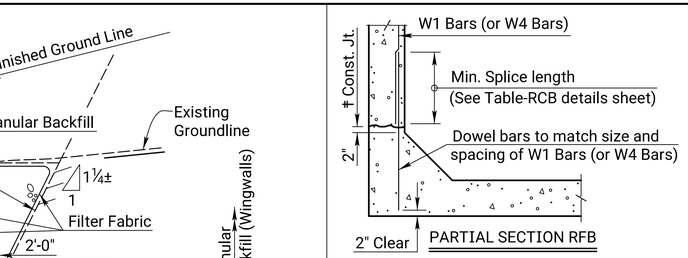
✡Weep holes will be adjusted up by the amount of embeddment shown on BR025A if the structure is embedded.



WINGWALL PLAN



ELEVATION (Back Face of Wall)



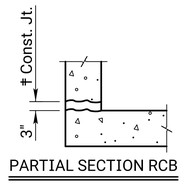
PARTIAL SECTION RFB

OPTIONAL BAR DETAIL

The Contractor shall have the option of using Dowel Bars to match vertical wall bars as shown, however no allowance will be made for additional steel required for bar laps.

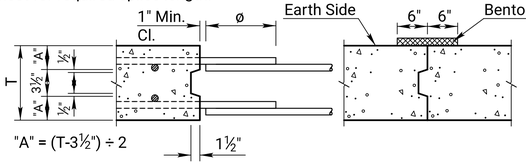
‡OPTIONAL COLD JOINT

The Contractor has the option of placing the Lower Horizontal Construction Joint at the top of the slab for RCB's or at the top of the fillet for RFB's.



PARTIAL SECTION RCB

ø Longitudinal bars shall extend through the joint to provide a minimum lap equal to the required splice length. See RCB Details sheet for required splice length.

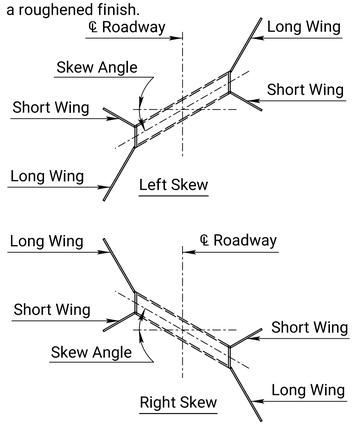


VERTICAL CONSTRUCTION JOINTS

NOTE: Vertical construction joints shall be perpendicular to the longitudinal axis of the RCB and shall be placed at any location as needed for construction and as approved by the Engineer.

NOTE: Horizontal construction joints shall be a roughened finish.

NOTE: Barrel Construction Joints located in a median with less than 5 ft. of fill or at locations specified by the Engineer, shall be protected by a bentonite based system as shown. Place the bentonite on the exterior walls and top slab. See requirements for bentonite in the KDOT Specifications for "Bridge Backwall Protection System". Material and installation of the bentonite system shall be subsidiary to the bid item "Grade 4.0 Concrete".



PLAN VIEW SKEWED R.C.B.

VERTICAL STRIP DRAIN

SECTION C-C (Strip Drain)

GENERAL NOTES

Wingwall Drainage:

1. All wingwalls with weepholes shall have horizontal and vertical wingwall drainage as shown. Strip drains will be used. See KDOT Specifications for "Abutment Strip Drains" for strip drain requirements.
2. Construction and materials for wingwall drainage, including weepholes, and strip drain shall be subsidiary to the bid item, "Grade 4.0 Concrete". Weepholes may be a formed opening or corrugated polyethylene tubing.

Wingwall Foundation Stabilization:
The Foundation Stabilization quantity has been calculated to the limits shown in the Section Thru Wingwall. The depth may be increased by the Engineer. Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.

Seal Course:
Seal Course consisting of 3" min. of Commercial Grade Concrete shall be constructed to the limits directed by the Engineer. No reinforcing in the floor of the slab or wall footing shall be placed until the Seal Course has gained sufficient strength to permit working upon it without injury.

GENERAL NOTES

Foundation Stabilization:
The depth of Foundation Stabilization may be increased by the Engineer. The Contractor may underrun Foundation Stabilization under the barrel if founded on firm material and with the Engineer's approval. Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.

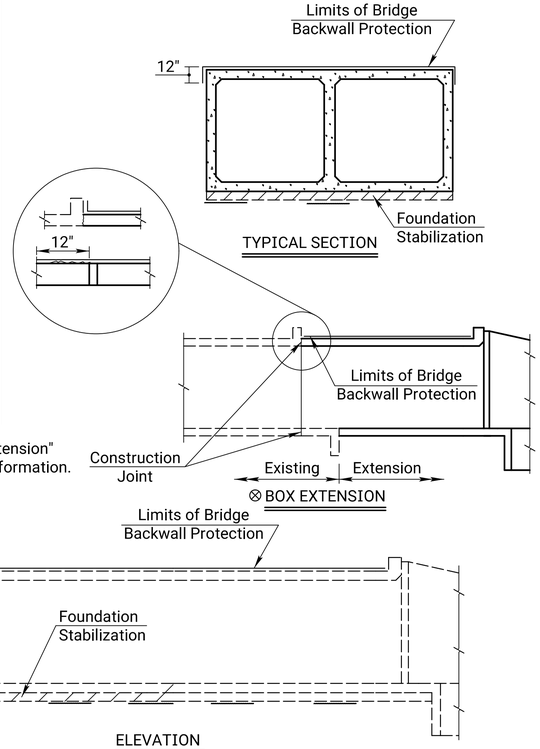
Granular Backfill (Wingwalls):

1. Granular Backfill shall be used to backfill behind wingwalls to the limits shown in the WINGWALL PLAN and Elevation detail. Granular Backfill construction may be used separately or combined with Foundation Stabilization as directed by the Engineer.
2. Measurement for the bid item, "Granular Backfill (Wingwalls)", shall be measured in Cubic Yards to the theoretical limits as shown.
3. Material for Granular Backfill (Wingwalls) shall conform to the requirements of SB-1, SB-2, SCA-1 or SCA-2.
4. Consolidate Granular Backfill using hand equipment only. Avoid over consolidation.
5. Use filter fabric complying with Section 1710. Use only within the limits of Granular Backfill to separate from the In-Situ Material. Filter Fabric is subsidiary to "Granular Backfill".

In-Situ Backfill (Wingwalls):

1. Use any material found within the project limits except Highly Plastic Clay(s) or organic material. The material is subsidiary to "Granular Backfill".
2. Use Type "B" Compaction.
3. Use only hand or walk behind equipment for Compaction.

⊗See "Typical Culvert Extension" RD080 for additional information.



TYPICAL SECTION

⊗BOX EXTENSION

ELEVATION (New Construction)

GENERAL NOTES

Bridge Backwall Protection System:

1. For all structures with less than or equal to 2'-0" of fill, apply a "Bridge Backwall Protection System" from Section 1700 to the limits shown. Do not place hot mix asphalt directly on this material.
2. Use a "non-coal tar" material from KDOT's approved list.
3. Protect this material from damage during backfilling. Repair at no additional cost.
4. When the Plans show hot mix asphalt placed directly on the slab, substitute "Pavement Water Proofing" material from Section 800, this material shall be subsidiary. Wait 7 days after top slab is completed before applying this material.

NO.	DATE	REVISIONS	BY	APP'D
07	02-06-18	Filter Fabric Clarification	M.L.L.	J.P.J.
06	06-07-17	Filter Fabric Modification	J.P.J.	J.P.J.
05	10-11-13	Granular Backfill Limits	J.P.J.	L.R.R.

KANSAS DEPARTMENT OF TRANSPORTATION

RCB AUXILIARY DETAILS (LRFD)

~~BR020B~~

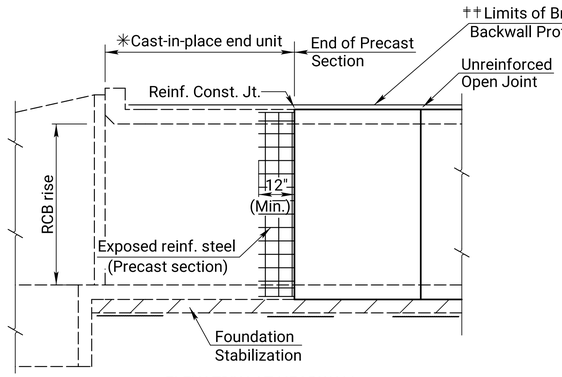
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DESIGNED	J.P.J.	DETAILED	R.A.A.	QUANTITIES		TRACED	R.A.A.
DESIGN CK.	J.S.R.	DETAIL CK.	J.P.J.	QUAN.CK.		TRACE CK.	J.P.J.

KDOT Graphics Certified 07-11-2024 Sh. No. 85

KDOT Graphics Certified

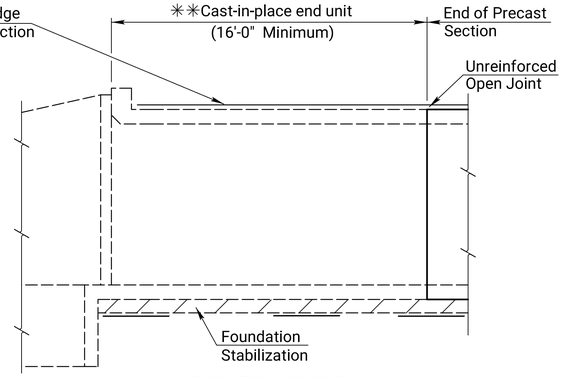
Drawn By : KKATHRIN Plotted : 07-11-24
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STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	86	293



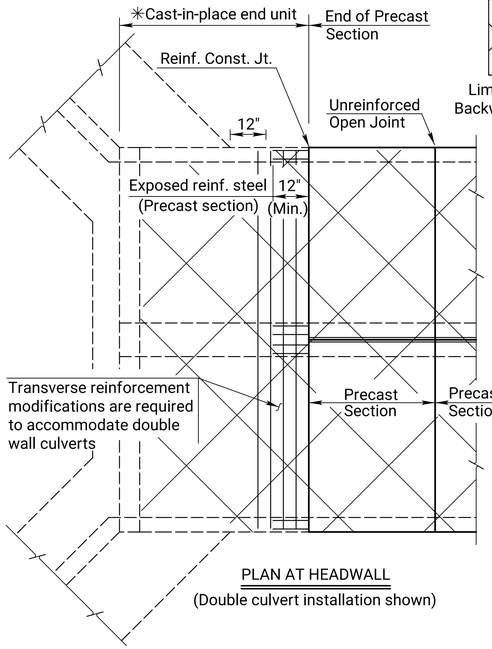
ELEVATION AT HEADWALL

✳ Minimum barrel length of cast-in-place end unit shall equal the RCB rise or 8'-0", whichever is less. This length can be used when the joint between the cast-in-place end unit and the precast section is reinforced as shown.



ELEVATION AT HEADWALL

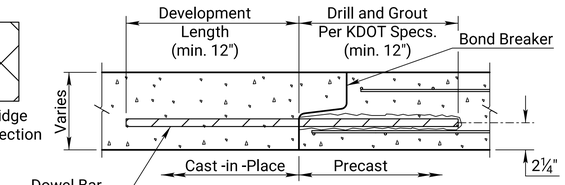
✳✳ Minimum barrel length of cast-in-place end unit shall be 16'-0" when using an unreinforced open joint at the end of the precast section.



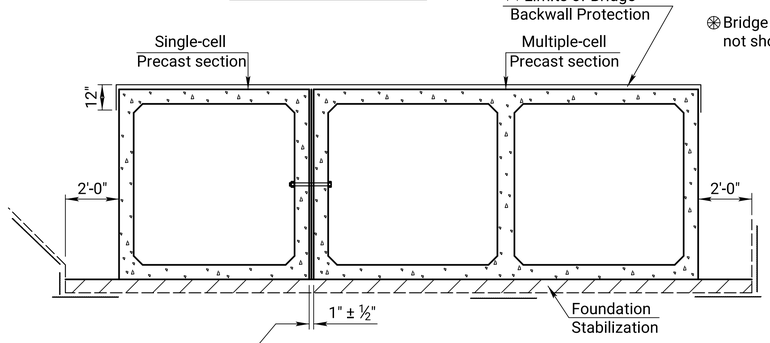
PLAN AT HEADWALL

(Double culvert installation shown)





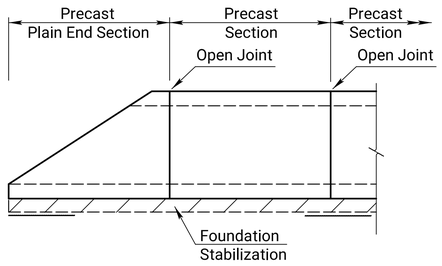
⊛PARTIAL DETAIL OF JOINT



TYPICAL INSTALLATION DETAILS

Fill space between boxes with grout. (To maintain proper joint gap, partially backfill boxes prior to grouting or provide a mechanical connection between boxes.)

⊛Bridge Backwall Protection not shown for clarity.



ELEVATION AT PRECAST END SECTION

(Precast End Sections are permitted where straight wings are shown in the plans or at the downstream end for single cell RCB with a rise of six feet or less.)

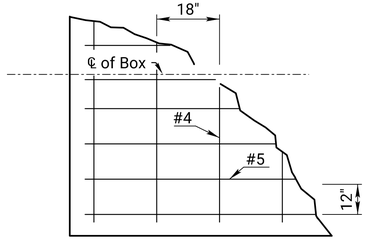
NOTE: See "Bridge Excavation" sheet, (Std. No. BR100B), for excavation details and basis of payment.

NOTE: Minimum length of precast section shall be 4'-0".

NOTE: A single cell box of equivalent area may be substituted for a double cell box with cell spans less than or equal to 6'-0". Any revision in the cell height from that shown on the plans will not be permitted, unless approved by the Engineer. Two single cell boxes may be substituted for a double cell box, when approved by the Engineer.

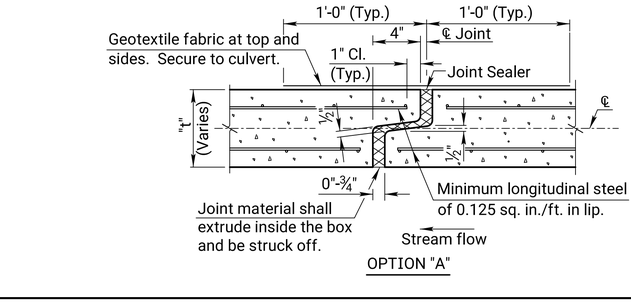
NOTE: See respective RCB Standard Sheets for cast-in-place details.

NOTE: When the fill height is 2'-0" or less "Bridge Backwall Protection" is required.

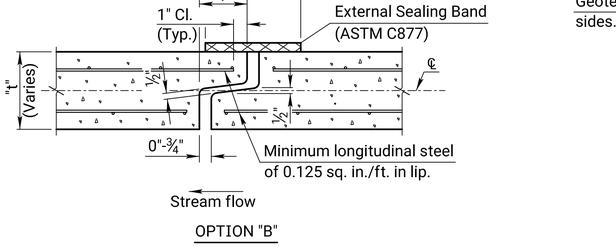


CAST IN PLACE DISTRIBUTION SLAB

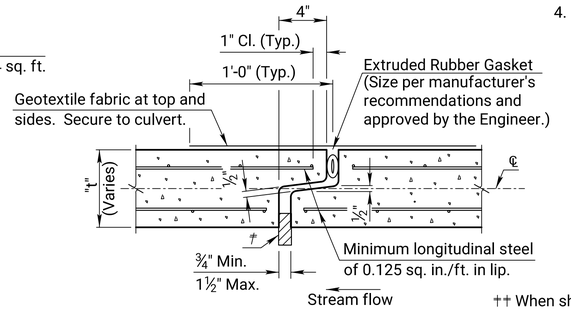
(Partial plan of reinforcement)



OPTION "A"



OPTION "B"



OPTION "C"

†Insert temporary, ¾"-1" wide, hardwood wedges to prevent over-compressing gasket.

⊛OPEN JOINT DETAIL

††When shown on the shop details use a Bridge Backwall Protection conforming to Section 1700 of the KDOT Specifications.

GENERAL NOTES

(All Items on this sheet are subsidiary)

PRECAST BOX CULVERTS: If precast boxes are specified, construct them at the locations shown in the plans and according to the requirement shown on this sheet. When approved by the Engineer, precast box culverts may be used in lieu of cast-in-place box culverts. If the Contractor chooses the precast option, use the cast-in-place quantities as the cost basis. This cost includes all labor equipment, material and incidentals necessary to complete the installation.

Unless otherwise approved by the Engineer, use cast-in-place collars at horizontal and vertical changes in RCB alignment. Use cast-in-place end sections and wingwalls except as noted on this sheet. The Engineer may require cast-in-place sections at junctions of drainage structures.

Cast-in-place concrete work shall conform to the requirements of the KDOT Specifications and Chapter 12 of KDOT's Bridge Design Manual. Use Grade 4.0 concrete and Grade 60 reinforcing steel conforming to ASTM A615 for cast-in-place construction.

Cast-in-place box sections shall have member thicknesses and reinforcement not less than the RCB Standard from the original design. Connections between the cast-in-place and precast members shall be drilled and grouted according to details shown on this sheet. When the wall thicknesses differ between the cast-in-place and precast, transition at a 4:1 without reducing the box opening size. See KDOT Specifications for further requirements.

SPECIFICATIONS: Single-cell Precast Concrete Box Culverts shall conform to the requirements of the following specifications except as noted in the KDOT Specifications. Design multiple-cell precast boxes in accordance with the criteria used to develop the single-cell precast boxes. (See Appendix of ASTM Specification C 1577-08, Table 2 and the latest AASHTO LRFD Specifications.)

DISTRIBUTION SLAB: Fill heights less than 2 feet require a distribution slab. Construct the distribution slab over the width of the exterior walls of the barrel to the outside edges of the roadway shoulders. Terminate the slab a minimum of 2 feet from the edge of a barrel segment.

If the fill height is less than or equal to one foot then:

A distribution slab shall be a minimum of 6 inches thick, reinforced with #4 bars spaced at 18 inches, placed perpendicular to centerline of the box and with #5 bars spaced at 12 inches, placed parallel to centerline of the box. Substitution of an equivalent welded wire fabric is acceptable. Place a min. of 3" of granular material between the box and slab.

If the fill height is greater than one foot then:

(Use one of the following options)

1. Use the cast-in-place criteria above.
2. Use precast distribution slabs with same criteria as the cast-in-place above. Center the joints in slabs over the box segments. Provide a minimum of 3 inches of granular material between the box and the slabs.
3. Reinforced concrete pavement (min. 6 inches thick) will meet the requirements of a distribution slab. Reinforce as noted above. Provide a minimum of 3 inches of granular material between the concrete pavement and the precast boxes.
4. Asphalt pavement (min. 6 inches thick) will meet the requirements of a distribution slab. Provide a minimum of 6 inches of granular material between the asphalt and the precast boxes. Also provide geogrid with 4" of cover to the asphalt within the granular material.

A special design will be required when the above options are not geometrically possible.

NO.	DATE	REVISIONS	BY	APP'D
05	08-19-13	Edit Geogrid Placement	J.P.J.	T.L.F.
04	07-28-11	Added Bridge Backwall Protection	J.P.J.	K.F.H.
03	03-10-10	Clarification of Extension	J.P.J.	K.F.H.

KANSAS DEPARTMENT OF TRANSPORTATION

PRECAST CONCRETE BOX CULVERT DETAILS

BR031

FHWA APPROVAL		09-20-11	APP'D.	Kenneth F. Hurst
DESIGNED	DETAILED	P.F.	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	R.A.M.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 06-29-2023 Sh. No. 86

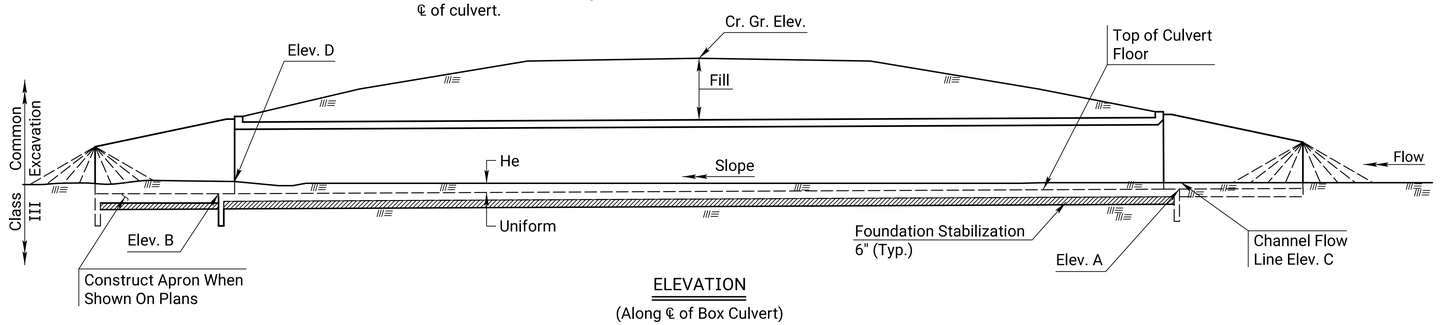
KDOT Graphics Certified

Drawn By : KKATHRIN Plotted : 07-11-24
File : c:\pwworking\central01\d2597941\ka602001bss-br031.dgn

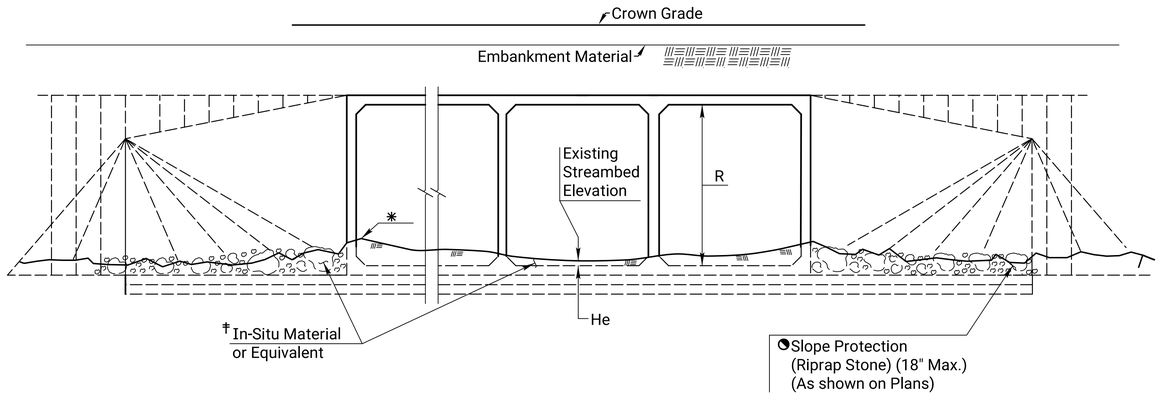
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	87	293

SUMMARY OF HYDRAULIC STRUCTURES											
Serial No.	Str. Type	Sta.	Size No. Cells - Span x Rise	Cr. Gr. Elev.	He	Floor Elev. A	Floor Elev. B	BackFill Elev. C	BackFill Elev. D	Up Stream Apron	Down Stream Apron
(056)	RFB	69+35.00	4 - 10' X 10'	1564.83	1.0	1550.71	1550.69	1551.71	1551.69	NO	NO
(549)	RFB	131+41.00	2 - 9' x 6'	1530.15	1.0	1522.30	1521.80	1523.30	1522.80	NO	YES
(057)	RFB	149+50.00	2 - 14' x 6'	1527.72	1.0	1518.50	1516.75	1519.50	1517.75	NO	YES

NOTE:
All elevations taken along
℄ of culvert.



ELEVATION
(Along ℄ of Box Culvert)



TYPICAL SECTION
(At the end of the box culvert)

GENERAL NOTES

†BACKFILL:
The backfill within the barrel will occur by natural process for structures equal to or less than 4'-0" in height. For these structures the contractor will backfill to the limits shown outside of the barrel. Backfill structures larger than 4'-0" in height to a minimum depth of 1'-0". Work and material required for backfill is not paid for directly, but is subsidiary to Foundation Stabilization.

MATERIAL:
Backfill shall be with insitu or equivalent material. Material shall be reasonably free of organic material. Slope Protection (Riprap Stone) shall conform to KDOT Specifications. Place this material to the limits shown. The intent of the Slope Protection material is to protect the toe of the embankment which wraps around the wing walls.

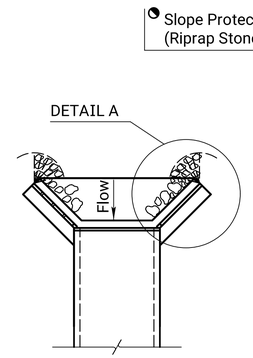
EXCAVATION:
The grading contractor will excavate and clear the channel to the limits shown on standard BR100. The bridge contractor will consider the additional excavation below this elevation as Class III for bridge sized structures. Excavation below the floor shall be subsidiary to Foundation Stabilization.

LOADING:
For structures larger than 4'-0" in height, place in-situ material or equivalent in an uncompacted state to a minimum depth of 1'-0". Do not operate equipment on floor until the concrete has reached a strength of at least 3.0 ksi.

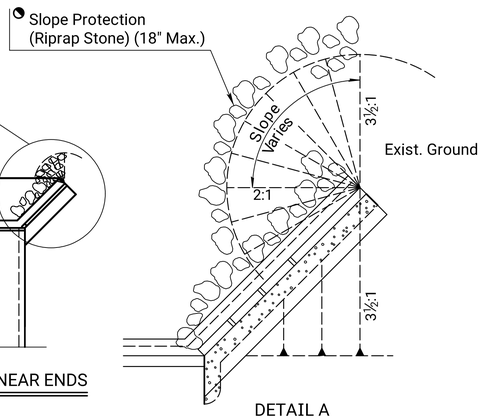
*Shape backfill in exterior cells so that top elevation of backfill material is 4" to 6" higher than the backfill material at ℄.

See "RCB Box" Sheet for "Slope Protection" Quantities.

†Backfill material is limited to the material found within the footprint of the excavated structure.



PARTIAL PLAN NEAR ENDS



DETAIL A

NO.	DATE	REVISIONS	BY	APP'D
03	07-21-22	Change Shot Rock to Riprap Stone	M.L.L.	M.A.H.
02	05-06-16	Various Revisions	M.J.O.	J.P.J.
01	06-18-12	Modified per 2012 requirements	J.P.J.	T.L.F.

KANSAS DEPARTMENT OF TRANSPORTATION

RCB AUXILIARY DETAILS
(Embedded Structure)
With Rise > 48"

Proj. 281-071 KA-6020-01 Osborne Co.

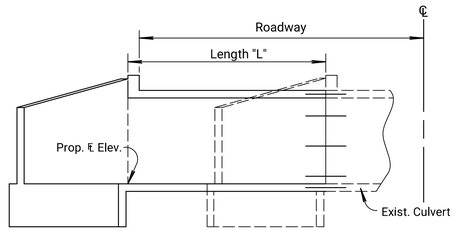
DESIGNED	M.J.O.	DETAILED	M.J.O.	QUANTITIES		CADD	R.A.A.
DESIGN CK.		DETAIL CK.		QUAN.CK.		CADD CK.	

KDOT Graphics Certified 02-01-2023

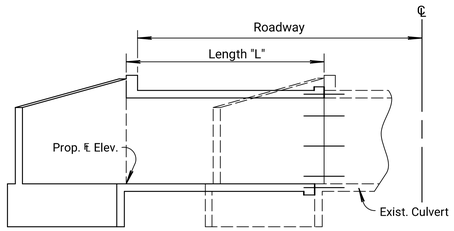
Sh. No. 87

KDOT Graphics Certified

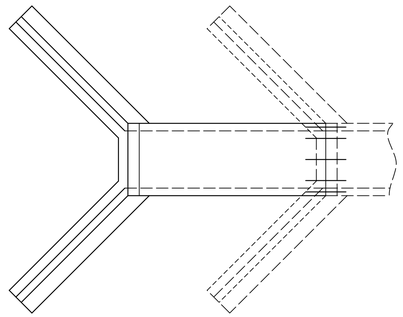
Drawn By : KKATHRIN Plotted : 07-11-24
File : c:\pwworking\central01\d2597941\ka602001bss-br025a.dgn



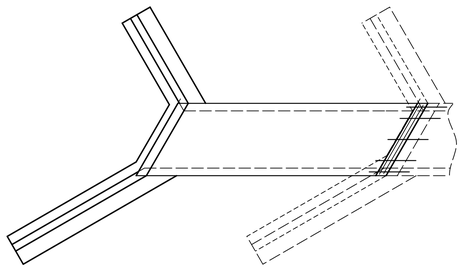
TYPICAL SECTION
(Flared Wings)



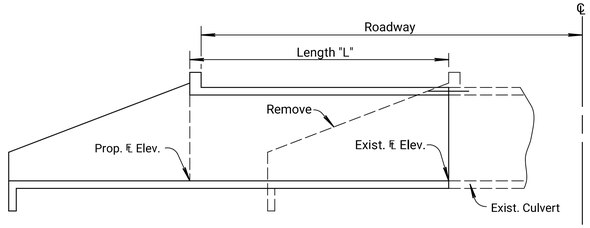
TYPICAL SECTION
(Skewed Structure)



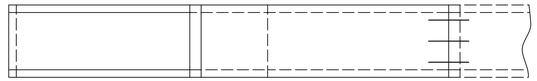
TYPICAL PLAN
(Flared Wings)



TYPICAL PLAN
(Skewed Structure)



TYPICAL SECTION
(Straight Wings)



TYPICAL PLAN
(Straight Wings)

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	88	293

GENERAL NOTE

Dimensions of existing structures shall be checked in the field prior to starting the new construction. Interior walls of multiple box extensions need not be the same thickness as the existing walls.

All existing concrete surfaces adjacent to new concrete shall be thoroughly cleaned by brushing, and soaked with water immediately prior to placing the new concrete.

All work and material necessary for installing the dowel bars shall be subsidiary to the bid item "Reinforcing Steel".

Grouting of bars shall meet the Standard Specifications of the Kansas Department of Transportation. Locate dowel bars near the center of walls and slabs.

For non-skewed boxes "s_1" and "f_1" bars shall be placed at ½ normal spacing for the first 18".

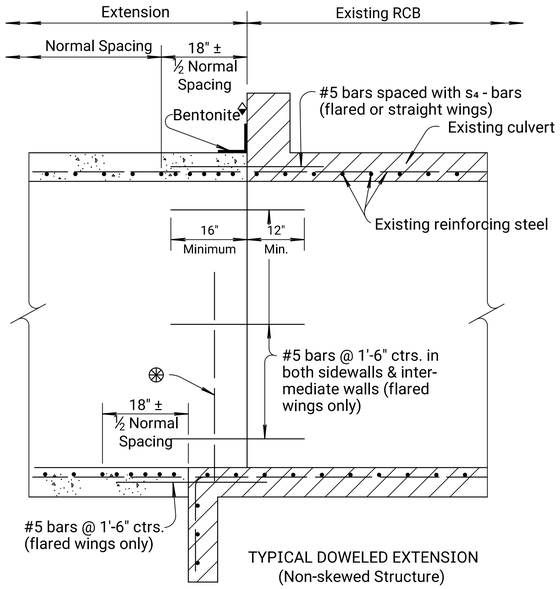
Straight Wing Extensions

Remove existing wings and wing aprons. Remove top of hubguard if necessary to clear new construction. A minimum of 24" length of the existing wing and floor steel shall be left intact and shall be cleaned and straightened to bond into the new concrete. Dowels (#5 deformed bars) shall be inserted across the top of box as shown in sketch. Butt extensions against existing culvert. This work shall be subsidiary to the bid item "Grade 4.0 Concrete".

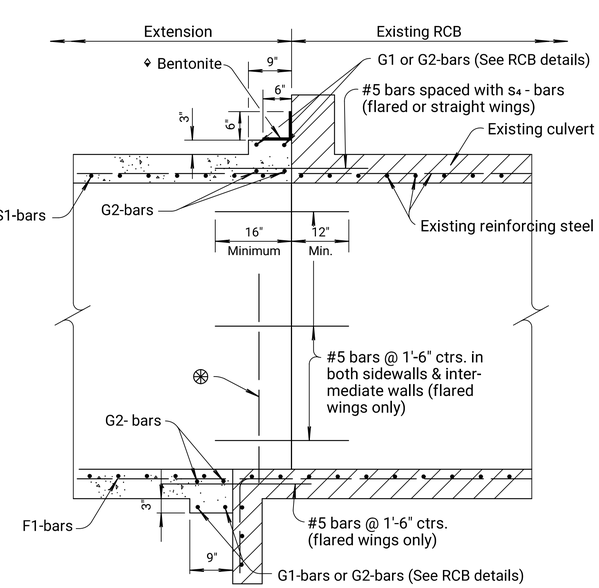
Flared Wing Extensions

Remove top of hubguard, if necessary, to clear new construction. Dowels (#5 deformed bars) shall be inserted in top, bottom, sides and intermediate walls, as shown in sketch. Butt extensions against existing culvert.

If the existing wingwall has an open vertical joint that interferes with the installation of the dowels, remove part of the wingwall to clear construction. This work shall be subsidiary to the bid item "Grade 4.0 Concrete".



TYPICAL DOWELED EXTENSION
(Non-skewed Structure)



TYPICAL DOWELED EXTENSION
(Skewed Structure)

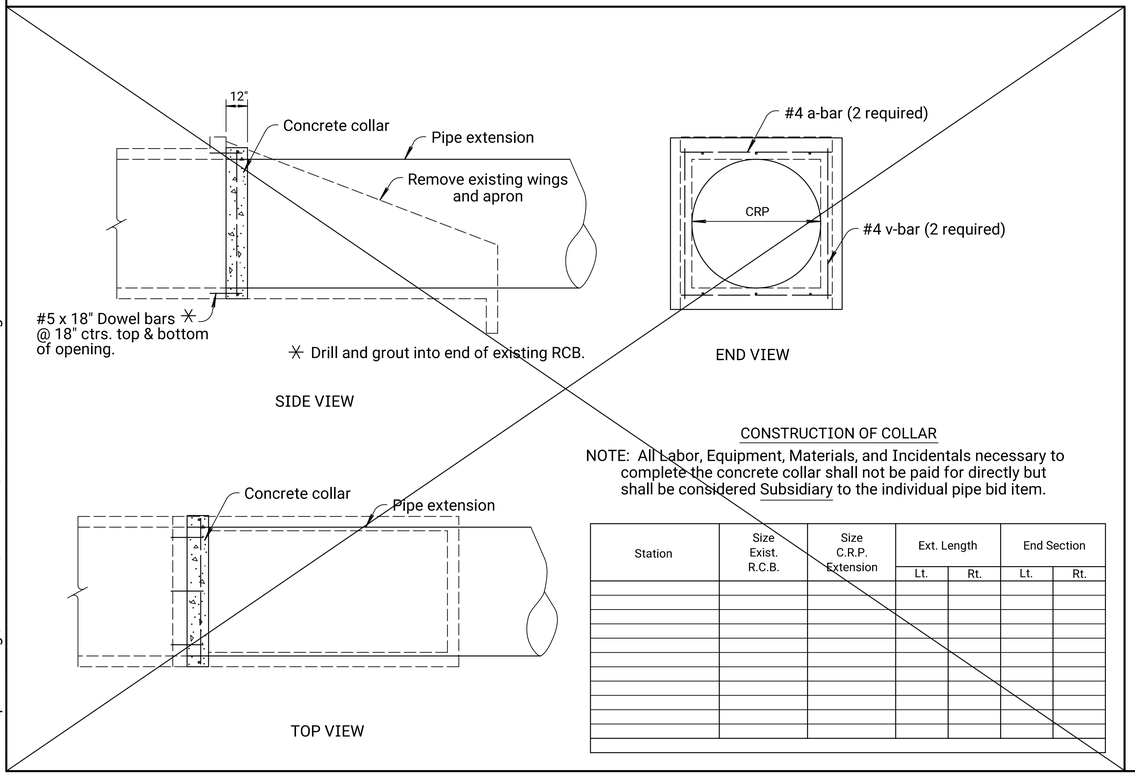
◇ NOTE: The joint between the RCB extension and the existing structure shall be protected by a bentonite based system as shown when the following conditions exist:

1. Fill depth over the joint is 2 feet or less.
2. Lateral location of the joint is 20 feet or less from edge of pavement.
3. RCB span is equal to or greater than 8 feet.

The bentonite shall be placed on the exterior walls and top slab and shall conform with the requirements of the Special Provision for "Bridge Backwall Protection System".

All materials and labor required for this work shall be Subsidiary to the bid item "Grade 4.0 Concrete".

⊛ If the existing footings are left in place, dowel any vertical reinforcing steel located in the new walls into the existing footing. For rigid frame boxes, this may require additional #5 dowel bars to splice to the exterior vertical bars in the wall.



CONSTRUCTION OF COLLAR

NOTE: All Labor, Equipment, Materials, and Incidentals necessary to complete the concrete collar shall not be paid for directly but shall be considered Subsidiary to the individual pipe bid item.

Station	Size Exist. R.C.B.	Size C.R.P. Extension	Ext. Length		End Section	
			Lt.	Rt.	Lt.	Rt.

Quantities on this sheet are included in Summary of Quantities, Sh. No. 58

Station	Size Exist. R.C.B.	Roadway		Length "L"		Grade 4.0 Conc. Cu. Yds.	Reinf. Steel Lbs.	Remarks
		Lt.	Rt.	Lt.	Rt.			
26+00	6'x6'	55'-11"	98'-0 $\frac{3}{4}$"	7'-0"	0'-0"	13.4	1560	7' Ext. Lt.

NO.	DATE	REVISIONS	BY	APP'D
08	05-04-05	Class to Grade Conc., notes & details	S.W.K.	J.O.B.
07	04-18-01	Revised General Note	R.J.S.	J.O.B.
06	12-05-00	Rev. General Note flared wing ext.	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

TYPICAL CULVERT EXTENSIONS

RD080

FHWA APPROVAL	06-10-05	APP'D.	James O. Brewer
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 06-29-2023 Sh. No. 88

KDOT Graphics Certified

Drawn By : KKATHRIN Plotted : 07-11-24
File : c:\pwworking\central01\d2597941\ka602001bss-rd080.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	89	293

SUMMARY OF QUANTITIES

	Class I Excavation	Concrete (Grade 4.0) (AE) (SW)	Concrete (Grade 4.0) (AE)	Reinforcing Steel Epoxy Coated Grade 60	Reinforcing Steel Grade 60	Structural Steel M270 (Gr. 50WT3)	Structural Steel A709 (Gr. 50W)	Piles (Steel) (HP12X74)	Test Piles (Special) (HP12x74)	Expansion Device (Sliding Plate)	Bearing (TFE/ (Elastromeric)	Bearing (Steel Reinf. (Elastromeric)	Welded Stud Shear Connectors	Drilled Shaft (60") (Cased)	Core Hole (Investigative)	Sonic Test (Drilled Shaft) (Set Price)	Abutment Strip Drain	Bridge Backwall Protection System	Bridge Deck Grooving	Slope Protection (Riprap Stone)††	Substructure Waterproofing Membrane
	Cu.Yds.	Cu. Yds.	Cu. Yds.	Lbs.	Lbs.	Lbs.	Lbs.	Lin. Ft.	Lin.Ft.	Lin/ Ft.	Each	Each	Each	Lin. Ft.	Lin. Ft.	Each	Sq. Yds.	Sq. Yds.	Sq. Yds.	Cu. Yds.	Sq. Yds.
Abutment No. 1	219		80.0	13,733				634	80	47	5						53	96		966	59
Pier No. 1			54.0		10,004						5			265.3							
Pier No. 2			56.2		10,481							5		263.6	120						
Pier No. 3			56.0		10,481							5		268.4						364	
Pier No. 4			56.1		10,481							5		267.8	120					455	
Pier No. 5			54.1		10,004						5			265.4							
Abutment No. 2	219		80.0	13,733				634	80	47	5						53	96		1,016	59
Substr. Total	438		436.4	27,466	51,451			1,268	160					1,330.5	240	1	106	192		2,801	118
Superstr. Total		893.1		257,306		880,257	122,011			94	20	15	8,102						2,643		
Total	438	893.1	436.4	284,770	51,450	880,257	◔122,011	† 1,268	† 160	94	20	15	8,102	1,330.5	240	1	106	192	2,643	2,801	118

Note: Only HP12x74 steel piles shall be used

† Summary of Piling: Abutment No. 1 - 5 Pile @ 70', 4 Battered Pile @ 71' & 1 Test Pile (Special) @ 80'
Abutment No. 2 - 5 Pile @ 70', 4 Battered Pile @ 71' & 1 Test Pile (Special) @ 80'

†† Shall meet the requirements of 200 LB class.

◔ Quantity includes 10,284 lbs. of ASTM A1085 material to be paid for as A709.

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

GENERAL NOTES

BRIDGE EXCAVATION: Elevation 1499.5 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.

PILING: Drive all piling to penetrate or bear upon the Fairpoint Chalk formation. Driving shall stop when in the opinion of the Engineer additional driving may damage the piling. Drive all piling to the Pile Driving Formula Load of:

Abutment No. 1 96.3 Tons
Abutment No. 2 96.3 Tons

As a minimum drive each pile to the load and penetration, but in no case shall the pile be driven to ore 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 Analyze (PDA) equipment be used. For additional notes, see "Engineering Geology" sheet.

TEST PILE SPECIAL: Drive the test pile special at the locations directed by the Engineer/Geologist or as on the Plans. Use Pile Driver Analyzer (PDA) equipment and methods compliant with KDOT Specifications. The test piling shall remain in place as permanent piling. Drive the test pile special piling to the resistance value of the Strength I load divided by Phi shown on the plans.

Excavation to plan grade should be performed prior to PDA testing. At least 24 hours should be allowed for each test to account for possible restrikes.

Please Contact KDOT Geology in Topeka at (785)291-3861 when a schedule for the test pile has been established. A minimum of 5 working days notice is required.

SLOPE PROTECTION (Riprap Stone): Place Slope Protection (Riprap Stone) to the limits and thicknesses shown on the plans or as directed by the Engineer. Use (Light 200 LB) as described in Division 1100 placed to the limits shown on the plans.

Place a 10 foot wide mat of geotextile under the rock/rubble embankment on the berm and berm slopes and centered on the drip lines of the slab.

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

DRILLED SHAFT BACKFILL: Backfill the annular space between the temporary casing and the permanent casing with grout/flowable fill as defined in the KDOT Specifications.

CAUSEWAY: If the Contractor chooses to build a causeway for bridge construction purposes, the Contractor shall obtain any required U.S. Army Corps of Engineers Section 404 Permit, Kansas Department of Agriculture permit, Kansas Department of Health and Environment Section 401 Permit, Kansas Department of Wildlife Parks and Tourism Permit, or any other permit required by law for causeway construction. Obtain the permit in a timely manner so as not to delay the completion of the project.

DRILLED SHAFTS: Construct the drilled shafts using the cased method. A permanent casing is required. All excavation, concrete, reinforcing steel, pipes for Sonic Testing, casings, labor, and incidentals necessary to complete the shaft as shown on the details and as directed by KDOT Specifications shall be included in the bid item "Drilled Shafts (60")". Use Grade 4.0 Concrete in the drilled shaft. In no case shall the bottom of the drilled shaft be placed higher than the elevation shown unless otherwise directed by the KDOT Geologist.

Drill an Investigative Core Hole at the locations shown on the plans. See KDOT Specifications.

If the location of the top of the shaft is such that the casing cannot be overtopped to remove concrete impurities, provide extra casing length to over-pour the concrete in the shaft and chip back to the plan elevation of the top of the shaft.

If the permanent casing is to be corrugated metal pipe (CMP) then it will be galvanized.

A drilled shaft pre-construction meeting must be held prior to the start of shaft construction. This meeting should take place at least a day before construction begins and include representatives of the general contractor, drilling contractor, concrete supplier, KDOT Construction, and KDOT Geology.

Notify the Geology Section when shaft construction has been scheduled. A representative of the Section will be present during drilled shaft construction.

Drilled shaft excavations may encounter large limestone concretions within the Blue Hill Shale. Equipment must be on site during drilled shaft construction to penetrate or remove any such obstruction that is found within the bedrock. There will be no extra pay for removing concretions.

Concrete must be placed within the shaft on the same day drilling is completed.

SONIC TESTING: Equip all drilled shafts with piping to allow sonic testing to be done. Install pipes at locations shown on the plans. All wet pours will be tested. Also, the Engineer has the option to require sonic, non-destructive, integrity testing at any location of concern. Sonic testing shall be paid for at the unit price set for "Sonic Test" (Drilled Shaft) (Set Price). If the sonic testing indicates defective concrete in the shaft, the Engineer will measure the first sonic test for payment, and the Contractor is responsible for subsequent sonic testing of that shaft. Report test results directly to KDOT's Chief Geologist. No work will be done above the top of drilled shaft without the approval of the Chief Geologist.

PERMANENT CASING: See KDOT Specifications.

BACKFILL COMPACTION: Compact backfill at the abutments.

INVESTIGATIVE CORE HOLES: Investigative Core Holes shall be drilled as shown. Rock core from each hole shall be boxed and stored with the drilling logs on site until the completion of the project. Please contact the Salina Geology Office when a schedule for the borings is established.

BRIDGE DECK GROOVING: After the bridge deck has cured, transversely groove the deck in accordance with KDOT Specifications. For phased construction groove each completed phase before opening to traffic. Align the grooves from each adjacent phase across the bridge deck without jogs or discontinuities. For skewed bridges all grooving will be perpendicular to the centerline of the bridge.

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

DESIGN DATA

DESIGN SPECIFICATIONS:
AASHTO Specifications, 2020 Edition. Load and Resistance Factor Design.

DESIGN LOADING:
HL-93
Design Dead Load included allowance for 15 psf for future wearing surface.

LRFD DESIGN PILE LOAD:

Design Loading (Tons/Pile)	Strength I	Service I	Phi
Abutment No. 1	96.3	76.4	0.65
Abutment No. 2	96.3	76.4	0.65

UNIT STRESSES:

Concrete (Grade 4.0)	f'c = 4 ksi
Concrete (Grade 4.0)(AE)	f'c = 4 ksi
Concrete (Grade 4.0)(AE)(SW)	f'c = 4 ksi
Reinforcing Steel(Grade 60)	fy = 60 ksi
Structural Steel (A709 Gr. 50W)	Fy = 50 ksi
Structural Steel (M270 Gr. 50W T3)	Fy = 50 ksi
Steel Piling (Gr. 50)	Fy = 50 ksi

LRFD DESIGN DRILLED SHAFT LOAD: *

Design Loading (tons/shaft)	Strength I	Service I	Phi
All Piers	484.7	388.0	End Bearing 0.50 Side Friction 0.55

*Note: Drilled Shaft Load includes the self-weight of the shaft.

LFD & LRFR RATING FACTORS		
Truck \ Rating Level	Inventory	Operating
HS-20 (36T)	1.67	2.79
Type HET (110T)	X	1.12
2002 LFD Rating, 17th Edition AASHTO		
HL-93 Loading	1.07	1.39
2019 Manual for Bridge Evaluation		

TRAFFIC DATA	
AADT (2024)	1400
AADT (2044)	1650
DHV	10%
D	60/40
T	17.5%

INDEX TO BRIDGE DRAWINGS

Sheet No.	Drawing
89 - 90	General Notes and Quantities
91	Contour Map
92 - 93	Construction Layout
94 - 95	Engineering Geology
96 - 98	Abutment Details
99	Abutment Strip Drain
100	Drilled Shaft Details
101 - 102	Pier Details
103 - 105	Bearing Device Details
106 - 107	Framing Plan
108 - 116	Girder Details
117 - 118	Cross Frame Details
119 - 121	Sliding Exp. Device Details
122 - 125	Deck Details
126 - 128	Dead Load Deflection and Camber Diagrams & Top of Pavement Elevations
129 - 131	32" Kansas Corral Rail Details
132 - 133	Bill of Reinf. and Bending Diagrams
	Standards
134	Bridge Berm and Slope Protection U-Type Abutment
135	Bridge Excavation (LRFD)
136	Standard Pile Details
137	Supports and Spacers for Reinf. Steel

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-071-198.72 (055) Sta. 186+90.75

GENERAL NOTES AND QUANTITIES (1 OF 2)
US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

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

KDOT Graphics Certified 10-30-2023

Sheet No. 89

KDOT Graphics Certified

Plotted By: KKATHRIN Plot Location:
File: c:\pwworking\central01\d2597941\ka602001bbr0055-GN1.dgn
Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	90	293

COLUMN CONSTRUCTION: Cure the drilled shaft footing as required by the KDOT Specifications before beginning the column construction (placing resteel or formwork). Do not place cast in place shear bolts, coil inserts or other devices used as falsework support in the column without the approval of the Engineer. Do not remove the column formwork without the approval of the Engineer. Curing shall continue after the formwork is removed as required by the KDOT Specifications.

PIER BEAM CONSTRUCTION: Cure the columns as required by the KDOT Specifications before beginning the pier beam construction (placing resteel or formwork). Do not drill and grout bolts or other devices into the columns used for falsework support unless shown on the plans. Cure the columns as required by the KDOT Specifications before placing pier beam concrete. Do not remove falsework used to support the pier beam until the pier beam concrete has cured as required by the KDOT Specifications. Do not set girders or beams on the pier beam until after the falsework is removed or the pier beam concrete has 0.75f'c strength as tested.

ERECTION ELEVATION CHECKS: After the abutment and pier concrete has cured and before setting any structural steel, present verification to the Engineer that the elevations at the bearings match plan elevation (±1/4"). Present verification to the Engineer that the elevations at all field splice locations match the elevations (±1/2") in the plans before any connection is fully tightened. (For steel girders that are blocked on the ground, fully tighten the bolted connections prior to erection.

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

BRIDGE BACKWALL PROTECTION SYSTEM: See the General Notes on the "Abutment Strip Drain" sheet.

ABUTMENT STRIP DRAIN: See the General Notes on the "Abutment Strip Drain" sheet.

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 State. "Category 2" falsework inspection is not paid for directly, but is subsidiary to other bid items.

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

STRUCTURAL STEEL: Girder flange plates and flange splice plates shall meet AASHTO M270 Gr. 50W T3 requirements. Girder web plates and web splice plates shall meet AASHTO M270 Gr. 50W T3 requirements. All other structural steel shall meet ASTM A709 Gr. 50W, unless noted otherwise. Shop and Field Splices shall be made only where shown on the Contract Plans as a "splice" or as an "optional splice." Elimination of any "splice" may be requested.

SHOP DETAILS: Reference blocking diagrams on the shop details to a level line running the entire length of the girder.

FABRICATION OF FIELD SPLICES: Prepare joints for the field splices in accordance with KDOT Specifications. Use Type "B" shop laydown.

FABRICATION OF WELDED SPLICES: See Figure 6.4.1-1 "Flange and Web Welded Splice Configurations" of the Bridge Design Manual. All flange splices shall be full penetration welds.

WELDING: Material, Fabrication and Construction shall conform to KDOT Specifications. On the shop drawings, show a code or symbol in the tail of the weld symbol that refers to an approved, pre-qualified weld procedure.

WELDED STUD SHEAR CONNECTORS: Weld Shear Stud Connectors with automatically timed stud welding equipment connected to a suitable power source. All stud welding shall conform to KDOT Specifications. For bridges with skewed reinforcing steel the contractor has the option to place the Welded Shear Stud Connectors parallel to the skew angle.

BOLTS: All bolts, nuts and hardened flat washers shall conform to the heavy hex structural requirements of ASTM F3125 Grade A325, Type 3, and KDOT Specifications unless otherwise noted. Direct Tension Indicators (DTIs) are to comply with the requirements of the latest edition of ASTM F959. No allowance will be made for high strength bolts used for permanent or temporary connections. This work is subsidiary to the bid item, "Structural Steel". The number of bolts is shown for the convenience of the Contractor.

BOLTED CONNECTIONS: Girder Connections: Use 7/8" diameter heavy hex structural bolts for the main member connections. Use 15/16" diameter bolt holes. Do not ream during field erection. Accurately align all connections by driving 15/16" diameter drift pins in all corners and in 1/4 of the remaining holes in each plate. See KDOT Specifications.

Secondary Member Connections: Use 7/8" diameter heavy hex structural bolts for the secondary member connections. Use 15/16" diameter bolt holes. Oversized or slotted holes, as specified in the KDOT Specifications, may be used in only one of the two members connected and must be shown in the approved shop drawings. Oversized or slotted holes may require additional standard hardened washers or plate washers. Report to the Engineer prior to any required field reaming that will remove more than 1/4" of material from one ply of the connected parts.

Use Direct Tension Indicators (DTIs) on all high strength bolts. Place the DTI under the bolt head and turn the nut to tighten. This method is preferred whenever possible. Face the protrusions on the DTI to the underside of the bolt head. Place a hardened flat washer under the nut. See KDOT Specifications.

FILLETS: Camber the steel girders for the total dead load deflection and the vertical curvature, if necessary. The ordinates shown for concrete dead load deflection represent the amount of camber that should be in the girders after they are erected and bolted but prior to placing the floor forms. After the structural steel is completely erected and the falsework bents are removed, measure the camber in the field by taking a profile of each girder. Correct any variation between the actual camber and the concrete dead load deflection shown in the plans by varying the depth of the concrete fillets over the girders so that the finished floor is constructed to the theoretical grade. The minimum depth of the slab over the girder shall be 8 1/2".

The theoretical amount of concrete required for the fillets is 22.3 Cu. Yds. This amount of concrete is included in the Summary of Quantities. Any additional concrete required to construct the fillets will be subsidiary.

ERECTION: Bring each line of girders to the correct line, grade (or relative grade) and camber, and secure in place prior to connection of the girder field splices. Provide falsework bents as necessary to maintain the correct line and elevation. Leave the falsework bents in place until all girder splice connections are completed. Submit information which clearly shows the proposed layout and use of falsework bents. The Engineer shall approve such information prior to erection of structural steel. Unless noted otherwise, erect and fully connect all structural steel in the unit including cross-frames, diaphragms and expansion devices prior to construction of the backwall and wingwall above the construction joint.

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

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

ERECTION PLANS: This is a Category B Structure. Submit detailed Erection Plans to the State Bridge Office (or Bureau of Local Projects) at least 4 weeks before beginning the erection process. Portions of the submitted details shall bear the seal of a licensed Professional Engineer. Identify, on the Erection Plans, the Erection Supervisor required by KDOT Specifications. No structural erection work will begin without approved erection plans.

PAINTING: The shop and field coats applied to Structural Steel shall conform to an inorganic zinc primer with a waterborne acrylic finish coat. The finish coat will be Kansas (Brown), this color will match Federal Standard 20045.

PAINTING: Blast clean all surfaces of all weathering steel, including all contact surfaces of bolted connections, to meet SSPC-SP6 Specifications (latest Revision). Blast clean to meet SSPC-SP10 Specifications and prime coat the embedded portion of the girders, including the abutment diaphragms; the top flanges, including the shear studs; and the top flange splice plates. Paint the areas of the girders near the expansion joint and the exterior surfaces of the exterior girders in accordance with KDOT Specifications.

TOUCH-UP: Prepare and paint all bolts, nuts, studs, and other small areas of damaged paint (1 square yard or less) requiring touch-up, with an approved organic zinc primer.

PAINTING TOP FLANGES: (Studs applied in the shop) Apply a 3 mil primer coat of an approved inorganic zinc primer to the tops of the top flanges and to the studs.

(Studs applied in the field) Shop Work - Blast clean the tops of the top flanges to SSPC-SP10 Specifications (latest Revision).

Field Work - Blast clean the tops of the top flanges to SSPC-SP6 Specifications (latest Revision) before the studs are applied. After the studs are applied, blast clean the tops of the top flanges and the studs to SSPC-SP6 Specifications and paint with an approved organic zinc primer to a minimum dry film thickness of 3 mils.

BEARING: See "PTFE Bearing Device Details" and "Fixed Bearing Device Details" sheets for general notes.

ANCHOR BOLTS: See "PTFE Bearing Device Details" and "Fixed Bearing Device Details" sheets for general notes.

CONCRETE: Superstructure concrete is bid as Concrete (Grade 4.0)(AE)(SW). Substructure concrete is bid as Concrete (Grade 4.0)(AE). If desired, the Contractor may use Concrete (Grade 4.0) in the footings and in the abutments below the construction joint. Bevel all exposed edges of all concrete with a 3/4" triangular molding, except where noted on the plans. Construction joints are optional, 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)". Where non-coated bars come in contact with epoxy coated bars, they need not be coated.

DEMOLITION PLANS: This is a Category C Demolition. Submit detailed Demolition Plans to the State Bridge Office (or Bureau of Local Projects) at least 4 weeks before beginning the demolition process. Portions of the submitted details shall bear the seal of a Licensed Professional Engineer. Identify, on the plans, the Demolition Supervisor meeting the requirements of the KDOT Specifications. The Demolition Supervisor will attend the required pre-demolition meeting before these operations begin, as described in KDOT Specifications. No demolition work will begin without approved Demolition Plans.

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.

GAGING STATION: Provide the United States Geological Survey (U.S.G.S.) with the labor and equipment necessary to access, remove, attach, support or anchor any new or existing stream gaging hardware to the bridge. Contact the U.S.G.S. office located in Lawrence, Kansas to coordinate this work. The labor and equipment required to perform this work will be considered subsidiary to the bid item "Grade 4.0 Concrete (AE)".

ASBESTOS INFORMATION: Samples of this structure were tested to determine the amount of Asbestos Containing Materials (ACM) present in the components. The results are listed below:

Concrete: 0%
Bituminous Wearing Surface: 0%

Date of Report: 12/28/2021

For any result above greater than 1%, abatement shall be performed according to KDOT Specifications. Results less than 1% require no abatement.

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)(SW)". Approval of the Contractor's alternate sequence is required prior to placement of concrete in the deck.

PLACING SEQUENCE: The Contractor will adhere to the placing direction/sequence shown on the plans. Changes will be accepted only if the Contractors Engineer adjusts the camber diagram so the fabricator can adjust the web camber and headed stud anchor heights accordingly. This revised diagram will be approved by the design Engineer prior to deck forming. If profile grinding decreases the clearance to the top mat of reinforcement to less than 2 1/2" a polymer overlay will be placed at no cost to the State.

CONCRETE PLACING: At the Contractor's option, the finishing machine may be set normal to the centerline of the structure; however, the concrete must be placed along the skew. This requires placing concrete ahead of the finishing machine; consequently, a set retarder may be advisable. Note both requirements on any alternate placing sequence.

EXISTING STRUCTURE: Plans of the existing structure are on file and available for inspection by qualified bidders at the State Bridge Office, KDOT, Eisenhower State Office Building, 700 SW Harrison, Topeka, KS.

PAINT SYSTEM ON EXISTING STRUCTURE: The structural steel has a paint history of:
1) Original paint system: Unknown, Date: 1986
2) Repaint system: Moist Cure Ureth/MCUS, Date: 2002
3) TCLP value is ND, Report Date: 04 Jan 2022

REMOVAL OF EXISTING STRUCTURES: 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.

BROKEN CONCRETE: Waste the broken concrete from the existing bridge on sites provided by the Contractor and approved by the Engineer.

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

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-071-198.72 (055) Sta. 186+90.75

GENERAL NOTES AND QUANTITIES (2 OF 2)
US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

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

KDOT Graphics Certified 07-11-2024

Sheet No. 90

KDOT Graphics Certified

Plotted By: KKATHRIN | Plot Location:
File: c:\pwworking\central01\d2597941\tx602001bbr0055-0N2.dgn
Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	91	293

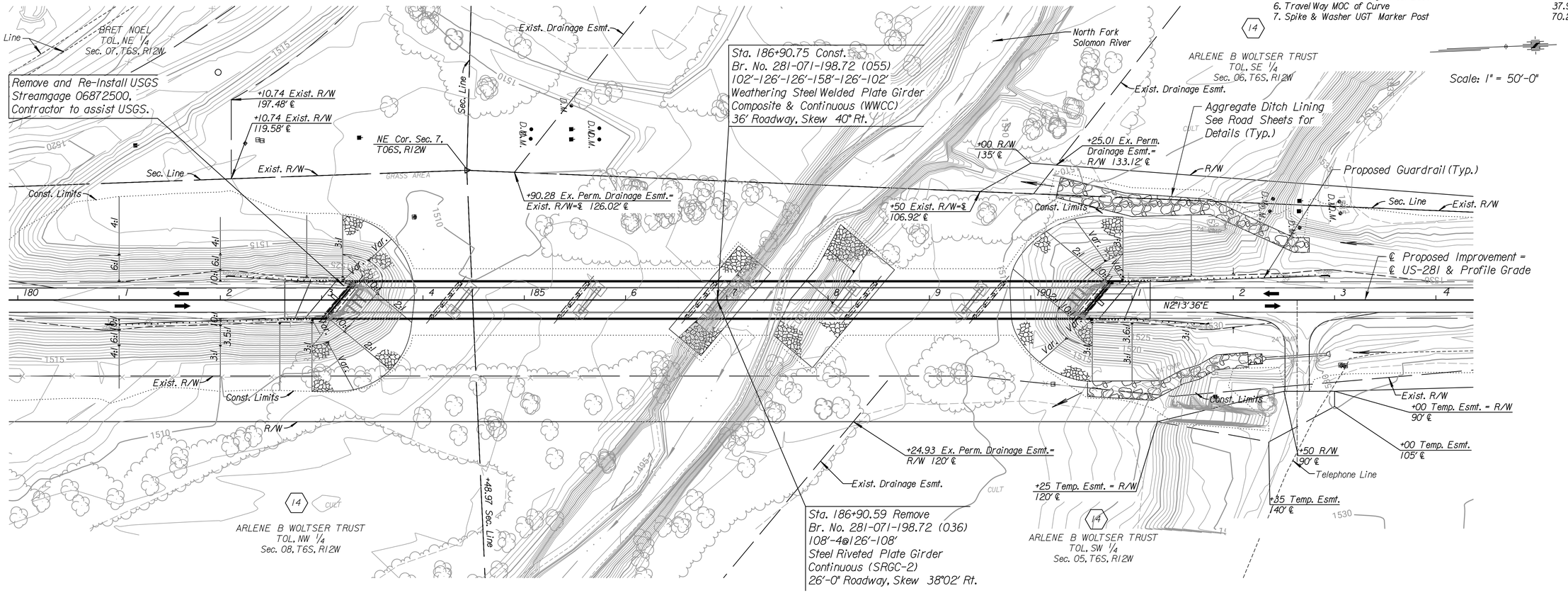
US-281 ALIGNMENT

P.O.T. ℄ Sta. 170+40.80		P.O.T. ℄ Sta. 191+00.00	
N 746,522.104 E 5,492,748.078		N 748,579.749 E 5,492,828.088	
1. 5/8" Rebar Set	(0.3' Deep)	1. Set 5/8" Rebar	(0.3' Deep)
2. 2" x 2" Street Sign @ Base	48.75' NW	2. Spike & Washer Top Fence Post	18.58' E
3. Spike & Washer in Sign Post	42.81' SW	3. Spike & Washer Top Fence End Post	31.82' NE
4. 5/8" Capped CFS Control (125)	53.67' SSW	4. Spike & Washer Top Fence End Post	59.61' NW
5. Spike & Washer in Sign Post	53.11' SSE	5. Std Tablet Gaging Sta.	50.51' SSE

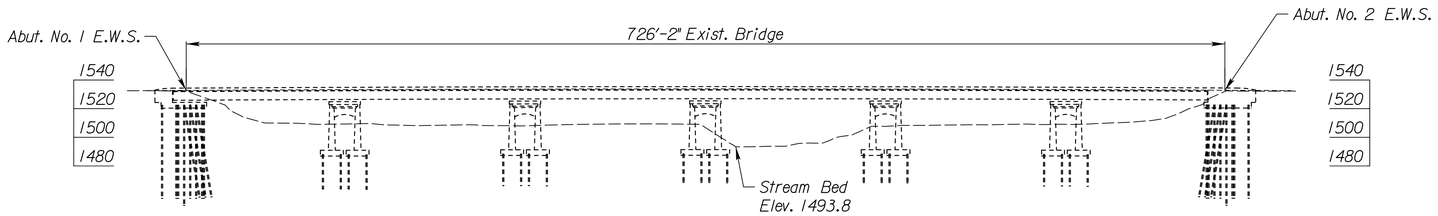
N 1/4 Cor. Sec. 7, T06S, R12W N 748,104.528 E 5,489,966.559	
1. Found 1/2" Rebar W/Alum. Cap over 2 1/2" Pipe BLM Monument	(0.5' Deep)
2. Travel Way Road E-W Gravel Road	2.0' S
3. Travel Way Field Entrance N	14.7' E
4. Mag Nail & Washer in West End 24" CMP	29.08' SSE
5. Mag Nail & Washer in East End 24"CMP	39.29' NE
6. Southeast Corner E Leg Irrigation Stop	44.95' NW
7. Travel Way Field Entrance to S	24.5' E
8. Spike & Washer in UGT Marker Post	92.68' ESE

NE Cor. Sec. 7, T06S, R12W N 747,928.488 E 5,492,674.691	
1. Found 2 1/2" Pipe BLM Monument	(At Grade)
2. 128.10' W of ℄ Sta. 184+48.97, SW Angle = 87°26'01" ℄ to ℄	
3. Spike and Washer W 'H' Pole	108.13' NNW
4. Spike and Washer S face 3-120" Cottonwood	81.74' W
5. Spike and Washer E face Power Pole	110.15'SSW
6. Spike and Washer UGT Marker Post	68.78' SE
7. W Face Column Bridge	115.35' E
8. 1/2" Lag Bolt in SE Face 40" Tree	94.55' NNE

N 1/4 Cor. Sec. 8, T06S, R12W N 747,944.362 E 5,495,350.870	
1. Found 2 1/2" Pipe BLM Monument	(0.3' Deep)
2. 2548.08' E of ℄ Sta. 184+48.97, NE Angle = 87°26'01" ℄ to ℄	
3. Travel Way N-S	17.6' E
4. Travel Way Road to E Extended	14.8' S
5. 1 3/4" x 1-3/4" in Sign Post Base	51.84' SE
6. Travel Way MOC of Curve	37.9' NE
7. Spike & Washer UGT Marker Post	70.25' NE



PLAN



EXISTING BRIDGE WATERWAY OPENING

(Looking Upstream)
Total Waterway Opening = 9,696 S.F.
Historic High Water Elev. 1517.0 (2008)
Top of Opening = Elev. 1526.2

Historic High Water was determined by using the USGS Gaging Station data between years 1955 and 2020, with Kirwin Reservoir operational.

HISTORIC HIGHWATER

There is no history of US-281 overtopping at this location.

Elevations shown are to NAVD 88 (Geoid 12A) Vertical Datum

Utility Owners

Telephone:
Nextech
145 N Main
Lenora, KS 67645
Phone - 785-567-4281

Overhead Power:
Prairie Land Electric Coop
223 W 5th St
Concordia, KS 66901
Phone - 785-243-1750

Plotted By: KKATHRIN | Plot Location:
File: c:\pwworking\central01\d2597941\ka602001\bbr0055-CM.dgn
Plot Date: 07-11-24

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 281-071-198.72 (055) Sta. 186+90.75

CONTOUR MAP
US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

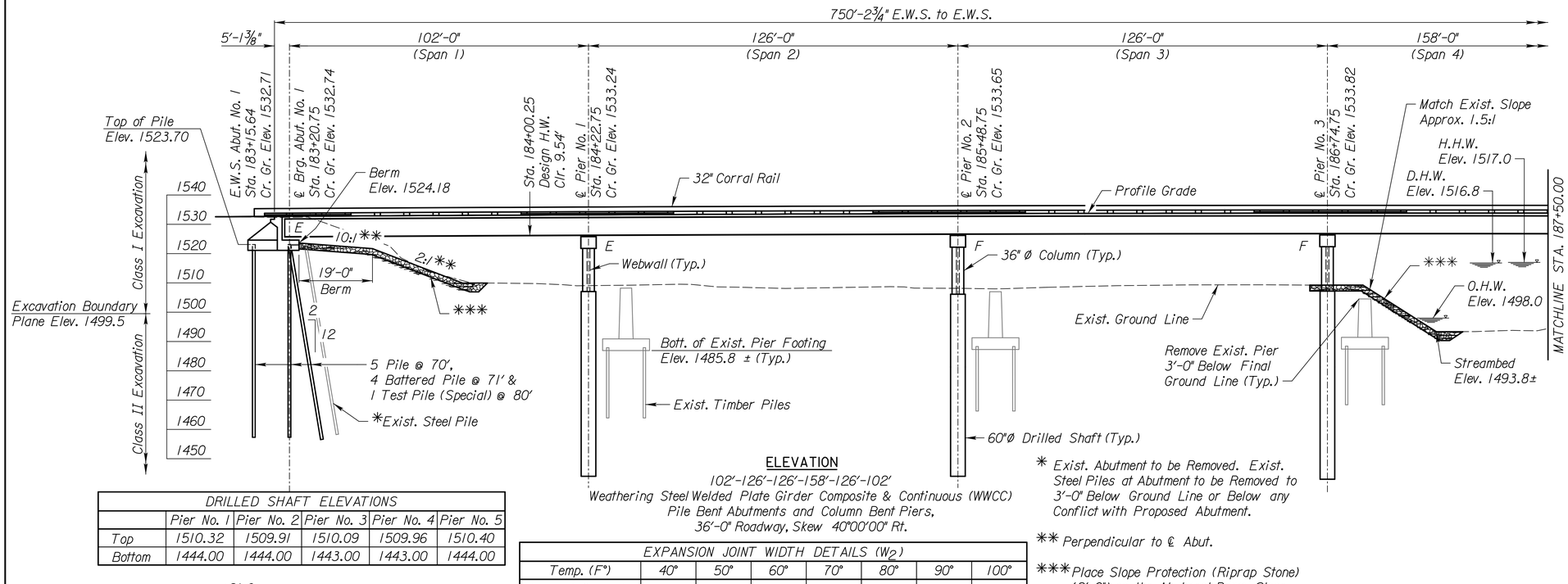
SHEET NO.	OF	SCALE		APP'D			
DESIGNED	MMD	DETAILED	MMD	QUANTITIES		CADD	KBK
DESIGN CK.	KVG	DETAIL CK.	KVG	QUAN. CK.		CADD CK.	KVG

KDOT Graphics Certified 02-01-2023

Sheet No. 91

KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	92	293



ELEVATION

102'-126'-126'-158'-126'-102'
Weathering Steel Welded Plate Girder Composite & Continuous (WWCC) Pile Bent Abutments and Column Bent Piers, 36'-0" Roadway, Skew 40°00'00" Rt.

DRILLED SHAFT ELEVATIONS					
	Pier No. 1	Pier No. 2	Pier No. 3	Pier No. 4	Pier No. 5
Top	1510.32	1509.91	1510.09	1509.96	1510.40
Bottom	1444.00	1444.00	1443.00	1443.00	1444.00

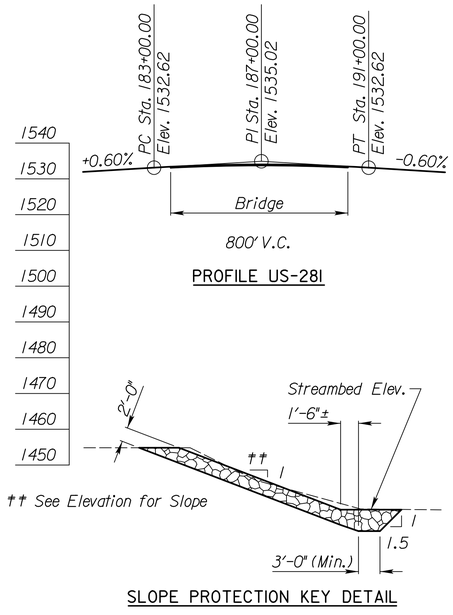
EXPANSION JOINT WIDTH DETAILS (W_2)							
Temp. (F°)	40°	50°	60°	70°	80°	90°	100°
Formed Concrete Opening Size	3"	3"	3"	3"	3"	3"	3"

Average Ambient Temperature over previous 24 hours.

* Exist. Abutment to be Removed. Exist. Steel Piles at Abutment to be Removed to 3'-0" Below Ground Line or Below any Conflict with Proposed Abutment.

** Perpendicular to ℄ Abut.

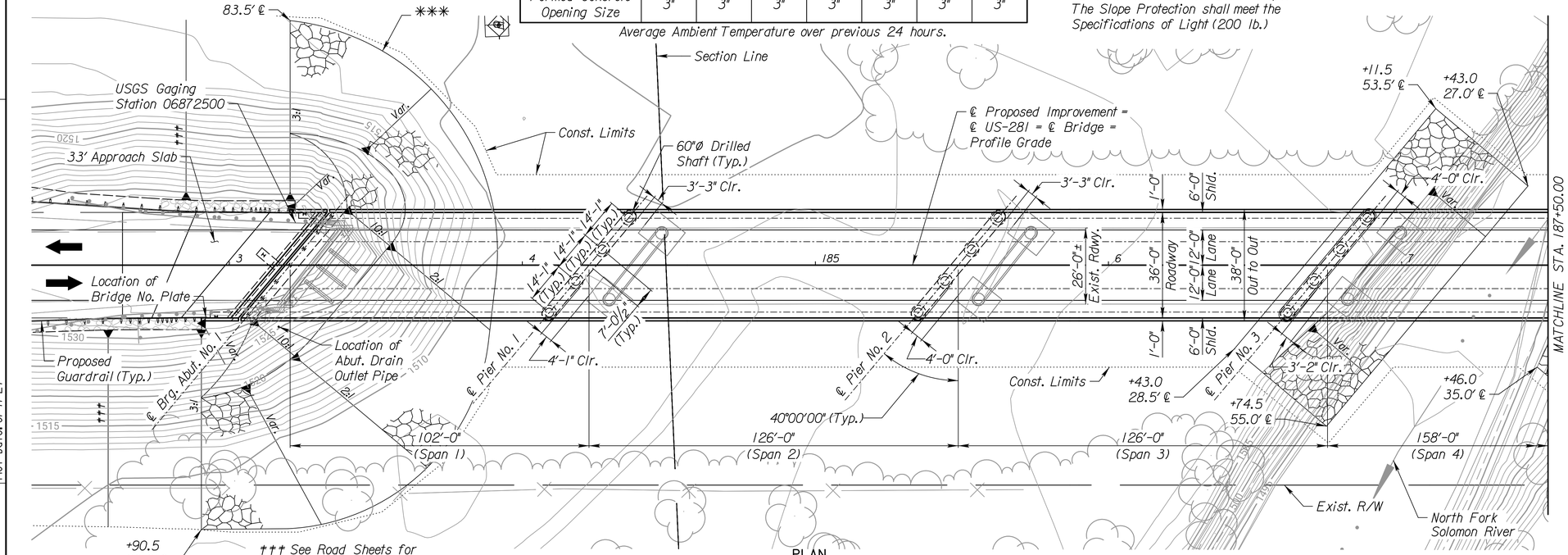
*** Place Slope Protection (Riprap Stone) (2'-0") on the Abutment Berm Slope. The Slope Protection shall meet the Specifications of Light (200 lb.)



PROFILE US-281

†† See Elevation for Slope

SLOPE PROTECTION KEY DETAIL



††† See Road Sheets for Transition to Normal Section

PLAN

Scale: 1" = 20'-0"

DRAINAGE DATA

Drainage Area	2,315	Sq. Mi.
Design Frequency	50	Years
Design Discharge (050)	20,740	cfs
Design High Water Elevation	1516.81	
Change in Design Backwater	0.00	Ft.
Design Backwater Elevation	1517.14	
Overtopping Elevation (Sta. 163+50)	1524.67	
Overtopping Discharge	64,750	cfs
Overtopping Frequency	>500	Years
Discharge at Q100	26,690	cfs
Change in Backwater at Q100	0.01	Ft.
Backwater Elevation at Q100	1518.22	
Historic High Water Elevation	1517.0	
Ordinary High Water Elevation	1498.0	
Total Waterway Provided	10,139	Sq. Ft.
Design Waterway Provided	4,590	Sq. Ft.
Estimated Ordinary High Water Discharge	452	cfs
Change in Waterway Opening	48	Sq. Ft.

Elevations Shown are to NAVD 88 Vertical Datum

BM24 - 'T' post driven flush with surface +/- 1' W. of Barb wire fence 71.85' Rt. ℄ US-281 Sta. 172+18.82 Elev. 1513.98

BM25 - 'O' cut Top S. End SW Conc. Hubguard BR #036 17.79' Lt. ℄ US-281 Sta. 183+27.55 Elev. 1533.23

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 281-071-198.72 (055) Sta. 186+90.75

CONSTRUCTION LAYOUT (1 OF 2)
US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

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

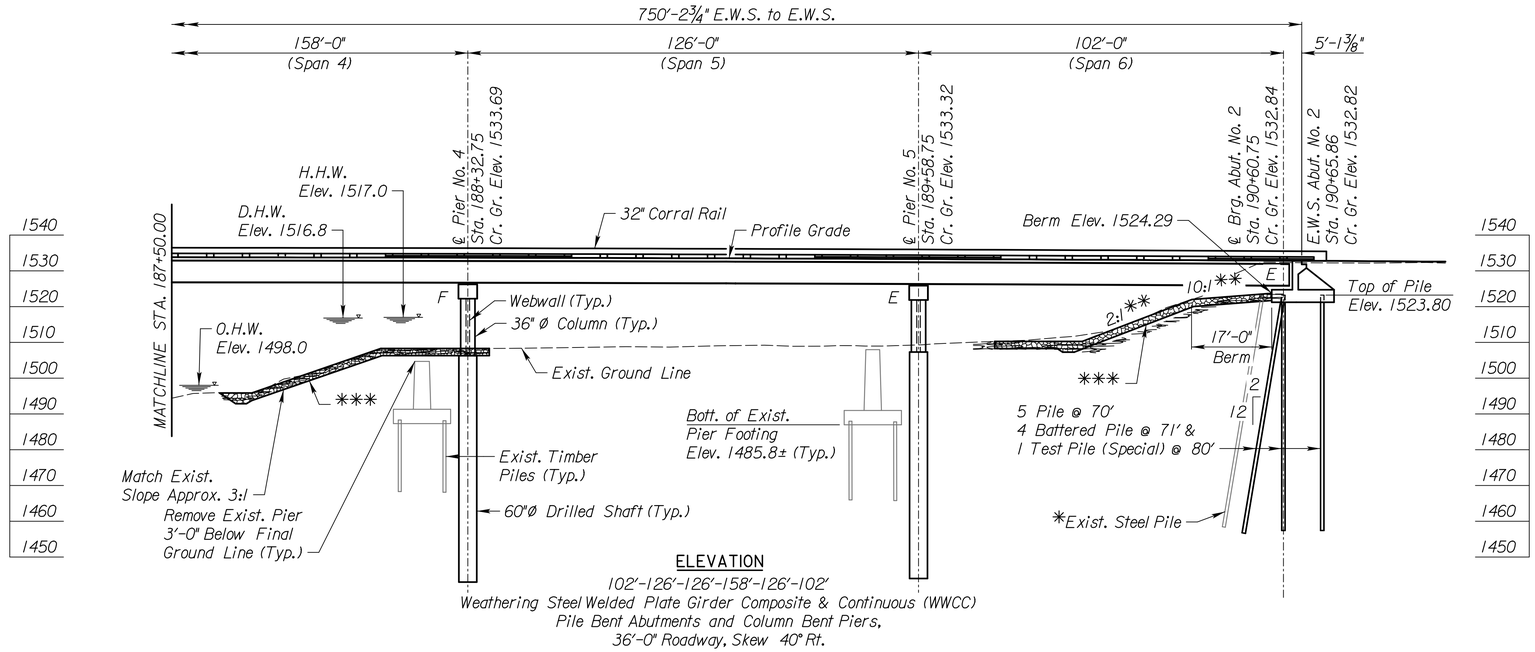
KDOT Graphics Certified 04-18-2023

Sheet No. 92

KDOT Graphics Certified

Plotted By: KKATHRIN
File: c:\pwworking\central01\d2597941\kd602001\bbr0055-CLI.dgn
Plot Date: 07-11-24
Plot Location:

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	93	293



ELEVATION

102'-126'-126'-158'-126'-102' Weathering Steel Welded Plate Girder Composite & Continuous (WWCC) Pile Bent Abutments and Column Bent Piers, 36'-0" Roadway, Skew 40° Rt.

EXPANSION JOINT WIDTH DETAILS (W_2)							
Temp. (F°)	40°	50°	60°	70°	80°	90°	100°
Formed Concrete Opening Size	3"	3"	3"	3"	3"	3"	3"

Average Ambient Temperature over previous 24 hours.

DRILLED SHAFT ELEVATIONS					
	Pier No. 1	Pier No. 2	Pier No. 3	Pier No. 4	Pier No. 5
Top	1510.32	1509.91	1510.09	1509.96	1510.40
Bottom	1444.00	1444.00	1443.00	1443.00	1444.00

Class I Excavation

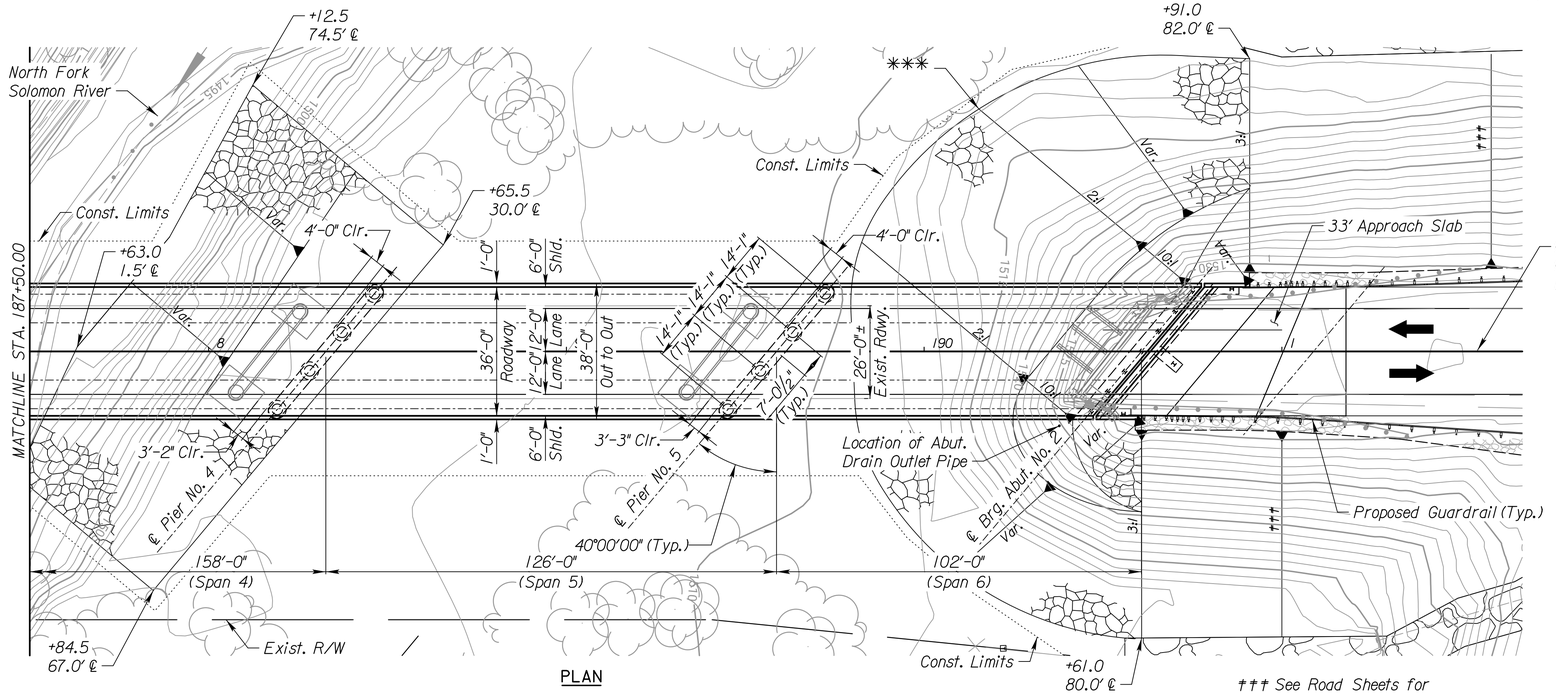
Excavation Boundary Plane Elev. 1499.5

Class II Excavation

* Exist. Abutment to be Removed. Exist. Steel Piles at Abutment to be Removed to 3'-0" Below Ground Line or Below any Conflict with Proposed Abutment.

** Perpendicular to ℄ Abut.

*** Place Slope Protection (Riprap Stone) (2'-0") on the Abutment Berm Slope. The Slope Protection shall meet the Specifications of Light (200 lb.)



PLAN

Scale: 1" = 20'-0"

BM26 - Top 3.5" Brass Disk (USGS) near N. End NE Conc. Hubguard 17.19' Rt. ℄ US-281 Sta. 190+52.54 Elev. 1533.33

Elevations Shown are to the NAVD 88 Vertical Datum

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 281-071-198.72 (055) Sta. 186+90.75

CONSTRUCTION LAYOUT (2 OF 2)
US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

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

KDOT Graphics Certified 04-18-2023

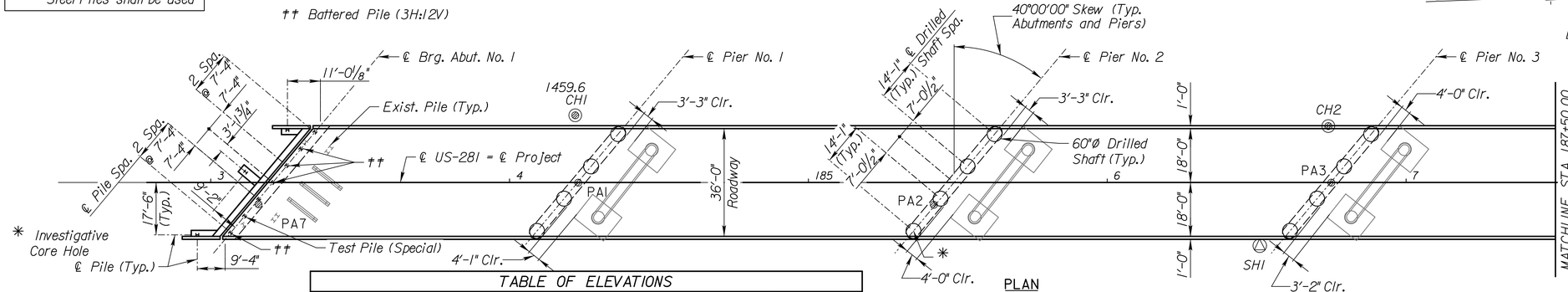
Sheet No. 93

KDOT Graphics Certified

Plotted By: KKATHRIN
Plot Location:
File: c:\pwworking\central01\d2597941\ka602001\bbr0055-CL2.dgn
Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	94	293

Note: Only HP12x74 Gr. 50 Steel Piles shall be used



PLAN

TABLE OF ELEVATIONS

	Top of Shaft Elevation	Bottom of Temporary Casing Elevation	Bottom of Shaft Elevation	Length of Shaft
Pier No. 1	1510.32	1464.40	1444.00	66.32′
Pier No. 2	1509.91	1464.90	1444.00	65.91′
Pier No. 3	1510.09	1464.80	1443.00	67.09′
Pier No. 4	1509.96	1465.10	1443.00	66.96′
Pier No. 5	1510.40	1464.90	1444.00	66.40′

INVESTIGATIVE CORE HOLES: Investigative Core Holes shall be drilled as shown. Rock core from each hole shall be boxed and stored with the drilling logs on site until the completion of the project. Please contact the Salina Geology Office when a schedule for the borings is established.

PILING: Once resistance is achieved, driving must cease to avoid damage to the pile. Final pile tip elevations shall be determined in the field using resistance calculations.

Do not drive pile below plan tip elevation without utilizing restrike procedures as outlined in the Standard Specifications, or as directed by KDOT Geology.

DRILLED SHAFTS: A Drilled Shaft Preconstruction Meeting must be held prior to the start of shaft construction. This meeting should take place at least a day before construction begins and include representatives of the general contractor, drilling contractor, concrete supplier, KDOT Construction, and KDOT Geology.

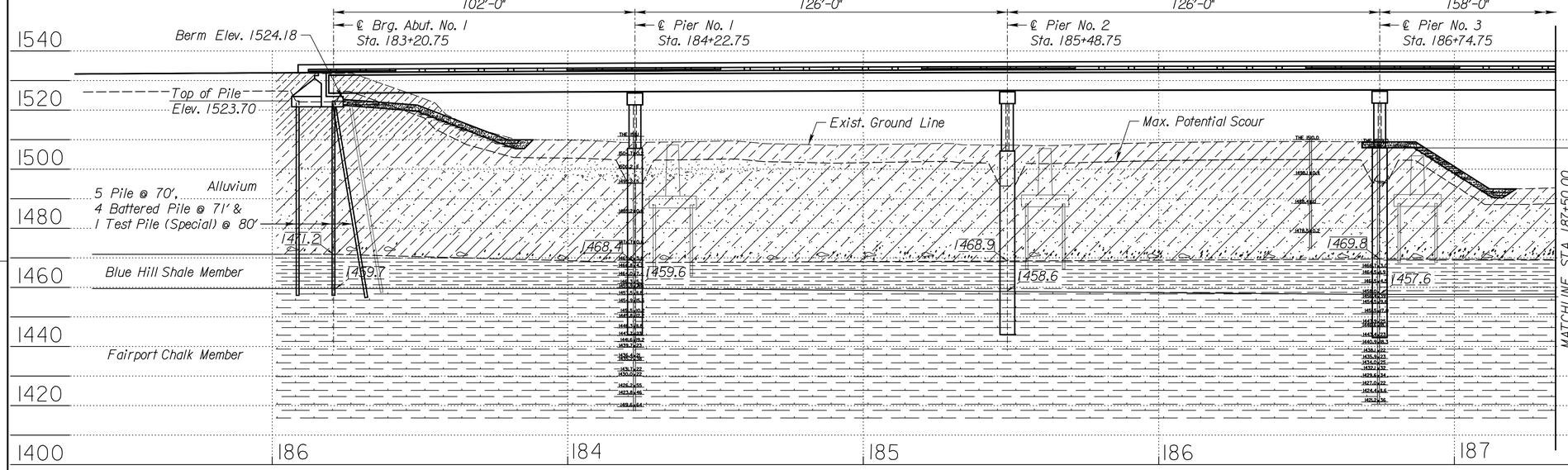
Notify the Geology Section when shaft construction has been scheduled. A representative of the Section will be present during drilled shaft construction.

Drilled shaft excavations may encounter large limestone concretions within the Blue Hill Shale. Equipment must be on site during drilled shaft construction to penetrate or remove any such obstruction that is found within the bedrock. There will be no extra pay for removing concretions.

Concrete must be placed within the shaft on the same day the drilling is completed.

TEST PILE (SPECIAL): Excavation to plan grade should be performed prior to PDA testing. At least 24 hours should be allowed for each test to account for possible restrikes.

Please contact KDOT Geology in Topeka at (785)291-3861 when a schedule for pile driving has been established. A minimum of 5 working days is necessary to allow for proper scheduling.



STANDARD GEOLOGIC SYMBOLS

Clay or Underclay
Caliche
Weathered Shale
Limestone
Mortarbed
Silty Clay
Silty or Clayey Shale
Sandstone
Cherty Limestone
Coal
Silt
Limy Shale
Shaly Sandstone
Shaly Limestone
Siltstone
Sand
Black or Fissile Shale
Gypsum bed
Sandy Limestone
Chalk
Gravel
Sandy Shale
Dolomite
Bentonite
Wavy limestone
Boulders
Gypsiferous Shale
Cross-bedded Sandstone
Loess
Chalky limestone

GEOLOGIC PROFILE

SOUNDINGS
Core drill
Power auger
Hand tools
Cone (CPT) penetrometer
Shelby tube
Water level 1495.0 4/2020

000.0 Elevation interpolated or from adjacent soundings
000.0 Actual sounding elevation

Elevation / Tons/sq. ft.
000.0 00
000.0 00
UNCONFINED COMPRESSION TEST

Elevation / Blows/ft.
000.0 00
000.0 00
STANDARD PENETRATION TEST

Graphic representation of Cone Penetration Test in N60
0 100 200 300 400
CONE (CPT) PENETROMETER TEST
Scale: N60

NOTE: Soundings shown on these plans are taken from notes obtained in the field and represent the best information available. Logs of these soundings are provided with the bid documents, or are available from the Kansas Department of Transportation in Topeka for inspection by interested and qualified bidders.

SCALE: 1"= 20′ Horiz. 1"= 20′ Vert.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 281-071-198.72 (055) Sta. 186+90.75

ENGINEERING GEOLOGY (1 of 2)

US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

SHEET NO.	OF	SCALE		APP'D	
DESIGNED	MMD	DETAILED	MMD	GEOLOGY DRAWN BY:	Geist
DESIGN CK.	KVG	DETAIL CK.	KVG	GEOLOGY LOCATION:	Salina

KDOT Graphics Certified 12-01-2023

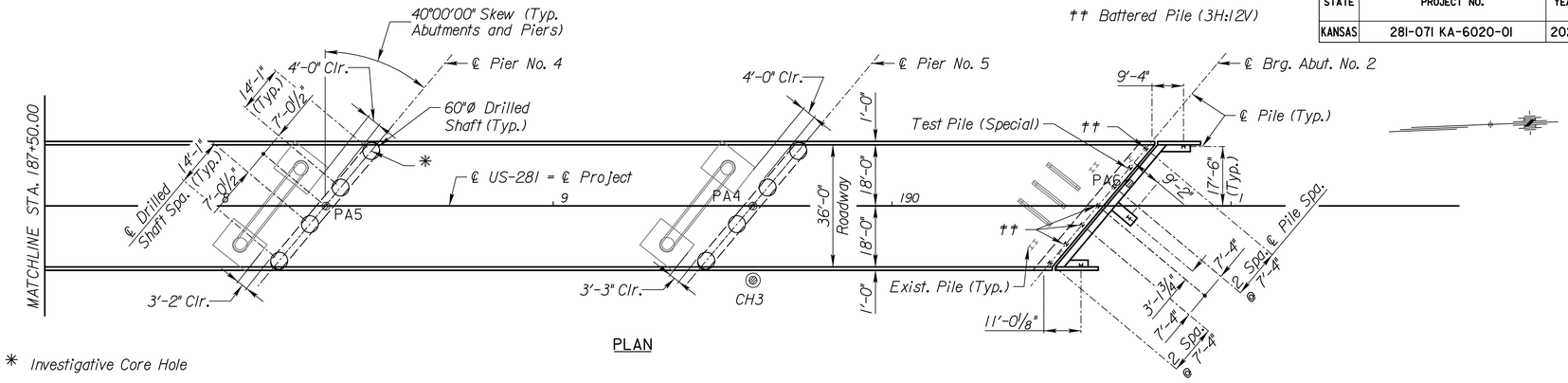
Sheet No. 94

KDOT Graphics Certified

Plotted By: KKATHRIN Plot Location:
File: c:\pwworking\central01\d2597941\ka602001\bbr0055-EG1.dgn
Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	95	293

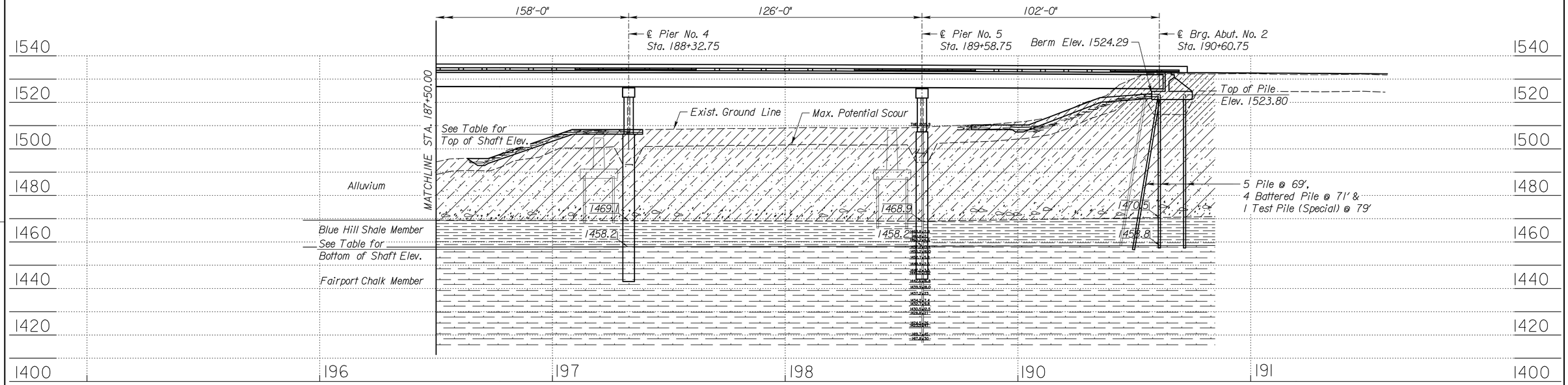
Note: Only HP12x74 Gr. 50 Steel Piles shall be used



PLAN

✳ Investigative Core Hole

Note:
For Drilled Shafts Notes, Piling, Test Pile Special Notes and Table of Elevations, See "Engineering Geology (1 of 2)" sheet.



STANDARD GEOLOGIC SYMBOLS

- Clay or Underclay
- Caliche
- Weathered Shale
- Limestone
- Mortarbed
- Silty Clay
- Silty or Clayey Shale
- Sandstone
- Cherty Limestone
- Coal
- Silt
- Limy Shale
- Shaly Sandstone
- Shaly Limestone
- Siltstone
- Sand
- Black or Fissile Shale
- Gypsum bed
- Sandy Limestone
- Chalk
- Gravel
- Sandy Shale
- Dolomite
- Bentonite
- Wavy limestone
- Boulders
- Gypsiferous Shale
- Cross-bedded Sandstone
- Loess
- Chalky limestone

SOUNDINGS

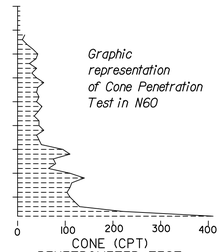
- Core drill
- Power auger
- Hand tools
- Cone (CPT) penetrometer
- Shelby tube
- Water level 1495.0 4/2020

GEOLOGIC PROFILE

- 000.0 Elevation interpolated or from adjacent soundings
- 000.0 Actual sounding elevation

UNCONFINED COMPRESSION TEST (Elevation, Tons/sq. ft.; 000.0 00 / 000.0 00)

STANDARD PENETRATION TEST (Elevation, Blows/ft.; 000.0 00 / 000.0 00)



CONE (CPT) PENETROMETER TEST
Scale: N60

NOTE: Soundings shown on these plans are taken from notes obtained in the field and represent the best information available. Logs of these soundings are provided with the bid documents, or are available from the Kansas Department of Transportation in Topeka for inspection by interested and qualified bidders.

SCALE: 1"= 20' Horiz. 1"=20' Vert.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-071-198.72 (055) Sta. 186+90.75
ENGINEERING GEOLOGY (2 of 2)
US-281 OVER NORTH FORK SOLOMON RIVER
Proj. No. 281-071 KA-6020-01 Osborne Co.

SHEET NO.	OF	SCALE		APP'D	
DESIGNED	MMD	DETAILED	MMD	GEOLOGY DRAWN BY:	Geist
DESIGN CK.	KVG	DETAIL CK.	KVG	GEOLOGY LOCATION:	Salina

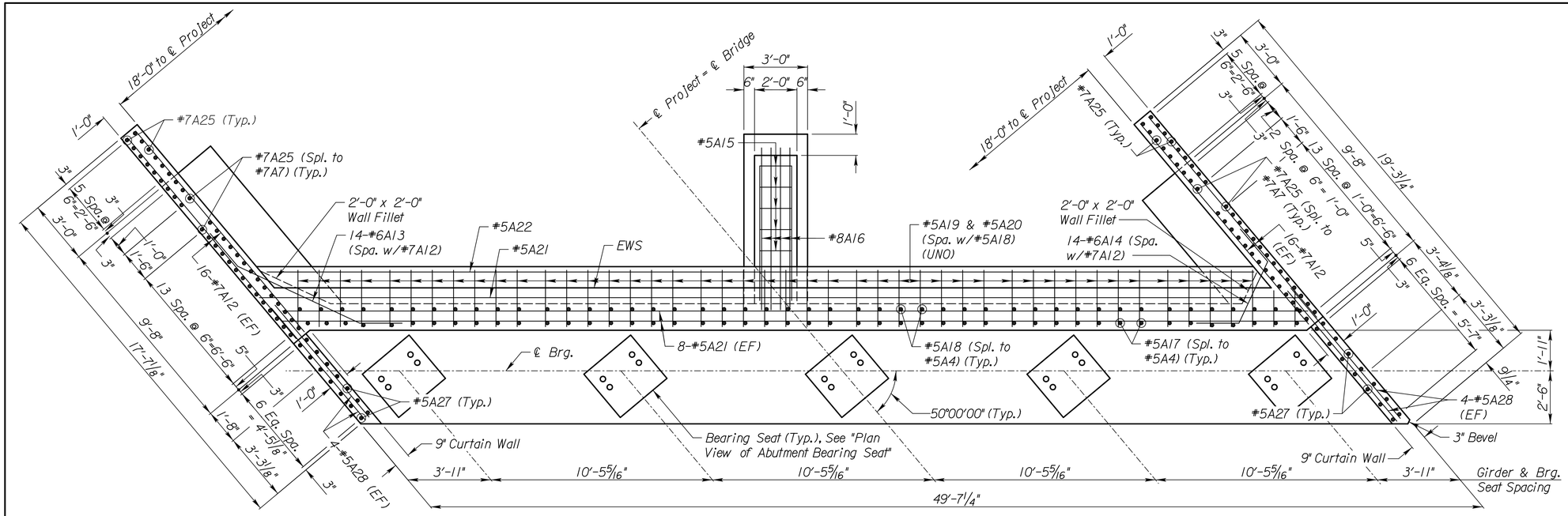
KDOT Graphics Certified 11-02-2023

Sheet No. 95

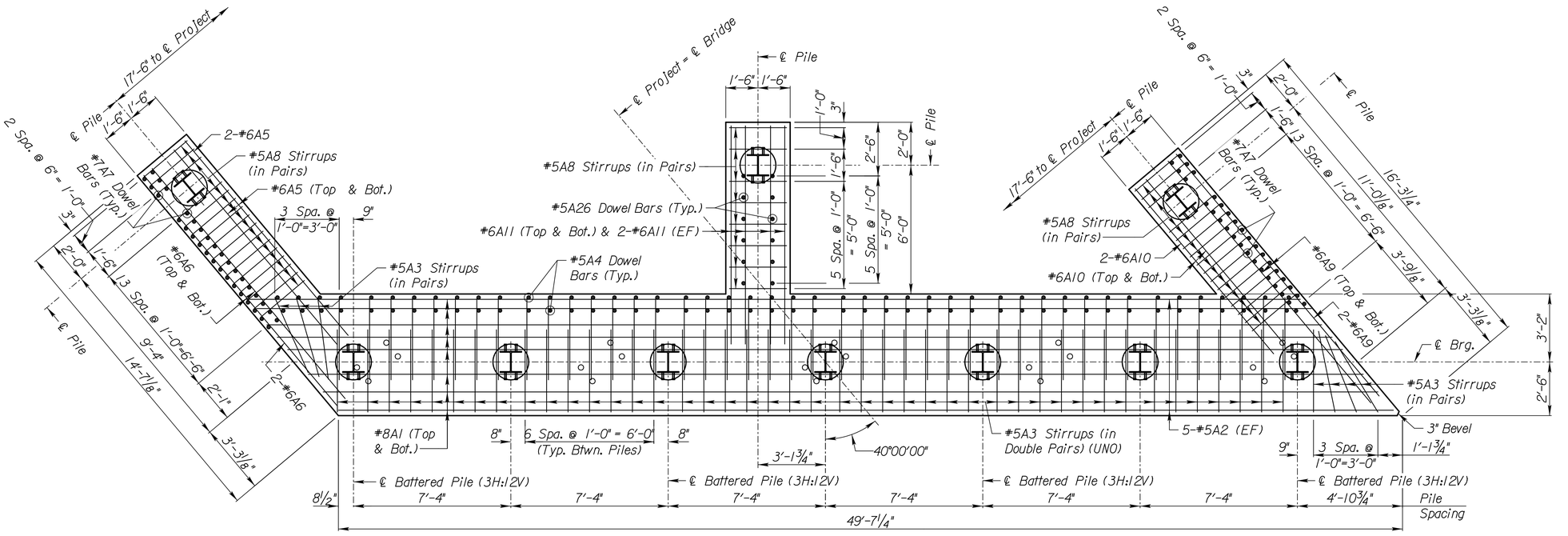
KDOT Graphics Certified

Plotted By: KKATHRIN Plot Location:
File: c:\pwworking\central01\d2597941\ka602001bbr0055-EG2.dgn
Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	96	293



PLAN VIEW OF ABUTMENT BACKWALL AND WINGWALLS



PLAN VIEW OF ABUTMENT BEAM AND WING FOOTINGS

ANCHOR BOLTS: Place the reinforcing bars below the bearing devices to clear the anchor bolts.

LEGEND

EWS = End of Wearing Surface
EF = Each Face
UNO = Unless Noted Otherwise

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 281-071-198.72 (055) Sta. 186+90.75

ABUTMENT DETAILS (1 OF 3)
US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

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

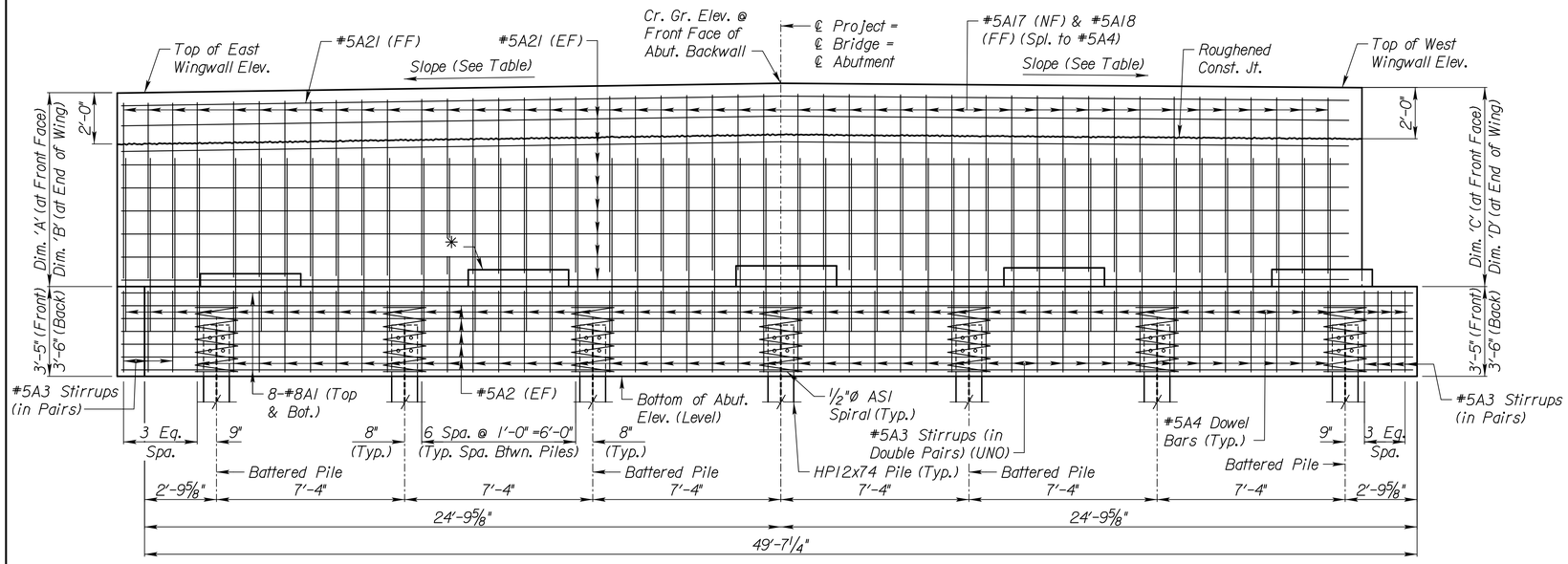
KDOT Graphics Certified 04-26-2023

Sheet No. 96

KDOT Graphics Certified

Plotted By: KKATHRIN
Plot Location:
File: c:\pwworkingcentral01\d2597941\kdot60200l\bbr0055-A-1.dgn
Plot Date: 07-11-24

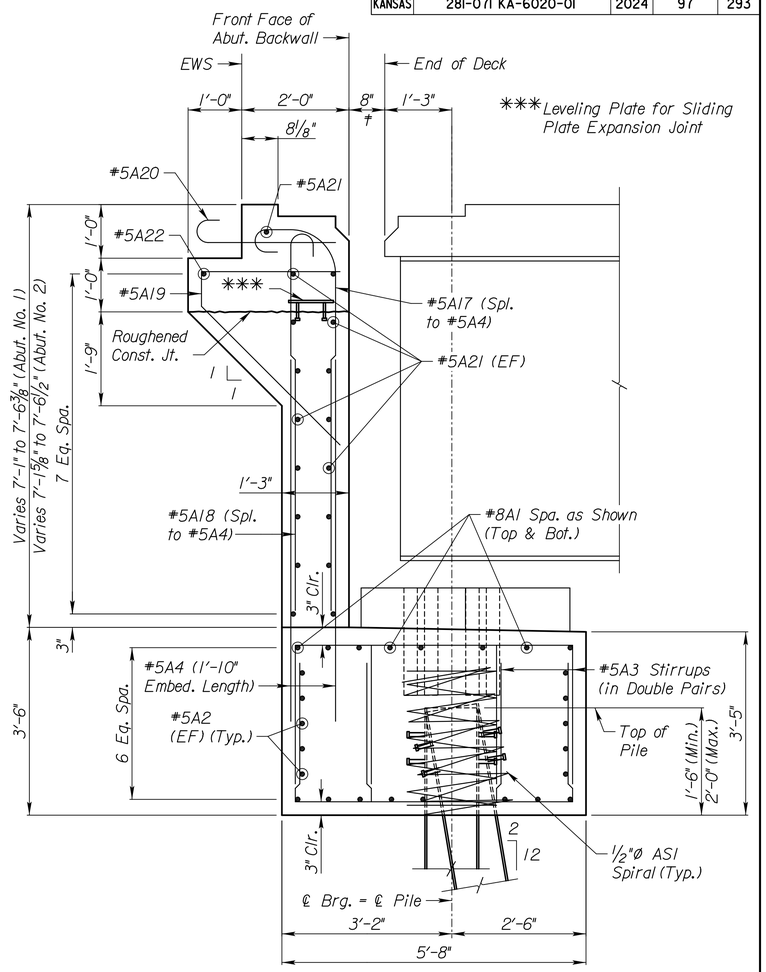
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	97	293



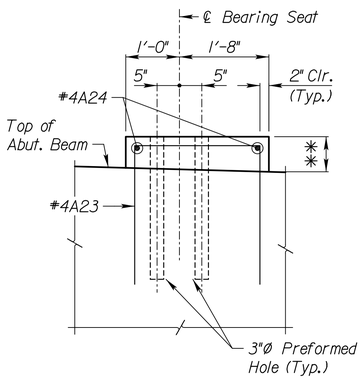
* Typical Bearing Seat, See Table for Elevations

ELEVATION VIEW OF ABUTMENT FOOTING AND BACKWALL

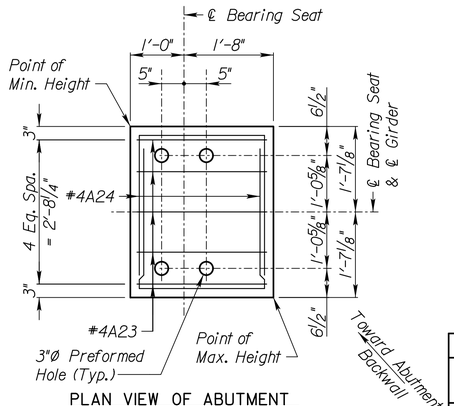
Abutment No. 1 Shown, Looking in the Direction of Decreasing Stationing. Abutment No. 2 Similar



TYPICAL SECTION THRU ABUTMENT



TYPICAL SECTION THRU ABUTMENT BEARING SEAT



PLAN VIEW OF ABUTMENT BEARING SEAT

PREFORMED ANCHOR BOLT HOLES: Preform 3"Ø holes using only corrugated polyethylene tubing (Type C) at the locations shown. When temperatures are expected to go below freezing, seal the preformed holes or fill them with a propylene glycol-based antifreeze to prevent expansion damage. The holes will be free of water, antifreeze or other foreign materials at the time of grouting the anchor bolts. The polyethylene tubing may remain in-place. Trim the tubing flush with the top of the concrete. This work shall be subsidiary to Concrete Grade 4.0 (AE).

TABLE OF ELEVATIONS, DIMENSIONS AND INFORMATION		
Description	Abutment No. 1	Abutment No. 2
Bottom of Abut. Beam & Wing Footing Elev.	1521.70	1521.80
Top of Pile Elev.	1523.70	1523.80
Crown Grade Elev. At Front Face of Backwall	1532.73	1532.83
Crown Grade Elev. At EWS	1532.73	1532.84
Top of East Wingwall Elev. @ End of Wing	1532.28	1532.57
Top of East Wingwall Elev. @ EWS	1532.34	1532.61
East Edge of Abut. Elev. @ Front Face of Backwall	1532.35	1532.62
Top of West Wingwall Elev. @ End of Wing	1532.46	1532.39
Top of West Wingwall Elev. @ EWS	1532.51	1532.44
West Edge of Abut. Elev. @ Front Face of Backwall	1532.52	1532.46
Slope of East Half of Abut. Backwall	-1.60%	-0.88%
Slope of West Half of Abut. Backwall	-0.86%	-1.58%
	7'-1 3/4"	7'-3 7/8"
Dimension 'B'	7'-1"	7'-3 1/8"
Dimension 'C'	7'-4"	7'-1 3/4"
Dimension 'D'	7'-3 1/8"	7'-1"

**BEARING SEAT HEIGHT										
Location	Girder A		Girder B		Girder C		Girder D		Girder E	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Abutment No. 1	5 1/4"	4 7/8"	6 1/4"	5 7/8"	7 3/8"	7"	5 3/8"	5"	3 3/8"	3"
Abutment No. 2	3 3/8"	3"	5 3/8"	5"	7 3/8"	7"	6 1/4"	5 7/8"	5 1/8"	4 3/4"

BEARING SEAT ELEVATIONS					
Location	Girder A	Girder B	Girder C	Girder D	Girder E
Abutment No. 1	1525.58	1525.67	1525.76	1525.60	1525.43
Abutment No. 2	1525.53	1525.70	1525.86	1525.77	1525.68

Notes:
Reinforcing steel shall be shifted to avoid Sliding Plate Expansion Joint compenents.

For Expansion Bearing Device Details, see Sh. No. 104 -105

For Sliding Plate Details, see Sh. No. 119 -121

The top clearance for the #5A3 stirrups will vary from 3" to 2".

Unless otherwise noted, clearance to reinforcing steel shall be 2".

* The dimensions shown are for a termparture of 60°F. They will vary with change in temperature. See Sliding Plate details for temperature adjustments.

LEGEND
EWS = End of Wearing Surface
EF = Each Face
FF = Far Face
NF = Near Face
UNO = Unless Noted Otherwise

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-071-198.72 (055) Sta. 186+90.75

ABUTMENT DETAILS (2 OF 3)
US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

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

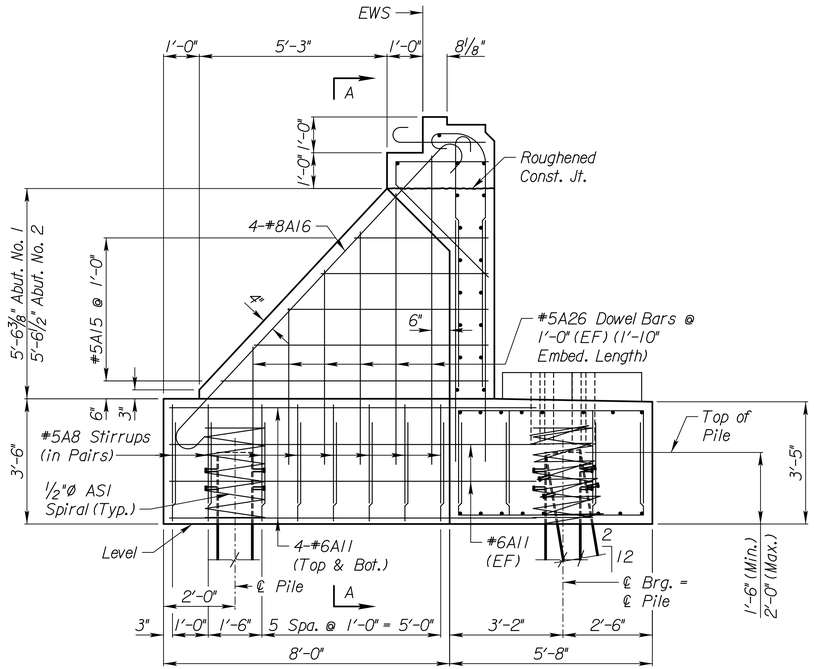
KDOT Graphics Certified 04-27-2023

Sheet No. 97

KDOT Graphics Certified

Plotted By: KKATHRIN Plot Location:
File: c:\pwworking\central01\d2597941\ka602001\bbr0055-A-2.dgn
Plot Date: 07-11-24

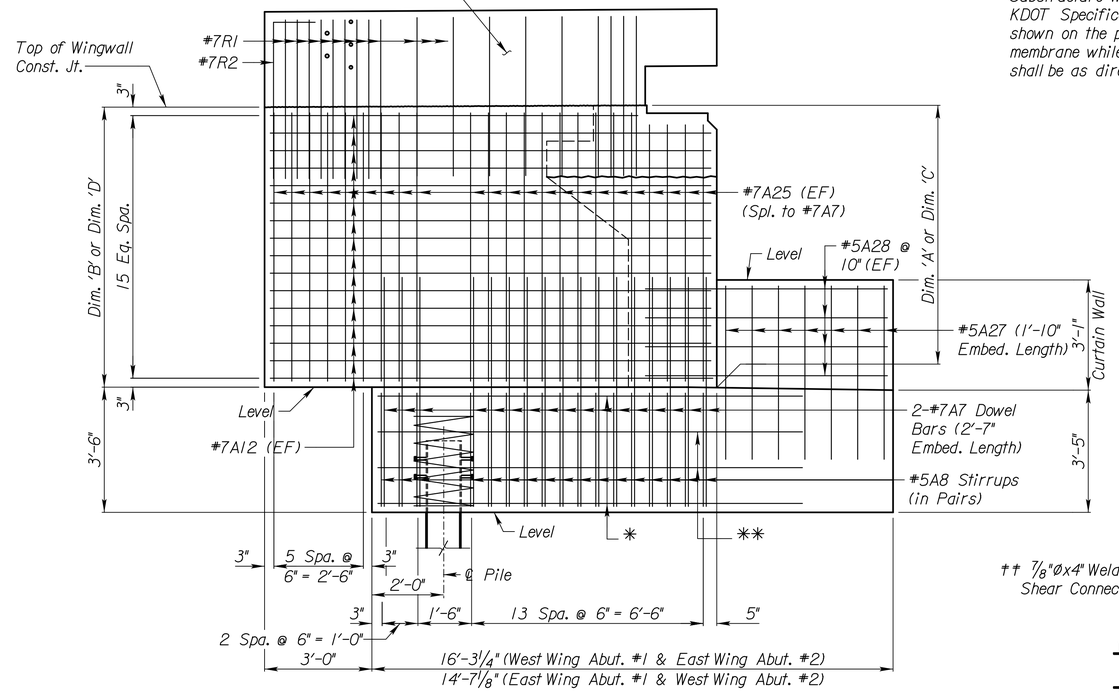
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	98	293



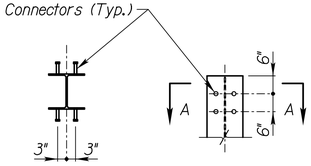
TYPICAL SECTION THRU COUNTERFORT

See "Corral Rail Details" for Details of Reinforcing and Dimensions above the Top of Wingwall Const. Joint

SUBSTRUCTURE WATERPROOFING MEMBRANE: Apply a Substructure Waterproofing Membrane in accordance with KDOT Specifications. Apply the membrane within the limits shown on the plans. Repair any damage done to the membrane while the bridge is under construction. All work shall be as directed and approved by the Engineer.



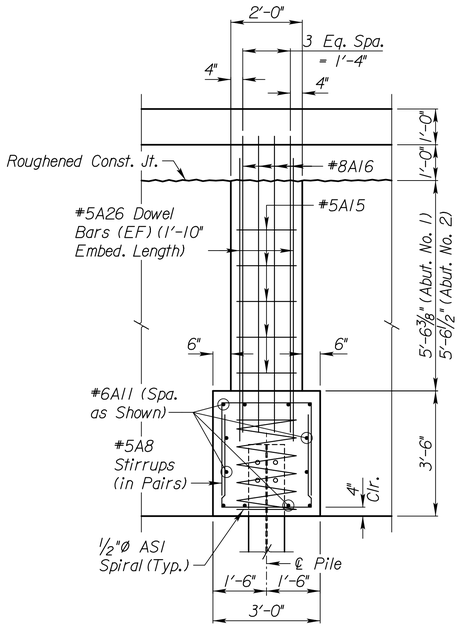
ELEVATION VIEW OF ABUTMENT WINGWALLS



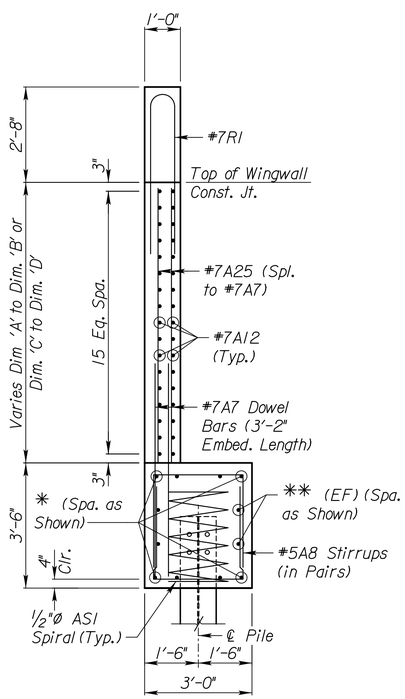
SECTION B-B

PILE WELDED STUD SHEAR CONNECTOR DETAIL

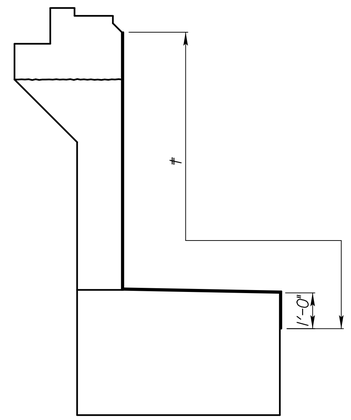
†† Welded Stud Shear Anchors are subsidiary to HP12x74 Steel Piles.
80 Required for Abutment No. 1
80 Required for Abutment No. 2



SECTION A-A



TYPICAL SECTION THRU ABUTMENT WINGWALL



SUBSTRUCTURE WATERPROOFING MEMBRANE DETAILS

WINGWALL FOOTING REINFORCING		
	*	**
Abut. No. 1 East Wing	2-#6A6 (NF) & 2-#6A5 (FF)	#6A6 (NF) & #6A5 (FF)
Abut. No. 1 West Wing	2-#6A9 (NF) & 2-#6A10 (FF)	#6A9 (NF) & #6A10 (FF)
Abut. No. 2 East Wing	2-#6A9 (NF) & 2-#6A10 (FF)	#6A9 (NF) & #6A10 (FF)
Abut. No. 2 West Wing	2-#6A6 (NF) & 2-#6A5 (FF)	#6A6 (NF) & #6A5 (FF)

† Apply Substructure Waterproofing Membrane to front face of abutment backwall and the top and front of the abutment beam as shown. Do not apply to top of bearing seats.

Note: For Table of Dimensions, see Sh. No. 97

LEGEND

EWS = End of Wearing Surface
EF = Each Face
FF = Far Face
NF = Near Face

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 281-071-198.72 (055) Sta. 186+90.75

ABUTMENT DETAILS (3 OF 3)
US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

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

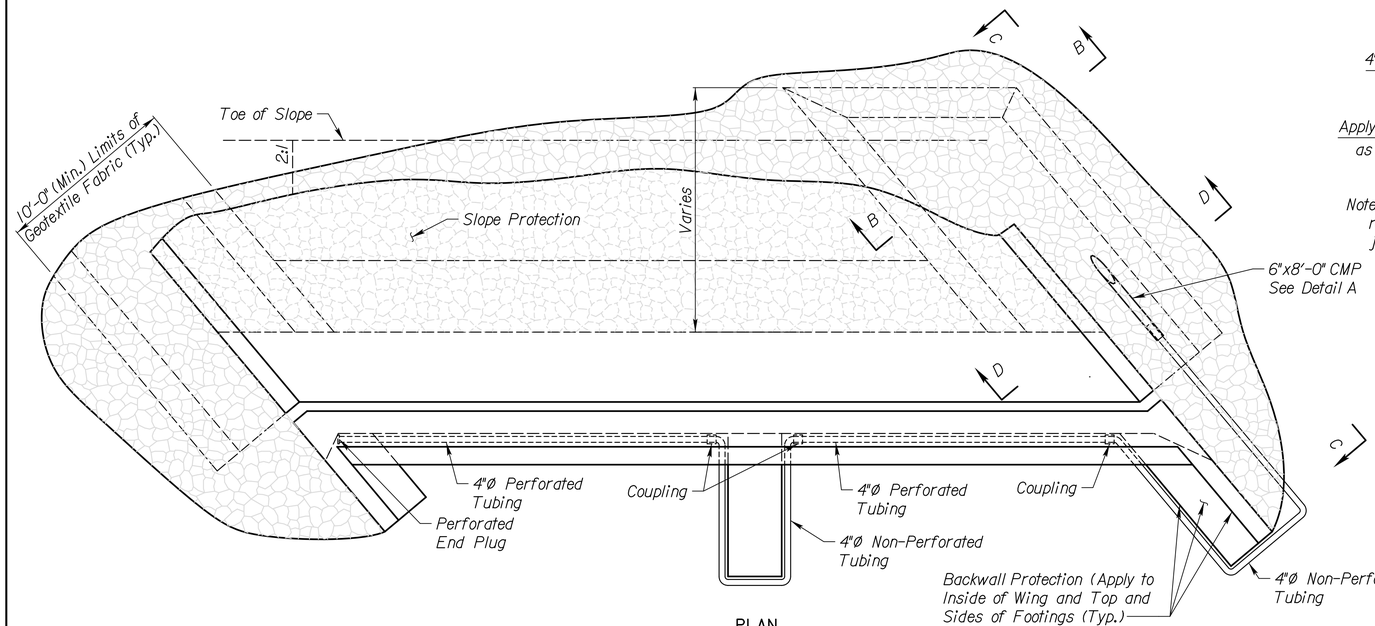
KDOT Graphics Certified 05-01-2023

Sheet No. 98

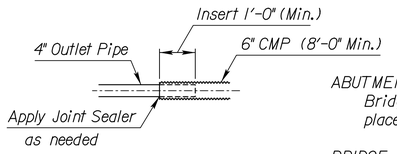
KDOT Graphics Certified

Plotted By: KKATHRIN
File: c:\pwworking\central01\d2597941\kdot6020001bbr00055-A-3.dgn
Plot Location:
Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	99	293

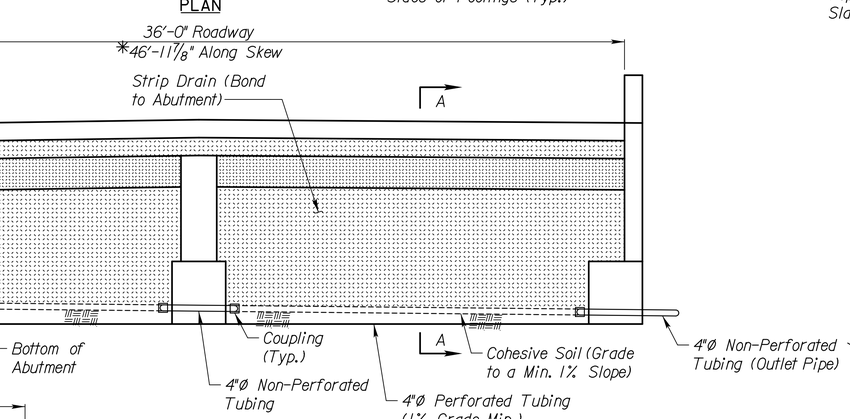


PLAN



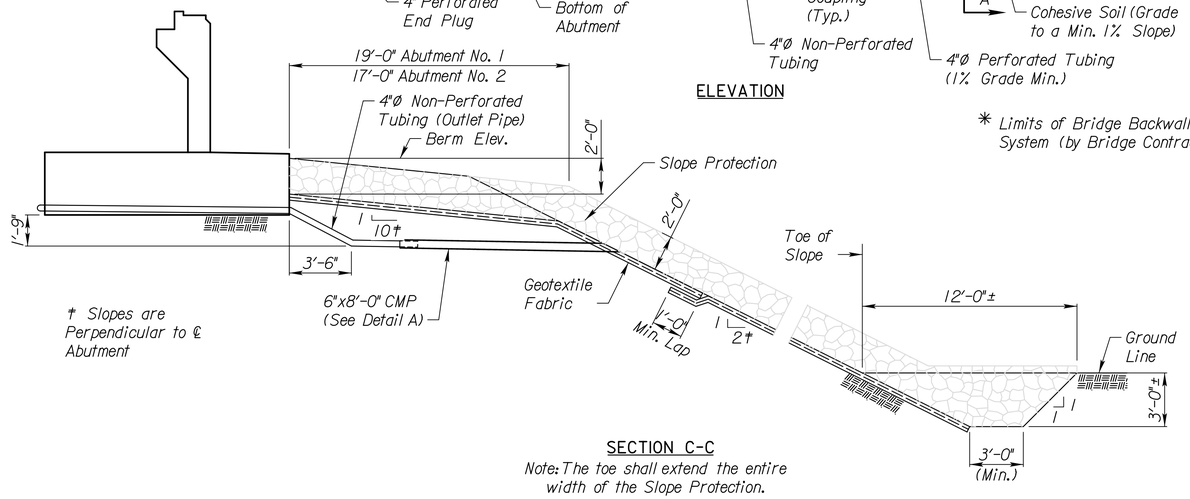
DETAIL A

Note: The 12" lap and Joint sealer may be replaced by a reducing coupler at the junction of the CMP and the 4"Ø tubing.



ELEVATION

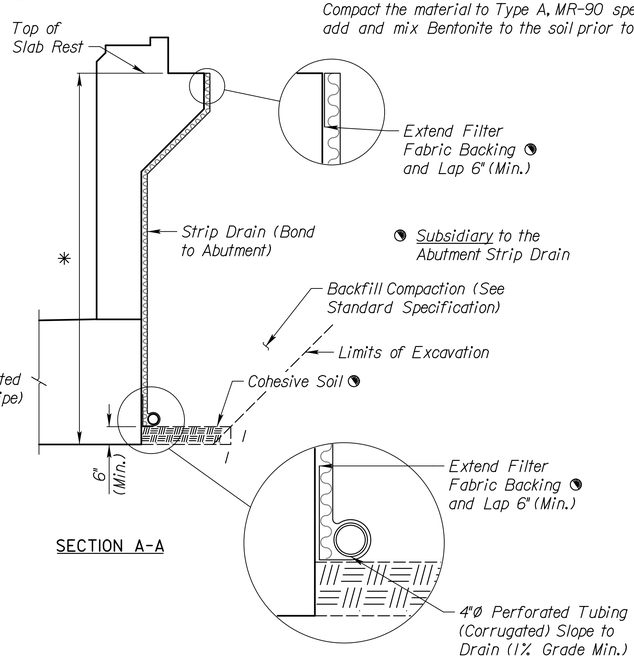
* Limits of Bridge Backwall Protection System (by Bridge Contractor)



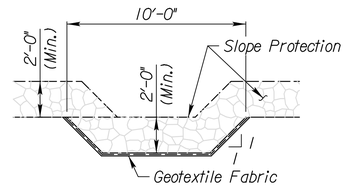
† Slopes are Perpendicular to ℄ Abutment

SECTION C-C

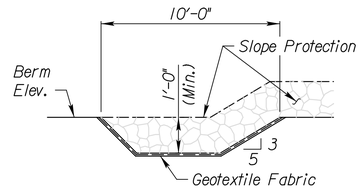
Note: The toe shall extend the entire width of the Slope Protection.



SECTION A-A



SECTION B-B



SECTION D-D

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, wings and counterfort 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 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 1/4" 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" sheets).

COHESIVE SOILS: Grade the bottom surface of the excavated area to drain. Backfill this area with a cohesive type soil. This soil will have a Unified Soil Classification CL, CH, ML or MH according to ASTM D2487 Classification System with 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 is ≥ 13.

SUMMARY OF QUANTITIES (2 ABUTMENTS)	
Abutment Strip Drain	106 Sq. Yds
Bridge Backwall Protection System	192 Sq. Yds
Items Subsidiary to Strip Drain	
4"Ø Perforated Pipe	82 Lin. Ft.
4"Ø Non-Perforated Pipe	127 Lin. Ft.
6"Ø CMP	16 Lin. Ft.
Items Subsidiary to Slope Protection	
Geotextile Fabric	397 Sq. Yds.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-071-198.72 (055) Sta. 186+90.75

ABUTMENT STRIP DRAIN
US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

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

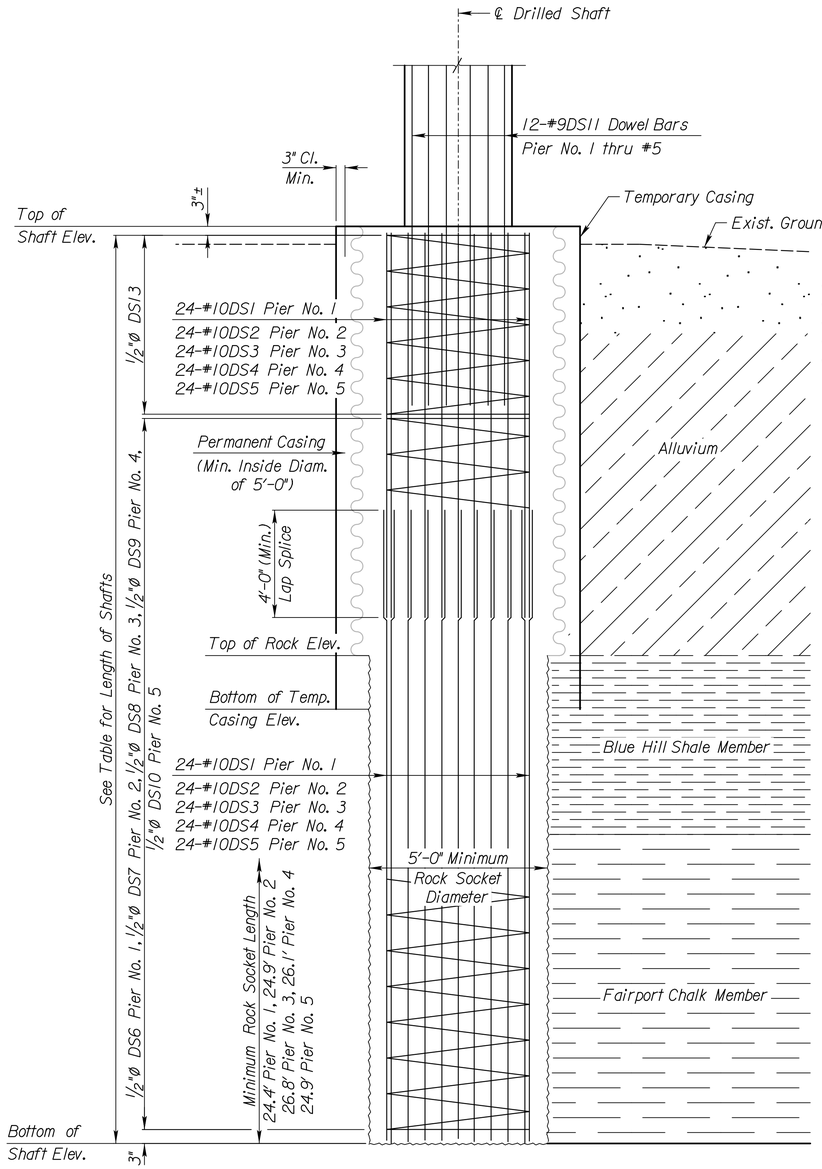
KDOT Graphics Certified 11-02-2023

Sheet No. 99

KDOT Graphics Certified

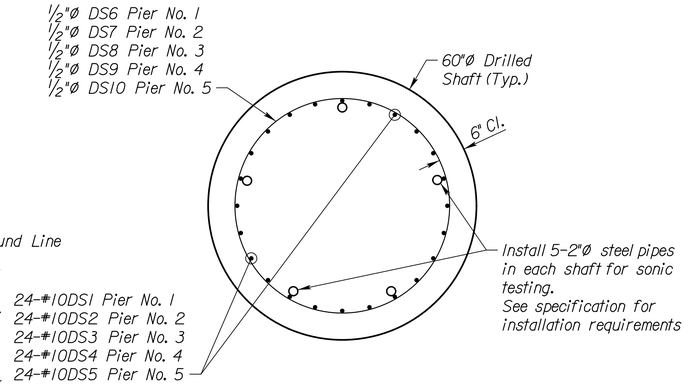
Plotted By: KKATHRIN | Plot Location:
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Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	100	293



TYPICAL ELEVATION VIEW OF DRILLED SHAFT

TABLE OF ELEVATIONS						
	Top of Shaft Elevation	Exist. Ground Line Elev.	Top of Rock Elevation	Bottom of Temporary Casing Elevation	Bottom of Shaft Elevation	Length of Shaft
Pier No. 1	1510.32	1509.0±	1468.40	1464.40	1444.00	66.32'
Pier No. 2	1509.91	1509.0±	1468.90	1464.90	1444.00	65.91'
Pier No. 3	1510.09	1509.0±	1469.80	1464.80	1443.00	67.09'
Pier No. 4	1509.96	1509.0±	1469.10	1465.10	1443.00	66.96'
Pier No. 5	1510.40	1509.0±	1468.90	1464.90	1444.00	66.40'



TYPICAL SECTION OF DRILLED SHAFT

DRILLED SHAFTS: Construct the drilled shafts using the cased method. A permanent casing is required. All excavation, concrete, reinforcing steel, pipes for Sonic Testing, casings, labor, and incidentals necessary to complete the shaft as shown on the details and as directed by KDOT Specifications shall be included in the bid item "Drilled Shafts (60")". Use Grade 4.0 Concrete in the drilled shaft. In no case shall the bottom of the drilled shaft be placed higher than the elevation shown unless otherwise directed by the KDOT Geologist.

Drill an Investigative Core Hole at the locations shown on the plans. See KDOT Specifications.

If the location of the top of the shaft is such that the casing cannot be overtopped to remove concrete impurities, provide extra casing length to over-pour the concrete in the shaft and chip back to the plan elevation of the top of the shaft.

If the permanent casing is to be corrugated metal pipe (CMP) then it will be galvanized.

A drilled shaft pre-construction meeting must be held prior to the start of shaft construction. This meeting should take place at least a day before construction begins and include representatives of the general contractor, drilling contractor, concrete supplier, KDOT Construction, and KDOT Geology.

Notify the Geology Section when shaft construction has been scheduled. A representative of the Section will be present during drilled shaft construction.

Drilled shaft excavations may encounter large limestone concretions within the Blue Hill Shale. Equipment must be on site during drilled shaft construction to penetrate or remove any such obstruction that is found within the bedrock. There will be no extra pay for removing concretions.

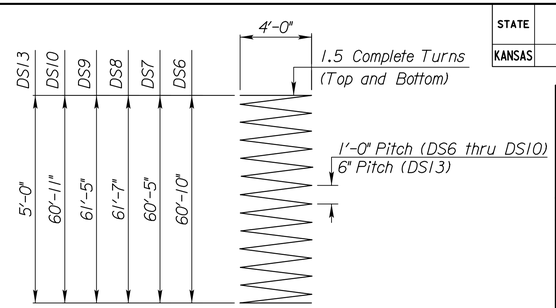
Concrete must be placed within the shaft on the same day drilling is completed.

SONIC TESTING: Equip all drilled shafts with piping to allow sonic testing to be done. Install pipes at locations shown on the plans. All wet pours will be tested. Also, the Engineer has the option to require sonic, non-destructive, integrity testing at any location of concern. Sonic testing shall be paid for at the unit price set for "Sonic Test" (Drilled Shaft) (Set Price). If the sonic testing indicates defective concrete in the shaft, the Engineer will measure the first sonic test for payment, and the Contractor is responsible for subsequent sonic testing of that shaft. Report test results directly to KDOT's Chief Geologist. No work will be done above the top of drilled shaft without the approval of the Chief Geologist.

PERMANENT CASING: See KDOT Specifications.

DRILLED SHAFT BACKFILL: Backfill the annular space between the temporary casing and the permanent casing with grout/flowable fill as defined in the KDOT Specifications.

INVESTIGATIVE CORE HOLES: Investigative Core Holes shall be drilled as shown. Rock core from each hole shall be boxed and stored with the drilling logs on site until the completion of the project. Please contact the Salina Geology Office when a schedule for the borings is established.



DS6 thru DS10, DS13

(½" Ø smooth or deformed bar)

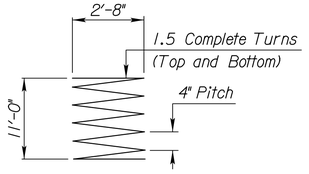
Spiral reinforcing shall meet the requirements of ASTM A615 Grade (60 or 40) or ASTM A82.

Spiral Spacer Bars:

1) Minimum section modulus = 0.30 in.^{3}
2) 4 required per spiral.

BILL OF REINFORCING STEEL Grade 60 Non-Epoxy Total for Pier No. 1 thru No. 5 Subsidiary to Drilled Shafts Shown for Information Only			
Mark	Size	Number	Length
DS1	10	192	35'-1"
DS2	10	192	34'-11"
DS3	10	192	35'-6"
DS4	10	192	35'-5"
DS5	10	192	35'-2"
DS6	1/2" Ø	4	††
DS7	1/2" Ø	4	††
DS8	1/2" Ø	4	††
DS9	1/2" Ø	4	††
DS10	1/2" Ø	4	††
DS11	9	240	11'-0"
DS12	5/8" Ø	20	††
DS13	1/2" Ø	20	††

†† See Bending Diagram



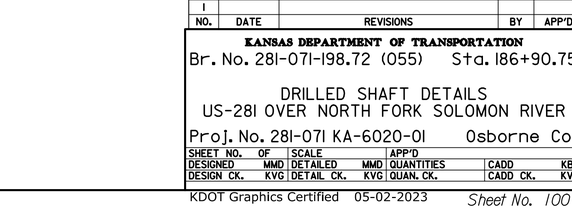
DS12

(⅝" Ø smooth or deformed bar)

Spiral reinforcing shall meet the requirements of ASTM A615 Grade (60 or 40) or ASTM A82.

Spiral Spacer Bars:

1) Minimum section modulus = 0.30 in.^{3}
2) 4 required per spiral.



DETAIL OF DRILLED SHAFT DOWEL BARS

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-071-198.72 (055) Sta. 186+90.75

DRILLED SHAFT DETAILS
US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

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

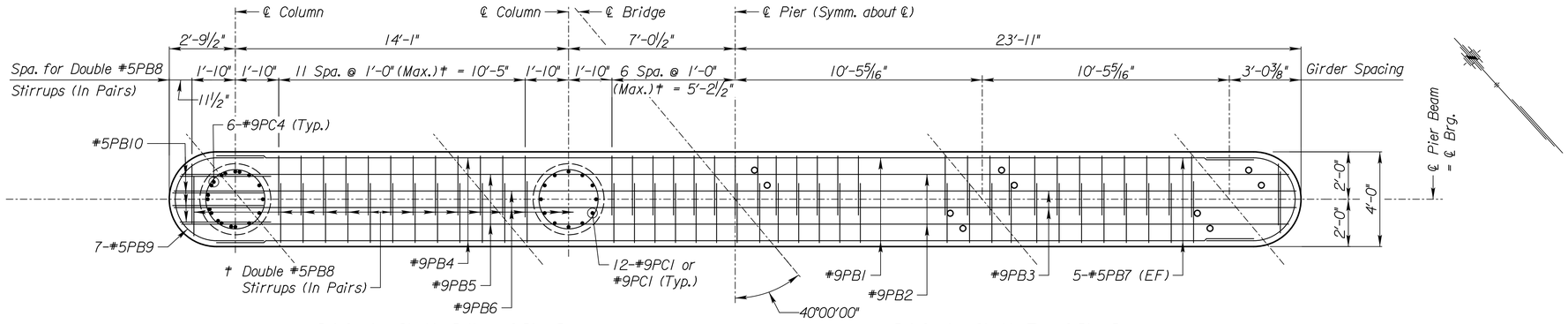
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Sheet No. 100

KDOT Graphics Certified

Plotted By: KKATHRIN
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Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	101	293

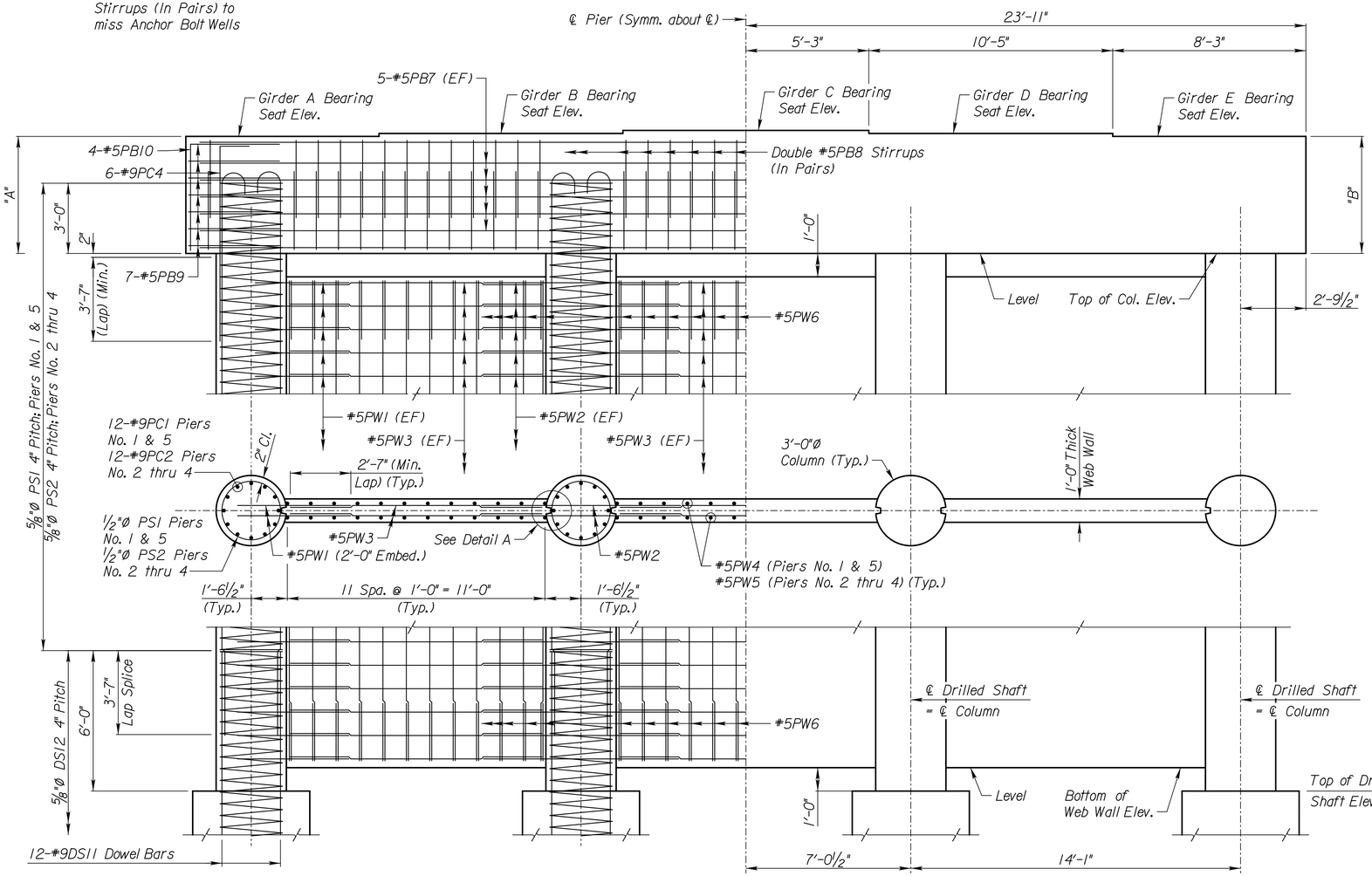


Reinforcing Steel in Bottom of Pier Beam

Reinforcing Steel in Top of Pier Beam

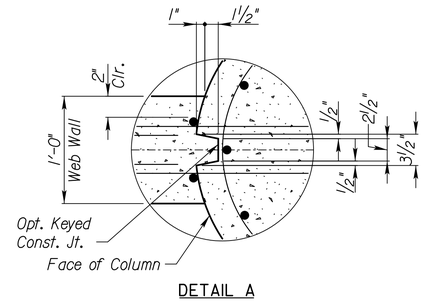
PLAN

† Space Double #5PB8 Stirrups (In Pairs) to miss Anchor Bolt Wells



ELEVATION

(Looking in the Direction of Increase Stationing)



DETAIL A

PIER COLUMN CONSTRUCTION: Either cast the columns and the pier web monolithically or cast the columns separately using a keyed joint as shown in Detail A. If the columns are cast separately, use threaded deformed bars in lieu of the PW1 & PW2 dowel bars. Bar diameter and embedment length into the web wall shall be as designated. The inserts shall develop the full yield strength of the bars. No change in compensation is allowed with the use of inserts. Coil inserts are not allowed.

Notes:
For Bearing Seat Elevations and Dimensions "A" and "B", see Sh. No. 102

EF = Each Face

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 281-071-198.72 (055) Sta. 186+90.75

PIER DETAILS (1 OF 2)
US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

SHEET NO.	OF	SCALE		APP'D			
DESIGNED	MMD	DETAILED	MMD	QUANTITIES		CADD	KBK
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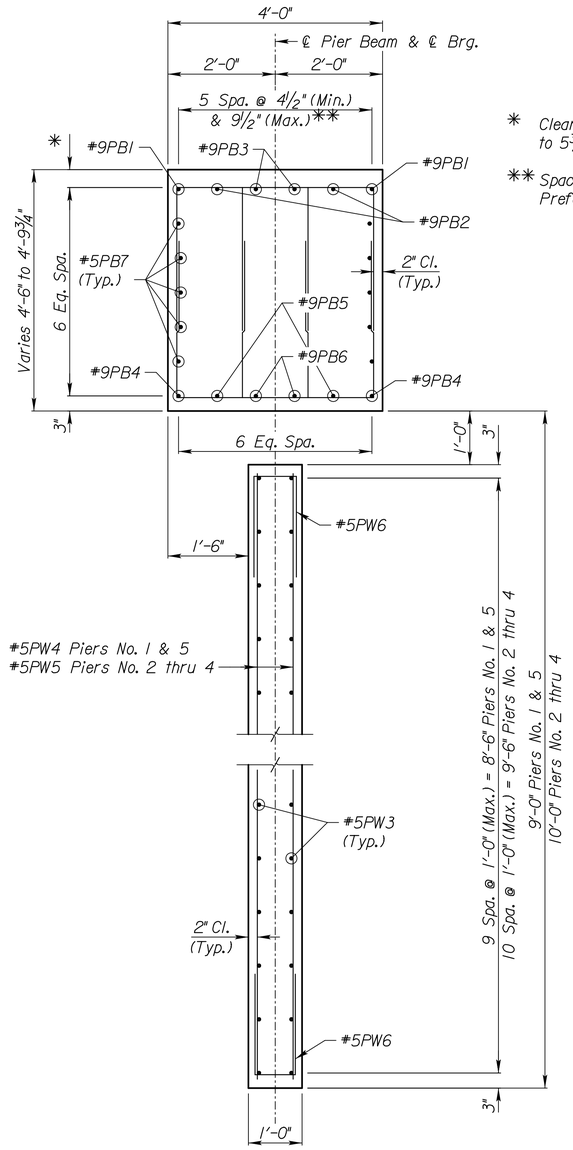
KDOT Graphics Certified 07-20-2023

Sheet No. 101

KDOT Graphics Certified

Plotted By: KKATHRIN | Plot Location:
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Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
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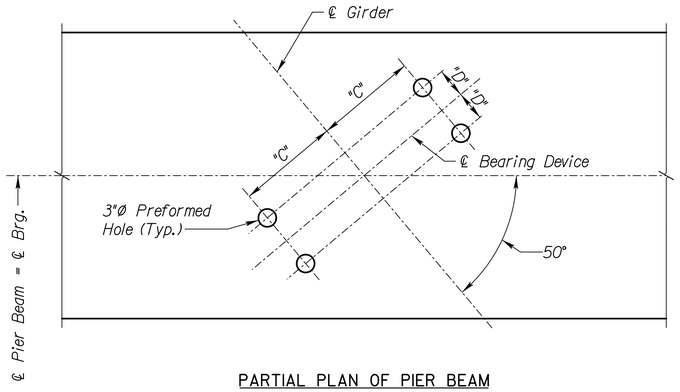


* *Clearance will vary from 2" to 5¾"*

** *Space Bars to miss Preformed Anchor Bolt Holes*

TYPICAL SECTION OF PIER BEAM AND WEB WALL

Notes:
Unless otherwise noted, clearance to reinforcing steel shall be 2".



PARTIAL PLAN OF PIER BEAM
(Showing Preformed Anchor Bolt Hole Locations)

PREFORMED ANCHOR BOLT HOLES: Preform 3 inch diameter holes using only corrugated polyethylene tubing (Type C) at the locations shown. When temperatures are expected to go below freezing, seal the preformed holes or fill them with a propylene glycol-based antifreeze to prevent expansion damage. The holes will be free of water, antifreeze or other foreign materials at the time of grouting the anchor bolts. The polyethylene tubing may remain in-place. Trim the tubing flush with the top of the concrete. This work shall be subsidiary to Concrete Grade 4.0 (AE).

TABLE OF ELEVATIONS AND DIMENSIONS

	Bearing Seat Elevations					Top of Col. Elevation	Bottom of Web Wall Elevation	Top of Shaft Elevation	Dim "A"	Dim "B"	Dim "C"	Dim "D"
	Girder A	Girder B	Girder C	Girder D	Girder E							
Pier No. 1	1525.93	1526.03	1526.13	1525.97	1525.82	1521.32	1511.32	1510.32	4'-7 3/8"	4'-6"	1'-0 5/8"	0'-5"
Pier No. 2	1526.47	1526.59	1526.70	1526.56	1526.41	1521.91	1510.91	1509.91	4'-6 3/4"	4'-6"	1'-2"	0'-6"
Pier No. 3	1526.60	1526.73	1526.86	1526.73	1526.59	1522.09	1511.09	1510.09	4'-6 1/8"	4'-6"	1'-5"	0'-5"
Pier No. 4	1526.46	1526.60	1526.74	1526.63	1526.51	1521.96	1510.96	1509.96	4'-6"	4'-6 5/8"	1'-5"	0'-5"
Pier No. 5	1525.90	1526.06	1526.21	1526.11	1526.01	1521.40	1511.40	1510.40	4'-6"	4'-7 1/4"	1'-0 5/8"	0'-5"

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
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PIER DETAILS (2 OF 2)
US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

SHEET NO.	OF	SCALE		APP'D			
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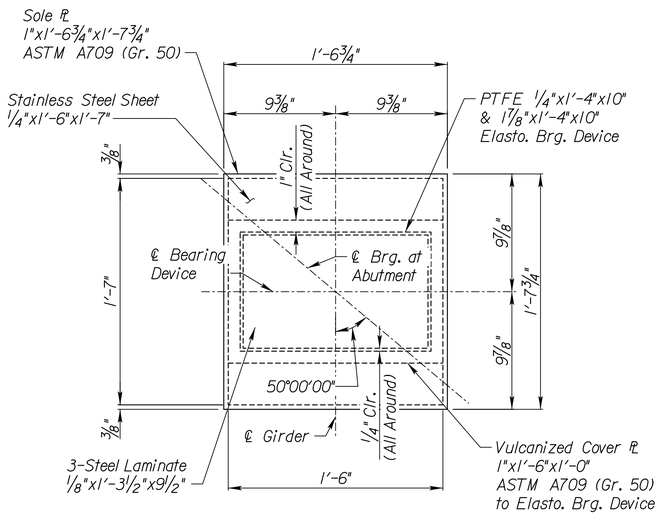
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Sheet No. 102

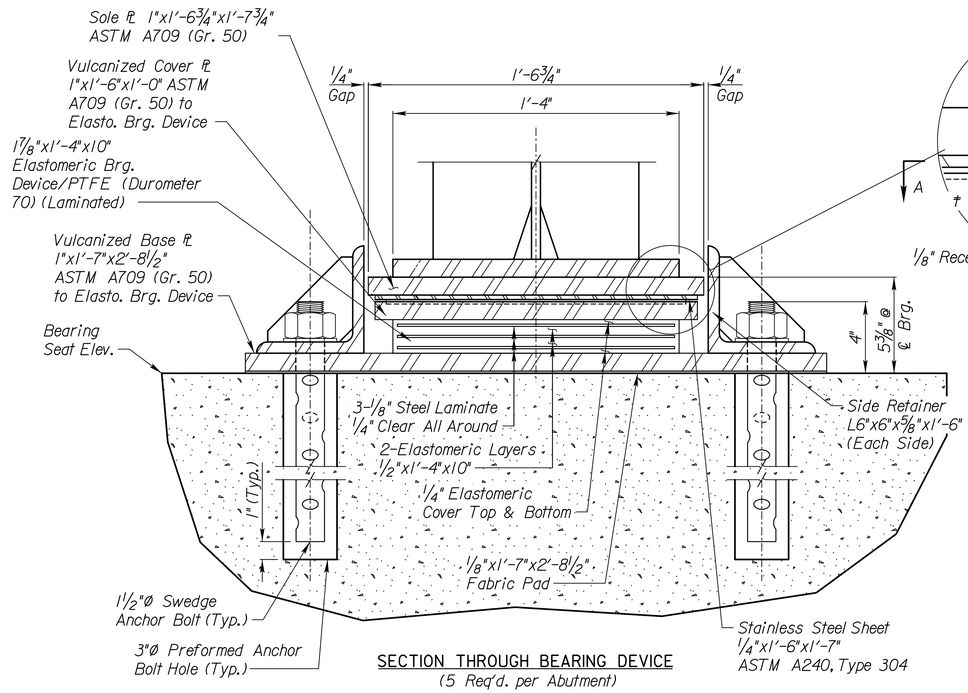
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Plot Date: 07-11-24

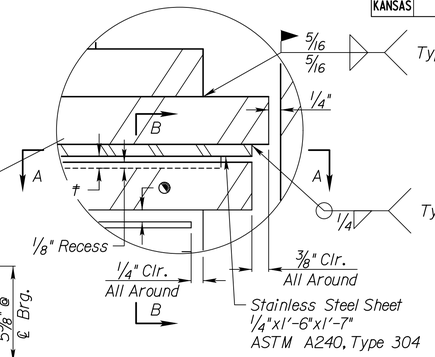
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	103	293



BEARING DEVICE PLAN
(5 Req'd. per Abutment)

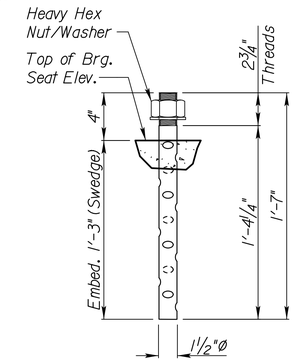


SECTION THROUGH BEARING DEVICE
(5 Req'd. per Abutment)



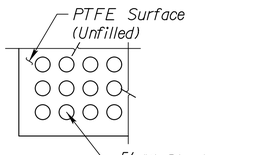
† PTFE ¼"x1'-4"x10"

◔ ¼" Elastomeric Cover Top & Bottom

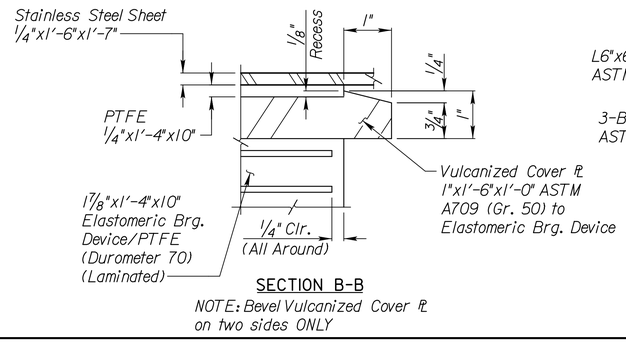


SWEDGE ANCHOR BOLT
(20 Req'd. per Abutment)

BEARING DEVICE BASE PLATE PLAN
(5 Req'd. per Abutment)

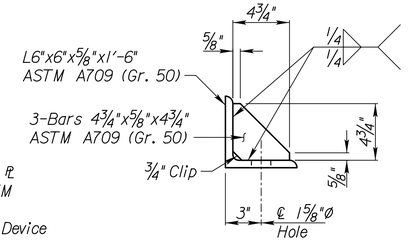


SECTION A-A

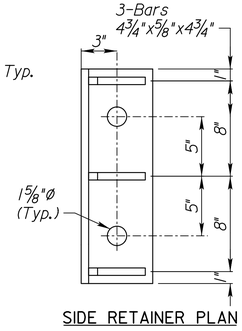


SECTION B-B

NOTE: Bevel Vulcanized Cover Pl on two sides ONLY



SIDE RETAINER
(10 Req'd. per Abutment)

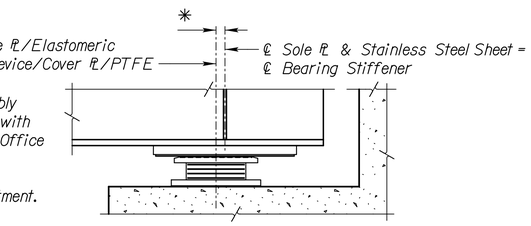


SIDE RETAINER PLAN

ANCHOR BOLTS: Anchor bolts will adhere to KDOT Standard Specification Division 1600 (Grade 105) with the following exception. The threads may be rolled or cut. Place the reinforcing bars below the bearing devices to clear the anchor bolts

BEARING: Bearing Type TFE/ELASTOMERIC (Method A):
Bearing Devices at Abutment shall be fabricated with an elastomer satisfying:
- *Shore A Durometer Hardness of 70*
- *Low Temperature Grade 3 requirements*
- *Type A certification for elastomeric bearing device acceptance is required*
- *Include design method and all material properties on shop details*

BEARING (TFE/ELASTOMERIC): The Elastomeric portion of the Bearing Device shall be factory bonded to the steel base plate and the steel cover plate by a vulcanization process. All exposed surfaces of the base plate, cover plate, sole plate and side retainers shall be painted with an inorganic zinc primer and water borne acrylic top coat. Repair painted surfaces damaged by welding operations. Mask all exposed stainless steel before field painting; clean any overspray on the stainless steel sheet. The steel plates, side retainers and swedge anchor bolts are subsidiary to the bid item "Bearing (TFE/Elastomeric)" and shall be furnished by the bearing device fabricator.



✳ *Note:*
Offset Between ℄ of Sole Pl Assembly and Elastomeric Assembly will vary with Temperature. Contact KDOT Bridge Office Before Field Welding Sole Plate to Bottom Girder Flange to allow for Possible Sole Plate Location Adjustment.

SECTION THROUGH BEARING DEVICE
(Side View for Girder to Bearing Relation)
(Side Retainers and Anchor Bolts not shown for clarity)

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-071-198.72 (055) Sta. 186+90.75
ABUTMENT NO 1& 2
EXPANSION BEARING DEVICE DETAILS
US-281 OVER NORTH FORK SOLOMON RIVER
Proj. No. 281-071 KA-6020-01 Osborne Co.

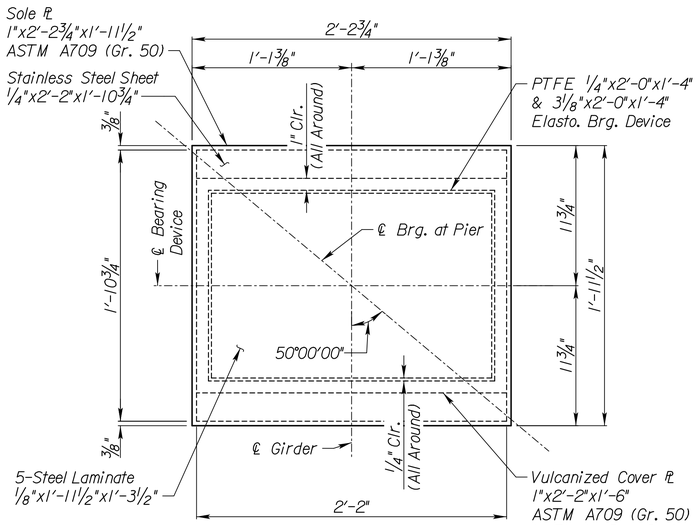
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DESIGNED	MMD	DETAILED	MMD	QUANTITIES		CADD	KBK
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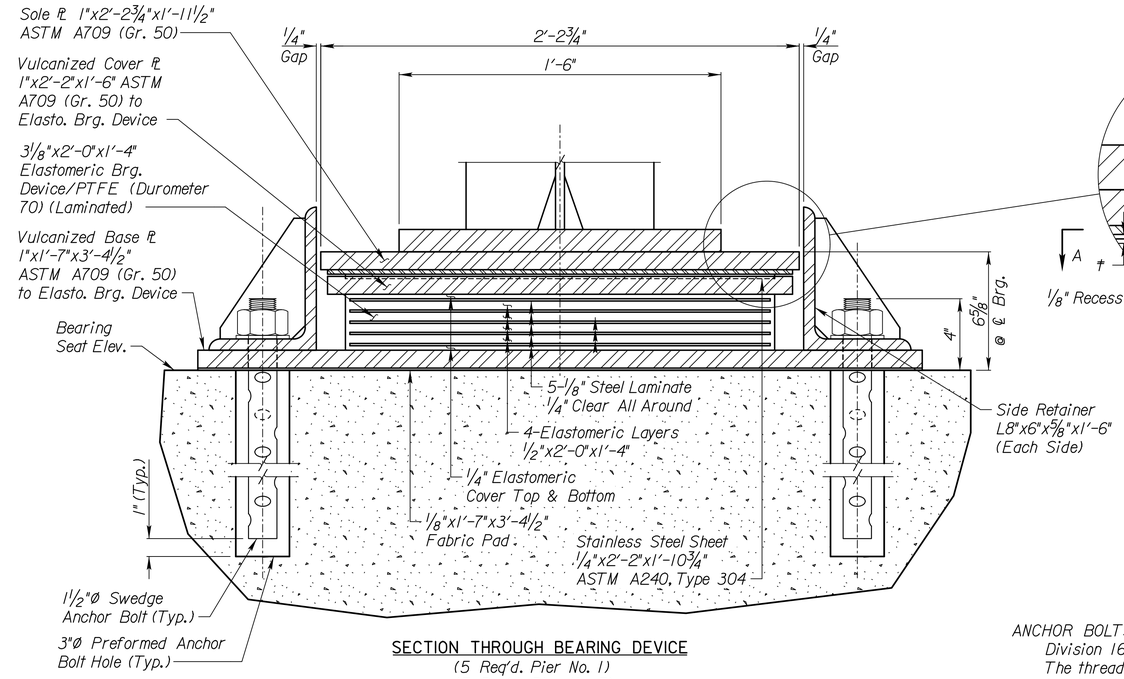
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Plot Date: 07-11-24

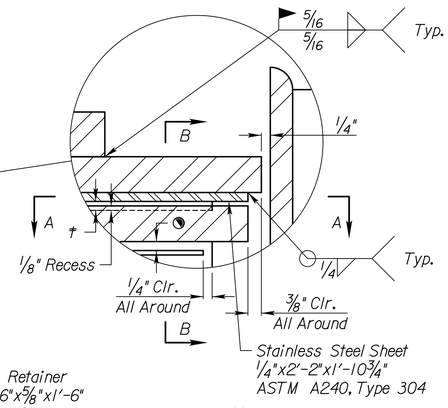
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KANSAS	281-071 KA-6020-01	2024	104	293

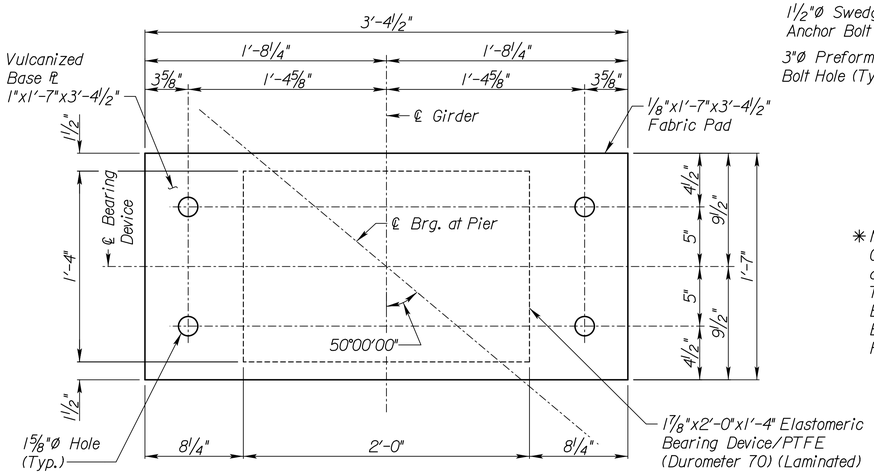


BEARING DEVICE PLAN
(5 Req'd. Pier No. 1)
(5 Req'd. Pier No. 5)

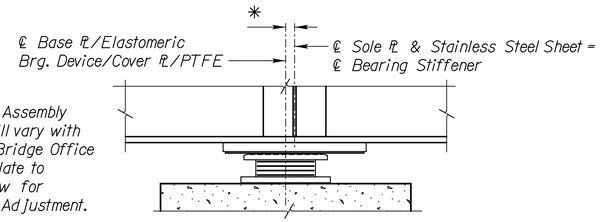


SECTION THROUGH BEARING DEVICE
(5 Req'd. Pier No. 1)
(5 Req'd. Pier No. 5)





BEARING DEVICE BASE PLATE PLAN
(5 Req'd. Pier No. 1)
(5 Req'd. Pier No. 5)



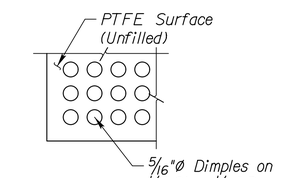
SECTION THROUGH BEARING DEVICE
(Side View for Girder to Bearing Relation)
(Side Retainers and Anchor Bolts not shown for clarity)

* Note:
Offset Between ℄ of Sole Pl Assembly and Elastomeric Assembly will vary with Temperature. Contact KDOT Bridge Office Before Field Welding Sole Plate to Bottom Girder Flange to allow for Possible Sole Plate Location Adjustment.

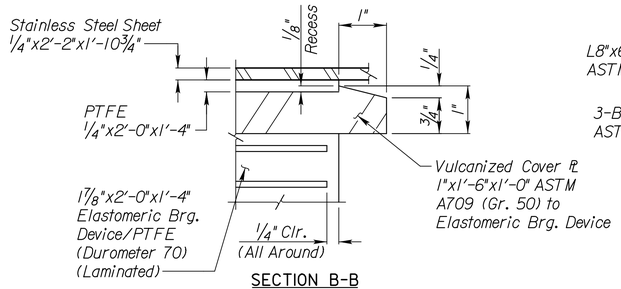
ANCHOR BOLTS: Anchor bolts will adhere to KDOT Standard Specification Division 1600 (Grade 105) with the following exception. The threads may be rolled or cut. Place the reinforcing bars below the bearing devices to clear the anchor bolts

BEARING: Bearing Type TFE/ELASTOMERIC (Method A):
Bearing Devices at Abutment shall be fabricated with an elastomer satisfying:
- Shore A Durometer Hardness of 70
- Low Temperature Grade 3 requirements
- Type A certification for elastomeric bearing device acceptance is required
- Include design method and all material properties on shop details

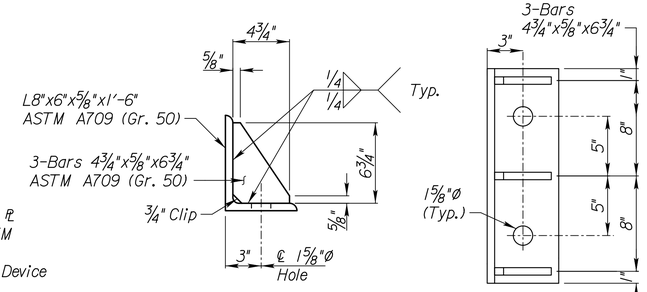
BEARING (TFE/ELASTOMERIC): The Elastomeric portion of the Bearing Device shall be factory bonded to the steel base plate and the steel cover plate by a vulcanization process. All exposed surfaces of the base plate, cover plate, sole plate and side retainers shall be painted with an inorganic zinc primer and water borne acrylic top coat. Repair painted surfaces damaged by welding operations. Mask all exposed stainless steel before field painting; clean any overspray on the stainless steel sheet. The steel plates, side retainers and swedge anchor bolts are subsidiary to the bid item "Bearing (TFE/Elastomeric)" and shall be furnished by the bearing device fabricator.



SECTION A-A

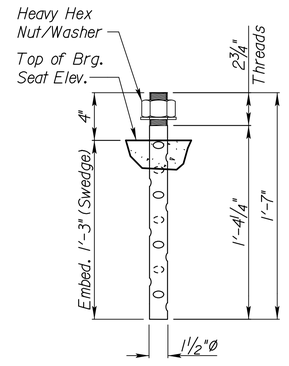


SECTION B-B
NOTE: Bevel Vulcanized Cover Pl on two sides ONLY



SIDE RETAINER
(10 Req'd. Pier No. 1)
(10 Req'd. Pier No. 5)

SIDE RETAINER PLAN



SWEDGE ANCHOR BOLT
(20 Req'd. Pier No. 1)
(20 Req'd. Pier No. 5)

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-071-198.72 (055) Sta. 186+90.75
PIER NO. 1 & 5
EXPANSION BEARING DEVICE DETAILS
US-281 OVER NORTH FORK SOLOMON RIVER
Proj. No. 281-071 KA-6020-01 Osborne Co.

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

KDOT Graphics Certified 05-07-2024

Sheet No. 104

KDOT Graphics Certified

Plotted By: KKATHRIN
Plot Location:
File: c:\pwworking\central01\d2597941\kd602001\br0055-B02.dgn
Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	105	293

BEARING (STEEL REINFORCED ELASTOMERIC) (Method A):
Bearing Devices at Pier Nos. 2, 3, and 4 shall be fabricated with an elastomer satisfying:
- Shore A Durometer Hardness of 60
- Low Temperature Grade 3 requirements
- Type A certificaiton for elastomeric bearing device acceptance is required
- Include design method and all material properties on shop details

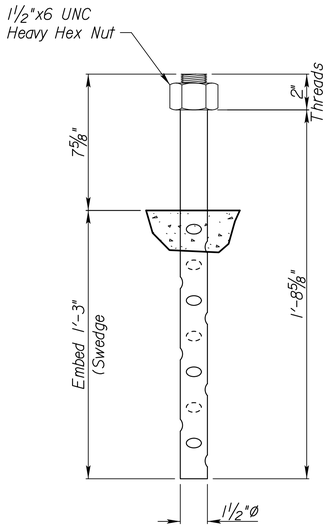
BEARING (STEEL REINFORCED ELASTOMERIC): Elastomeric Bearing Device shall be factory bonded to the steel sole plate by a vulcanization process. The steel sole plate and swedge anchor bolts are subsidiary to the bid item, "Bearing (Steel Reinforced Elastomeric)" and shall be furnished by the bearing device fabricator.

ANCHOR BOLTS: Anchor bolts will adhere to KDOT Standard Specification Division 1600 (Grade 105) with the following exception. The threads may be rolled or cut.

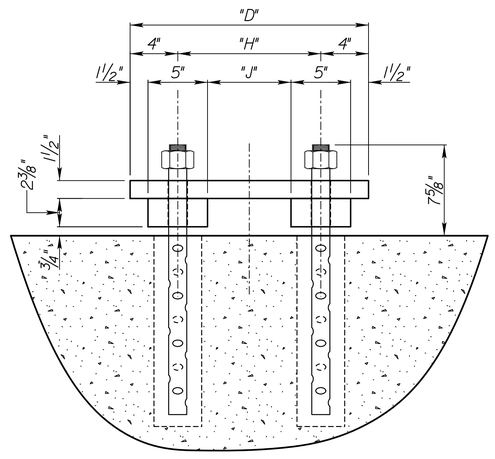
Place the reinforcing bars below the bearing devices to clear the anchor bolts.

TABLE OF FIXED BEARING DEVICES FABRICATOR VARIABLES

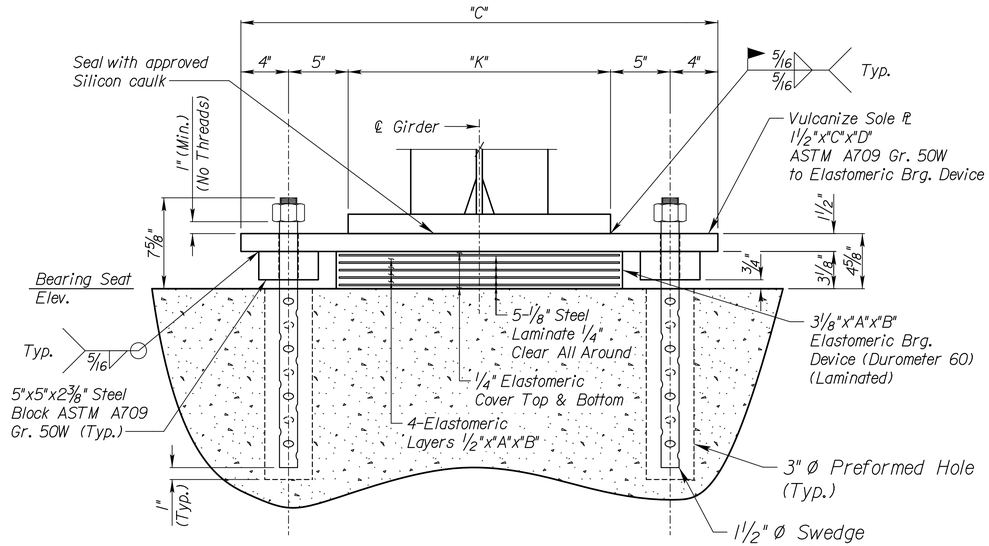
Location	Number Required	Bearing Pad		Sole Plate							Girder Flange
		"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"	"J"	"K"
Pier No. 2	5	1'-6"	1'-4"	3'-0"	1'-8"	1'-6"	1'-2"	10"	1'-0"	7"	18"
Pier No. 3	5	2'-0"	1'-2"	3'-6"	1'-6"	1'-9"	1'-5"	9"	10"	5"	24"
Pier No. 4	5	2'-0"	1'-2"	3'-6"	1'-6"	1'-9"	1'-5"	9"	10"	5"	24"



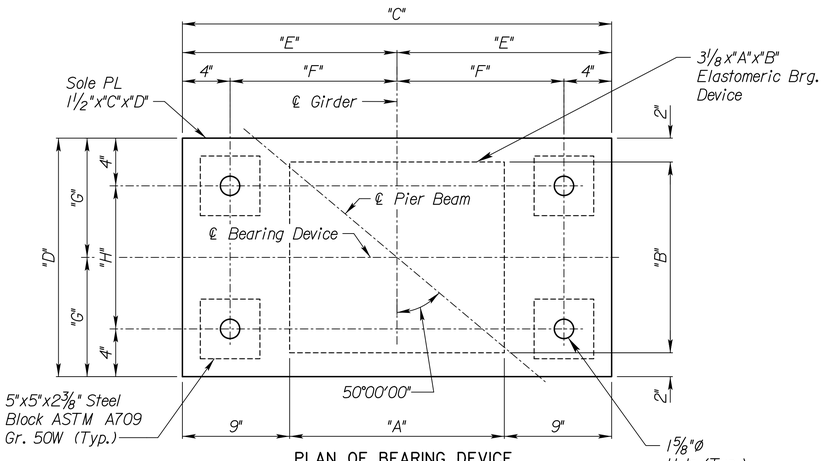
SWEDGE ANCHOR BOLT
(60 Required, 20 per Pier)



SIDE VIEW OF BEARING DEVICE
(Bearing Pad Not Shown for Clarity)



SECTION THROUGH OF BEARING DEVICE



PLAN OF BEARING DEVICE
FOR PIERS NO. 2, 3 & 4

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-071-198.72 (055) Sta. 186+90.75
PIER NO. 2, 3 & 4
FIXED BEARING DEVICE DETAILS
US-281 OVER NORTH FORK SOLOMON RIVER
Proj. No. 281-071 KA-6020-01 Osborne Co.

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

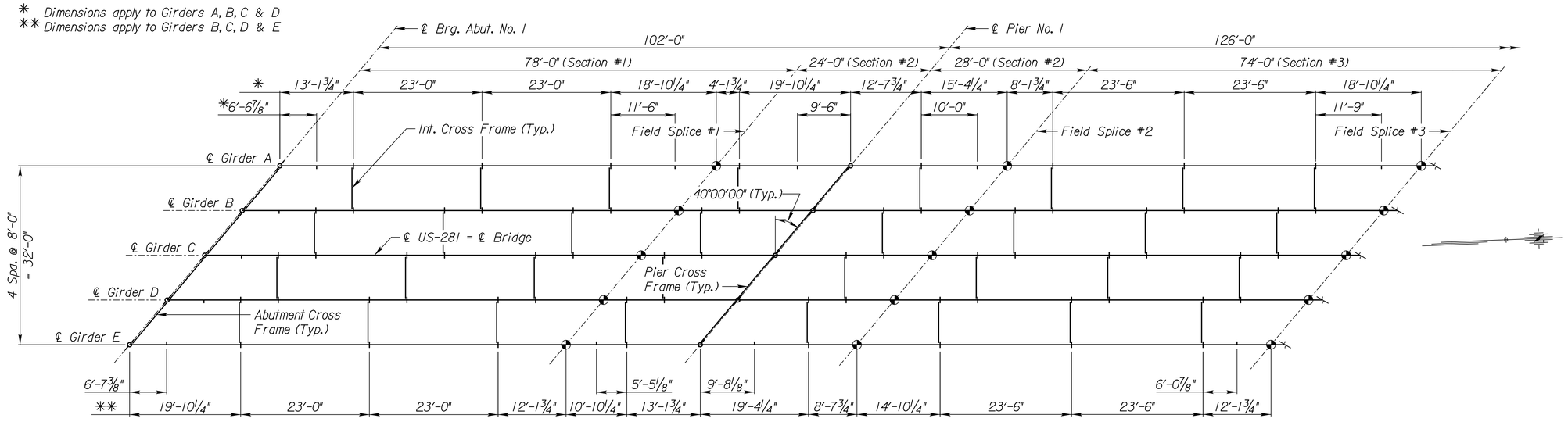
KDOT Graphics Certified 05-07-2024

Sheet No. 105

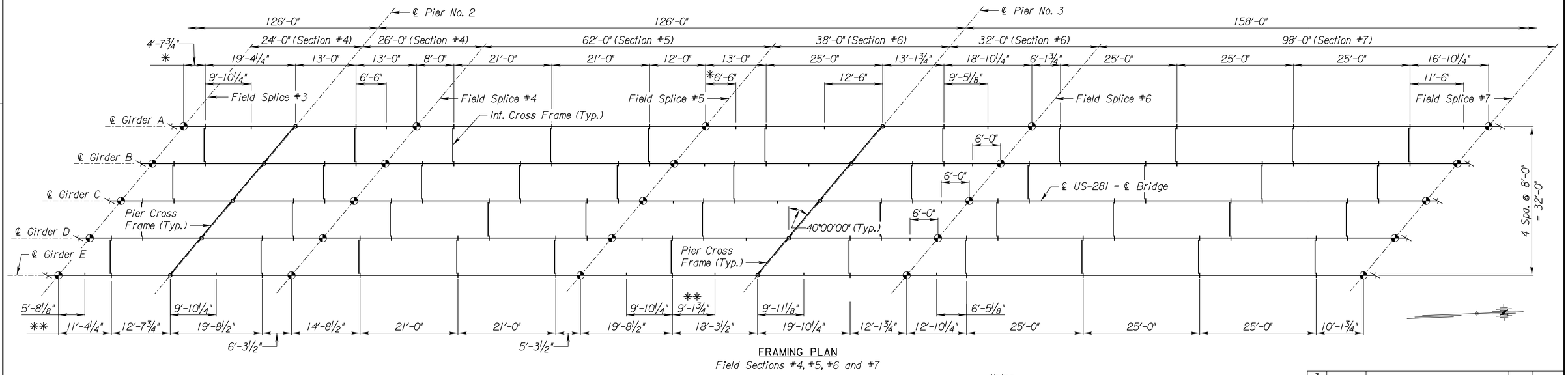
KDOT Graphics Certified

Plotted By: KKATHRIN Plot Location:
File: c:\pwworking\central01\d2597941\kx602200\bbr0055-BD3.dgn
Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	106	293



FRAMING PLAN
Field Sections #1, #2 and #3



FRAMING PLAN
Field Sections #4, #5, #6 and #7

Notes:
Blast clean all gusset plates of cross frames and stiffeners at bolted connections to a surface condition of SSPC-SP6 or better to satisfy Class B Surface requirements.

All transverse web stiffeners are perpendicular to the top flange of the girder except the bearing stiffeners which shall be vertical. Cut girder web ends vertical. Correct girder lengths for grade.

For Structural Steel Summary, see "Framing Plan (2 of 2)".

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-071-198.72 (055) Sta. 186+90.75

FRAMING PLAN (1 OF 2)
US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

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

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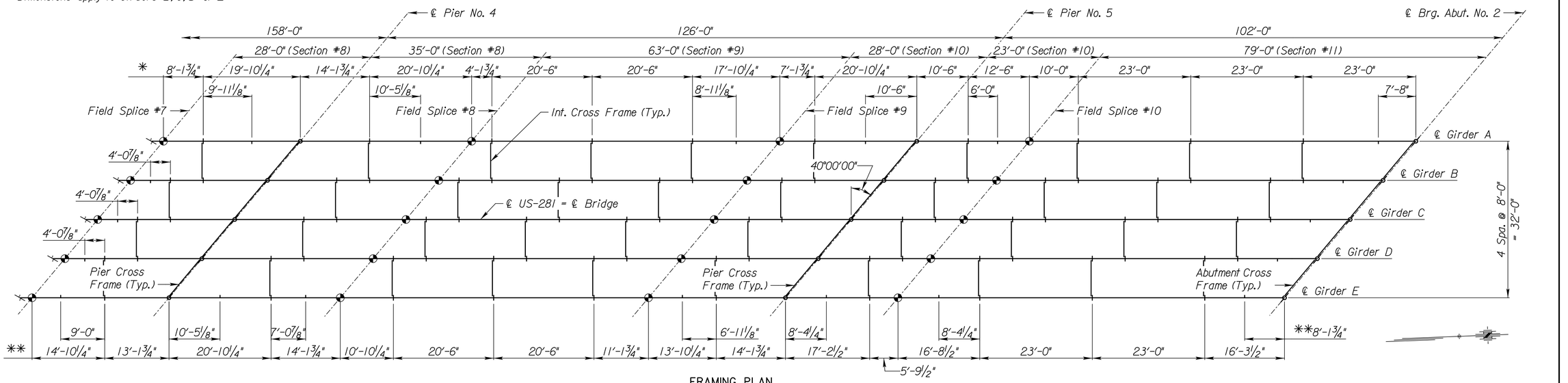
Sheet No. 106

KDOT Graphics Certified

Plotted By: KKATHRIN
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Plot Date: 07-11-24
Plot Location:

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	107	293

* Dimensions apply to Girders A, B, C & D
** Dimensions apply to Girders B, C, D & E



FRAMING PLAN
Field Sections #8, #9, #10 and #11

STRUCTURAL STEEL SUMMARY		
	AASHTO M270 Gr. 50W T3 (Lbs.)	ASTM A709 Gr. 50W (Lbs.)
Girder Flanges	437,036	
Girder Webs	416,882	
Flange Splice Plates	17,940	
Web Splice Plates	8,399	
Abutment Bearing Stiffeners		† 4,268
Pier Bearing Stiffeners		† 15,101
Intermediate Stiffeners		33,805
Intermediate Crossframes		45,450
Pier Crossframes		12,952
Abutment Crossframes		4,302
Abutment Beam Support		6,133
TOTAL STRUCTURAL STEEL	880,257	† 122,011

† Quantities for Abutment Bearing Stiffeners and Pier Bearing Stiffeners includes 10,284 lbs of ASTM A1085 material to be paid for as A709.

Notes:
Blast clean all gusset plates of cross frames and stiffeners at bolted connections to a surface condition of SSPC-SP6 or better to satisfy Class B Surface requirements.

All transverse web stiffeners are perpendicular to the top flange of the girder except the bearing stiffeners which shall be vertical. Cut girder web ends vertical. Correct girder lengths for grade.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-071-198.72 (055) Sta. 186+90.75

FRAMING PLAN (2 OF 2)
US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

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

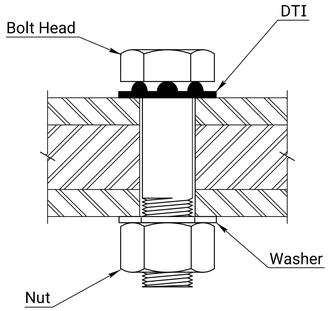
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Sheet No. 107

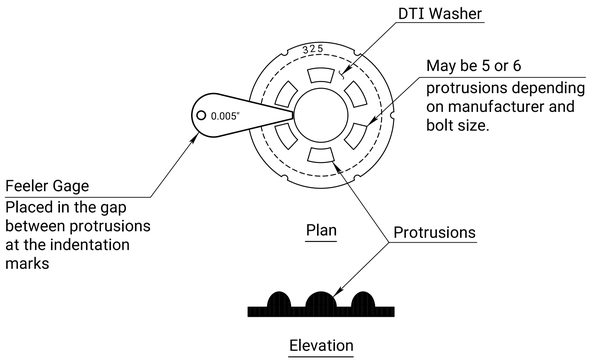
KDOT Graphics Certified

Plotted By: KKATHRIN | Plot Location:
File: c:\pwworking\central01\d2597941\ka602001\bbr0055-FP2.dgn
Plot Date: 07-11-24

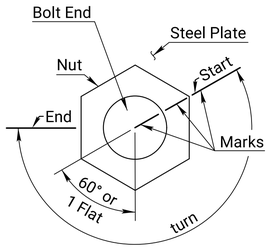
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	108	293



TYPICAL BOLT AND
DIRECT TENSION INDICATOR (DTI)

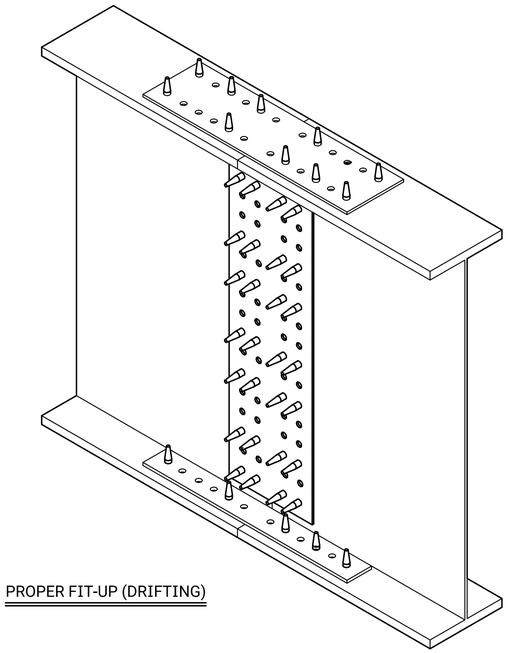


TYPICAL DIRECT TENSION INDICATOR (DTI)

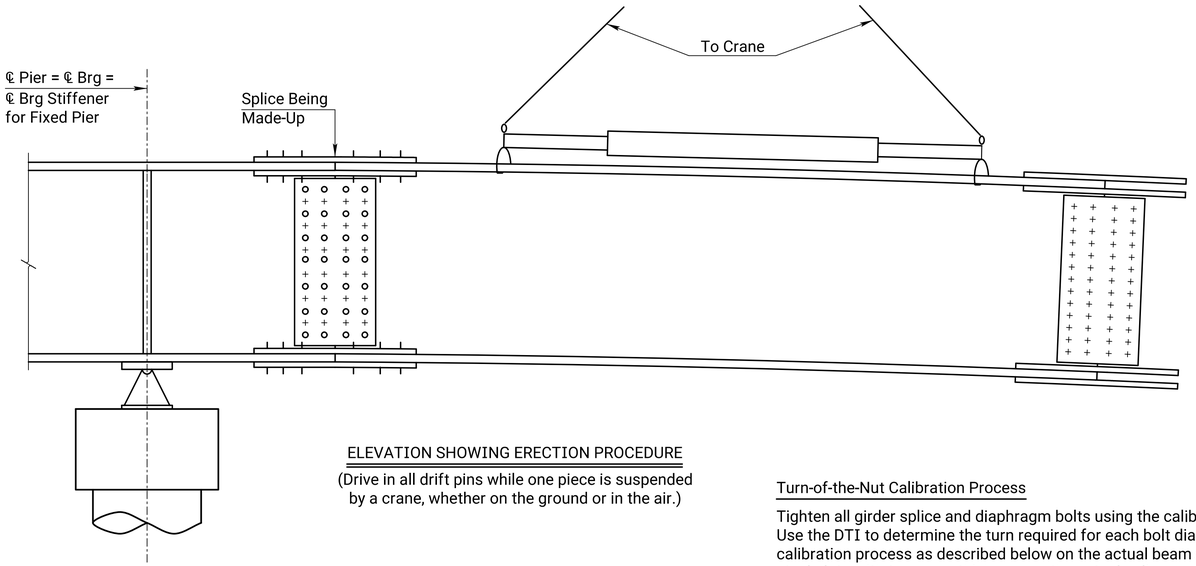


REQUIRED MARKING DETAIL

(shows calibrated turn = 3½ flats from snug tight condition.) Example only, calibrated turn may be more or less than shown.



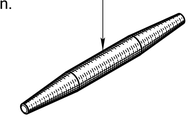
PROPER FIT-UP (DRIFTING)



ELEVATION SHOWING ERECTION PROCEDURE

(Drive in all drift pins while one piece is suspended by a crane, whether on the ground or in the air.)

Drift Pin Diameter = Hole Diameter
Hole ø = $1\frac{5}{16}$" for girder splice.
Hole ø = $1\frac{5}{16}$" for X-frame or diaphragm connection.



DRIFT PIN

Production Bolt Tightening

1. Install bolts and tighten to "snug tight" in a pattern, starting at the center of the splice and working toward the edge. On large girders this may have to be done twice, as the center bolts will become loose as plates are "Ironed out". This step is important because typically, any variation in results during production bolting is the result of a change in the materials, lubricant or equipment used to take the bolts to a "snug tight" condition during the calibration process.

2. Mark all of the bolts, nuts and the plate as shown in the marking detail. Mark the socket with a start and stop point. The stop point corresponds to the target rotation determined earlier.

3. Align the start mark on the socket with the line on the plate. While the bolt is being backed up, turn the nut until the stop mark on the socket lines up with the start mark on the plate.

4. Repeat with all bolts of the same length in the splice.

Acceptance and Rejection of Bolts

1. The Engineer will check all bolts with a feeler gage.

2. All nuts must be turned at least the target rotation beyond "snug tight".

3. All DTI's must have at least 3 refusals of the 0.005" gage.

4. If all gaps refuse the 0.005" gage, and the nut, plate and bolt are not marked, reject the bolt.

5. If all gaps refuse the 0.005" gage, and the turned element has not been rotated more than 45° beyond the calibrated turn, accept the bolt.

6. If all gaps refuse the 0.005" gage, and the turned element has been rotated more than 45° beyond the calibrated turn, reject the bolt.

For additional information see the structural steel section of the Bridge Construction Manual.

Suggested Impact wrench models:
CP 611
IR 2940
Cleco WS2110
ATP 1011/1040
Norbar PT1500

Fit Up

During the fit up, install drift pins in all corner bolt holes, plus 25 percent of the bolt holes (as a min.), evenly distributed throughout the splice. Fill at least 25 percent of the bolt holes with high strength bolts. Fully tighten these bolts by the calibrated turn-of-the-nut method before removing any drift pins or moving the members. These bolts may be either erection bolts or production bolts. Erection bolts are used during fit up, to compress the plies of the splice to achieve a snug condition. Erection bolts are the property of the Contractor and do not remain in the bridge permanently. Erection bolts must be A325, and can be reused. Erection bolts are required when the abutting plates are of different thickness and no fill plate is provided. This situation usually results in a slight bending of the splice plates. If erection bolts are not used, the DTI's may fully compress before the plates are in firm contact. This would be cause for rejecting the splice. Clearly mark the erection bolts so that they are not left in the splice.

Erection

Two independent crews will survey the bearing seat elevations. The Engineer will verify that the results of those surveys show that the bearing seat elevations are within ±¼ inch of the plan elevations before erection begins. Use the blocking diagram, as shown on the shop drawings, when erecting the beams/girders on the ground. Do not lift the assembled pieces into position until at least 25 percent of the holes are filled with fully tightened bolts. Locate the centerline of the bearing stiffener with the centerline of bearing device. Secure the beams/girders to the top of the pier cap prior to placement of the bearing device anchor bolts.

Turn-of-the-Nut Calibration Process

Tighten all girder splice and diaphragm bolts using the calibrated turn-of-the-nut method. Use the DTI to determine the turn required for each bolt diameter & length. Perform the calibration process as described below on the actual beam splice or using 3 plies of steel plate with the same thickness as the actual splice.

1. Bring at least 25 percent of the bolts in the splice to a "snug-tight-condition". "Snug tight condition" is defined as (with all plies in firm contact) "the full effort of a man on a spud wrench". Usually a smaller impact gun (½" drive) is used to snug the splice and a larger impact gun (1" drive) is used for final tightening. This is preferred over the use of a spud wrench. Production bolting and calibration must use the same tools and lubricating procedures. If an impact wrench is used to "iron the plates" and snug the bolts for calibration, then an impact wrench must be used during the snugging process during production bolting.

2. See "Required Marking Detail" (choose a bolt at the center of the splice and recheck snug on adjacent bolts).
   a. Mark the outside of the socket at one of the corners.
   b. Mark the bolt, plate, and nut at a corner with a start line.
   c. Align the mark on the socket with the start mark on the bolt end.
   d. While holding a backup wrench on the head of the bolt, turn the nut 1/2 turn (3 flats).
   e. Record the number of refusals.
   f. If all of the gaps refuse, go to another bolt and turn the nut 2 flats (1/3 turn).
   g. If there are fewer than 3 refusals turn the nut an additional 1/4 of a flat (15 degrees).
   h. Repeat step g., turning the nut 1/3 of a flat or less each time, until all of the gaps refuse the feeler gage. Record the amount required to cause all of the gaps to refuse the feeler gage. This is the target rotation.

3. Repeat this process for each bolt diameter and length.

NO.	DATE	REVISIONS	BY	APP'D
03				
02				
01	04-25-05	Current Release	R.A.M.	K.F.H.

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 281-071-198.72 (055) Sta. 186+90.75

STEEL ERECTION, FIT-UP
AND BOLTING PROCEDURE

Proj. 281-071 KA-6020-01 Osborne Co.

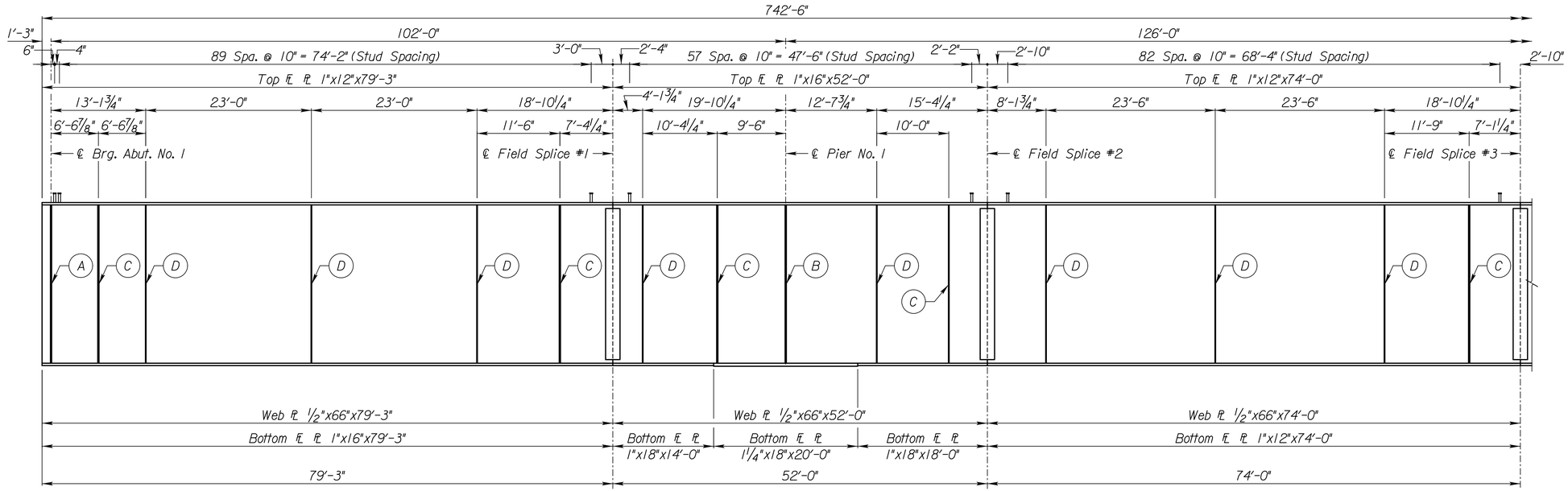
DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN.CK.	CADD CK.

KDOT Graphics Certified 05-16-2023 Sh. No. 108

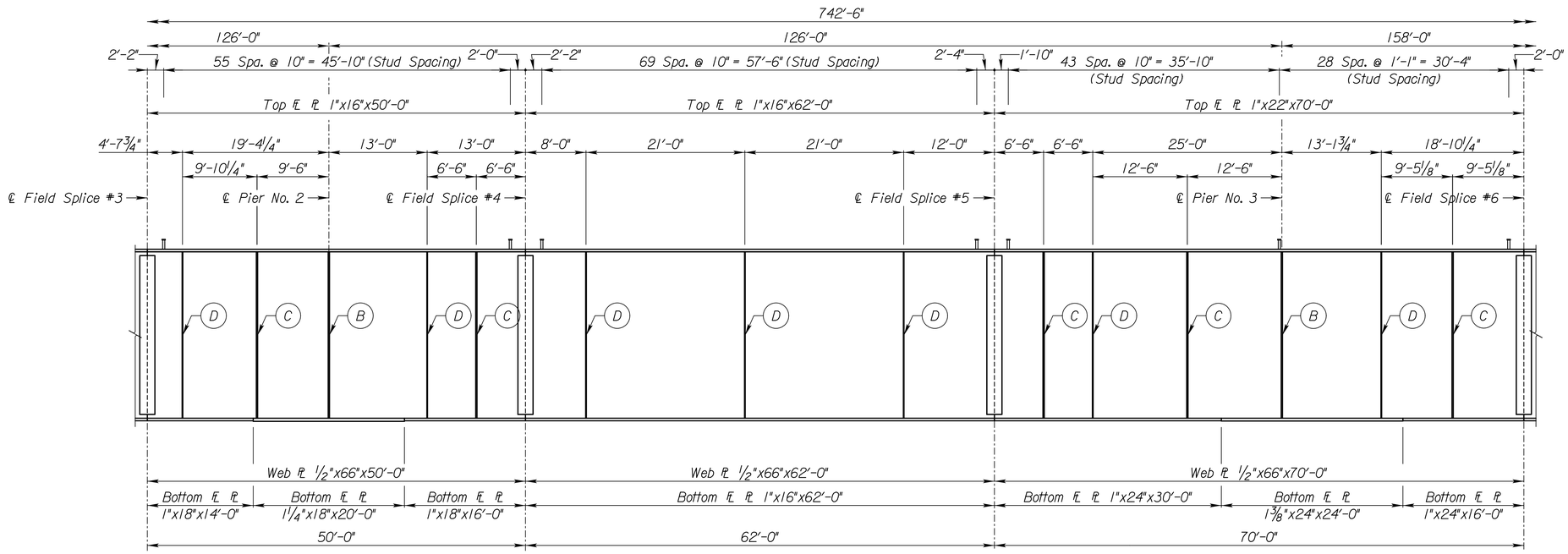
KDOT Graphics Certified

Drawn By : KKATHRIN Plotted : 07-11-24
File : c:\pwworking\central01\d2597941\ka602001bbr0055-SE.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	109	293



PARTIAL ELEVATION



PARTIAL ELEVATION

(A) Abut. Brg. Stiffener (E.S.)†

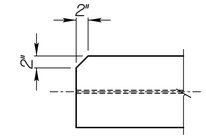
(B) Pier Brg. Stiffener (E.S.)†

(C) 1/2"x7"x5'-6" Int. Stiffener (N.S.)

(D) 1/2"x7"x5'-6" Int. Conn. Stiff (E.S.)

† For Plate Details, See Sh. No. 115

Notation:
Each Side (E.S.)
Near Side (N.S.)
Far Side (F.S.)



TYPICAL GIRDER FLANGE TRIM DETAIL
(Note: Trim Top & Bottom Flanges)

Note:
All longitudinal dimensions are horizontal. All transverse web stiffeners are perpendicular to the top flange of the girder except the bearing stiffeners which shall be vertical. Cut girder web ends vertical. Correct girder lengths for grade.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 281-071-198.72 (055) Sta. 186+90.75

GIRDER A DETAILS (1 OF 2)
US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

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

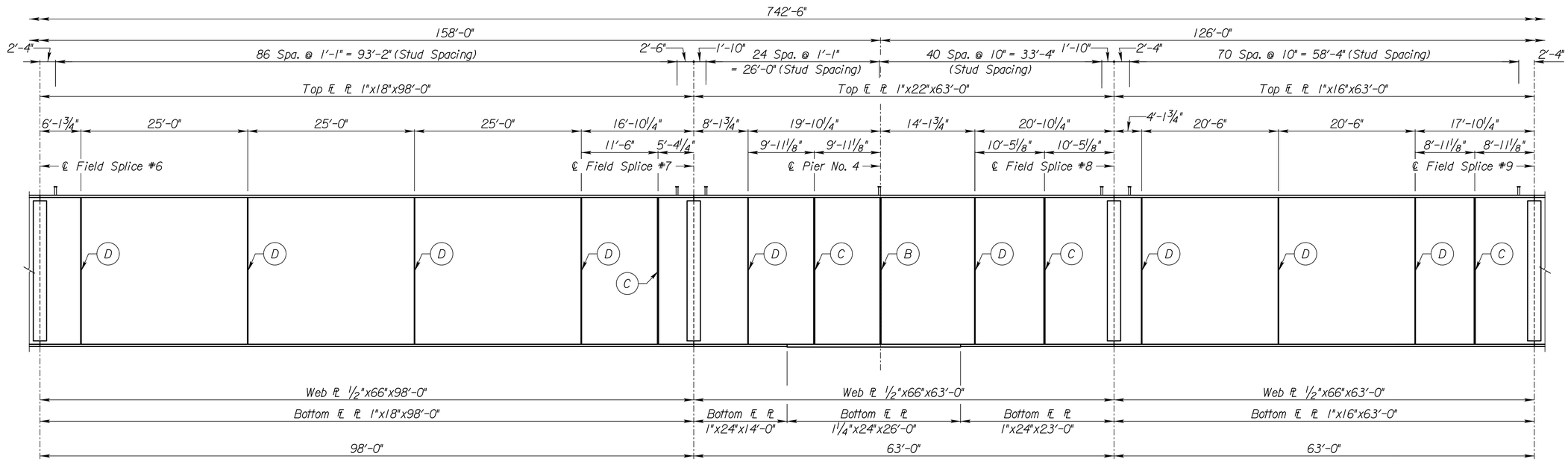
KDOT Graphics Certified 04-25-2023

Sheet No. 109

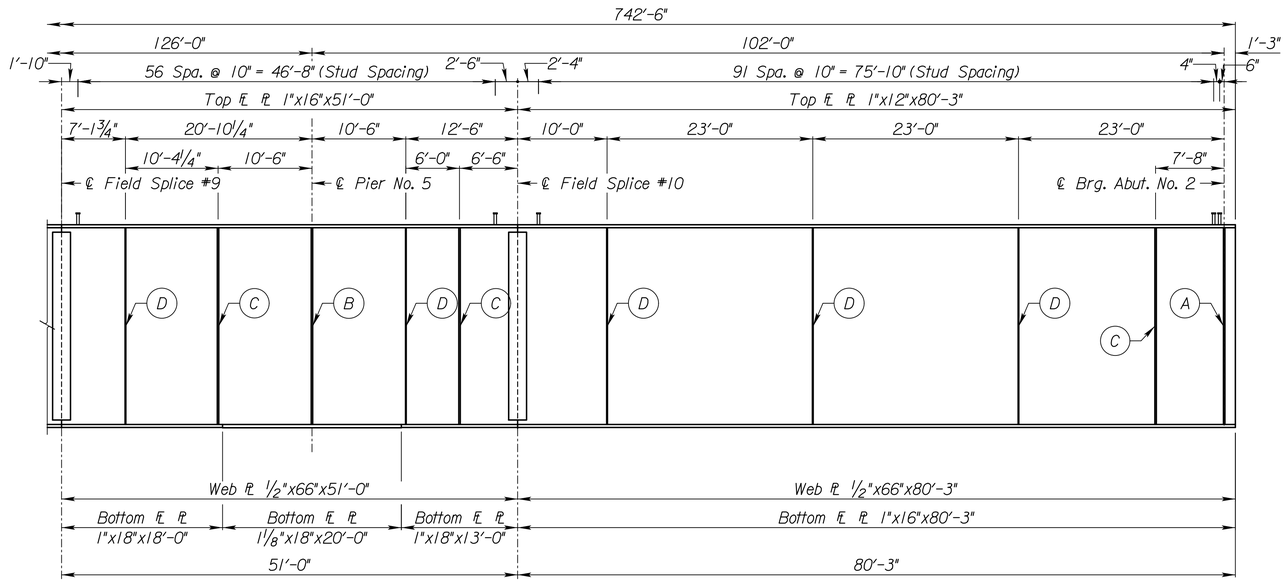
KDOT Graphics Certified

Plotted By: KKATHRIN | Plot Location:
File: c:\pwworking\central01\d2597941\kda60200lbbr0055-G01.dgn
Plot Date: 07-11-24

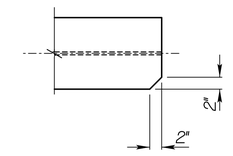
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	110	293



PARTIAL ELEVATION



PARTIAL ELEVATION



TYPICAL GIRDER FLANGE TRIM DETAIL
(Note: Trim Top & Bottom Flanges)

- (A) Abut. Brg. Stiffener (E.S.)†
- (B) Pier Brg. Stiffener (E.S.)†
- (C) 1/2"x7"x5'-6" Int. Stiffener (N.S.)
- (D) 1/2"x7"x5'-6" Int. Conn. Stiff (E.S.)

† For Plate Details, See Sh. No. 115

Notation:
Each Side (E.S.)
Near Side (N.S.)
Far Side (F.S.)

Note:
All longitudinal dimensions are horizontal. All transverse web stiffeners are perpendicular to the top flange of the girder except the bearing stiffeners which shall be vertical. Cut girder web ends vertical. Correct girder lengths for grade.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-071-198.72 (055) Sta. 186+90.75

GIRDER A DETAILS (2 OF 2)
US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

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

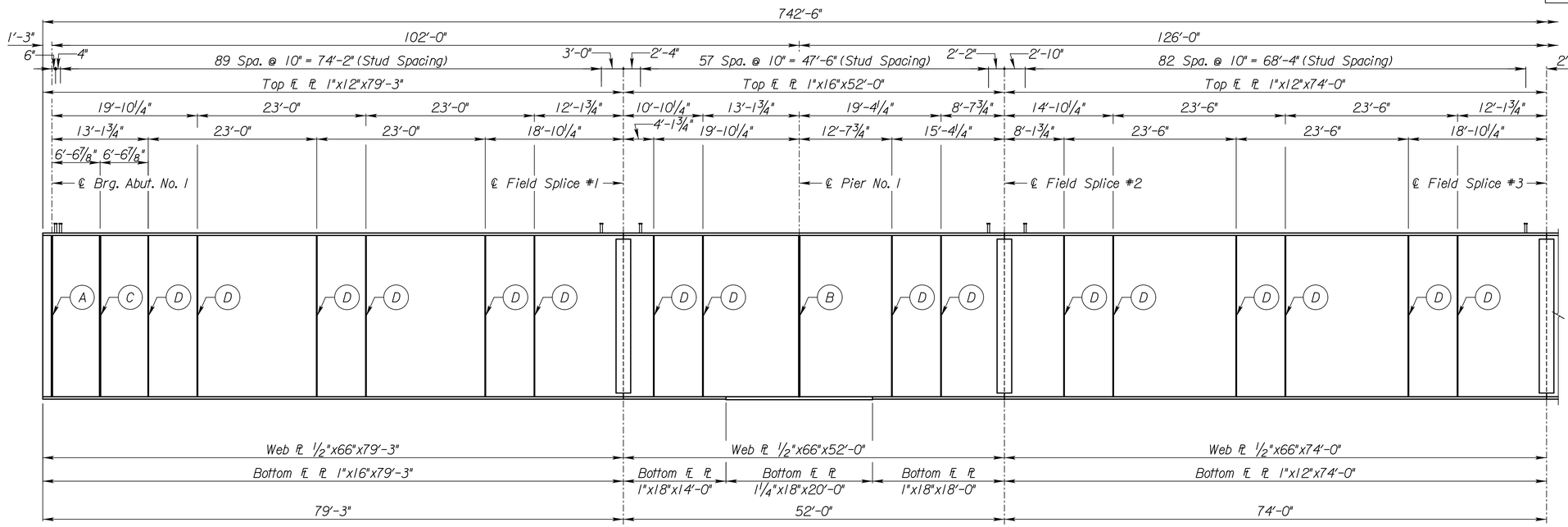
KDOT Graphics Certified 07-17-2023

Sheet No. 110

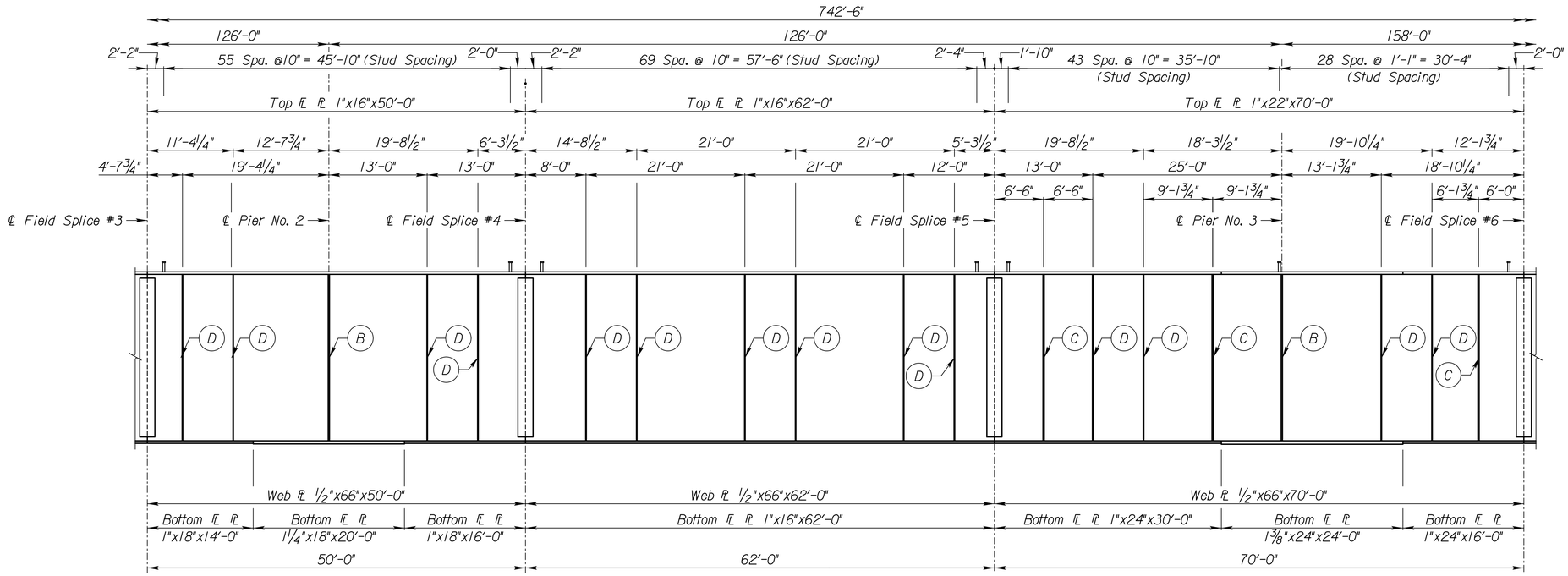
KDOT Graphics Certified

Plotted By: KKATHRIN Plot Location:
File: c:\pwworking\central01\d2597941\kx602001\bbr0055-g02.dgn
Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	111	293



PARTIAL ELEVATION



PARTIAL ELEVATION

(A) Abut. Brg. Stiffener (E.S.)†

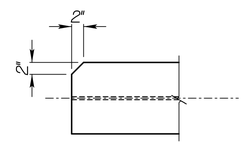
(B) Pier Brg. Stiffener (E.S.)†

(C) 1/2"x7"x5'-6" Int. Stiffener (N.S.)

(D) 1/2"x7"x5'-6" Int. Conn. Stiff (E.S.)

† For Plate Details, See Sh. No. 115

Notation:
Each Side (E.S.)
Near Side (N.S.)
Far Side (F.S.)



TYPICAL GIRDER FLANGE TRIM DETAIL
(Note: Trim Top & Bottom Flanges)

Note:
All longitudinal dimensions are horizontal. All transverse web stiffeners are perpendicular to the top flange of the girder except the bearing stiffeners which shall be vertical. Cut girder web ends vertical. Correct girder lengths for grade.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-071-198.72 (055) Sta. 186+90.75

GIRDERS B, C & D DETAILS (1 OF 2)
US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

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

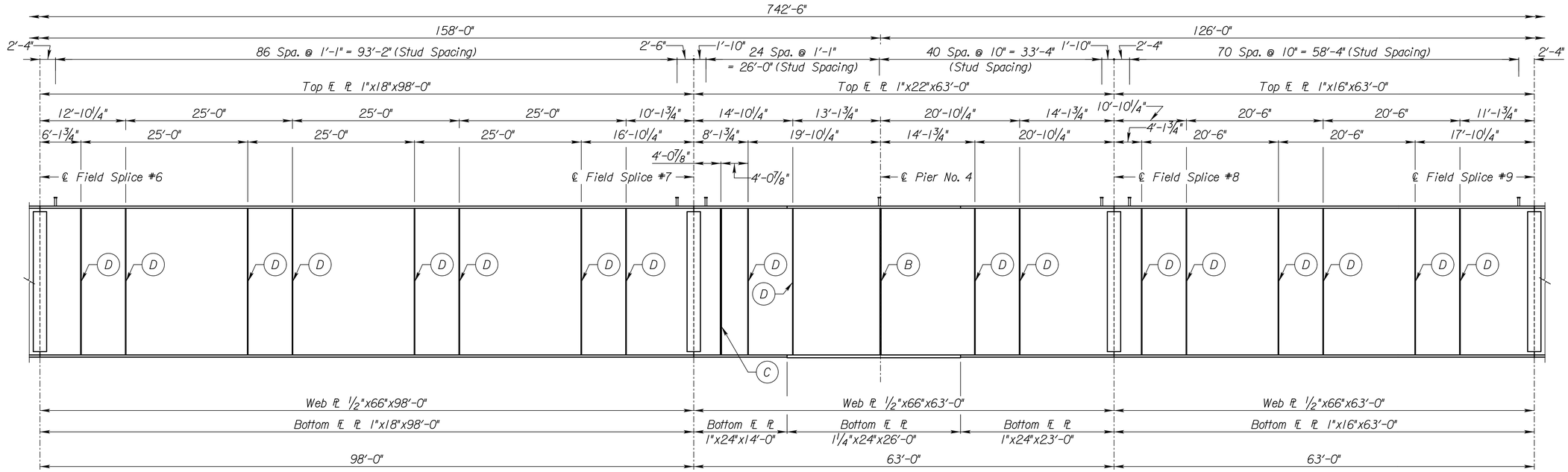
KDOT Graphics Certified 07-14-2023

Sheet No. 111

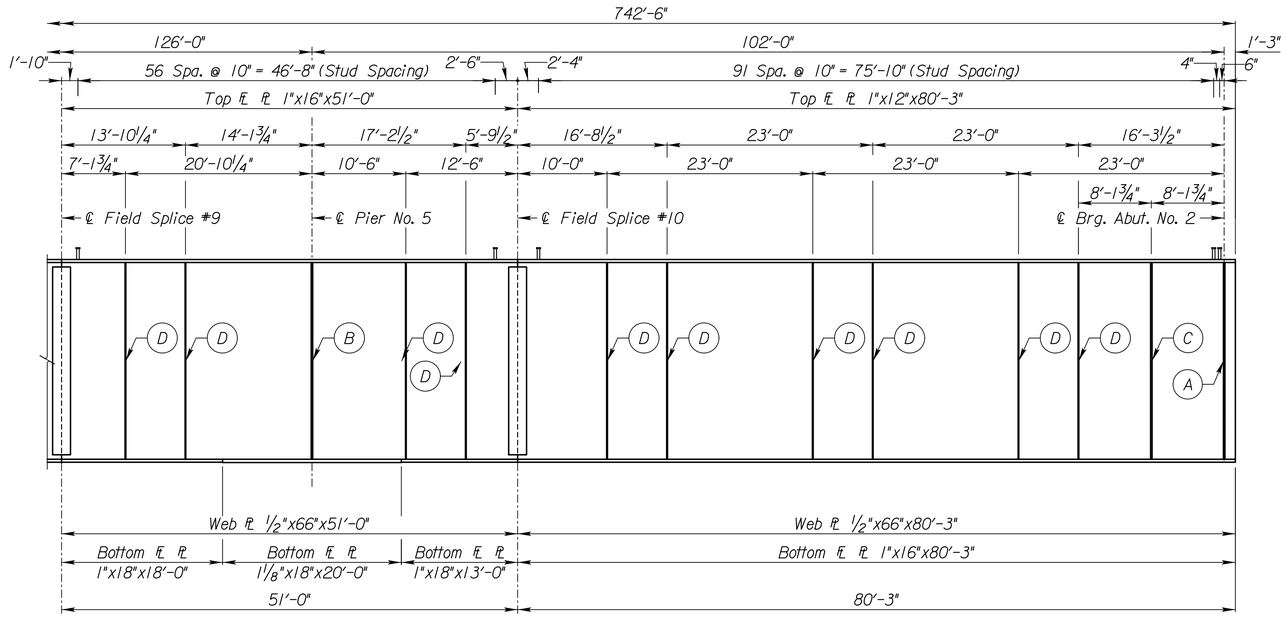
KDOT Graphics Certified

Plotted By: KKATHRIN
File: c:\pwworking\central01\d2597941\kx602200\bbr0055-603.dgn
Plot Location:
Plot Date: 07-11-24

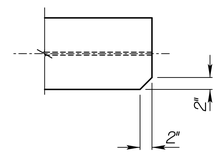
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	112	293



PARTIAL ELEVATION



PARTIAL ELEVATION



TYPICAL GIRDER FLANGE TRIM DETAIL
(Note: Trim Top & Bottom Flanges)

(A) Abut. Brg. Stiffener (E.S.)†
(B) Pier Brg. Stiffener (E.S.)†
(C) 1/2"x7"x5'-6" Int. Stiffener (N.S.)
(D) 1/2"x7"x5'-6" Int. Conn. Stiff (E.S.)

† For Plate Details, See Sh. No. 115

Notation:
Each Side (E.S.)
Near Side (N.S.)
Far Side (F.S.)

Note:
All longitudinal dimensions are horizontal. All transverse web stiffeners are perpendicular to the top flange of the girder except the bearing stiffeners which shall be vertical. Cut girder web ends vertical. Correct girder lengths for grade.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-071-198.72 (055) Sta. 186+90.75

GIRDER B, C & D DETAILS (2 OF 2)
US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

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

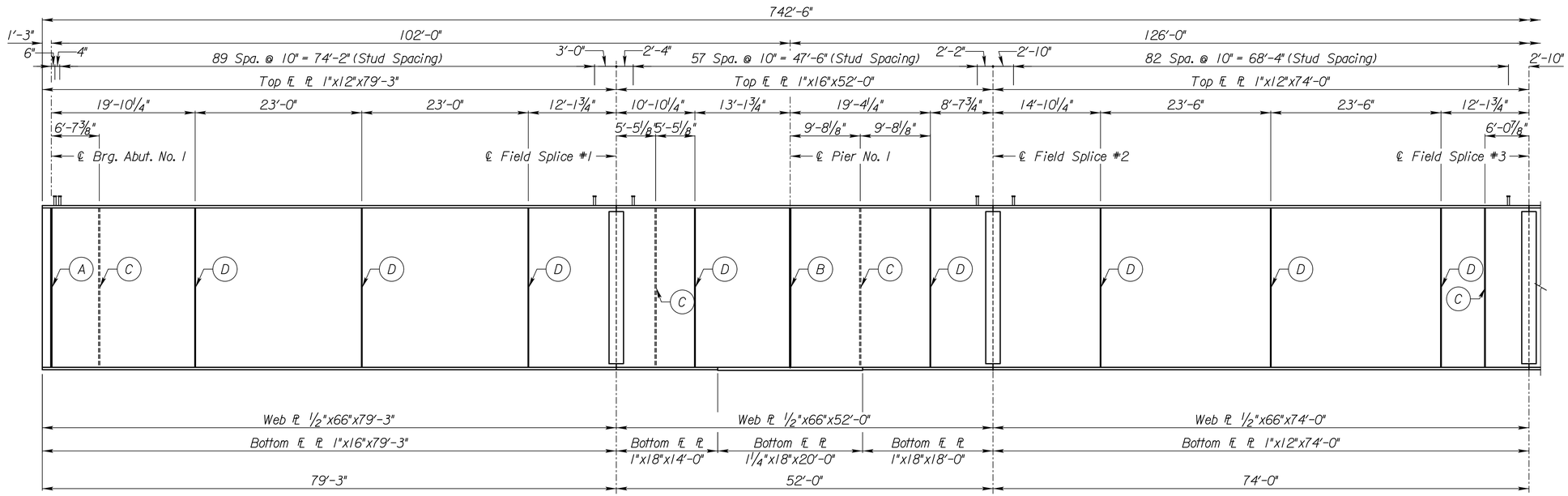
KDOT Graphics Certified 07-17-2023

Sheet No. 112

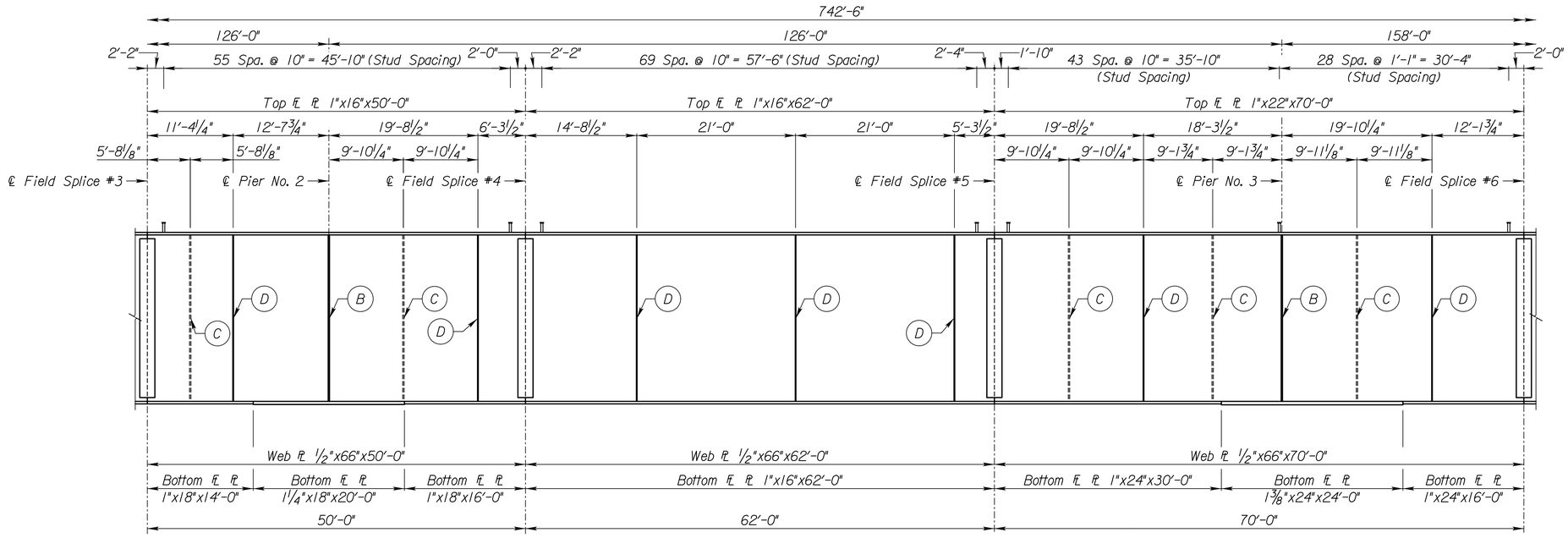
KDOT Graphics Certified

Plotted By: KKATHRIN | Plot Location:
File: c:\pwworking\central01\d2597941\tx6020001bbr0055-GD4.dgn
Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	113	293



PARTIAL ELEVATION



PARTIAL ELEVATION

(A) Abut. Brg. Stiffener (E.S.)†

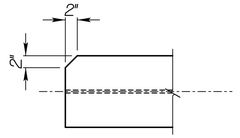
(B) Pier Brg. Stiffener (E.S.)†

(C) 1/2"x7"x5'-6" Int. Stiffener (F.S.)

(D) 1/2"x7"x5'-6" Int. Conn. Stiff (E.S.)

† For Plate Details, See Sh. No. 115

Notation:
Each Side (E.S.)
Near Side (N.S.)
Far Side (F.S.)



TYPICAL GIRDER FLANGE TRIM DETAIL
(Note: Trim Top & Bottom Flanges)

Note:
All longitudinal dimensions are horizontal. All transverse web stiffeners are perpendicular to the top flange of the girder except the bearing stiffeners which shall be vertical. Cut girder web ends vertical. Correct girder lengths for grade.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-071-198.72 (055) Sta. 186+90.75

GIRDER E DETAILS (1 OF 2)
US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

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

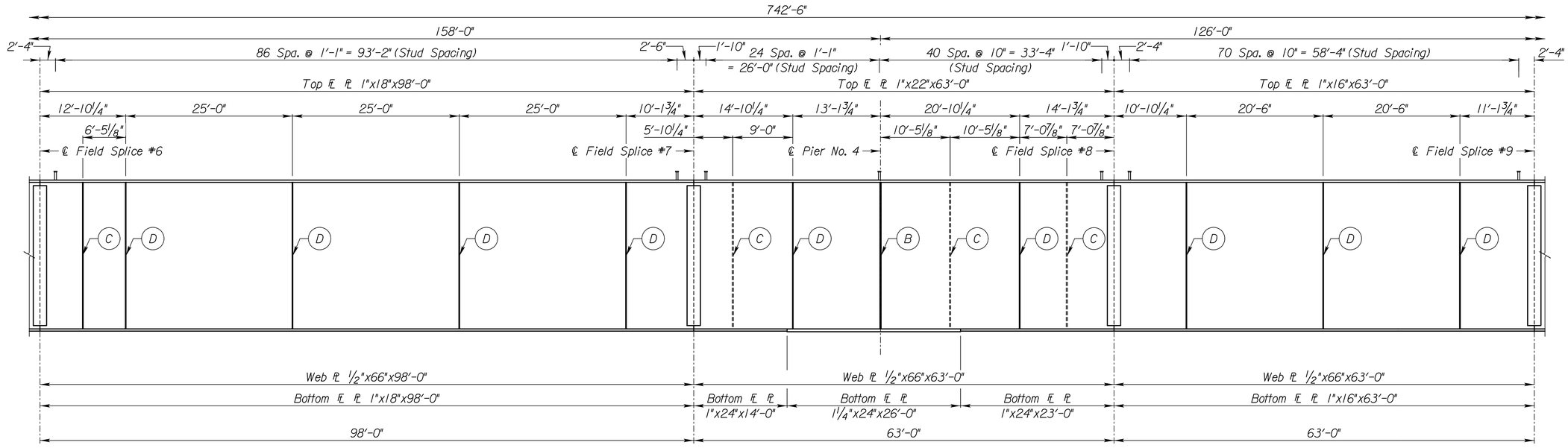
KDOT Graphics Certified 07-17-2023

Sheet No. 113

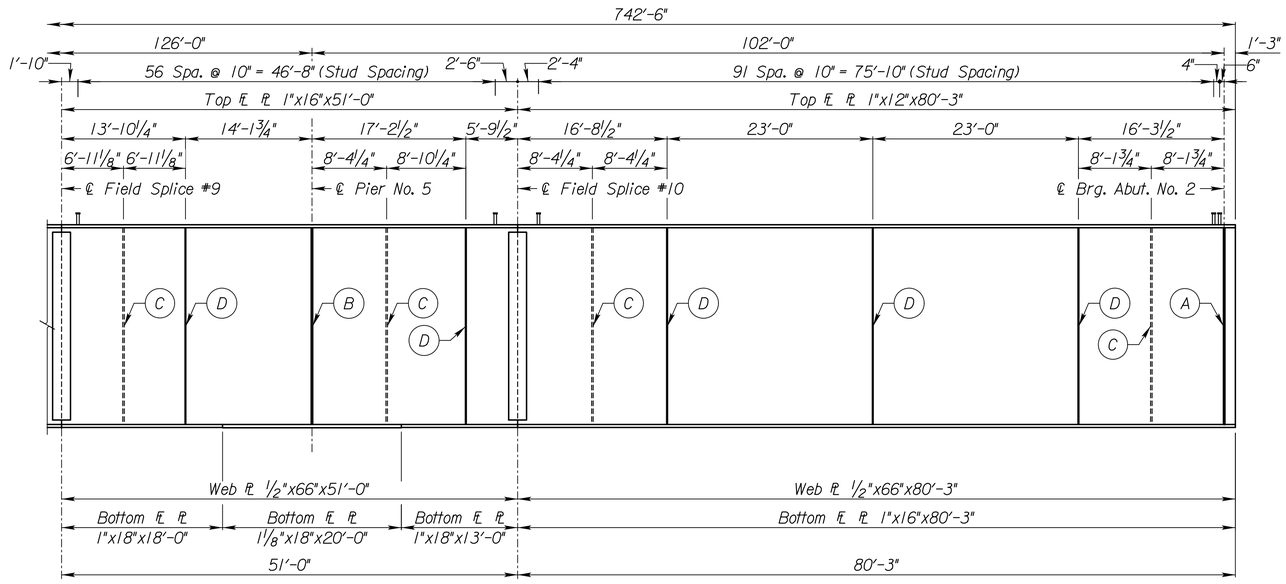
KDOT Graphics Certified

Plotted By: KKATHRIN
Plot Location:
File: c:\pwworking\central01\d2597941\kdot6020001bbr0055-GD5.dgn
Plot Date: 07-11-24

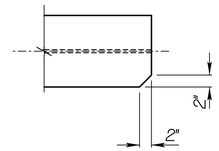
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	114	293



PARTIAL ELEVATION



PARTIAL ELEVATION



TYPICAL GIRDER FLANGE TRIM DETAIL
(Note: Trim Top & Bottom Flanges)

(A) Abut. Brg. Stiffener (E.S.)†
(B) Pier Brg. Stiffener (E.S.)†
(C) 1/2"x7"x5'-6" Int. Stiffener (F.S.)
(D) 1/2"x7"x5'-6" Int. Conn. Stiff (E.S.)

† For Plate Details, See Sh. No. 115

Notation:
Each Side (E.S.)
Near Side (N.S.)
Far Side (F.S.)

Note:
All longitudinal dimensions are horizontal. All transverse web stiffeners are perpendicular to the top flange of the girder except the bearing stiffeners which shall be vertical. Cut girder web ends vertical. Correct girder lengths for grade.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-071-198.72 (055) Sta. 186+90.75

GIRDER E DETAILS (2 OF 2)
US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

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

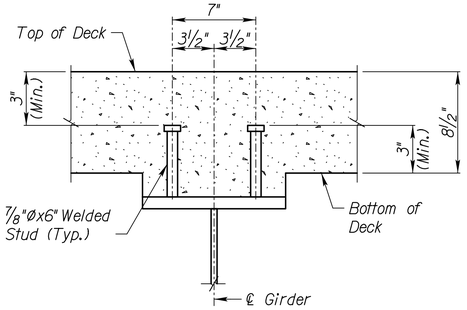
KDOT Graphics Certified 09-20-2023

Sheet No. 114

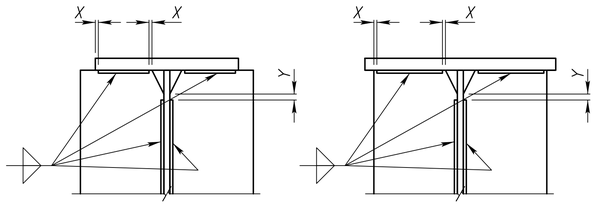
KDOT Graphics Certified

Plotted By: KKATHRIN Plot Location:
File: c:\pwworkingcentral01\d2597941\kx602001bbr0055-606.dgn
Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	115	293



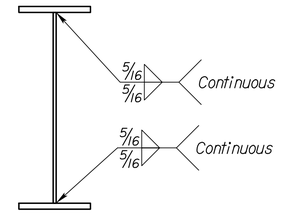
SHEAR CONNECTOR DETAIL



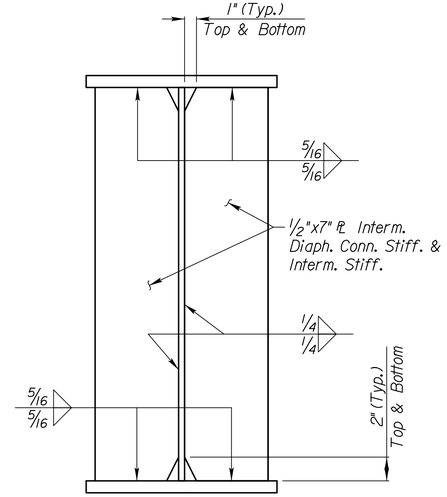
TYPICAL WELD LIMIT DETAILS

$X = \frac{1}{4}" \pm \frac{1}{8}"$

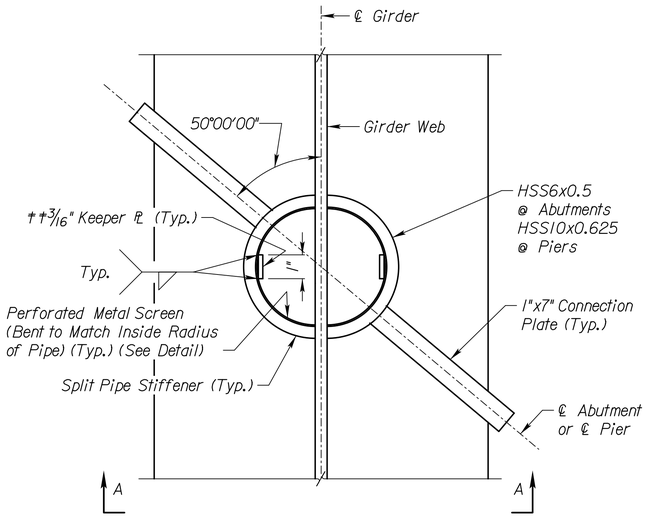
$Y = \frac{1}{2}" \pm \frac{1}{4}"$



TYPICAL WEB TO FLANGE WELD



INTERMEDIATE DIAPHRAGM CONNECTION STIFFENERS
INTERMEDIATE STIFFENERS

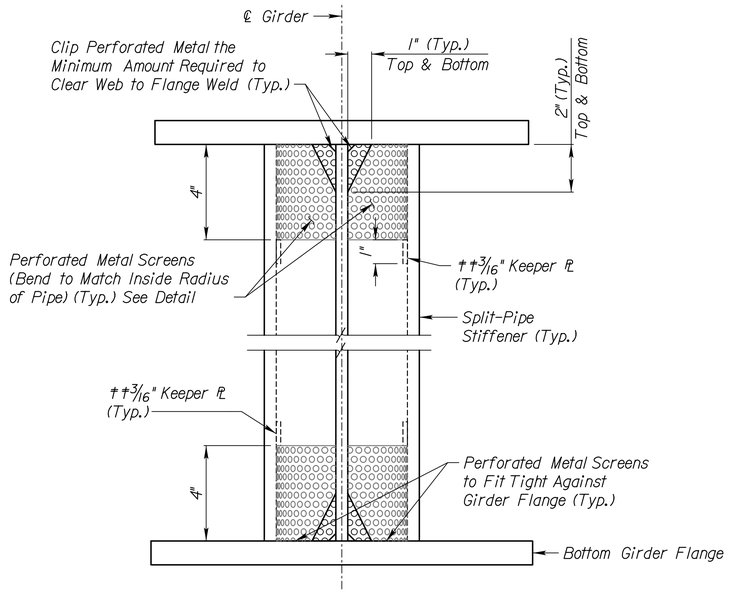


SPLIT PIPE BEARING STIFFENER ASSEMBLY PLAN

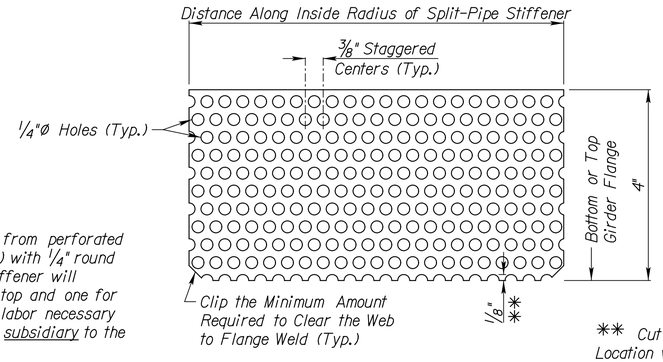
†† An adhesive may be used to bond the perforated metal screens to inside face of split-pipe stiffener to aid in fit and assembly. Install 3/16" keeper plates prior to welding split-pipe stiffener to girder web.

Notes: Prime and paint the split-pipe stiffener after the connection plates have been welded. Finish coat shall match Kansas Brown, Federal #20045.

Structural steel for the split pipe stiffeners shall meet the requirements of ASTM A1085.



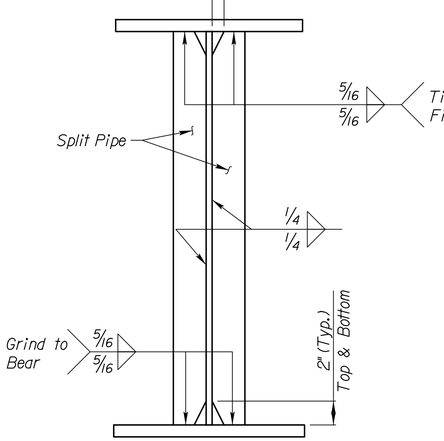
SECTION A-A
(Connection Plates Not Shown)



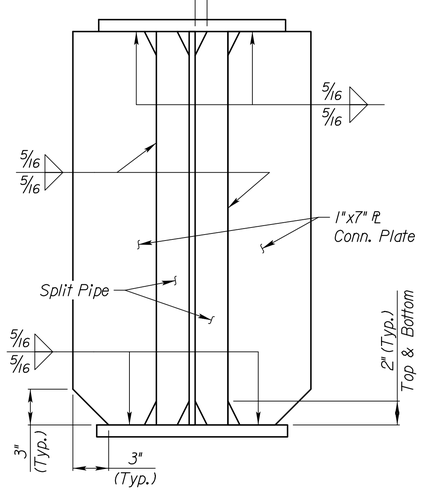
PERFORATED METAL DETAIL

** Cut Perforated Metal to the Half Hole Location where it Touches the Girder Bottom Flange to allow for Drainage.

Note: The Perforated Metal Screens shall be fabricated from perforated metal, stainless steel, Type 304, 11 gauge (⅛" thick) with ¼" round holes on ⅜" staggered centers. Each split pipe stiffener will require two (2) Perforated Metal Screens, one for top and one for bottom as shown in the details. All materials and labor necessary to fabricate the Perforated Metal Screens shall be subsidiary to the bid item "Structural Steel (M270) (Grade 50WT3)".



SPLIT PIPE BEARING STIFFENER
(Connection Plates Not Shown)



SPLIT PIPE BEARING STIFFENER

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-071-198.72 (055) Sta. 186+90.75

MISCELLANEOUS GIRDER DETAILS
US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

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

KDOT Graphics Certified 09-08-2023

Sheet No. 115

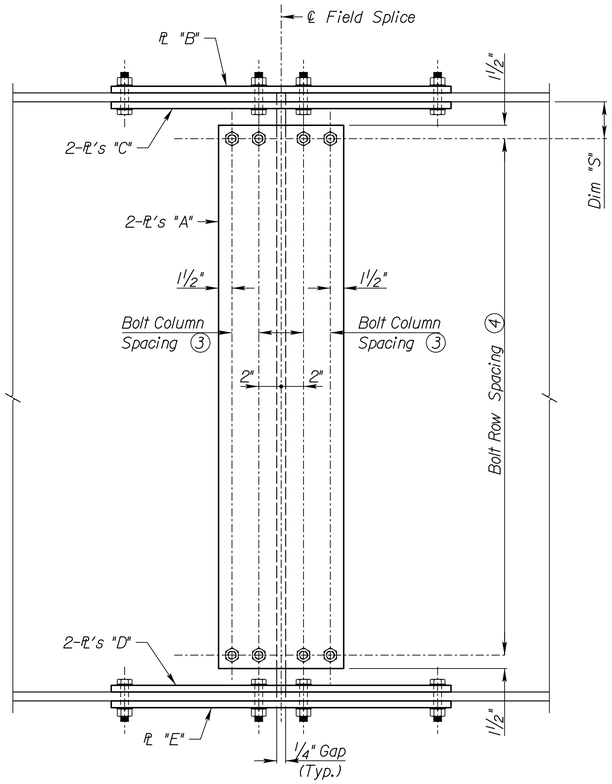
KDOT Graphics Certified

Plotted By: KKATHRIN Plot Location:
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Plot Date: 07-11-24

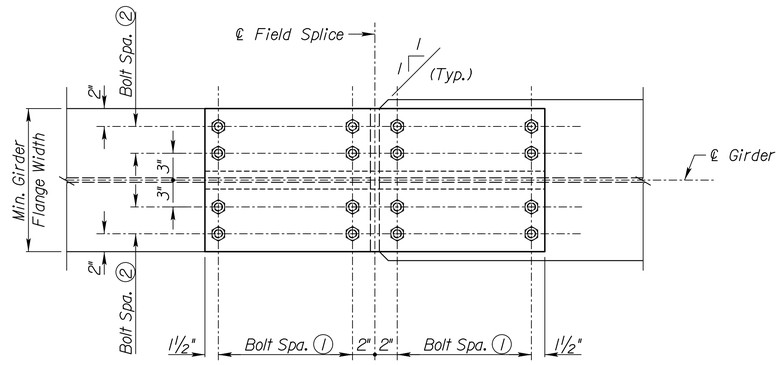
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	116	293

FIELD SPLICE SCHEDULE

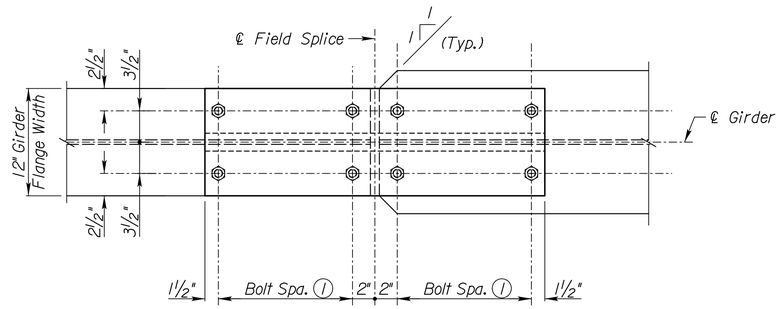
Field Splice #	Top Flange Splice					Web Plate Splice				Bottom Flange Splice				
	Min. Flange Width	Plate "B"	Plate "C" (2 Required)	① Bolt Spacing	② Bolt Spacing	Web Plate "A" (2 Required)	③ Bolt Column Spacing	④ Bolt Row Spacing	Dim "S"	Min. Flange Width	Plate "D" (2 Required)	Plate "E"	① Bolt Row Spacing	② Bolt Row Spacing
1 & 10	12"	3/4" x 12" x 3'-7"	7/8" x 5" x 3'-7"	6 @ 3" = 1'-6"	-	3/8" x 13" x 5'-0 3/4"	1 @ 3" = 0'-3"	11 @ 5 1/4" = 4'-9 3/4"	4 1/8"	16"	3/4" x 7" x 2'-1"	5/8" x 16" x 2'-1"	3 @ 3" = 0'-9"	1 @ 3" = 0'-3"
2 & 3	12"	3/4" x 12" x 3'-1"	7/8" x 5" x 3'-1"	5 @ 3" = 1'-3"	-	3/8" x 13" x 5'-0 3/4"	1 @ 3" = 0'-3"	11 @ 5 1/4" = 4'-9 3/4"	4 1/8"	12"	7/8" x 5" x 3'-1"	3/4" x 12" x 3'-1"	5 @ 3" = 1'-3"	-
4, 5, 8 & 9	16"	5/8" x 16" x 2'-1"	3/4" x 7" x 2'-1"	3 @ 3" = 0'-9"	1 @ 3" = 0'-3"	3/8" x 13" x 5'-0 3/4"	1 @ 3" = 0'-3"	11 @ 5 1/4" = 4'-9 3/4"	4 1/8"	16"	3/4" x 7" x 2'-7"	5/8" x 16" x 2'-7"	4 @ 3" = 1'-0"	1 @ 3" = 0'-3"
6 & 7	18"	5/8" x 18" x 2'-7"	3/4" x 8" x 2'-7"	4 @ 3" = 1'-0"	1 @ 4" = 0'-4"	3/8" x 13" x 5'-0 3/4"	1 @ 3" = 0'-3"	11 @ 5 1/4" = 4'-9 3/4"	4 1/8"	18"	3/4" x 8" x 2'-7"	5/8" x 18" x 2'-7"	4 @ 3" = 1'-0"	1 @ 4" = 0'-4"



WEB FIELD SPLICE ELEVATION



FLANGE SPLICE
(Field Splices #4, 5, 6, 7, 8 & 9 Top Flange)
(Field Splices #1, 4, 5, 6, 7, 8, 9 & 10 Bottom Flange)



FLANGE SPLICE
(Field Splices #1, 2, 3 & 10 Top Flange)
(Field Splices #2 & 3 Bottom Flange)

STRUCTURAL STEEL: The flange and web splice plates shall meet AASHTO M270 Gr. 50W T3 requirements.

PAINTING: Blast clean faying surfaces to a surface condition of SSPC-SP6 or better to satisfy Class B surface requirements prior to connection. Shop prime coat the top flange, top flange splice plates, and exterior web splice plate of exterior girders.

Note:
All bolt locations require 15/16"Ø holes. All bolts shall be 7/8"Ø ASTM F3125 Grade A325, Type 3, with Direct Tension Indicators (DTI's) complying with requirements of the latest edition of ASTM F959.

Plotted By: KKATHRIN
File: c:\pwworking\central01\d2597941\ka602001\bbr0055-SD.dgn
Plot Location:
Plot Date: 07-11-24

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-071-198.72 (055) Sta. 186+90.75

FIELD SPLICE DETAILS
US-281 OVER NORTH FORK SOLOMON RIVER

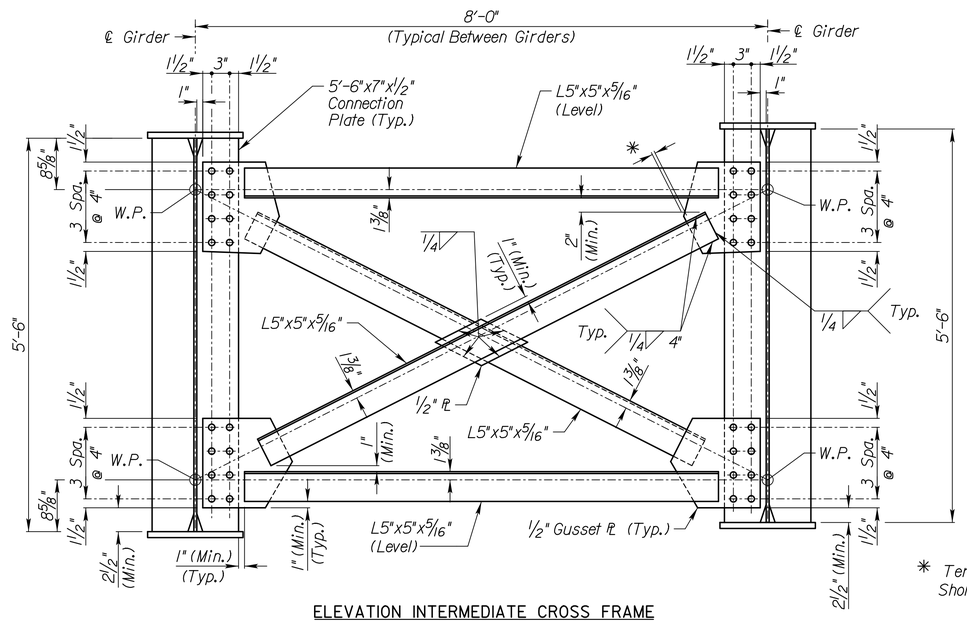
Proj. No. 281-071 KA-6020-01 Osborne Co.

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

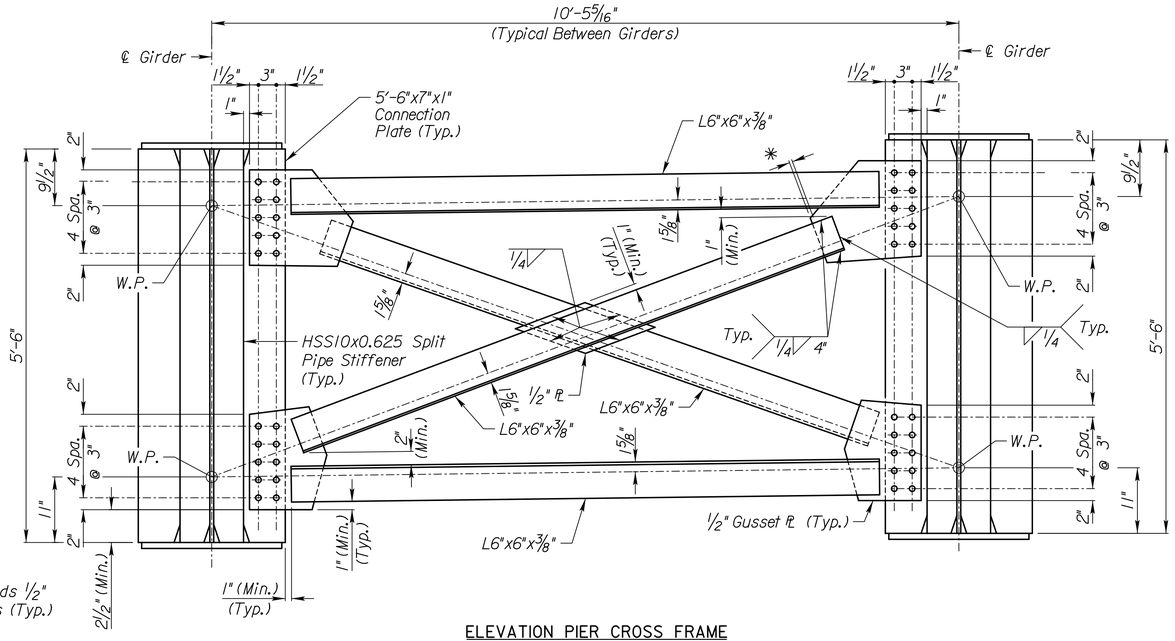
KDOT Graphics Certified 05-07-2024

KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	117	293



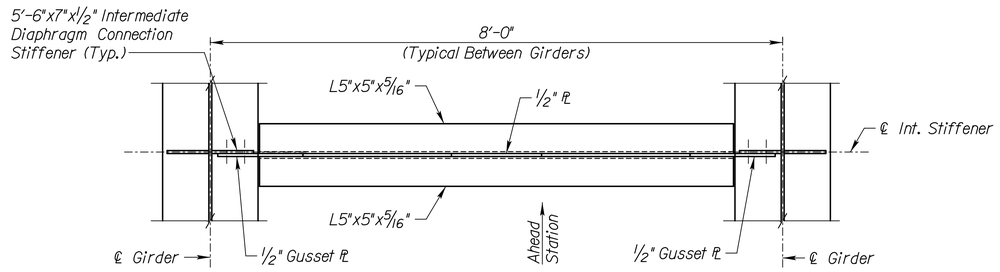
ELEVATION INTERMEDIATE CROSS FRAME
(116 Required)
(Looking Ahead Station)
(Adjacent Cross Frames Not Shown)
(All Horizontal Dimensions are Taken Perpendicular to ℄ Girder)



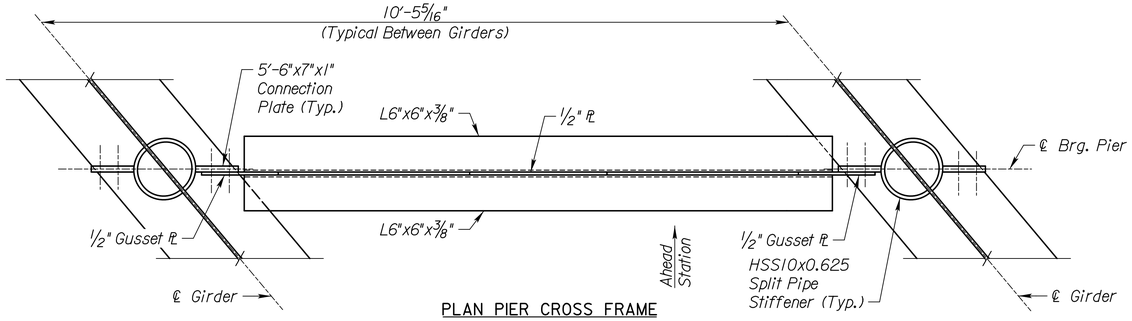
ELEVATION PIER CROSS FRAME
(4 Required Each Pier)
(Looking Ahead Station)
(Adjacent Cross Frames Not Shown)
(All Horizontal Dimensions are Taken Along ℄ Brg.)

* Terminate Welds 1/2" Short of Edges (Typ.)

Note:
Cross frames shall be fabricated for "Steel Dead Load Fit" (SDLF).



PLAN INTERMEDIATE CROSS FRAME
(Girder Top Flange Not Shown)
(Adjacent Cross Frames Not Shown)
(All Horizontal Dimensions are Taken Perpendicular to ℄ Girder)



PLAN PIER CROSS FRAME
(Girder Top Flange Not Shown)
(Adjacent Cross Frames Not Shown)
(All Horizontal Dimensions are Taken Along ℄ Brg.)

Note:
All bolt locations require 1"Ø holes.
All bolts shall be 7/8".

NO.	DATE	REVISIONS	BY	APP'D
3				
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1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-071-198.72 (055) Sta. 186+90.75

CROSS FRAME DETAILS (1 OF 2)
US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

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

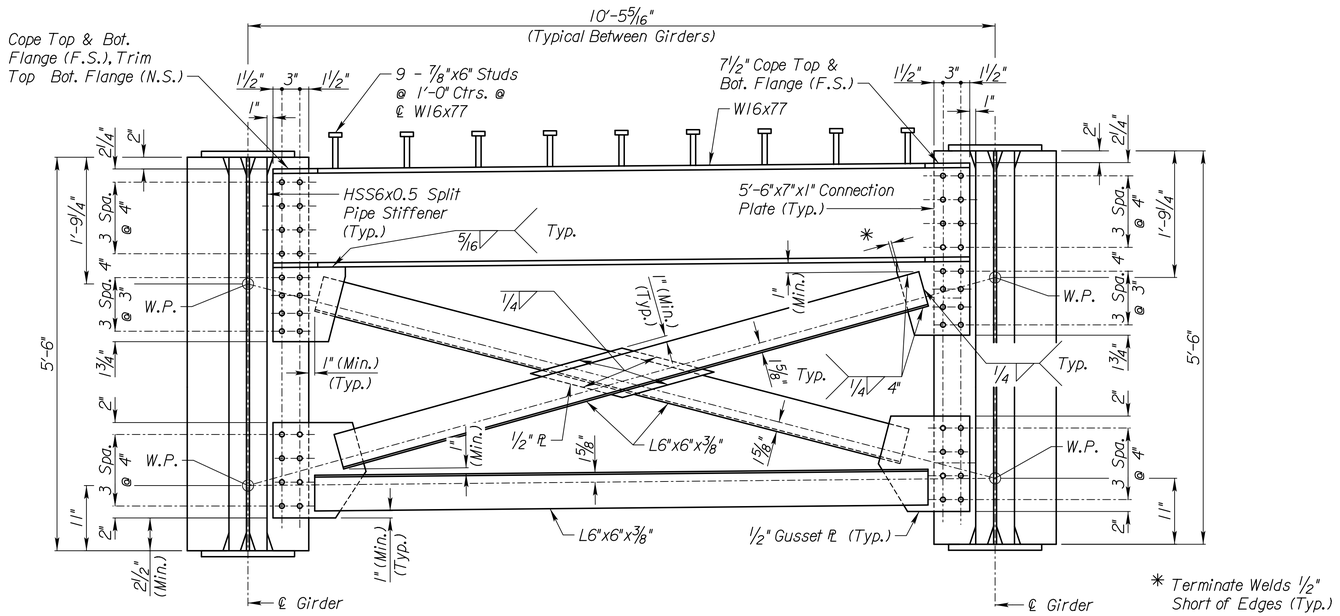
KDOT Graphics Certified 10-13-2023

Sheet No. 117

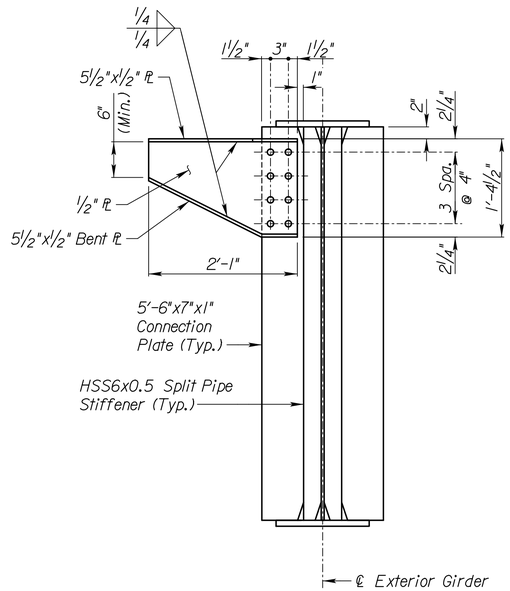
KDOT Graphics Certified

Plotted By: KKATHRIN Plot Location:
File: c:\pwworking\central01\d2597941\ka6020001\bbr0055-CF1.dgn
Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	118	293

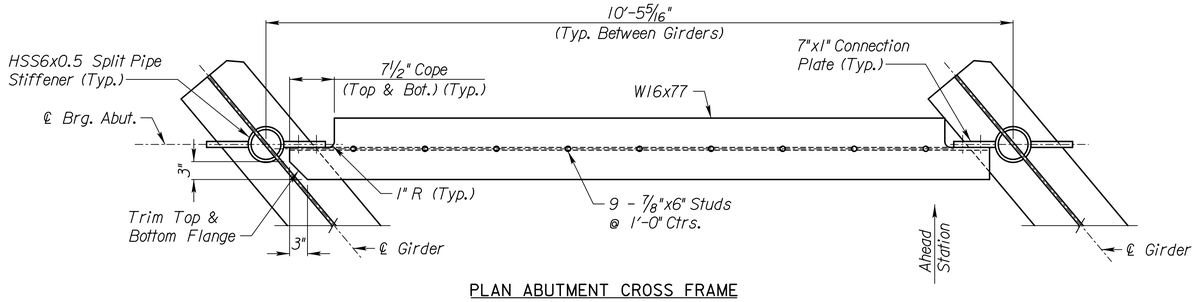


ELEVATION ABUTMENT CROSS FRAME
(Looking Ahead Station)
(Adjacent Cross Frames Not Shown)
(4 Required Each Abutment)
(All Horizontal Dimensions are Taken Along ℄ Brg.)

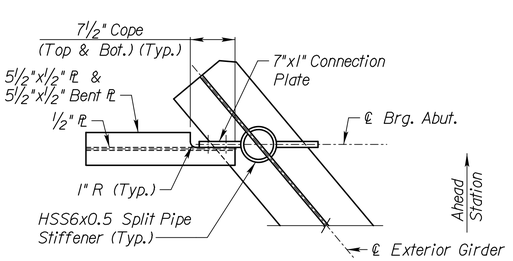


ELEVATION ABUTMENT CROSS FRAME
(Looking Ahead Station)
(Adjacent Cross Frames Not Shown)
(2 Required Each Abutment)
(All Horizontal Dimensions are Taken Along ℄ Brg.)

Note:
Cross frames shall be fabricated for "Steel Dead Load Fit" (SDLF).



PLAN ABUTMENT CROSS FRAME
(Girder Top Flange Not Shown)
(Gusset ℄ & L's Not Shown)
(Adjacent Cross Frames Not Shown)
(Abutment No. 2 Shown, Abutment No. 1 Similar)
(All Horizontal Dimensions are Taken Along ℄ Brg.)



PLAN ABUTMENT CROSS FRAME
(Girder Top Flange Not Shown)
(Adjacent Cross Frames Not Shown)
(Abutment No. 2 Shown, Abutment No. 1 Similar)
(All Horizontal Dimensions are Taken Along ℄ Brg.)

Note:
All bolt locations require 1"Ø holes.
All bolts shall be 7/8".

Notation:
F.S. = Far Side
N.S. = Near Side

NO.	DATE	REVISIONS	BY	APP'D
3				
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1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-071-198.72 (055) Sta. 186+90.75

CROSS FRAME DETAILS (2 OF 2)
US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

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

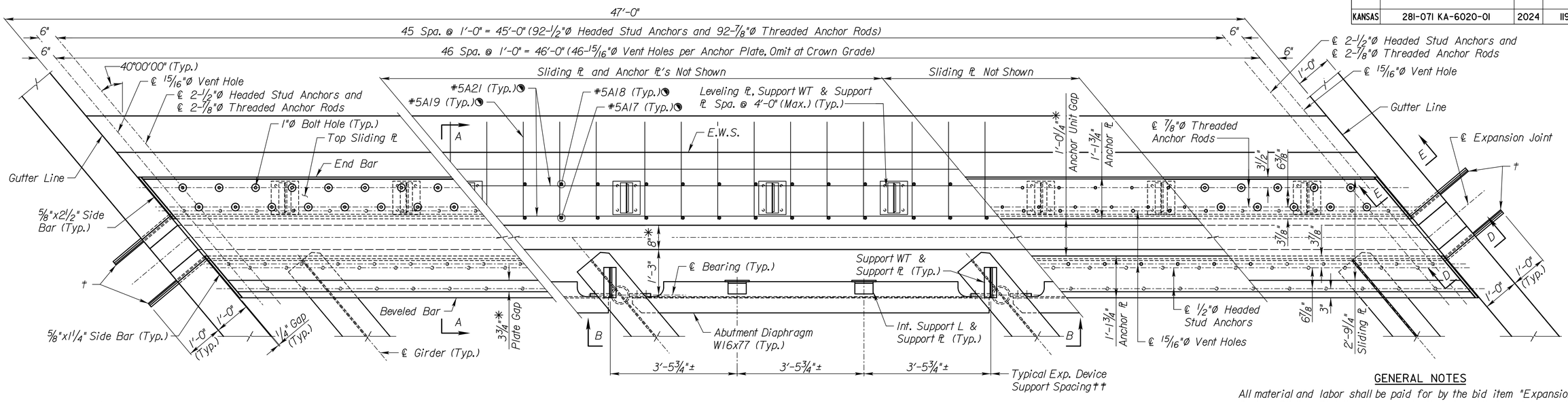
KDOT Graphics Certified 10-13-2023

Sheet No. 118

KDOT Graphics Certified

Plotted By: KKATHRIN | Plot Location:
File: c:\pwworking\central01\d2597941\vx6020001\bbr0055-CF2.dgn
Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	119	293



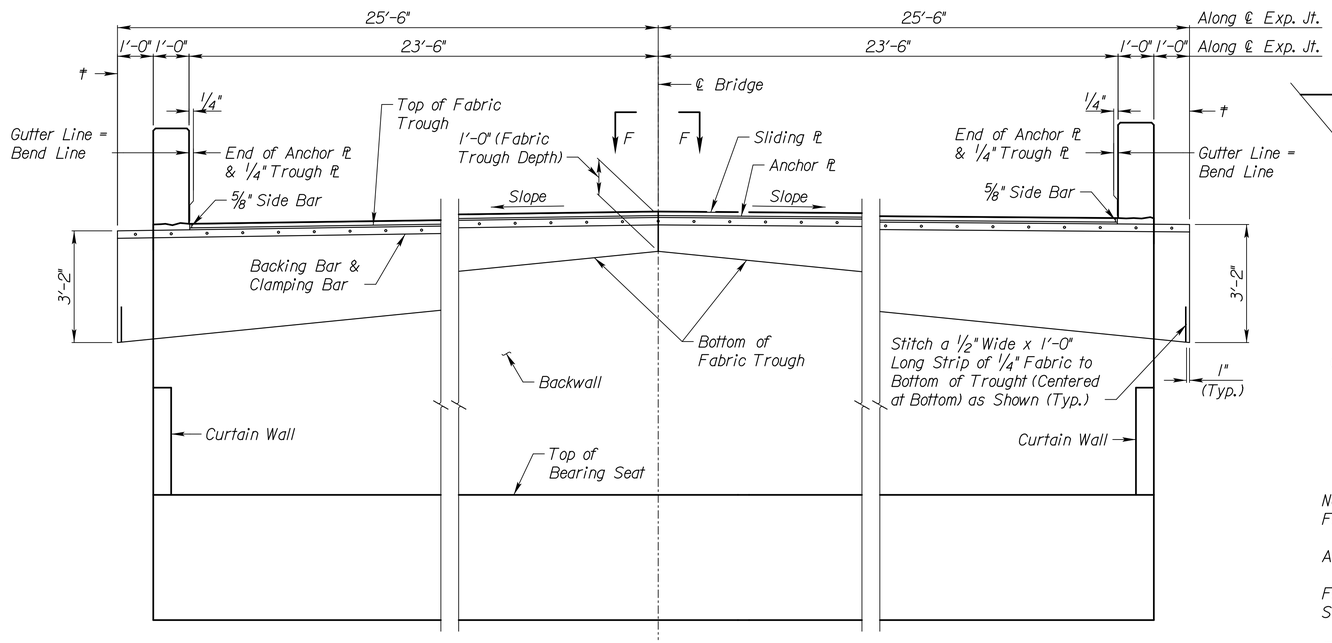
EXPANSION JOINT PLAN

* Indicated Dimension @ 60°F

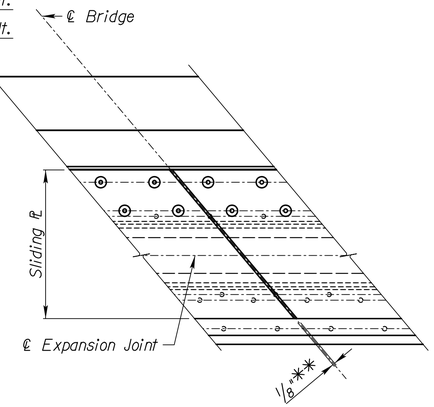
† End of Fabric Trough, Backing Bar and Clamping Bar (Use 1/4" Thick ℄ Washer in Place of Trough ℄ at Bolts Near end of Trough Overhang)

◔ See Abutment Sheets

†† Adjust as needed to clear Headed Stud Anchors



ELEVATION OF FABRIC TROUGH
(Along ℄ Trough)
(Looking Back Station @ Abutment No. 1, Abutment No. 2 Similar)



SECTION F-F

** 1/8" (Max.) Gap Allowed at Sliding Plate Field Splice

Notes:
For Sections B-B, D-D & E-E, see Sh. No. 121

Adjust rebar to clear anchor unit supports.

For Section A-A, General Notes, and Suggested Expansion Joint Installation Sequence, see Sh. No. 120

For top of backwall elevations (to fabricate plate), see Sh. No. 97

For deck reinforcing details, see Sh. No. 122 - 125

EWS = End of Wearing Surface

GENERAL NOTES

All material and labor shall be paid for by the bid item "Expansion Device (Sliding Plate)" unless noted otherwise. All steel plates and bars shall be ASTM A36 or A709 Grade 36 steel, except sliding plate shall be AASHTO M270 Grade 50 (T3). No weathering steel is allowed.

Anchor rods shall meet the requirements of AASHTO M314 with 55 ksi yield strength. Tighten the high-strength bolts (used to align the device) using the turn-of-the-nut method (Direct Tension Indicater (DTI) washers are not required). See Section 707 of the Standard Specifications for minimum torque values. Use special plate washers over the slotted holes in the bent support and the vertical support plates. Use a hardened washer under the turned element of the fastener.

Galvanize all structural steel after fabrication except the bent support plates and bearing bars. Shop paint the bent support plates and bearing bars with an approved inorganic zinc primer to a nominal dry film thickness of 3 mil. Galvanize in accordance with ASTM A123. Galvanize the barrier plate assemblies after fabrication.

Completely remove any coating prior to welding. Also remove any coating damaged during the welding process. Touch-up any painted areas damaged by welding with an approved organic zinc primer. Touch-up any damaged galvanized areas with a zinc rich paint.

Galvanize all anchor rods, bolts, heavy hex nuts and washers. Ship the galvanized bolts and threaded rods together in the same shipping container in a plastic bag to protect the lubricants. Show proper manufacturer's marking on bolts and threaded rods. Bolts and threaded rods with improper bolt markings will be rejected.

The fabric material for the trough shall meet the requirements of KDOT Specifications. Supply the trough in one continuous piece from end to end.

NO.	DATE	REVISIONS	BY	APP'D
3				
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1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-071-198.72 (055) Sta. 186+90.75

JOINT DETAILS (1 OF 3)
US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

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

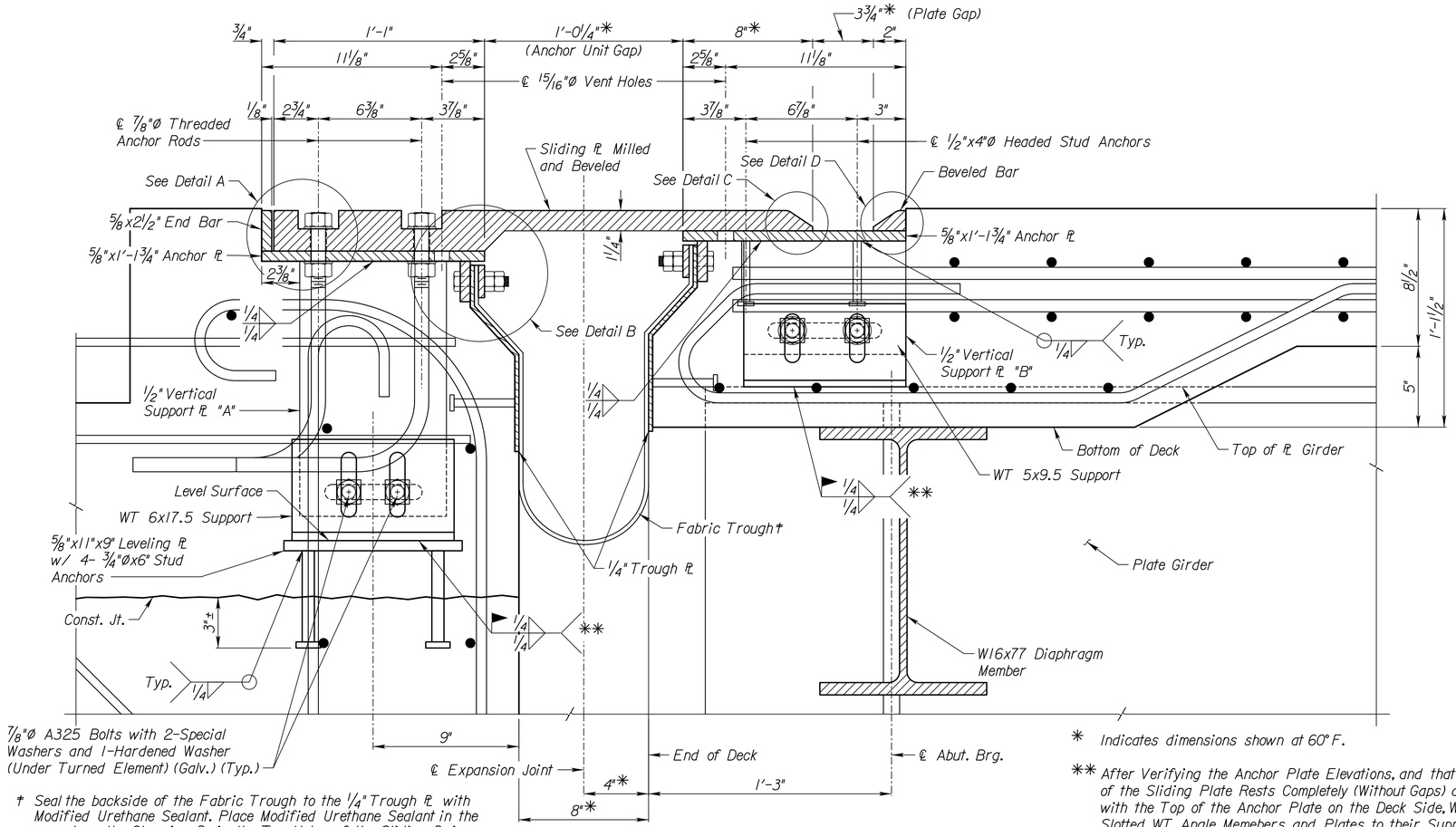
KDOT Graphics Certified 02-07-2023

Sheet No. 119

KDOT Graphics Certified

Plotted By: KKATHRIN Plot Location:
File: c:\pwworking\central01\d2597941\ka602001bbr0055-JD1.dgn
Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	120	293



† Seal the backside of the Fabric Trough to the 1/4" Trough ℄ with Modified Urethane Sealant. Place Modified Urethane Sealant in the gap above the Clamping ℄ in the Top Holes of the Sliding ℄, in the Gap between the 3/8"x2" End Bar and Sliding ℄. Welding of the Sliding ℄ at the Field Splices is not allowed.

SECTION A-A
(Section Perpendicular to ℄ Brg.)

* Indicates dimensions shown at 60° F.

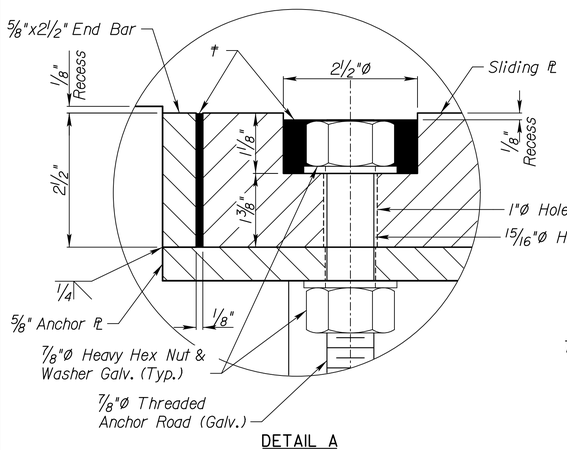
** After Verifying the Anchor Plate Elevations, and that the Bottom of the Sliding Plate Rests Completely (Without Gaps) and Flush with the Top of the Anchor Plate on the Deck Side, Weld the Slotted WT, Angle Memebers and Plates to their Supports.

PLATE GAP								
Temp. F°	30	40	50	60	70	80	90	100
Gap	4 3/8"	4 1/4"	4"	3 3/4"	3 1/2"	3 1/4"	3 1/8"	2 7/8"

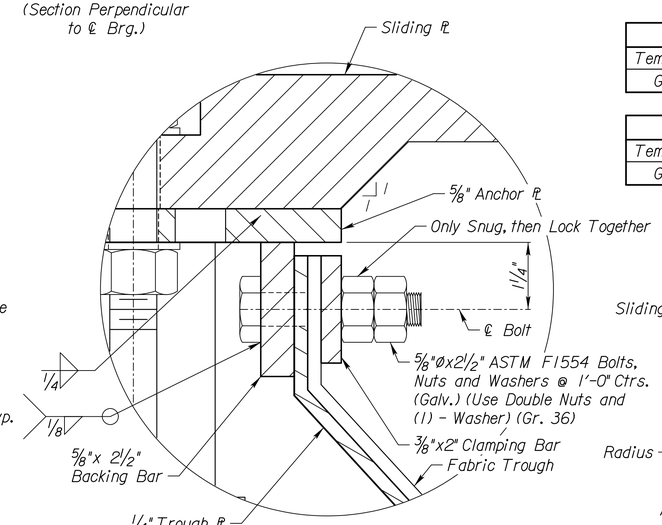
ANCHOR UNIT GAP								
Temp. F°	30	40	50	60	70	80	90	100
Gap	1'-0 7/8"	1'-0 3/4"	1'-0 1/2"	1'-0 1/4"	1'-0"	11 3/4"	11 1/2"	11 3/8"

SUGGESTED EXPANSION JOINT INSTALLATION SEQUENCE

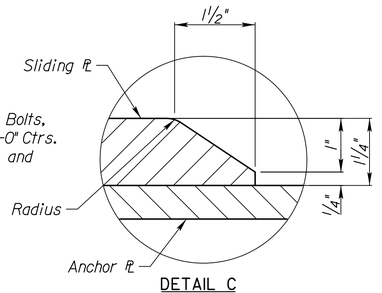
1. Concrete for the abutment diaphragm shall be placed to the construction joint with the bearing bar installed at the proper location. The concrete shall cure a minimum of 3 days prior to installing the anchor units.
2. Bring the anchor units, with sliding plate bolted in place, to proper grade and alignment. Set the top surface of the sliding plate parallel to the roadway slope. Check the scribe lines for proper alignment.
3. Position the bent support plates against the vertical support plates on both anchor units and clamp the bent support plates to the top of the bearing bar. Weld the bent support plates to the top of the bearing bar.
4. Adjust the expansion joint gap based on the average ambient air temperature during the previous 24 hours. Tighten the bolts (using the turn-of-the-nut method) connecting the bent support plates to the vertical support plates.
5. Remove the sliding plate and place the concrete for the abutment backwall. Thoroughly vibrate and compact the concrete around the anchor unit until concrete comes up through the vent holes and no voids exist under the anchor unit. Allow concrete to cure a minimum of 3 hours before continuing installation.
6. Re-align the anchor unit on the deck side to proper alignment and grade with the sliding plate in place. Tighten the bolts (using the turn-of-the-nut method) connecting the support angles to the vertical support plates.
7. Remove the sliding plate and place concrete around the anchor unit. Again, thoroughly vibrate and compact the concrete around the anchor unit until concrete comes up through the vent holes and no voids exist under the anchor unit.
8. Three days after the concrete placement the Engineer will check for voids and loose bolts by sounding the anchor plate. Fill any voids by drilling through the anchor plate and pumping in an approved epoxy mortar at a minimum of 75 PSI. This work will be subsidiary to the bid item "Expansion Device (Sliding Plate)".
9. Install the fabric trough and the sliding plate according to KDOT Specifications. Coat all threads of the anchor rods and nuts with beeswax just prior to installation and tightening.
10. After installation of the sliding plate, the Engineer shall inspect the plate for alignment. Any portion of the sliding plate that the Engineer determines is misaligned, so that it may be struck by a snow plow, shall be ground as directed by the Engineer. This work shall be subsidiary to the bid item "Expansion Device (Sliding Plate)".
11. Clean the trough of all foreign material after the completion of all superstructure work.



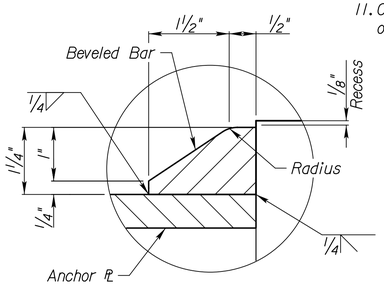
DETAIL A



DETAIL B



DETAIL C



DETAIL D

Plotted By: KKATHRIN | Plot Location:
File: c:\pwworking\central01\d2597941\kd602001\bbr0055-j02.dgn
Plot Date: 07-11-24

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-071-198.72 (055) Sta. 186+90.75

JOINT DETAILS (2 OF 3)
US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

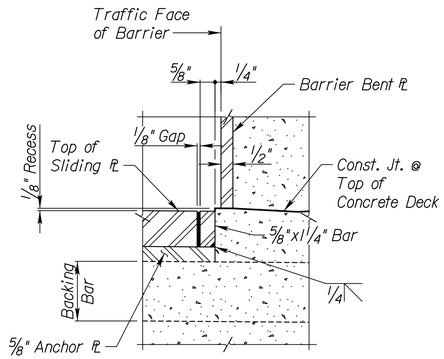
SHEET NO.	OF	SCALE		APP'D			
DESIGNED	MMD	DETAILED	MMD	QUANTITIES		CADD	KBK
DESIGN CK.	KVG	DETAIL CK.	KVG	QUAN. CK.		CADD CK.	KVG

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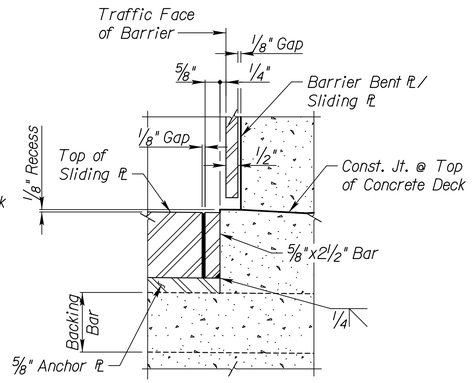
Sheet No. 120

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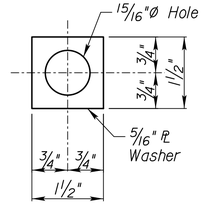
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	121	293



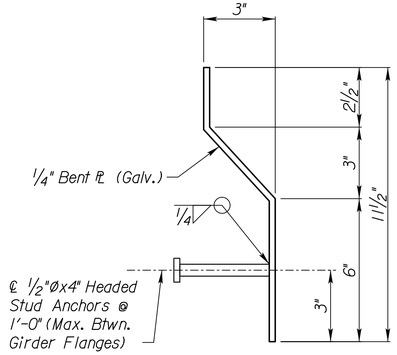
SECTION D-D



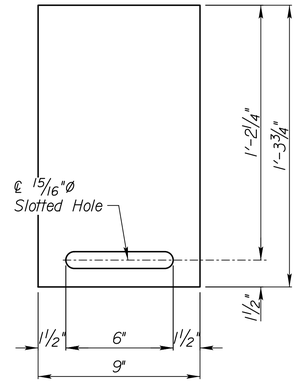
SECTION E-E



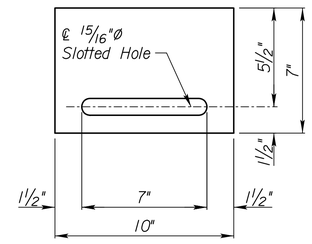
SPECIAL WASHER



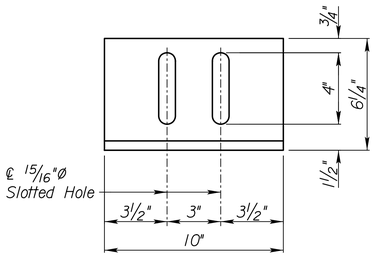
1/4" TROUGH ℄



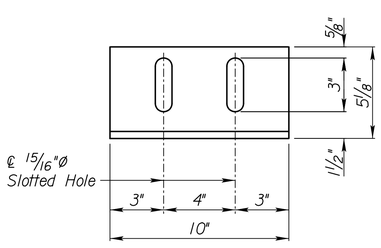
1/2" VERTICAL SUPPORT ℄ "A"
(Support Assembly at Backwall)



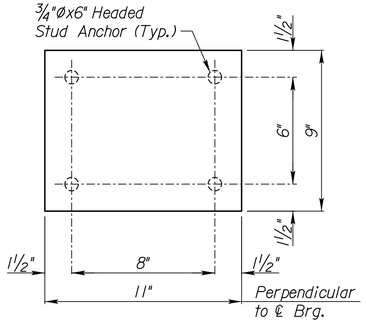
1/2" VERTICAL SUPPORT ℄ "B"
(Support Assembly at Girder)



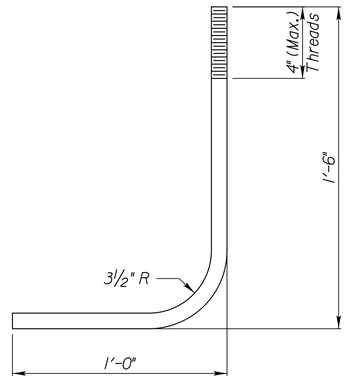
WT 6X17.5 SUPPORT
(Support Assembly at Backwall)



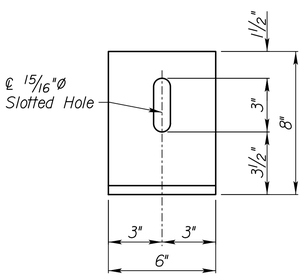
WT 5X9.5 SUPPORT
(Support Assembly at Girder)



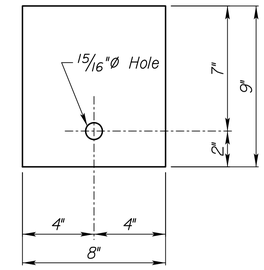
5/8"XII"X9" LEVELING ℄
(Support Assembly at Backwall)



7/8"ø ANCHOR BOLT (GALV.)

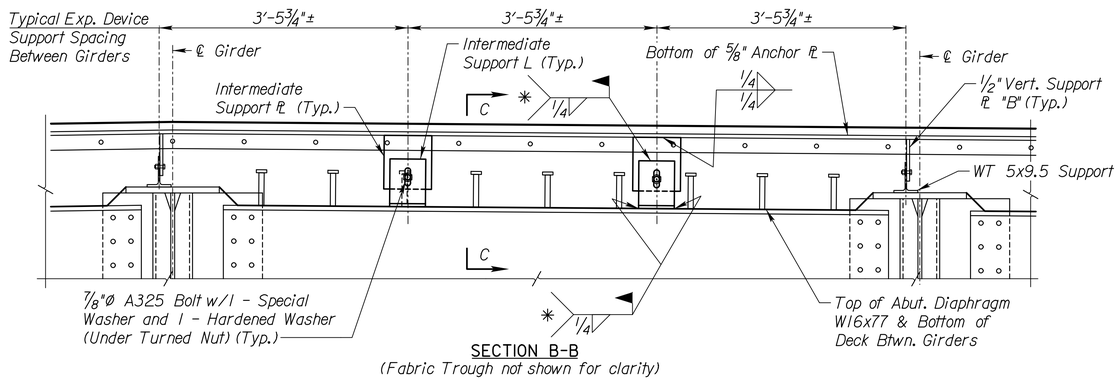


L8X4X1/2"X0'-6" INT. SUPPORT

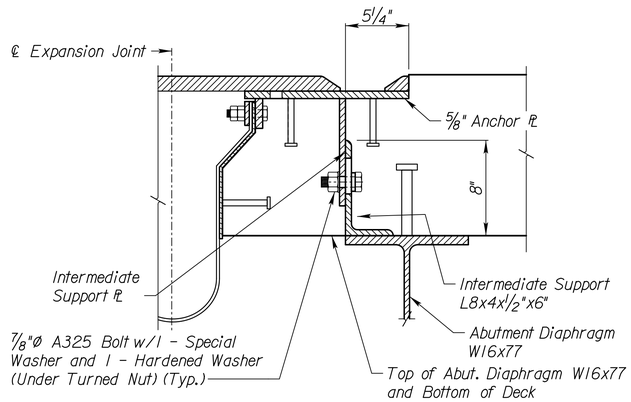


1/2" INTERMEDIATE SUPPORT ℄

* *After verifying the anchor plate elevations, and that the bottom of the sliding plate rests completely (without gaps) and flush with the top of the anchor plate on the deck side, weld the slotted WT, angle members and plates to their supports.*



SECTION B-B
(Fabric Trough not shown for clarity)



SECTION C-C

Note:
For location of Section B-B, see Sh. No. 119

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-071-198.72 (055) Sta. 186+90.75

JOINT DETAILS (3 OF 3)
US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

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

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Sheet No. 121

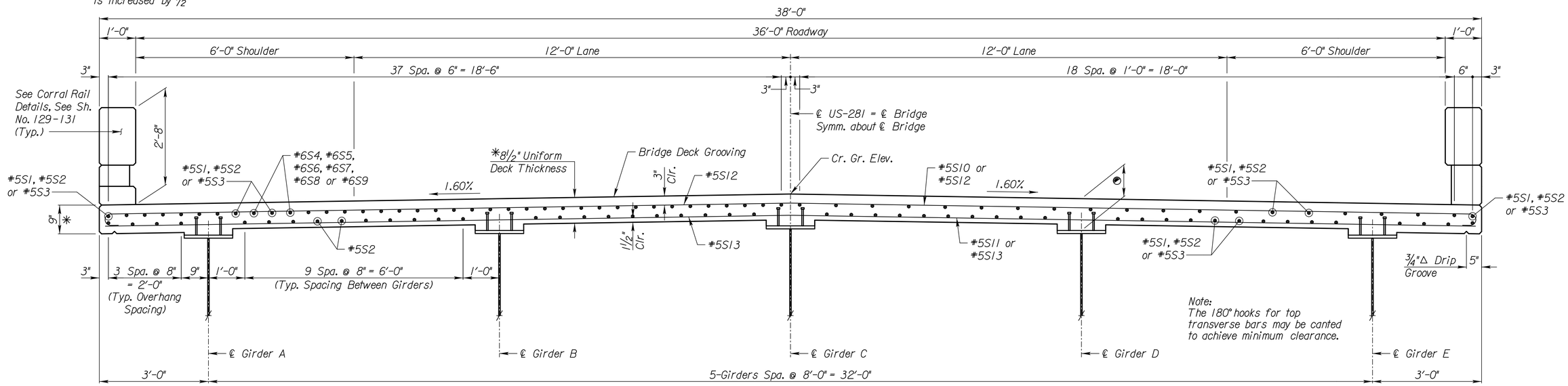
KDOT Graphics Certified

Plotted By: KKATHRIN
Plot Location:
File: c:\pwworkingcentral01\d2597941\ka602001bbr0055-j03.dgn
Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	122	293

✳ The Thickness of the Cantilevered Deck Overhang is Increased by 1/2"

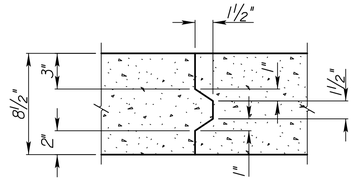
◔ Note:
Fabricate girders to provide a constant theoretical distance of 11 1/2" from top of the deck to the top of the web plate.



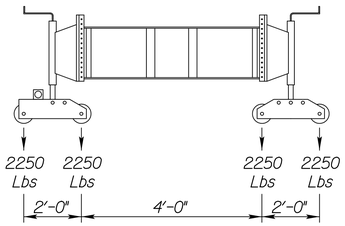
Half Section Near Pier

Half Section Near Mid-Span

TYPICAL SECTION
(Shown Perpendicular to Roadway)



TRANSVERSE CONSTRUCTION JOINT



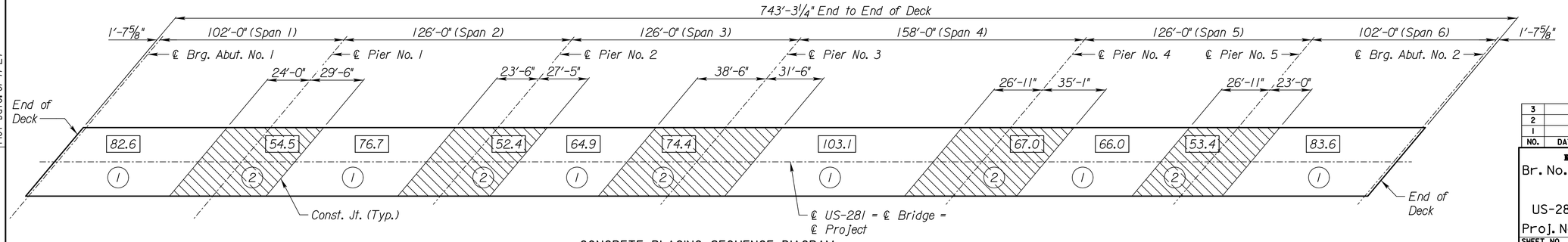
ASSUMED FINISHING MACHINE VALUES LOADING DIAGRAM

Note: Rotation (maximum = 1°) in the exterior girder was calculated assuming screed wheel loads as shown and placed 3" beyond the outside of the deck. The maximum overhang bracket spacing was assumed at 4'-0". The actual screed loadings or bracket spacing will be reflected in the design calculations for a torsional analysis of the exterior girder and bracing. The design calculations shall bear the seal of a licensed Professional Engineer. Submit according to KDOT Specifications Section 700 for falsework and formwork.

CONCRETE PLACING SEQUENCE: Segmental, combined or continuous pours are allowed by an approved alternate placing sequence. Any discontinuous pour must stop at a construction joint short of pier.

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

CONSTRUCTION JOINTS: Place the construction joints only at locations shown or at locations approved by the Engineer.



CONCRETE PLACING SEQUENCE DIAGRAM

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-071-198.72 (055) Sta. 186+90.75

TYPICAL SECTION
US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

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

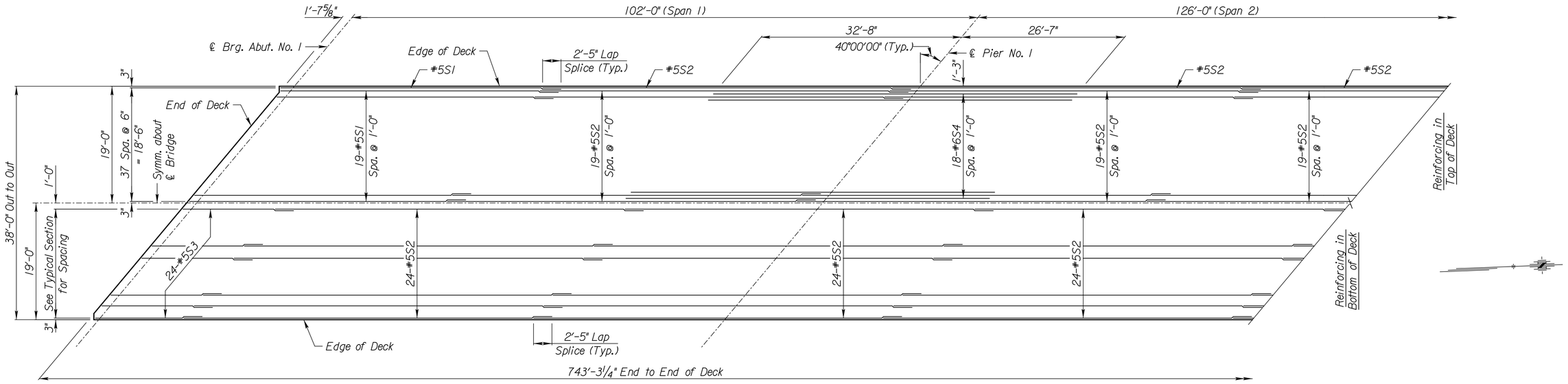
KDOT Graphics Certified 10-26-2023

Sheet No. 122

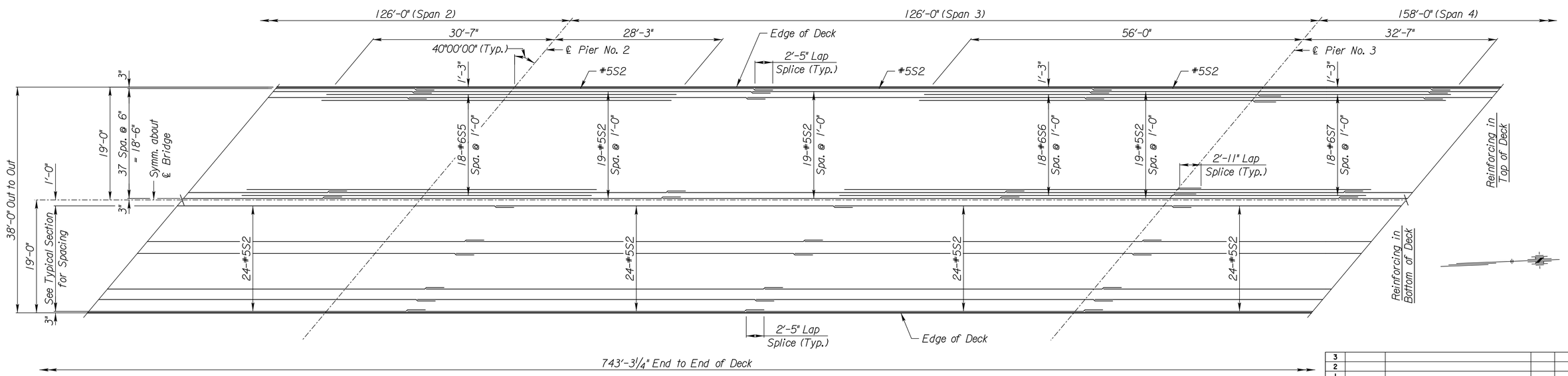
KDOT Graphics Certified

Plotted By: KKATHRIN Plot Location:
File: c:\pwworking\central01\d2597941\ka602001\bbr0055-TS.dgn
Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	123	293



DECK PLAN



DECK PLAN

Notes:
For Transverse Reinforcement Layout, See Sh. No. 125

For Typical Section, See Sh. No. 122

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 281-071-198.72 (055) Sta. 186+90.75

DECK PLAN (1 OF 3)
US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

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

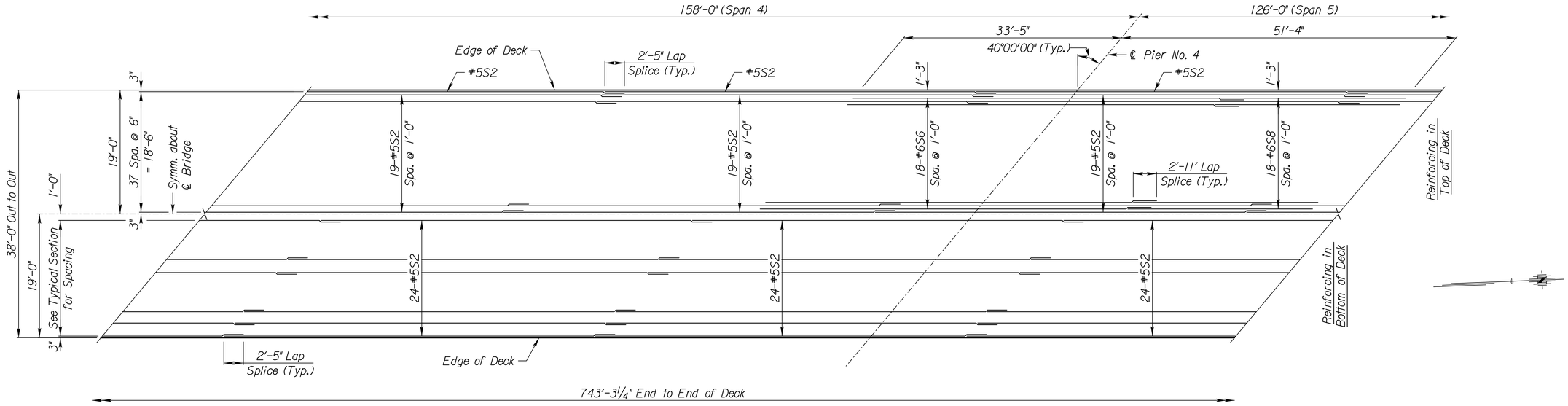
KDOT Graphics Certified 05-03-2023

Sheet No. 123

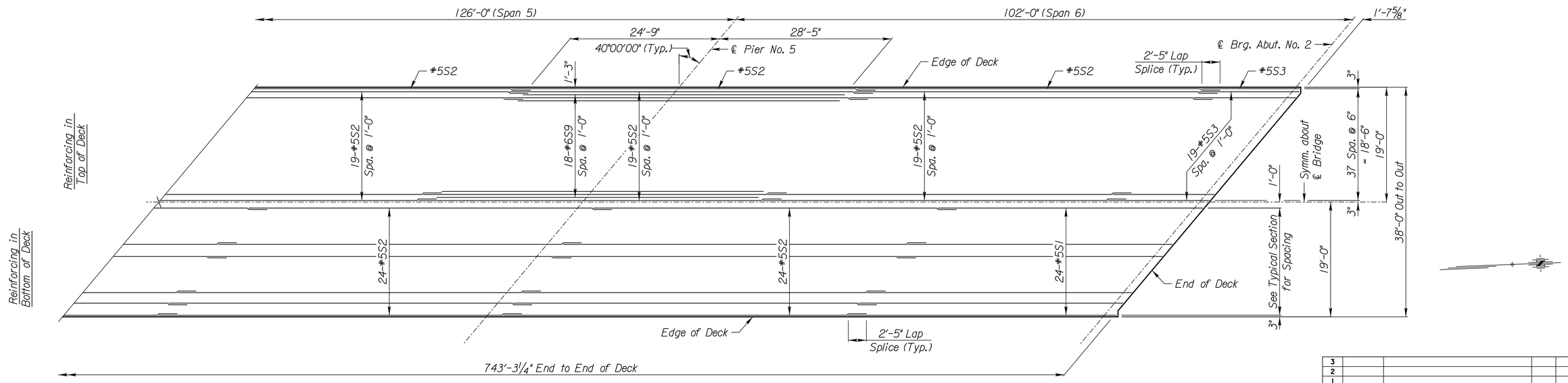
KDOT Graphics Certified

Plotted By: KKATHRIN
File: c:\pwworking\central01\d2597941\kdot60200\bbr0055-DP1.dgn
Plot Date: 07-11-24
Plot Location:

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	124	293



DECK PLAN



DECK PLAN

Notes:
For Transverse Reinforcement Layout, See Sh. No. 125

For Typical Section, See Sh. No. 122

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 281-071-198.72 (055) Sta. 186+90.75

DECK PLAN (2 OF 3)
US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

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

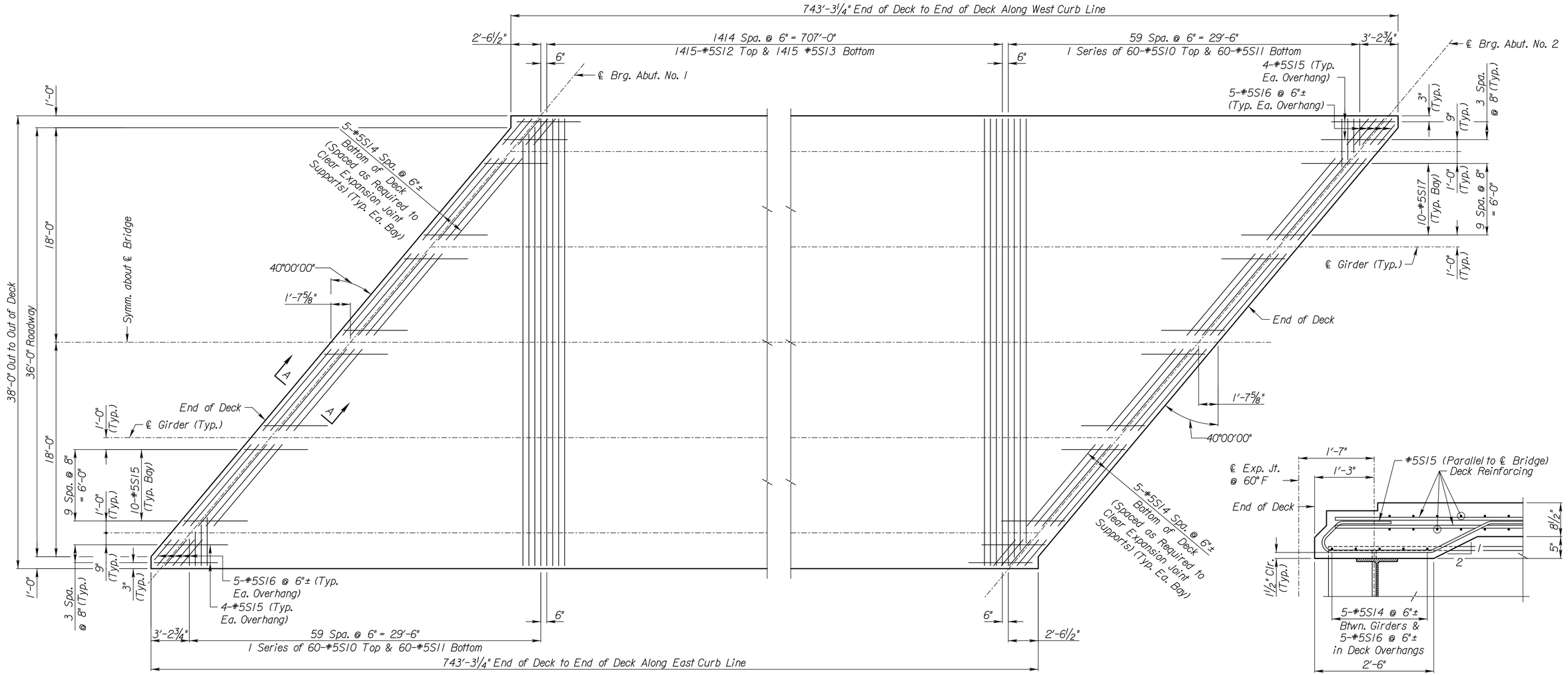
KDOT Graphics Certified 07-10-2023

Sheet No. 124

KDOT Graphics Certified

Plotted By: JHOVERSO Plot Location:
File: c:\pwworking\central01\d2597941\kdot6020001bbr0055-DP2.dgn
Plot Date: 07-15-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	125	293



PARTIAL PLAN

(Showing Transverse and End of Deck Reinforcing Steel Only)

SECTION A-A

Notes:

For Longitudinal Reinforcement, See Sh. No. 123- 124

For Typical Section, See Sh. No. 122

For Sliding Plate Details, See Sh. No. 119 -121

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 281-071-198.72 (055) Sta. 186+90.75

DECK PLAN (3 OF 3)
US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

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

KDOT Graphics Certified 07-17-2023

Sheet No. 125

KDOT Graphics Certified

Plotted By: KKATHRIN | Plot Location:
File: c:\pwworking\central01\d2597941\kd602001\bbr0055-DP3.dgn
Plot Date: 07-11-24

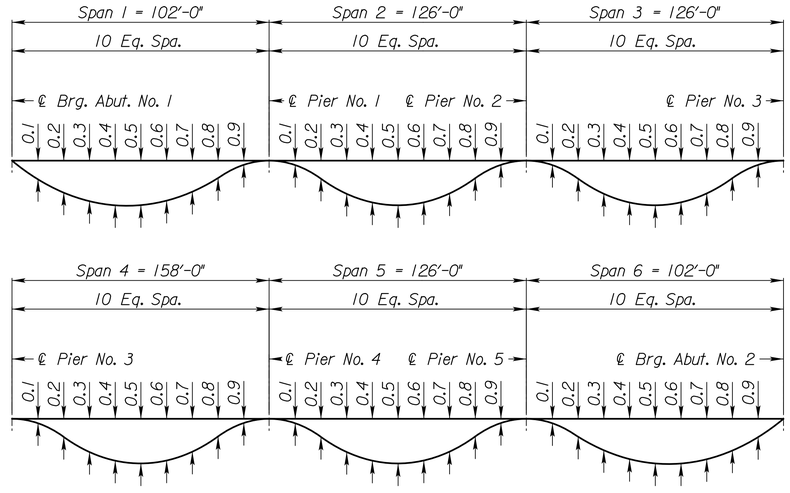
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	126	293

Total Dead Load Deflections (Steel + Concrete) (Feet)					
Location	Girder A	Girder B	Girder C	Girder D	Girder E
Abut No. 1	0.000	0.000	0.000	0.000	0.000
0.1	0.030	0.026	0.027	0.027	0.031
0.2	0.056	0.048	0.048	0.048	0.056
0.3	0.072	0.062	0.063	0.063	0.073
0.4	0.079	0.068	0.069	0.069	0.079
0.5	0.075	0.065	0.066	0.065	0.076
0.6	0.063	0.054	0.055	0.054	0.063
0.7	0.045	0.038	0.038	0.038	0.044
0.8	0.024	0.021	0.021	0.021	0.024
0.9	0.008	0.006	0.006	0.006	0.008
Pier No. 1	0.000	0.000	0.000	0.000	0.000
0.1	0.017	0.014	0.014	0.015	0.017
0.2	0.045	0.040	0.039	0.039	0.046
0.3	0.076	0.066	0.066	0.066	0.076
0.4	0.100	0.088	0.087	0.087	0.100
0.5	0.111	0.097	0.096	0.096	0.111
0.6	0.105	0.093	0.092	0.091	0.105
0.7	0.085	0.075	0.074	0.074	0.085
0.8	0.055	0.049	0.048	0.048	0.055
0.9	0.024	0.021	0.021	0.021	0.023
Pier No. 2	0.002	0.002	0.002	0.002	0.002
0.1	0.002	0.001	0.002	0.002	0.002
0.2	0.012	0.009	0.010	0.010	0.013
0.3	0.024	0.018	0.019	0.020	0.025
0.4	0.030	0.024	0.025	0.025	0.032
0.5	0.029	0.022	0.024	0.024	0.031
0.6	0.020	0.014	0.016	0.016	0.022
0.7	0.007	0.003	0.004	0.004	0.008
0.8	-0.005	-0.007	-0.006	-0.007	-0.005
0.9	-0.010	-0.010	-0.010	-0.010	-0.010
Pier No. 3	0.002	0.003	0.003	0.003	0.002
0.1	0.057	0.053	0.052	0.053	0.056
0.2	0.130	0.120	0.118	0.119	0.129
0.3	0.201	0.184	0.181	0.183	0.199
0.4	0.252	0.231	0.227	0.229	0.249
0.5	0.270	0.248	0.243	0.246	0.268
0.6	0.253	0.232	0.228	0.230	0.250
0.7	0.203	0.186	0.183	0.184	0.201
0.8	0.131	0.121	0.119	0.119	0.130
0.9	0.057	0.053	0.052	0.052	0.057
Pier No. 4	0.002	0.003	0.003	0.003	0.002
0.1	-0.009	-0.009	-0.009	-0.009	-0.009
0.2	-0.003	-0.005	-0.005	-0.005	-0.003
0.3	0.010	0.005	0.006	0.006	0.010
0.4	0.024	0.017	0.017	0.017	0.024
0.5	0.033	0.025	0.025	0.025	0.033
0.6	0.033	0.026	0.026	0.026	0.033
0.7	0.026	0.020	0.020	0.020	0.026
0.8	0.013	0.010	0.010	0.010	0.013
0.9	0.002	0.001	0.001	0.001	0.002
Pier No. 5	0.000	0.000	0.000	0.000	0.000
0.1	0.017	0.015	0.015	0.015	0.017
0.2	0.040	0.036	0.035	0.036	0.040
0.3	0.065	0.057	0.057	0.057	0.065
0.4	0.085	0.075	0.075	0.075	0.085
0.5	0.098	0.086	0.085	0.085	0.097
0.6	0.099	0.087	0.087	0.086	0.098
0.7	0.089	0.078	0.078	0.077	0.088
0.8	0.067	0.059	0.059	0.058	0.067
0.9	0.037	0.032	0.032	0.032	0.036
Abut. No. 2	0.000	0.000	0.000	0.000	0.000

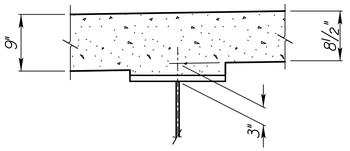
Concrete Dead Load Deflections (Composite + Non-Composite) (Feet)					
Location	Girder A	Girder B	Girder C	Girder D	Girder E
Abut No. 1	0.000	0.000	0.000	0.000	0.000
0.1	0.025	0.020	0.021	0.021	0.025
0.2	0.045	0.037	0.038	0.038	0.045
0.3	0.059	0.048	0.049	0.049	0.059
0.4	0.064	0.053	0.053	0.054	0.064
0.5	0.061	0.050	0.051	0.051	0.061
0.6	0.051	0.042	0.042	0.042	0.051
0.7	0.036	0.029	0.030	0.030	0.036
0.8	0.020	0.016	0.016	0.016	0.019
0.9	0.006	0.005	0.005	0.005	0.006
Pier No. 1	0.000	0.000	0.000	0.000	0.000
0.1	0.014	0.012	0.012	0.012	0.014
0.2	0.038	0.032	0.032	0.032	0.038
0.3	0.063	0.054	0.053	0.053	0.064
0.4	0.083	0.071	0.070	0.070	0.084
0.5	0.092	0.078	0.078	0.077	0.093
0.6	0.088	0.075	0.074	0.074	0.088
0.7	0.071	0.061	0.060	0.060	0.071
0.8	0.046	0.040	0.039	0.039	0.046
0.9	0.020	0.018	0.017	0.017	0.020
Pier No. 2	0.001	0.002	0.002	0.002	0.001
0.1	0.001	0.000	0.000	0.000	0.001
0.2	0.008	0.005	0.006	0.006	0.009
0.3	0.017	0.012	0.013	0.013	0.019
0.4	0.022	0.015	0.017	0.017	0.024
0.5	0.021	0.014	0.016	0.016	0.023
0.6	0.015	0.008	0.010	0.010	0.016
0.7	0.005	0.000	0.001	0.001	0.006
0.8	-0.005	-0.007	-0.006	-0.007	-0.004
0.9	-0.008	-0.009	-0.008	-0.008	-0.008
Pier No. 3	0.002	0.002	0.002	0.002	0.002
0.1	0.046	0.042	0.041	0.041	0.045
0.2	0.105	0.094	0.092	0.093	0.103
0.3	0.162	0.144	0.141	0.143	0.159
0.4	0.203	0.181	0.177	0.179	0.199
0.5	0.217	0.194	0.189	0.192	0.214
0.6	0.203	0.182	0.177	0.180	0.200
0.7	0.163	0.146	0.143	0.144	0.161
0.8	0.106	0.095	0.093	0.094	0.104
0.9	0.046	0.042	0.041	0.041	0.046
Pier No. 4	0.002	0.002	0.002	0.002	0.002
0.1	-0.007	-0.008	-0.007	-0.007	-0.007
0.2	-0.003	-0.006	-0.005	-0.005	-0.003
0.3	0.007	0.002	0.002	0.003	0.008
0.4	0.018	0.011	0.011	0.011	0.018
0.5	0.025	0.017	0.017	0.017	0.025
0.6	0.025	0.018	0.018	0.018	0.026
0.7	0.020	0.013	0.014	0.013	0.020
0.8	0.010	0.006	0.006	0.006	0.010
0.9	0.001	0.000	0.000	0.000	0.001
Pier No. 5	0.000	0.000	0.000	0.000	0.000
0.1	0.014	0.012	0.012	0.012	0.014
0.2	0.034	0.029	0.029	0.029	0.033
0.3	0.054	0.046	0.046	0.046	0.054
0.4	0.071	0.060	0.060	0.060	0.070
0.5	0.081	0.069	0.068	0.068	0.080
0.6	0.082	0.069	0.069	0.069	0.081
0.7	0.073	0.062	0.062	0.062	0.073
0.8	0.055	0.047	0.047	0.046	0.055
0.9	0.030	0.026	0.025	0.025	0.030
Abut. No. 2	0.000	0.000	0.000	0.000	0.000

Camber (Feet)*					
Location	Girder A	Girder B	Girder C	Girder D	Girder E
Abut No. 1	0.000	0.000	0.000	0.000	0.000
0.1	0.037	0.033	0.034	0.033	0.037
0.2	0.068	0.060	0.061	0.061	0.068
0.3	0.089	0.079	0.079	0.079	0.089
0.4	0.098	0.087	0.087	0.087	0.097
0.5	0.095	0.085	0.085	0.085	0.095
0.6	0.082	0.073	0.073	0.073	0.082
0.7	0.061	0.055	0.054	0.055	0.061
0.8	0.037	0.033	0.033	0.033	0.037
0.9	0.015	0.014	0.013	0.014	0.015
Pier No. 1	0.000	0.000	0.000	0.000	0.000
0.1	0.028	0.025	0.025	0.026	0.028
0.2	0.064	0.059	0.058	0.059	0.064
0.3	0.101	0.092	0.091	0.092	0.101
0.4	0.128	0.117	0.115	0.116	0.129
0.5	0.141	0.127	0.126	0.126	0.140
0.6	0.133	0.121	0.120	0.120	0.133
0.7	0.110	0.101	0.099	0.099	0.110
0.8	0.074	0.068	0.067	0.066	0.074
0.9	0.034	0.033	0.032	0.031	0.034
Pier No. 2	0.002	0.002	0.002	0.002	0.002
0.1	0.012	0.012	0.013	0.013	0.013
0.2	0.031	0.028	0.030	0.029	0.032
0.3	0.048	0.044	0.044	0.045	0.049
0.4	0.059	0.053	0.054	0.054	0.060
0.5	0.059	0.052	0.054	0.053	0.060
0.6	0.049	0.043	0.044	0.044	0.050
0.7	0.032	0.028	0.029	0.030	0.033
0.8	0.014	0.013	0.013	0.012	0.014
0.9	0.001	0.001	0.001	0.001	0.001
Pier No. 3	0.002	0.003	0.003	0.003	0.002
0.1	0.074	0.070	0.069	0.070	0.073
0.2	0.160	0.150	0.148	0.149	0.159
0.3	0.241	0.224	0.221	0.223	0.238
0.4	0.297	0.276	0.272	0.275	0.293
0.5	0.317	0.295	0.290	0.292	0.315
0.6	0.297	0.277	0.273	0.274	0.295
0.7	0.242	0.225	0.222	0.224	0.240
0.8	0.161	0.151	0.148	0.149	0.160
0.9	0.074	0.070	0.069	0.069	0.074
Pier No. 4	0.002	0.003	0.003	0.003	0.002
0.1	0.002	0.002	0.002	0.002	0.002
0.2	0.016	0.014	0.014	0.014	0.016
0.3	0.035	0.030	0.031	0.031	0.036
0.4	0.052	0.046	0.045	0.046	0.053
0.5	0.063	0.055	0.055	0.055	0.063
0.6	0.062	0.055	0.054	0.054	0.062
0.7	0.051	0.045	0.045	0.045	0.051
0.8	0.033	0.029	0.029	0.029	0.033
0.9	0.013	0.012	0.012	0.011	0.013
Pier No. 5	0.000	0.000	0.000	0.000	0.000
0.1	0.024	0.022	0.021	0.021	0.023
0.2	0.053	0.048	0.048	0.047	0.052
0.3	0.081	0.074	0.073	0.073	0.081
0.4	0.104	0.095	0.093	0.093	0.104
0.5	0.118	0.106	0.104	0.104	0.116
0.6	0.117	0.106	0.105	0.105	0.117
0.7	0.105	0.095	0.093	0.093	0.105
0.8	0.079	0.072	0.071	0.071	0.079
0.9	0.043	0.040	0.038	0.038	0.044
Abut. No. 2	0.000	0.000	0.000	0.000	0.000

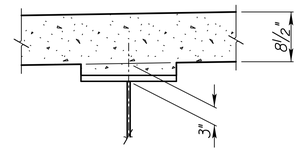
* *Note:*
Fabricator shall calculate camber adjustments for overall profile of girder. Local Vertical Curve correction from a chord line from bearing to bearing has been included in the camber values shown.



DEAD LOAD DEFLECTION DIAGRAM AT TENTH POINTS



HAUNCH AT EXTERIOR GIRDERS



HAUNCH AT INTERIOR GIRDERS

FILLETS: Camber the steel girder for the total dead load deflection and the vertical curvature, if necessary. The ordinates shown for concrete dead load deflection represent the amount of camber that should be in the girders after they are erected and bolted but prior to placing the floor forms. After the structural steel is completely erected and the falsework bents are removed, measure the camber in the field by taking a profile of each girder. Correct any variation between the actual camber and the concrete dead load deflection shown in the plans by varying the depth of concrete fillets over the girders so that the finished floor is constructed to the theoretical grade. The minimum depth of the deck over the girder shall be 8½".

The theoretical amount of concrete required for the fillets is 22.3 C.Y. This amount of concrete is included in the Summary of Quantities. Any additional concrete required to construct the fillets will be subsidiary.

Notes:
Positive deflections are downward. Positive camber are upward.

For Vertical Curve Correction, Girder Field Splice Elevations and Dead Load Deflections at Field Splice tables, see Sh. No. 127

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-071-198.72 (055) Sta. 186+90.75
DEAD LOAD DEFLECTION AND CAMBER DIAGRAMS (1 OF 2)
US-281 OVER NORTH FORK SOLOMON RIVER
Proj. No. 281-071 KA-6020-01 Osborne Co.

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

KDOT Graphics Certified 02-03-2023

Sheet No. 126

KDOT Graphics Certified

Plotted By: KKATHRIN Plot Location:
File: c:\pwworking\central01\d2597941\ke602001\bbr0055-DLI.dgn
Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	127	293

Girder Field Splice Elevations

Location		Girder A	Girder B	Girder C	Girder D	Girder E
F.S.1	Elev.	1532.16	1532.25	1532.35	1532.19	1532.03
	Splice Plate Thick.	3/4"	3/4"	3/4"	3/4"	3/4"
	Top Flange Thick.	1"	1"	1"	1"	1"
F.S.2	Elev.	1532.38	1532.48	1532.58	1532.43	1532.28
	Splice Plate Thick.	3/4"	3/4"	3/4"	3/4"	3/4"
	Top Flange Thick.	1"	1"	1"	1"	1"
F.S.3	Elev.	1532.60	1532.70	1532.81	1532.67	1532.53
	Splice Plate Thick.	3/4"	3/4"	3/4"	3/4"	3/4"
	Top Flange Thick.	1"	1"	1"	1"	1"
F.S.4	Elev.	1532.66	1532.77	1532.89	1532.74	1532.61
	Splice Plate Thick.	5/8"	5/8"	5/8"	5/8"	5/8"
	Top Flange Thick.	1"	1"	1"	1"	1"
F.S.5	Elev.	1532.73	1532.85	1532.97	1532.83	1532.70
	Splice Plate Thick.	5/8"	5/8"	5/8"	5/8"	5/8"
	Top Flange Thick.	1"	1"	1"	1"	1"
F.S.6	Elev.	1532.84	1532.96	1533.09	1532.96	1532.85
	Splice Plate Thick.	5/8"	5/8"	5/8"	5/8"	5/8"
	Top Flange Thick.	1"	1"	1"	1"	1"
F.S.7	Elev.	1532.73	1532.86	1533.00	1532.88	1532.77
	Splice Plate Thick.	5/8"	5/8"	5/8"	5/8"	5/8"
	Top Flange Thick.	1"	1"	1"	1"	1"
F.S.8	Elev.	1532.50	1532.64	1532.79	1532.68	1532.57
	Splice Plate Thick.	5/8"	5/8"	5/8"	5/8"	5/8"
	Top Flange Thick.	1"	1"	1"	1"	1"
F.S.9	Elev.	1532.31	1532.45	1532.61	1532.50	1532.40
	Splice Plate Thick.	5/8"	5/8"	5/8"	5/8"	5/8"
	Top Flange Thick.	1"	1"	1"	1"	1"
F.S.10	Elev.	1532.14	1532.29	1532.45	1532.35	1532.25
	Splice Plate Thick.	3/4"	3/4"	3/4"	3/4"	3/4"
	Top Flange Thick.	1"	1"	1"	1"	1"

Dead Load Deflections at Field Splice (Inches)

Location		Girder A	Girder B	Girder C	Girder D	Girder E
F.S.1	Conc.	5/16	1/4	1/4	1/4	5/16
	Total	3/8	5/16	5/16	5/16	3/8
F.S.2	Conc.	1/2	7/16	7/16	7/16	1/2
	Total	5/8	9/16	9/16	9/16	5/8
F.S.3	Conc.	1/2	7/16	7/16	7/16	1/2
	Total	5/8	9/16	9/16	9/16	5/8
F.S.4	Conc.	1/8	1/16	1/16	1/16	1/8
	Total	1/8	1/8	1/8	1/8	3/16
F.S.5	Conc.	1/16	0	0	0	1/16
	Total	1/16	1/16	1/16	1/16	1/8
F.S.6	Conc.	1 1/4	1 1/8	1 1/8	1 1/8	1 1/4
	Total	1 9/16	1 7/16	1 7/16	1 7/16	1 9/16
F.S.7	Conc.	1 1/8	1	1	1	1 1/16
	Total	1 3/8	1 1/4	1 1/4	1 1/4	1 3/8
F.S.8	Conc.	1/16	0	0	0	1/16
	Total	1/16	1/16	1/16	1/16	1/16
F.S.9	Conc.	1/8	1/8	1/8	1/8	1/8
	Total	3/16	1/8	1/8	1/8	3/16
F.S.10	Conc.	7/16	3/8	3/8	3/8	7/16
	Total	9/16	1/2	1/2	1/2	9/16

Vertical Curve Correction (Inches)

Location	Girder A	Girder B	Girder C	Girder D	Girder E
Abut No. 1	0	0	0	0	0
0.1	1/16	1/16	1/16	1/16	1/16
0.2	1/8	1/8	1/8	1/8	1/8
0.3	3/16	3/16	3/16	3/16	3/16
0.4	1/4	1/4	1/4	3/16	3/16
0.5	1/4	1/4	1/4	1/4	1/4
0.6	1/4	1/4	3/16	1/4	1/4
0.7	3/16	3/16	3/16	3/16	3/16
0.8	1/8	1/8	1/8	1/8	1/8
0.9	1/16	1/16	1/16	1/16	1/16
Pier No. 1	0	0	0	0	0
0.1	1/8	1/8	1/8	1/8	1/8
0.2	1/4	1/4	1/4	1/4	1/4
0.3	5/16	5/16	5/16	5/16	5/16
0.4	5/16	3/8	5/16	3/8	5/16
0.5	3/8	3/8	3/8	3/8	3/8
0.6	5/16	3/8	5/16	5/16	5/16
0.7	5/16	5/16	5/16	5/16	5/16
0.8	1/4	1/4	1/4	1/4	1/4
0.9	1/8	1/8	1/8	1/8	1/8
Pier No. 2	0	0	0	0	0
0.1	1/8	1/8	1/8	1/8	1/8
0.2	1/4	1/4	1/4	1/4	1/4
0.3	5/16	5/16	5/16	5/16	5/16
0.4	5/16	3/8	3/8	5/16	5/16
0.5	3/8	3/8	3/8	3/8	3/8
0.6	5/16	5/16	3/8	5/16	5/16
0.7	5/16	5/16	5/16	5/16	5/16
0.8	1/4	1/4	1/4	1/4	1/4
0.9	1/8	1/8	1/8	1/8	1/8
Pier No. 3	0	0	0	0	0
0.1	3/16	3/16	3/16	3/16	3/16
0.2	3/8	3/8	3/8	3/8	3/8
0.3	1/2	1/2	1/2	1/2	7/16
0.4	9/16	9/16	9/16	9/16	9/16
0.5	9/16	9/16	9/16	9/16	9/16
0.6	9/16	9/16	9/16	9/16	9/16
0.7	1/2	1/2	7/16	1/2	1/2
0.8	3/8	3/8	3/8	3/8	3/8
0.9	3/16	3/16	3/16	3/16	3/16
Pier No. 4	0	0	0	0	0
0.1	1/8	1/8	1/8	1/8	1/8
0.2	1/4	1/4	1/4	1/4	1/4
0.3	5/16	5/16	5/16	5/16	5/16
0.4	5/16	3/8	5/16	3/8	5/16
0.5	3/8	3/8	3/8	3/8	3/8
0.6	5/16	3/8	5/16	5/16	5/16
0.7	5/16	5/16	5/16	5/16	5/16
0.8	1/4	1/4	1/4	1/4	1/4
0.9	1/8	1/8	1/8	1/8	1/8
Pier No. 5	0	0	0	0	0
0.1	1/16	1/16	1/16	1/16	1/16
0.2	1/8	1/8	1/8	1/8	1/8
0.3	3/16	3/16	3/16	3/16	3/16
0.4	1/4	1/4	1/4	1/4	1/4
0.5	1/4	1/4	1/4	1/4	1/4
0.6	1/4	1/4	1/4	1/4	1/4
0.7	3/16	3/16	3/16	3/16	3/16
0.8	1/8	3/16	1/8	1/8	1/8
0.9	1/16	1/16	1/16	1/16	1/16
Abut. No. 2	0	0	0	0	0

DEFLECTION AND CAMBER NOTES: The girder shall be fabricated such that under load, the top of the girder web will parallel the finished deck grade defined by the "Top of Finished Deck Elevations" table on the "Top of Deck Elevations" sheet.

"Dead Load Steel" ordinates represent the amount of deflection due to all structural steel.

"Dead Load Concrete" ordinates represent the amount of deflection due to the deck and barrier rail pours, these ordinates represent the amount of camber that should be in the girders after they are erected and prior to placing deck formwork.

"Total Dead Load" ordinates represent the total deflection which is the sum of the steel and concrete deflections.

The distance from the top of the deck to the top of the girder web shall be 11 1/2" measured at the ℄ girder.

Plotted By: KKATHRIN | Plot Location:
File: c:\pwworking\central01\d2597941\ka602001\bbr0055-DL2.dgn
Plot Date: 07-11-24

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-071-198.72 (055) Sta. 186+90.75
DEAD LOAD DEFLECTION AND CAMBER DIAGRAMS (2 OF 2)
US-281 OVER NORTH FORK SOLOMON RIVER
Proj. No. 281-071 KA-6020-01 Osborne Co.

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

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STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	128	293

TOP OF SLAB ELEVATION

	Girder A			Girder B			Girder C			Girder D			Girder E		
Location	Station	Offset (ft)	Elevation	Station	Offset (ft)	Elevation	Station	Offset (ft)	Elevation	Station	Offset (ft)	Elevation	Station	Offset (ft)	Elevation
℄ Brg. Abutment 1	183+34.18	-16.00	1532.56	183+27.46	-8.00	1532.65	183+20.75	0.00	1532.74	183+14.04	8.00	1532.58	183+07.33	16.00	1532.41
0.1L	183+44.38	-16.00	1532.62	183+37.66	-8.00	1532.71	183+30.95	0.00	1532.80	183+24.24	8.00	1532.63	183+17.53	16.00	1532.47
0.2L	183+54.58	-16.00	1532.67	183+47.86	-8.00	1532.76	183+41.15	0.00	1532.85	183+34.44	8.00	1532.69	183+27.73	16.00	1532.53
0.3L	183+64.78	-16.00	1532.72	183+58.06	-8.00	1532.82	183+51.35	0.00	1532.91	183+44.64	8.00	1532.75	183+37.93	16.00	1532.58
0.4L	183+74.98	-16.00	1532.77	183+68.26	-8.00	1532.87	183+61.55	0.00	1532.96	183+54.84	8.00	1532.80	183+48.13	16.00	1532.64
0.5L	183+85.18	-16.00	1532.82	183+78.46	-8.00	1532.92	183+71.75	0.00	1533.01	183+65.04	8.00	1532.85	183+58.33	16.00	1532.69
0.6L	183+95.38	-16.00	1532.87	183+88.66	-8.00	1532.97	183+81.95	0.00	1533.06	183+75.24	8.00	1532.90	183+68.53	16.00	1532.74
0.7L	184+05.58	-16.00	1532.91	183+98.86	-8.00	1533.01	183+92.15	0.00	1533.11	183+85.44	8.00	1532.95	183+78.73	16.00	1532.79
0.8L	184+15.78	-16.00	1532.96	184+09.06	-8.00	1533.06	184+02.35	0.00	1533.16	183+95.64	8.00	1533.00	183+88.93	16.00	1532.84
0.9L	184+25.98	-16.00	1533.00	184+19.26	-8.00	1533.10	184+12.55	0.00	1533.20	184+05.84	8.00	1533.04	183+99.13	16.00	1532.89
℄ Pier No. 1	184+36.18	-16.00	1533.04	184+29.46	-8.00	1533.14	184+22.75	0.00	1533.24	184+16.04	8.00	1533.09	184+09.33	16.00	1532.93
0.1L	184+48.78	-16.00	1533.09	184+42.06	-8.00	1533.19	184+35.35	0.00	1533.30	184+28.64	8.00	1533.14	184+21.93	16.00	1532.98
0.2L	184+61.38	-16.00	1533.14	184+54.66	-8.00	1533.24	184+47.95	0.00	1533.34	184+41.24	8.00	1533.19	184+34.53	16.00	1533.04
0.3L	184+73.98	-16.00	1533.18	184+67.26	-8.00	1533.29	184+60.55	0.00	1533.39	184+53.84	8.00	1533.24	184+47.13	16.00	1533.08
0.4L	184+86.58	-16.00	1533.22	184+79.86	-8.00	1533.33	184+73.15	0.00	1533.43	184+66.44	8.00	1533.28	184+59.73	16.00	1533.13
0.5L	184+99.18	-16.00	1533.26	184+92.46	-8.00	1533.37	184+85.75	0.00	1533.48	184+79.04	8.00	1533.33	184+72.33	16.00	1533.18
0.6L	185+11.78	-16.00	1533.30	185+05.06	-8.00	1533.41	184+98.35	0.00	1533.52	184+91.64	8.00	1533.37	184+84.93	16.00	1533.22
0.7L	185+24.38	-16.00	1533.33	185+17.66	-8.00	1533.44	185+10.95	0.00	1533.55	185+04.24	8.00	1533.41	184+97.53	16.00	1533.26
0.8L	185+36.98	-16.00	1533.37	185+30.26	-8.00	1533.48	185+23.55	0.00	1533.59	185+16.84	8.00	1533.44	185+10.13	16.00	1533.29
0.9L	185+49.58	-16.00	1533.39	185+42.86	-8.00	1533.51	185+36.15	0.00	1533.62	185+29.44	8.00	1533.47	185+22.73	16.00	1533.33
℄ Pier No. 2	185+62.18	-16.00	1533.42	185+55.46	-8.00	1533.54	185+48.75	0.00	1533.65	185+42.04	8.00	1533.51	185+35.33	16.00	1533.36
0.1L	185+74.78	-16.00	1533.45	185+68.06	-8.00	1533.56	185+61.35	0.00	1533.68	185+54.64	8.00	1533.53	185+47.93	16.00	1533.39
0.2L	185+87.38	-16.00	1533.47	185+80.66	-8.00	1533.59	185+73.95	0.00	1533.70	185+67.24	8.00	1533.56	185+60.53	16.00	1533.42
0.3L	185+99.98	-16.00	1533.49	185+93.26	-8.00	1533.61	185+86.55	0.00	1533.72	185+79.84	8.00	1533.58	185+73.13	16.00	1533.44
0.4L	186+12.58	-16.00	1533.51	186+05.86	-8.00	1533.63	185+99.15	0.00	1533.74	185+92.44	8.00	1533.61	185+85.73	16.00	1533.47
0.5L	186+25.18	-16.00	1533.52	186+18.46	-8.00	1533.64	186+11.75	0.00	1533.76	186+05.04	8.00	1533.62	185+98.33	16.00	1533.49
0.6L	186+37.78	-16.00	1533.54	186+31.06	-8.00	1533.66	186+24.35	0.00	1533.78	186+17.64	8.00	1533.64	186+10.93	16.00	1533.50
0.7L	186+50.38	-16.00	1533.55	186+43.66	-8.00	1533.67	186+36.95	0.00	1533.79	186+30.24	8.00	1533.66	186+23.53	16.00	1533.52
0.8L	186+62.98	-16.00	1533.55	186+56.26	-8.00	1533.68	186+49.55	0.00	1533.80	186+42.84	8.00	1533.67	186+36.13	16.00	1533.53
0.9L	186+75.58	-16.00	1533.56	186+68.86	-8.00	1533.69	186+62.15	0.00	1533.81	186+55.44	8.00	1533.68	186+48.73	16.00	1533.54
℄ Pier No. 3	186+88.18	-16.00	1533.56	186+81.46	-8.00	1533.69	186+74.75	0.00	1533.82	186+68.04	8.00	1533.68	186+61.33	16.00	1533.55
0.1L	187+03.98	-16.00	1533.56	186+97.26	-8.00	1533.69	186+90.55	0.00	1533.82	186+83.84	8.00	1533.69	186+77.13	16.00	1533.56
0.2L	187+19.78	-16.00	1533.56	187+13.06	-8.00	1533.69	187+06.35	0.00	1533.82	186+99.64	8.00	1533.69	186+92.93	16.00	1533.56
0.3L	187+35.58	-16.00	1533.56	187+28.86	-8.00	1533.69	187+22.15	0.00	1533.82	187+15.44	8.00	1533.69	187+08.73	16.00	1533.56
0.4L	187+51.38	-16.00	1533.54	187+44.66	-8.00	1533.68	187+37.95	0.00	1533.81	187+31.24	8.00	1533.69	187+24.53	16.00	1533.56
0.5L	187+67.18	-16.00	1533.53	187+60.46	-8.00	1533.67	187+53.75	0.00	1533.80	187+47.04	8.00	1533.68	187+40.33	16.00	1533.55
0.6L	187+82.98	-16.00	1533.51	187+76.26	-8.00	1533.65	187+69.55	0.00	1533.78	187+62.84	8.00	1533.66	187+56.13	16.00	1533.54
0.7L	187+98.78	-16.00	1533.49	187+92.06	-8.00	1533.63	187+85.35	0.00	1533.77	187+78.64	8.00	1533.65	187+71.93	16.00	1533.53
0.8L	188+14.58	-16.00	1533.47	188+07.86	-8.00	1533.61	188+01.15	0.00	1533.74	187+94.44	8.00	1533.63	187+87.73	16.00	1533.51
0.9L	188+30.38	-16.00	1533.44	188+23.66	-8.00	1533.58	188+16.95	0.00	1533.72	188+10.24	8.00	1533.60	188+03.53	16.00	1533.48
℄ Pier No. 4	188+46.18	-16.00	1533.40	188+39.46	-8.00	1533.55	188+32.75	0.00	1533.69	188+26.04	8.00	1533.57	188+19.33	16.00	1533.46
0.1L	188+58.78	-16.00	1533.38	188+52.06	-8.00	1533.52	188+45.35	0.00	1533.66	188+38.64	8.00	1533.55	188+31.93	16.00	1533.43
0.2L	188+71.38	-16.00	1533.34	188+64.66	-8.00	1533.49	188+57.95	0.00	1533.63	188+51.24	8.00	1533.52	188+44.53	16.00	1533.41
0.3L	188+83.98	-16.00	1533.31	188+77.26	-8.00	1533.46	188+70.55	0.00	1533.60	188+63.84	8.00	1533.49	188+57.13	16.00	1533.38
0.4L	188+96.58	-16.00	1533.27	188+89.86	-8.00	1533.42	188+83.15	0.00	1533.57	188+76.44	8.00	1533.46	188+69.73	16.00	1533.35
0.5L	189+09.18	-16.00	1533.24	189+02.46	-8.00	1533.39	188+95.75	0.00	1533.53	188+89.04	8.00	1533.42	188+82.33	16.00	1533.32
0.6L	189+21.78	-16.00	1533.20	189+15.06	-8.00	1533.35	189+08.35	0.00	1533.49	189+01.64	8.00	1533.39	188+94.93	16.00	1533.28
0.7L	189+34.38	-16.00	1533.15	189+27.66	-8.00	1533.30	189+20.95	0.00	1533.45	189+14.24	8.00	1533.35	189+07.53	16.00	1533.24
0.8L	189+46.98	-16.00	1533.11	189+40.26	-8.00	1533.26	189+33.55	0.00	1533.41	189+26.84	8.00	1533.31	189+20.13	16.00	1533.20
0.9L	189+59.58	-16.00	1533.06	189+52.86	-8.00	1533.21	189+46.15	0.00	1533.37	189+39.44	8.00	1533.26	189+32.73	16.00	1533.16
℄ Pier No. 5	189+72.18	-16.00	1533.01	189+65.46	-8.00	1533.16	189+58.75	0.00	1533.32	189+52.04	8.00	1533.22	189+45.33	16.00	1533.11
0.1L	189+82.38	-16.00	1532.97	189+75.66	-8.00	1533.12	189+68.95	0.00	1533.28	189+62.24	8.00	1533.18	189+55.53	16.00	1533.07
0.2L	189+92.58	-16.00	1532.92	189+85.86	-8.00	1533.08	189+79.15	0.00	1533.24	189+72.44	8.00	1533.14	189+65.73	16.00	1533.03
0.3L	190+02.78	-16.00	1532.88	189+96.06	-8.00	1533.04	189+89.35	0.00	1533.19	189+82.64	8.00	1533.09	189+75.93	16.00	1532.99
0.4L	190+12.98	-16.00	1532.83	190+06.26	-8.00	1532.99	189+99.55	0.00	1533.15	189+92.84	8.00	1533.05	189+86.13	16.00	1532.95
0.5L	190+23.18	-16.00	1532.78	190+16.46	-8.00	1532.94	190+09.75	0.00	1533.10	190+03.04	8.00	1533.00	189+96.33	16.00	1532.91
0.6L	190+33.38	-16.00	1532.73	190+26.66	-8.00	1532.89	190+19.95	0.00	1533.05	190+13.24	8.00	1532.96	190+06.53	16.00	1532.86
0.7L	190+43.58	-16.00	1532.68	190+36.86	-8.00	1532.84	190+30.15	0.00	1533.00	190+23.44	8.00	1532.91	190+16.73	16.00	1532.81
0.8L	190+53.78	-16.00	1532.63	190+47.06	-8.00	1532.79	190+40.35	0.00	1532.95	190+33.64	8.00	1532.86	190+26.93	16.00	1532.76
0.9L	190+63.98	-16.00	1532.57	190+57.26	-8.00	1532.74	190+50.55	0.00	1532.90	190+43.84	8.00	1532.81	190+37.13	16.00	1532.71
℄ Brg. Abutment 2	190+74.18	-16.00	1532.51	190+67.46	-8.00	1532.68	190+60.75	0.00	1532.84	190+54.04	8.00	1532.75	190+47.33	16.00	1532.66

Plotted By: KKATHRIN
Plot Location:
File: c:\pwworking\central01\d2597941\kx602201\bbr0055-TOP.dgn
Plot Date: 07-11-24

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 281-071-198.72 (055) Sta. 186+90.75

TOP OF PAVEMENT ELEVATIONS
US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

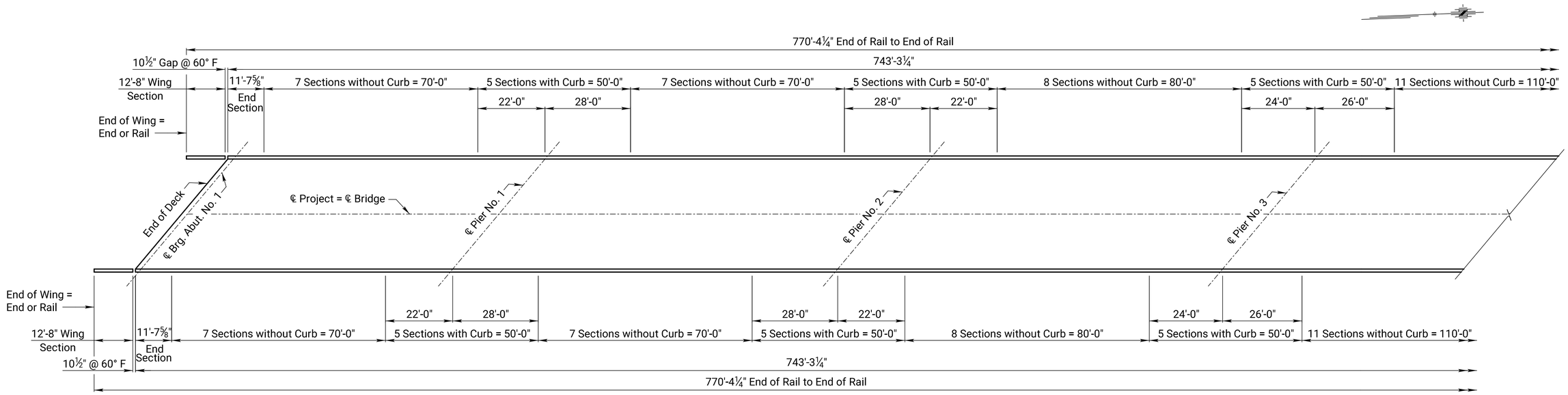
SHEET NO.	OF	SCALE		APP'D			
DESIGNED	MMD	DETAILED	MMD	QUANTITIES		CADD	KBK
DESIGN CK.	KVG	DETAIL CK.	KVG	QUAN. CK.		CADD CK.	KVG

KDOT Graphics Certified 05-07-2024

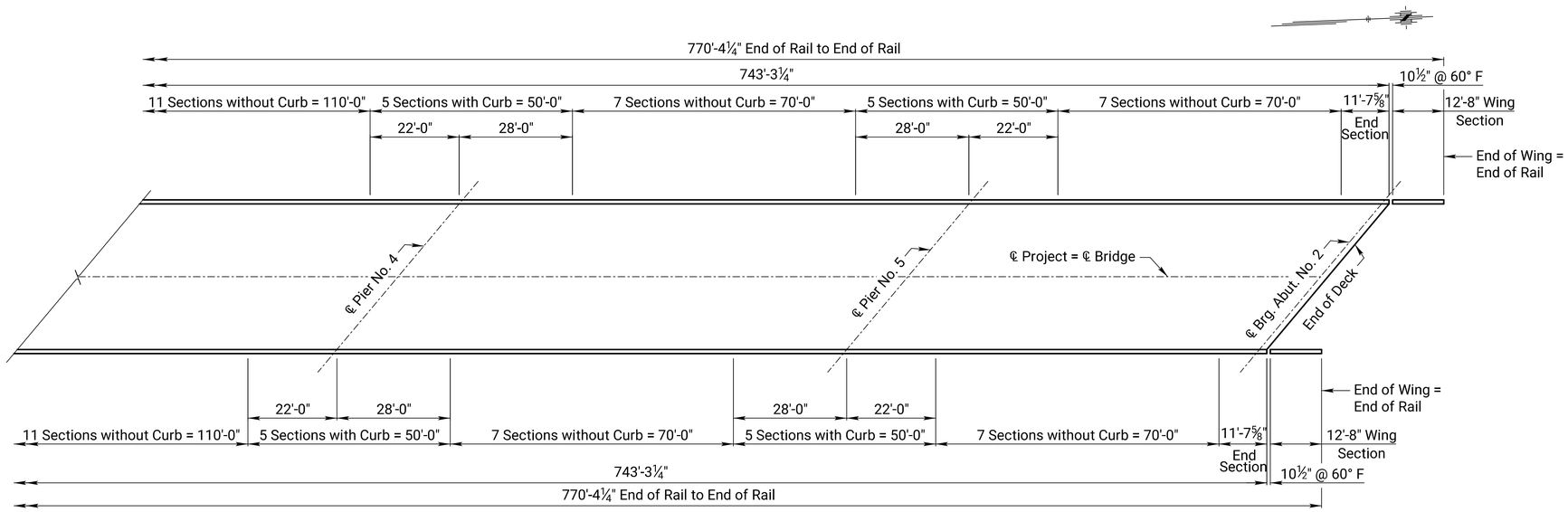
Sheet No. 128

KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	129	293



PARTIAL PLAN VIEW SHOWING CURB SECTIONS



PARTIAL PLAN VIEW SHOWING CURB SECTIONS

Note: All dimensions are to traffic face of Corral Rail.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 281-071-198.72 (055) Sta. 186+90.75

32" CORRAL RAIL DETAILS (1 OF 3)
US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

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

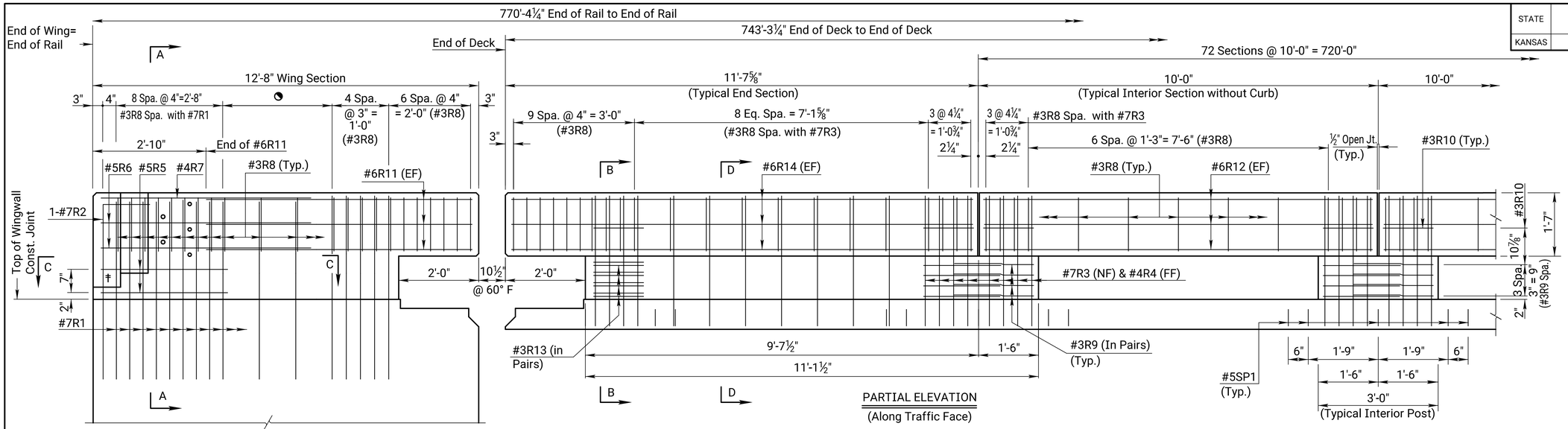
KDOT Graphics Certified 05-09-2023

Sheet No. 129

KDOT Graphics Certified

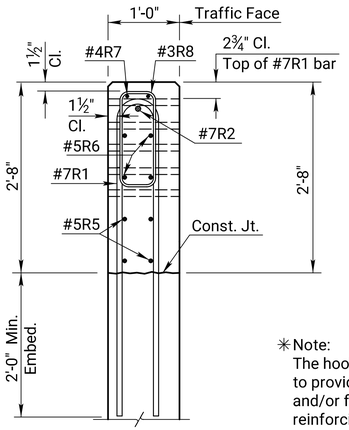
Plotted By: KKATHRIN Plot Location:
File: c:\pwworking\central01\d2597941\ke602001\bbr0055-CRI.dgn
Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	130	293

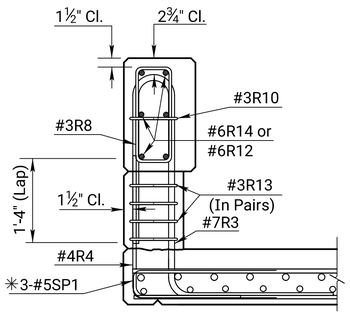


◔ 5 Eq. Spa. = 6'-2"

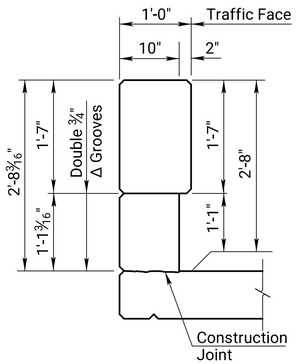
†Extend the 12:3 taper to the top of the approach slab curb.



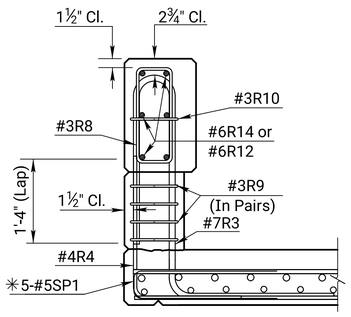
SECTION A-A



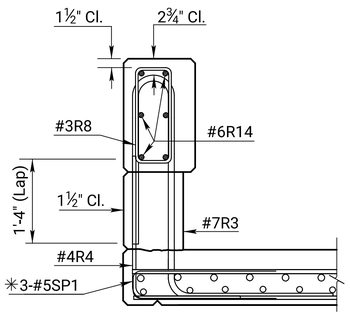
SECTION B-B



TYPICAL INTERIOR POST
(Without Curb)

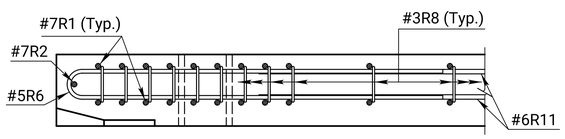


SECTION THRU TYPICAL POST
(Without Curb)

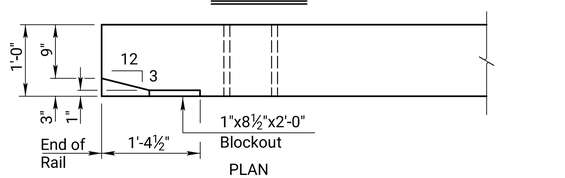


SECTION D-D

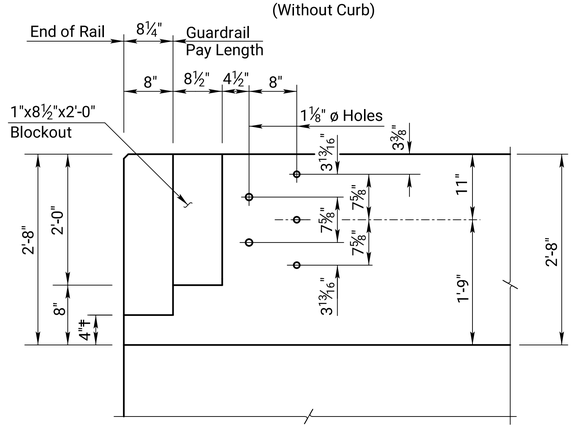
✳Note:
The hook may be canted to provide clearance and/or fit between reinforcing.



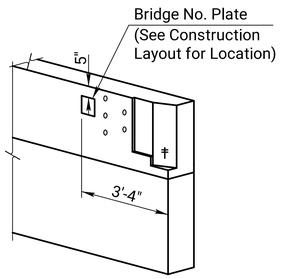
SECTION C-C



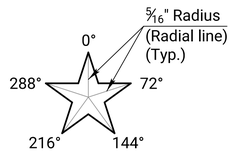
PLAN



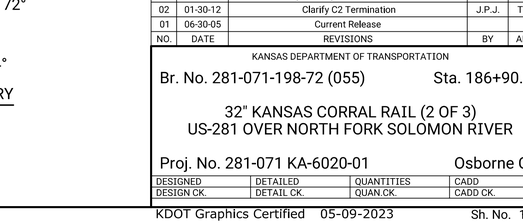
ELEVATION
(Dimensions at Traffic Face of Rail)



BRIDGE NUMBER PLATE PLACEMENT DETAIL



STAR GEOMETRY



XX Year Bridge is Completed.

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

NO.	DATE	REVISIONS	BY	APP'D
03	12-03-21	Changed Bridge Number Plate detail	M.L.L.	M.A.H.
02	01-30-12	Clarify C2 Termination	J.P.J.	T.L.F.
01	06-30-05	Current Release		

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 281-071-198-72 (055) Sta. 186+90.75

32" KANSAS CORRAL RAIL (2 OF 3)
US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

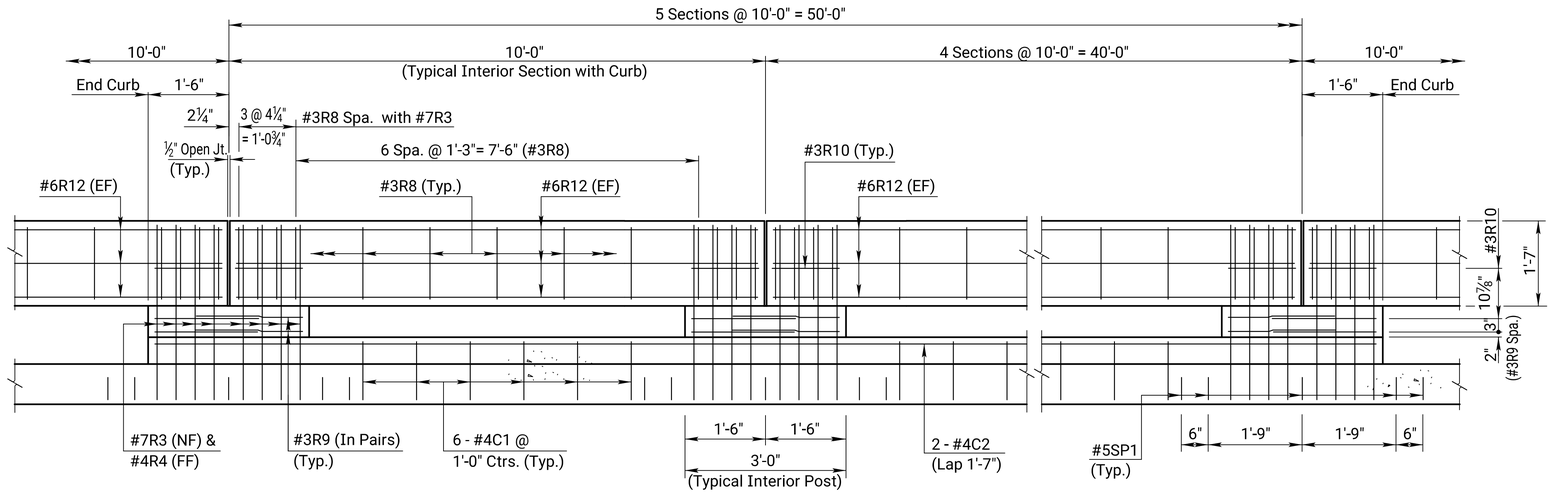
DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN.CK.	CADD CK.

KDOT Graphics Certified 05-09-2023 Sh. No. 130

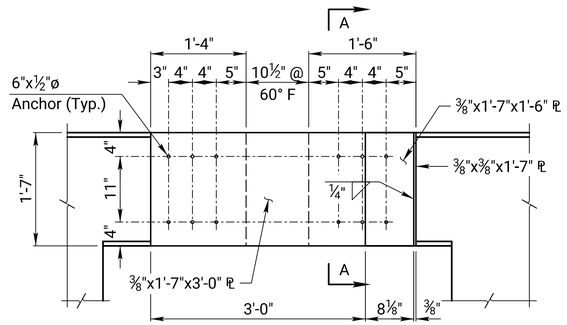
KDOT Graphics Certified

Drawn By : KKATHRIN Plotted : 07-11-24
File : c:\pwworking\central01\d2597941\ka602001bbr0055-CR2.dgn

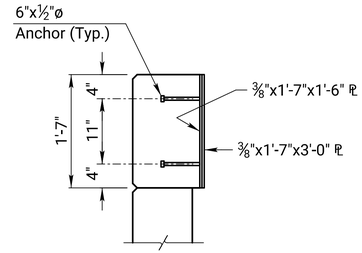
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	131	293



PARTIAL ELEVATION SECTIONS WITH CURB
(Along Traffic Face)

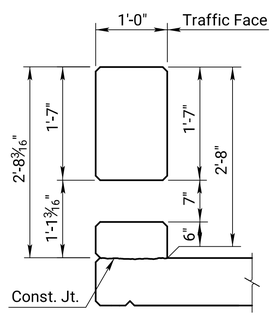


ELEVATION OF BRIDGE RAIL AT EXPANSION DEVICE
(Typical Both Rails at Each Abutment)

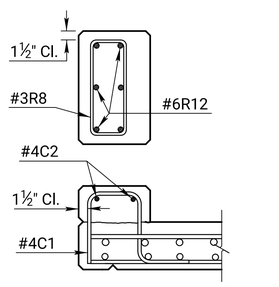


SECTION A-A

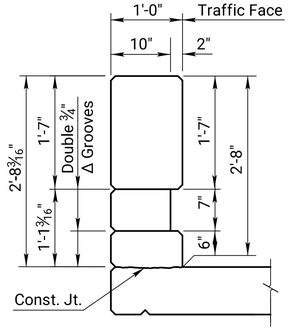
Note: The plates and bar shown in the sliding plate details are to be ASTM A36. The stud anchors will be made of material as specified for Shear connector Studs in the KDOT Specifications. The steel along with the anchors shall be considered subsidiary to the bid item "Expansion Device (Sliding Plate)". Stud welding will be in accordance with the latest edition of AWS D1.1. See other "CORRAL RAIL DETAILS" sheet for location of sliding plates. The sliding plates shall be galvanized according to ASTM A123.



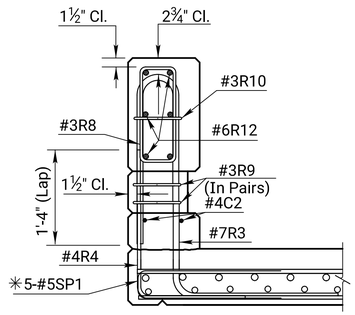
TYPICAL SECTION BETWEEN POSTS
(With Curb)



TYPICAL SECTION BETWEEN POSTS
(With Curb)



TYPICAL INTERIOR POST
(With Curb)



SECTION THRU POST
(With Curb)

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

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

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 281-071-198.72 (055) Sta. 186+90.75
32" KANSAS CORRAL RAIL (3 OF 3)
US-281 OVER NORTH FORK SOLOMON RIVER
Proj. No. 281-071 KA-6020-01 Osborne Co.

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

KDOT Graphics Certified 05-09-2023

Sheet No. 131

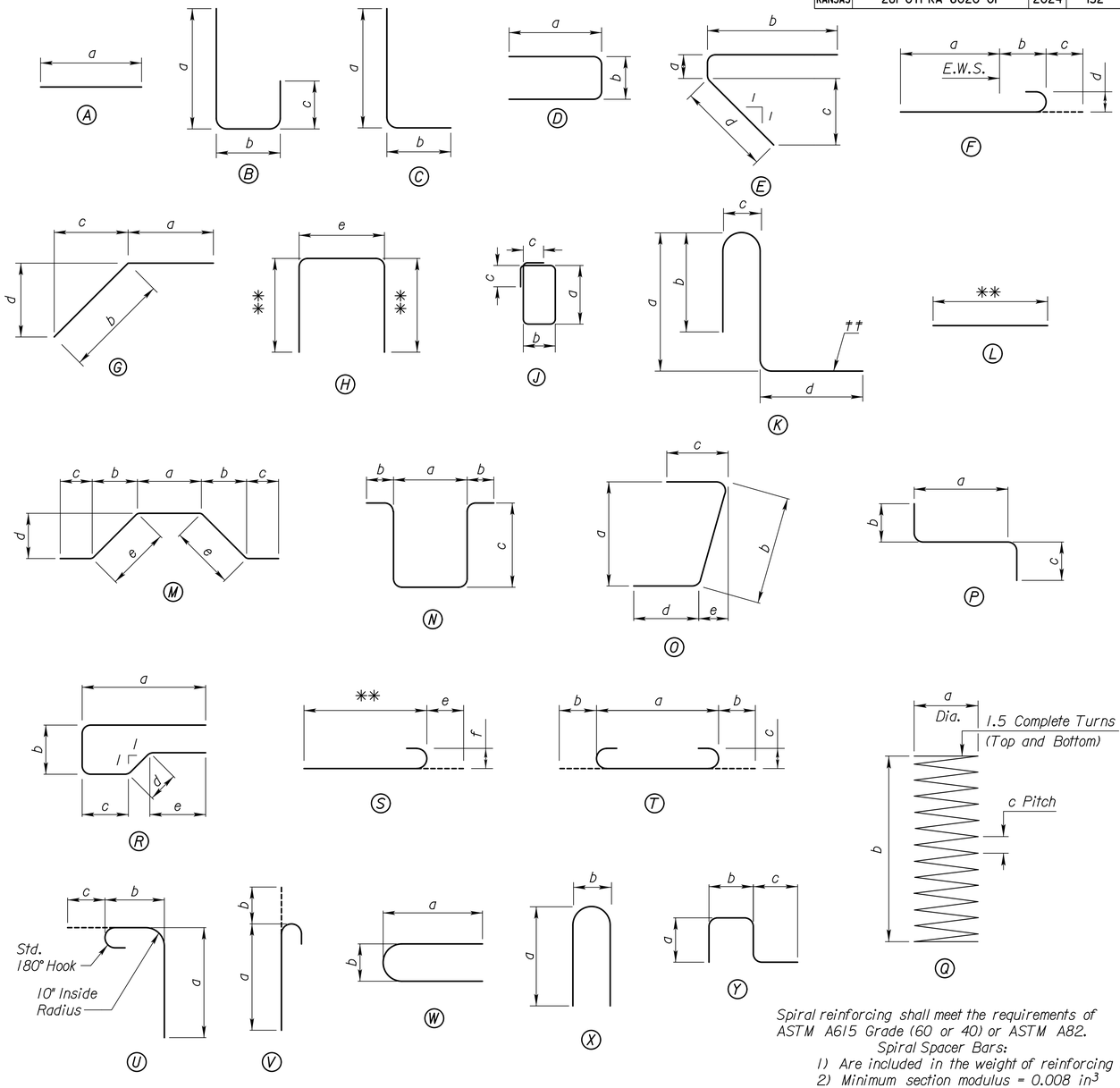
KDOT Graphics Certified

Plotted By: KKATHRIN Plot Location:
File: c:\pwworking\central01\d2597941\kd602001\bbr0055-CR3.dgn
Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	132	293

REINFORCING STEEL SCHEDULE (Grade 60)

Location	Epoxy	Bar Label	No. Req.	Shape	Size	Total Length	Dimensions a	b	c	d	e	f	g
Abutments	†	A1	32	A	8	49'-2"	49'-2"						
	†	A2	20	A	5	49'-2"	49'-2"						
	†	A3	372	D	5	9'-2"	2'-9"	3'-8"					
	†	A4	184	A	5	4'-11"	4'-11"						
	†	A5	12	A	6	11'-9"	11-9"						
	†	A6	12	A	6	14'-3"	14'-3"						
	†	A7	136	A	7	7'-7"	7'-7"						
	†	A8	180	D	5	8'-2"	2'-9"	2'-8"					
	†	A9	12	A	6	15'-11"	15'-11"						
	†	A10	12	A	6	8'-5"	8'-5"						
	†	A11	24	A	6	10'-0"	10'-0"						
	†	A12	128	A	7	12'-4"	12'-4"						
	†	A13	28	M	6	11'-1"	6'-9"	1'-11 5/8"	0"	11"	2'-2"		
	†	A14	28	M	6	7'-8"	3'-4"	11"	0"	1'-11 5/8"	2'-2"		
	†	A15	10	H	5	VARIES	3'-9"	7'-5"	11"	2	1'-8"		
	†	A16	8	T	8	13'-2"	11'-4"	11"	8"				
	†	A17	92	U	5	8'-6"	6'-5"	1'-10"	7"				
	†	A18	92	V	5	7'-0"	6'-5"	7"					
	†	A19	88	E	5	6'-5"	9"	2'-8"	2'-1 1/2"	3'-0"			
	†	A20	88	V	5	3'-2"	2'-7"	7"					
	†	A21	34	A	5	49'-2"	49'-2"						
	†	A22	2	A	5	46'-6"	46'-6"						
	†	A23	50	D	4	6'-4"	2'-0"	2'-4"					
	†	A24	20	D	4	8'-0"	2'-10"	2'-4"					
	†	A25	154	A	7	6'-9"	6'-9"						
	†	A26	24	L	5	VARIES	3'-3"	8'-8"	1'-1"	4			
	†	A27	56	A	5	4'-9"	4'-9"						
	†	A28	32	A	5	8'-11"	8'-11"						
	†	AS1	20	Q	1/2"Ø	SPIRAL	2'-0"	2'-6"	6"				
Pier No. 1		PB1	2	A	9	43'-10"	43'-10"						
		PB2	2	A	9	46'-9	46'-9"						
		PB3	2	A	9	47'-5"	47'-5"						
		PB4	2	A	9	43'-10"	43'-10"						
		PB5	2	A	9	46'-9"	46'-9"						
		PB6	2	A	9	47'-5"	47'-5"						
		PB7	10	A	6	43'-10"	43'-10"						
		PB8	156	D	5	9'-0"	3'-3"	2'-6"					
		PB9	14	W	5	10'-0"	4'-0"	3'-6"					
		PB10	8	C	5	8'-2"	4'-2"	4'-0"					
		PC1	48	V	9	12'-10"	11'-7"	1'-3"					
		PC4	12	C	9	10'-10"	8'-1"	2'-9"					
		PW1	40	A	5	4'-9"	4'-9"						
		PW2	40	A	5	8'-6"	8'-6"						
		PW3	60	A	5	10'-9"	10'-9"						
		PW4	72	A	5	8'-8"	8'-8"						
		PW6	72	D	5	4'-8"	2'-0"	8"					
		PS1	4	Q	5/8"Ø	SPIRAL	2'-8"	8'-0"	4"				



Spiral reinforcing shall meet the requirements of ASTM A615 Grade (60 or 40) or ASTM A82.

Spiral Spacer Bars:

1) Are included in the weight of reinforcing steel.
2) Minimum section modulus = 0.008 in^3

** Increase from a to b by c increments. Cut d bars to length. Each set has d bars.

BENDING DIAGRAMS

(All dimensions are out to out of bars.)

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 281-071-198.72 (055) Sta. 186+90.75

BILL OF REINFORCING STEEL (1 OF 2)
US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

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

KDOT Graphics Certified 02-07-2023

Sheet No. 132

KDOT Graphics Certified

Plotted By: KKATHRIN Plot Location:
File: c:\pwworking\central01\d2597941\kdot6020001\bbr0055-BR1.dgn
Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	133	293

REINFORCING STEEL SCHEDULE (Grade 60)

Location	Epoxy	Bar Label	No. Req.	Shape	Size	Total Length	Dimensions a	b	c	d	e	f	g
Pier No. 2		PB1	2	A	9	43'-10"	43'-10"						
		PB2	2	A	9	46'-9	46'-9"						
		PB3	2	A	9	47'-5"	47'-5"						
		PB4	2	A	9	43'-10"	43'-10"						
		PB5	2	A	9	46'-9"	46'-9"						
		PB6	2	A	9	47'-5"	47'-5"						
		PB7	10	A	6	43'-10"	43'-10"						
		PB8	156	D	5	9'-0"	3'-3"	2'-6"					
		PB9	14	W	5	10'-0"	4'-0"	3'-6"					
		PB10	8	C	5	8'-2"	4'-2"	4'-0"					
		PC2	48	V	9	13'-10"	12'-7"	1'-3"					
		PC4	12	C	9	10'-10"	8'-1"	2'-9"					
		PW1	44	A	5	4'-9"	4'-9"						
		PW2	44	A	5	8'-6"	8'-6"						
		PW3	66	A	5	10'-9"	10'-9"						
		PW5	72	A	5	9'-8"	9'-8"						
		PW6	72	D	5	4'-8"	2'-0"	8"					
		PS2	4	Q	5/8"Ø	SPIRAL	2'-8"	9'-0"	4"				
Pier No. 3		PB1	2	A	9	43'-10"	43'-10"						
		PB2	2	A	9	46'-9	46'-9"						
		PB3	2	A	9	47'-5"	47'-5"						
		PB4	2	A	9	43'-10"	43'-10"						
		PB5	2	A	9	46'-9"	46'-9"						
		PB6	2	A	9	47'-5"	47'-5"						
		PB7	10	A	6	43'-10"	43'-10"						
		PB8	156	D	5	9'-0"	3'-3"	2'-6"					
		PB9	14	W	5	10'-0"	4'-0"	3'-6"					
		PB10	8	C	5	8'-2"	4'-2"	4'-0"					
		PC2	48	V	9	13'-10"	12'-7"	1'-3"					
		PC4	12	C	9	10'-10"	8'-1"	2'-9"					
		PW1	44	A	5	4'-9"	4'-9"						
		PW2	44	A	5	8'-6"	8'-6"						
		PW3	66	A	5	10'-9"	10'-9"						
		PW5	72	A	5	9'-8"	9'-8"						
		PW6	72	D	5	4'-8"	2'-0"	8"					
		PS2	4	Q	5/8"Ø	SPIRAL	2'-8"	9'-0"	4"				
Pier No. 4		PB1	2	A	9	43'-10"	43'-10"						
		PB2	2	A	9	46'-9	46'-9"						
		PB3	2	A	9	47'-5"	47'-5"						
		PB4	2	A	9	43'-10"	43'-10"						
		PB5	2	A	9	46'-9"	46'-9"						
		PB6	2	A	9	47'-5"	47'-5"						
		PB7	10	A	6	43'-10"	43'-10"						
		PB8	156	D	5	9'-0"	3'-3"	2'-6"					
		PB9	14	W	5	10'-0"	4'-0"	3'-6"					
		PB10	8	C	5	8'-2"	4'-2"	4'-0"					
		PC2	48	V	9	13'-10"	12'-7"	1'-3"					
		PC4	12	C	9	10'-10"	8'-1"	2'-9"					
		PW1	44	A	5	4'-9"	4'-9"						
		PW2	44	A	5	8'-6"	8'-6"						
		PW3	66	A	5	10'-9"	10'-9"						
		PW5	72	A	5	9'-8"	9'-8"						
		PW6	72	D	5	4'-8"	2'-0"	8"					
		PS2	4	Q	5/8"Ø	SPIRAL	2'-8"	9'-0"	4"				

REINFORCING STEEL SCHEDULE (Grade 60)

Location	Epoxy	Bar Label	No. Req.	Shape	Size	Total Length	Dimensions a	b	c	d	e	f	g
Pier No. 5		PB1	2	A	9	43'-10"	43'-10"						
		PB2	2	A	9	46'-9	46'-9"						
		PB3	2	A	9	47'-5"	47'-5"						
		PB4	2	A	9	43'-10"	43'-10"						
		PB5	2	A	9	46'-9"	46'-9"						
		PB6	2	A	9	47'-5"	47'-5"						
		PB7	10	A	6	43'-10"	43'-10"						
		PB8	156	D	5	9'-0"	3'-3"	2'-6"					
		PB9	14	W	5	10'-0"	4'-0"	3'-6"					
		PB10	8	C	5	8'-2"	4'-2"	4'-0"					
		PC1	48	V	9	12'-10"	11'-7"	1'-3"					
		PC4	12	C	9	10'-10"	8'-1"	2'-9"					
		PW1	40	A	5	4'-9"	4'-9"						
		PW2	40	A	5	8'-6"	8'-6"						
		PW3	60	A	5	10'-9"	10'-9"						
		PW4	72	A	5	8'-8"	8'-8"						
		PW6	72	D	5	4'-8"	2'-0"	8"					
		PS1	4	Q	5/8"Ø	SPIRAL	2'-8"	8'-0"	4"				
Deck	†	S1	88	A	5	40'-0"	40'-0"						
	†	S2	1056	A	5	60'-0"	60'-0"						
	†	S3	88	A	5	14'-9"	14'-9"						
	†	S4	36	A	6	59'-3"	59'-3"						
	†	S5	36	A	6	58'-10"	58'-10"						
	†	S6	72	A	6	60'-0"	60'-0"						
	†	S7	36	A	6	31'-6"	31'-6"						
	†	S8	36	A	6	27'-8"	27'-8"						
	†	S9	36	A	6	53'-2"	53'-2"						
	†	S10	120	S	5	VARIES	2'-7"	37'-8"	7 1/8"	2	7"	5"	
	†	S11	120	L	5	VARIES	2'-7"	37'-8"	7 1/8"	2			
	†	S12	1415	T	5	38'-10"	37'-8"	7"	5"				
	†	S13	1415	A	5	37'-8"	37'-8"						
	†	S14	40	A	5	8'-8"	8'-8"						
	†	S15	96	R	5	10'-11"	5'-0"	7"	1'-11"	1'-2"	2'-3"		
	†	S16	20	A	5	2'-9"	2'-9"						
Barrier Curb	†	R1	72	X	7	9'-3"	4'-6"	7"					
	†	R2	4	C	7	5'-7"	4'-5"	1'-2"					
	†	R3	1212	K	7	7'-7"	3'-1"	2'-3"	7"	2'-0"			
	†	R4	1212	C	4	4'-2"	2'-4"	1'-10"					
	†	R5	8	X	5	6'-6"	3'-2"	5"					
	†	R6	8	X	5	10'-8"	5'-3"	5"					
	†	R7	4	X	4	10'-8"	5'-3"	4"					
	†	R8	2052	J	3	4'-4"	1'-4"	6"	4"				
	†	R9	1168	D	3	4'-6"	1'-11"	8"					
	†	R10	296	J	3	4'-6"	1'-3"	8"	4"				
	†	R11	24	A	6	9'-8"	9'-8"						
	†	R12	864	A	6	9'-8"	9'-8"						
	†	R13	32	D	3	3'-2"	1'-3"	8"					
	†	R14	24	A	6	11'-3"	11'-3"						
	†	SP1	742	D	5	4'-5"	2'-0"	5"					
	†	C1	300	Y	4	3'-5"	1'-0"	9"	8"				
	†	C2	40	A	4	27'-2"	27'-2"						

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 281-071-198.72 (055) Sta. 186+90.75

BILL OF REINFORCING STEEL (2 OF 2)
US-281 OVER NORTH FORK SOLOMON RIVER

Proj. No. 281-071 KA-6020-01 Osborne Co.

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

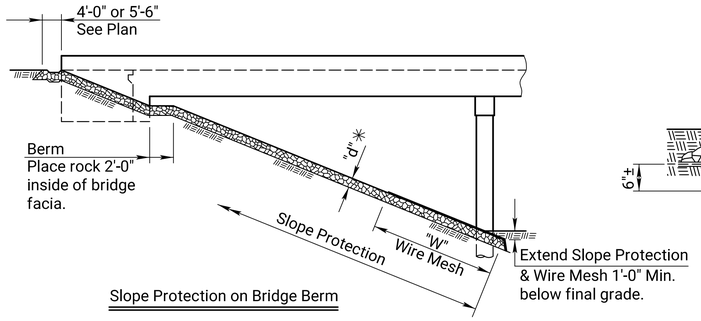
KDOT Graphics Certified 02-07-2023

KDOT Graphics Certified

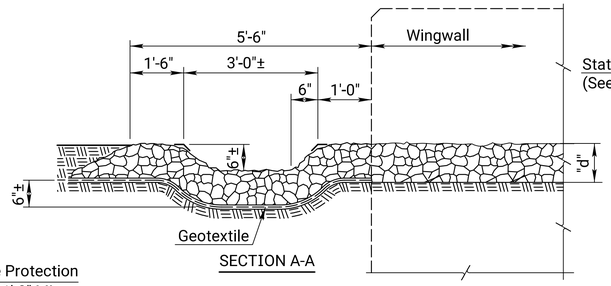
Sheet No. 133

Plotted By: KKATHRIN Plot Location:
File: c:\pwworking\central01\d2597941\kdot6020101br0055-BR2.dgn
Plot Date: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	134	293

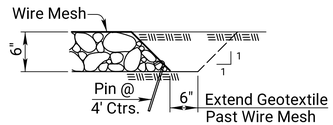


Slope Protection on Bridge Berm

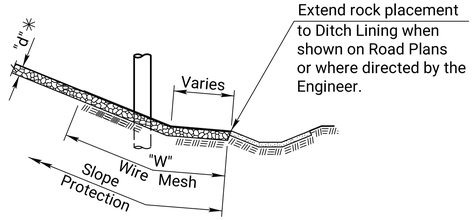


SECTION A-A

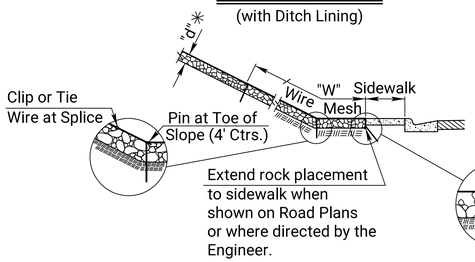
NOTE: Section A-A, Rock Flume required when curb is omitted on the approach slab or when shown on the Construction Layout sheet.



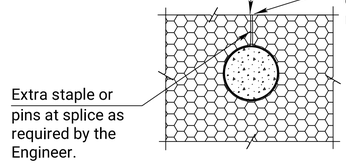
DETAIL AT EDGE OR TOE



Slope Protection at Toe
(with Ditch Lining)

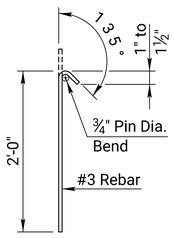


Slope Protection at Toe
(with Sidewalk)



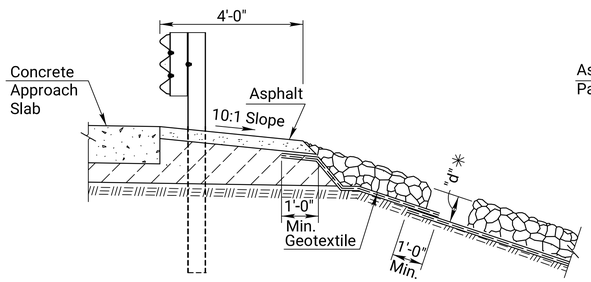
DETAIL AT COLUMNS
(Or Other Obstruction)

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

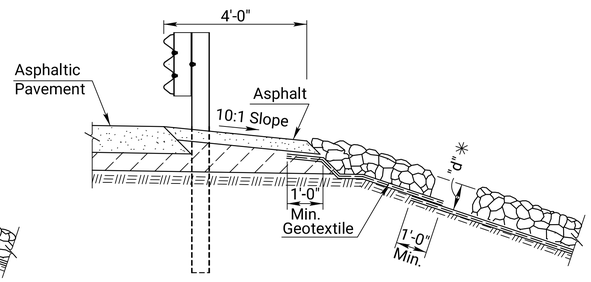


TYPICAL PIN
DETAIL

✳See General Notes
for minimum dimensions.

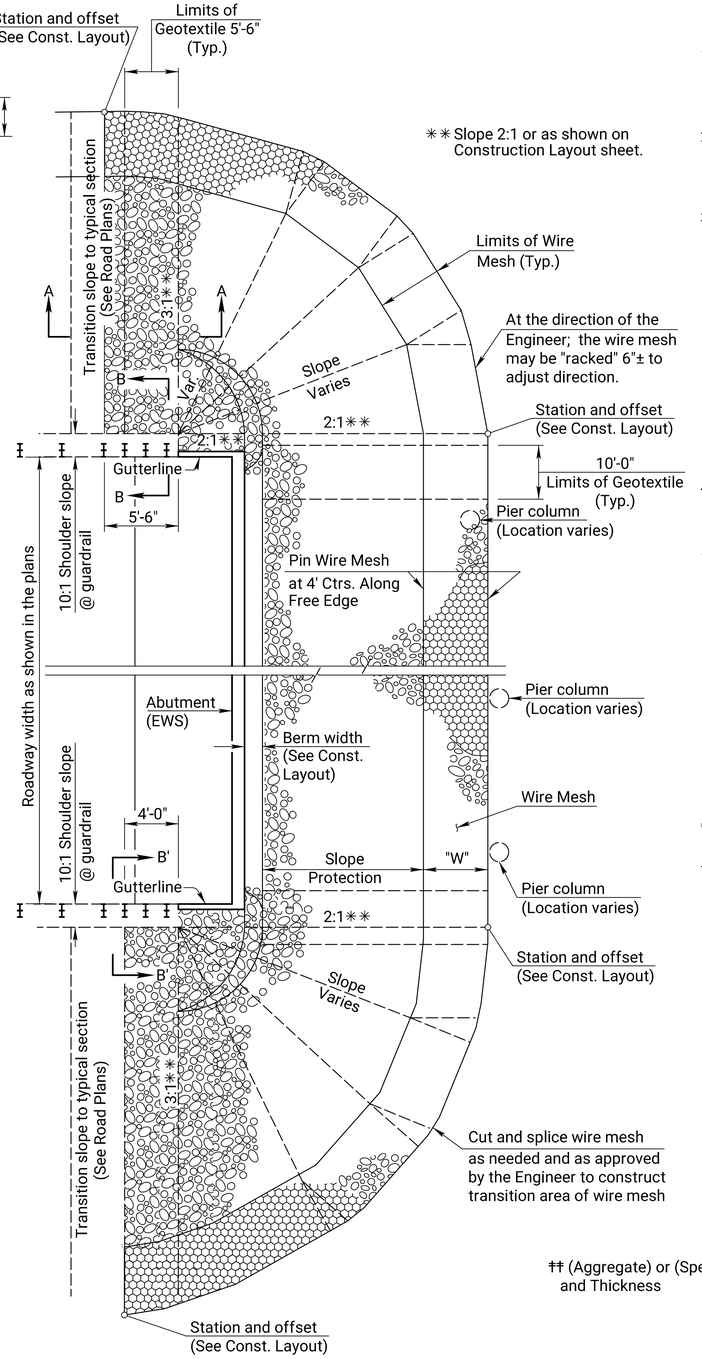


SECTION B-B
(For Concrete Approach Slab)



SECTION B'-B'
(For Asphaltic Pavement)

TYPICAL ELEVATIONS



BERM AND SLOPE PROTECTION PLAN
(U-Type Abutment)

GENERAL NOTES

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

QUANTITIES
† For Information Only

Slope Protection (††) Cu. Yds.	†Geotextile Sq. Yds.	†Wire Mesh Sq. Yds.
2801	397	0

†† (Aggregate) or (Special) and Thickness

NO.	DATE	REVISIONS	BY	APP'D
03	12-10-10	Clarified Geotextile	J.P.J.	T.L.F.
02	07-14-04	Changed to guard "rail"	R.A.M.	K.F.H.
01	05-15-02	Clarified Bid Items	R.A.M.	K.F.H.

KANSAS DEPARTMENT OF TRANSPORTATION

BRIDGE BERM AND SLOPE PROTECTION U-TYPE ABUTMENT

BR132B

FHWA APPROVAL		06-04-02	APP'D.	Kenneth F. Hurst	
DESIGNED	R.R.R.	DETAILED	P.G.F.	QUANTITIES	TRACED P.G.F.
DESIGN CK.		DETAIL CK.	R.R.R.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 02-01-2023

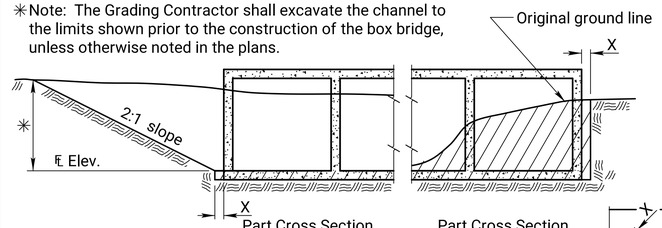
Sh. No. 134

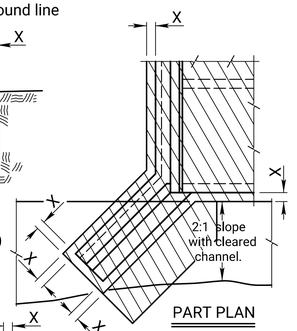
KDOT Graphics Certified

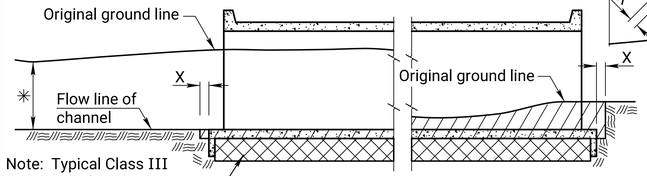
Drawn By : KKATHRIN Plotted : 07-11-24
File : c:\pwworking\central01\d2597941\ka602001bss-br132b.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	135	293

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

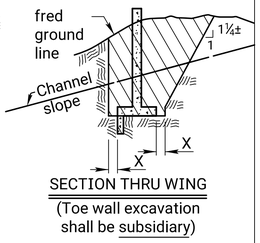






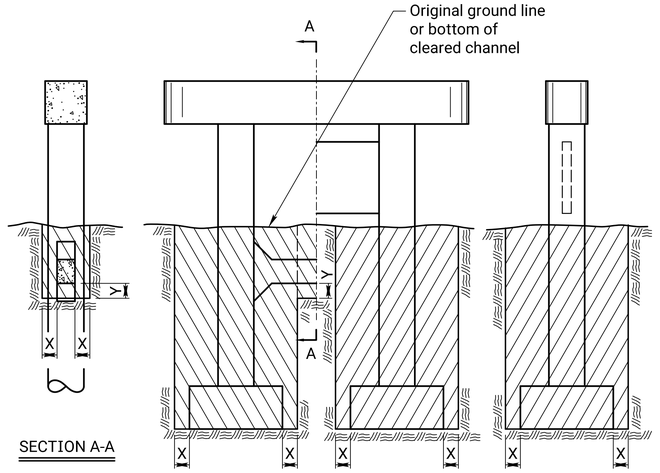
Note: Typical Class III Excavation for box bridges shall be below the "cleared" channel unless otherwise noted on the plans.

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



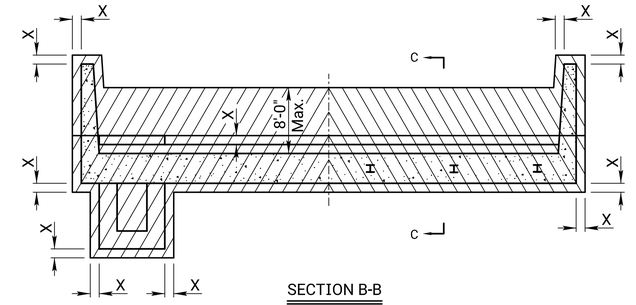
EXCAVATION DETAILS FOR REINFORCED CONCRETE BOX CULVERT

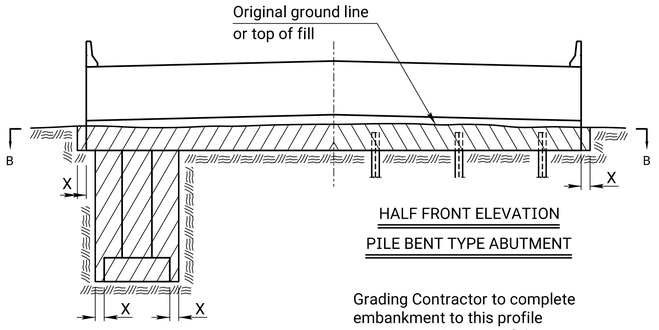
Note: Excavation for culverts less than bridge length and the additional excavation for "Embedded Structures" shall not be paid for as Class III Excavation, but shall be subsidiary to Grade 4.0 Concrete.



EXCAVATION DETAILS FOR TYPICAL PIERS

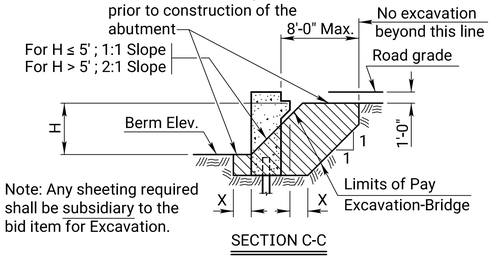
See detail when rock or shale (rock) is encountered. ⊛





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

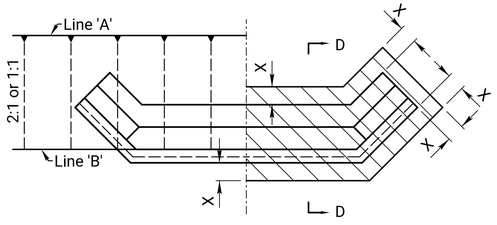
Grading Contractor to complete embankment to this profile prior to construction of the abutment

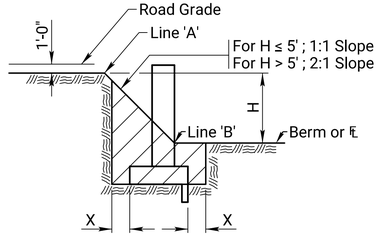


Note: Any sheeting required shall be subsidiary to the bid item for Excavation.

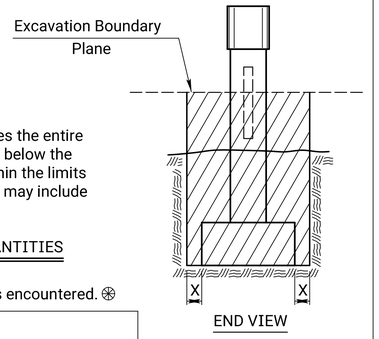
EXCAVATION DETAILS FOR TYPICAL ABUTMENTS

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





EXCAVATION DETAILS FOR ABUTMENTS WITH FLARED WINGWALLS



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

CLASS II EXCAVATION QUANTITIES

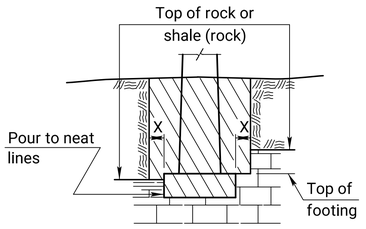
See detail when rock or shale (rock) is encountered. ⊛

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

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

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

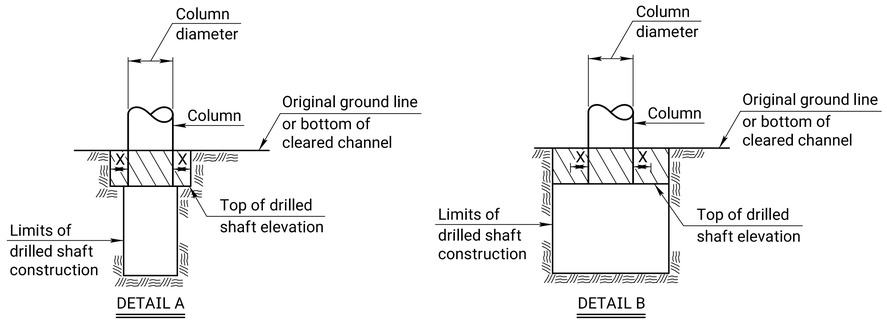
Dimension "Y" shall be 1'-6" unless indicated otherwise on the general plans.



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

(Piers and Abutments)

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



DRILLED SHAFT DETAILS

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

NO.	DATE	REVISIONS	BY	APP'D
06	08-15-12	Embedment Excavation Subsidiary	J.P.J.	T.L.F.
05	05-15-12	Revised Wing Excavation	J.P.J.	T.L.F.
04	03-03-10	Revised Wing Excavation	J.P.J.	T.L.F.

KANSAS DEPARTMENT OF TRANSPORTATION

BRIDGE EXCAVATION (LRFD)

BR100B

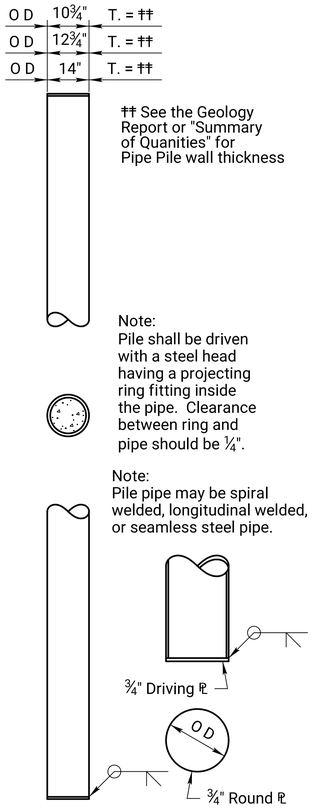
FHWA APPROVAL		04-17-10	APP'D.		Terry L. Fleck
DESIGNED	DETAILED	R.D.R.	QUANTITIES	TRACED	
DESIGN CK.	DETAIL CK.	L.R.R.	QUAN.CK.	TRACE CK.	

KDOT Graphics Certified 02-01-2023 Sh. No. 135

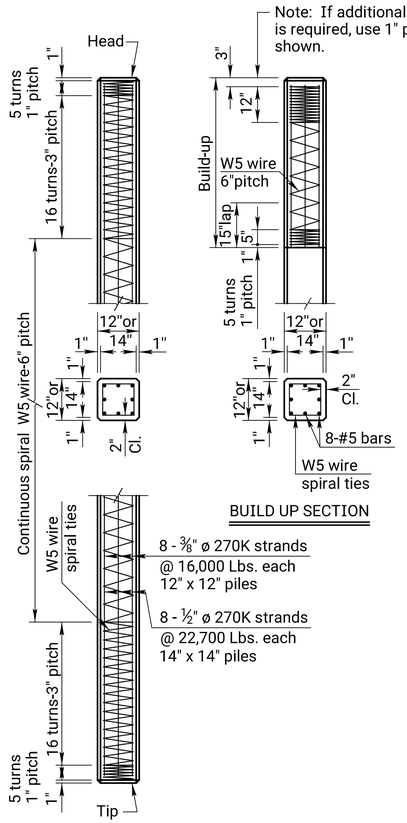
KDOT Graphics Certified

Drawn By : KKATHRIN Plotted : 07-11-24
File : c:\pwworking\central01\d2597941\ka602001bss-br100b.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	136	293

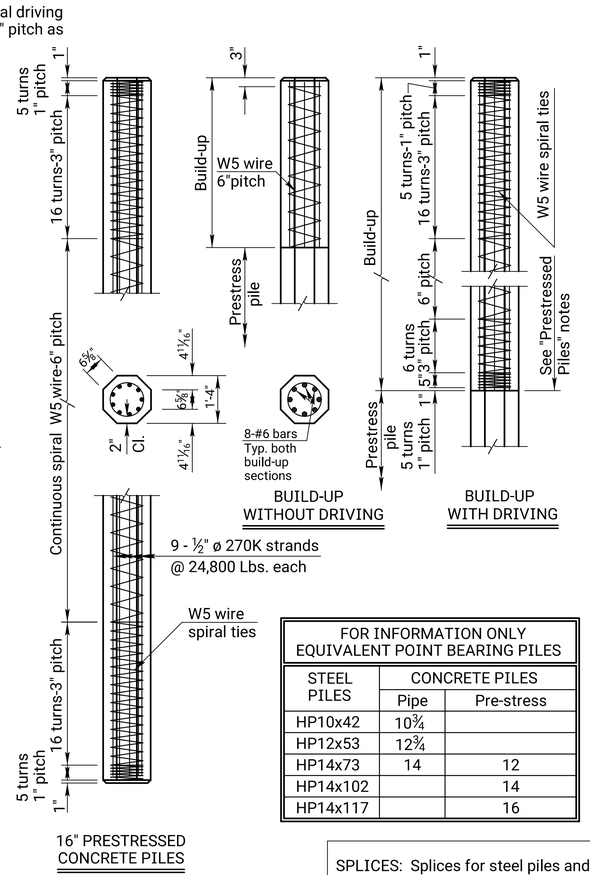


PLAIN ROUND
CAST-IN-PLACE CONCRETE PILES



12" OR 14"
PRESTRESSED
CONCRETE PILES

BUILD UP SECTION



BUILD-UP
WITHOUT DRIVING

BUILD-UP
WITH DRIVING

16" PRESTRESSED
CONCRETE PILES

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

GENERAL NOTES

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

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

ALTERNATE METHODS: Method of attachment of a pile to build-up may be by any of the following methods:

1. Cut off at least 2'-0" of pile and expose a minimum of 2'-0" of strands.
2. Cast 8-#6, or 8-#5 bars (equally spaced) into pile head. All bars shall extend into pile head and project from pile head a minimum of 2'-0".
3. Drill 8 holes in pile head (equally spaced) for installation of 8 grouted dowel bars of same size and length as in 2.
4. Provide cored holes for bars as in 3.

No bars or strands are to extend from head of pile or build-up into footing or pile cap unless approved by the Engineer.

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

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

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

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

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

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

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

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

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

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

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

Use only low hydrogen E7018, 7016, or 7015 series welding rod (electrode) for all welding applications during pile splicing.

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

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

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

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

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

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

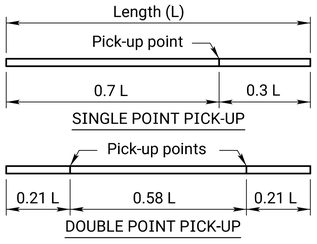
All piles driven without a mandrel shall be of the minimum thicknesses shown. Piles driven with a mandrel shall be of sufficient strength and thickness to withstand driving without injury and to resist harmful distortion and/or buckling due to soil pressure after the mandrel is removed.

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

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

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

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



PICK-UP POINTS FOR PRESTRESSED PILING

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

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



SHELL PILE POINT

CAST STEEL PILE POINT

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

Weld Symbology Definition

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

Lay full penetration root weld from beveled side of splice.

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

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

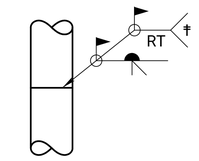
Verify that enough filler metal has been correctly placed in all weld locations to obtain a flush or convex surface with no concavity produced upon completion of the final welds.

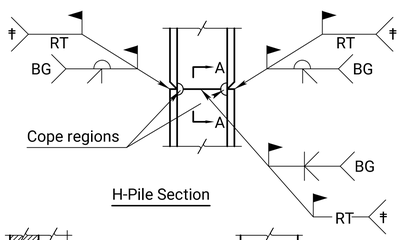
SPLICES: Splices for steel piles and shell piling shall be in accordance with details shown on this sheet and the Standard Specifications.

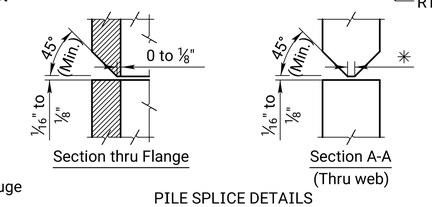
For integral pile bent abutments and piers, if a pile splice is required, do not locate the pile splice within a region extending 2'-0" above and 10'-0" below the bottom of the concrete web wall. For abutments, locate the pile splice at least 10'-0" below top of fill.

With the approval of the Engineer, one splice per bent may be allowed in the region described above without testing. If additional splices are anticipated, based on the geology, the Contractor prior to driving, will locate the splice so that the splice will not fall within the regions described above.

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







✳ Minimum as required by welding process.

BG = Backgouge

PILE SPLICE DETAILS

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

KANSAS DEPARTMENT OF TRANSPORTATION

STANDARD PILE DETAILS

BR110

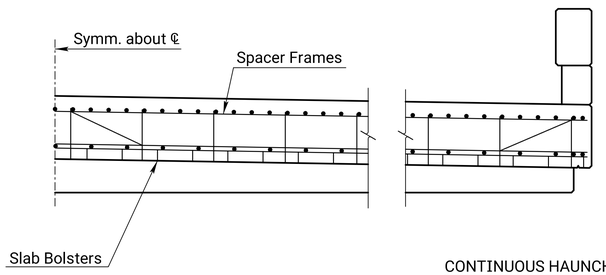
FHWA APPROVAL	10-04-12	APP'D.	Terry L. Fleck
DESIGNED J.P.J.	DETAILED	QUANTITIES	TRACED R.A.A.
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

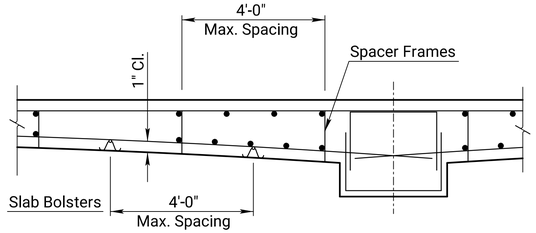
KDOT Graphics Certified 02-01-2023 Sh. No. 136

KDOT Graphics Certified

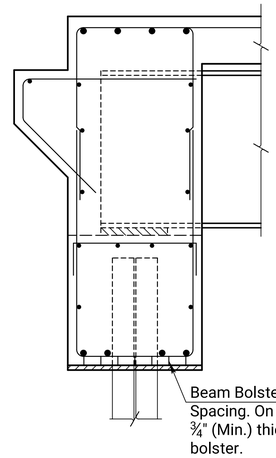
Drawn By : KKATHRIN Plotted : 07-11-24
File : c:\pwworking\central01\d2597941\ka602001bss-br110.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	137	293



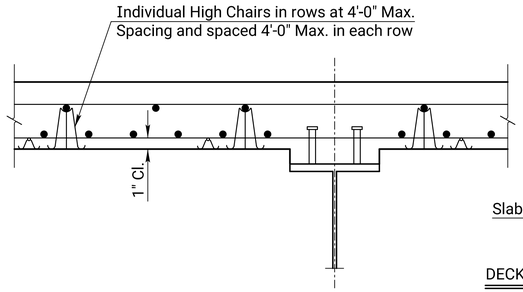


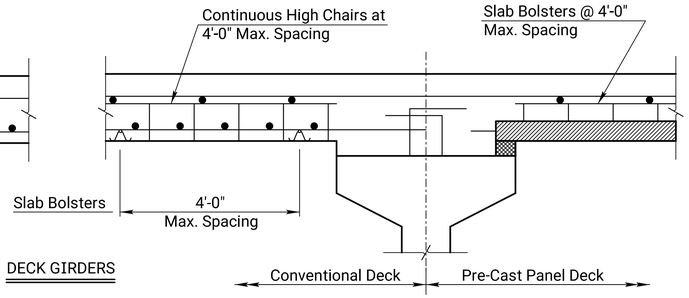
CONTINUOUS HAUNCHED SLAB



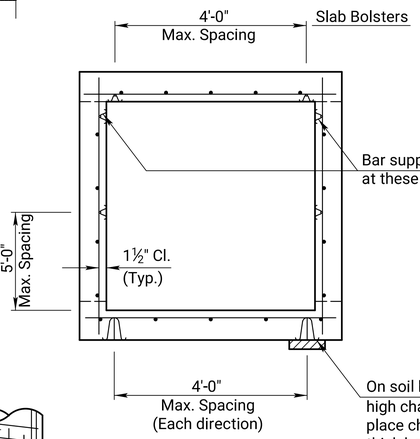
Beam Bolster at 4'-0" Max. Spacing. On soil bearing, place a ¾" (Min.) thick board under bolster.

ABUTMENT

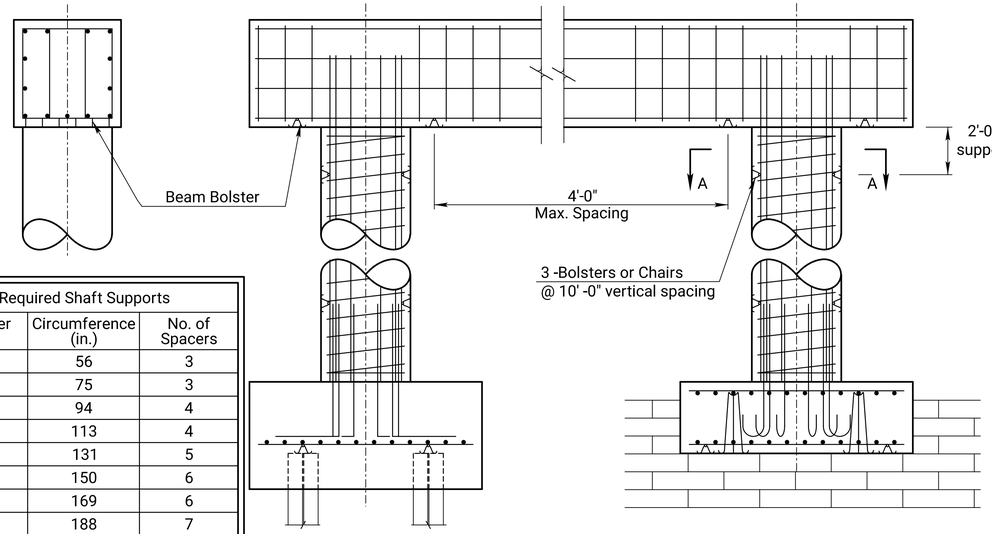




DECK GIRDERS

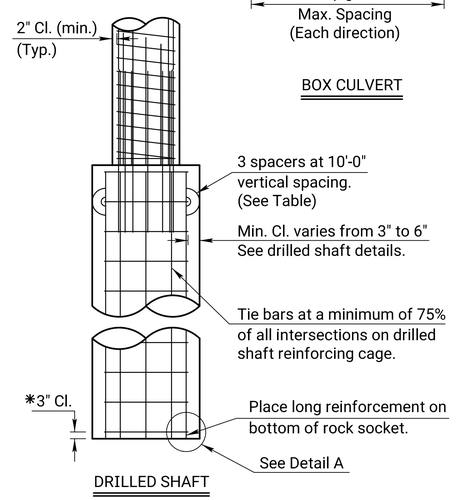


BOX CULVERT

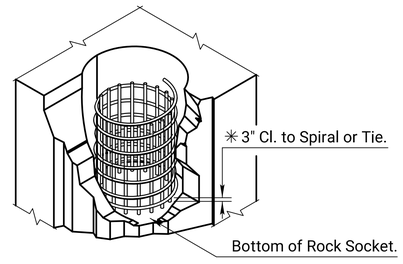


PIER

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

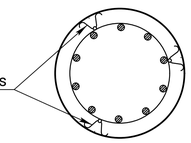


DRILLED SHAFT



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.

KDOT Graphics Certified 02-01-2023 Sh. No. 137

KDOT Graphics Certified

Drawn By : KKATHRIN Plotted : 07-11-24
File : c:\pwworking\central01\d2597941\ka602001bss-br120.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-01	2024	I38	293

EARTHWORK

BALANCE	ALIGNMENT	STATION TO STATION		EXCAVATION					COMPACTION		THRU CUT NOT SUBGRADED		REMARKS
				COMMON		COMMON (PAVEMENT)		CONTR FURN (CY)	TYPE A MR-5-5 (CY)	TYPE AA MR-5-5 (CY)	TYPE AA MR-5-5 (CY)	COMMON (CY)	
				CY	VMF	CY	VMF						
1	US-281	26+18.44	80+00.00	23,048	0.81	1,891	1.00	4,317	20,456	1,710	3,042	3,042	
2	US-281	80+00.00	132+00.00	17,802	0.81	1,741	1.00	5,230	17,315	1,341	2,271	2,271	
3	US-281	132+00.00	183+15.64	27,018	0.81	1,589	1.00	49,344	64,621	567	2,932	2,932	
4	US-281	190+65.86	210+40.00	7,328	0.81	634	1.00		2,590	11	1,382	1,382	
TOTAL				75,196		5,855		58,891	104,982	3,629	9,627	9,627	

RUMBLE STRIPS (MILLED) (ASPHALT)

ALIGNMENT	STATION TO STATION		DIRECTION	SHOULDER LOCATION	LENGTH (Sta.)
US-281	26+33.00	27+83.00	NB	Outside	1.50
US-281	48+50.00	73+00.00	NB	Outside	24.50
US-281	73+00.00	77+86.00	NB	Outside	4.86
US-281	79+56.00	105+00.00	NB	Outside	25.44
US-281	105+00.00	130+54.00	NB	Outside	25.54
US-281	132+24.00	137+00.00	NB	Outside	4.76
US-281	137+00.00	169+00.00	NB	Outside	32.00
US-281	169+00.00	182+63.57	NB	Outside	13.64
US-281	191+17.94	200+00.00	NB	Outside	8.82
US-281	200+00.00	210+40.00	NB	Outside	10.40
US-281	33+78.00	41+00.00	SB	Outside	7.22
US-281	41+00.00	73+00.00	SB	Outside	32.00
US-281	73+00.00	77+96.00	SB	Outside	4.96
US-281	79+66.00	105+00.00	SB	Outside	25.34
US-281	105+00.00	130+56.00	SB	Outside	25.56
US-281	132+26.00	137+00.00	SB	Outside	4.74
US-281	137+00.00	169+00.00	SB	Outside	32.00
US-281	169+00.00	178+54.00	SB	Outside	9.54
US-281	180+36.00	182+63.57	SB	Outside	2.28
US-281	191+17.94	200+00.00	SB	Outside	8.82
US-281	200+00.00	210+40.00	SB	Outside	10.40
Total					**314.32**

MOWING

LOCATION	SIDE	LENGTH (PMPS)	REMARKS
US-281 Sta. 26+18.44 to Sta. 210+40	LT	3.5	
US-281 Sta. 26+18.44 to Sta. 210+40	RT	3.5	
Total		7.0	

Δ REMOVAL OF EXISTING STRUCTURES (LUMP SUM)

ALIGNMENT	STATION	OFFSET (FT)	SIDE	SIZE	TYPE	LENGTH (FT)	STRUCTURE	COMMENTS
US-281	26+00		LT	6'x6'	RCB		Remove Wingwalls	
US-281	33+40		CL	30"	CRP	144'	30" x 144' RCP	
US-281	51+97	43'	RT	2-30"	EP	48'	2-30" x 24' CMP	
US-281	62+17	35'	LT	24"	EP	24'	24" x 24' CMP	
US-281	69+25		CL	4-10' x 9'	RCB	36.5'	4-10' x 9' x 36.5' RCB Br. No. 281-71-196.25 (035)	
US-281	68+50 to 70+00	17'	LT		Guardrail	140'	Remove 140' Guardrail	
US-281	68+50 to 70+00	17'	RT		Guardrail	140'	Remove 140' Guardrail	
US-281	70+54	50'	LT	24"	EP	28'	24" x 28' CMP	
US-281	78+30		CL	30"	CRP	40'	30" x 40' RCP with Headwalls	
US-281	79+15		CL	6' x 2'	RCB	42'	6' x 2' x 42' RCB	
US-281	82+62	49'	CL	24"	EP	24'	24" x 24' CMP	
US-281	117+45	46'	RT	2-30"	EP	48'	Remove 2-30" x 24' CMP	
US-281	117+49	44'	LT	2-30"	EP	48'	Remove 2-30" x 24' CMP	
US-281	123+00		CL	7' x 2'	RCB	34'	7' x 2' x 34' RCB	
US-281	124+35	116'	LT				Remove House and Foundation	
US-281	124+81	37'	LT	2-6' x 2'	RCB	26.5'	Remove 2-6' x 2' x 26.5' RCB Culvert No. 531	
US-281	130+74	81'	RT				Remove Pump and Propane Tank	
US-281	130+75		CL	2-6' x 2'	RCB	36.5'	Remove 2-6' x 2' x 36.5' RCB Culvert No. 532	
US-281	131+40		CL	8' x 2'	RCB	59'	8' x 2' x 59' RCB	
US-281	131+41	46'	LT	2-6' x 2'	RCB	34.5'	Remove 2-6' x 2' x 34.5' RCB Culvert No. 533	
US-281	137+16	69'	RT				Remove Pump and Propane Tank	
US-281	144+57	46'	LT	2-6' x 3'	RCB	27'	Remove 2-6' x 3' x 27' RCB Culvert No. 534	
US-281	150+70	36'	RT	6' x 2'	RCB	36'	Remove 6' x 2' x 36' RCB	
US-281	150+87		CL	2-6' x 3'	RCB	198'	Remove 2-6' x 3' x 198' RCB Culvert No. 535	
US-281	152+67	63'	LT	24"	EP	70'	Remove 24" x 70' CMP with Headwalls	
US-281	153+00	16'	RT		Guardrail	525'	Remove 525' Guardrail	
US-281	155+23		CL	3' x 3'	RCB	206'	Remove 3' x 3' x 206' RCB	
US-281	183+00	15'	LT		Guardrail	90'	Remove 90' Guardrail	
US-281	183+00	15'	RT		Guardrail	88'	Remove 88' Guardrail	
US-281	186+90.59		CL	108'-4@126'-108'		726.17'	Remove Br. No. 281-71-198.72 (036)	
US-281	191+00	15'	LT		Guardrail	89'	Remove 989' Guardrail	
US-281	191+00	15'	RT		Guardrail	90'	Remove 890' Guardrail	
US-281	191+54	73'	RT	24"	EP	57'	Remove 24" x 57' CMP with Headwalls	
US-281	191+80	108'	RT				Remove Pit Silo	
US-281	192+15	69'	LT	24"	EP	68'	Remove 24" x 68' CMP	
US-281	192+63	60'	RT	24"	EP	29'	Remove 24" x 29' CMP	
US-281	200+12	37'	LT	24"	EP	28'	Remove 24" x 28' CMP	
US-281	200+42	38'	RT	24"	EP	28'	Remove 24" x 28' CMP	
US-281	201+85	36'	RT	24"	EP	42'	Remove 24" x 42' CMP	
US-281	203+46	38'	RT	24"	EP	53'	Remove 24" x 53' CMP	
US-281	205+38	19'	RT	24"	EP	56'	Remove 24" x 56' CMP	
US-281	205+38	19'	RT				Remove Brick Building and Appurtenances	
US-281	205+98	30'	LT	24"	EP	28'	Remove 24" x 28' CMP	
US-281	206+99	28'	LT	24"	EP	28'	Remove 24" x 28' CMP	
US-281	209+37	31'	RT	24"	EP	28'	Remove 24" x 28' CMP	

Δ The listing shown may not be complete. Payment for structures or obstructions not listed but whose removal is required by the construction, as determined by the Engineer, should not be paid for directly, but should be included in the bid item "Removal of Existing Structures".

CLEANING EXISTING STRUCTURES (LUMP SUM)

LOCATION	SIDE	LENGTH (FT)	REMARKS
US-281 Sta. 26+00	LT	212	6'X6' RCB

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

SUMMARY OF QUANTITIES

~~RD050~~

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

KDOT Graphics Certified 03-04-2024

Sh. No. 138

KDOT Graphics Certified

Drawn By : MDELEON Plotted :07-11-24
File : c:\pwworking\central01\d2274982\ka602001rd50b.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-071 KA-6020-01	2024	139	293

GUARDRAIL, STEEL PLATE (MGS)

ALIGNMENT	STATION TO STATION		SIDE	MGS-SRT (ALT. 1)	MGS-FLEAT (ALT. 2)	FLARE RATE	LENGTH (Lin. Ft.)
US-281 Mainline	150+96.69	156+28.00	Rt.	2	2	30:1, 15:1	450.00
US-281 Mainline	180+88.23	182+91.26	Rt.	1	1	30:1	162.50
US-281 Mainline	182+07.68	183+23.15	Lt.	1	1	15:1	75.00
US-281 Mainline	190+58.36	191+73.82	Rt.	1	1	15:1	75.00
US-281 Mainline	190+90.24	192+93.27	Lt.	1	1	30:1	162.50
Total				**6**	**6**		**925.00**

AGGREGATE DITCH LINING

ALIGNMENT	STATION TO STATION		SIDE (L,R,C)	LENGTH (ft)	W (ft)	d (ft)	T (ft)	*D_{50} = 4" (TONS)	*D_{50} = 6" (TONS)
US-281	155+00.00	156+10.00	L	110.00	Var.	2.0	1.5		255.4
Total									**255.4**

*Calculated at the rate of 120 pcf

PLUGGING (WATER) WELLS

ALIGNMENT	STATION	SIDE	OFFSET	EACH
US-281	130+74	Rt.	93'	1
US-281	132+80	Rt.	60'	1
US-281	137+16	Rt.	72'	1
US-281	205+38	Rt.	19'	1
Total				**4**

ARTICULATING CONCRETE BLOCK

ALIGNMENT	STATION	LOCATION	AREA (SQ FT)
US-281	150+75	Rt.	3680
Total			**3680**

CONCRETE PAVEMENT (BRIDGE APPROACH)

ALIGNMENT	STATION TO STATION		CONCRETE PAVEMENT (10.5" UNIFORM) (AE) (BR APP) (SQ YD)	BRIDGE APPROACH SLAB FOOTING (CY)	REMARKS
	FROM	TO			
US-281	182+63.57	183+15.64	209.7	14.2	
US-281	190+65.86	191+17.94	209.7	14.2	
Total			**419.4**	**28.4**	

SALVAGED TOPSOIL

LOCATION	SIDE	AREA (SQ YD)	REMARKS
US-281 Sta. 26+18.44 to Sta. 41+00	Lt.	11249.7	
US-281 Sta. 26+18.44 to Sta. 41+00	Rt.	8815.4	
US-281 Sta. 41+00 to Sta. 73+00	Lt.	21185.1	
US-281 Sta. 41+00 to Sta. 73+00	Rt.	21413.0	
US-281 Sta. 73+00 to Sta. 105+00	Lt.	19837.9	
US-281 Sta. 73+00 to Sta. 105+00	Rt.	18673.0	
US-281 Sta. 105+00 to Sta. 137+00	Lt.	24135.7	
US-281 Sta. 105+00 to Sta. 137+00	Rt.	19329.5	
US-281 Sta. 137+00 to Sta. 169+00	Lt.	28540.1	
US-281 Sta. 137+00 to Sta. 169+00	Rt.	29652.5	
US-281 Sta. 169+00 to Sta. 200+00	Lt.	15780.4	
US-281 Sta. 169+00 to Sta. 200+00	Rt.	18152.0	
US-281 Sta. 200+00 to Sta. 210+40	Lt.	3647.9	
US-281 Sta. 200+00 to Sta. 210+40	Rt.	3581.3	
Total		**243993.5**	

RECAPITULATION OF BRIDGE QUANTITIES

BRIDGE NUMBER	STATION	SEE SHEET NO.
281-071-196.25 (056)	69+35.00	78
281-071-197.67 (057)	149+50.00	82
281-071-198.72 (055)	186+90.75	89

RECAPITULATION OF ROADWAY QUANITIES

ITEM	QUANITY	UNIT
Clearing Existing Structures	Lump Sum	L.S.
Contractor Construction Staking	Lump Sum	L.S.
Field Office and Laboratory (Type A)	1	Each
Foundation Stabilization (Set Price)	1	Each
Mobilization	Lump Sum	L.S.
Mobilization (DBE)	Lump Sum	L.S.
Removal of Existing Structures	Lump Sum	L.S.
## Maintenance and Restoration of Haul Roads (Set Price)	Lump Sum	L.S.
## Trainees Highway Construction (Set Price)	1,400	Hour
Curing Environment	Lump Sum	L.S.
Granular Backfill (Wingwalls)(Set Price)	1	Cu. Yd.
Clearing and Grubbing	Lump Sum	L.S.
Common Excavation (Rural Small)	90,678	Cu. Yd.
Common Excavation (Contractor Furnished)	58,891	Cu. Yd.
Compaction of Earthwork (Type A)(MR-5-5)	104,982	Cu. Yd.
Compaction of Earthwork (Type AA)(MR-5-5)	13,256	Cu. Yd.
Water (Grading)(Set Price)	1	M. Gal.
Salvaged Topsoil	243,994	Sq. Yd.
Concrete for Seal Course (Set Price)	1	Cu. Yd.
Concrete (Gr. 4.0)(RCB)	195.7	Cu. Yd.
Reinforcing Steel (Gr. 60)	26,580	Lbs
Foundation Stabilization	87	Cu. Yd.
Granular Backfill (Wingwalls)	55	Cu. Yd.
Cross Road Pipe (30") (RCP)	238	Lin. ft.
End Section (24")	4	Each
End Section (30")	4	Each
End Section (30") (RC)	4	Each
End Section (36")	2	Each
End Section (36") (RC)	8	Each
End Section (3.0 SQ.FT.) (RCHE)	12	Each
Entrance Pipe (24")	106	Lin. ft.
Entrance Pipe (30")	92	Lin. ft.
Entrance Pipe (36")	60	Lin. ft.
Entrance Pipe (36") (RCP)	184	Lin. ft.
Entrance Pipe (3.0 SQ.FT.) (RCPHE)	220	Lin. ft.
Guard Rail, Steel Plate (MGS)	925.00	Lin. ft.
Guard Rail End Terminal (MGS-SRT) (Alt. 1)	6	Each
Guard Rail End Terminal (MGS-FLEAT) (Alt. 2)	6	Each
Aggregate Ditch Lining (6")	255	Ton
Slope Protection (Aggregate)	111	Cu. Yd.
Slope Protection (Riprap Stone)	5,870	Cu. Yd.
Bedding for Slope Protection	734	Cu. Yd.
Geotextile Fabric	1,880	Sq. Yd.
Articulating Concrete Block	3,680	Sq. Ft.
Temporary Surfacing Material (Aggregate)(Set Price)	1	Cu. Yd.
Mailbox Installation (Set Price)	1	Each
Mowing	7.0	PMPS
Plugging (Water) Wells	4	Each
Rumble Strips (Milled)(Asphalt)	314.3	Sta.
Concrete Pavement (10.5" Uniform) (AE) (Br App)	419	Sq. Yd.
Bridge Approach Slab Footing	28.4	Cu. Yd.

CROSSROAD AND ENTRANCE PIPES

ALIGNMENT	STATION	SIDE	SIZE	TYPE	MATERIAL	PIPE LENGTH								END SECTIONS							REMARKS
						ENTRANCE PIPE					CROSS ROAD PIPE			TYPE I							
						3.0 SF	24"	30"	36"	36" RCP	24" RCP	30" RCP	36" RCP	24"	30"	36"	3.0 SF RCHE	24" RC	30" RC	36" RC	
US-281	33+40.00	CL	30"	CRP	RCP							146							2		Install 30" x 146' with end sections
US-281 (RT Ent)	51+97.00	Rt.	36"	EP	RCP					92										4	Install 2 - 36" x 46' E.P. with end sections and a 3.5° LT rotation
US-281 (LT Ent)	51+97.00	Lt.	24"	EP	RCP,CSP,ACSP,CAP		46							2							Install 24" x 46' E.P. with end sections
US-281	78+15.00	CL	30"	CRP	RCP							92							2		Install 30" x 92' with end sections
US-281 (RT Ent)	117+45.00	Rt.	36"	EP	RCP					92										4	Install 2 - 36" x 46' E.P. with end sections
US-281 (LT Ent)	117+49.00	Lt.	30"	EP	RCP,CSP,ACSP,CAP			92							4						Install 2 - 30" x 46' E.P. with end sections
US-281 (RT Ent)	148+00.00	Rt.	36"	EP	RCP,CSP,ACSP,CAP				60							2					Install 36" x 60' E.P. with end sections
US-281 (RT Ent)	192+63.00	Rt.	24"	EP	RCP,CSP,ACSP,CAP		60							2							Install 24" x 60' E.P. with end sections and a 4.0° LT rotation
US-281 (LT Ent)	200+12.00	Lt.	3.0 SF	EP	RCPHE	34											2				Install 3.0 SF x 34' E.P. with end sections
US-281 (RT Ent)	200+42.00	Rt.	3.0 SF	EP	RCPHE	34											2				Install 3.0 SF x 34' E.P. with end sections
US-281 (RT Ent)	201+85.00	Rt.	3.0 SF	EP	RCPHE	36											2				Install 3.0 SF x 36' E.P. with end sections
US-281 (LT Ent)	205+98.00	Lt.	3.0 SF	EP	RCPHE	36											2				Install 3.0 SF x 36' E.P. with end sections
US-281 (LT Ent)	206+99.00	Lt.	3.0 SF	EP	RCPHE	38											2				Install 3.0 SF x 38' E.P. with end sections
US-281 (RT Ent)	209+37.00	Rt.	3.0 SF	EP	RCPHE	42											2				Install 3.0 SF x 42' E.P. with end sections
TOTAL						**220**	**106**	**92**	**60**	**184**		**238**		**4**	**4**	**2**	**12**		**4**	**8**	

RCB/RFB DRAINAGE STRUCTURES <10'

ALIGMENT	STATION	SIDE	SIZE	TYPE	CONCRETE (GRADE 4.0) (RCB) (C.Y.)	CONCRETE (GRADE 4.0) (AE)(RCB) (C.Y.)	BRIDGE BACKWALL PROTECTION SYSTEM (S.Y.)	REINFORCING STEEL (GR.60) (LBS.)	REINFORCING STEEL (GR.60) (EPOXY COATED) (LBS.)	SLOPE PROTECTION RIPRAP STONE (200 Lbs) (C.Y.)	FOUNDATION STABILIZATION (C.Y.)	GRANULAR BACKFILL (WINGWALLS) (C.Y.)	LENGTH (FT.)	ROTATION (DEG.)(LT/RT)	SKEW (DEG.)(LT/RT)	SERIAL NO.	REMARKS
US-281	26+00	Lt.	6' x 6'	RCB	13.4			1560			5	27	7	45° (RT)			Extend 6' x 6' x 212' RCB 7'-0" LT
US-281	79+40	CL	6' x 2'	RCB	42.8			5050			22		90				Construct 6' x 2' x 90' RCB
US-281	123+00	CL	7' x 3'	RFB	61.3			10860			24	16	90				Construct 7' x 3' x 90' RFB
US-281	155+00	CL	4' x 4'	RCB	78.2			9110			36	12	190	10° (LT)			Construct 4' x 4' x 190' RCB Brokenback
TOTAL					**195.7**	**0.0**	**0**	**26580**	**0**	**0**	**87**	**55**					

SLOPE PROTECTION (RIPRAP STONE)

ALIGNMENT	STATION TO STATION		SIDE	LENGTH (FT.)	'W'	'T'	BEDDING FOR SLOPE PROTECTION (CY)	100 LBS QUANTITY (CY)	200 LBS QUANTITY (CY)	3/4 Ton QUANTITY (CY)	1 Ton QUANTITY (CY)	GEOTEXTILE FABRIC (SY)	Remarks
US-281	29+90.00	31+20.00	Lt.	130	30	2.0		290				506	
US-281	130+82.00	131+16.00	Lt.	34	Var.	2.5			36			77	Between Culv. 547 & 549
US-281	149+75.00	-	Rt.	685	Var.	0.5	734						Bank Stabilization
US-281	149+75.00	-	Rt.	685	Var.	2.5			5032				Bank Stabilization
US-281	190+56.00	192+15.00	Rt.	159	Var.	2.0		184				357	
US-281	190+25.00	192+75.00	Lt.	250	Var.	2.0		328				615	
TOTAL							**734**	**802**	**5068**			**1555**	

SLOPE PROTECTION (AGGREGATE)

ALIGNMENT	STATION TO STATION		SIDE	LENGTH (FT.)	'W'	'T'	(D_{50} = 4") QUANTITY (CY)	(D_{50} = 6") QUANTITY (CY)	GEOTEXTILE FABRIC (SY)	Remarks
US-281	26+53.00	26+91.00	LT	38	Var.	1.5		49	118	
US-281	33+40.00	-	LT	18-20	9	1.5		10	30	
US-281	52+24.00	52+40.00	RT	16	16	1.5		14	39	
US-281	52+23.00	52+37.00	LT	14	10	1.0	5		21	
US-281	78+15.00	-	RT	14	10	1.0	5		21	
US-281	117+73.00	117+89.00	RT	16	16	1.0	9		36	
US-281	117+76.00	117+92.00	LT	16	16	1.5		14	39	
US-281	192+15.00	192+29.00	RT	14	10	1.0	5		21	
TOTAL							24	87	325	

For Summary of Quantities Culvert No 546, See Sheet No. 68
For Summary of Quantities Culvert No 547, See Sheet No. 71
For Summary of Quantities Culvert No 549, See Sheet No. 74
For Summary of Surfacing Quantities, See Sheet No. 140
For Summary of Erosion Control Quantities, See Sheet No. 141
For Summary of Seeding Quantities, See Sheet No. 155
For Summary of Signing Quantities, See Sheet No. 177
For Summary of Pavement Marking Quantities, See Sheet No. 193
For Summary of Traffic Control Quantities, See Sheet No. 209

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

KANSAS DEPARTMENT OF TRANSPORTATION

SUMMARY OF QUANTITIES

~~RD050~~

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

KDOT Graphics Certified 06-08-2021

Sh. No. 139

KDOT Graphics Certified

Drawn By : MDELEON Plotted :07-11-24
File : c:\pwworking\central01\d2274982\ka6020001rd50c.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-071 KA-6020-01	2024	140	293

GENERAL NOTE:

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

~~Over all structures, unless otherwise directed by the Engineer, where the top of the hubguard is level with or above the finished shoulder grade, the earth cover over the structure slab shall be removed and backfilled with Aggregate Shoulder (AS-1) material as directed by the Engineer. The removal of this material will be subsidiary.~~

~~The Aggregate Shoulder (AS-1) material used to backfill over the structure shall be paid for at the prices shown in the contract.~~

The earth shoulders shall be compacted full depth (Type AA - MR 5-5) except, when ordered by the Engineer, the top 3" shall be left uncompacted for seeding.

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

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

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

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

~~Quantities for aggregate for shoulders, AS-1, are calculated on the basis of 150 lbs. per cu. ft. Quantities for stabilized base course, AB-3, are calculated on the basis of 1 56 lbs. per cu. ft. Weight/cu. ft. includes moisture allowed by specification.~~

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

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

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

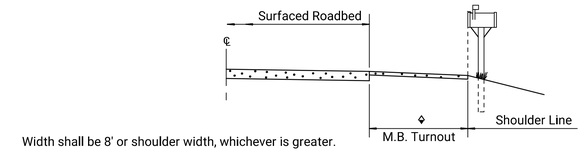
Asphalt Material quantities are calculated on the basis of 8.328 lbs. per gal.

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

PROJECT SURFACING

ALIGNMENT	STATION TO STATION		ASPHALT PAVING					SUBGRADE MODIFICATION				4" AGGREGATE SHOULDER (AS-1) (SY)
			1.5" HMA SURFACE (SR-12.5A)(PG64-28) (TONS)	2.5" HMA BASE (SR-12.5A)(PG64-28) (TONS)	6.5" HMA BASE (SR-19A)(PG64-22) (TONS)	EMULSIFIED ASPHALT (SS-1HP) TONS	6" HMA-COMMERCIAL GRADE (CLASS A) (TONS)	MANIPULATION FOR AGGREGATE SUBGRADE MODIFICATION (MILLINGS)(CEMENT) (SQ YD)	AGGREGATE FOR SUBGRADE MODIFICATION (MILLINGS) (CU YDS)	*CEMENT (TONS)	Milling (TONS)	
US-281	26+18.44	41+00.00	625.5	1,055.6	2,821.2	5.8		8,295.1	921.7	123.2	1,580.2	
US-281	41+00.00	73+00.00	925.3	1,570.3	4,247.4	8.7	110.8	12,688.9	1,409.9	188.4	2,417.2	
US-281	73+00.00	105+00.00	876.4	1,488.7	4,035.4	8.2	306.2	12,088.9	1,343.2	179.5	2,302.9	
US-281	105+00.00	137+00.00	876.4	1,488.7	4,035.4	8.2	482.2	12,088.9	1,343.2	179.5	2,302.9	
US-281	137+00.00	169+00.00	876.4	1,488.7	4,035.4	8.2	216.8	12,088.9	1,343.2	179.5	2,302.9	707.7
US-281	169+00.00	200+00.00	615.0	1,044.7	2,831.9	5.8	208.7	8,959.1	995.5	133.0	1,706.7	725.0
US-281	200+00.00	210+40.00	284.1	482.7	1,308.5	2.7	304.9	3,920.4	435.6	58.2	746.8	
Totals			**5079.1**	**8619.4**	**23315.2**	**47.6**	**1629.6**	**70130.2**	**7792.3**	**1041.3**	**13359.6**	**1432.7**

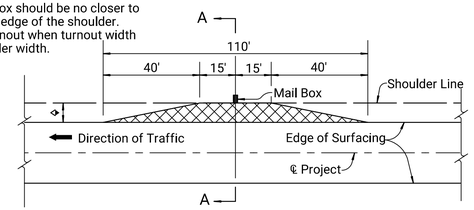
*Calculated at 5.5% weight of Millings + Soil



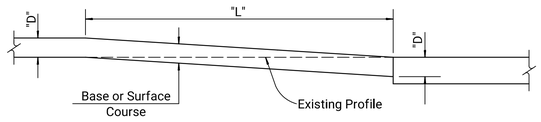
Width shall be 8' or shoulder width, whichever is greater.

SECTION A-A

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



DETAIL FOR SURFACING OF MAIL BOX TURNOUTS



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.

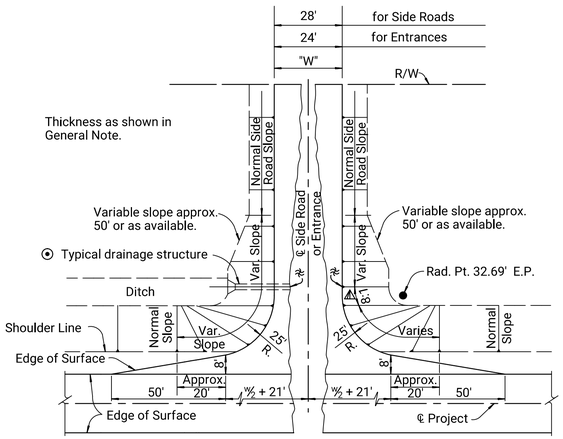
TABLE OF DIMENSIONS												
D	L	D	L	D	L	D	L	D	L	D	L
1"	25'	3"	75'	5"	125'	7"	175'	9"	225'	11"	275'
2"	50'	4"	100'	6"	150'	8"	200'	10"	250'	12"	300'

QUANTITY FACTORS

RATE	UNIT	ITEM
145	pcf	HMA
110	pcf	Unit Weight of Soil
127	pcf	Unit Weight of Millings
120	pcf	Unit Weight of Millings + Soil
0.06	gal/sq. yd.	Tack Coat
8.328	lbs./gal	Liquid Asphalt Weight

RECAPITULATION OF QUANTITIES

ITEM	TOTAL	UNIT
Manipulation for Aggregate Subgrade Modification (Milings)(Cement)	70,130	SY
Aggregate for Subgrade Modification (Millings)	7,792	CY
Cement	1,041	TONS
Water (Subgrade Modification) (Set Price)	1	MGAL
HMA Surface (SR-12.5A) (PG64-28)	5,079	TONS
HMA Base (SR-12.5A) (PG64-28)	8,619	TONS
HMA Base (SR-19A) (PG64-22)	23,315	TONS
Emulsified Asphalt (SS-1HP)	48	TONS
Quality Control Testing (HMA)	37,013	TONS
Field Office and Laboratory (Type A)	1	EACH
Asphalt Air Void Pay Adjustment	1	EACH
Asphalt Density Pay Adjustment	1	EACH
Asphalt Pavement Smoothness	1	EACH
Asphalt Core (Set Price)	1	EACH
Aggregate Shoulder (AS-1) (4")	1,433	SY
Water (Aggregate Shoulders)(Set Price)	1	MGAL
Milling	13,360	TONS
HMA-Commercial Grade (Class A)	1,630	TONS



WITH DRAINAGE STRUCTURE MOUND ENTRANCE OR SIDE ROAD

DETAIL FOR SURFACING OF SIDE ROADS & HOUSE ENTRANCES

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

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

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

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

KANSAS DEPARTMENT OF TRANSPORTATION

SUMMARY OF QUANTITIES (Surfacing)

~~RD051~~

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

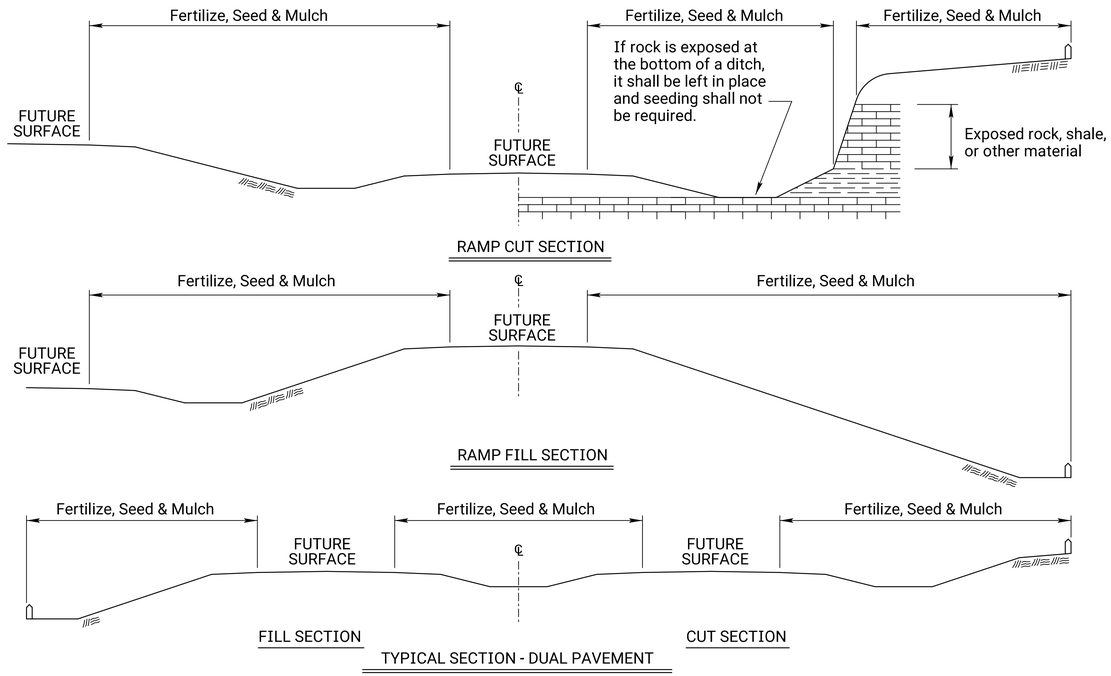
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STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	14I	293



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		60		Temporary Fertilizer (15 - 30 - 15)	9000	LB
20		48.65		Temporary Seed (Canada Wildrye)	973	LB
45		48.65		Temporary Seed (Grain Oats)	2189.3	LB
45		48.65		Temporary Seed (Sterile Wheatgrass)	2189.3	LB
	97.8		11.35	Soil Erosion Mix	1110	LB
				Erosion Control (Class 1, Type C)	14848	SQ YD
				Erosion Control (Class 2, Type E)	40067	SQ YD
				Sediment Removal (Set Price)	1	CU YD
				Synthetic Sediment Barrier		LF
				Temporary Berm (Set Price)	1	LF
				Temporary Ditch Check (Rock)	341	CU YD
				Temporary Inlet Sediment Barrier		EACH
				Temporary Sediment Basin		CU YD
				Temporary Slope Drain	125	LF
				Biodegradable Log (9")	1913	EACH
				Biodegradable Log (12")	2550	LF
				Biodegradable Log (20")	4254	LF
				Filter Sock (12")	1913	LF
				Filter Sock (18")	3616	LF
				Geotextile (Erosion Control)		SQ YD
				Silt Fence	1916	LF
				SWPPP Design †	LUMP SUM	LS
				SWPPP Inspection †	45	EACH
				Water Pollution Control Manager †	45	EACH
900 lbs / acre		24.5		Mulch Tacking Slurry	22050	LB
2 tons / acre		48.65		Mulching	146	TON
				Water (Erosion Control) (Set Price)	1	MGAL

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

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

Regreen and Quick Guard are the approved sterile wheatgrass products.

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

✱✱✱✱ List size of material.

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

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

SOIL EROSION MIX

PLS RATE	NAME	QTY (lb)
20	CANADA WILDRYE	227
20	GRAIN OATS	227
1	BLUE GRAMA (LOVINGTON)	11.4
24.5	BUFFALO GRASS (TREATED)	278.1
6.3	SIDE OATS GRAMA (EL RENO)	71.5
20	STERILE WHEATGRASS	227
6	WESTERN WHEAT (BARTON)	68.1
97.8	Total (lb)	1110

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.

KDOT Graphics Certified 03-04-2024

Sh. No. 14I

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Drawn By : MDELEON Plotted : 07/11/2024
File : c:\pwworking\central01\d2274982\ka6020001la852a.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	I42	293

CLASS 1 TYPE C

Type	SIDE	SLOPE H:V	ALIGN-MENT	STATION TO STATION		LENGTH (FT)	AVG. WIDTH SLOPE (FT)	EROSION CONTROL CLASS I (SQUARE YARDS)	
								TYPE C	TYPE D
C	LT	7:1	US-281	26+40.00	26+80.00	40.00	20.00	89	
C	LT	5:1	US-281	33+25.00	33+55.00	30.00	15.00	50	
C	RT	5:1	US-281	33+25.00	33+55.00	30.00	15.00	50	
C	RT	6:1	US-281	51+70.00	51+85.00	15.00	35.00	58	
C	RT	6:1	US-281	52+10.00	52+25.00	15.00	35.00	58	
C	LT	6:1	US-281	61+90.00	62+05.00	15.00	25.00	42	
C	LT	6:1	US-281	62+25.00	62+40.00	15.00	25.00	42	
C	RT	11:1	US-281	68+80.00	69+85.00	105.00	45.00	525	
C	LT	11:1	US-281	68+80.00	69+85.00	105.00	45.00	525	
C	RT	6:1	US-281	78+00.00	78+30.00	30.00	15.00	50	
C	LT	6:1	US-281	78+00.00	78+30.00	30.00	15.00	50	
C	RT	6:1	US-281	79+15.00	79+65.00	50.00	20.00	111	
C	LT	6:1	US-281	79+15.00	79+65.00	50.00	20.00	111	
C	RT	3:1	US-281	112+00.00	117+15.00	515.00	15.00	858	
C	RT	6:1	US-281	117+15.00	117+30.00	15.00	35.00	58	
C	LT	6:1	US-281	117+20.00	117+35.00	15.00	35.00	58	
C	RT	6:1	US-281	117+55.00	117+70.00	15.00	35.00	58	
C	LT	6:1	US-281	117+60.00	117+75.00	15.00	35.00	58	
C	RT	14:1	US-281	122+75.00	123+25.00	50.00	20.00	111	
C	LT	14:1	US-281	122+75.00	123+25.00	50.00	20.00	111	
C	LT	6:1	US-281	124+45.00	124+70.00	25.00	60.00	167	
C	LT	6:1	US-281	124+90.00	125+15.00	25.00	60.00	167	
C	LT	10:1	US-281	130+50.00	131+00.00	50.00	20.00	111	
C	RT	10:1	US-281	130+50.00	131+00.00	50.00	20.00	111	
C	LT	20:1	US-281	131+00.00	131+25.00	25.00	60.00	167	
C	LT	20:1	US-281	131+60.00	131+85.00	25.00	60.00	167	
C	RT	6:1	US-281	147+65.00	147+80.00	15.00	25.00	42	
C	RT	6:1	US-281	148+20.00	148+35.00	15.00	25.00	42	
C	LT	6:1	US-281	148+45.00	149+45.00	100.00	30.00	333	

CLASS 1 TYPE C

Type	SIDE	SLOPE H:V	ALIGN-MENT	STATION TO STATION		LENGTH (FT)	AVG. WIDTH SLOPE (FT)	EROSION CONTROL CLASS I (SQUARE YARDS)	
								TYPE C	TYPE D
C	RT	6:1	US-281	149+75.00	150+50.00	75.00	30.00	250	
C	RT	3:1	US-281	150+00.00	156+00.00	600.00	40.00	2667	
C	LT	4:1	US-281	154+95.00	155+45.00	50.00	20.00	111	
C	LT	3:1	US-281	180+00.00	183+25.00	325.00	60.00	2167	
C	RT	3:1	US-281	180+00.00	182+95.00	295.00	70.00	2294	
C	RT	3:1	US-281	190+55.00	192+25.00	170.00	60.00	1133	
C	LT	3:1	US-281	190+85.00	192+80.00	195.00	60.00	1300	
C	RT	6:1	US-281	192+25.00	192+40.00	15.00	25.00	42	
C	RT	6:1	US-281	192+80.00	192+95.00	15.00	25.00	42	
C	LT	6:1	US-281	199+90.00	200+05.00	15.00	25.00	42	
C	LT	6:1	US-281	200+15.00	200+30.00	15.00	25.00	42	
C	RT	6:1	US-281	200+20.00	200+35.00	15.00	25.00	42	
C	RT	6:1	US-281	201+65.00	201+80.00	15.00	25.00	42	
C	RT	6:1	US-281	201+90.00	202+05.00	15.00	25.00	42	
C	LT	6:1	US-281	205+75.00	205+90.00	15.00	25.00	42	
C	LT	6:1	US-281	206+05.00	206+20.00	15.00	25.00	42	
C	LT	6:1	US-281	206+75.00	206+90.00	15.00	25.00	42	
C	LT	6:1	US-281	207+05.00	207+20.00	15.00	25.00	42	
C	RT	6:1	US-281	209+10.00	209+25.00	15.00	25.00	42	
C	RT	6:1	US-281	209+45.00	209+60.00	15.00	25.00	42	
						TOTAL (ALL SHEETS)		14848	0

CLASS 2 TYPE E

Type	SIDE	ALIGN-MENT	STATION TO STATION		LENGTH (FT)	AVG. WIDTH (FT)	EROSION CONTROL CLASS II (SQUARE YARDS)			
							TYPE E	TYPE F	TYPE G	TYPE H
E	LT	US-281	26+54.00	33+35.00	681.00	22.00	1665			
E	RT	US-281	30+00.00	33+35.00	335.00	22.00	819			
E	LT	US-281	43+00.00	52+00.00	900.00	25.00	2500			
E	RT	US-281	46+00.00	55+00.00	900.00	25.00	2500			
E	LT	US-281	52+00.00	58+00.00	600.00	22.00	1467			
E	RT	US-281	55+00.00	69+00.00	1400.00	22.00	3422			
E	LT	US-281	62+00.00	63+00.00	100.00	22.00	244			
E	LT	US-281	68+00.00	69+00.00	100.00	22.00	244			
E	RT	US-281	69+70.00	71+00.00	130.00	22.00	318			
E	LT	US-281	69+70.00	70+70.00	100.00	22.00	244			
E	LT	US-281	77+00.00	78+10.00	110.00	22.00	269			
E	LT	US-281	79+50.00	88+50.00	900.00	22.00	2200			
E	RT	US-281	95+00.00	117+00.00	2200.00	22.00	5378			
E	LT	US-281	97+00.00	117+25.00	2025.00	22.00	4950			
E	LT	US-281	117+25.00	122+90.00	565.00	26.00	1632			
E	LT	US-281	123+10.00	125+05.00	195.00	32.00	693			
E	LT	US-281	125+05.00	148+60.00	2355.00	36.00	9420			
E	RT	US-281	149+00.00	149+75.00	75.00	22.00	183			
E	LT	US-281	149+30.00	150+00.00	70.00	18.00	140			
E	LT	US-281	153+00.00	155+10.00	210.00	18.00	420			
E	LT	US-281	155+30.00	156+00.00	70.00	18.00	140			
E	RT	US-281	191+20.00	191+83.00	63.00	22.00	154			
E	LT	US-281	191+70.00	192+60.00	90.00	22.00	220			
E	LT	US-281	207+20.00	210+40.00	320.00	19.00	676			
E	RT	US-281	209+60.00	210+40.00	80.00	19.00	169			
					TOTAL (ALL SHEETS)		40067	0	0	0

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

EROSION CONTROL SEEDING-SODDING

LA852A-EC

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

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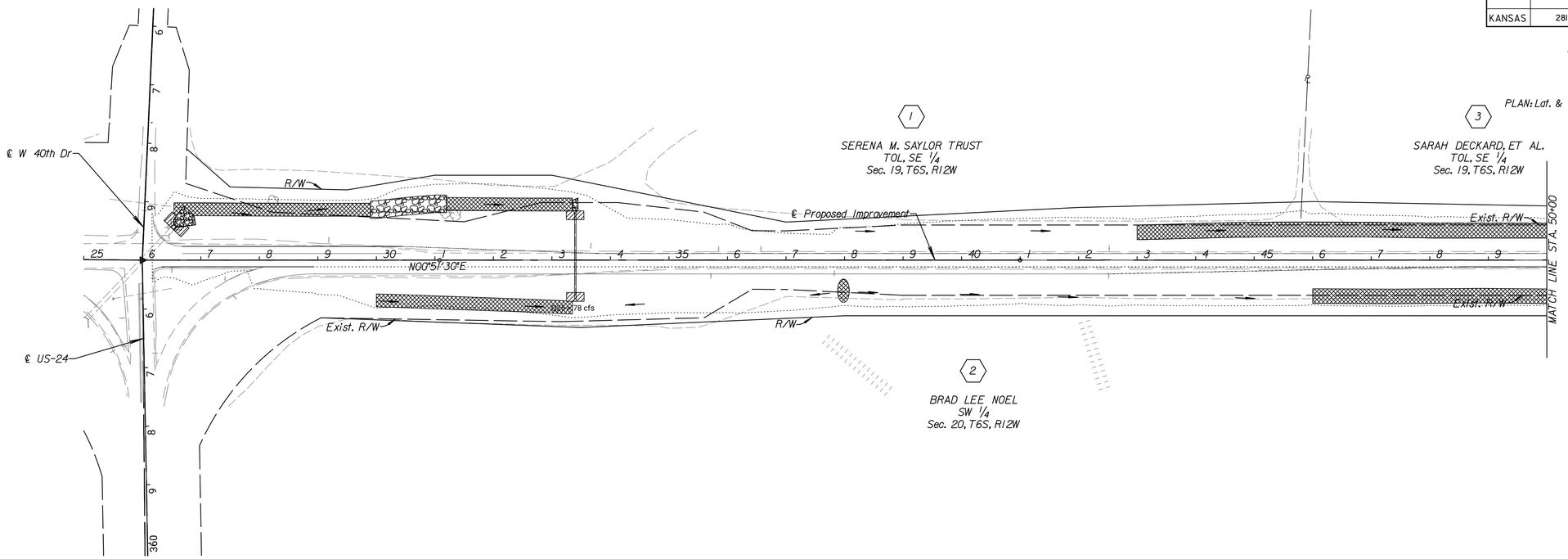
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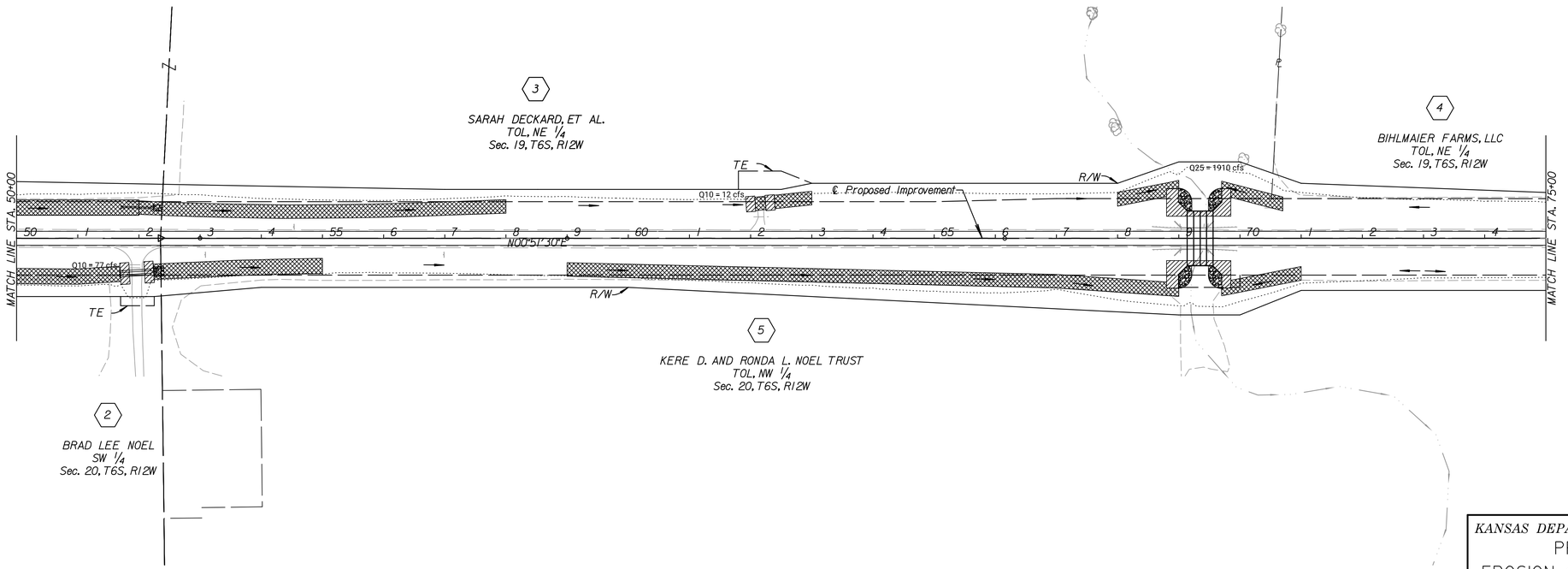
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Plotted :07/11/2024

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	143	293

SCALE
100' 0 100' 200'
PLAN: Lat. & Long.





LEGEND
- Class 1 Erosion Control
- Class 2 Erosion Control
- Slope Protection

KANSAS DEPARTMENT OF TRANSPORTATION
PROPOSED FINAL
EROSION CONTROL PLAN US-281
STA. 26+18 TO STA. 75+00

KDOT Graphics Certified 06-13-2024

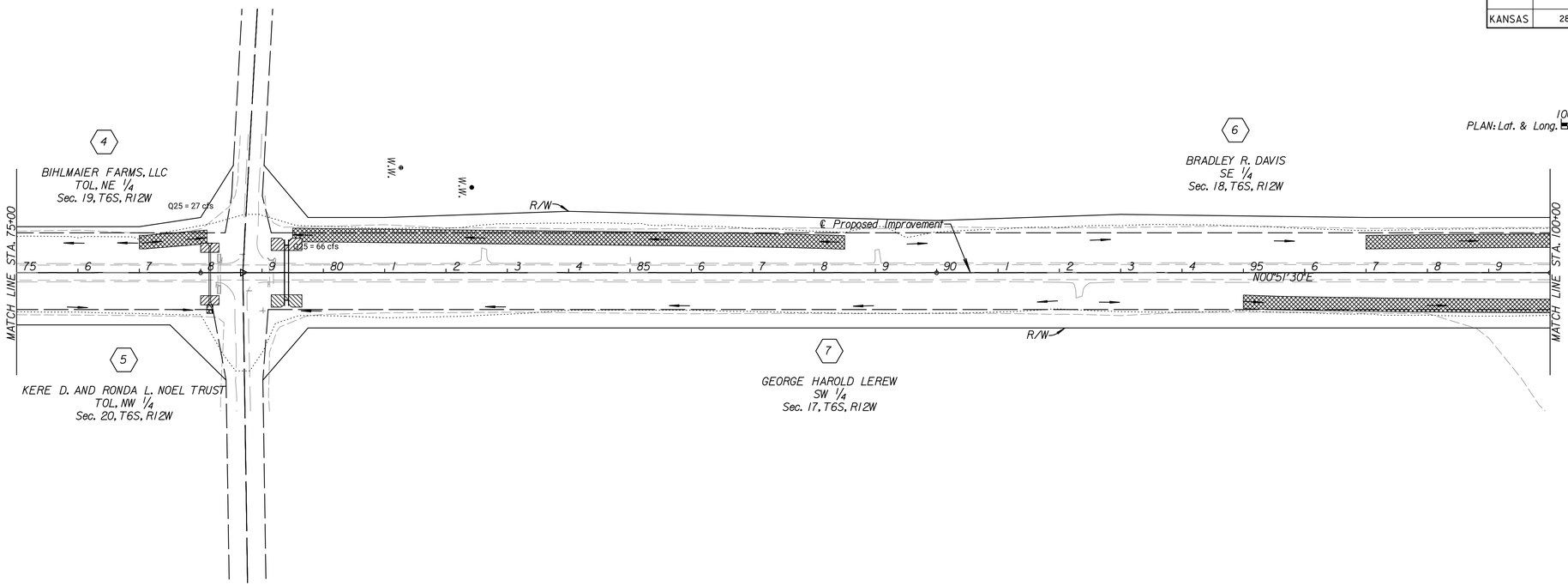
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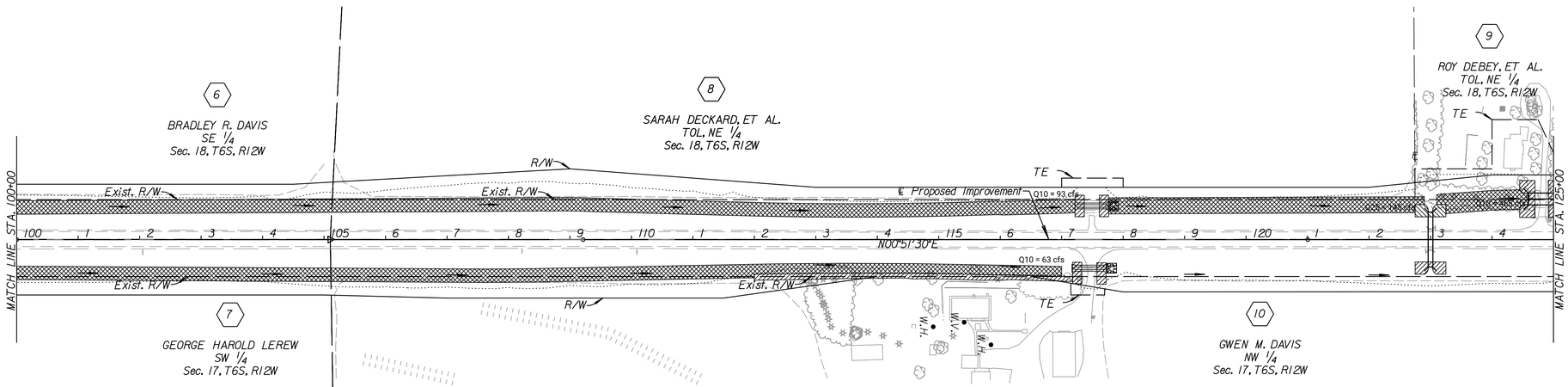
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Plotted : 07-11-24
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KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	144	293

SCALE
100' 0 100' 200'
PLAN: Lat. & Long.





LEGEND
- Class 1 Erosion Control
- Class 2 Erosion Control
- Slope Protection

KANSAS DEPARTMENT OF TRANSPORTATION
PROPOSED FINAL
EROSION CONTROL PLAN US-281
STA. 75+00 TO STA. 125+00

KDOT Graphics Certified 06-13-2024

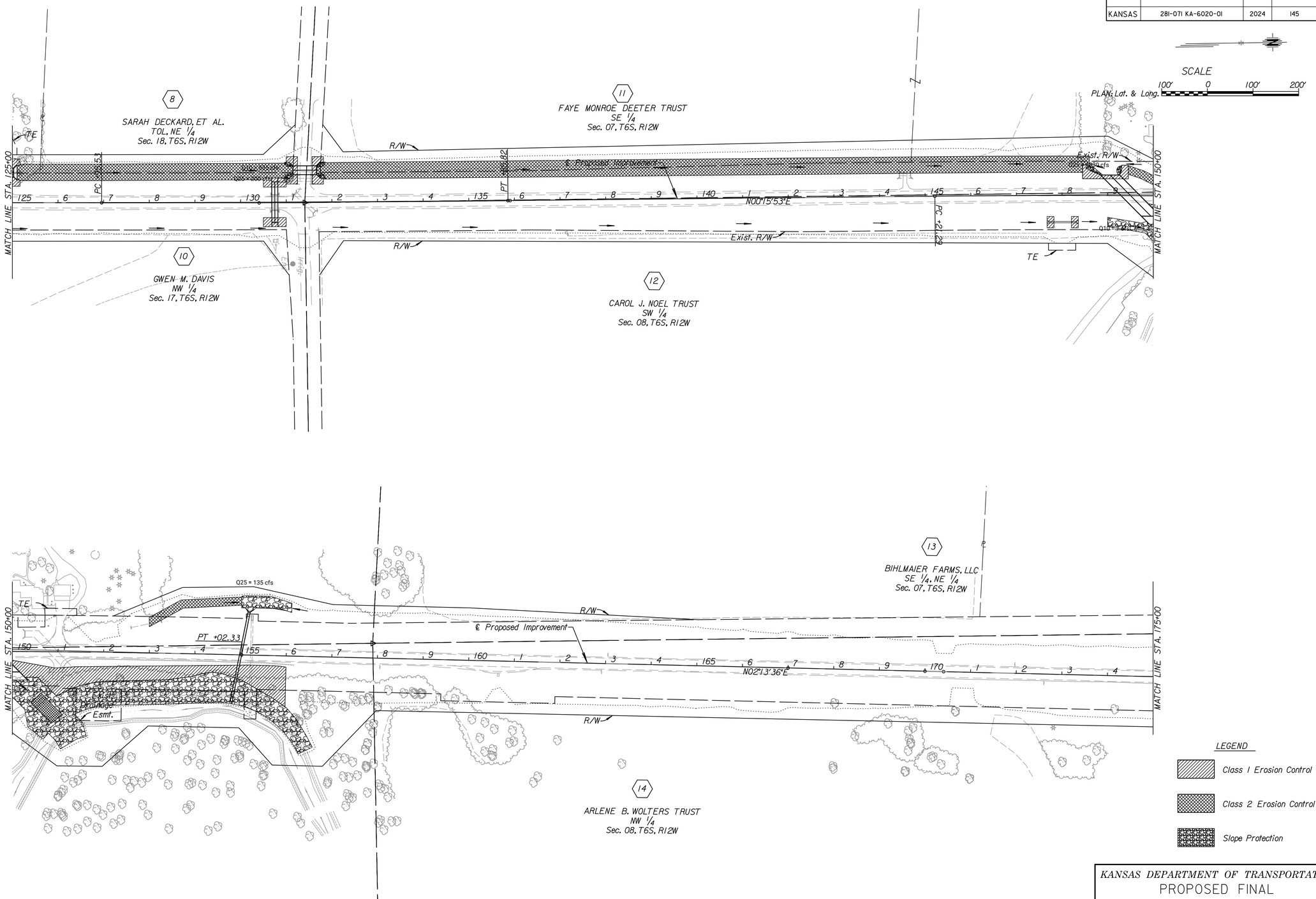
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Plotted : 07-11-24
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STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	145	293

SCALE
100' 0 100' 200'
PLAN: Lat. & Long.



LEGEND
- Class 1 Erosion Control
- Class 2 Erosion Control
- Slope Protection

KANSAS DEPARTMENT OF TRANSPORTATION
PROPOSED FINAL
EROSION CONTROL PLAN US-281
STA. 125+00 TO STA. 175+00

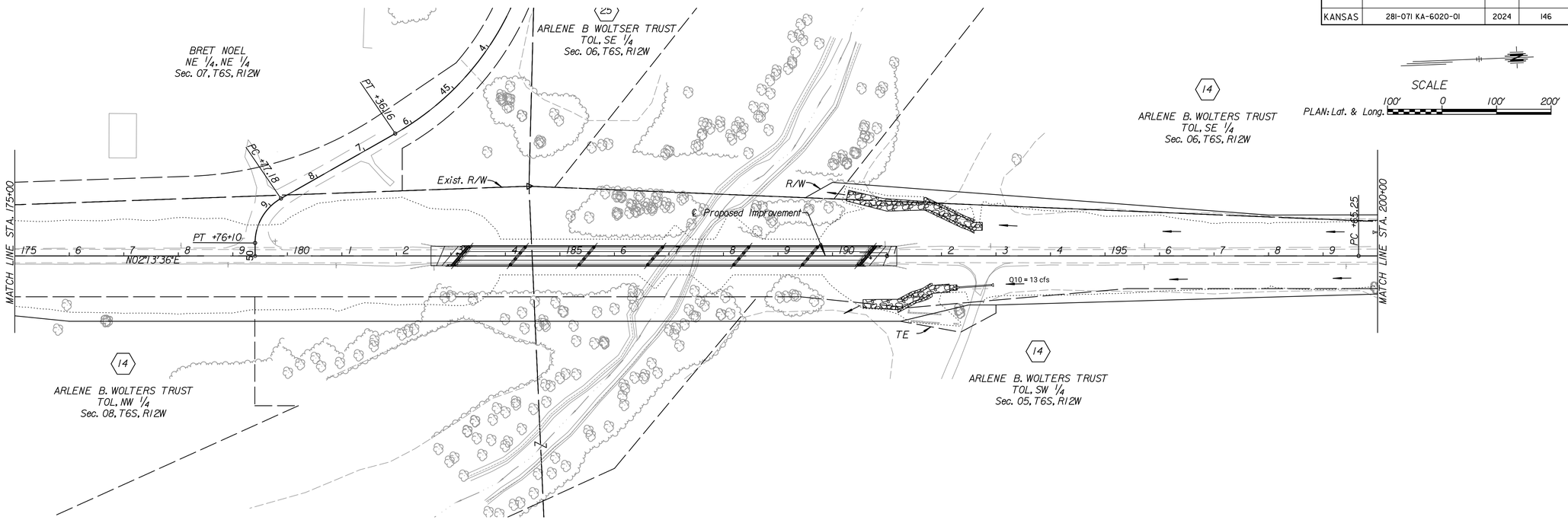
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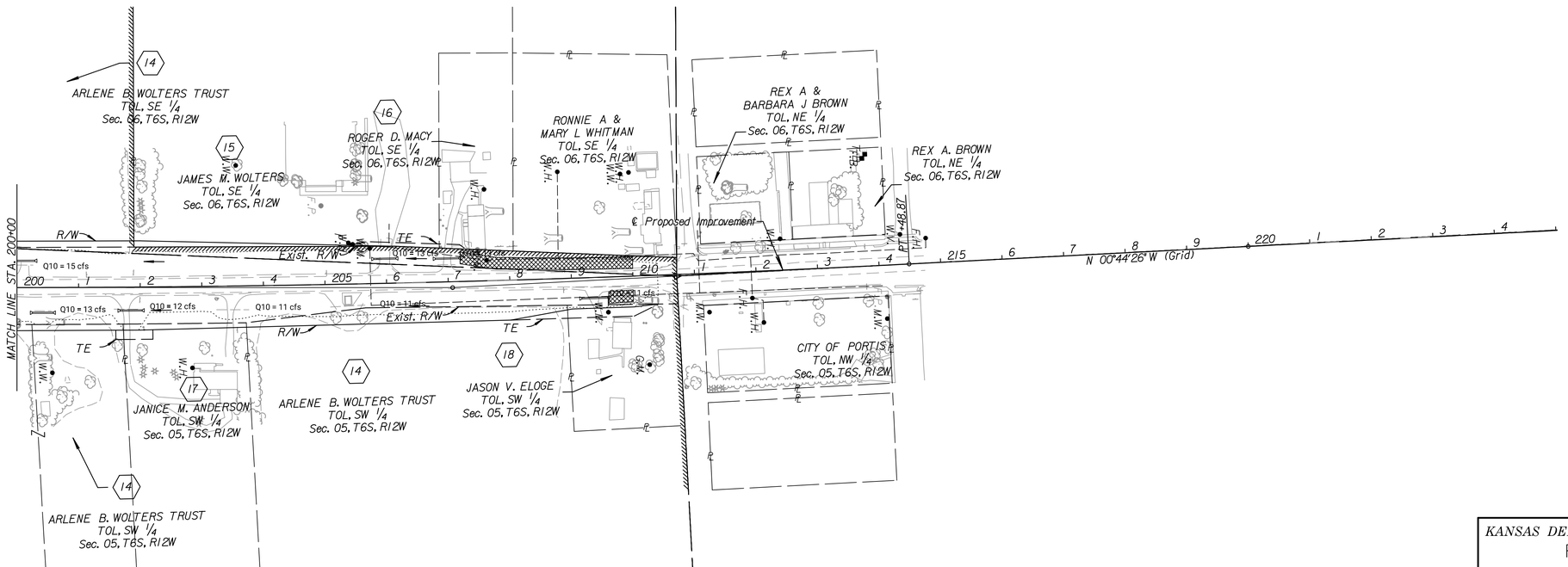
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KDOT Graphics Certified

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Plotted : 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	146	293





KANSAS DEPARTMENT OF TRANSPORTATION

PROPOSED FINAL EROSION CONTROL PLAN US-281 STA. 175+00 TO END

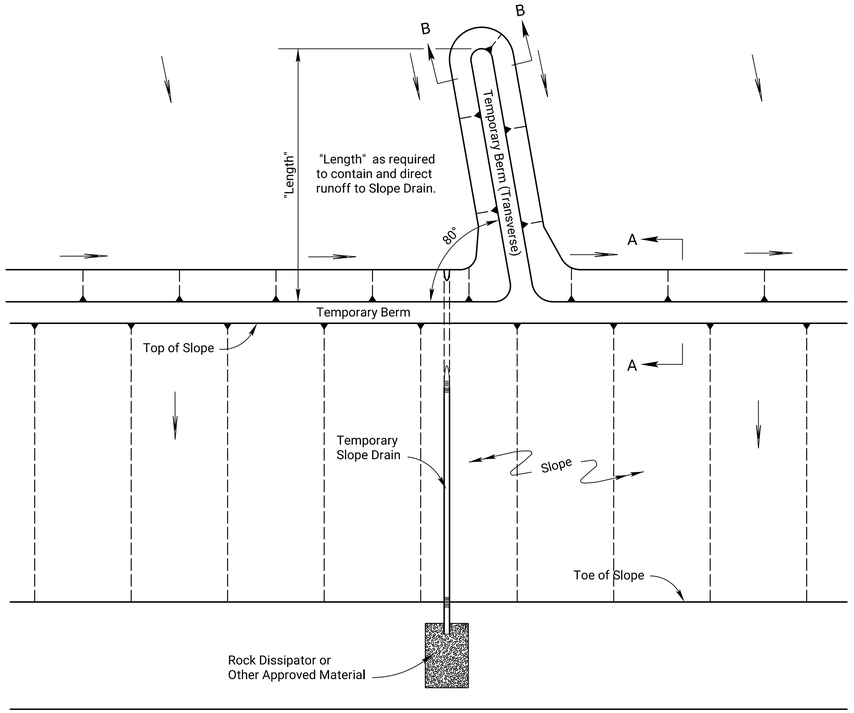
KDOT Graphics Certified 06-13-2024

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KDOT Graphics Certified

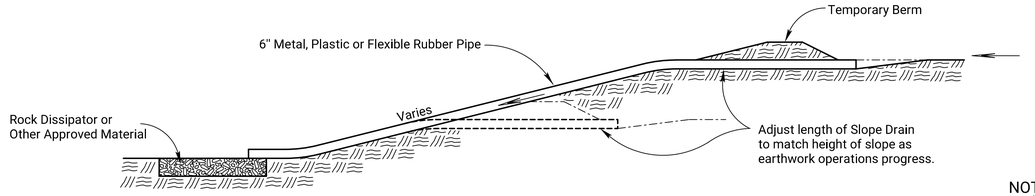
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STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	I47	293



TYPICAL PLAN VIEW OF TEMPORARY BERM AND TEMPORARY SLOPE DRAIN

NO SCALE



TYPICAL PROFILE OF TEMPORARY SLOPE DRAIN

NO SCALE

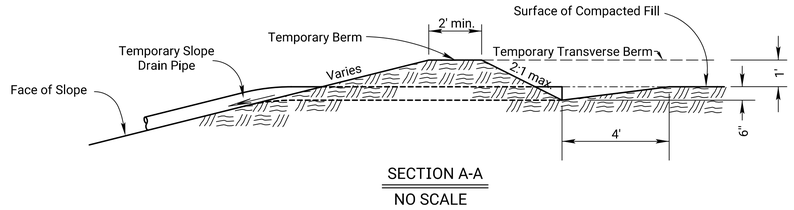
NOTES:

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

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

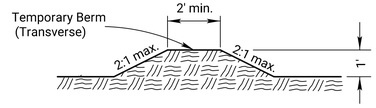
3) Pipe shall be secured in place as approved by Engineer.

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



SECTION A-A

NO SCALE

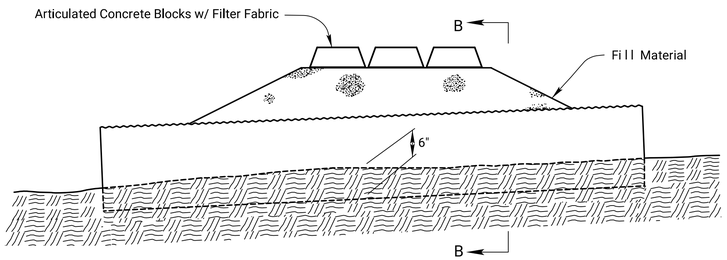


SECTION B-B

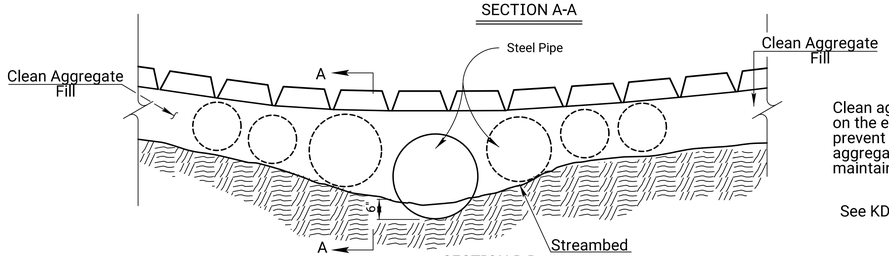
NO SCALE

TYPICAL PROFILE OF TEMPORARY BERM

NO SCALE



SECTION A-A



SECTION B-B

TEMPORARY STREAM CROSSING (ARTICULATED CONCRETE BLOCKS)

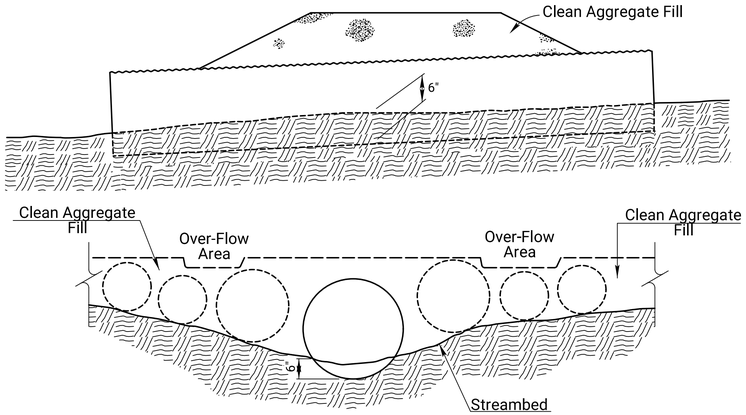
NO SCALE

Pipe size may vary.

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

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

See KDOT Specifications for more information.



SECTION B-B

TEMPORARY STREAM CROSSING (AGGREGATE)

NO SCALE

Pipe size may vary.

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

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

See KDOT Specifications for more information.

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

KANSAS DEPARTMENT OF TRANSPORTATION

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

LA852B

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

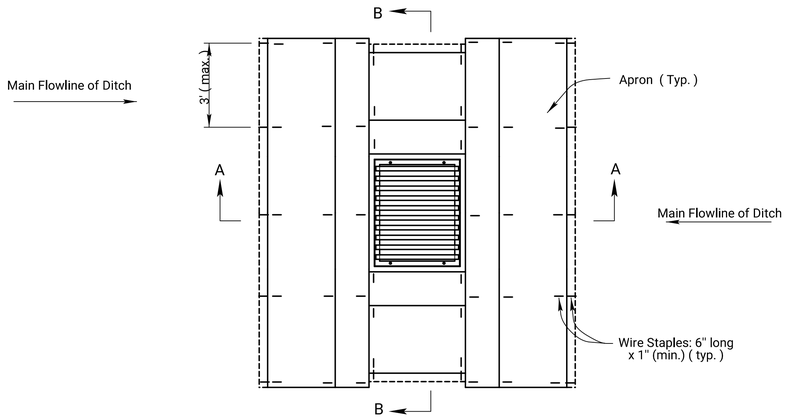
KDOT Graphics Certified 06-17-2022

Sh. No. 147

KDOT Graphics Certified

Drawn By : MDELEON Plotted :07/11/2214
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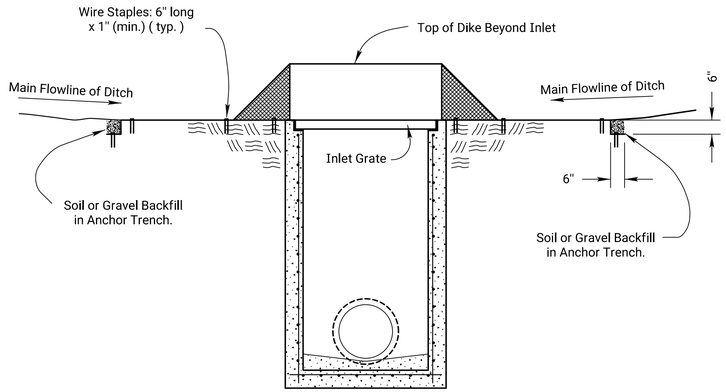
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	I48	293



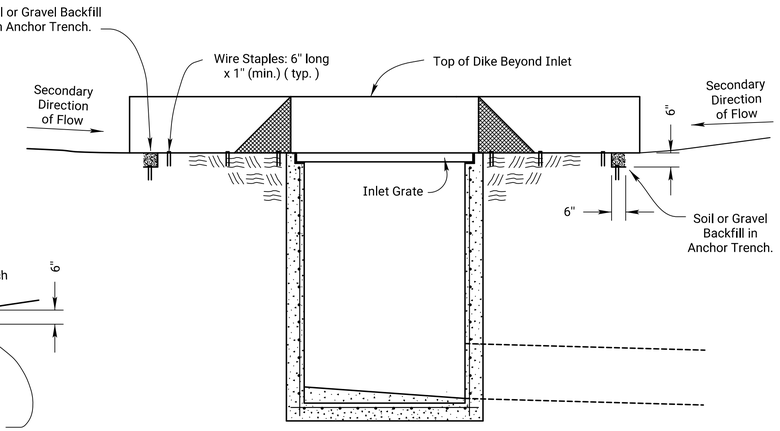
PLAN

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

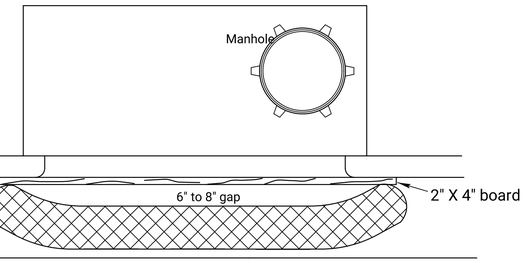
NO SCALE



SECTION A - A



SECTION B - B

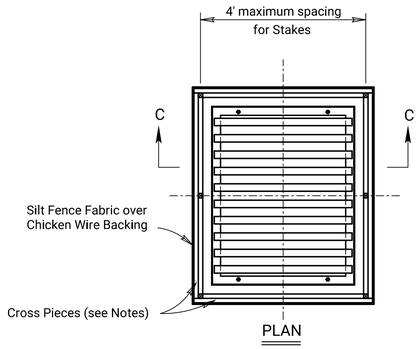


Bags = synthetic net (3mm mesh) or burlap bags

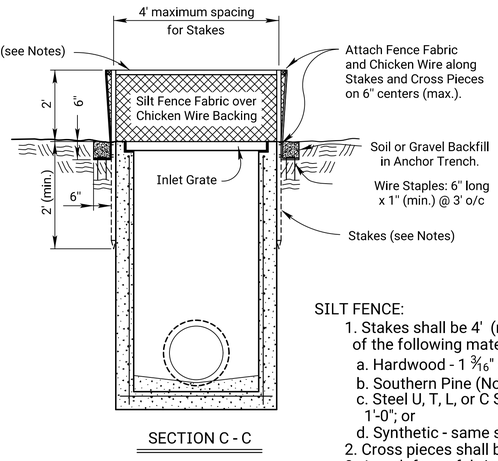
Rock = approximately 1" to 2" diameter

CURB INLET PROTECTION

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



PLAN



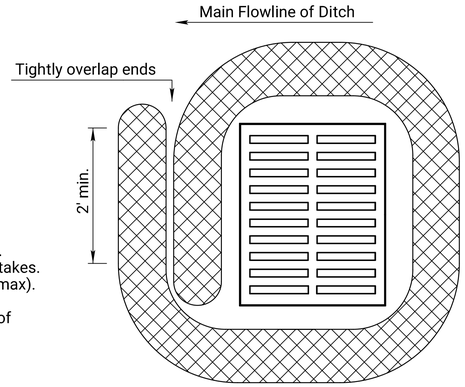
SECTION C - C

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

NO SCALE

SILT FENCE:

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



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

BIODEGRADABLE LOG/FILTER SOCK
DROP INLET PROTECTION

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

Stake every 4'

Material Requirements
Use 100% shredded mulch or other non-compost biodegradable material as fill for logs.
No compost or fines.
No hay or straw.
Do not use material which prohibits water infiltration.
Log Mesh: Use mesh with ¼" openings or larger. Mesh must allow water infiltration but also hold fill material in place.

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

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION AND POLLUTION CONTROL, TEMPORARY INLET SEDIMENT BARRIER (SILT FENCE) TEMP. INLET SEDIMENT BARRIER (T.S.D.) LA852C

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

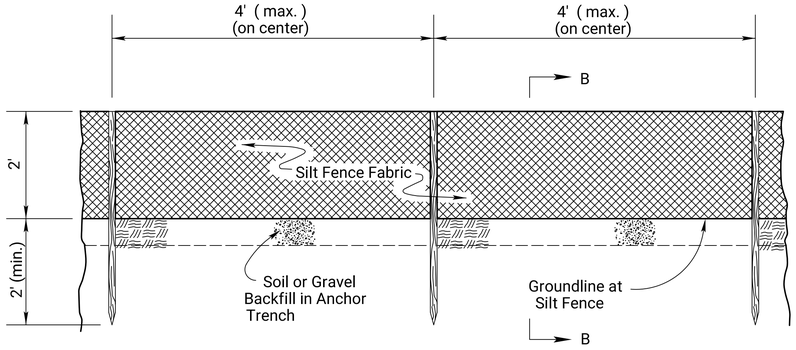
KDOT Graphics Certified 07-14-2022

Sh. No. 148

KDOT Graphics Certified

Drawn By : MDELEON Plotted :07/11/2024
File : c:\pwworking\central01\d2274982\ka602001la852c.dgn

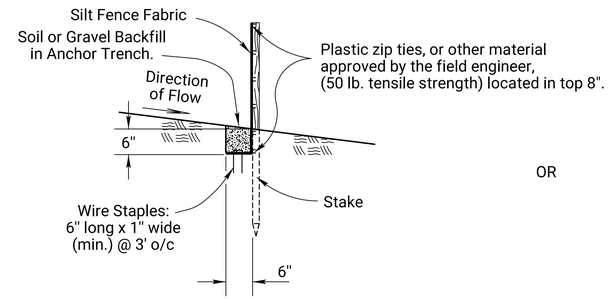
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	149	293



TYPICAL ELEVATION

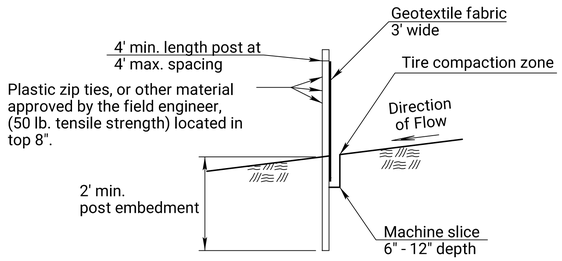
SILT FENCE BARRIER

NO SCALE

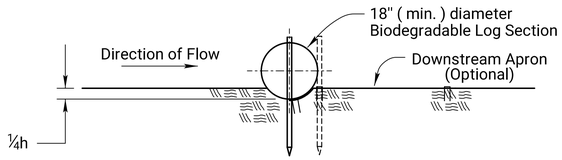


SECTION B-B

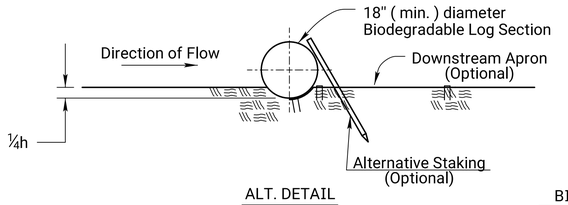
OR



SECTION B-B

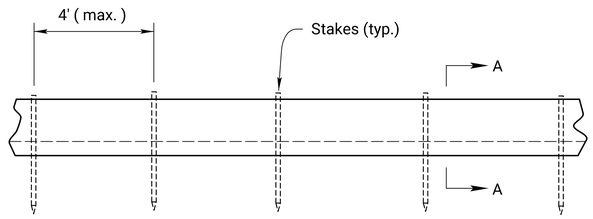


SECTION A - A



ALT. DETAIL

OPTIONAL



TYPICAL ELEVATION

BIODEGRADABLE LOG SLOPE INTERRUPTIONS

OR Filter Sock

INSTALLATION NOTES

SILT FENCE:

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

BIODEGRADABLE LOG OR FILTER SOCK

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

Biodegradable Log or Filter Sock Slope Interruptions

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

Deviations should be approved by the Field Engineer.

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

GENERAL NOTES

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

NO.	DATE	REVISIONS	BY	APP'D
03	06-28-16	Revised Standard	R.A.	S.H.S.
02	03-01-15	Revised Standard	R.A.	S.H.S.
01	06-01-13	Revised Standard	M.R.M.	S.H.S.

KANSAS DEPARTMENT OF TRANSPORTATION

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

LA852D

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

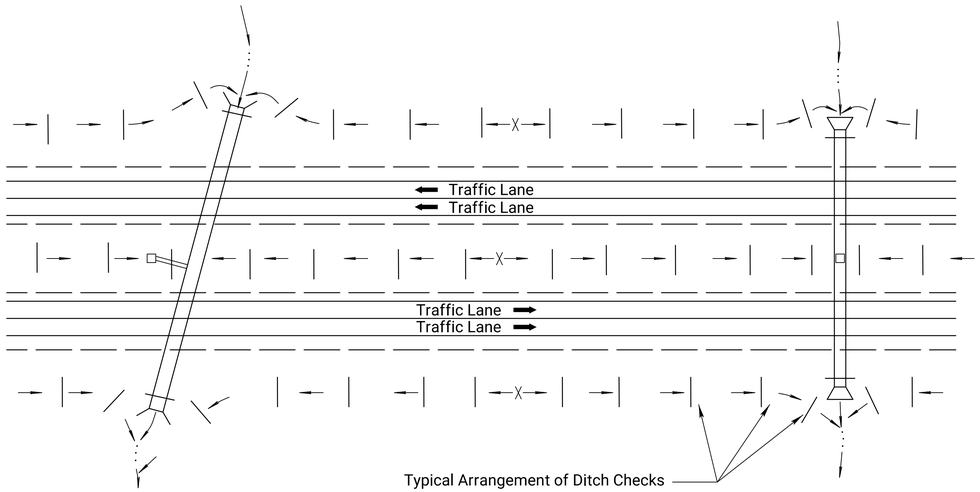
KDOT Graphics Certified 06-18-2022

Sh. No. 149

KDOT Graphics Certified

Drawn By : MDELEON
File : c:\pwworking\central01\d2274982\ka602001la852d.dgn
Plotted : 07/11/2024

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-01	2024	I50	293



Typical Arrangement of Ditch Checks

TYPICAL DITCH CHECK LAYOUT PLAN

NO SCALE

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

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

GENERAL NOTES

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

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

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

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

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION AND POLLUTION CONTROL DITCH CHECKS

LA852E

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

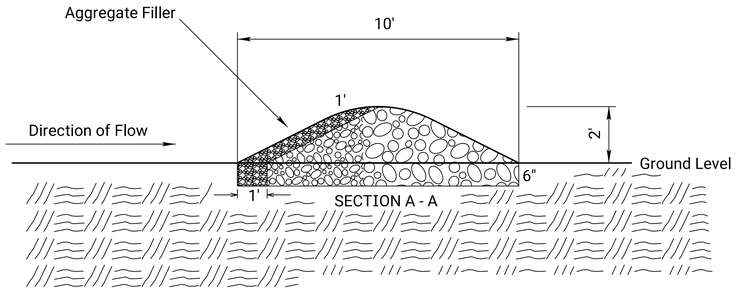
KDOT Graphics Certified 06-18-2022

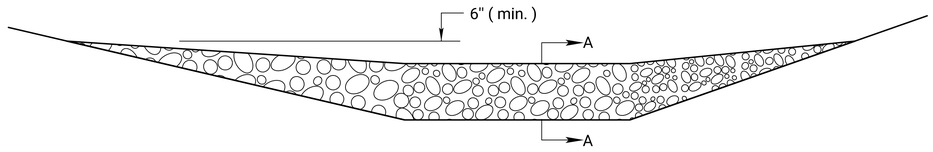
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KDOT Graphics Certified

Drawn By : MDELEON
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Plotted :07/11/2024

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	I5I	293





TYPICAL ELEVATION

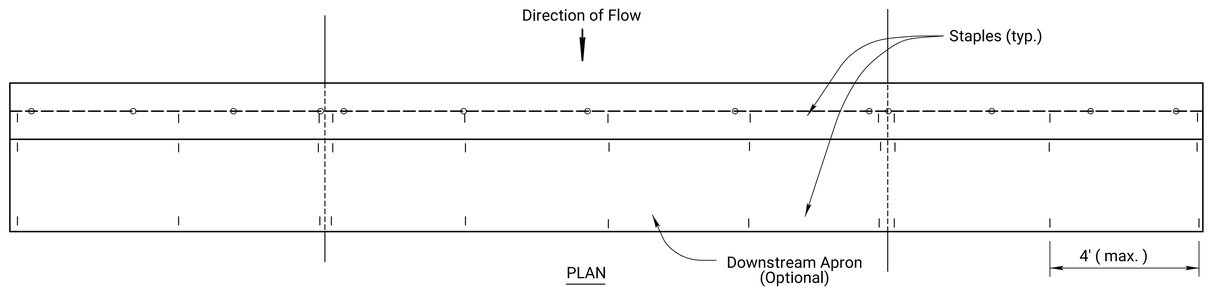
ROCK DITCH CHECK

NO SCALE

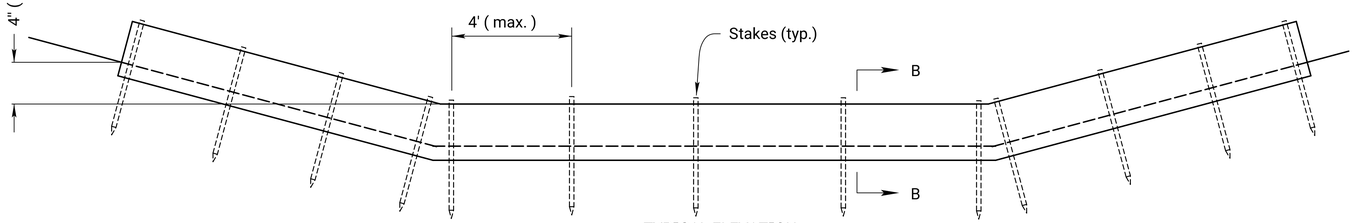
TEMPORARY ROCK DITCH CHECK SPACING	
DITCH ℄ SLOPE (%)	SPACING INTERVAL (FEET)
5.0	60
6.0	50
7.0	43
8.0	36
9.0	33
10.0	29
NOTE: Use this spacing for Rock Ditch Checks only.	

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

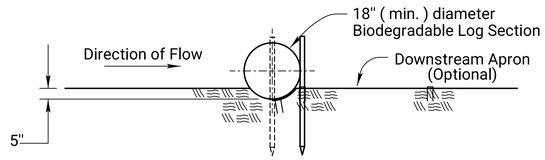


TYPICAL ELEVATION

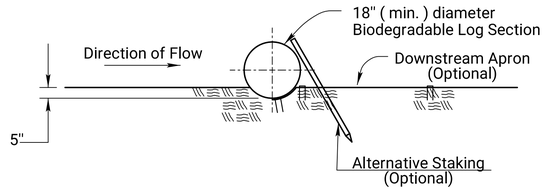
BIODEGRADABLE LOG DITCH CHECK

OR Filter Sock Ditch Check

NO SCALE



SECTION B - B



ALT. DETAIL
OPTIONAL

BIODEGRADABLE LOG DITCH CHECK NOTES

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

NO.	DATE	REVISIONS	BY	APP'D
03	11-19-20	Revised Standard	M.R.D.	M.L.
02	08-10-16	Revised Standard	R.A.A.	S.H.S.
01	10-21-15	Revised Standard	R.A.A.	S.H.S.

KANSAS DEPARTMENT OF TRANSPORTATION

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

LA852G

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

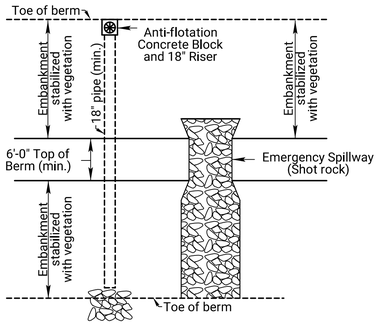
KDOT Graphics Certified 07-14-2022

Sh. No. I5I

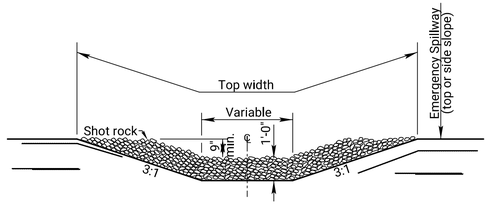
KDOT Graphics Certified

Drawn By : MDELEON
File : c:\pwworking\central01\d2274982\ka602001la852g.dgn
Plotted 07/11/2024

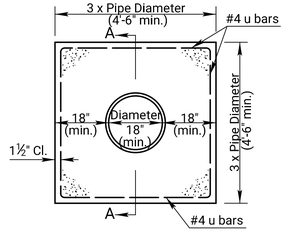
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	I52	293



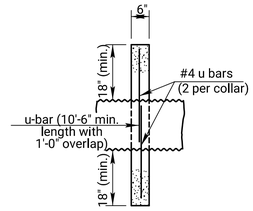
SEDIMENT STORAGE BASIN (PLAN)



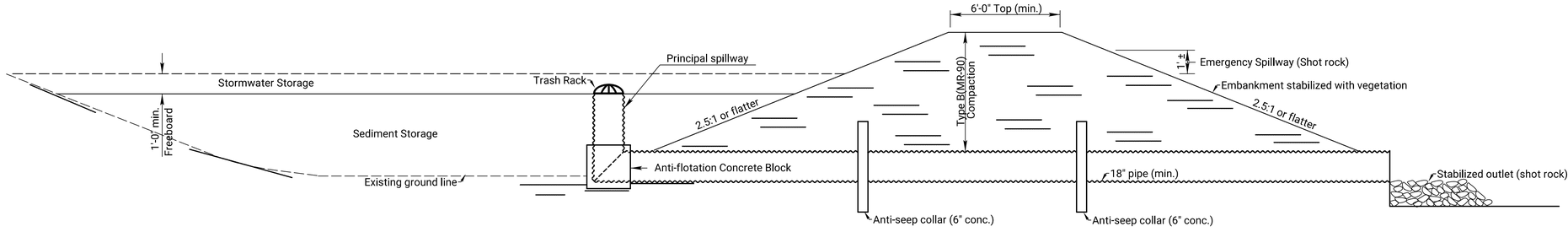
CROSS SECTION (EMERGENCY SPILLWAY)



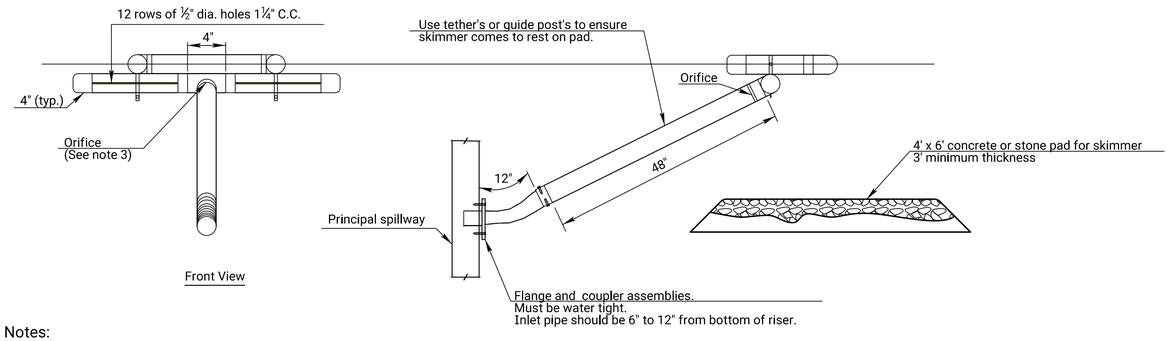
CONCRETE ANTI-SEEP COLLAR



SECTION A-A



SEDIMENT STORAGE BASIN (ELEVATION)



Notes:

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

SKIMMER DEWATERING DEVICE

NOTES:

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

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

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

SEDIMENT STORAGE BASIN LOCATIONS

STATION TO STATION	SIDE	REQUIRED STORAGE CAPACITY

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

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION AND POLLUTION CONTROL SEDIMENT STORAGE BASIN

LA852H

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

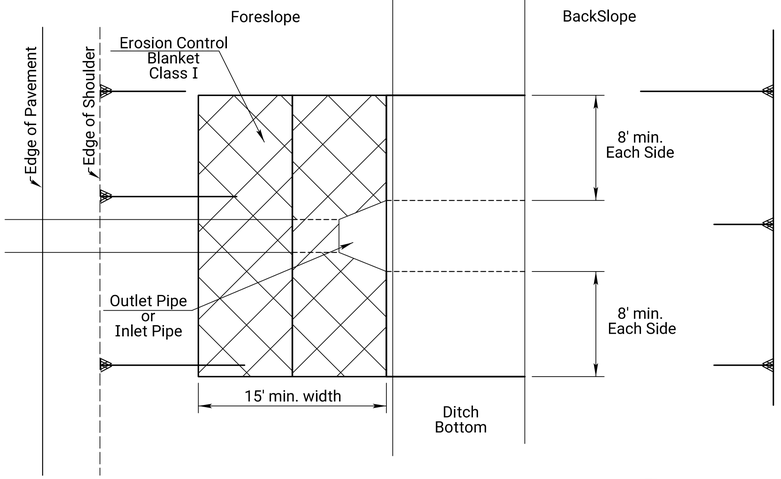
KDOT Graphics Certified 06-20-2022

Sh. No. 152

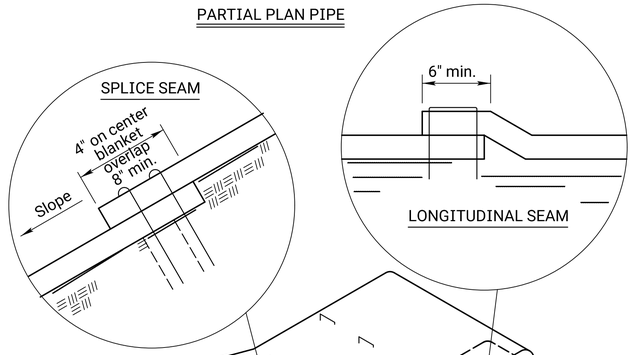
KDOT Graphics Certified

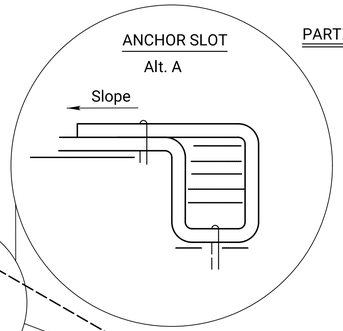
Drawn By : MDELEON Plotted :07/11/2024
File : c:\pwworking\central01\d2274982\ka602001la852h.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-071 KA-6020-01	2024	153	293

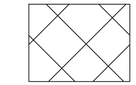


PARTIAL PLAN PIPE

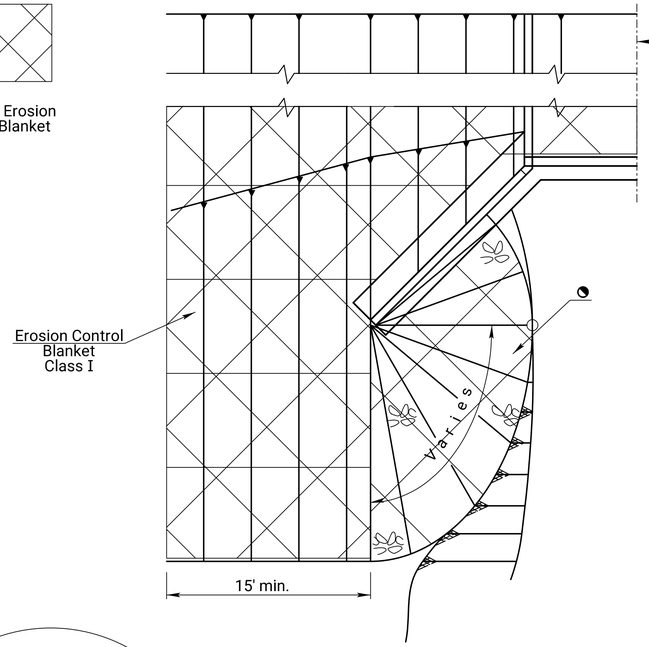




ISOMETRIC VIEW



Limits of Erosion Control Blanket



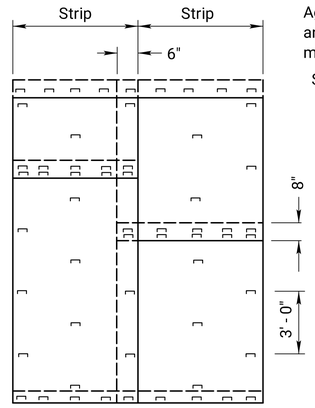
PARTIAL PLAN BOX CULVERT

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

INSTALLATION DETAILS FOR EROSION CONTROL CLASS 1

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

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



PLAN VIEW - ANCHORING DIAGRAM

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

Single post ring and shank staple is acceptable.

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

KANSAS DEPARTMENT OF TRANSPORTATION

INSTALLATION DETAIL EROSION CONTROL CLASS 1 SLOPE PROTECTION

LA855

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

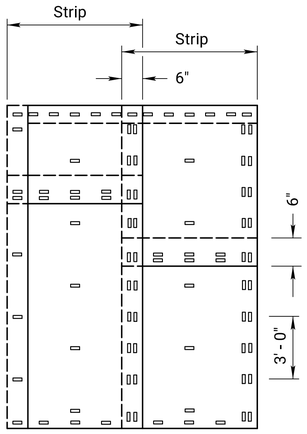
KDOT Graphics Certified 06-20-2022

Sh. No. 153

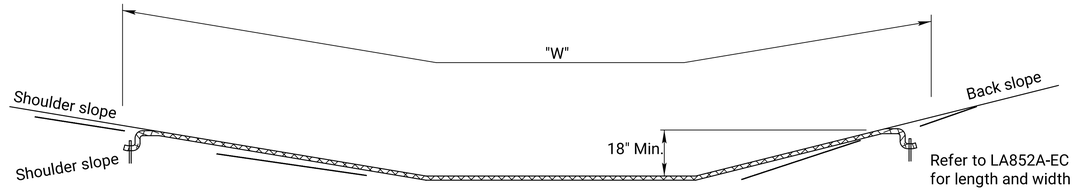
KDOT Graphics Certified

Drawn By : MDELEON Plotted 07/11/2024
File : c:\pwworking\central01\d2274982\ka6020011a8555.dgn

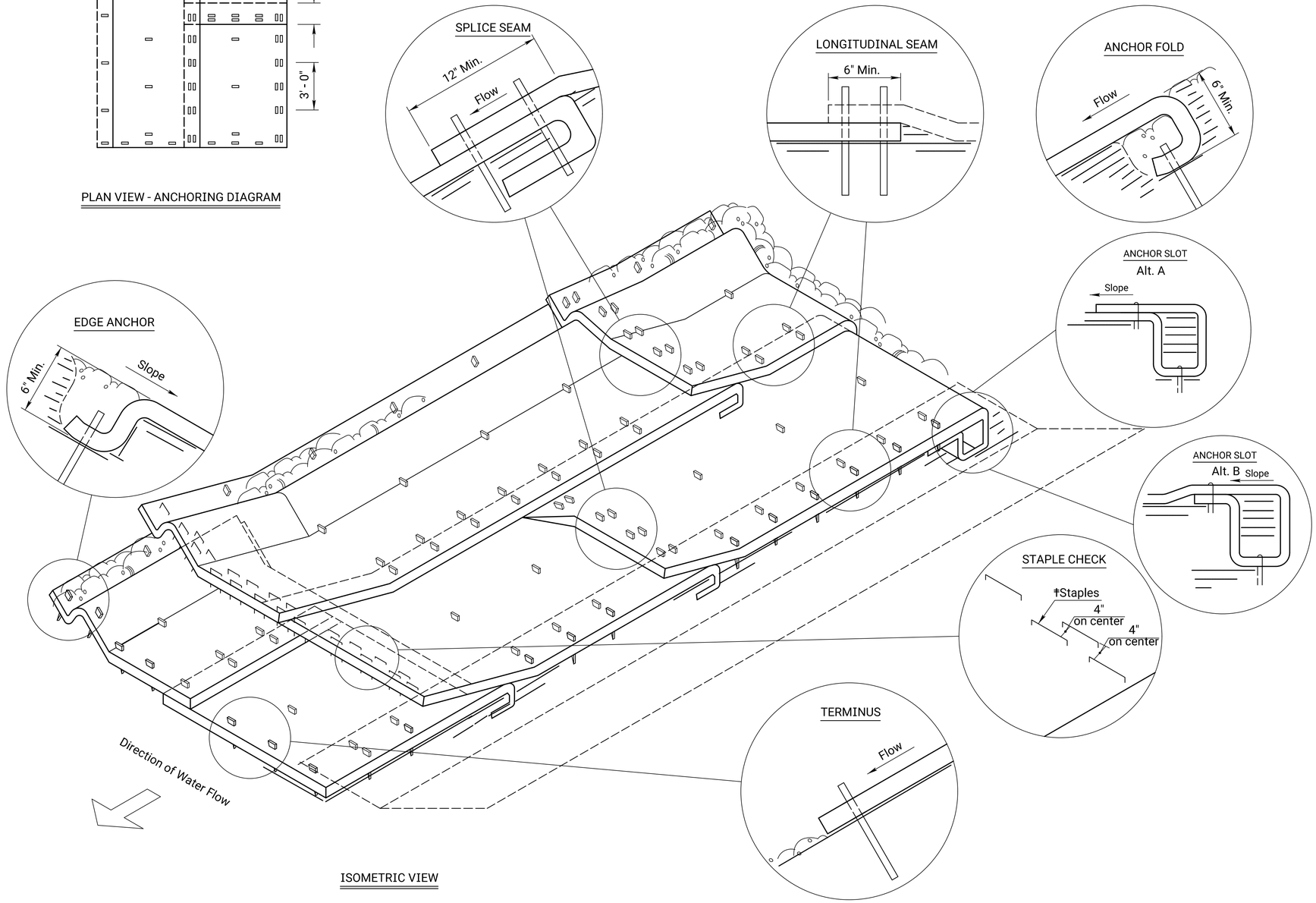
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	I54	293



PLAN VIEW - ANCHORING DIAGRAM



CROSS SECTION (Ditch Lining)



ISOMETRIC VIEW

INSTALLATION DETAILS FOR EROSION CONTROL CLASS 2

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

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

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

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

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

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

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

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

NO.	DATE	REVISIONS	BY	APP'D
04	09-25-15	Modified Staple Check	R.A.A.	S.H.S.
03	09-15-14	Revised Standard	R.A.A.	S.H.S.
02	03-01-13	Revised Standard	M.R.M.	S.H.S.

KANSAS DEPARTMENT OF TRANSPORTATION

INSTALLATION DETAIL
EROSION CONTROL CLASS 2
FLEXIBLE CHANNEL LINER

LA856

FHWA APPROVAL			11-02-15	APP'D.	Scott H. Shields		
DESIGNED	R.A.A.	DETAILED	R.A.A.	QUANTITIES		TRACED	R.A.A.
DESIGN CK.	S.H.S.	DETAIL CK.	S.H.S.	QUAN.CK.		TRACE CK.	

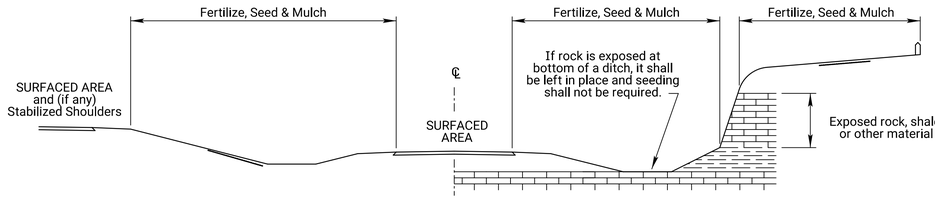
KDOT Graphics Certified 06-20-2022

Sh. No. 154

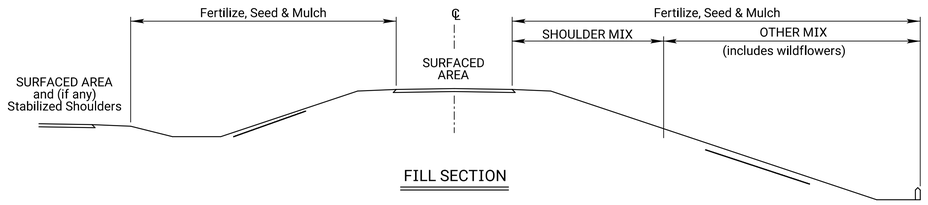
KDOT Graphics Certified

Drawn By : MDELEON Plotted : 07/31/2024
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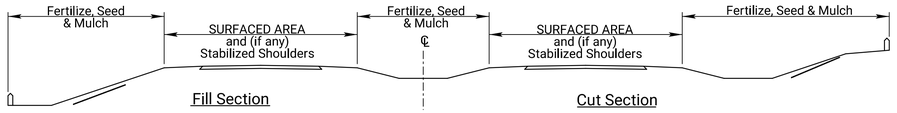
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	I55	293



CUT SECTION



FILL SECTION



TYPICAL SECTION - DUAL PAVEMENT

GRASS & WILDFLOWER SEEDING SEASONS

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

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

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

SODDING SEASONS

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

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

GENERAL NOTES

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

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

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

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

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

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

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

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

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

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

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

NATIVE WILDFLOWER MIX 1

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

NATIVE WILDFLOWER MIX 2

PLS RATE	NAME	QTY (lb)
0.3	Butterfly Milkweed	14.37
0.3	Black Eyed Susan	14.37
0.5	Black Sampson Coneflower	23.95
1.0	Blanket Flower	47.90
0.2	Maximilian Sunflower	9.58
0.2	Plains Coreopsis	9.58
0.2	Upright Prairie Coneflower	9.58
0.2	Western Yarrow	9.58
0.3	Lemon Mint	14.37
0.4	Pitcher Sage	19.16
1.5	Illinois Bundleflower	71.85
0.2	Common Evening Primrose	9.58
1.0	Blue Wild Indigo	47.90
0.4	Leadplant	19.16
0.4	Purple Prairie Clover	19.16
0.3	White Prairie Clover	14.37
7.4	Total (lb)	354.5

Package and deliver the wildflower seed separately from the grass seed mix. Package and deliver the Tall Drop Seed separately from the grass seed and the wildflower mix. Place the grass seed (except Tall Drop Seed) in the large seed box and drill (cover) seed ⅛" -¼". Place the wildflower seed in a separate seed box and drill (cover) seed 1/16" maximum. Place the Tall Drop Seed in a separate (third) seed box and place the seed (using the seed drill) on the soil surface.

OPTION: Broadcast Tall Drop Seed on the soil surface.

SUMMARY OF SEEDING QUANTITIES

P.L.S. RATE/ACRE				ACRES				BID ITEM	QUANTITY	UNIT
SHLDR	OTHER			SHLDR	OTHER					
50	50			0.75	47.9			Fertilizer (16 - 20 - 0)	2432.5	Lbs
	2				47.9			Seed (Big Bluestem (Kaw))	95.8	Lbs
1	1			0.75	47.9			Seed (Blue Grama (Lovington))	48.7	Lbs
24.5	8.8			0.75	47.9			Seed (Buffalograss (Treated))	439.9	Lbs
	2				47.9			Seed (Indiangrass (Osage))	95.8	Lbs
	2.5				47.9			Seed (Little Bluestem (Aldous))	119.8	Lbs
6.3	6.3			0.75	47.9			Seed (Side Oats Grama (El Reno))	306.5	Lbs
10	10			0.75	47.9			Seed (Sterile Wheatgrass)	486.5	Lbs
	1				47.9			Seed (Switchgrass (Blackwell))	47.9	Lbs
6	4			0.75	47.9			Seed (Western Wheat (Barton))	196.1	Lbs
	7.4				47.9			Seed (Native Wildflower Mix 2)	354.5	Lbs
								Mulching *		

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

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

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

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

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

NO.	DATE	REVISIONS	BY	APP'D
02	11-25-20	Updated Seeding / Sodding Periods Charts	M.R.D.	M.L.
01	08-03-20	Revised Standard	M.R.D.	S.H.S.

KANSAS DEPARTMENT OF TRANSPORTATION

PERMANENT SEEDING
SUMMARY OF SEEDING QUANTITIES

LA850

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

KDOT Graphics Certified 03-04-2024

Sh. No. 155

KDOT Graphics Certified

Drawn By : MDELEON Plotted :07/11/2024
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STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	I56	293

SYMBOL KEY

- REMOVE SIGN
- REMOVE POST
- REMOVE FOOTING
- REMOVE SIGN & POST
- REMOVE POST & FOOTING
- REMOVE SIGN, POST, & FOOTING
- MOUNT ON WOOD POST IN CONCRETE FOOTING
- MOUNT ON WOOD POST IN SOIL
- MOUNT ON STEEL BEAM BREAKAWAY POST
- MOUNT ON STEEL U-POST
- MOUNT ON PSST POST
- MOUNT ON EXISTING POST
- MOUNT ON VERTICAL SUPPORT
- SHOULDER MOUNTED INSTALLATION
- OFFSET MOUNTED INSTALLATION
- EXISTING SIGN
- EXISTING SIGN TO BE OVERLAID
- SIGN IS NOT PART OF PROJECT
- TYPE 'A' DELINEATOR (RIGID)
- TYPE 'A' DELINEATOR (RIGID) (BK-BK)
- TYPE 'B' DELINEATOR (RIGID)
- TYPE 'A' DELINEATOR (FLEXIBLE)
- TYPE 'A' DELINEATOR (FLEXIBLE) (BK-BK)
- TYPE 'B' DELINEATOR (FLEXIBLE)
- TYPE 2 OBJECT MARKER
- TYPE 3 OBJECT MARKER
- TYPE 3 OBJECT MARKER (BK-BK)

GENERAL NOTES

In order to expedite the completion of the project for traffic service, the signing and delineator work shall be sequenced with any other contract work such that the phases of construction may proceed and be completed at the same time.

New signs erected on the project which are in conflict with existing signing are to be completely covered until the existing signs are removed or the new signing is applicable. The existing signs that are being replaced, removed, or do not follow the current MUTCD signing standards are to be removed when the project is completed or as determined by the Engineer.

The Contractor shall exercise caution at all times when installing sign supports in and around areas where utilities exist, either underground or overhead, and will be held responsible for any damage incurred to the system. The installation of sign supports shall include the excavation, drilling, or driving the support footing and the erection of the sign support. The contractor shall exercise caution when working around any existing signs that are to remain and will be held responsible for any damage to the signs, supports, or footings. The Contractor shall exercise care when working around shrubbery while removing or installing signs or sign supports.

An existing sign post installation shall be plumb and the compaction of the backfill soil shall comply with the specifications after the removal and resetting of a sign, the removal and replacement of a sign, or the installation of a new sign.

The Contractor shall provide mounting bolts that are of a length that does not extend more than a nominal 1 inch beyond the sign post. The Contractor shall not make any field modifications to the mounting bolt prior to or after the sign is installed.

Specific service (LOGO) signs that are to be removed shall have the business logo plaques removed and transported to location determined by KDOT, at which time the plaques become the property of KDOT. The Contractor will be assessed a replacement cost for any damage to a business logo plaque prior to the plaque becoming the property of KDOT.

The materials and fabrication for signing and delineation work shall conform to the Standard Specifications for State Road and Bridge Construction (2015 edition) and Special Provisions.

INDEX OF SHEETS

156	SIGNING INDEX, SYMBOLS, & GENERAL NOTES
157	POST SPACING & SIGN ANGLE DETAILS
158	HEIGHT & LATERAL DISTANCE FOR ERECTION
159- 161	POSITIONING, DESIGN, & MOUNTING OF DELINEATORS
162-163	POSITIONING, DESIGN, & MOUNTING FOR OBJECT MARKERS (TYPE 2 & 3)
164-167	PLAN SHEETS (INSTALLATIONS)
168- 171	PLAN SHEETS (REMOVALS)
172-174	QUANTITIES SHEETS (INSTALLATIONS)
175	QUANTITIES SHEET (DELINEATORS & OBJECT MARKERS)
176	SUMMARY SHEET (INSTALLATIONS & REMOVALS)
177	RECAPITULATION SHEET
178-179	STANDARD STRUCTURAL SIGN SUPPORTS (WOOD & STEEL POSTS)
180- 181	MOUNTING OF SIGNS ON WOOD POSTS
182-184	DETAILS FOR FLAT SHEET SIGN BLANKS
185	DETAILS FOR PROCESSED SIGNS
186	DETAILED SIGN SPECIFICATIONS
187	SIGN FABRICATION DETAILS

NO.	DATE	REVISIONS	BY	APP'D
2	10/01/19	Changed symbols, notes, & index	D.D.G.	E.W.N.
1	7/23/10	Changed General Notes and Spec Book Date	D.D.G.	D.B.

KANSAS DEPARTMENT OF TRANSPORTATION

SIGNING SYMBOL KEY
GENERAL NOTES
AND INDEX

TE402 7/1/03

FHWA APPROVAL		10/01/2019	APP'D	Steven A. Buckley	
DESIGNED	D.D.G.	DETAILED	W.S.B.	QUANTITIES	TRACED
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.	TRACE CK.

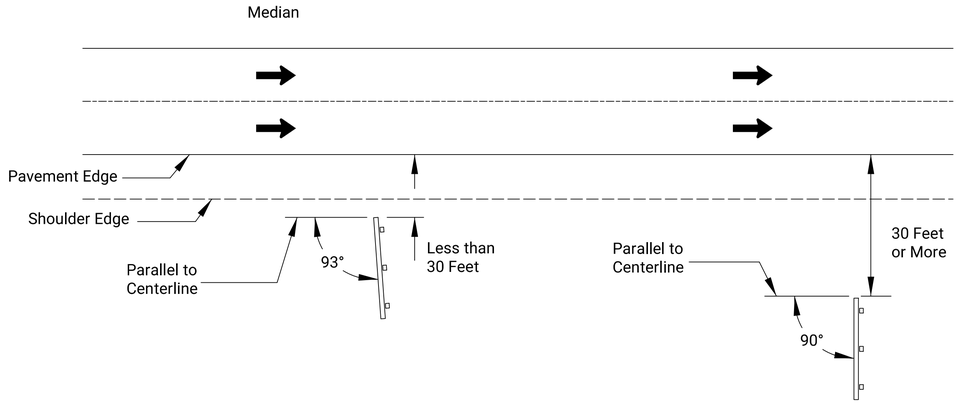
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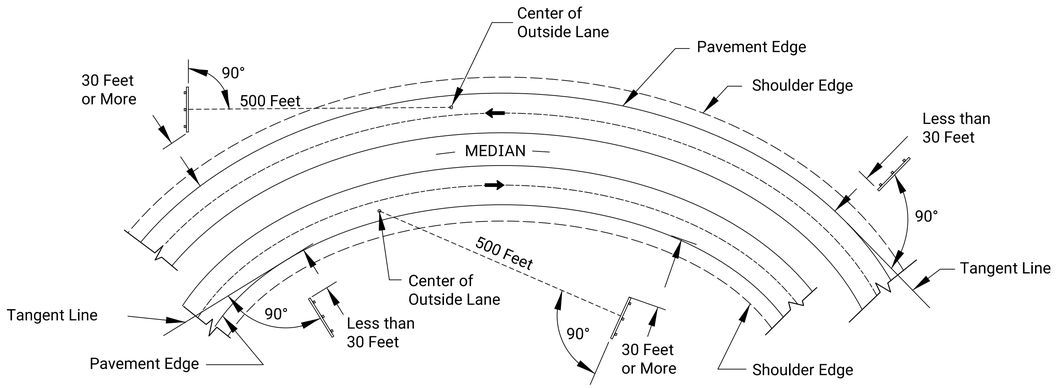
KDOT Graphics Certified

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STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	I57	293

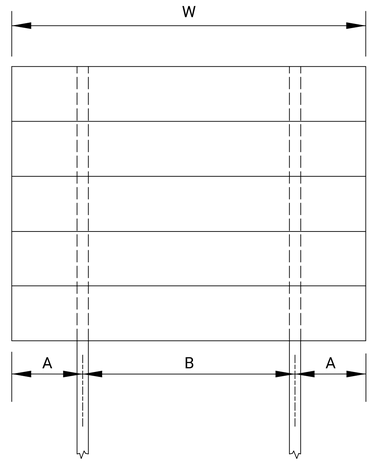


ANGLE OF SIGNS ERECTED ON STRAIGHT ROADWAY



ANGLE OF SIGNS ERECTED ON CURVED ROADWAY

GENERAL NOTE:
Gore and median signs shall normally be erected such that the sign face is truly vertical and rotated 93 degrees away from the center of the lane which the sign serves. All angles are measured to the face of the sign.



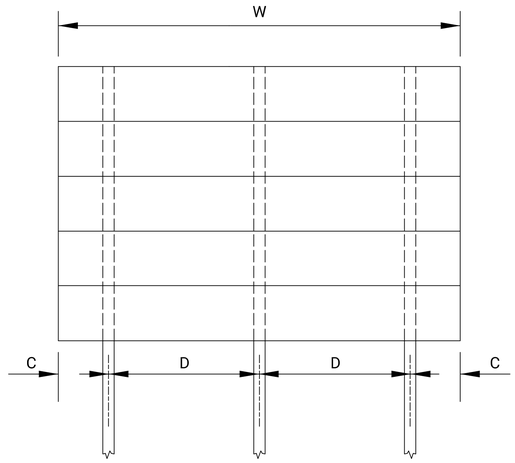
TWO POST SPACING

Wood Post		
A	B	W
6" (Min.)	3/5 W (Min.)	NA

Steel Beam Post (Width less than or equal to 13'-0")		
A	B	W
12" (Min.)	8'	10'-0" (Min.)

Steel Beam Post (Width greater than 13'-0")		
A	B	W
32" (Min.)	8' (Min.)	13'-6" (Min.)

Spacing Pattern: A+B+A
W= Sign Width
A= 1/5 W
B= 3/5 W



THREE POST SPACING

Wood Post		
C	D	W
6" (Min.)	4' (Min.)	9'-0" (Min.)

Steel Beam Post (Width less than or equal to 21'-0")		
C	D	W
12" (Min.)	8'	18'-0" (Min.)

Steel Beam Post (Width greater than 21'-0")		
C	D	W
32" (Min.)	8' (Min.)	21'-6" (Min.)

Spacing Pattern: C+D+D+C
W= Sign Width
C= 1/8 W
D= 3/8 W

NOTE: All spacing dimensions are measured to the centerline of the posts.

POST SPACING FOR REINFORCED PANEL SIGNS

NO.	DATE	REVISIONS	BY	APP'D
1	10/01/19	Changed the post spacing tables and notes	D.D.G.	E.W.N.

KANSAS DEPARTMENT OF TRANSPORTATION
POST SPACING FOR REINFORCED PANEL SIGNS AND ANGLE OF SIGNS

TE404 7/1/03

FHWA APPROVAL		10/01/2019	APP'D	Steven A. Buckley	
DESIGNED	D.D.G.	DETAILED	W.S.B.	QUANTITIES	TRACED
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.	TRACE CK.

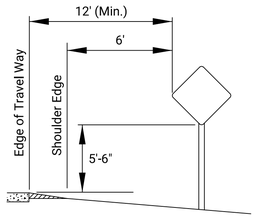
KDOT Graphics Certified 12-17-2019

Sh. No. 157

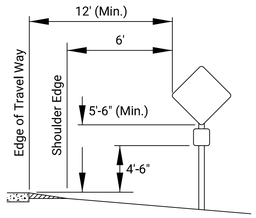
KDOT Graphics Certified

Drawn By : MDELEON Plotted :07-11-24
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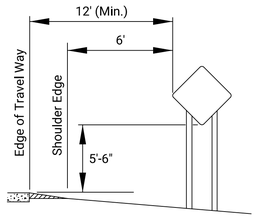
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	I58	293



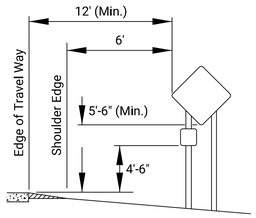
ONE POST



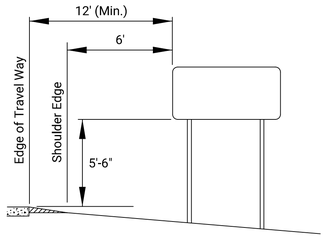
ONE POST WITH SUPPLEMENTAL SIGN



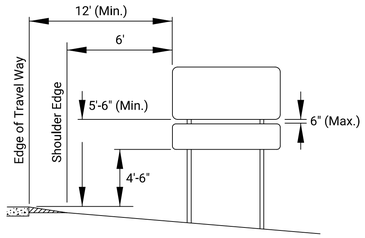
TWO POSTS



TWO POSTS WITH SUPPLEMENTAL SIGN

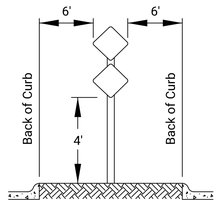


MULTIPLE POSTS

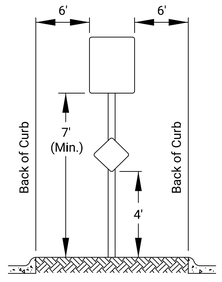


MULTIPLE POSTS WITH SUPPLEMENTAL SIGN

CONVENTIONAL HIGHWAY AND SIDE ROADS

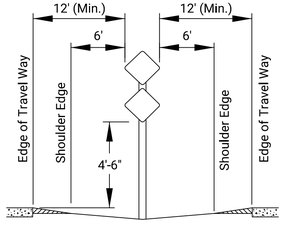


ONE OR TWO OM1-3

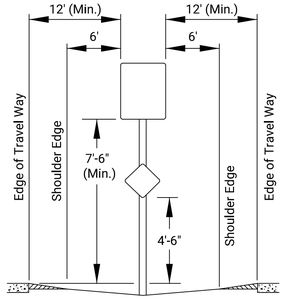


PRIMARY SIGN WITH OM1-3

RAISED



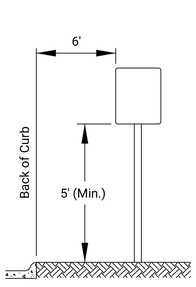
ONE OR TWO OM1-3



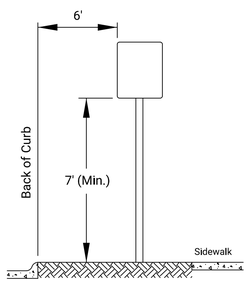
PRIMARY SIGN WITH OM1-3

DEPRESSED

MEDIANS AND ISLANDS

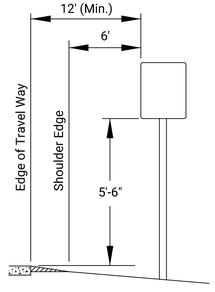


NO PARKING OR SIDEWALK



PARKING OR SIDEWALK

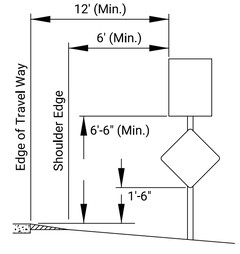
CURB



TYPICAL

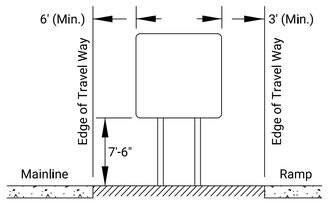
NO CURB

URBAN ROADWAYS

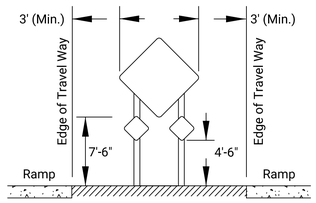


TYPICAL

ADOPT A HIGHWAY

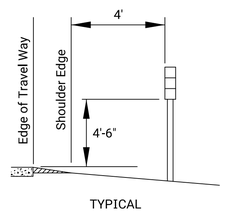


MAINLINE/RAMP



RAMP/RAMP

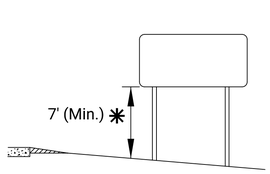
HIGHWAY GORES



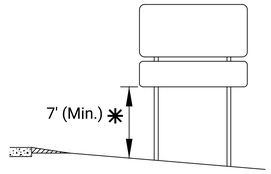
TYPICAL

Reference Marker Post: 2 Lb/Ft "U" Post

REFERENCE MARKERS



PRIMARY SIGN



PRIMARY SIGN WITH SUPPLEMENTAL SIGN

✱NOTE: Measured from the nearest point between the sign and the groundline.

GROUND CLEARANCE FOR STEEL BEAM POSTS

NOTES

The "Edge of Travel Way" is the edge line or the edge of the driving lane.

The outer edge of the sign shall not extend beyond the right of way line.

A minimum lateral clearance of 6' from pavement edge may be used where lateral offsets are limited.

In business, commercial, or residential districts where with limited lateral offsets, a minimum lateral clearance of 2' with a 7'-6" minimum mounting height may be used.

When signs are behind guard rail, the near edge of the sign shall not extend beyond the back side of the guard rail and the nearest sign post shall be a minimum of 5' from the face of the guard rail. Shoulder mounted shall not be located between 100' in advance of and 50' beyond the nose of the guard rail.

When the median or island is too narrow for the typical lateral placement, the sign may be placed a minimum of 2' from the back of the curb. In no case shall the sign edge extend beyond the back edge of the curb.

The gore sign shall be installed in the paved gore area. The edges of the gore sign shall not extend beyond the shoulder edge. The minimum distance from the centerline of the posts to the back of the paved gore area is 2'.

Signs may be moved laterally or longitudinally if it will improve visibility of the sign or other signs or if it will protect the sign more. The maximum allowable longitudinal adjustment is 100', with the exception of the reference marker which is 50'.

The minimum spacing between signs, excluding reference markers is 100'.

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

MOUNTING HEIGHT & LATERAL OFFSET FOR CONVENTIONAL HIGHWAYS, SIDE ROADS, MEDIANS, ISLANDS, GORES, AND URBAN ROADWAYS

TE407 10/01/19

FHWA APPROVAL			10/01/2019	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.	

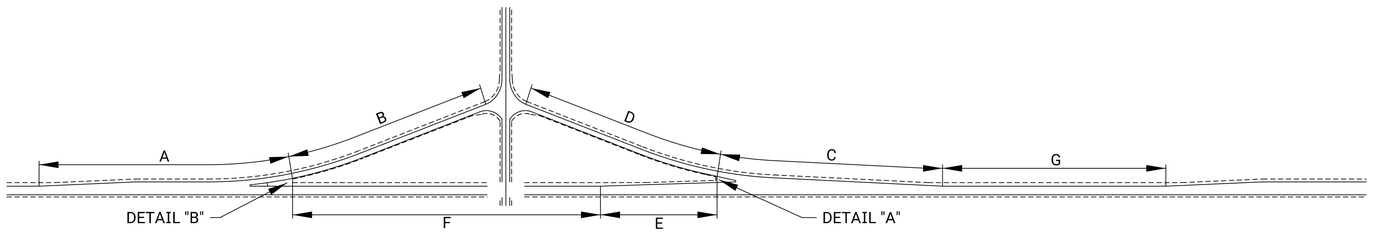
KDOT Graphics Certified 12-17-2019

Sh. No. 158

KDOT Graphics Certified

Drawn By : MDELEON Plotted :07-11-24
File : c:\pwworking\central01\d2274982\ka602001pss407-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-01	2024	I59	293



DELINEATION SPACING TABLE

	Beginning Point	Ending Point	Typical Spacings	Delineator Type
A	End of acceleration lane taper	Perpendicular to entrance ramp gore	100 Feet	"B"
B	Perpendicular to entrance ramp gore	Ramp terminal radius	100 Feet	"A"
C	End of deceleration lane taper	Perpendicular to exit ramp gore sign	100 Feet	"B"
D	Perpendicular to exit ramp gore sign	Ramp terminal radius	100 Feet	"A"
E	Perpendicular to exit ramp gore sign	End of exit gore taper	75-100 Ft	"A"
F	End of exit gore taper	Entrance ramp gore	400-500 Ft	"A"
	Beginning of curve for direction of travel (mainline)	End of curve for direction of travel (mainline)	20-528 Ft (1)	"A"
	Beginning of curve for direction of travel (ramp)	End of curve for direction of travel (ramp)	20-100 Ft (1)	"A"
	Beginning of curve for outside lane (two way traffic)	End of curve for outside lane (two way traffic)	10-140 Ft (1)	"A" (2)

	Beginning Point	Ending Point	Typical Spacings	Delineator Type
G	End of acceleration or deceleration lane taper (mainline)	End of acceleration or deceleration lane taper (3) (mainline)	528 Ft	"A"
	3000 feet from perpendicular to exit ramp gore sign (Exit Only lane)	Perpendicular to exit ramp gore sign (Exit Only lane)	100 Feet	"B"
	Perpendicular to exit ramp gore sign (Auxiliary lane 4000 feet or less in length✳)	Perpendicular to entrance ramp gore (Auxiliary lane 4000 feet or less in length✳)	100 Feet	"B"
	3000 feet from perpendicular to exit ramp gore sign (Auxiliary lane greater than 4000 feet in length✳)	Perpendicular to exit ramp gore sign (Auxiliary lane greater than 4000 feet in length✳)	100 Feet	"B"
	1000 feet from perpendicular to entrance ramp gore (Auxiliary lane greater than 4000 feet in length✳)	Perpendicular to entrance ramp gore (Auxiliary lane greater than 4000 feet in length✳)	100 Feet	"B"
	1000 feet from perpendicular to entrance ramp gore (Auxiliary lane greater than 5000 feet in length✳)	Perpendicular to entrance ramp gore (Auxiliary lane greater than 5000 feet in length✳)	100 Feet	"B"
	1000 feet from perpendicular to entrance ramp gore (Auxiliary lane greater than 5000 feet in length✳)	3000 feet from perpendicular to exit ramp gore sign (Auxiliary lane greater than 5000 feet in length✳)	528 Ft	"A"

(1) Spacing is rounded to nearest foot using the formula:

Spacing = $3 \times \sqrt{(\text{Radius} - 50)}$

(2) Delineators are back to back on the post.

(3) 3000 feet from perpendicular to exit ramp gore sign for Exit Only lane

✳ Auxiliary lane length is measured from perpendicular to entrance ramp gore to perpendicular to exit ramp gore sign

Note:
See 'Delineation Spacing Table' for type of delineator and typical spacing. The spacing shall be continuous and uniform. The color of delineation shall match the color of the pavement marking edgeline.

Delineation shall be located on the outside edge of mainline, acceleration lanes, deceleration lanes, ramps, and curves. Delineation is not to be used along the mainline median or on the left side of a ramp, unless the roadway curves to the right. Delineation shall not be used on curves or loops when chevrons (W1-8 signs) are used, except at the entrance and exit gore areas. When changing from delineating one edge of the roadway to the other edge, the delineation on both edges shall overlap the typical spacing shown in the delineation spacing table.

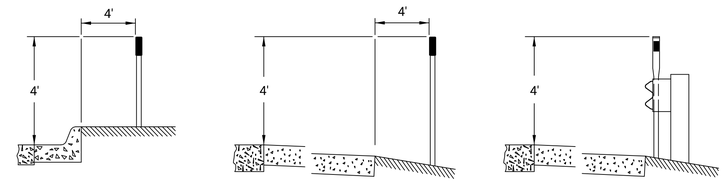
When delineating a curve, the first delineator should be located at the beginning of the curve. The spacing on the curve shall not exceed the typical spacing for the road type.

All delineation used within 100 feet in advance of the nose of guard rail end terminal and throughout the area with guard rail shall be flexible post mounted.

Delineation located on a median between the entrance and exit ramps should be installed according to median width:

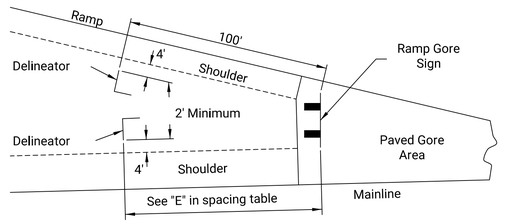
Median width less than 6 ft: delineation installed back-to-back on a single post along the median centerline.

Median width greater than or equal to 6 ft: delineation installed as shown for the typical delineator locations.

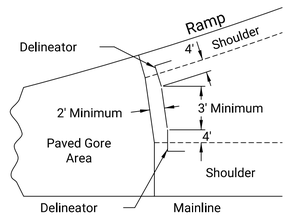


CURB SECTION SHOULDER SECTION GUARDRAIL SECTION

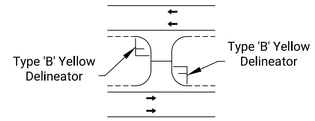
DELINEATOR INSTALLATIONS



DETAIL "A"



DETAIL "B"



MEDIAN CROSS-OVER

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

DESIGN DETAILS FOR POSITIONING OF DELINEATORS

TE410 10/01/19

FHWA APPROVAL			10/01/2019	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.	

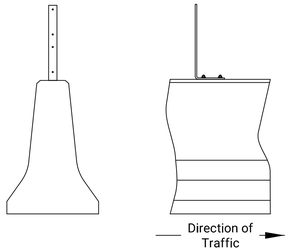
KDOT Graphics Certified 12-17-2019

Sh. No. 159

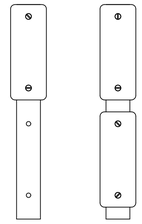
KDOT Graphics Certified

Drawn By : MDELEON Plotted :07-11-24
File : c:\pwworking\central01\d2274982\ka602001pss410-01.dgn

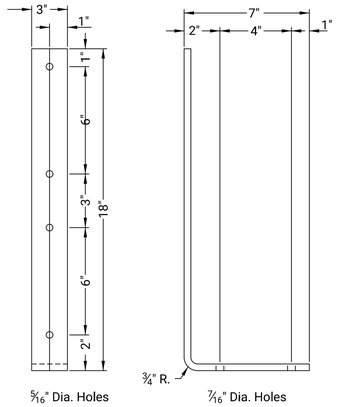
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	I60	293



FRONT SIDE
TYPICAL MOUNTING DETAIL
BARRIER

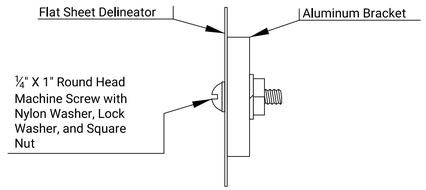


TYPE "A" TYPE "B"
DELINEATOR POSITION
DETAILS

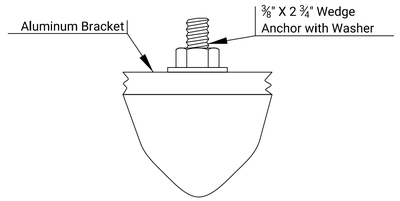


FRONT SIDE
DELINEATOR BRACKET
DETAILS

DETAILS FOR BARRIER AND BRIDGE RAIL LESS 48" TALL



DETAILS FOR ATTACHING DELINEATOR TO BRACKET

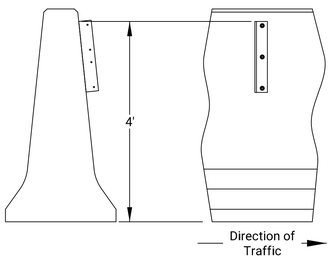


DETAILS FOR ATTACHING BRACKET TO CONCRETE SURFACE

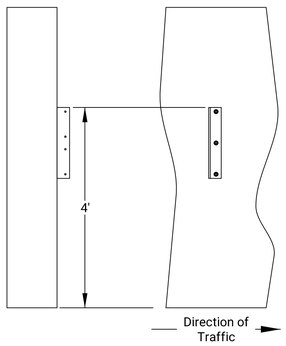
NOTES:
See flat sheet sign blank detail sheets for the aluminum delineator blank details.
The 3" X 8" delineator sign face shall be covered with Type XI white or yellow retroreflective sheeting.

The delineator brackets shall be fabricated from 3/8" thick aluminum in the size and shape shown. All burrs and sharp edges shall be smoothed off. The brackets shall not be fabricated by the use of welding.

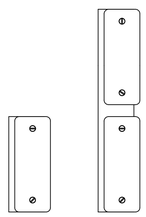
All items of the fastening accessories shall be zinc or cadmium plated.



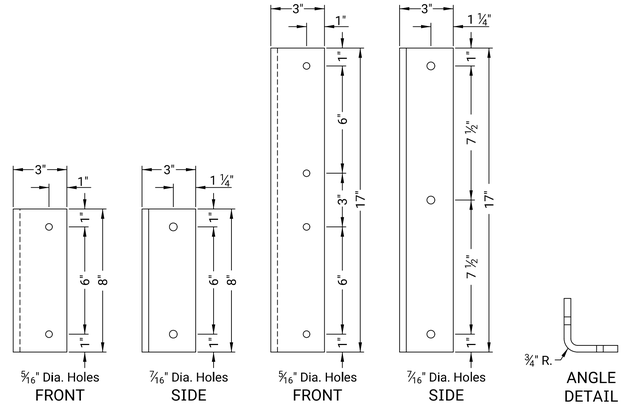
FRONT SIDE
TYPICAL MOUNTING DETAIL
BARRIER



FRONT SIDE
TYPICAL MOUNTING DETAIL
RETAINING WALL



TYPE "A" TYPE "B"
DELINEATOR POSITION
DETAILS



FRONT SIDE FRONT SIDE ANGLE
TYPE "A" TYPE "B"
DELINEATOR BRACKET DETAILS DETAIL

DETAILS FOR BARRIER AND BRIDGE RAIL GREATER THAN OR EQUAL TO 48" TALL

DELINEATION NOTE:
See the design details for positioning of delineators sheet and/or plan sheets for the delineation spacing, type, and color.

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

DELINEATOR DESIGN DETAILS CONCRETE BARRIER, BRIDGE RAIL, & RETAINING WALL

TE411 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.	

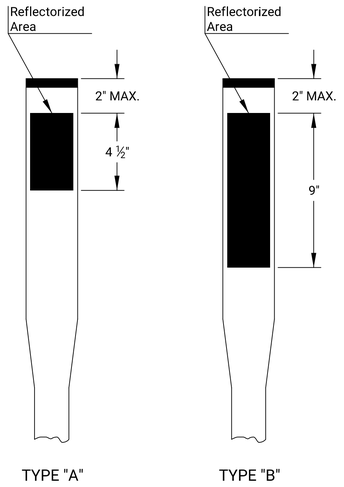
KDOT Graphics Certified 05-25-2022

Sh. No. 160

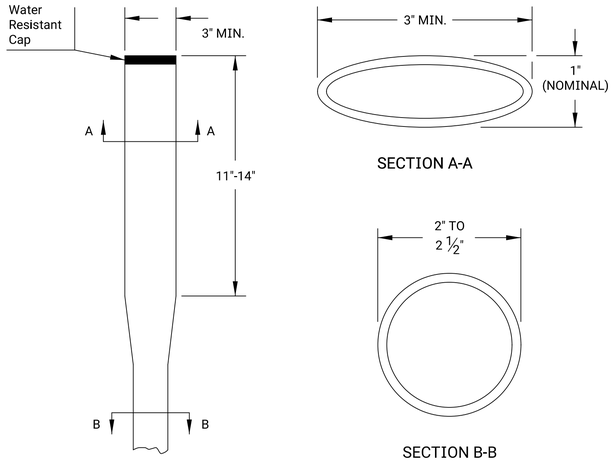
KDOT Graphics Certified

Drawn By : MDELEON Plotted :07-11-24
File : c:\pwworking\central01\d2274982\ka602001pss411-01.dgn

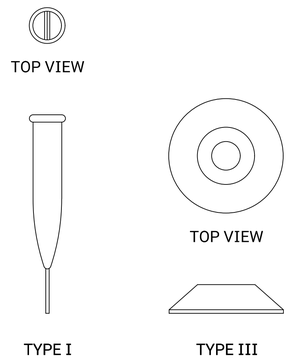
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	I6I	293



REFLECTORIZED AREA POSITIONING



FLEXIBLE DELINEATOR POST DETAILS



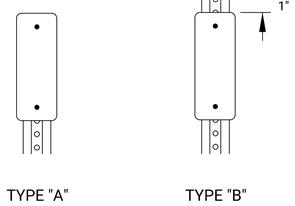
ANCHORING DEVICES

FLEXIBLE POST DELINEATOR INSTALLATION

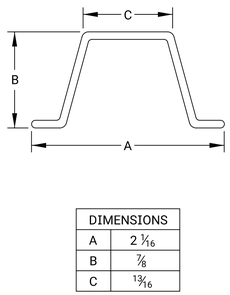
GENERAL NOTE:
See the "Design Details for Positioning of Delineators" standard and/or plan sheets for the delineator spacing, type, and color. The delineators shall be covered with Type XI High Intensity white or yellow retroreflective sheeting.

FLEXIBLE POST DELINEATORS:
The total length of the flexible delineator post shall be determined by the contractor, as per location and anchoring device. The reflectorized area for flexible delineators shall be a minimum of 3" in width.

STEEL POST DELINEATORS:
See flat sheet sign blank standard sheets for the 3" x 8" delineators details.

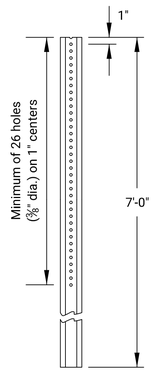


TYPICAL DELINEATOR ASSEMBLY

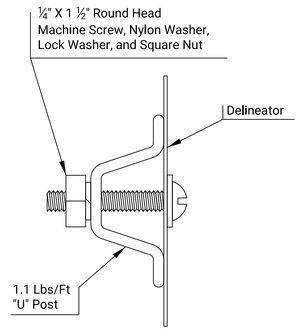


DIMENSIONS	
A	2 1⁄16
B	⅞
C	13⁄16

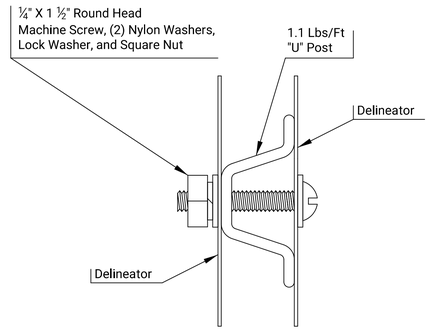
(Dimensions are nominal)



PUNCHING DETAILS



MOUNTING DETAILS (TYPICAL)



MOUNTING DETAILS (BACK TO BACK)

STEEL POST DELINEATOR INSTALLATION

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

NO.	DATE	REVISIONS	BY	APP'D
02	10-01-19	Changed drawings and notes	D.D.G.	E.W.N.
01	07-23-10	Changed Sheeting Type	D.D.G.	D.B.

KANSAS DEPARTMENT OF TRANSPORTATION

DELINEATOR DESIGN DETAILS STEEL POST MOUNT & FLEXIBLE POST MOUNT

TE412 07-01-03

FHWA APPROVAL			10-01-19	APP'D.		Steven A. Buckley	
DESIGNED	D.D.G.	DETAILED	W.S.B.	QUANTITIES		TRACED	
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN.CK.		TRACE CK.	

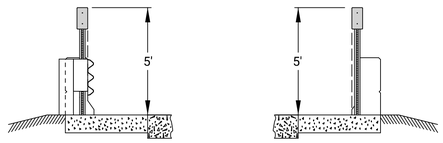
KDOT Graphics Certified 07-07-2022

Sh. No. I6I

KDOT Graphics Certified

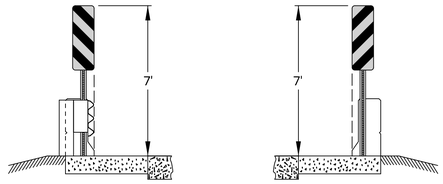
Drawn By : MDELEON Plotted 07-11-24
File : c:\pwworking\central01\d2274982\ka602001pss412-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	I62	293



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)

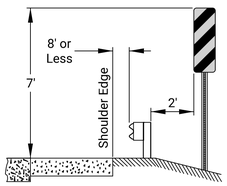
NOTE:
The longitudinal location of the object markers from the structure end shall be a maximum spacing of 42".

END OF STRUCTURE

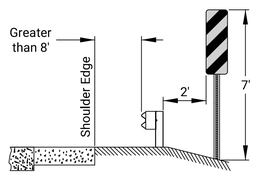
LONGITUDINAL PLACEMENT

LONGITUDINAL PLACEMENT

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

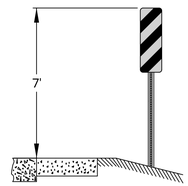


GUARDRAIL 8' OR LESS FROM SHOULDER EDGE



GUARDRAIL GREATER THAN 8' FROM SHOULDER EDGE

STRUCTURE APPROACH GUARDRAIL WITHOUT MARKERS



STRUCTURE APPROACH WITHOUT GUARDRAIL

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

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

TE415 10/01/19

FHWA APPROVAL			10/01/2019	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.	

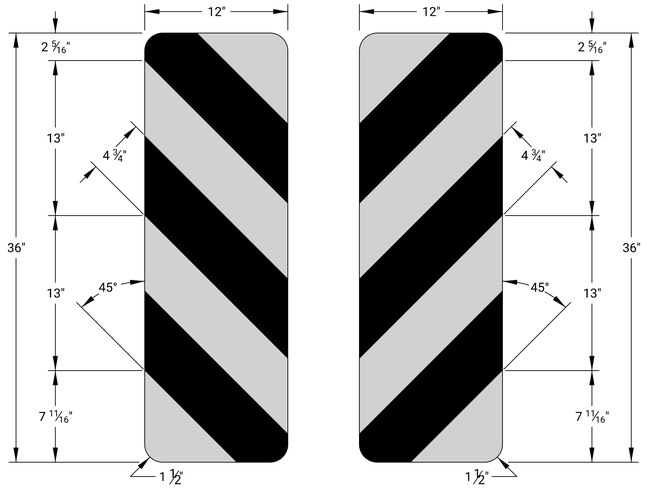
KDOT Graphics Certified 12-17-2019

Sh. No. I62

KDOT Graphics Certified

Drawn By : MDELEON Plotted 07-11-24
File : c:\pwworking\central01\d2274982\ka602001pss415-01.dgn

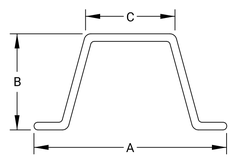
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-071 KA-6020-01	2024	163	293



OM3-L

OM3-R

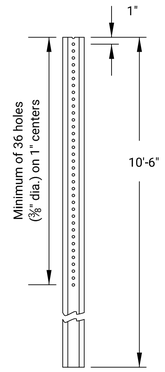
COLORS:
Yellow Background (Reflective)
Black Stripes (Non-reflective)



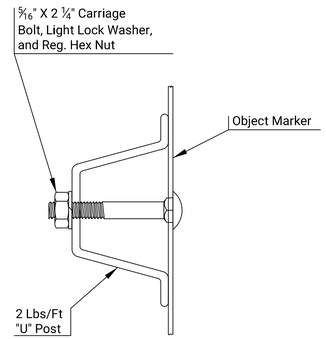
DIMENSIONS	
A	3 1/8
B	1 17/32
C	1 1/4

(Dimensions are nominal)

2 lb/ft "U" POST



PUNCHING DETAILS

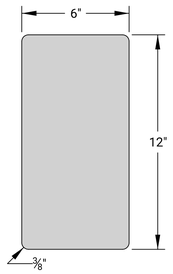


MOUNTING DETAILS

TYPE 3 OBJECT MARKER

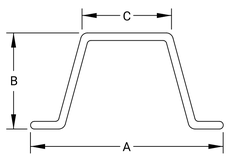
GENERAL NOTE:
See flat sheet sign blank standard sheets for the 6" x 12" and 12" x 36" sign blank details.

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



OM2

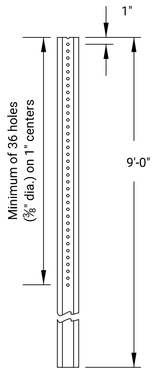
COLOR:
Yellow Background (Reflective)



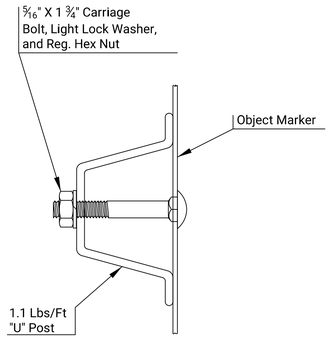
DIMENSIONS	
A	2 1/16
B	7/8
C	1 3/16

(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			10/01/2019	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.

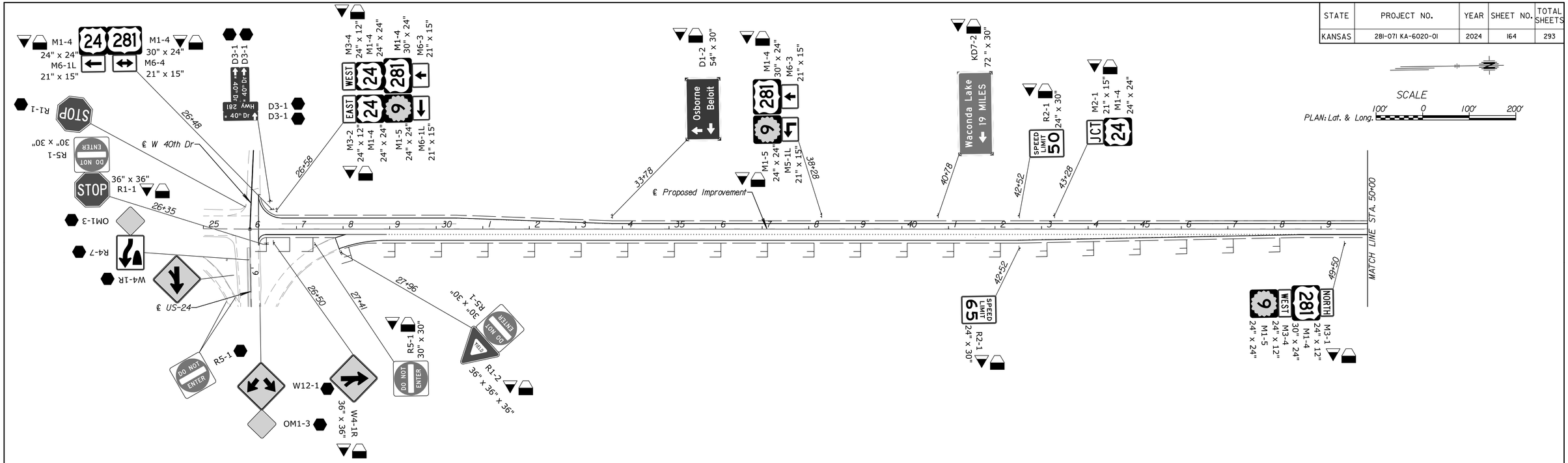
KDOT Graphics Certified 12-17-2019

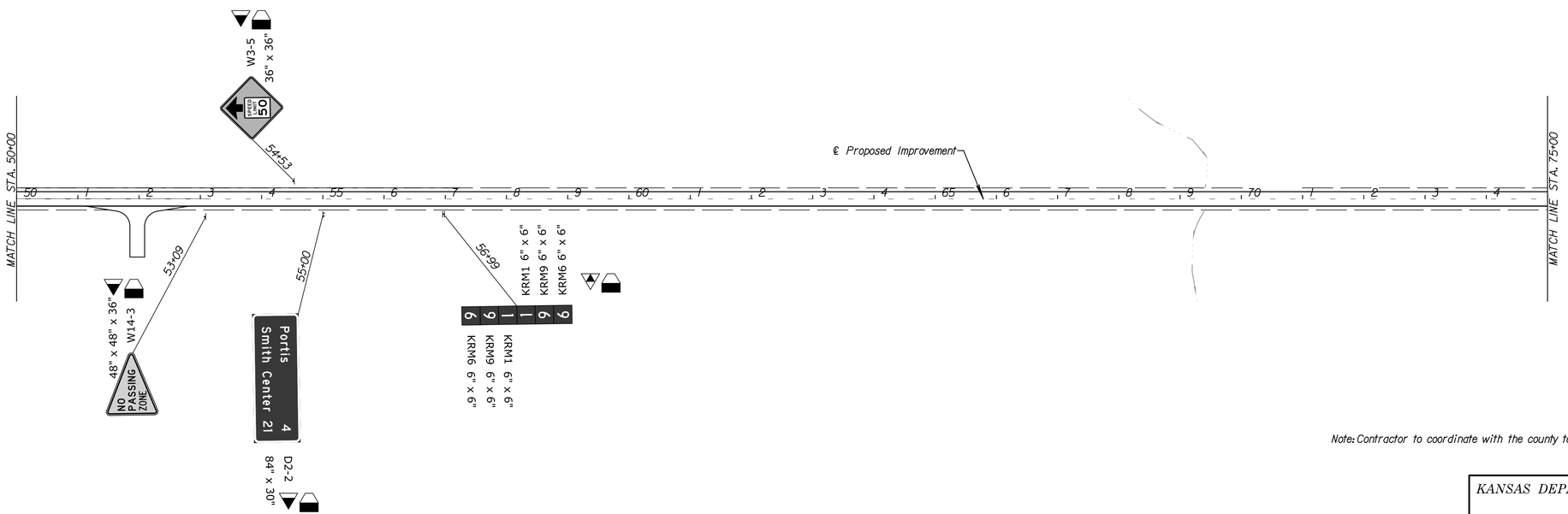
Sh. No. 163

KDOT Graphics Certified

Drawn By : MDELEON Plotted :07-11-24
File : c:\pwworking\central01\d2274982\ka602001pss416-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	164	293





Note: Contractor to coordinate with the county to remove and reset D3-1 street name signs.

KANSAS DEPARTMENT OF TRANSPORTATION
SIGNING PLAN

US-281

STA. 26+18 TO STA. 75+00

KDOT Graphics Certified 03-04-2024

Sh. No. 164

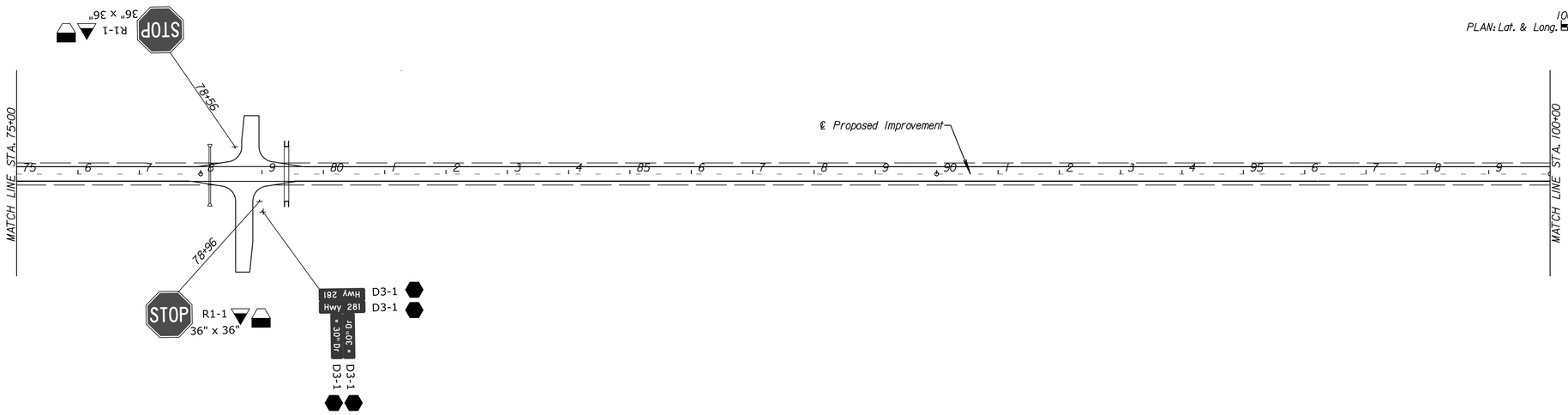
Drawn By : MDELEON Plotted : 07-11-24
File : c:\pwworking\central01\d2274982\ka602001ppl-01.dgn

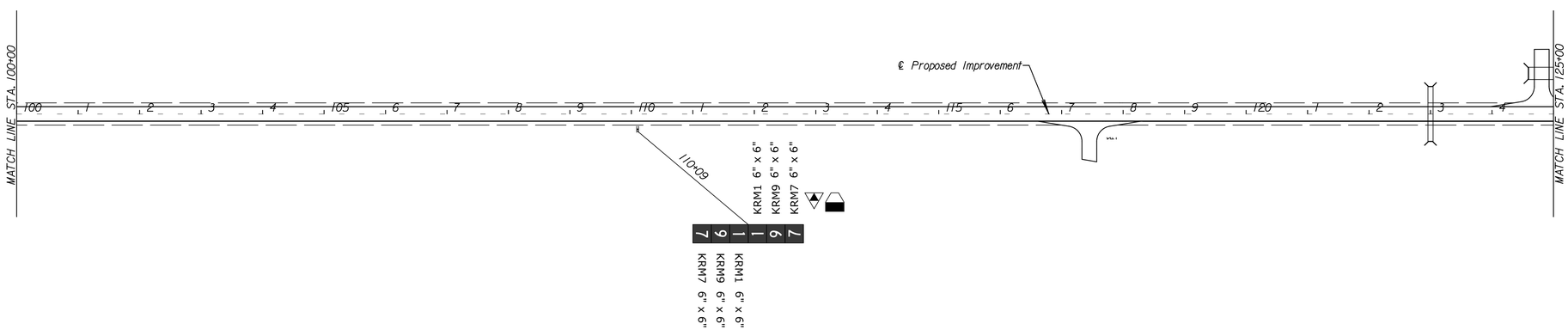
KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	165	293

SCALE

PLAN: Lat. & Long. 100' 0 100' 200'





Note: Contractor to coordinate with the county to remove and reset D3-1 street name signs.

KANSAS DEPARTMENT OF TRANSPORTATION

SIGNING PLAN

US-281

STA. 75+00 TO STA. 125+00

KDOT Graphics Certified 09-05-2023

Sh. No. 165

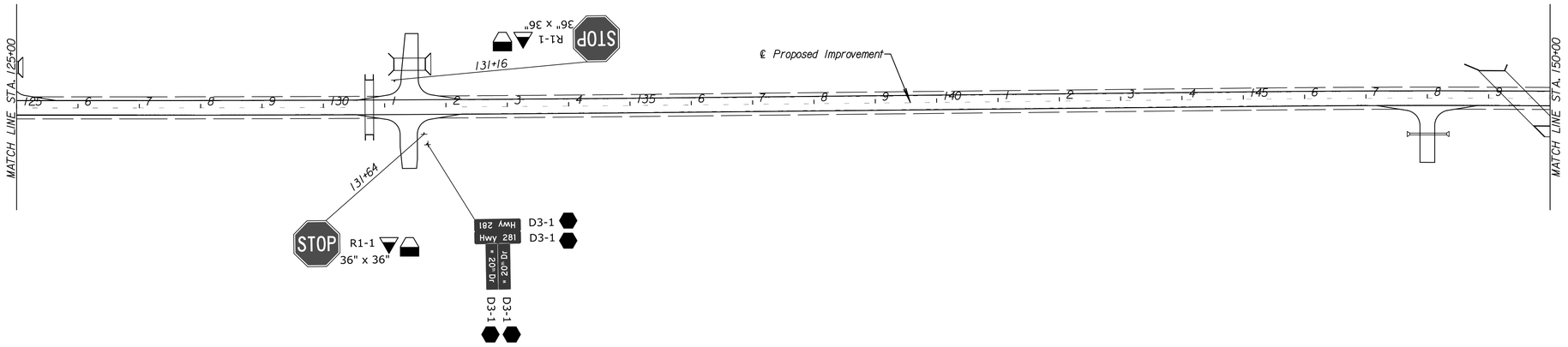
KDOT Graphics Certified

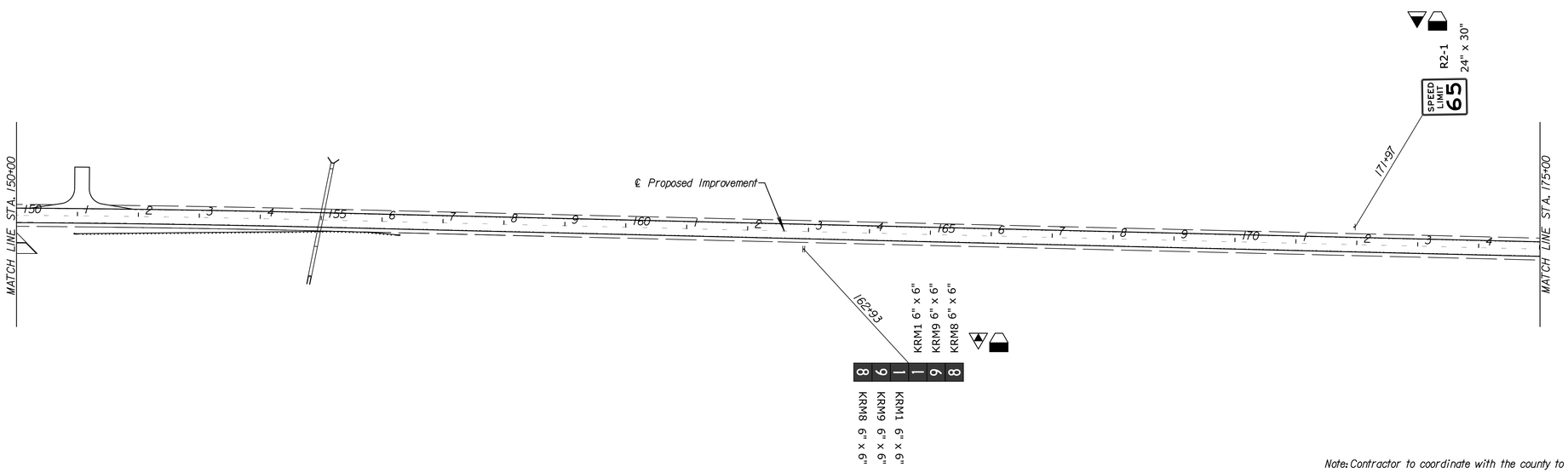
Drawn By : MDELEON Plotted : 07-11-24

File : c:\pwworking\central01\d2274982\ka602001ppl-02.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	166	293

SCALE
100' 0 100' 200'
PLAN: Lat. & Long.





Note: Contractor to coordinate with the county to remove and reset D3-1 street name signs.

KANSAS DEPARTMENT OF TRANSPORTATION
SIGNING PLAN

US-281

STA. 125+00 TO STA. 175+00

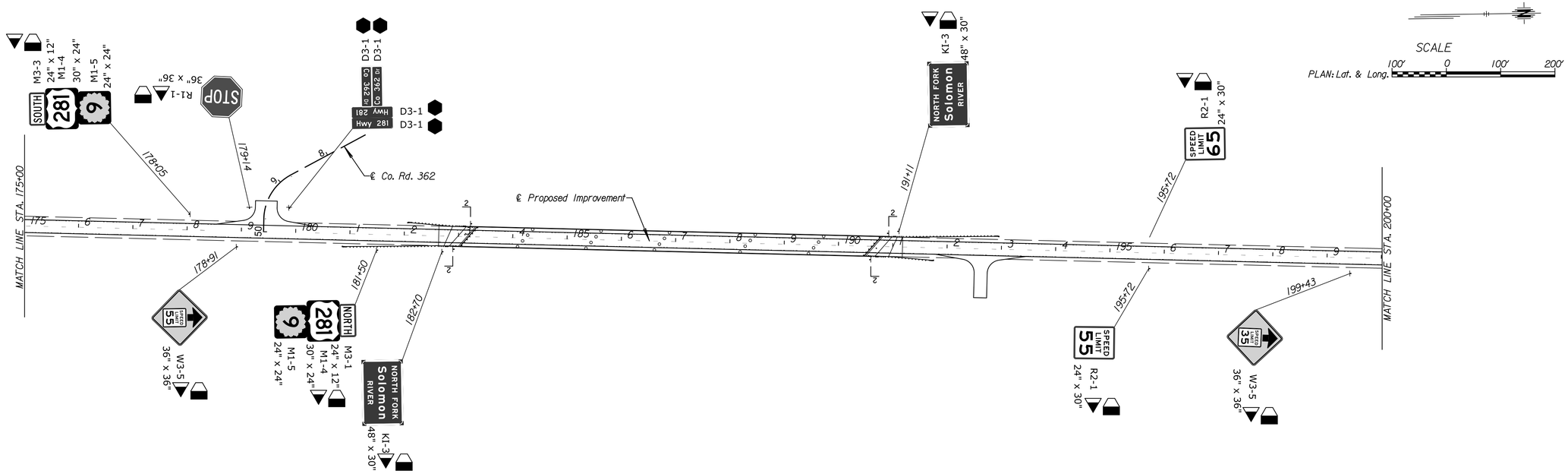
KDOT Graphics Certified 03-04-2024

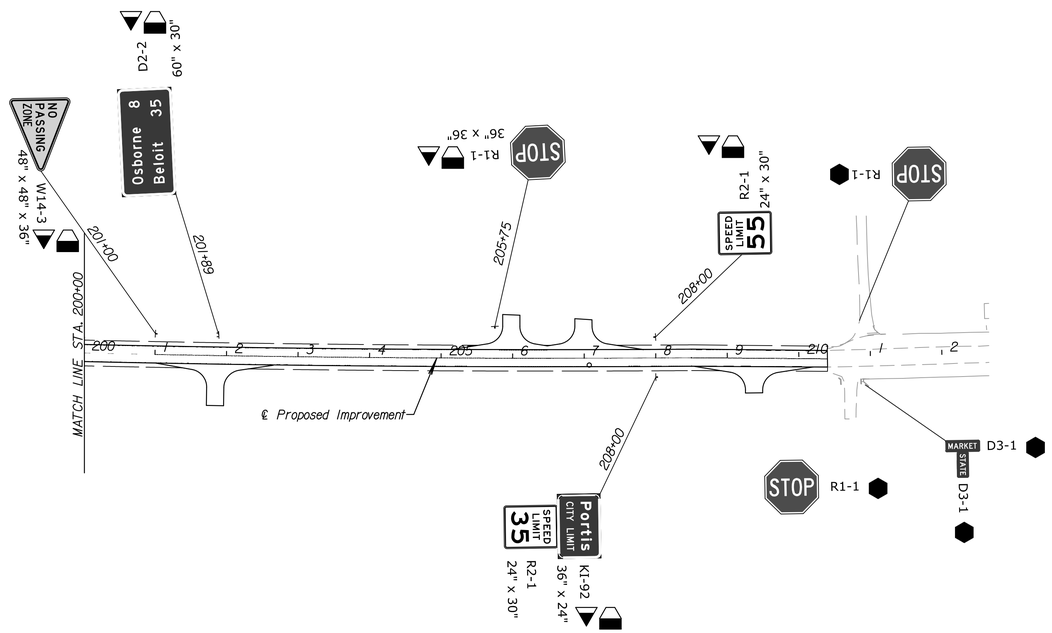
Sh. No. 166

Drawn By : MDELEON Plotted : 07-11-24
File : c:\pwworking\central01\d2274982\ka602001ppl-03.dgn

KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	167	293





Note: Contractor to coordinate with the county to remove and reset D3-1 street name signs.

KANSAS DEPARTMENT OF TRANSPORTATION
SIGNING PLAN

US-281

STA. 175+00 TO STA. 210+40

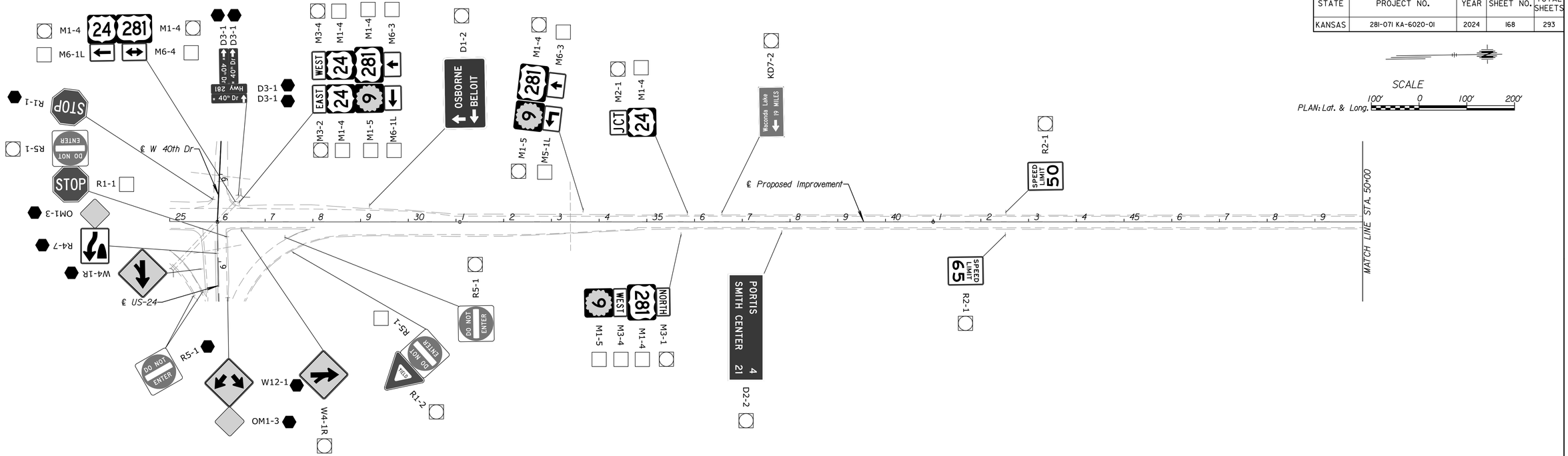
KDOT Graphics Certified 03-04-2024

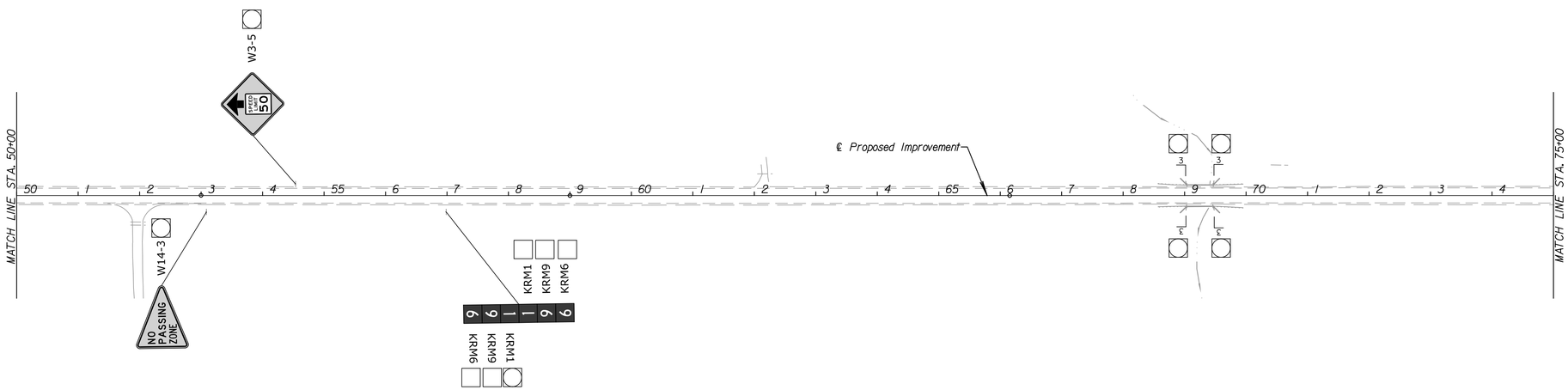
Sh. No. 167

KDOT Graphics Certified

Drawn By : MDELEON Plotted : 07-11-24
File : c:\pwworking\central01\d2274982\ka602001ppl-04.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	168	293





SCALE
PLAN: Lat. & Long.
100' 0 100' 200'

Note: Contractor to coordinate with the county to remove and reset D3-1 street name signs.

KANSAS DEPARTMENT OF TRANSPORTATION
SIGNING REMOVAL PLAN

US-281

STA. 26+18 TO STA. 75+00

KDOT Graphics Certified 03-04-2024

Sh. No. 168

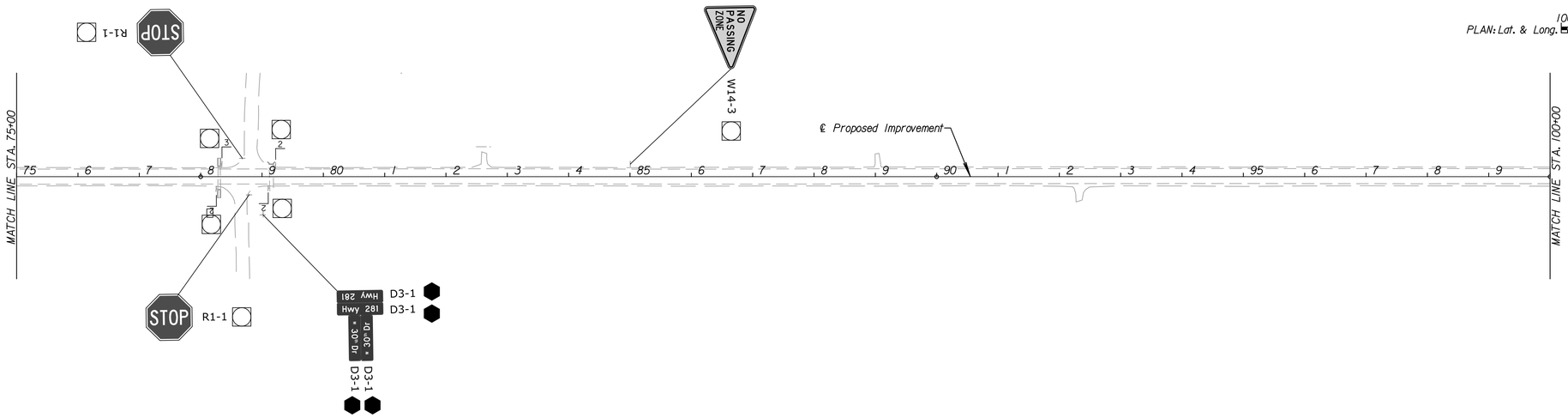
KDOT Graphics Certified

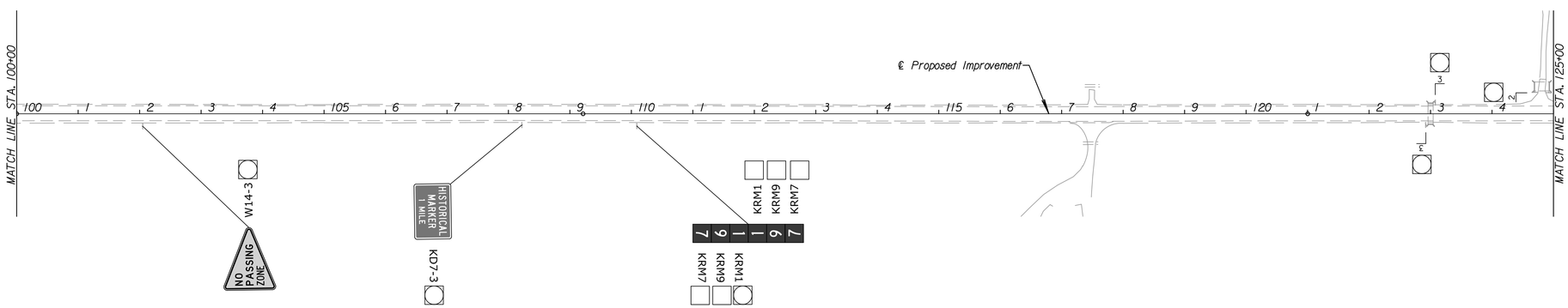
Drawn By : MDELEON
File : c:\pwworking\central01\d2274982\ka602001prm-01.dgn
Plotted : 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	169	293

SCALE

PLAN: Lat. & Long. 100' 0 100' 200'





Note: Contractor to coordinate with the county to remove and reset D3-1 street name signs.

KANSAS DEPARTMENT OF TRANSPORTATION

SIGNING REMOVAL PLAN

US-281

STA. 75+00 TO STA. 125+00

KDOT Graphics Certified 03-04-2024

Sh. No. 169

KDOT Graphics Certified

Drawn By : MDELEON Plotted : 07-11-24

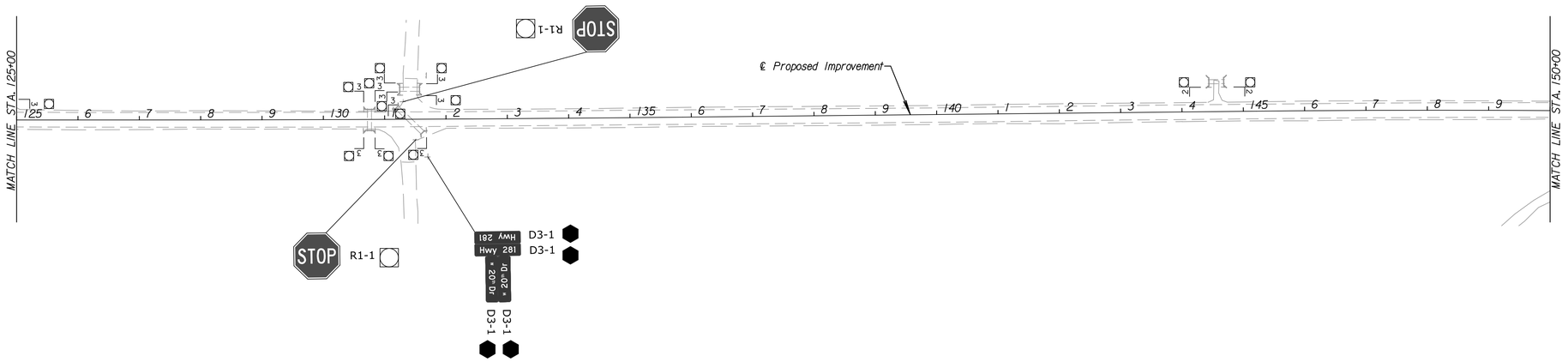
File : c:\pwworking\central01\d2274982\ka602001prm-02.dgn

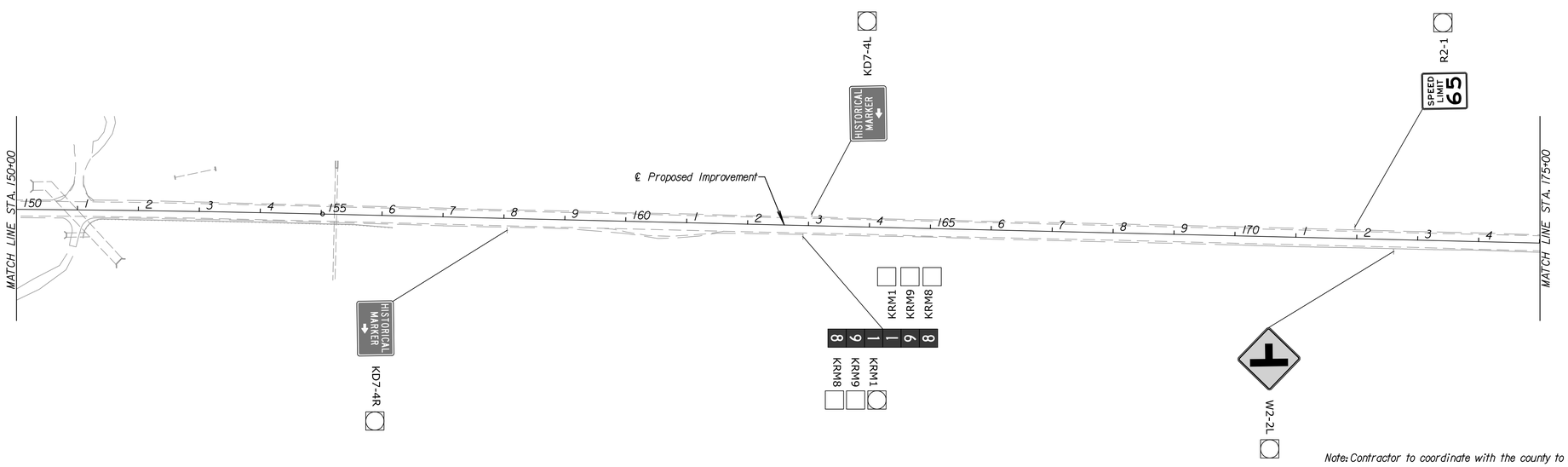
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	170	293

SCALE

100' 0 100' 200'

PLAN: Lat. & Long.





Note: Contractor to coordinate with the county to remove and reset D3-1 street name signs.

KANSAS DEPARTMENT OF TRANSPORTATION

SIGNING REMOVAL PLAN

US-281

STA. 125+00 TO STA. 175+00

KDOT Graphics Certified 03-04-2024

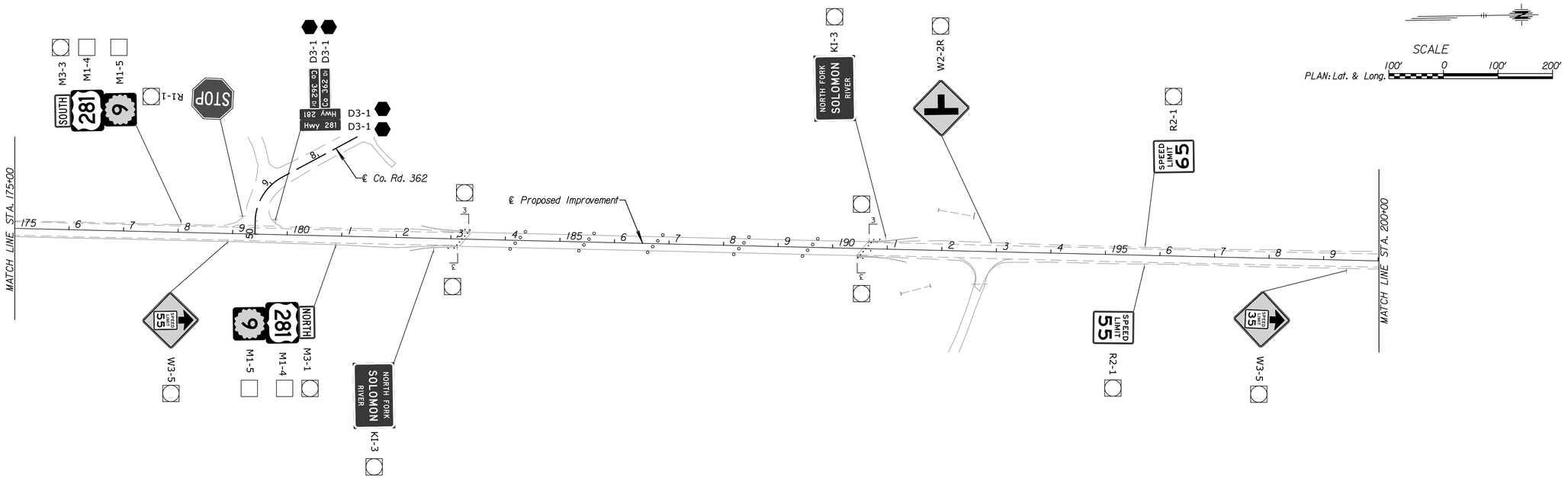
Sh. No. 170

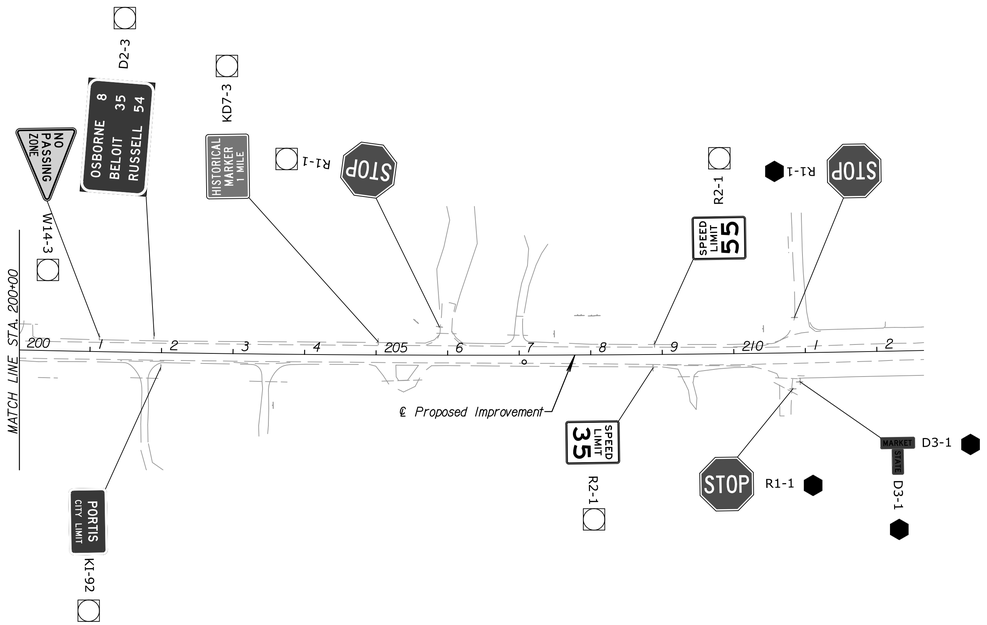
KDOT Graphics Certified

Drawn By : MDELEON Plotted : 07-11-24

File : c:\pwworking\central01\d2274982\ka602001prm-03.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	171	293





Note: Contractor to coordinate with the county to remove and reset D3-1 street name signs.

KANSAS DEPARTMENT OF TRANSPORTATION

SIGNING REMOVAL PLAN

US-281

STA. 175+00 TO STA. 210+40

KDOT Graphics Certified 03-04-2024

Sh. No. 171

Drawn By : MDELEON Plotted : 07-11-24
File : c:\pwworking\central01\d2274982\ka602001prm-04.dgn

KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-01	2024	I72	293

QUANTITIES SHEET

SIGNS, POSTS, & FOOTINGS TO BE INSTALLED ON PROJECT

PLAN SHEET NUMBER	PLAN STATION NUMBER	CENTERLINE LOCATION / INSTALL POSITION	SIGN DESIGNATION	SIGN SIZE	SIGN LAYOUT SHEET NUMBER	TYPE OF SIGN FABRICATION			4" X 6" POSTS			3I2.25 ALUMINUM BEAM	U-POSTS		GALVANIZED STEEL BEAM POSTS						PERFORATED SQUARE STEEL TUBE (PSST) POSTS										CONCRETE FOOTINGS					SIGN STRUCTURE TYPE						VERTICAL SUPPORT MOUNT	MOUNT ABOVE GUIDE SIGN DESIGNATION
									WOOD		STEEL				W6x9		W10x12		W10x22		1 3/4"			2"			2 1/4"		2 1/2"		WOOD POST	STEEL BEAM POST										
																																A36		A572 (ALT)									
						FLAT SHEET	REINFORCED PANEL	OVERLAY	FLAT SHEET SIGN	REINFORCED PANEL SIGN	STRUCTURAL TUBING		2 LB PER FT	3 LB PER FT	A36	A572 (ALT)	A36	A572 (ALT)	A36	A572 (ALT)	POST	FOOTING	BRACKET	POST	FOOTING	BRACKET	POST	FOOTING	POST	FOOTING	18" DIA.	24" DIA.	30" DIA.	24" DIA.	30" DIA.	OVERHEAD	CANTILEVER	BUTTERFLY	BRIDGE MOUNT ATTACHMENT	MAST ARM	SINGLE TAPERED TUBE		
164	26+35	R/S	R1-1	36 x 36		X			1																																
164	26+35	R/S	R5-1	30 x 30		X																																				
164	26+48	L/S	M6-1L	21 x 15		X			1																																
164	26+48	L/S	M1-4	24 x 24		X																																			
164	26+48	L/S	M6-4	21 x 15		X			1																																
164	26+48	L/S	M1-4	30 x 24		X																																			
164	26+50	R/S	W4-1R	36 x 36		X			1																																
164	26+58	L/S	M6-1L	21 x 15		X			1																																
164	26+58	L/S	M1-5	24 x 24		X																																			
164	26+58	L/S	M1-4	24 x 24		X																																			
164	26+58	L/S	M3-2	24 x 12		X																																			
164	26+58	L/S	M6-3	21 x 15		X			1																																
164	26+58	L/S	M1-4	30 x 24		X																																			
164	26+58	L/S	M1-4	24 x 24		X																																			
164	26+58	L/S	M3-4	24 x 12		X																																			
164	27+41	R/S	R5-1	30 x 30		X			1																																
164	27+96	R/S	R5-1	30 x 30		X			1																																
164	27+96	R/S	R1-2	36 x 36 x 36		X																																			
164	33+78	L/S	D1-2	54 x 30		X			2																																
164	38+28	L/S	M5-1L	21 x 15		X			1																																
164	38+28	L/S	M1-5	24 x 24		X																																			
164	38+28	L/S	M6-3	21 x 15		X			1																																
164	38+28	L/S	M1-4	30 x 24		X																																			
164	40+78	L/S	KD7-2	72 x 30		X			2																																
164	42+52	R/S	R2-1	24 x 30		X			1																																
164	42+52	L/S	R2-1	24 x 30		X			1																																
164	43+28	L/S	M1-4	24 x 24		X			1																																
164	43+28	L/S	M2-1	21 x 15		X																																			

CENTERLINE LOCATION
L or LL - Left of Centerline
R or RR - Right of Centerline
C - On the Centerline

INSTALL POSITION
S - Shoulder Mount
O - Offset Mount
G - Gore Mount
M - Median Mount
OH - Overhead Mount

NOTE: See standard plan sheet TE590 for detailed specifications.

NO.	DATE	REVISIONS	BY	APP'D
2	10/01/19	Added Tapered Tube. Removed Couplers.	D.D.G.	E.W.N.
1	7/23/10	Added Coupler and Coupler/Footing Quantity	D.D.G.	D.B.

FHWA APPROVAL				10/01/2019	APP'D	Steven A. Buckley	
DESIGNED	D.D.G.	DETAILED	K.S.	QUANTITIES		TRACED	B.B.
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.		TRACE CK.	

TE430

7/1/03

KDOT Graphics Certified 12-17-2019

KDOT Graphics Certified

Sh. No. 172

Drawn By : MDELEON
File : c:\pwworking\central01\d2274982\ka602001pss430a-01.dgn
Plotted :07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	I73	293

QUANTITIES SHEET

SIGNS, POSTS, & FOOTINGS TO BE INSTALLED ON PROJECT

PLAN SHEET NUMBER	PLAN STATION NUMBER	CENTERLINE LOCATION / INSTALL POSITION	SIGN DESIGNATION	SIGN SIZE	SIGN LAYOUT SHEET NUMBER	TYPE OF SIGN FABRICATION			4" X 6" POSTS			3I2.25 ALUMINUM BEAM	U-POSTS		GALVANIZED STEEL BEAM POSTS						PERFORATED SQUARE STEEL TUBE (PSST) POSTS										CONCRETE FOOTINGS					SIGN STRUCTURE TYPE						VERTICAL SUPPORT MOUNT	MOUNT ABOVE GUIDE SIGN DESIGNATION
									WOOD		STEEL				W6x9		W10x12		W10x22		1 3/4"			2"			2 1/4"			2 1/2"				WOOD POST	STEEL BEAM POST									
																																	A36		A572 (ALT)								
						FLAT SHEET	REINFORCED PANEL	OVERLAY	FLAT SHEET SIGN	REINFORCED PANEL SIGN	STRUCTURAL TUBING		2 LB PER FT	3 LB PER FT	A36	A572 (ALT)	A36	A572 (ALT)	A36	A572 (ALT)	POST	FOOTING	BRACKET	POST	FOOTING	BRACKET	POST	FOOTING	POST	FOOTING			18" DIA.	24" DIA.	30" DIA.	24" DIA.	30" DIA.	OVERHEAD	CANTILEVER	BUTTERFLY	BRIDGE MOUNT ATTACHMENT	MAST ARM	SINGLE TAPERED TUBE		
164	49+50	R/S	M3-1	24 x 12		X			1																																
164	49+50	R/S	M1-4	30 x 24		X																																				
164	49+50	R/S	M3-4	24 x 12		X																																				
164	49+50	R/S	M1-5	24 x 24		X																																				
164	53+09	R/S	W14-3	48 x 48 x 36		X			1																																	
164	54+53	L/S	W3-5	36 x 36		X			1																																	
164	55+00	R/S	D2-2	84 x 30		X			2																																	
164	56+99	R/S	KRM1	6 x 6		X							1																														
164	56+99	R/S	KRM9	6 x 6		X																																				
164	56+99	R/S	KRM6	6 x 6		X																																				
164	56+99	R/S	KRM1	6 x 6		X																																				
164	56+99	R/S	KRM9	6 x 6		X																																				
164	56+99	R/S	KRM6	6 x 6		X																																				
165	78+56	L/S	R1-1	36 x 36		X			1																																	
165	78+56	L/S	R1-1	36 x 36		X			1																																	
165	78+96	R/S	R1-1	36 x 36		X			1																																	
165	110+09	R/S	KRM1	6 x 6		X							1																														
165	110+09	R/S	KRM9	6 x 6		X																																				
165	110+09	R/S	KRM7	6 x 6		X																																				
165	110+09	R/S	KRM1	6 x 6		X																																				
165	110+09	R/S	KRM9	6 x 6		X																																				
165	110+09	R/S	KRM7	6 x 6		X																																				
166	131+16	L/S	R1-1	36 x 36		X			1																																	
166	131+64	R/S	R1-1	36 x 36		X			1																																	
166	162+93	R/S	KRM1	6 x 6		X							1																														
166	162+93	R/S	KRM9	6 x 6		X																																				
166	162+93	R/S	KRM8	6 x 6		X																																				
166	162+93	R/S	KRM1	6 x 6		X																																				
166	162+93	R/S	KRM9	6 x 6		X																																				
166	162+93	R/S	KRM8	6 x 6		X																																				

CENTERLINE LOCATION
L or LL - Left of Centerline
R or RR - Right of Centerline
C - On the Centerline

INSTALL POSITION
S - Shoulder Mount
O - Offset Mount
G - Gore Mount
M - Median Mount
OH - Overhead Mount

NOTE: See standard plan sheet TE590 for detailed specifications.

NO.	DATE	REVISIONS	BY	APP'D
2	10/01/19	Added Tapered Tube. Removed Couplers.	D.D.G.	E.W.N.
1	7/23/10	Added Coupler and Coupler/Footing Quantity	D.D.G.	D.B.

FHWA APPROVAL		10/01/2019	APP'D	Steven A. Buckley	
DESIGNED	D.D.G.	DETAILED	K.S.	QUANTITIES	TRACED B.B.
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.	TRACE CK.

TE430

7/1/03

KDOT Graphics Certified 12-17-2019

KDOT Graphics Certified

Sh. No. 173

Drawn By : MDELEON
File : c:\pwworking\central01\d2274982\ka602001pss430b-01.dgn
Plotted :07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	I74	293

QUANTITIES SHEET

SIGNS, POSTS, & FOOTINGS TO BE INSTALLED ON PROJECT

PLAN SHEET NUMBER	PLAN STATION NUMBER	CENTERLINE LOCATION / INSTALL POSITION	SIGN DESIGNATION	SIGN SIZE	SIGN LAYOUT SHEET NUMBER	TYPE OF SIGN FABRICATION			4" X 6" POSTS			3I2.25 ALUMINUM BEAM	U-POSTS		GALVANIZED STEEL BEAM POSTS						PERFORATED SQUARE STEEL TUBE (PSST) POSTS										CONCRETE FOOTINGS					SIGN STRUCTURE TYPE							VERTICAL SUPPORT MOUNT	MOUNT ABOVE GUIDE SIGN DESIGNATION
									WOOD		STEEL				W6x9		W10x12		W10x22		1 3/4"			2"			2 1/4"		2 1/2"		WOOD POST	STEEL BEAM POST										
															A36	A572 (ALT)	A36	A572 (ALT)	A36	A572 (ALT)	POST	FOOTING	BRACKET	POST	FOOTING	BRACKET	POST	FOOTING	POST	FOOTING		A36		A572 (ALT)									
						FLAT SHEET	REINFORCED PANEL	OVERLAY	FLAT SHEET SIGN	REINFORCED PANEL SIGN	STRUCTURAL TUBING		2 LB PER FT	3 LB PER FT																	18" DIA.	24" DIA.	30" DIA.	24" DIA.	30" DIA.	OVERHEAD	CANTILEVER	BUTTERFLY	BRIDGE MOUNT ATTACHMENT	MAST ARM	SINGLE TAPERED TUBE		
166	171+97	L/S	R2-1	24 x 30		X			1																																
167	178+05	L/S	M1-5	24 x 24		X			1																																
167	178+05	L/S	M1-4	30 x 24		X																																			
167	178+05	L/S	M3-3	24 x 12		X																																			
167	178+91	R/S	W3-5	36 x 36		X			1																																
167	179+14	L/S	R1-1	36 x 36		X			1																																
167	181+50	R/S	M1-5	24 x 24		X			1																																
167	181+50	R/S	M1-4	30 x 24		X																																			
167	181+50	R/S	M3-1	24 x 12		X																																			
167	182+70	R/S	KI-3	48 x 30		X			1																																
167	191+11	L/S	KI-3	48 x 30		X			1																																
167	195+72	L/S	R2-1	24 x 30		X			1																																
167	195+72	R/S	R2-1	24 x 30		X			1																																
167	199+43	R/S	W3-5	36 x 36		X			1																																
167	201+00	L/S	W14-3	48 x 48 x 36		X			1																																
167	201+89	L/S	D2-2	60 x 30		X			2																																
167	205+75	L/S	R1-1	36 x 36		X			1																																
167	208+00	R/S	R2-1	24 x 30		X			1																																
167	208+00	R/S	KI-92	36 x 24		X																																			
167	208+00	L/S	R2-1	24 x 30		X			1																																
167	208+54	R/S	R2-1	24 x 30		X			1																																
167	208+54	L/S	R2-1	24 x 30		X			1																																

CENTERLINE LOCATION
L or LL - Left of Centerline
R or RR - Right of Centerline
C - On the Centerline

INSTALL POSITION
S - Shoulder Mount
O - Offset Mount
G - Gore Mount
M - Median Mount
OH - Overhead Mount

NOTE: See standard plan sheet TE590 for detailed specifications.

NO.	DATE	REVISIONS	BY	APP'D
2	10/01/19	Added Tapered Tube. Removed Couplers.	D.D.G.	E.W.N.
1	7/23/10	Added Coupler and Coupler/Footing Quantity	D.D.G.	D.B.

FHWA APPROVAL		10/01/2019	APP'D	Steven A. Buckley	
DESIGNED	D.D.G.	DETAILED	K.S.	QUANTITIES	TRACED B.B.
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.	TRACE CK.

TE430

7/1/03

KDOT Graphics Certified 12-17-2019

Sh. No. 174

Drawn By : MDELEON
File : c:\pwworking\central01\d2274982\ka602001pss430c-01.dgn
Plotted :07-11-24

KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	I75	293

QUANTITIES SHEET

DELINEATORS AND OBJECT MARKERS

			RIGID DELINEATORS												FLEXIBLE DELINEATORS												OBJECT MARKERS				
			TYPE 'A'								TYPE 'B'				TYPE 'A'								TYPE 'B'				TYPE 2	TYPE 3			
			WHITE		WHITE (BACK TO BACK)		YELLOW		YELLOW (BACK TO BACK)		WHITE		YELLOW		WHITE		WHITE (BACK TO BACK)		YELLOW		YELLOW (BACK TO BACK)		WHITE		YELLOW						
BEGINNING STATION	ENDING STATION	LOCATION DESCRIPTION	'U' POST	BRACKET MOUNT	'U' POST	BRACKET MOUNT	'U' POST	BRACKET MOUNT	'U' POST	BRACKET MOUNT	'U' POST	BRACKET MOUNT	'U' POST	BRACKET MOUNT	TYPE I ANCHOR	TYPE III ANCHOR	TYPE I ANCHOR	TYPE III ANCHOR	TYPE I ANCHOR	TYPE III ANCHOR	TYPE I ANCHOR	TYPE III ANCHOR	TYPE I ANCHOR	TYPE III ANCHOR	TYPE I ANCHOR	TYPE III ANCHOR	'U' POST	'U' POST	'U' POST	'U' POST	'U' POST
26+18	27+18	NB US-281	3																												
28+12	48+12	NB US-281									21																				
182+90	183+24	NB US-281																									2				
190+60	190+92	SB US-281																									2				

NO.	DATE	REVISIONS	BY	APP'D
1	10/01/19	Added delineator & object marker types	D.D.G.	E.W.N.

KANSAS DEPARTMENT OF TRANSPORTATION

QUANTITIES SHEET
DELINEATORS & OBJECT MARKERS

TE436 7/1/03

FHWA APPROVAL			10/01/2019	APP'D	Steven A. Buckley		
DESIGNED	D.D.G.	DETAILED	K.D.S.	QUANTITIES		TRACED	
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.		TRACE CK.	

KDOT Graphics Certified 12-17-2019

Sh. No. 175

KDOT Graphics Certified

Drawn By : MDELEON Plotted :07-11-24
File : c:\pwworking\central01\d2274982\ka602001pss436-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-01	2024	I76	293

SUMMARY OF QUANTITIES

SIGNS

TYPE	NUMBER	SQUARE FEET
FLAT SHEET	77	331.03
REINFORCED PANEL		
OVERLAY		

DELINEATORS

TYPE	FLEXIBLE DELINEATOR		RIGID DELINEATOR	
	TYPE I ANCHOR	TYPE III ANCHOR	"U" POST	BRACKET MOUNT
TYPE 'A' WHITE			3	
TYPE 'A' YELLOW				
TYPE 'B' WHITE			21	
TYPE 'B' YELLOW				
TYPE 'A' WHITE (BACK TO BACK)				
TYPE 'A' YELLOW (BACK TO BACK)				

OBJECT MARKERS

TYPE			NUMBER
TYPE 2 ("U" POST)			4
TYPE 3 ("U" POST)			
INFORMATION ONLY	OM3-L		
	OM3-R		
	OM3-C		
TYPE 3 ("U" POST) (BACK TO BACK)			

POSTS AND ALUMINUM BEAMS

	4" x 6" POST				"U" POST		GALVANIZED STEEL BEAM POST						PERFORATED SQUARE STEEL TUBE (PSST)			
	WOOD		STEEL				W6x9		W10x12		W10x22					
	FLAT SHEET SIGN	REINFORCED PANEL SIGN	STRUCTURAL TUBING	3I2.25 ALUMINUM BEAM	2 LBS/FT	3 LBS/FT	A36 STEEL	A572 STEEL (ALT)	A36 STEEL	A572 STEEL (ALT)	A36 STEEL	A572 STEEL (ALT)	1-3/4"	2"	2-1/4"	2-1/2"
NUMBER	42				3											
FEET	626.00				23.25											

POST FOOTINGS AND BRACKETS

	CONCRETE FOOTING (DIA.)					PERFORATED SQUARE STEEL					
						TUBE FOOTING				BRACKET	
	WOOD	A36 STEEL		A572 STEEL (ALT)							
	18"	24"	30"	24"	30"	1-3/4"	2"	2-1/4"	2-1/2"	1-3/4"	2"
NUMBER											
FEET											

BASE PLATES AND STUB POSTS

	W6x9		W10x12		W10x22	
BREAKAWAY BASES	A36 STEEL	A572 STEEL (ALT)	A36 STEEL	A572 STEEL (ALT)	A36 STEEL	A572 STEEL (ALT)
BASE PLATE (TOP)						
STUB POST WITH BASE PLATE						
NON-BREAKAWAY BASES						
BASE PLATE						

REMOVALS

TYPE	NUMBER
SIGNS	113
POSTS	89
FOOTINGS	
SIGN STRUCTURES	

NUMBER & LENGTHS OF POSTS & ALUMINUM BEAMS (INFORMATION ONLY)

LENGTH OF POST OR BEAM	4" x 6" POST			3I2.25 ALUMINUM BEAM	"U" POST		GALVANIZED STEEL BEAM POST						PERFORATED SQUARE STEEL TUBE (PSST)			
	WOOD		STEEL				W6x9		W10x12		W10x22					
	FLAT SHEET SIGN	REINFORCED PANEL SIGN	STRUCTURAL TUBING		2 LBS/FT	3 LBS/FT	A36 STEEL	A572 STEEL (ALT)	A36 STEEL	A572 STEEL (ALT)	A36 STEEL	A572 STEEL (ALT)	1-3/4"	2"	2-1/4"	2-1/2"
2.1' - 4'																
4.1' - 6'																
6.1' - 8'					3											
8.1' - 10'																
10.1' - 12'																
12.1' - 14'	2															
14.1' - 16'	34															
16.1' - 18'	4															
18.1' - 20'	2															
20.1' - 22'																
22.1' - 24'																
24.1' - 26'																
26.1' - 28'																
28.1' - 30'																
30.1' - 32'																

SIGN STRUCTURES

TYPE	NEW	MODIFIED	REMOVE AND RESET	RESET
OVERHEAD STRUCTURE				
CANTILEVER STRUCTURE				
BUTTERFLY STRUCTURE				
BRIDGE MOUNT ATTACHMENT				
MAST ARM SIGN SUPPORT				
SINGLE TAPERED TUBE SIGN SUPPORT				

NO.	DATE	REVISIONS	BY	APP'D
2	10/01/19	Revised Tables	D.D.G.	E.W.N.
1	7/23/10	Revised Tables	D.D.G.	D.B.

KANSAS DEPARTMENT OF TRANSPORTATION

SUMMARY OF QUANTITIES
FOR
INSTALLATIONS AND REMOVALS

TE439 7/1/03

FHWA APPROVAL		10/01/2019	APP'D	Steven A. Buckley	
DESIGNED	D.D.G.	DETAILED	K.D.S.	QUANTITIES	TRACED
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.	TRACE CK.

KDOT Graphics Certified 12-17-2019

Sh. No. 176

KDOT Graphics Certified

Drawn By : MDELEON Plotted :07-11-24
File : c:\pwworking\central01\d2274982\ka602001pss439-01.dgn

RECAPITULATION OF SIGNING & DELINEATION BID ITEMS

BID ITEMS	APPROXIMATE QUANTITIES		UNITS
SIGN (FLAT SHEET) (HIGH PERFORMANCE)	331.03		SQUARE FOOT
SIGN (REINFORCED PANEL) (HIGH PERFORMANCE)			SQUARE FOOT
SIGN (OVERLAY) (HIGH PERFORMANCE)			SQUARE FOOT
SIGN POST (4" x 6" WOOD) (FLAT SHEET SIGN)	626		LINEAR FOOT
SIGN POST (4" x 6" WOOD) (REINFORCED PANEL SIGN)			LINEAR FOOT
SIGN POST (2 LB/FT "U" STEEL)	23		LINEAR FOOT
SIGN POST (3 LB/FT "U" STEEL)			LINEAR FOOT
SIGN POST (1-3/4" PERFORATED SQUARE STEEL TUBE)			LINEAR FOOT
SIGN POST (2" PERFORATED SQUARE STEEL TUBE)			LINEAR FOOT
SIGN POST (2-1/4" PERFORATED SQUARE STEEL TUBE)			LINEAR FOOT
SIGN POST (2-1/2" PERFORATED SQUARE STEEL TUBE)			LINEAR FOOT
SIGN POST (4" X 6" STRUCTURAL STEEL)			LINEAR FOOT
SIGN POST (3 I 2.25 ALUMINUM)			LINEAR FOOT
	A36	A572(ALT)	
SIGN POST (W6X9 STEEL BEAM)			LINEAR FOOT
SIGN POST (W10X12 STEEL BEAM)			LINEAR FOOT
SIGN POST (W10X22 STEEL BEAM)			LINEAR FOOT
SIGN POST STUB WITH BREAKAWAY BASE PLATE (W6X9)			EACH
SIGN POST STUB WITH BREAKAWAY BASE PLATE (W10X12)			EACH
SIGN POST STUB WITH BREAKAWAY BASE PLATE (W10X22)			EACH
SIGN POST BREAKAWAY BASE PLATE (W6X9)			EACH
SIGN POST BREAKAWAY BASE PLATE (W10X12)			EACH
SIGN POST BREAKAWAY BASE PLATE (W10X22)			EACH
SIGN POST FOOTING (24" Dia. CONCRETE)(STEEL BEAM POST)			LINEAR FOOT
SIGN POST FOOTING (30" Dia. CONCRETE)(STEEL BEAM POST)			LINEAR FOOT
SIGN POST FOOTING (18" Dia. CONCRETE)(WOOD POST)			LINEAR FOOT
SIGN POST FOOTING (1-3/4" PERFORATED SQUARE STEEL TUBE)			EACH
SIGN POST FOOTING (2" PERFORATED SQUARE STEEL TUBE)			EACH
SIGN POST FOOTING (2-1/4" PERFORATED SQUARE STEEL TUBE)			EACH
SIGN POST FOOTING (2-1/2" PERFORATED SQUARE STEEL TUBE)			EACH
SIGNING OBJECT MARKER (TYPE 2)	4		EACH
SIGNING OBJECT MARKER (TYPE 3)			EACH
SIGNING DELINEATOR (TYPE A)(WHITE RIGID, "U" POST)	3		EACH
SIGNING DELINEATOR (TYPE A)(YELLOW RIGID, "U" POST)			EACH
SIGNING DELINEATOR (TYPE B)(WHITE RIGID, "U" POST)	21		EACH
SIGNING DELINEATOR (TYPE B)(YELLOW RIGID, "U" POST)			EACH
SIGNING DELINEATOR (TYPE A)(WHITE FLEXIBLE)(TYPE I ANCHOR)			EACH
SIGNING DELINEATOR (TYPE A)(YELLOW FLEXIBLE)(TYPE I ANCHOR)			EACH
SIGNING DELINEATOR (TYPE B)(WHITE FLEXIBLE)(TYPE I ANCHOR)			EACH
SIGNING DELINEATOR (TYPE B)(YELLOW FLEXIBLE)(TYPE I ANCHOR)			EACH
SIGNING DELINEATOR (TYPE A)(WHITE FLEXIBLE)(TYPE 3 ANCHOR)			EACH
SIGNING DELINEATOR (TYPE A)(YELLOW FLEXIBLE)(TYPE 3 ANCHOR)			EACH
SIGNING DELINEATOR (TYPE B)(WHITE FLEXIBLE)(TYPE 3 ANCHOR)			EACH
SIGNING DELINEATOR (TYPE B)(YELLOW FLEXIBLE)(TYPE 3 ANCHOR)			EACH

BID ITEMS	APPROXIMATE QUANTITIES	UNITS

Note:
The contract bid for steel beam posts, stub posts, base plates, and footings will be based on A36 Grade steel quantities. When furnishing the A572 Grade alternate steel, the payment will be based on the equivalent A36 steel unit prices in the contract.

NO.	DATE	REVISIONS	BY	APP'D
2	10/01/19	Removed PSST coupler and changed the tables	D.D.G.	E.W.N.
1	7/23/10	Changed Bid Items as per Spec Book (2007)	D.D.G.	D.B.

KANSAS DEPARTMENT OF TRANSPORTATION
RECAPITULATION OF
SIGNING & DELINEATION
BID ITEMS

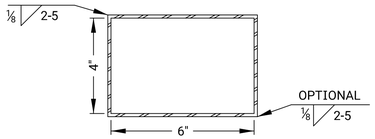
TE450 7/1/03

FHWA APPROVAL 10/01/2019 APP'D Steven A. Buckley
DESIGNED D.D.G. DETAILED K.D.S. QUANTITIES TRACED
DESIGN CK. S.A.B. DETAIL CK. D.D.G. QUAN. CK. TRACE CK.

KDOT Graphics Certified

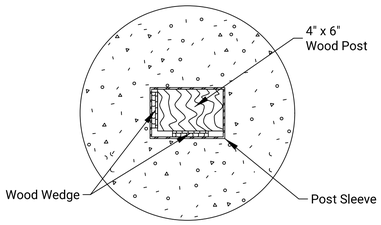
Drawn By : MDELEON
Plotted :07-11-24
File : c:\pwworking\central01\d2274982\ka602001pss450-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	I78	293

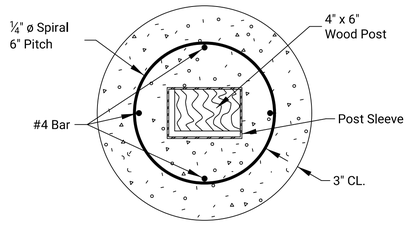


NOTE: Dimensions are to inside of post sleeve.

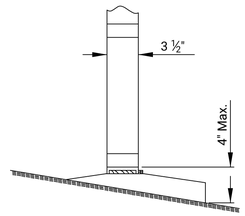
POST SLEEVE



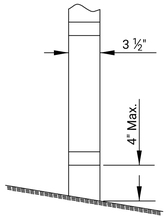
SECTION A-A



SECTION B-B



FRONT ELEVATION
CONCRETE FOOTING



FRONT ELEVATION
SOIL

NOTE TO THE ENGINEER:
The intent of the "AASHTO Roadside Design Guide" and these plans is to have a 4" or less projection above the finished ground line after impact.

BREAKAWAY CLEARANCE

GENERAL NOTES

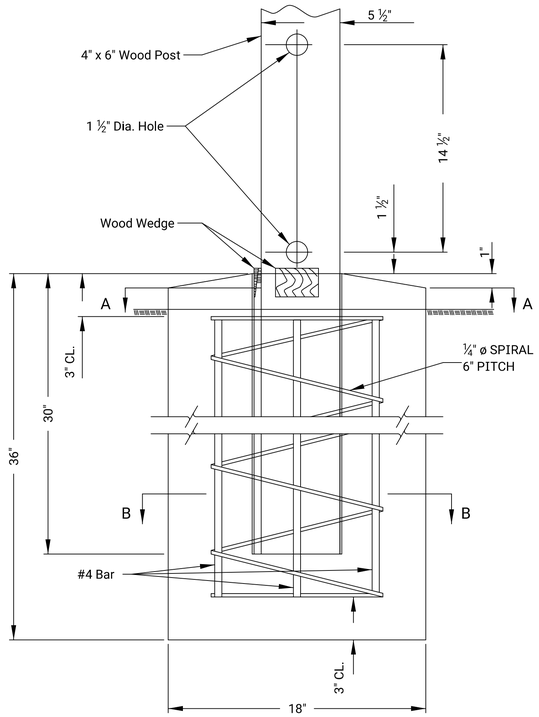
The post sleeve shall be formed from 10 gauge sheet steel to meet the requirements of ASTM A653 and zinc coated to meet the requirements of coating designation A123. If galvanized sheet steel is used, no other galvanization is required. It is permissible to close the bottom of the sleeve with a metal plate. Basis of acceptance shall be visual inspection of the finished sleeve and determination of zinc thickness by magnetic gage.

All sign mounting holes in the wood posts shall be drilled prior to treating.

Breakaway holes, field drilled sign mounting holes, and field cuts shall be treated in accordance with the preservative treatment specifications.

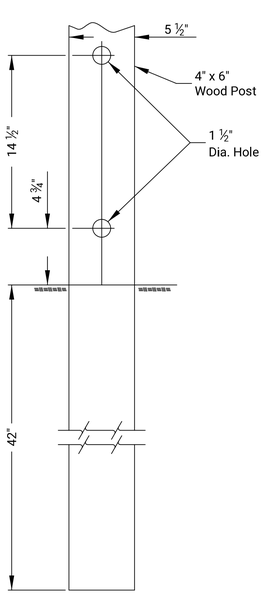
Prior to sealing the opening between the wood post and the top of the concrete footing, secure the post by placing 3" wide by 2" long wood wedges into the opening on two adjacent sides of the post. The wedges are be flush with up to a maximum of ⅜" sticking up above the top of the footing.

Commercial grade concrete may be substituted for sign support footings.



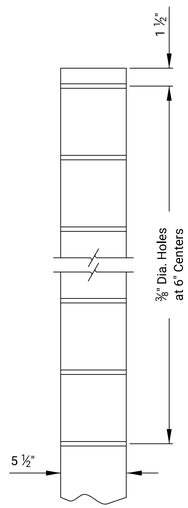
SIDE ELEVATION

WOOD POST IN CONCRETE FOOTING



SIDE ELEVATION

WOOD POST IN SOIL



SIGN POST

SIGN MOUNTING HOLES

All dimensions in inches unless otherwise noted.

NO.	DATE	REVISIONS	BY	APP'D
1	10/01/19	Change details and note	D.D.G.	E.W.N.

KANSAS DEPARTMENT OF TRANSPORTATION

DETAILS FOR WOOD POSTS

TE460 7/1/03

FHWA APPROVAL				10/01/2019	APP'D	Steven A. Buckley	
DESIGNED	D.D.G.	DETAILED	A.A.D.		QUANTITIES		TRACED
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.		QUAN. CK.		TRACE CK.

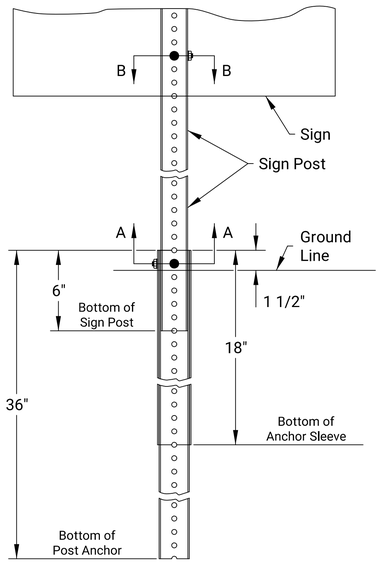
KDOT Graphics Certified 12-17-2019

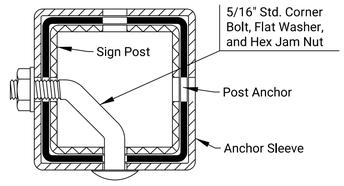
Sh. No. 178

KDOT Graphics Certified

Drawn By : MDELEON Plotted :07-11-24
File : c:\pwworking\central01\d2274982\ka602001pss460-01.dgn

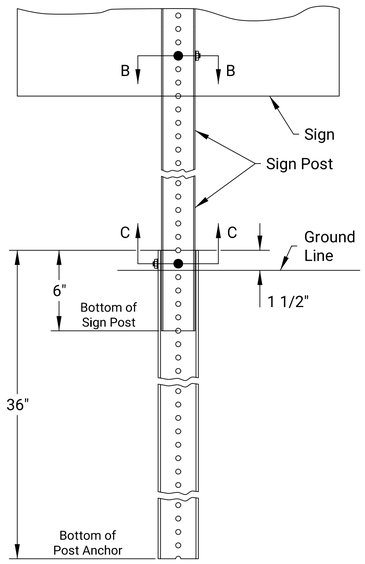
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	I79	293

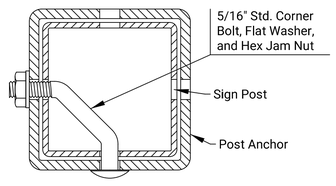




SECTION A-A

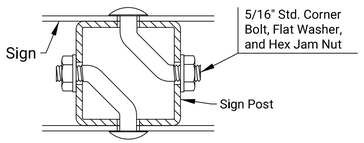
1 ¾", 2", OR 2 ¼" PSST SIGN POST





SECTION C-C

2 ½" PSST SIGN POST



SECTION B-B

MATERIALS TABLE FOR SIGN POST AND FOOTING		
SIGN POST 12 GA. OR 14 GA.	FOOTING	
	POST ANCHOR	ANCHOR SLEEVE
1 ¾" X 1 ¾"	2" X 2" X 12 GA.	2 ¼" X 2 ¼" X 12 GA.
2" X 2"	2 ¼" X 2 ¼" X 12 GA.	2 ½" X 2 ½" X 12 GA.
2 ¼" X 2 ¼"	2 ½" X 2 ½" X 12 GA.	3" X 3" X 7 GA.
2 ½" X 2 ½"	3" X 3" X 7 GA.	Not Required

NOTE: 14 ga. posts must meet a certified minimum yield strength of 60,000 p.s.i.

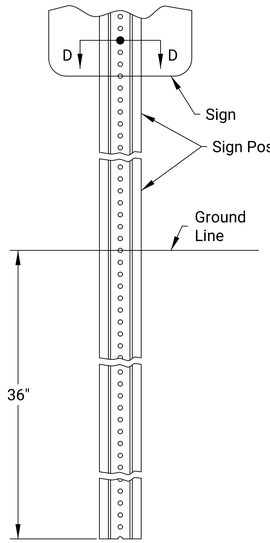
INSTALLATION PROCEDURES

1. Plumb and drive post anchor into the ground 18", if anchor sleeve is required, or to the specified height above the ground line.

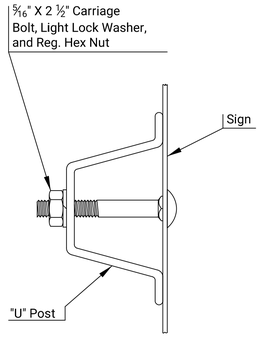
2. Install anchor sleeve (if required) on the post anchor and align the first holes above the ground line. Plumb and drive post anchor with anchor sleeve into the ground to the specified height above the ground line.

3. Install sign post into the post anchor.

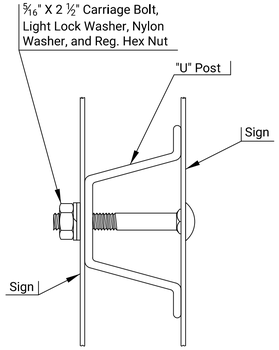
PERFORATED SQUARE STEEL TUBE POST (PSST)



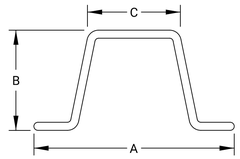
TYPICAL



SECTION D-D
(TYPICAL)



SECTION D-D
(BACK TO BACK)



DIM.	2 LBS/FT	3 LBS/FT
A	3 1/8 "	3 1/2 "
B	1 17/32 "	1 3/4 "
C	1 1/4 "	1 5/8 "

(Dimensions are nominal)

"U" POST

STEEL "U" POST

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

DETAILS FOR PERFORATED SQUARE STEEL TUBE POSTS (PSST) AND STEEL "U" POSTS

TE466 10/01/19

FHWA APPROVAL			10/01/2019	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.	

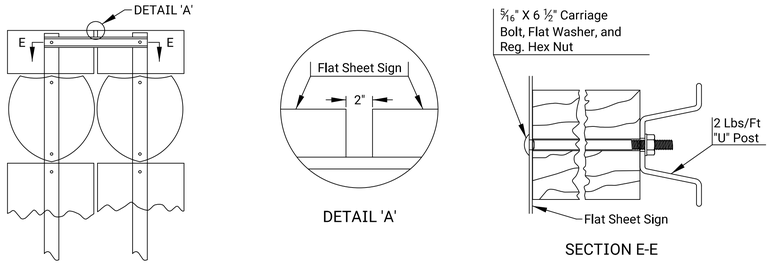
KDOT Graphics Certified 12-17-2019

Sh. No. 179

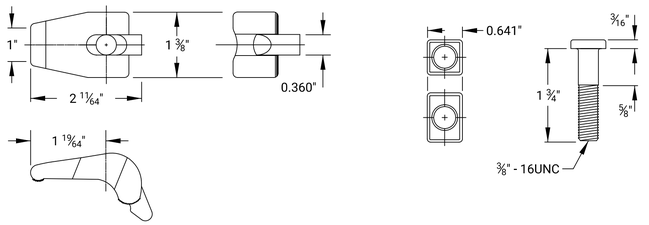
KDOT Graphics Certified

Drawn By : MDELEON Plotted :07-11-24
File : c:\pwworking\central01\d2274982\ka6020001pss466-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	I80	293



ROUTE MARKER ASSEMBLIES ATTACHMENT



ALUMINUM POST CLIP AND POST CLIP BOLT

NOTES:

The top of the post shall not extend above the top of the sign.

When signs are mounted back to back, the signs shall be mounted at their prescribed height. In general installations, the bottom holes of the signs should be aligned. In order to prevent having to drill holes in the signs or posts, the sign on the back should be raised and positioned such that the holes are aligned. When a sign is mounted on the back of the R1-1 (Stop) sign, that sign is to be centered vertically on the R1-1 sign. When a sign is mounted on the back of the R1-2 (Yield) sign, the top holes of the signs should be aligned.

The primary sign and supplemental sign are to be mounted at their prescribed height, but under no circumstances shall the signs overlap each other. If the primary sign cannot be mounted without overlapping, then it shall be raised above the supplemental sign.

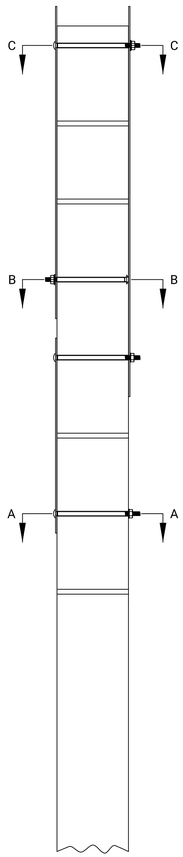
Any additional mounting holes, either through the sign or post, shall be drilled by the contractor. All holes drilled in the post shall be treated with a perservative. All holes drilled in the sign shall be free of any defects and the sheeting around the hole shall not be damaged.

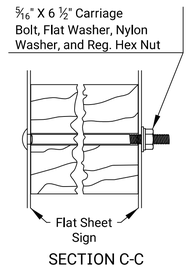
A nylon washer shall be placed against the sheeting when a nut is to be tightened against the sign face.

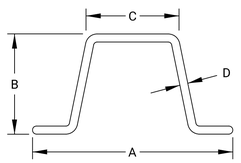
The 3 lb/ft steel "U" post used for reinforced panel sign installations is to be included in the bid item 'SIGN POST (4" x 6" WOOD) (REINFORCED PANEL SIGN)'.

When the 2 lb/ft steel "U" post is used for the route marker assemblies attachment, it shall be subsidiary to the bid item 'SIGN POST (4" x 6" WOOD) (FLAT SHEET SIGN)'.

The aluminum post clip bolt may have a rectangular head if the smaller dimension is equal to the square head dimension.



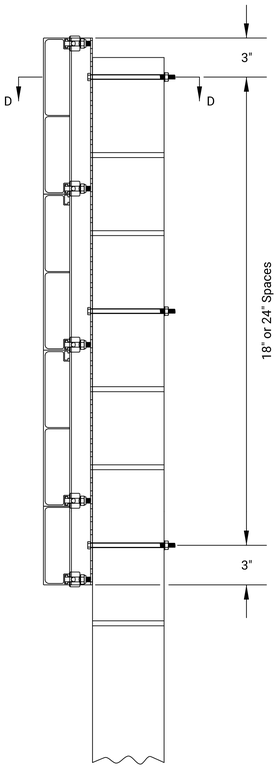


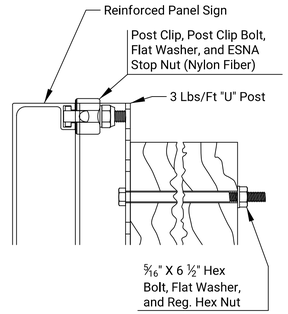


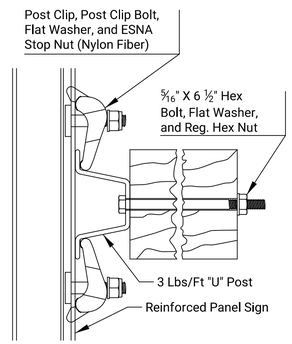
DIM.	2 LBS/FT	3 LBS/FT
A	3 1/8 "	3 1/2 "
B	1 17/32 "	1 3/4 "
C	1 1/4 "	1 5/8 "
D	1/8 "	9/64 "

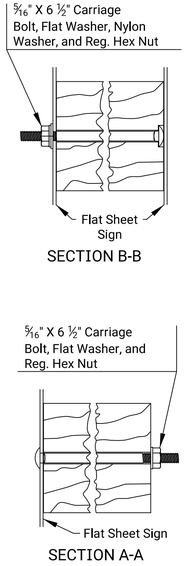
(DIMENSIONS ARE NOMINAL)

"U" POST









TYPICAL MOUNTING OF FLAT SHEET SIGNS

TYPICAL MOUNTING OF REINFORCED PANEL SIGNS

All dimensions are in inches

NO.	DATE	REVISIONS	BY	APP'D
1	10/01/19	Revised drawings and notes	D.D.G.	E.W.N.

KANSAS DEPARTMENT OF TRANSPORTATION

DETAILS FOR MOUNTING SIGNS ON WOOD POSTS

FLAT SHEET AND REINFORCED PANEL

TE481 7/1/03

FHWA APPROVAL			10/01/2019	APP'D	Steven A. Buckley		
DESIGNED	D.D.G.	DETAILED	A.A.D.	QUANTITIES		TRACED	
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.		TRACE CK.	

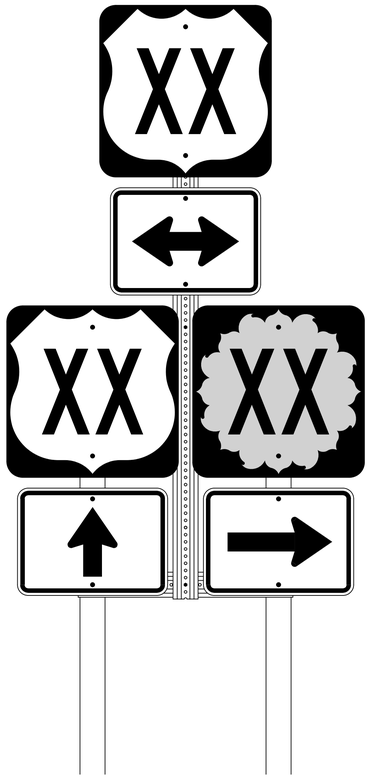
KDOT Graphics Certified 12-17-2019

Sh. No. 180

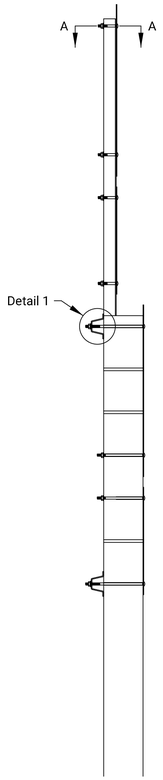
KDOT Graphics Certified

Drawn By : MDELEON Plotted :07-11-24
File : c:\pwworking\central01\d2274982\ka6020001pss481-01.dgn

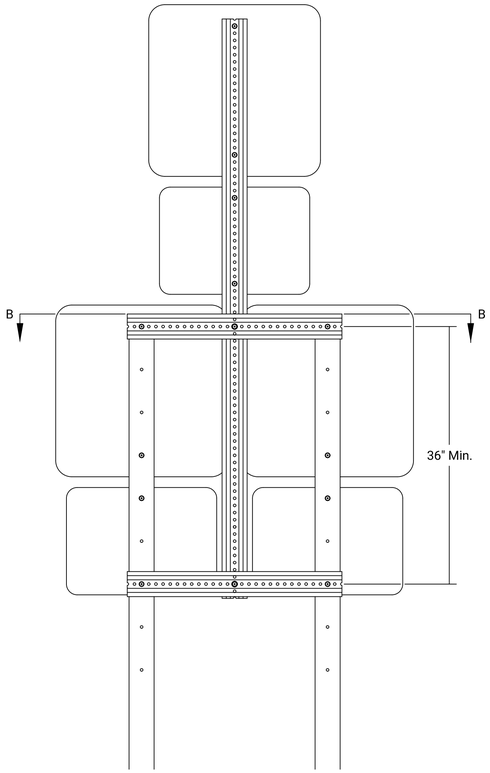
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	18I	293

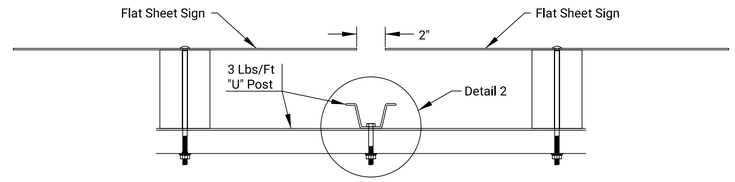


SIDE VIEW

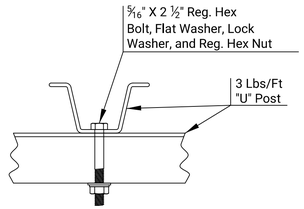


BACK VIEW

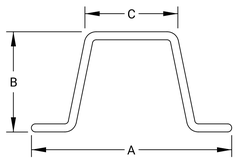




SECTION B-B



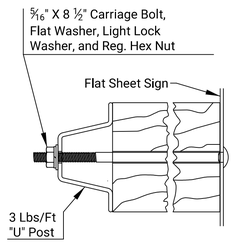
DETAIL 2



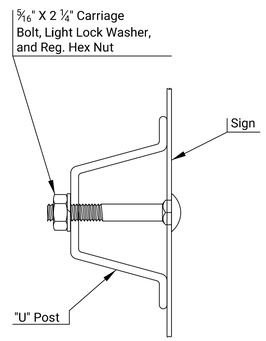
DIM.	3 LBS/FT
A	3 1/2"
B	1 3/4"
C	1 5/8"

(DIMENSIONS ARE NOMINAL)

"U" POST



DETAIL 1



SECTION A-A

NOTES:
The top of the post shall not extend above the top of the sign.

Any additional mounting holes, either through the sign or post, shall be drilled by the contractor. All holes drilled in the post shall be treated with a perservative. All holes drilled in the sign shall be free of any defects and the sheeting around the hole shall not be damaged.

A nylon washer shall be placed against the sheeting when a nut is to be tightened against the sign face.

The 3 lb/ft steel "U" post shall be subsidiary to the bid item 'SIGN POST (4" x 6" WOOD) (FLAT SHEET SIGN)'.

NO.	DATE	REVISIONS	BY	APP'D
1	10/01/19	Revised drawings and notes	D.D.G.	E.W.N.

KANSAS DEPARTMENT OF TRANSPORTATION

DETAILS FOR MOUNTING SIGNS ABOVE TURN ASSEMBLIES

WOOD POST

TE484 7/1/03

FHWA APPROVAL			10/01/2019	APP'D	Steven A. Buckley		
DESIGNED	D.D.G.	DETAILED	A.A.D.	QUANTITIES		TRACED	
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.		TRACE CK.	

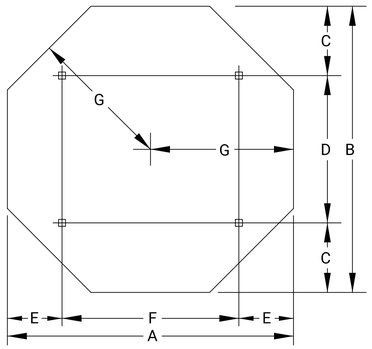
KDOT Graphics Certified 12-17-2019

Sh. No. 18I

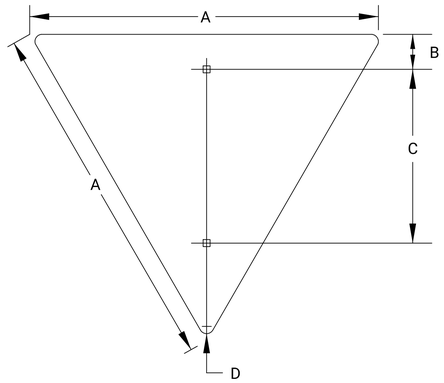
KDOT Graphics Certified

Drawn By : MDELEON Plotted 07-11-24
File : c:\pwworking\central01\d2274982\ka6020001pss484-01.dgn

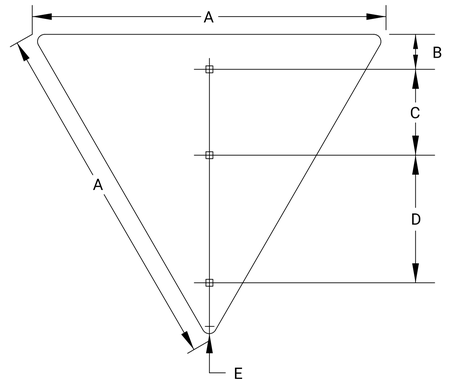
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	I82	293



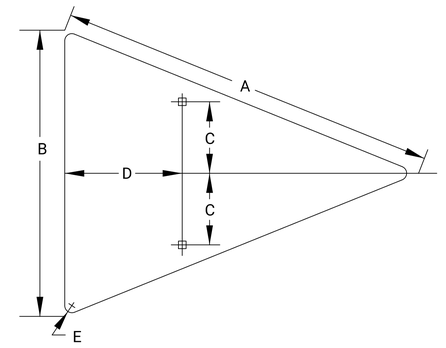
SIGN SIZE	A	B	C	D	E	F	G	T	AREA
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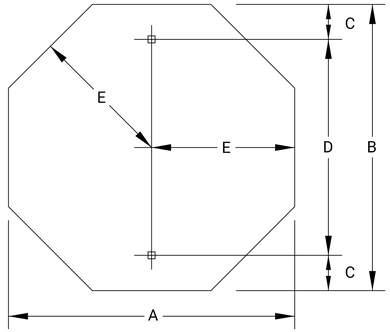
SIGN SIZE	A	B	C	D	T	AREA
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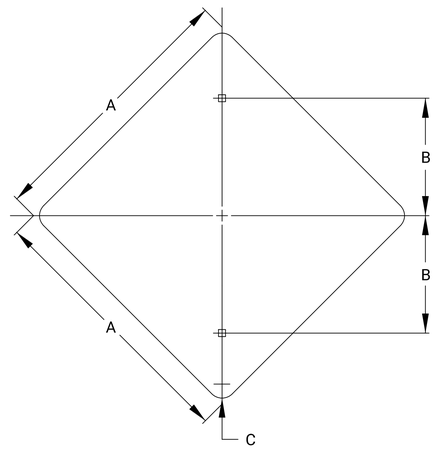
SIGN SIZE	A	B	C	D	E	T	AREA
48 X 48	48	3	12	18	3	0.080	6.93
60 X 60	60	3	18	18	4	0.100	10.83



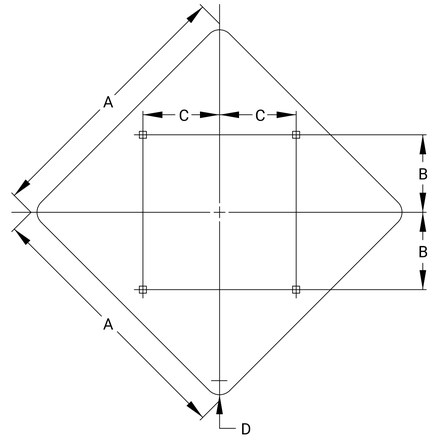
SIGN SIZE	A	B	C	D	E	T	AREA
48 X 36	48	36	9	14 ¾	2 ¼	0.125	5.56



SIGN SIZE	A	B	C	D	E	T	AREA
30 X 30	30	30	3	24	15	0.080	5.18
36 X 36	36	36	6	24	18	0.080	7.46



	SIGN SIZE	A	B	C	T	AREA
	18 X 18	18	6	1 ½	0.080	2.25
	24 X 24	24	12	1 ½	0.080	4.00
	30 X 30	30	12	1 ⅞	0.080	6.25
(1)	36 X 36	36	18	2 ¼	0.080	9.00



SIGN SIZE	A	B	C	D	T	AREA
48 X 48	48	12	15	3	0.100	16.00

NOTE:
All holes are 3/8 " square unless otherwise noted.

The dimension "t" is the thickness of the aluminum blank.

(1) Center hole is required.

All dimensions are in inches.

NO.	DATE	REVISIONS	BY	APP'D
	10/01/19	Update sign blank details and dimensions	D.D.G.	E.W.N.

KANSAS DEPARTMENT OF TRANSPORTATION

SIGN BLANK DETAILS FOR FLAT SHEET SIGNS

TE503 7/1/03

FHWA APPROVAL		10/01/2019	APP'D	Steven A. Buckley	
DESIGNED	D.D.G.	DETAILED	A.A.D.	QUANTITIES	TRACED
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.	TRACE CK.

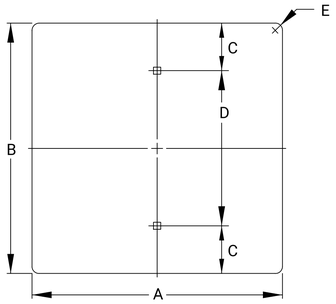
KDOT Graphics Certified 12-17-2019

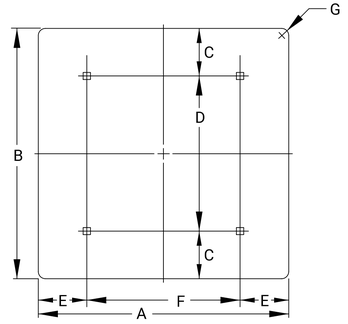
Sh. No. 182

KDOT Graphics Certified

Drawn By : MDELEON Plotted 07-11-24
File : c:\pwworking\central01\d2274982\ka602001pss503-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	I83	293





	SIGN SIZE	A	B	C	D	E	T	AREA
(1)	3 X 8	3	8	1	6	3/8	0.040	0.17
(1)	6 X 12	6	12	3	6	3/8	0.063	0.50
	12 X 6	12	6	1 1/2	3	3/4	0.063	0.50
	12 X 9	12	9	1 1/2	6	1 1/2	0.063	0.75
	12 X 18	12	18	3	12	1 1/2	0.063	1.50
	12 X 24	12	24	3	18	1 1/2	0.080	2.00
	12 X 36	12	36	6	24	1 1/2	0.080	3.00
	12 X 48	12	48	6	36	1 1/2	0.080	4.00
	18 X 6	18	6	1 1/2	3	1 1/2	0.063	0.75
	18 X 18	18	18	3	12	1 1/2	0.063	2.25
	18 X 30	18	24	3	24	1 1/2	0.080	3.75
	18 X 36	18	24	6	24	1 1/2	0.080	4.50
	18 X 42	18	24	6	30	1 1/2	0.080	5.25
	18 X 48	18	24	6	36	1 1/2	0.080	6.00
	21 X 15	21	15	1 1/2	12	1 1/2	0.080	2.19
	24 X 6	24	6	1 1/2	3	1 1/2	0.080	1.00
	24 X 12	24	12	3	6	1 1/2	0.080	2.00
	24 X 18	24	18	3	12	1 1/2	0.080	3.00
	24 X 24	24	24	3	18	1 1/2	0.080	4.00
	24 X 30	24	30	3	24	1 1/2	0.080	5.00
	24 X 36	24	36	6	24	1 1/2	0.080	6.00
	30 X 12	30	12	3	6	1 7/8	0.080	2.50
	30 X 15	30	15	1 1/2	12	1 7/8	0.080	3.13
	30 X 18	30	18	3	12	1 7/8	0.080	3.75
	30 X 21	30	21	1 1/2	18	1 1/2	0.080	4.38
	30 X 24	30	24	3	18	1 7/8	0.080	5.00
	30 X 30	30	30	3	24	1 7/8	0.080	6.25
	30 X 36	30	36	6	24	1 7/8	0.080	7.50
	36 X 12	36	12	3	6	1 1/2	0.080	3.00
	36 X 18	36	18	3	12	1 1/2	0.080	4.50
	36 X 24	36	24	3	18	1 1/2	0.080	6.00
	36 X 30	36	30	3	24	2 1/4	0.080	7.50
	36 X 36	36	36	6	24	2 1/4	0.080	9.00
(3)	45 X 36	45	36	3	30	2 1/4	0.100	11.25

	SIGN SIZE	A	B	C	D	E	F	G	T	AREA
	36 X 12	36	12	3	6	3	30	1 1/2	0.080	3.00
	36 X 30	36	30	3	24	3	30	2 1/4	0.080	7.50
	36 X 48	36	48	9	30	6	24	0	0.100	12.00
	36 X 60	36	60	12	36	6	24	0	0.100	15.00
(2)	36 X 72	36	72	6	60	6	24	0	0.100	18.00
	42 X 12	48	12	3	6	6	30	1 1/2	0.080	3.50
	42 X 18	48	18	3	12	6	30	1 1/2	0.080	5.25
	42 X 24	48	24	6	12	6	30	1 7/8	0.080	7.00
	42 X 36	48	36	6	24	6	30	0	0.100	10.50
	48 X 12	48	12	3	6	9	30	1 1/2	0.080	4.00
	48 X 18	48	18	3	12	9	30	1 1/2	0.080	6.00
	48 X 24	48	24	6	12	9	30	1 7/8	0.080	8.00
	48 X 30	48	30	6	18	9	30	0	0.100	10.00
	48 X 36	48	36	6	24	9	30	0	0.100	12.00
	48 X 42	48	42	6	30	9	30	0	0.100	14.00
	48 X 48	48	48	9	30	9	30	0	0.100	16.00
	48 X 60	48	60	12	36	9	30	0	0.100	20.00
(2)	48 X 72	48	72	6	60	9	30	0	0.100	24.00
(2)	48 X 96	48	96	12	72	9	30	0	0.100	32.00
	60 X 12	60	12	3	6	12	36	0	0.100	5.00

SIGN SIZE	A	B	C	D	E	F	G	T	AREA
60 X 18	60	18	3	12	12	36	0	0.100	7.50
60 X 24	60	24	6	12	12	36	0	0.100	10.00
60 X 30	60	30	6	18	12	36	0	0.100	12.50
60 X 36	60	36	6	24	12	36	0	0.100	15.00
60 X 42	60	42	6	30	12	36	0	0.100	17.50
60 X 48	60	48	9	30	12	36	0	0.100	20.00
72 X 12	72	12	3	6	15	42	0	0.100	6.00
72 X 18	72	18	3	12	15	42	0	0.100	9.00
72 X 24	72	24	6	12	15	42	0	0.100	12.00
72 X 30	72	30	6	18	15	36	0	0.100	15.00
72 X 36	72	36	6	24	15	42	0	0.100	18.00
72 X 42	72	42	6	30	15	42	0	0.100	21.00
72 X 48	72	48	9	30	15	42	0	0.100	24.00
84 X 12	84	18	3	6	18	48	0	0.100	7.00
84 X 18	84	18	3	12	18	48	0	0.100	10.50
84 X 24	84	24	6	12	18	48	0	0.100	14.00
84 X 30	84	30	6	18	18	48	0	0.100	17.50
84 X 36	84	36	6	24	18	48	0	0.100	21.00
84 X 42	84	42	6	30	18	48	0	0.100	24.50
84 X 48	84	48	9	30	18	48	0	0.100	28.00

NOTE:
All holes are 3/8" square, unless otherwise noted.

The dimension "T" is the thickness of the aluminum blank.

(1) Holes shall be 5/16" diameter.

(2) Dimension "D" requires a center hole.

(3) Additional hole 12" below top hole.

All dimensions are in inches.

NO.	DATE	REVISIONS	BY	APP'D
1	10/01/19	Update sign blank details and dimensions	D.D.G.	E.W.N.

KANSAS DEPARTMENT OF TRANSPORTATION

SIGN BLANK DETAILS FOR FLAT SHEET SIGNS

TE506 7/1/03

FHWA APPROVAL		10/01/2019	APP'D	Steven A. Buckley	
DESIGNED	D.D.G.	DETAILED	A.A.D.	QUANTITIES	TRACED
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.	TRACE CK.

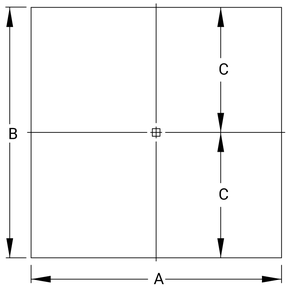
KDOT Graphics Certified 12-17-2019

Sh. No. 183

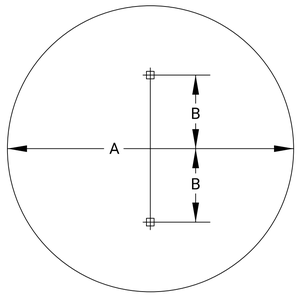
KDOT Graphics Certified

Drawn By : MDELEON Plotted :07-11-24
File : c:\pwworking\central01\d2274982\ka602001pss506-01.dgn

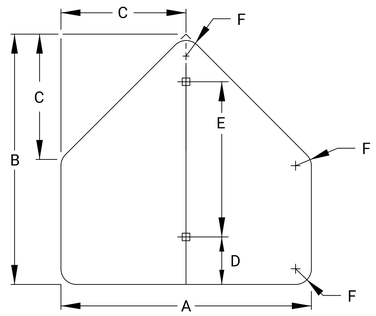
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-01	2024	184	293



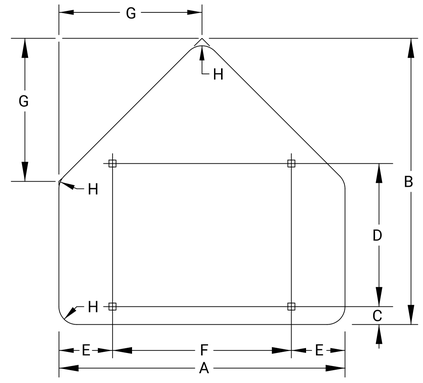
SIGN SIZE	A	B	C	T	AREA
6 X 6	6	6	3	0.063	0.25



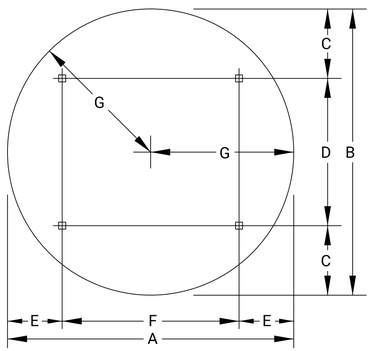
SIGN SIZE	A	B	T	AREA
36 DIA	36	12	0.080	7.07



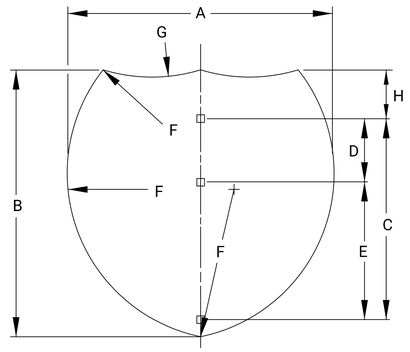
SIGN SIZE	A	B	C	D	E	F	T	AREA
30 X 30	30	30	15	3	24	1 ⅞	0.080	4.69
36 X 36	36	36	18	6	24	2 ¼	0.080	6.75



SIGN SIZE	A	B	C	D	E	F	G	H	T	AREA
48 X 48	48	48	3	24	9	30	24	3	0.100	12.00



SIGN SIZE	A	B	C	D	E	F	G	T	AREA
48 X 48	48	48	12	24	9	30	24	0.100	12.57



INDEPENDENT USE

DIMENSIONS										
SIZE	A	B	C	D	E	F	G	H	T	AREA
24 X 24	24	24	18	-	-	15	15	3	0.080	3.20
36 X 36	36	36	30	12	18	22 ½	22 ½	3	0.080	7.20
30 X 24	30	24	18	-	-	17	24	3	0.080	3.99
45 X 36	45	36	30	12	18	25 ½	36	3	0.100	8.99

NOTE:
All holes are ⅜" square, unless otherwise noted.
Dimension "T" is the thickness of the aluminum blank.

All dimensions are in inches.

NO.	DATE	REVISIONS	BY	APP'D
	10/01/19	Update sign blank details and dimensions	D.D.G.	E.W.N.

KANSAS DEPARTMENT OF TRANSPORTATION

SIGN BLANK DETAILS FOR FLAT SHEET SIGNS

TE509 7/1/03

FHWA APPROVAL			10/01/2019	APP'D	Steven A. Buckley		
DESIGNED	D.D.G.	DETAILED	A.A.D.	QUANTITIES		TRACED	
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.		TRACE CK.	

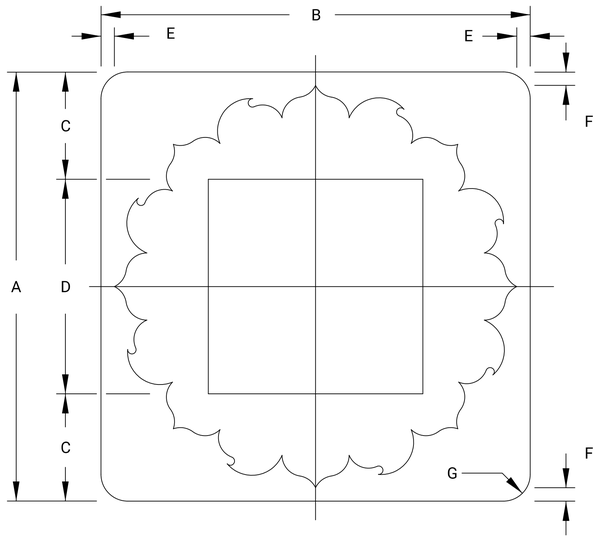
KDOT Graphics Certified 12-17-2019

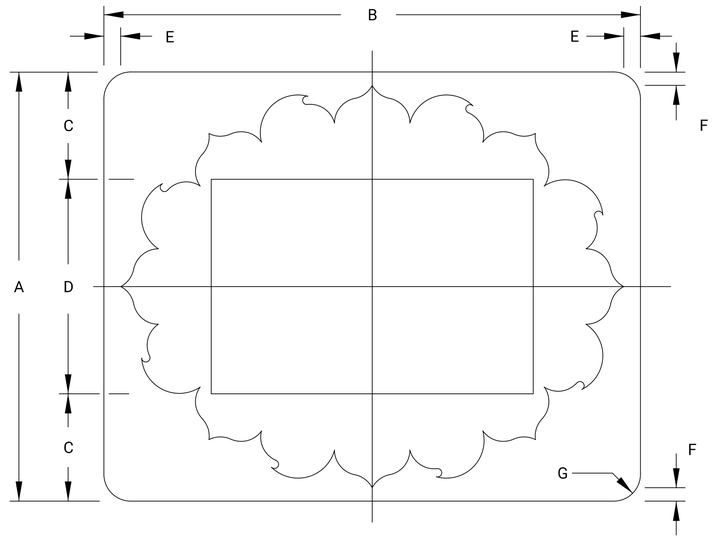
Sh. No. 184

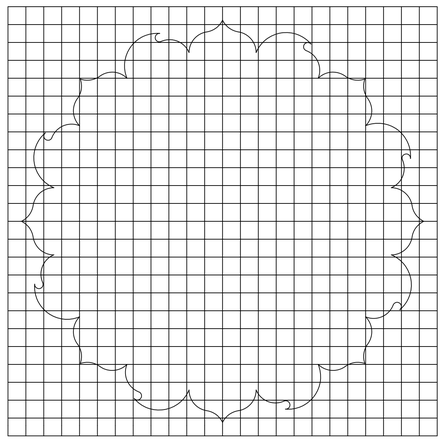
KDOT Graphics Certified

Drawn By : MDELEON Plotted :07-11-24
File : c:\pwworking\central01\d2274982\ka602001pss509-01.dgn

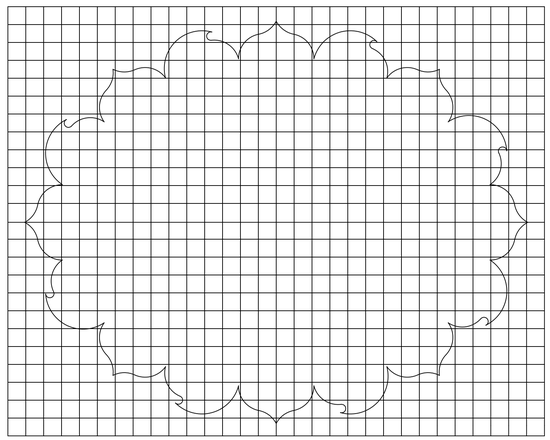
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	I85	293







1 OR 2 DIGITS



3 DIGITS

COLORS:
Background around sunflower - Black
Sunflower - Yellow
Numerals - Black

NOTE:
See plan, quantity, or sign design layout sheets for numerals to be used. The numerals shall be Series "D" legend. The numerals are to be optically spaced about the vertical centerline.

See standard plan sheet TE590 for detailed specifications.

SIZE	A	B	C	D	E	F	G
24 X 24	24	24	6	12	¾	¾	1 ½
30 X 24	24	30	6	12	1	¾	1 ½
36 X 36	36	36	9	18	1 ⅛	1 ⅛	2 ¼
45 X 36	36	45	9	18	1 ½	1 ⅛	2 ¼

All dimensions in inches.

NO.	DATE	REVISIONS	BY	APP'D
	10/01/19	Added 36" route shields.	D.D.G.	E.W.N.

KANSAS DEPARTMENT OF TRANSPORTATION

PROCESSED SIGN DETAILS
KANSAS ROUTE MARKERS

TE515 7/1/03

FHWA APPROVAL			10/01/2019	APP'D	Steven A. Buckley	
DESIGNED	D.D.G.	DETAILED	B.A.H.	QUANTITIES		TRACED
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.		TRACE CK.

KDOT Graphics Certified 12-17-2019

Sh. No. 185

KDOT Graphics Certified

Drawn By : MDELEON Plotted :07-11-24
File : c:\pwworking\central01\d2274982\ka602001pss515-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	I86	293

DETAILED SPECIFICATIONS FOR FLAT SHEET SIGNS AND OVERLAY PANELS

All new flat sheet sign blanks shall be of the fabrication and thickness shown on the flat sheet blank detail sheets, unless other details are shown in the plans.

Flat sheet blanks shall be used for signs that are less than or equal to 7'-0" in length and/or less than or equal to 4'-0" in height, unless other details are shown in the plans. Flat sheet blanks shall also be used for signs that are 4'-0" in length and less than or equal to 8'-0" in height, unless other details are shown in the plans.

The design details for signs (color, letter height, and letter series) shall be as shown in the FHWA Standard Highway Signs and Markings book (2004 edition and supplements), unless other details are shown in the plans.

All sign faces shall be covered with Type IV high intensity retroreflective sheeting, unless otherwise noted in the plans.

The sheeting used for the direct applied legend and borders shall be Type IV high intensity retroreflective sheeting, unless otherwise noted in the plans.

The school warning signs, the "SCHOOL" portion of the S5-1 sign, S4-3p plaque, and any supplemental plaques used with these warning signs shall have a fluorescent yellow-green background, unless otherwise noted in the plans.

The type of adhesive used for retroreflective sheeting or lettering film shall be heat activated or pressure sensitive.

DETAILED SPECIFICATIONS FOR REINFORCED PANEL SIGNS

All new reinforced sign panels shall be of the fabrication and thickness shown on the reinforced panel detail sheets. If extrusheet fabricated sign panels are used, they shall be of the length, width and in the position shown. If extrusheet fabricated panel dimensions are not shown, a line of legend should be placed entirely on one panel. If extruded fabricated sign panels are used, either 1'-0" or 6" panels shall be used. The 6" panels shall be used only at the top or bottom of signs.

Reinforced panels shall be used for signs that are greater than 7'-0" in length or greater than 4'-0" in height, unless other details are shown in the plans.

All sign faces shall be covered with Type IV high intensity retroreflective sheeting, unless otherwise noted in the plans.

The sheeting used for the direct applied legend and borders shall be Type IV high intensity retroreflective sheeting, unless otherwise noted in the plans.

The type of adhesive used for retroreflective sheeting or lettering film shall be heat activated or pressure sensitive.

Letters and numbers on reinforced panel signs are modified Series "E" unless otherwise shown.

Spacing table dimensions are in inches.

NO.	DATE	REVISIONS	BY	APP'D
2	10/01/19	Changed notes	D.D.G.	E.W.N.
1	7/23/10	Changed Notes and Sheeting Type	D.D.G.	D.B.

KANSAS DEPARTMENT OF TRANSPORTATION

DETAILS SPECIFICATIONS FOR REINFORCED SIGN PANELS AND FLAT SHEET SIGNS

TE590 7/01/03

FHWA APPROVAL		10/01/2019	APP'D	Steven A. Buckley	
DESIGNED	D.D.G.	DETAILED	K.D.S.	QUANTITIES	TRACED
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN. CK.	TRACE CK.

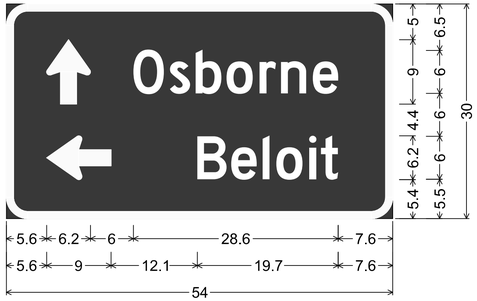
KDOT Graphics Certified 12-17-2019

Sh. No. 186

KDOT Graphics Certified

Drawn By : MDELEON Plotted :07-11-24
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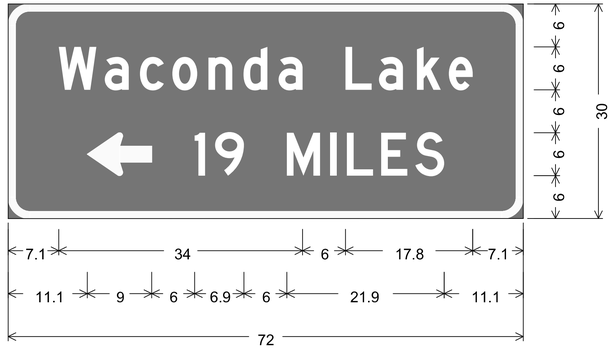
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-01	2024	187	293



D1-2;
3.0" Radius, 1.0" Border, White on Green;
Standard Arrow Custom 9.0" X 6.1" 90°;
"Osborne", D 2K;
Standard Arrow Custom 9.0" X 6.1" 180°;
"Beloit", D 2K;
Table of distances between letter and object lefts

	↑	O	s	b	o	r	n	e	
5.6	12.2	5.1	3.6	4.3	4.6	3.0	4.4	3.6	7.6

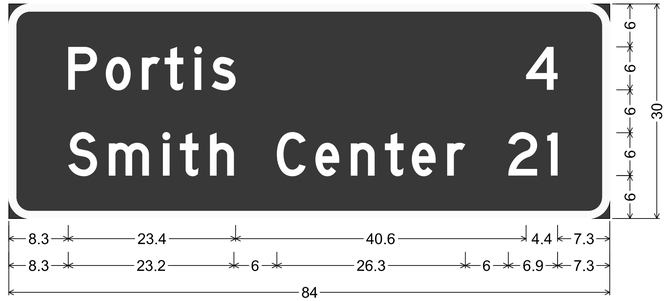
	←	B	e	l	o	i	t		
5.6	21.1	4.7	4.4	1.9	4.7	1.6	2.4	7.6	



KD7-2;
3.0" Radius, 1.0" Border, White on Brown;
"Waconda Lake", D;
Standard Arrow Custom 9.0" X 6.0" 180°;
"19 MILES", D;
Table of distances between letter and object lefts

	W	a	c	o	n	d	a	L	a	k	e	
7.1	6.4	4.9	4.5	5.1	4.9	4.9	9.3	4.7	5.3	4.5	3.3	7.1

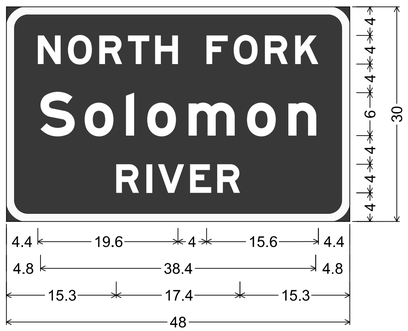
	←	I	9	M	I	L	E	S	
11.1	15.0	2.8	10.1	6.0	2.3	4.8	4.8	4.0	11.1



D2-2;
3.0" Radius, 1.0" Border, White on Green;
"Portis", D; "4", D; "Smith Center", D; "21", D;
Table of distances between letter and object lefts

	P	o	r	t	i	s	4	
8.3	5.3	5.0	3.2	4.2	2.4	43.9	4.4	7.3

	S	m	i	t	h	C	e	n	t	e	r	2	1	
8.3	5.7	7.5	2.4	4.2	9.4	5.3	5.0	4.8	3.7	5.0	8.5	5.4	1.5	7.3

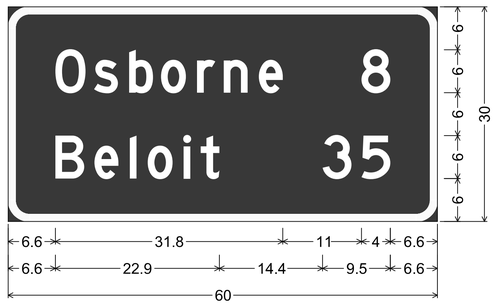


KI-3;
3.0" Radius, 1.0" Border, White on Green;
"NORTH FORK", E Mod;
"Solomon", E Mod; "RIVER", E Mod;
Table of distances between letter and object lefts

	N	O	R	T	H	F	O	R	K	
4.4	4.2	4.4	4.0	3.8	7.2	3.8	4.3	4.3	3.2	4.4

	S	o	l	o	m	o	n	
4.8	6.1	5.8	3.0	5.8	8.1	5.8	3.8	4.8

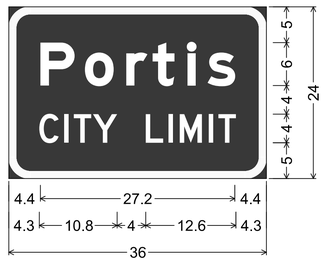
	R	I	V	E	R	
15.3	4.3	1.6	4.5	3.8	3.2	15.3



D2-2;
3.0" Radius, 1.0" Border, White on Green;
"Osborne", D; "8", D; "Beloit", D; "35", D;
Table of distances between letter and object lefts

	O	s	b	o	r	n	e	8	
6.6	5.4	4.9	4.5	5.0	3.7	4.9	14.4	4.0	6.6

	B	e	l	o	i	t	3	5	
6.6	5.5	4.9	2.5	5.0	2.4	17.0	5.5	4.0	6.6



KI-92;
3.0" Radius, 1.0" Border, White on Green;
"Portis", E Mod;
"CITY LIMIT", D;
Table of distances between letter and object lefts

	P	o	r	t	i	s	
4.4	6.2	5.8	3.7	4.9	2.8	3.8	4.4

	C	I	T	Y	L	I	M	I	T	
4.3	3.4	1.4	2.7	7.3	3.2	1.6	4.0	1.4	2.4	4.3

Drawn By : MDELEON Plotted : 07-11-24
File : c:\pwworking\central01\d2274982\ka602001psl-01.dgn

KANSAS DEPARTMENT OF TRANSPORTATION

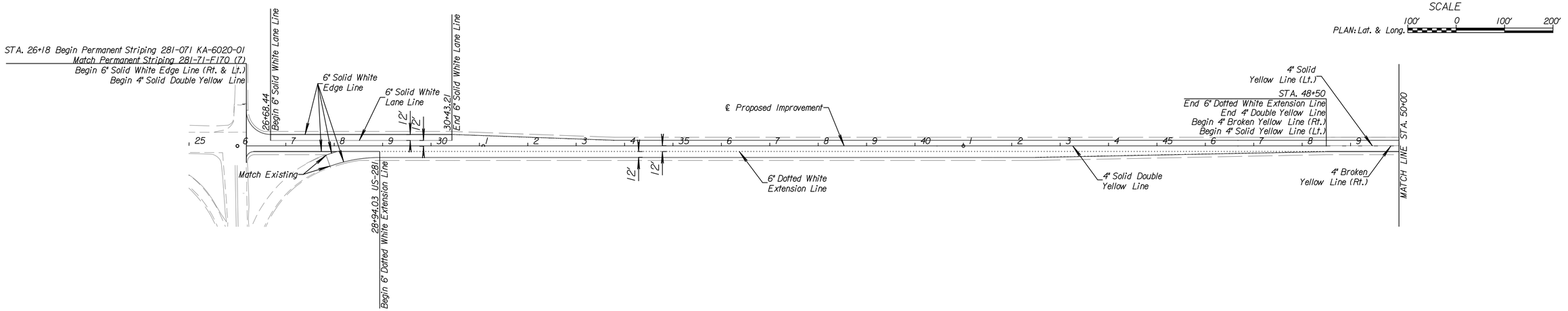
SIGN FABRICATION DETAILS

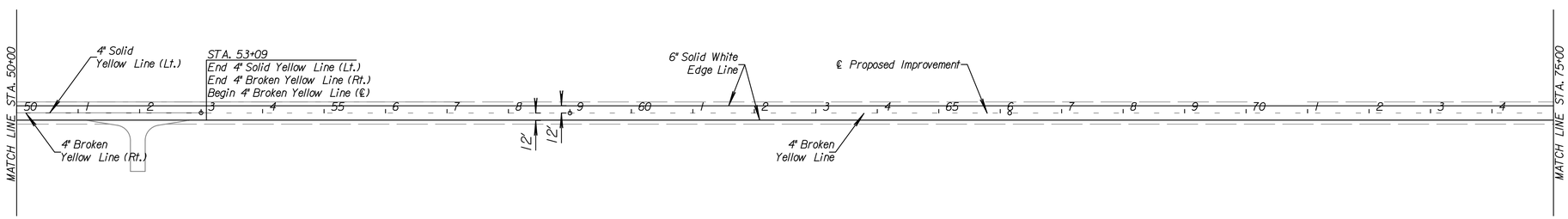
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	188	293

SCALE

100' 0 100' 200'

PLAN: Lat. & Long.





KANSAS DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING

MAINLINE US-281

STA: 26+18 - STA: 75+00

KDOT Graphics Certified 09-01-2023

Sh. No. 188

KDOT Graphics Certified

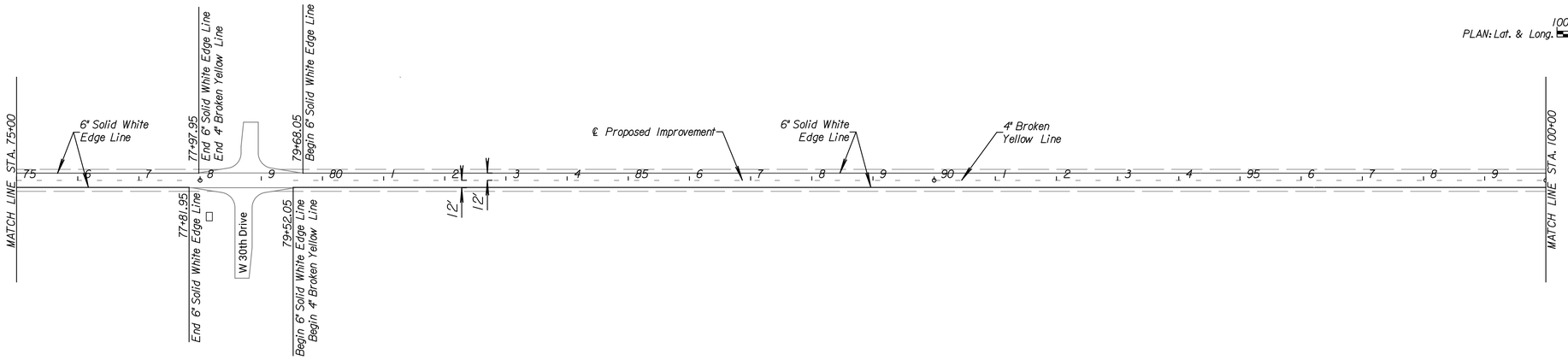
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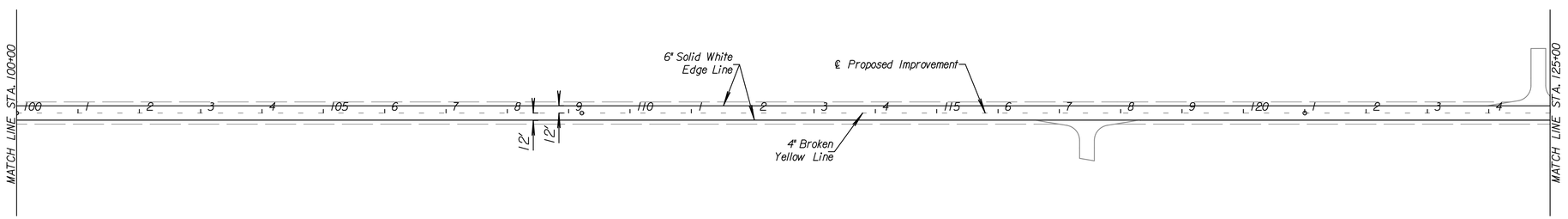
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STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	189	293

SCALE

PLAN: Lat. & Long. 100' 0 100' 200'





KANSAS DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING

MAINLINE US-281

STA: 75+00 - STA: 125+00

KDOT Graphics Certified 09-01-2023

Sh. No. 189

KDOT Graphics Certified

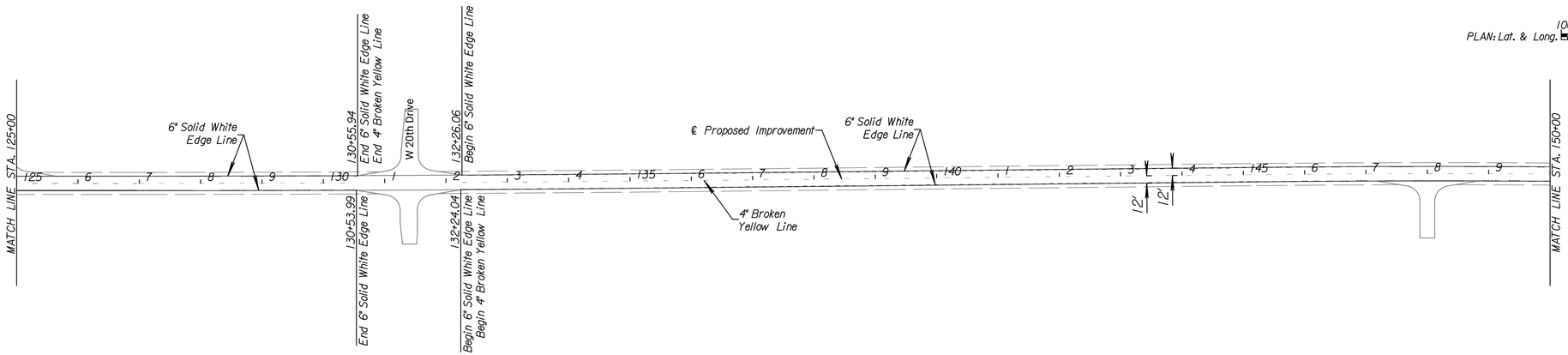
Drawn By : MDELEON Plotted : 07-11-24

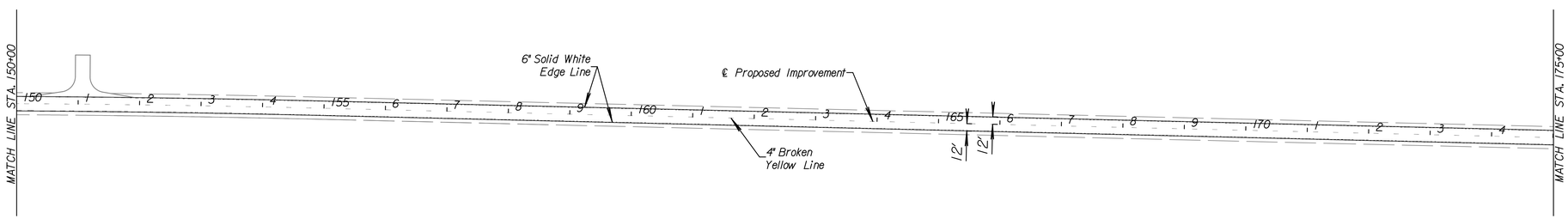
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STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	190	293

SCALE

PLAN: Lat. & Long. 100' 0 100' 200'





KANSAS DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING

MAINLINE US-281

STA: 125+00 - STA: 175+00

KDOT Graphics Certified 09-01-2023

Sh. No. 190

KDOT Graphics Certified

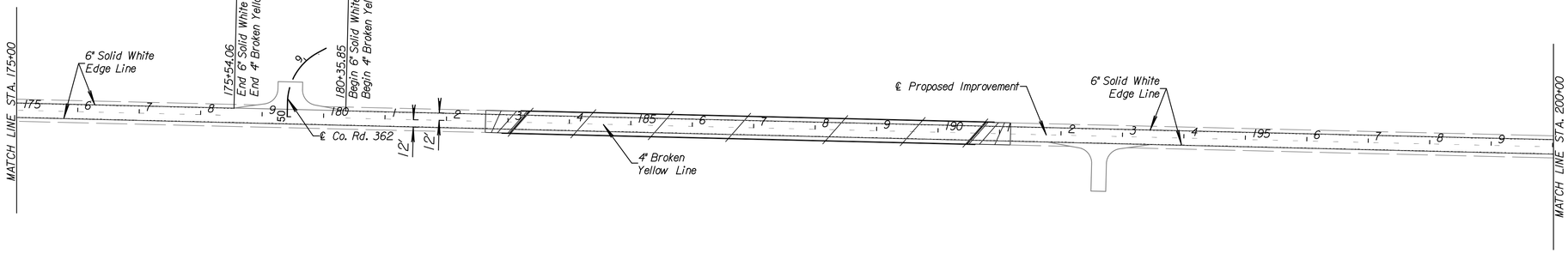
Drawn By : MDELEON Plotted : 07-11-24

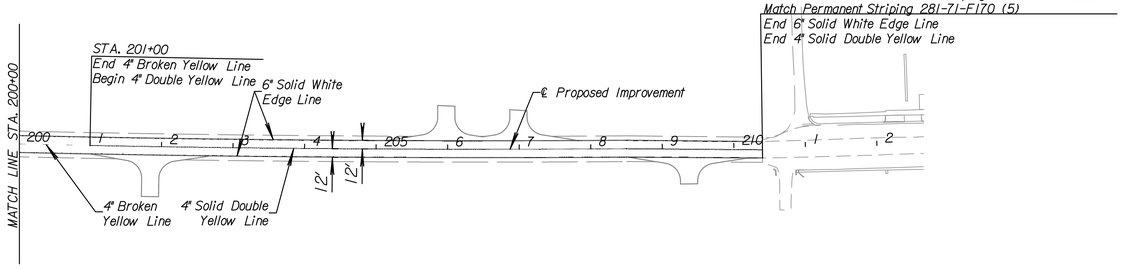
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STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	191	293

SCALE

PLAN: Lat. & Long. 100' 0 100' 200'





Drawn By : MDELEON Plotted : 07-11-24
File : c:\pwworking\central01\d2274982\ka602001mpl-04.dgn

KANSAS DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING

MAINLINE US-281

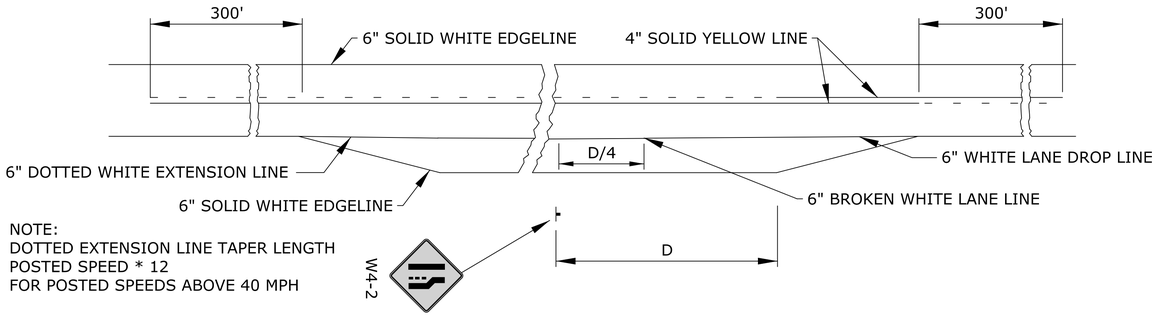
STA: 175+00 - STA: 210+40

KDOT Graphics Certified 09-01-2023

Sh. No. 191

KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	I92	293

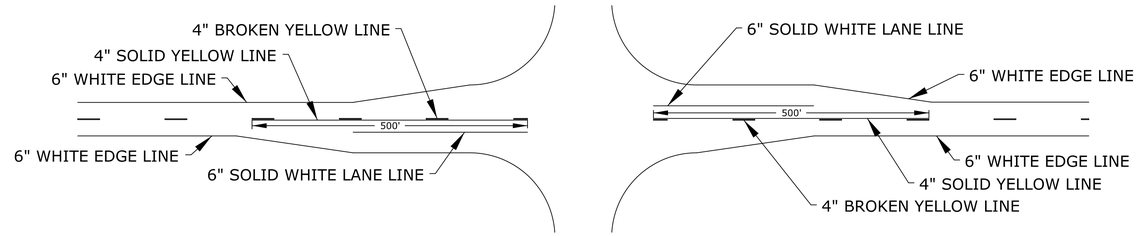


NOTE:
DOTTED EXTENSION LINE TAPER LENGTH
POSTED SPEED * 12
FOR POSTED SPEEDS ABOVE 40 MPH

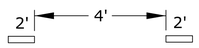
TYPICAL MARKING FOR AUXILIARY PASSING LANE

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

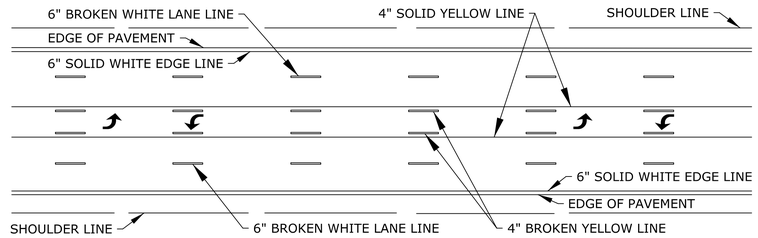
FOR HIGHWAY JUNCTIONS THE NO PASSING ZONE WILL EXTEND 1000' FROM INTERSECTION.



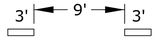
TYPICAL ROAD JUNCTION MARKINGS WITH BYPASS LANES



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

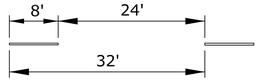


TWO-WAY LEFT TURN DETAIL FOR FIVE LANE ROADWAY

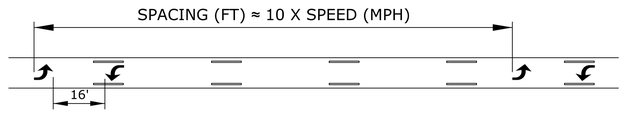


TYPICAL SPACING FOR LANE DROP. UNLESS OTHERWISE NOTED ON PLANS.

TWO-WAY LEFT TURN DETAIL FOR THREE LANE ROADWAY

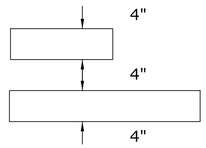


TYPICAL SPACING FOR BROKEN LINES UNLESS OTHERWISE NOTED ON PLANS

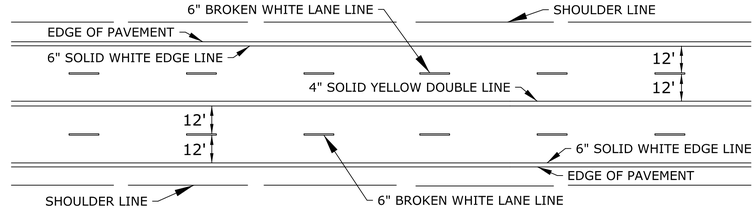


TWO-WAY LEFT TURN ARROW SPACING DETAIL

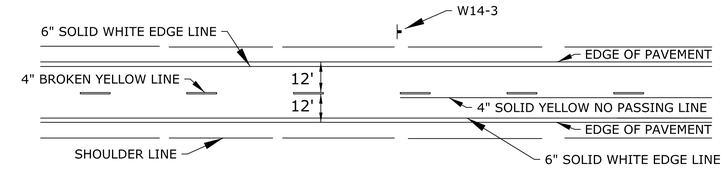
NOTE:
IF ARROWS ARE USED SPACE THE ARROWS AS SHOWN IN THE SPACING DETAIL.



TYPICAL SPACING FOR NO PASSING LINES UNLESS OTHERWISE NOTED ON PLANS



TYPICAL MARKINGS FOR FOUR LANE ROADWAY



TYPICAL TWO LANE MARKINGS

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

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

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

KANSAS DEPARTMENT OF TRANSPORTATION

TYPICAL PAVEMENT MARKING DETAILS FOR UNDIVIDED ROADWAYS

TE308

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

KDOT Graphics Certified 07-17-2018

Sh. No. 192

KDOT Graphics Certified

Drawn By : MDELEON Plotted :07-11-24
File : c:\pwworking\central01\d2274982\ka602001mss308-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-01	2024	I93	293

SUMMARY OF PAVEMENT MARKINGS

LOCATION	4" Solid WHITE Edge Line	6" Solid WHITE Edge Line	6" Broken WHITE Lane Line	6" Broken WHITE Lane Line (PCP)	6" Dotted WHITE Extension Line	6" Broken WHITE Lane Drop Line	6" Solid WHITE Lane Line	8" Broken WHITE Lane Drop Line	8" Solid WHITE Gore Line	8" Dotted WHITE Extension Line	12" Solid WHITE Diagonal Line	12" Solid WHITE Chevron Line	12" Solid WHITE Type I Crosswalk Line	24" Solid WHITE Type II Crosswalk Line	24" Solid WHITE Stop Line	4" Solid YELLOW Edge Line	4" Solid YELLOW Double Line	4" Solid YELLOW Line	4" Broken YELLOW Line	6" Solid YELLOW Edge Line	12" Solid YELLOW Diagonal Line
MAINLINE US-281																					
STA: 26+18 - STA: 75+00		9,921			1,956												2,232	459	2,650		
STA: 75+00 - STA: 125+00		9,660																	4,846		
STA: 125+00 - STA: 175+00		9,661																	4,823		
STA: 175+00 - STA: 210+40		6,897															940		2,417		
TOTALS		36,139			652												6,344	459	3,684		

RECAPITULATION OF QUANTITIES

ITEMS	TOTAL	UNITS
PAVEMENT MARKING (MULTI-COMPONENT)(WHITE)(4")		FT
PAVEMENT MARKING (MULTI-COMPONENT)(WHITE)(6")	36,791	FT
PAVEMENT MARKING (MULTI-COMPONENT)(WHITE)(8")		FT
PAVEMENT MARKING (MULTI-COMPONENT)(WHITE)(12")		FT
PAVEMENT MARKING (MULTI-COMPONENT)(YELLOW)(4")	10,487	FT
PAVEMENT MARKING (MULTI-COMPONENT)(YELLOW)(6")		FT
PAVEMENT MARKING (MULTI-COMPONENT)(YELLOW)(12")		FT
PAVEMENT MARKING (THERMOPLASTIC)(WHITE)(4")		FT
PAVEMENT MARKING (THERMOPLASTIC)(WHITE)(6")		FT
PAVEMENT MARKING (THERMOPLASTIC)(WHITE)(8")		FT
PAVEMENT MARKING (THERMOPLASTIC)(WHITE)(12")		FT
PAVEMENT MARKING (THERMOPLASTIC)(YELLOW)(4")		FT
PAVEMENT MARKING (THERMOPLASTIC)(YELLOW)(6")		FT
PAVEMENT MARKING (THERMOPLASTIC)(YELLOW)(12")		FT
PAVEMENT MARKING (EPOXY)(WHITE)(4")		FT
PAVEMENT MARKING (EPOXY)(WHITE)(6")		FT
PAVEMENT MARKING (EPOXY)(WHITE)(8")		FT
PAVEMENT MARKING (EPOXY)(WHITE)(12")		FT
PAVEMENT MARKING (EPOXY)(YELLOW)(4")		FT
PAVEMENT MARKING (EPOXY)(YELLOW)(6")		FT
PAVEMENT MARKING (EPOXY)(YELLOW)(12")		FT
PAVEMENT MARKING (INTERSECTION GRADE)(WHITE)(12")		FT
PAVEMENT MARKING (INTERSECTION GRADE)(WHITE)(24")		FT
PAVEMENT MARKING (INTERSECTION GRADE)(YELLOW)(12")		FT
PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(WHITE)( )		EACH
PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(WHITE)( )		EACH
PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(WHITE)( )		EACH
PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(WHITE)( )		EACH
PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(WHITE)( )		EACH
PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(US-SHIELD)( )		EACH
PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(K-SHIELD)( )		EACH
PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(I-SHIELD)( )		EACH
PAVEMENT MARKING (PATTERNED COLD PLASTIC)(WHITE)(6")		FT
PAVEMENT MARKING (PATTERNED COLD PLASTIC)(WHITE)(8")		FT
PAVEMENT MARKING (PATTERNED COLD PLASTIC)(WHITE)(12")		FT
PAVEMENT MARKING REMOVAL		FT

SUMMARY OF WORD & SYMBOL MARKINGS

LOCATION							STOP	ONLY	X-ING	SCHOOL			24	400							
TOTALS																					

NOTE:
WORDS & SYMBOLS SHALL CONFORM TO THE LATEST EDITION OF "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS" PRINTED BY THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION.

PRIOR TO COMMENCEMENT OF PAVEMENT MARKING WORK THE ENGINEER WILL ESTABLISH THE LIMITS FOR "NO PASSING" ZONES. THESE LIMITS SHALL BE USED FOR THE LOCATION OF "NO PASSING" LINES AND FOR THE COMPUTATION OF ACTUAL MARKING QUANTITIES FOR THIS LINE TYPE.

NOTE: FOR SPECIFIC PAVEMENT MARKING DETAILS AND DIMENSIONS SEE PLAN SHEETS

NOTE: ALL TOTALS REFLECT ACTUAL QUANTITY OF PAVEMENT MARKING MATERIALS REQUIRED.

NO.	DATE	REVISIONS	BY	APP'D
2	5/25/12	Added Line Types, Symbols, and Shields	B.A.H.	B.D.G.
1	7/26/05	New FHWA Approval Date	J.F.F.	B.D.G.

KANSAS DEPARTMENT OF TRANSPORTATION

SUMMARY AND RECAPITULATION OF PAVEMENT MARKING QUANTITIES

TE311

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

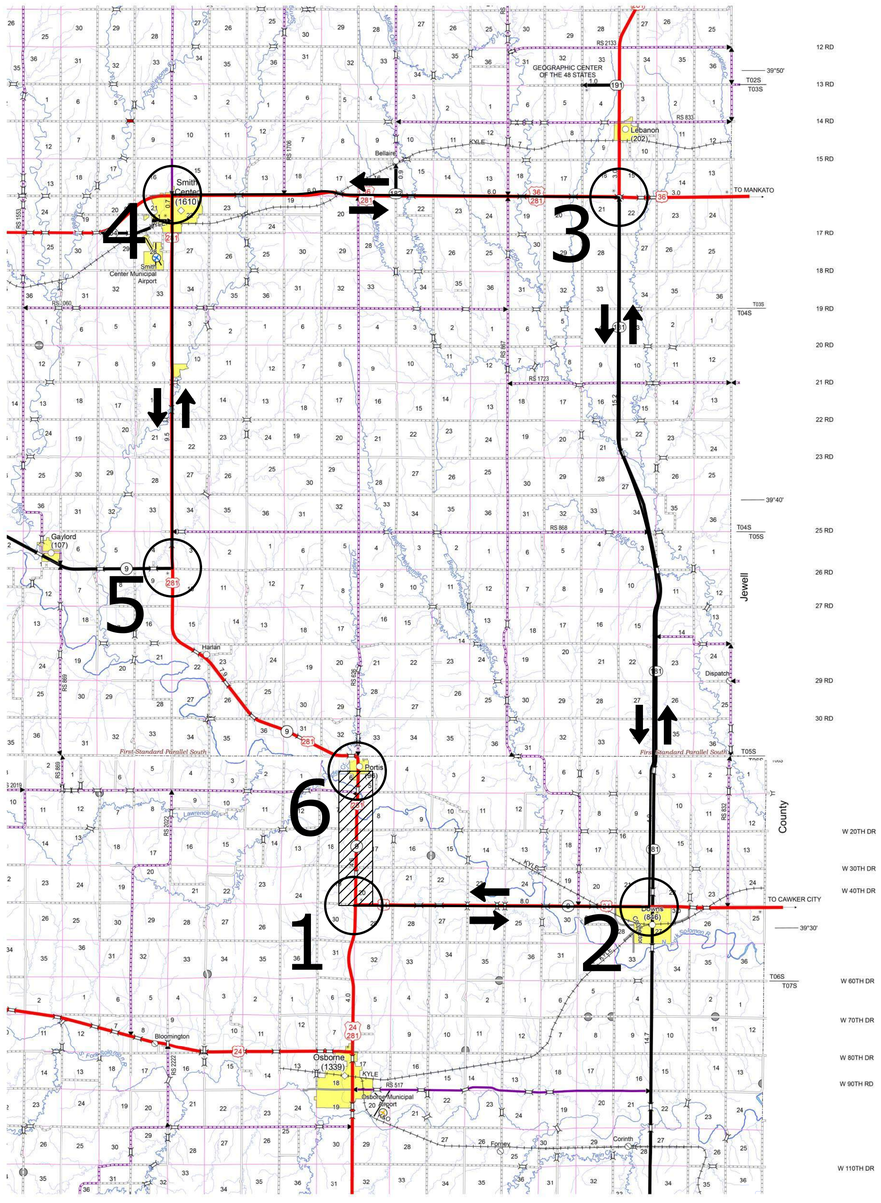
KDOT Graphics Certified 07-17-2018

Sh. No. 193

KDOT Graphics Certified

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STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	194	293



Detour Routes

US-281 Southbound Traffic from US-281 and K-9 West Junction

To US-281 South
North on US-281 to US-36 West Junction
East on US-36 to K-181 Junction
South on K-181 to US-24 in Downs
West on US-24 to US-281 North Junction

US-281 Northbound Traffic from US-281 and US-24 North Junction

To US-281 North
East on US-24 to K-181 in Downs
North on K-181 to US-36/US-281 East Junction

K-9 Eastbound Traffic from US-281 and K-9 West Junction

To K-9 East
North on US-281 to US-36 West Junction
East on US-36 to K-181
South on K-181 to K-9/US-24 East Junction

K-9 Westbound Traffic from K-9/US-24 East Junction

To K-9 West
North on K-181 to US-36/US-281 East Junction
West on US-36 to US-281 West Junction
South on US-281 to K-9 North Junction

Note: All local access to be maintained by Contractor

Legend

- Project Site
- Detour Route
- Direction of Traffic
- Detour Plan Area

KANSAS DEPARTMENT OF TRANSPORTATION

US-281/K-9 DETOUR MAP

Drawn By : MDELEON
Plotted : 07-11-24
File : c:\pwworking\central01\d2274982\ka602001cdt-01.dgn

Sh. No. 194

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	195	293

W 40th Dr

WB US-24/K-9 (DETOUR SB US-281)

EB US-24/K-9 (DETOUR NB US-281/WB K-9)

US-281

M4-8 24" x 12"
M3-3 24" x 12"
M6-1L 21" x 15"
COVER OR REMOVE

ROAD CLOSED
R11-2 48" x 30"

M4-10R 48" x 18"

ROAD CLOSED
R11-2 48" x 30"

M4-8 24" x 12"
M3-3 24" x 12"
M1-4 30" x 24"
COVER OR REMOVE

STOCKTON
OSBORNE
SMITH CENTER
COVER

M1-5 24" x 24"
M3-4 24" x 12"
M1-4 30" x 24"
M3-1 24" x 12"
M4-8 24" x 12"

M4-8 24" x 12"
M3-3 24" x 12"
M1-4 30" x 24"
COVER OR REMOVE

JCT
COVER OR REMOVE

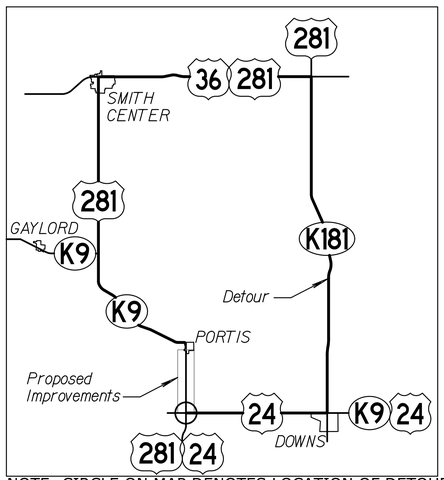
M4-8 24" x 12"
M3-1 24" x 12"
M3-4 24" x 12"
M3-2 24" x 12"
COVER OR REMOVE
M6-2R 21" x 15"

M4-8a 24" x 18"

SMITH CENTER
D1-1 VAR x 18" (BLACK ON ORANGE) 6" D LETTERS
COVER

M4-8 24" x 12"
M3-1 24" x 12"
M3-4 24" x 12"
M3-2 24" x 12"
M1-5 24" x 24"
M1-5 24" x 24"
COVER OR REMOVE
M5-2R 21" x 15"

DETOUR AHEAD
W20-2 48" x 48"



NOTE: CIRCLE ON MAP DENOTES LOCATION OF DETOUR
SEE FIGURE 1 ON TE704 FOR SIGN SPACING NEAR WORKZONE
NOT TO SCALE

○ TYPE A LOW INTENSITY WARNING LIGHT
TYPE III BARRICADE
EXISTING
X EXISTING SIGN TO BE COVERED OR REMOVED

ALL CONFLICTING ROUTE MARKERS ALONG THE DETOUR ROUTE SHALL BE COVERED OR REMOVED.
EXISTING SIGNS NOT SHOWN AT THESE JUNCTIONS SHALL REMAIN IN PLACE UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
ERECT DETOUR CONFIRMING ASSEMBLIES IN CONJUNCTION WITH EXISTING ROUTE MARKER ASSEMBLIES ALONG DETOUR ROUTE.
THE SPACING BETWEEN PROPOSED SIGNS MAY BE ADJUSTED AS APPROVED BY THE ENGINEER IN ORDER TO MAXIMIZE VISIBILITY.

N

SCALE
PLAN: Lat. & Long. 100' 0 100' 200'

SHEET 1 of 6

KANSAS DEPARTMENT OF TRANSPORTATION

US-281/K-9 DETOUR PLAN

AREA 1

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Sh. No. 195

Drawn By : MDELEON
File : c:\pwworking\central01\d2274982\ka602001cdt-02.dgn
Plotted : 07-11-24

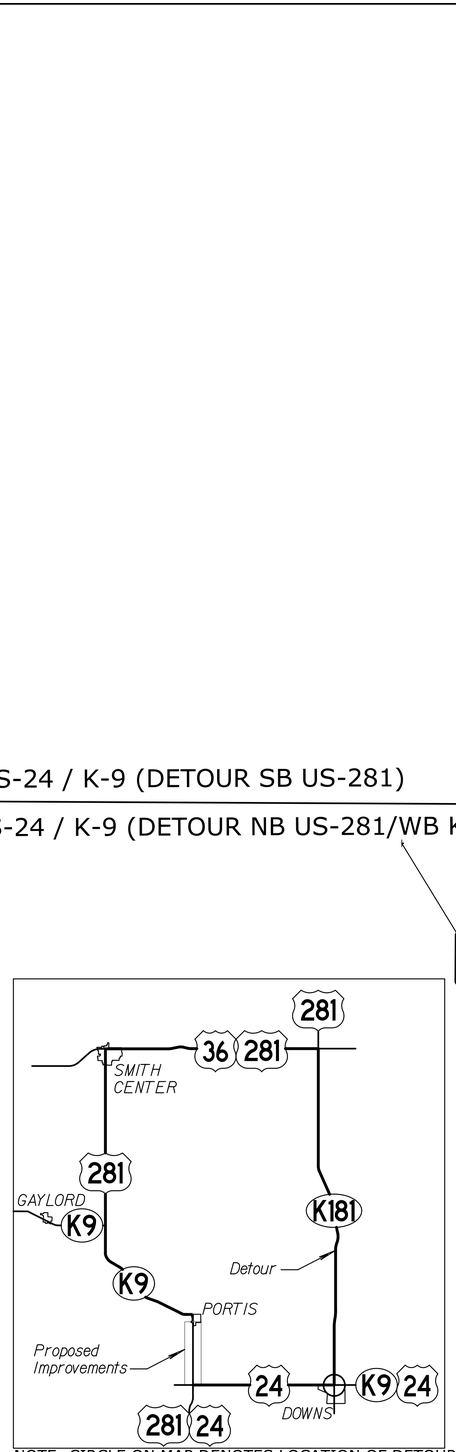
KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	196	293

WB US-24 / K-9 (DETOUR SB US-281)

EB US-24 / K-9 (DETOUR NB US-281/WB K-9)

US-24 / K-9



NOTE: CIRCLE ON MAP DENOTES LOCATION OF DETOUR
SEE FIGURE 1 ON TE704 FOR SIGN SPACING NEAR WORKZONE
NOT TO SCALE

SB K-181 (DETOUR SB US-281/EB K-9)

NB K-181 (DETOUR NB US-281/WB K-9)

K-181

TYPE A LOW INTENSITY WARNING LIGHT
TYPE III BARRICADE
EXISTING

EXISTING SIGN TO BE COVERED OR REMOVED

ALL CONFLICTING ROUTE MARKERS ALONG THE DETOUR ROUTE SHALL BE COVERED OR REMOVED.
EXISTING SIGNS NOT SHOWN AT THESE JUNCTIONS SHALL REMAIN IN PLACE UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
ERECT DETOUR CONFIRMING ASSEMBLIES IN CONJUNCTION WITH EXISTING ROUTE MARKER ASSEMBLIES ALONG DETOUR ROUTE.
THE SPACING BETWEEN PROPOSED SIGNS MAY BE ADJUSTED AS APPROVED BY THE ENGINEER IN ORDER TO MAXIMIZE VISIBILITY.

SCALE
PLAN: Lat. & Long. 100' 0 100' 200'

SHEET 2 of 6

KANSAS DEPARTMENT OF TRANSPORTATION

US-281/K-9 DETOUR PLAN

AREA 2

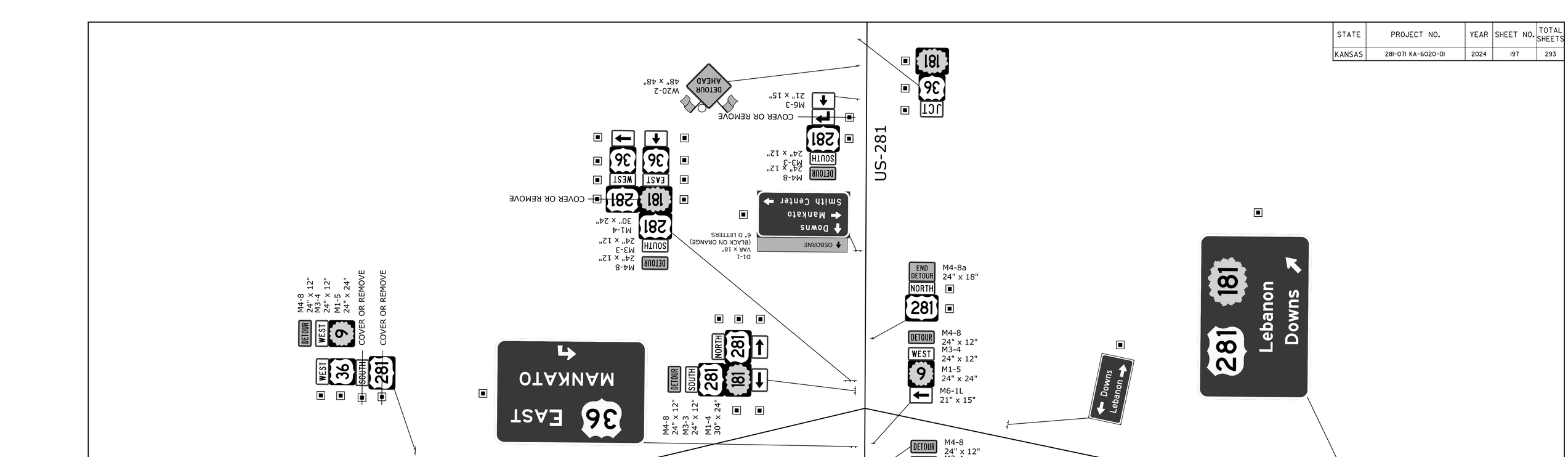
KDOT Graphics Certified 09-01-2023

Sh. No. 196

KDOT Graphics Certified

Drawn By : MDELEON Plotted : 07-11-24
File : c:\pwworking\central01\d2274982\ka602001cdt-03.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	197	293



SHEET 3 of 6

KANSAS DEPARTMENT OF TRANSPORTATION

US-281/K-9 DETOUR PLAN

AREA 3


Drawn By : MDELEON
File : c:\pwworking\central01\d2274982\ka602001cdt-04.dgn
Plotted : 07-11-24

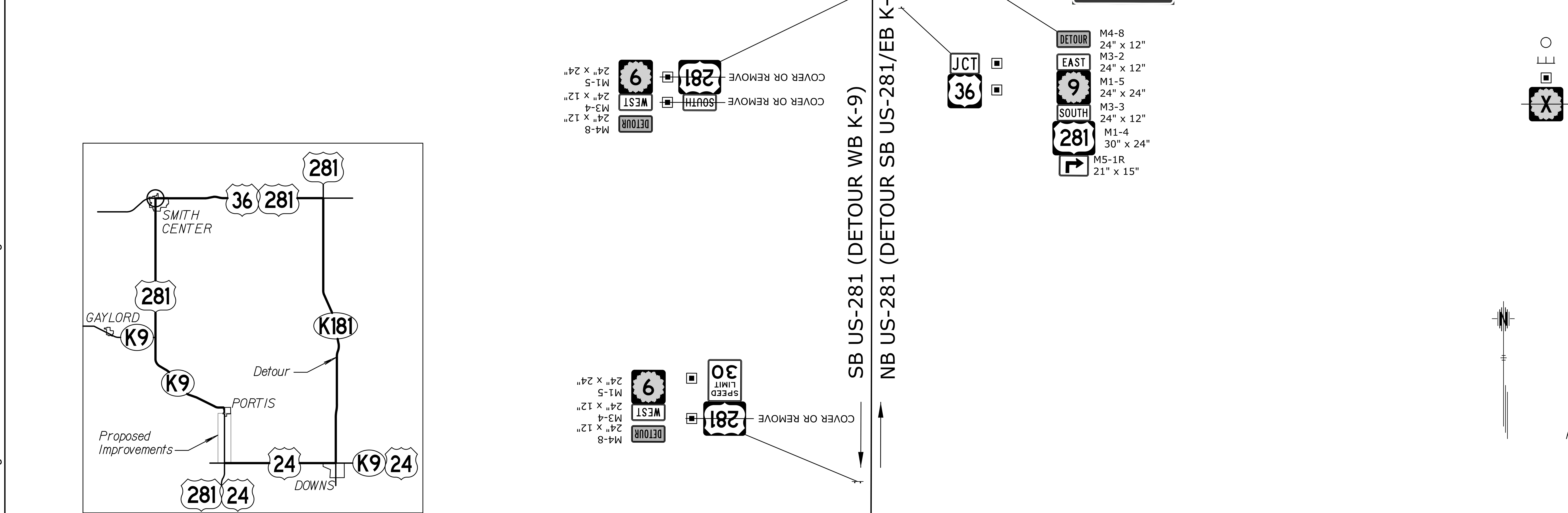
KDOT Graphics Certified 09-01-2023

KDOT Graphics Certified

Sh. No. 197

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	198	293





NOTE: CIRCLE ON MAP DENOTES LOCATION OF DETOUR
SEE FIGURE 1 ON TE704 FOR SIGN SPACING NEAR WORKZONE
NOT TO SCALE

TYPE A LOW INTENSITY WARNING LIGHT
TYPE III BARRICADE
EXISTING
EXISTING SIGN TO BE COVERED OR REMOVED

ALL CONFLICTING ROUTE MARKERS ALONG THE DETOUR ROUTE SHALL BE COVERED OR REMOVED.
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ERECT DETOUR CONFIRMING ASSEMBLIES IN CONJUNCTION WITH EXISTING ROUTE MARKER ASSEMBLIES ALONG DETOUR ROUTE.
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SCALE
PLAN: Lat. & Long. 100' 0 100' 200'

SHEET 4 of 6

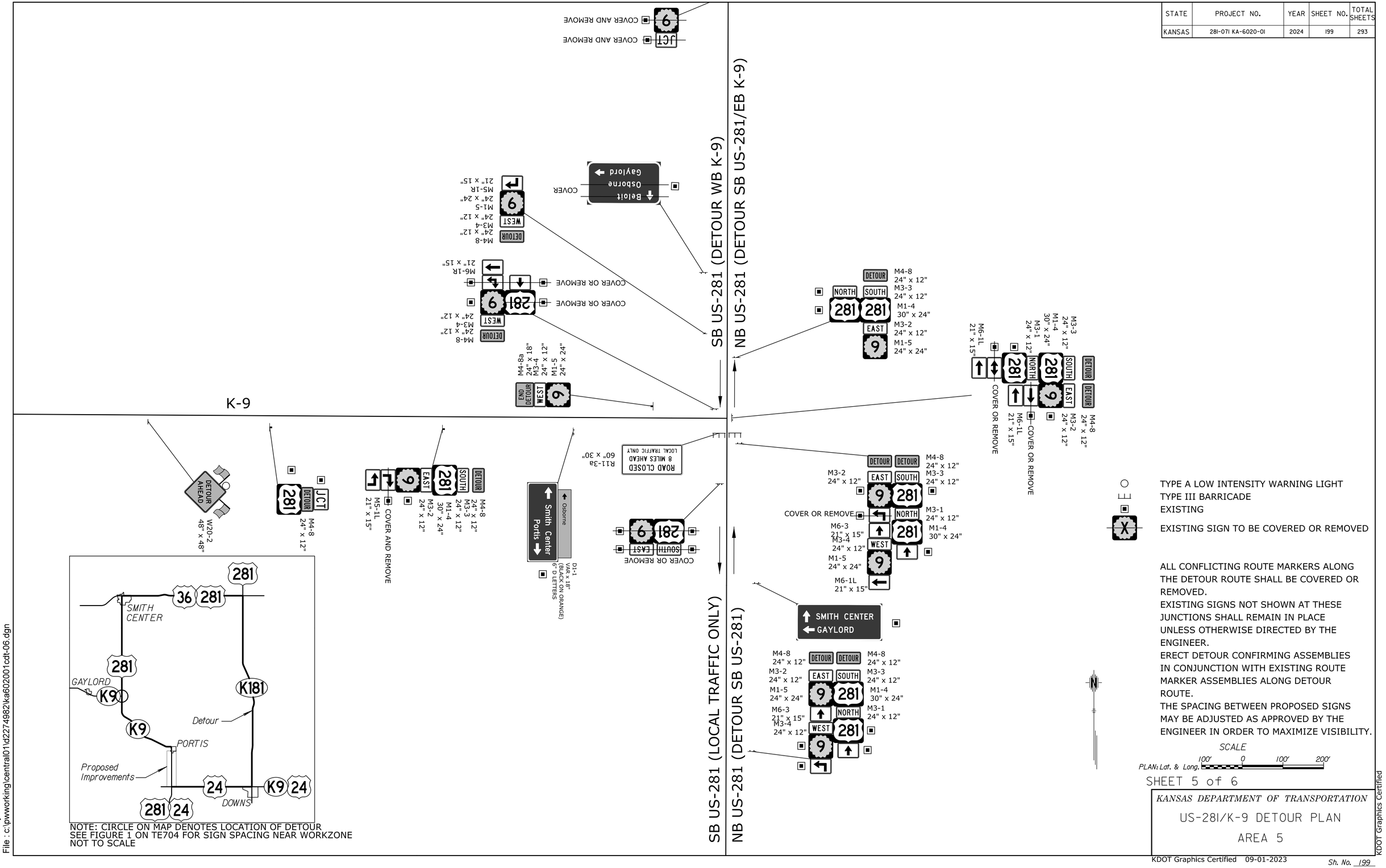
KANSAS DEPARTMENT OF TRANSPORTATION
US-281/K-9 DETOUR PLAN
AREA 4

KDOT Graphics Certified 09-01-2023

Sh. No. 198

Drawn By : MDELEON Plotted : 07-11-24
File : c:\pwworking\central01\d2274982\ka602001cdt-05.dgn
KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	199	293



TYPE A LOW INTENSITY WARNING LIGHT
TYPE III BARRICADE
EXISTING

EXISTING SIGN TO BE COVERED OR REMOVED

ALL CONFLICTING ROUTE MARKERS ALONG THE DETOUR ROUTE SHALL BE COVERED OR REMOVED.
EXISTING SIGNS NOT SHOWN AT THESE JUNCTIONS SHALL REMAIN IN PLACE UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
ERECT DETOUR CONFIRMING ASSEMBLIES IN CONJUNCTION WITH EXISTING ROUTE MARKER ASSEMBLIES ALONG DETOUR ROUTE.
THE SPACING BETWEEN PROPOSED SIGNS MAY BE ADJUSTED AS APPROVED BY THE ENGINEER IN ORDER TO MAXIMIZE VISIBILITY.

SCALE
PLAN: Lat. & Long. 100' 0 100' 200'

SHEET 5 of 6

KANSAS DEPARTMENT OF TRANSPORTATION
US-281/K-9 DETOUR PLAN
AREA 5

KDOT Graphics Certified 09-01-2023

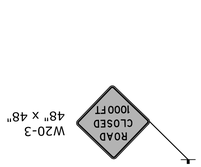
Sh. No. 199

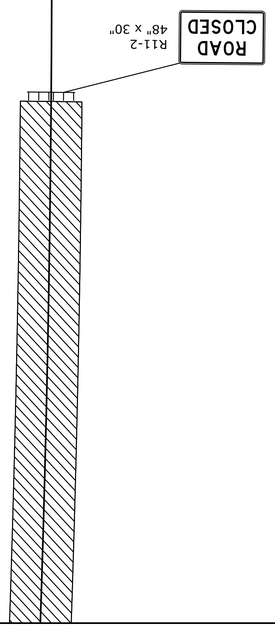
Drawn By : MDELEON Plotted : 07-11-24
File : c:\pwworking\central01\d2274982\ka6020001cdt-06.dgn

KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	200	293

NOTE: CIRCLE ON MAP DENOTES LOCATION OF DETOUR
SEE FIGURE 1 ON TE704 FOR SIGN SPACING NEAR WORKZONE
NOT TO SCALE





TYPE A LOW INTENSITY WARNING LIGHT
TYPE III BARRICADE
EXISTING

EXISTING SIGN TO BE COVERED OR REMOVED

ALL CONFLICTING ROUTE MARKERS ALONG THE DETOUR ROUTE SHALL BE COVERED OR REMOVED.
EXISTING SIGNS NOT SHOWN AT THESE JUNCTIONS SHALL REMAIN IN PLACE UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
ERECT DETOUR CONFIRMING ASSEMBLIES IN CONJUNCTION WITH EXISTING ROUTE MARKER ASSEMBLIES ALONG DETOUR ROUTE.
THE SPACING BETWEEN PROPOSED SIGNS MAY BE ADJUSTED AS APPROVED BY THE ENGINEER IN ORDER TO MAXIMIZE VISIBILITY.



SCALE
PLAN: Lat. & Long. 100' 0 100' 200'

SHEET 6 of 6

KANSAS DEPARTMENT OF TRANSPORTATION

US-281/K-9 DETOUR PLAN

AREA 6

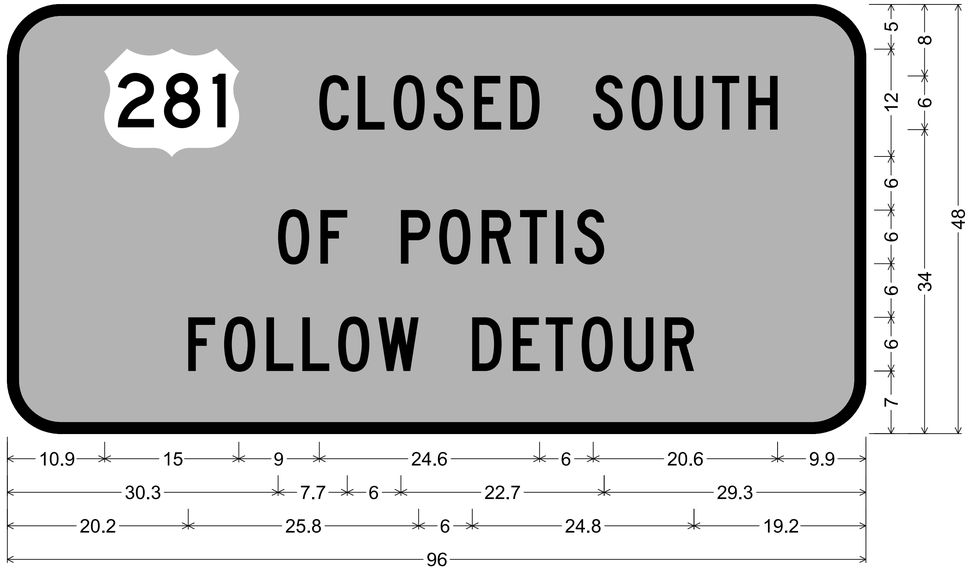
KDOT Graphics Certified 09-01-2023

Sh. No. 200

KDOT Graphics Certified

Drawn By : MDELEON
File : c:\pwworking\central01\d2274982\ka602001cdt-07.dgn
Plotted : 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	201	293



SP-1;
6.0" Radius, 1.3" Border, Black on Orange;
"CLOSED SOUTH", C; "OF PORTIS", C; "FOLLOW DETOUR", C;
Table of distances between letter and object lefts

	281	C	L	O	S	E	D	S	O	U	T	H	
10.9	24.0	4.3	4.0	4.5	4.5	4.0	9.3	4.3	4.7	4.3	4.0	3.3	9.9

	O	F	P	O	R	T	I	S	
30.3	4.7	9.0	4.3	4.7	4.3	4.0	2.1	3.3	29.3

	F	O	L	L	O	W	D	E	T	O	U	R	
20.2	4.0	4.8	4.0	4.0	4.5	10.5	4.5	3.7	4.0	4.7	4.6	3.3	19.2

Drawn By : MDELEON Plotted : 07-11-24
File : c:\pwworking\central01\d2274982\ka602001csl-01.dgn

KANSAS DEPARTMENT OF TRANSPORTATION

DETOUR SIGNING LAYOUT

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-01	2024	202	293

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

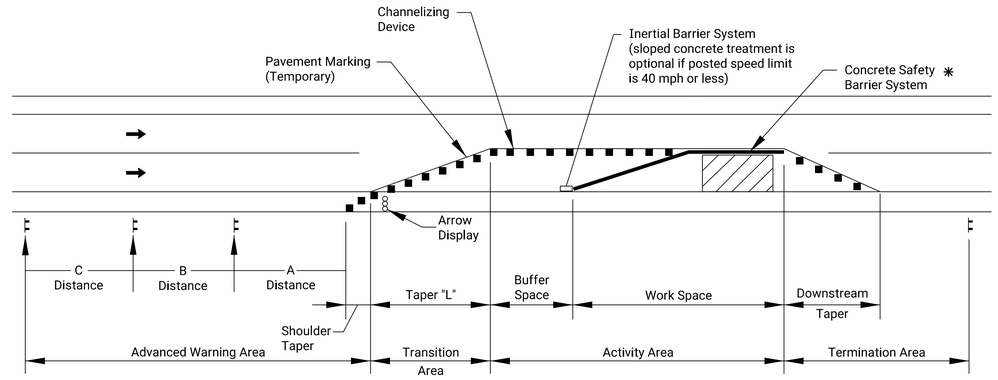
2) Minimum Lane Width: Lane widths shall be a minimum of 11' (measured between centerlines of pavement markings) or as shown on the plans, or as directed by the engineer. A lane width less than 11' may require restricted roadway width signing.

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

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

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

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



TYPICAL WORK ZONE COMPONENTS

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

Minimum advance warning sign spacing (in feet):

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

✳ Posted speed prior to work starting

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

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

Taper Formulas:

L = WS for speeds of 45 MPH or more

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

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

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

Channelizer Placement:

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

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

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

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

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

Buffer Space

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

✳ Posted speed prior to work starting

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

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

NO.	DATE	REVISIONS	BY	APP'D
3				
2	03/13/18	W8-15p usage changed to Shall	R.W.B.	E.G.K.
1	08/18/15	Channelizer spacing info	R.W.B.	K.E.

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL
GENERAL NOTES

TE700

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

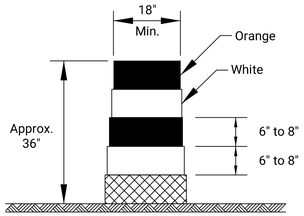
KDOT Graphics Certified 03-13-2018

Sh. No. 202

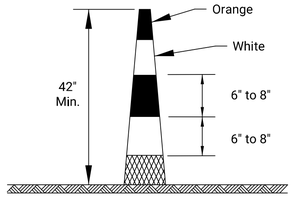
KDOT Graphics Certified

Drawn By : MDELEON Plotted :07-11-24
File : c:\pwworking\central01\d2274982\ka602001css700-01.dgn

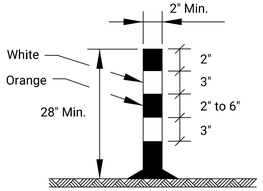
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	203	293



DRUM

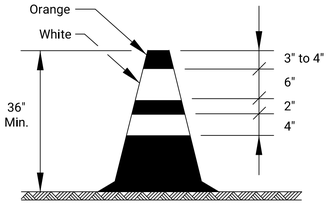


CONICAL DELINEATOR

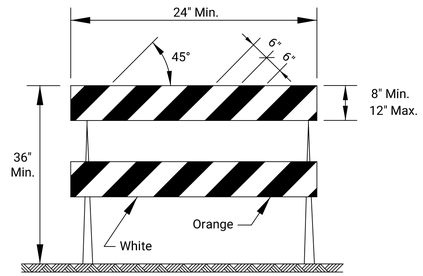


TUBULAR MARKER

Striping as shown for up to 42".

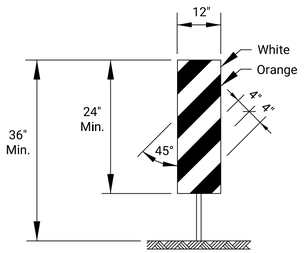


TRAFFIC CONE



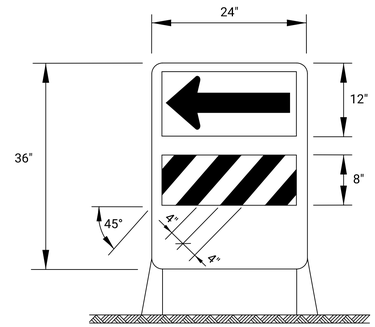
TYPE 2 BARRICADE

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



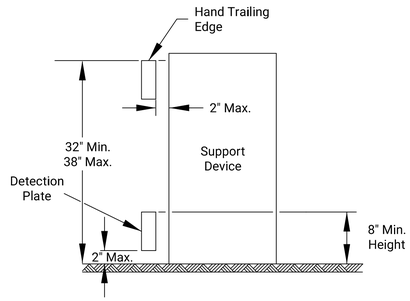
VERTICAL PANEL

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
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL
CHANNELIZING DEVICES

TE702

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

KDOT Graphics Certified 03-29-2018

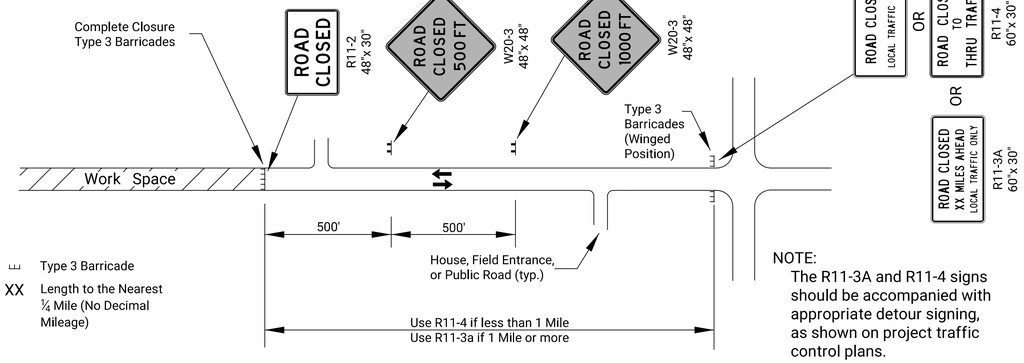
Sh. No. 203

KDOT Graphics Certified

Drawn By : MDELEON Plotted :07-11-24
File : c:\pwworking\central01\d2274982\ka602001css702-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	204	293

Note: Signs shown for one approach to work zone.



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

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

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

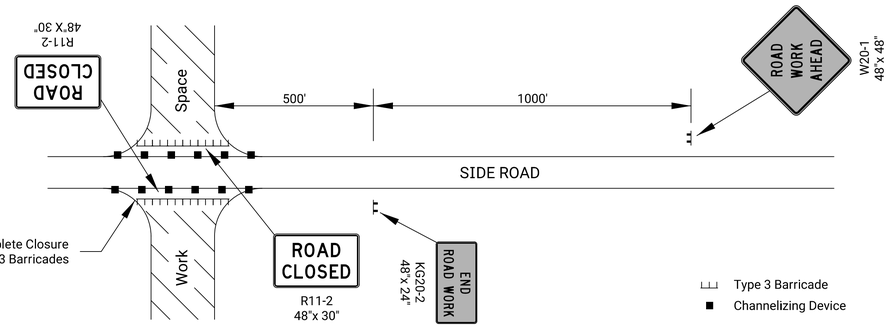


FIGURE 2: TYPICAL SIGNING FOR SIDE ROAD OPEN

Note: Signs shown for one approach to work zone.

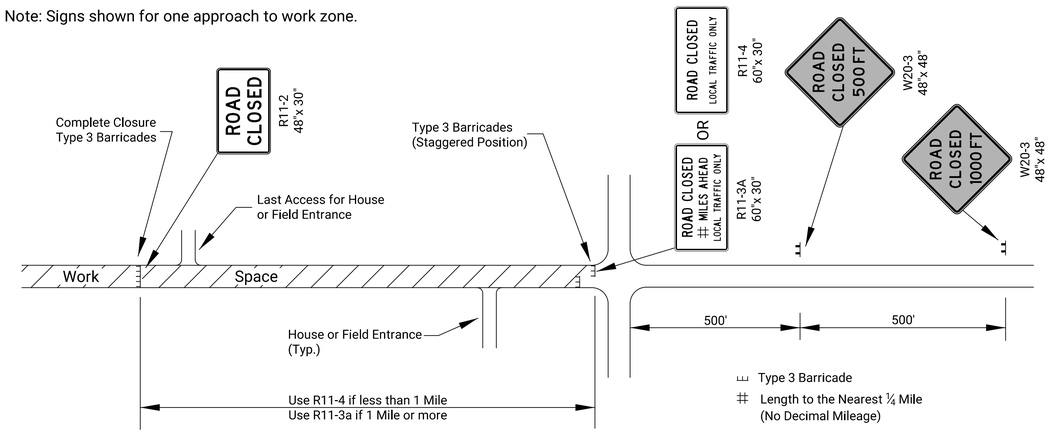


FIGURE 3: TYPICAL SIGNING FOR ROAD CLOSURE - LOCAL TRAFFIC ACCESS

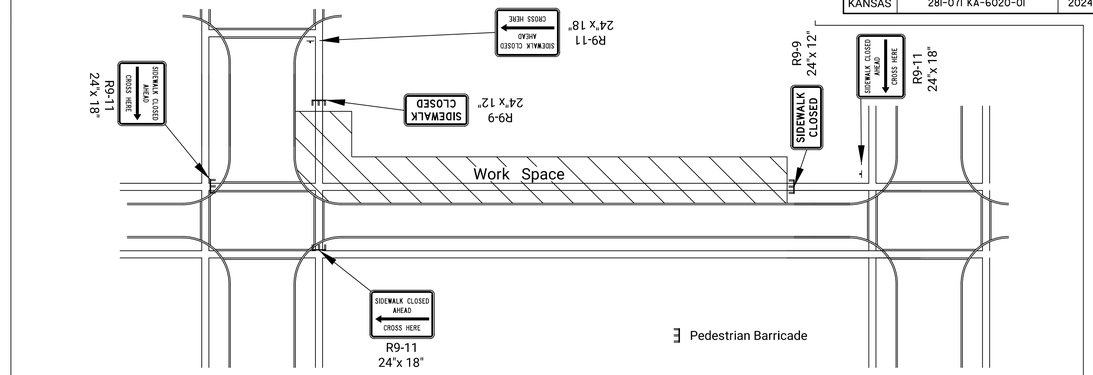
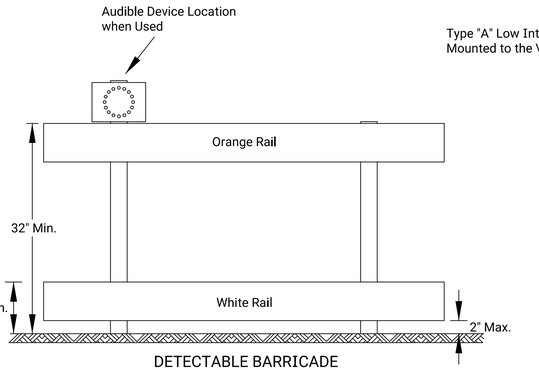
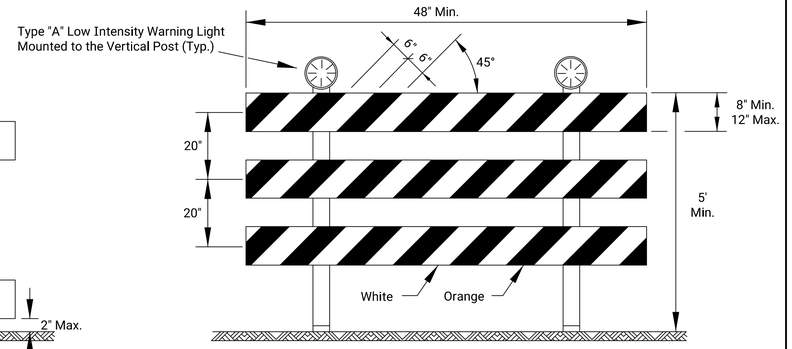


FIGURE 4: TYPICAL SIGNING FOR SIDEWALK CLOSED WITH OPPOSITE SIDEWALK AVAILABLE



DETECTABLE BARRICADE

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



TYPE 3 BARRICADE WITH LIGHTS

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

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

ROAD CLOSED GENERAL NOTES

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

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

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

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

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

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL CLOSURES

TE704

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

KDOT Graphics Certified 03-29-2018

Sh. No. 204

Drawn By : MDELEON Plotted 07-11-24
File : c:\pwworking\central01\d2274982\ka602001css704-01.dgn

KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	205	293

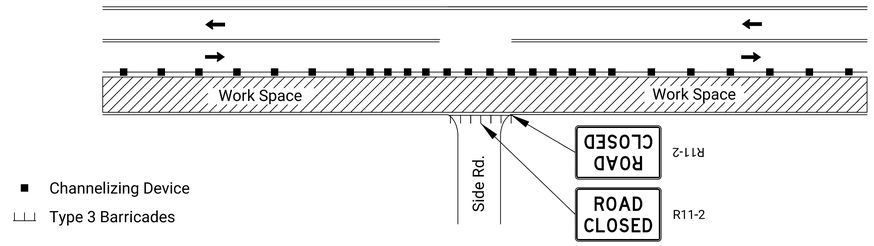


FIGURE 1: SIDE ROAD OR ENTRANCE CLOSED THROUGH WORK AREA

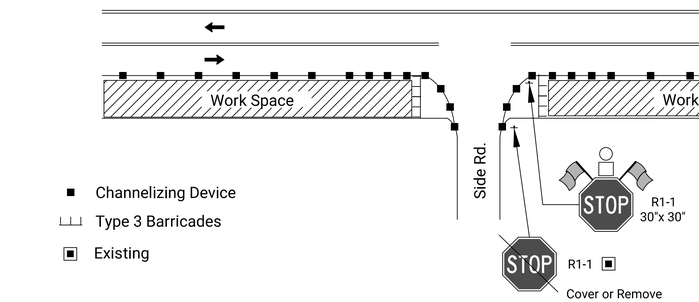


FIGURE 2: SIDE ROAD OR ENTRANCE OPEN THROUGH WORK AREA

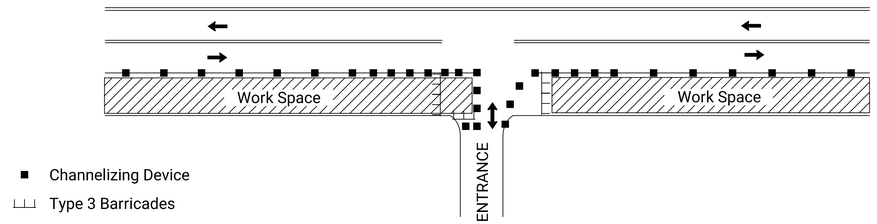


FIGURE 3: LOW VOLUME ENTRANCE CONTRUCTED HALF AT A TIME

Note: Consider large vehicles making right turns into and out of entrance
and use figure 4 as needed

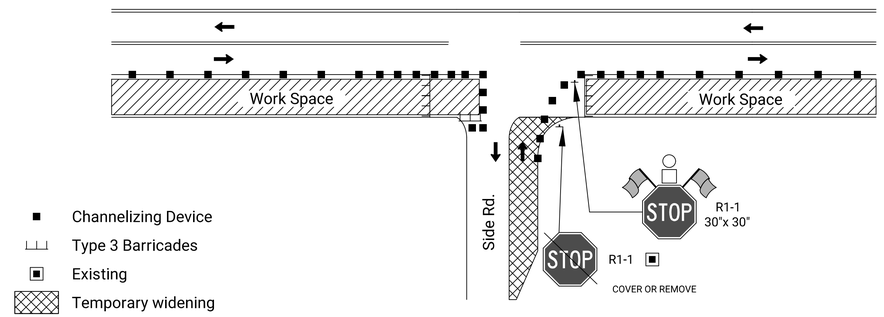


FIGURE 4: SIDE ROAD OR ENTRANCE CONSTRUCTED HALF AT A TIME:
TWO WAY TRAFFIC REQUIRED

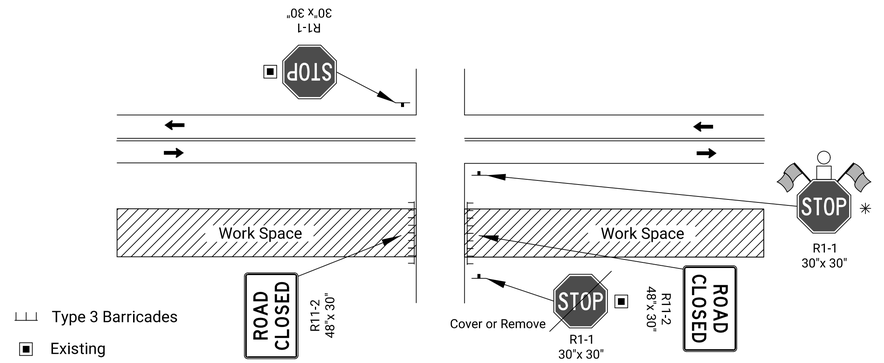


FIGURE 5: SIDE ROAD OPEN THROUGH WORK AREA ON DIVIDED ROADWAY

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL
ACCESS THROUGH THE WORK AREA

TE705

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

KDOT Graphics Certified 03-29-2018

Sh. No. 205

KDOT Graphics Certified

Drawn By : MDELEON Plotted 07-11-24
File : c:\pwworking\central01\d2274982\ka6020001css705-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	206	293

SIGN LAYOUT INFORMATION

END ROAD WORK
KG20-2
Std. Size Expwy/Freeway: 6" C, 48"x 24"

WAIT FOR PILOT CAR
KG20-5
Std. Size Expwy/Freeway: 6" C, 48"x 24"

WORK ZONE
KM4-20
Std. Size: 3" C, 24"x 6"
Expwy/Freeway: 6" C, 48"x 12"

NEXT X MILES
W7-3a
Mileage to be Determined by the Engineer.


W8-17
Std. Size Expwy/Freeway: 48"x 48"

SHOULDER DROP-OFF
W8-17P (Optional)
Std. Size Expwy/Freeway: 30"x 24"

GROOVED PAVEMENT
W8-15
Std. Size Expwy/Freeway: 8" D, 48"x 48"

LOOSE GRAVEL
W8-7
Std. Size Expwy/Freeway: 8" D, 48"x 48"


W8-15p
Std. Size Expwy/Freeway: 30"x 24"

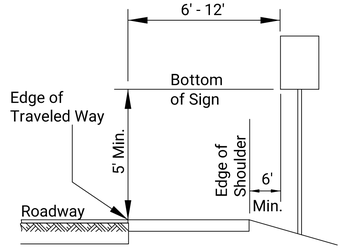
UNEVEN LANES
W8-11
Std. Size Expwy/Freeway: 8" D, 48"x 48"

NB US-75 CLOSED
FOLLOW DETOUR
SP-01 (Special Sign)
Std. Size: 6" C
Expwy/Freeway: 10" D

US-75 CLOSED
NORTH OF Topeka
FOLLOW DETOUR
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.

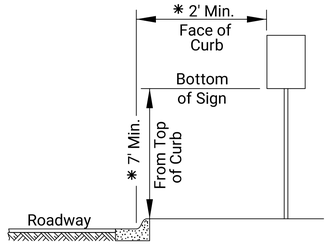


RURAL

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.

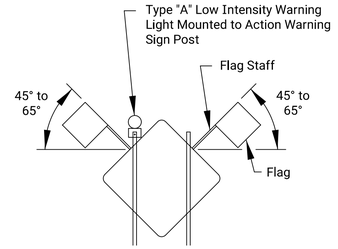
2) Neither portable nor permanent sign supports should be located on sidewalks or areas designated for pedestrian or bicycle traffic.

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.

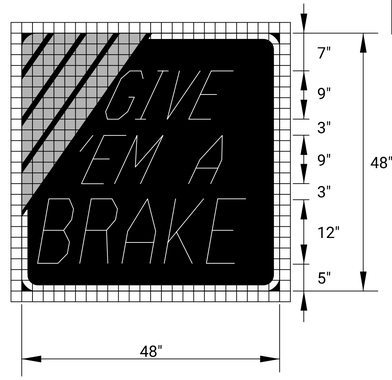
5) Large signs having an area exceeding 50 square feet installed on multiple breakaway posts shall be mounted a minimum of 7' above the ground.

* 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.



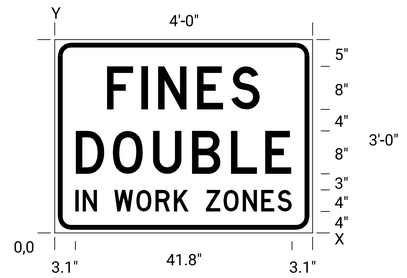
When the sign width is equal to or greater than 9', three or more wood posts may be used with a minimum of 4' between the centerline of each post. All signs less than 9' in width shall use a maximum of two wood posts.

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

Notes:

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

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

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

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL SIGN INFORMATION

TE710

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

KDOT Graphics Certified 03-29-2018

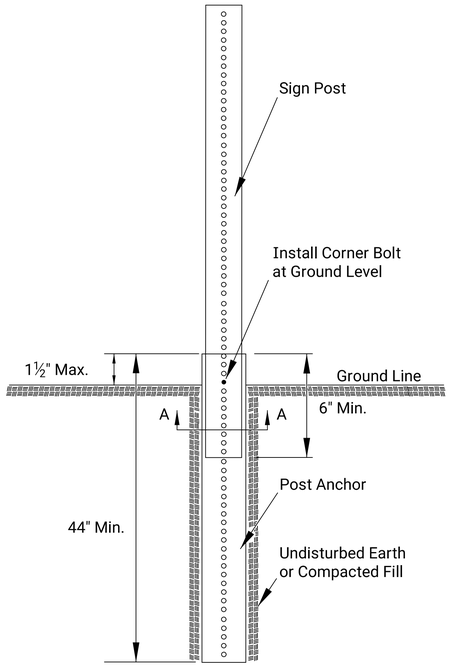
KDOT Graphics Certified

Sh. No. 206

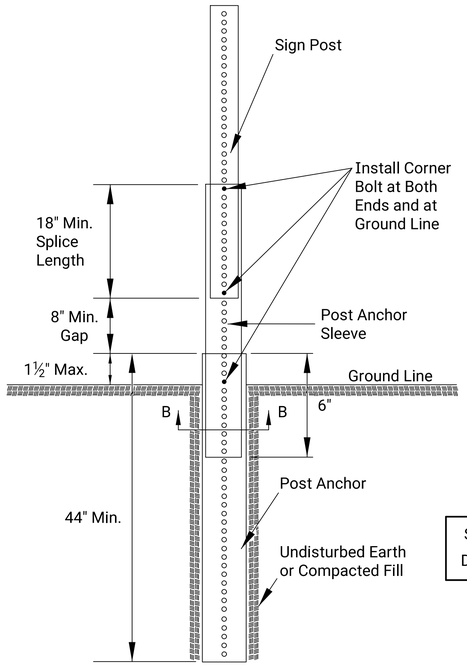
Drawn By : MDELEON
File : c:\pwworking\central01\d2274982\ka602001tcss710-01.dgn
Plotted :07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-071 KA-6020-01	2024	207	293

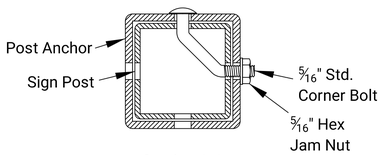
PERFORATED SQUARE STEEL TUBE (P.S.S.T.) POST SETUP



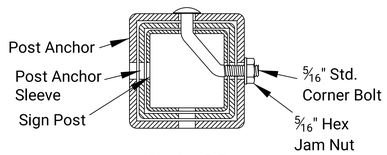
P.S.S.T. Detail



Telescoping P.S.S.T. Detail



Section A-A

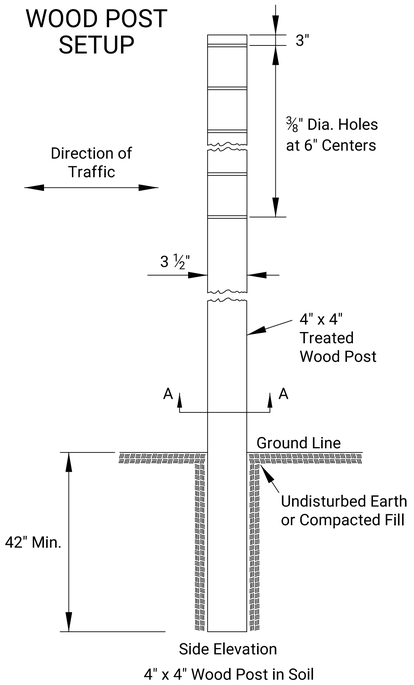


Section B-B

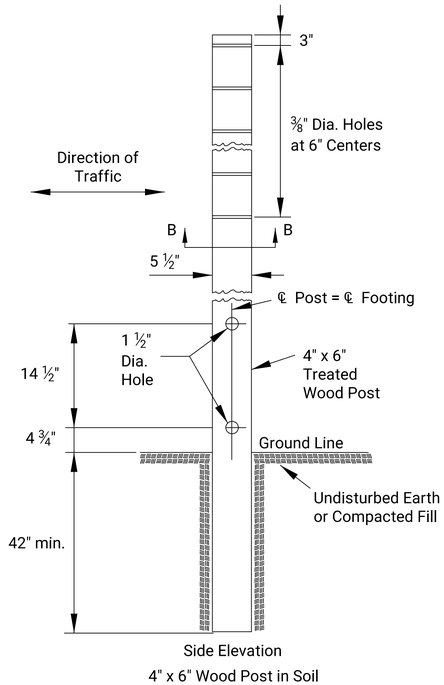
Details for 2", 2 ¼", or 2 ½" sign posts

Place bolts in the same corner along each sign post.

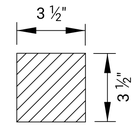
WOOD POST SETUP



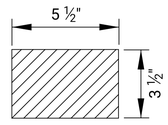
Side Elevation
4" x 4" Wood Post in Soil



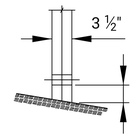
Side Elevation
4" x 6" Wood Post in Soil



Section A-A



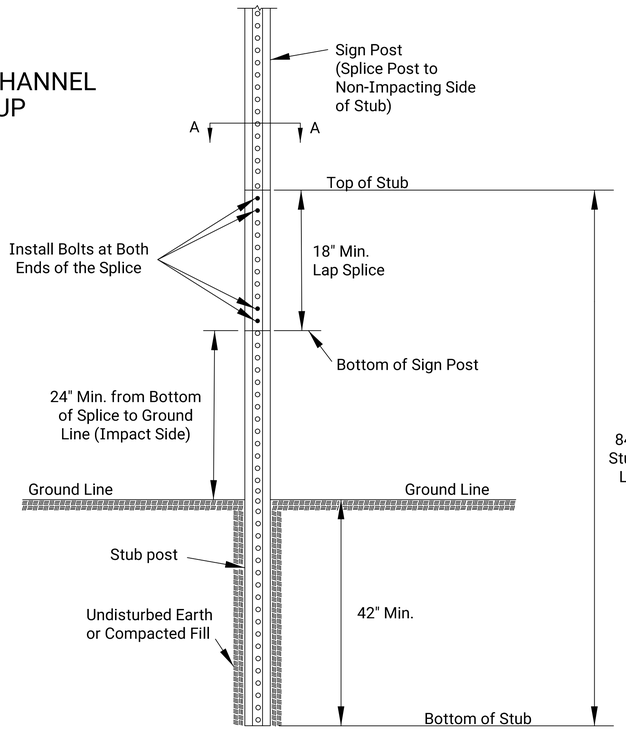
Section B-B



Front Elevation

See TE710 for Additional Details and Requirements

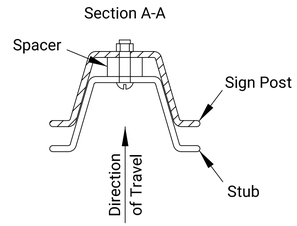
3 LB/F U-CHANNEL SETUP



Notes:

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

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



NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL SIGN POSTS

TE712

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

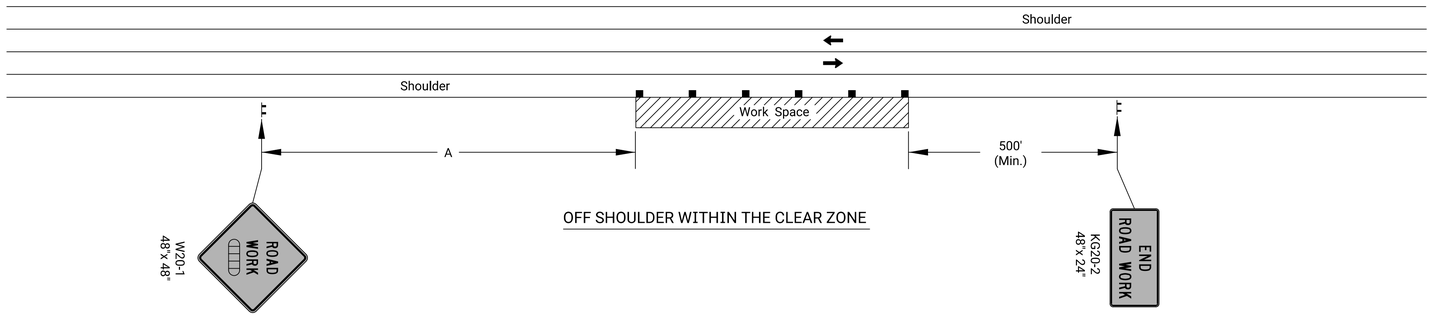
KDOT Graphics Certified 03-29-2018

Sh. No. 207

KDOT Graphics Certified

Drawn By : MDELEON Plotted :07-11-24
File : c:\pwworking\central01\d2274982\ka602001css712-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-01	2024	208	293

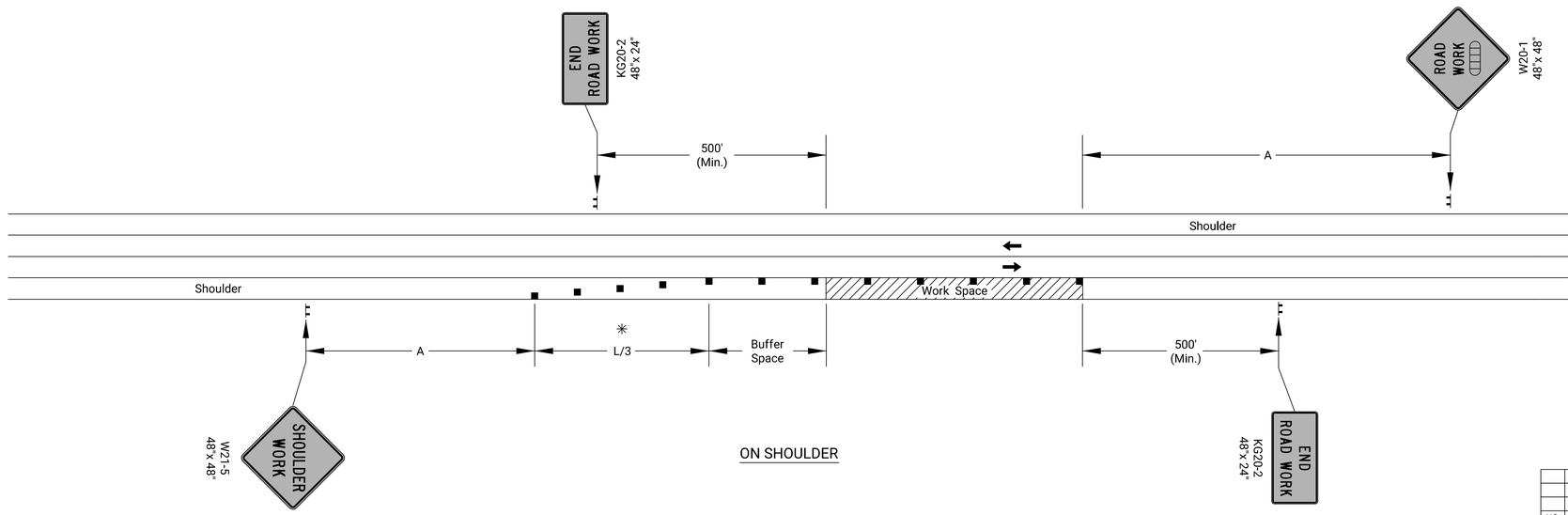


OFF SHOULDER WITHIN THE CLEAR ZONE

Notes:

No traffic control is required if the Work Space is located outside of the clear zone.

For operations of 60 minutes or less, all signs and channelizing devices may be eliminated if a vehicle with high-intensity rotating, flashing, oscillating, or strobe lights is used.



ON SHOULDER

✳ Omit taper if paved shoulder is less than 8' wide.

■ Channelizing Device

Ahead, 1500 ft, or 1 Mile

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL SHOULDER WORK UNDIVIDED ROADWAY

TE720

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

KDOT Graphics Certified 07-18-2022

Sh. No. 208

KDOT Graphics Certified

Drawn By : MDELEON Plotted :07-11-24
File : c:\pwworking\central01\d2274982\ka602001css720-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	28I-07I KA-6020-0I	2024	209	293

SUMMARY OF TRAFFIC CONTROL DEVICES (EACH)

Work Zone Sign (Special)		
Sign No.	16.25 Sq.Ft. & Less	16.26 Sq.Ft. & Over
SP-1		1

SUMMARY OF TRAFFIC CONTROL DEVICES (EACH PER DAY)

✳ Quantity most used on the project at any one time

Work Zone Signs ✳			
Sign No.	Size - Sq.Ft.		
	0-9.25	9.26-16.25	16.26 & Over
W20-7		2	
D1-1	11		
D1-2		1	
M1-4	48		
M1-5	63		
M3-1	20		
M3-2	36		
M3-3	38		
M3-4	33		
M4-8	85		
M4-8a	4		
M4-10L	1		
M4-10R	2		
M5-1L	4		
M5-1R	6		
M5-2R	2		
M6-1L	9		
M6-1R	5		
M6-2R	2		
M6-3	8		
M6-4	1		
R11-2		3	
R11-3a		3	
W20-1	2		
W20-2	3		
W20-3	2		
W21-5	1		
KG20-2	3		

Barricades ✳		Channelizing Devices ✳		
Type 3 (4' to 12')	Pedestrian	Fixed	Portable	Pedestrian
29			16	

Lighted Devices ✳	
Work Zone Warning Light (Type "A" Low Intensity)	19
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.)	95,310	Each Per Day
Work Zone Signs (9.26 to 16.25 Sq.Ft.)	2210	Each Per Day
Work Zone Signs (16.26 Sq.Ft. & Over)		Each Per Day
Work Zone Barricades (Type 3 - 4' to 12')	7110	Each Per Day
Work Zone Barricades (Pedestrian)		Each Per Day
Channelizer (Fixed)		Each Per Day
Channelizer (Portable)	3920	Each Per Day
Channelizer (Pedestrian)		Each Per Day
Work Zone Warning Light (Type "A" Low Intensity)	4660	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)	1	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	Lump Sum
Traffic Control		Lump Sum
Flagger (Set Price)	1	Hour

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL
SUMMARY OF DEVICES
RECAPITULATION OF QUANTITIES

TE795

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

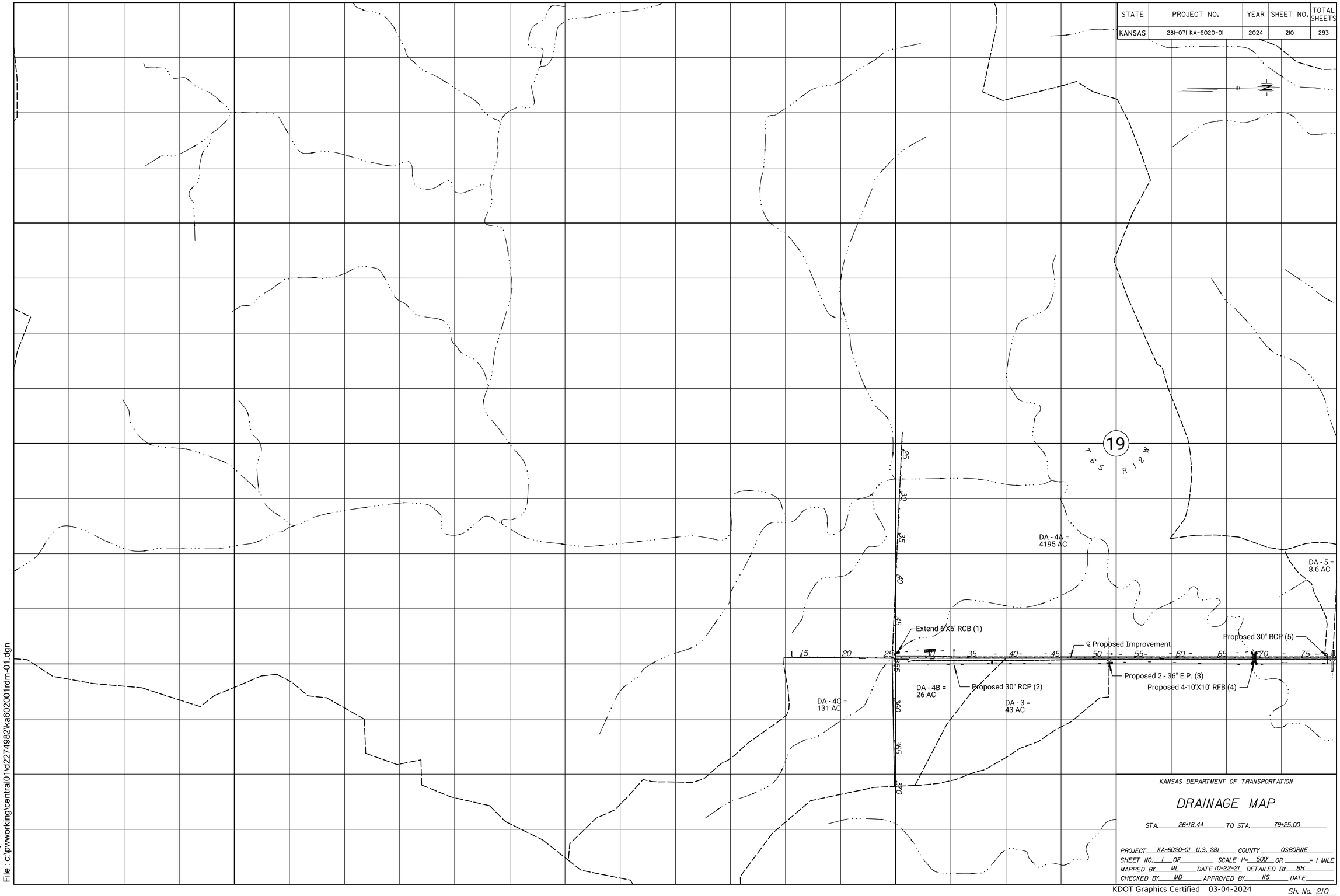
KDOT Graphics Certified 01-05-2023

KDOT Graphics Certified

Sh. No. 209

Drawn By : MDELEON Plotted :07-11-24
File : c:\pwworking\central01\d2274982\ka602001css795-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	210	293



KANSAS DEPARTMENT OF TRANSPORTATION

DRAINAGE MAP

STA. 26+18.44 TO STA. 79+25.00

PROJECT KA-6020-01 U.S. 281 COUNTY OSBORNE

SHEET NO. 1 OF _____ SCALE 1"= 500' OR _____ = 1 MILE

MAPPED BY ML DATE 10-22-21 DETAILED BY BH

CHECKED BY MD APPROVED BY KS DATE _____

Sh. No. 210

KDOT Graphics Certified 03-04-2024

KDOT Graphics Certified

Drawn By : MDELEON Plotted : 07-11-24

File : c:\pwworking\central01\d2274982\ka602001rdm-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	211	293

18 T 6 S R 12 W

07 T 6 S R 12 W

06 T 6 S R 12 W

DA - 13C = 880 AC

DA - 6 = 20 AC

DA - 13D = 65 AC

DA - 7 = 35 AC

DA - 13B = 620 AC

DA - 13A = 501 AC

DA - 14 = 4.1 AC

DA - 15 = 63 AC

Proposed 2 - 9'X4' RFB (10)

Proposed 7'X3' RFB (9)

Proposed 2 - 30" E.P. (8)

℄ Proposed Improvement

Proposed 6' x 2' RFB (6)

Proposed 2 - 6'X2' RFB (11)

Proposed 2 - 36" E.P. (7)

Proposed 2 - 9'X6' RFB (12)

Proposed 2 - 14'X6' RFB (13)

Proposed 36" E.P. (14)

Proposed 4'X4' RCB (15)

80 85 90 95 100 105 110 115 120 125 130 135 140 145 150 155 160 165 170 175 180 185 190 195 200 205 210 215 220 225

35 40 45

Plotted : 07-11-24
Drawn By : MDELEON
File : c:\pwworking\central01\d2274982\ka602001rdm-02.dgn

KANSAS DEPARTMENT OF TRANSPORTATION

DRAINAGE MAP

STA. 79+25.00 TO STA. 210+40.00

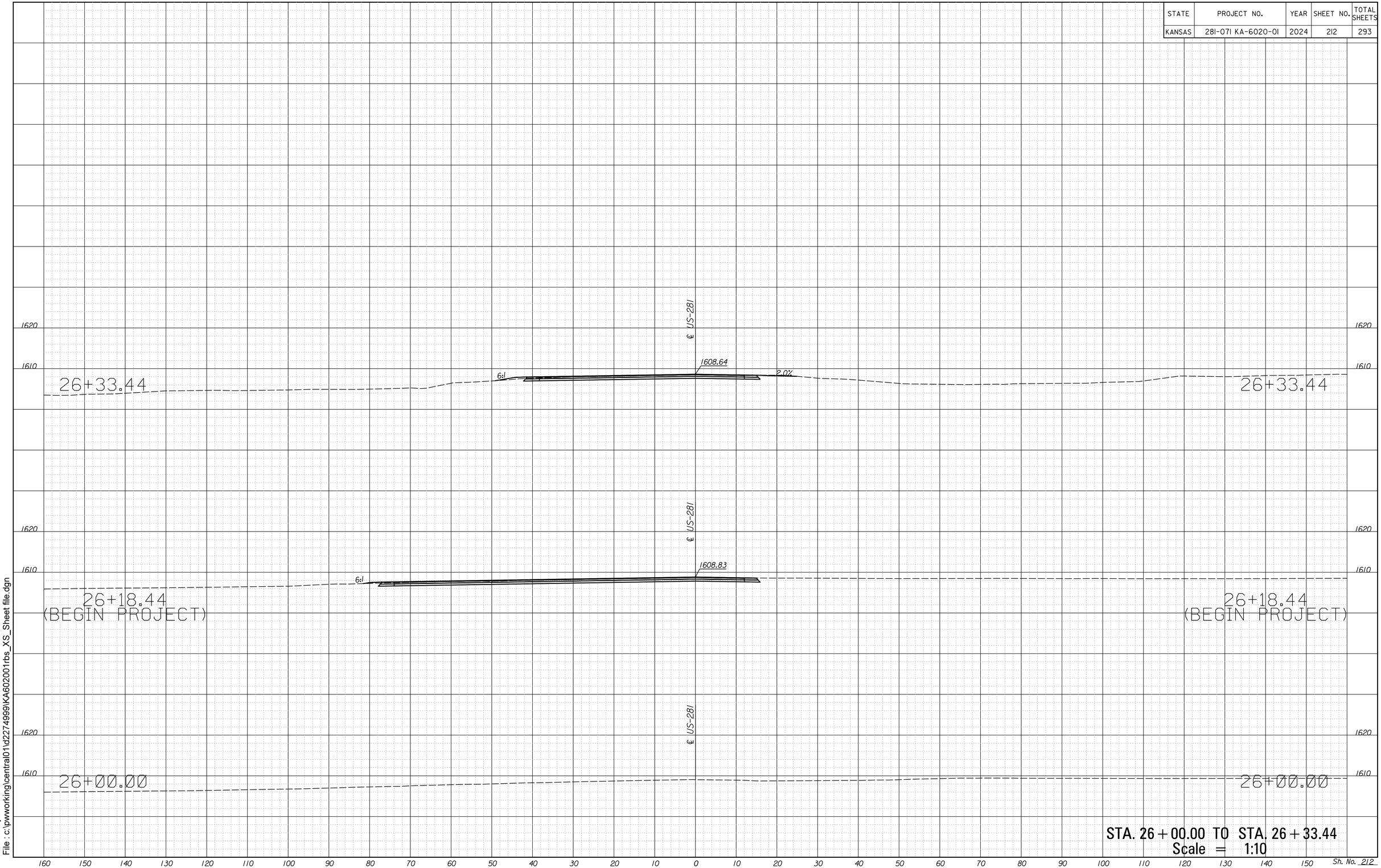
PROJECT KA-6020-01 U.S. 281 COUNTY OSBORNE
SHEET NO. 1 OF SCALE 1"= 500' OR = 1 MILE
MAPPED BY ML DATE 10-22-21 DETAILED BY BH
CHECKED BY MD APPROVED BY KS DATE

KDOT Graphics Certified 03-04-2024

Sh. No. 211

KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	212	293

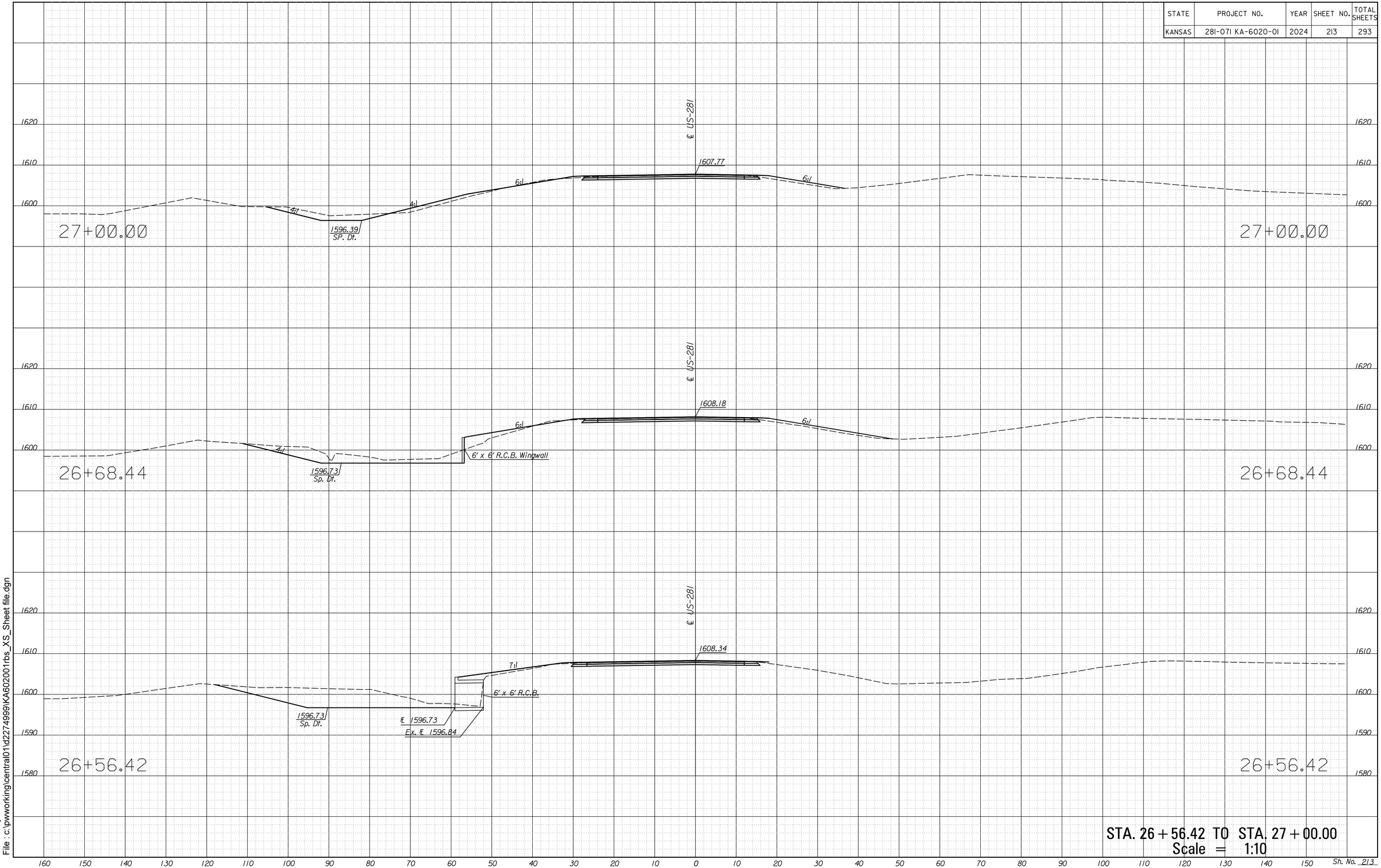


STA. 26 + 00.00 TO STA. 26 + 33.44
Scale = 1:10

Sh. No. 212

Drawn By : MDELEON Plotted : 07-11-24
File : c:\pwworking\central01\d2274999\KA6020001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	213	293

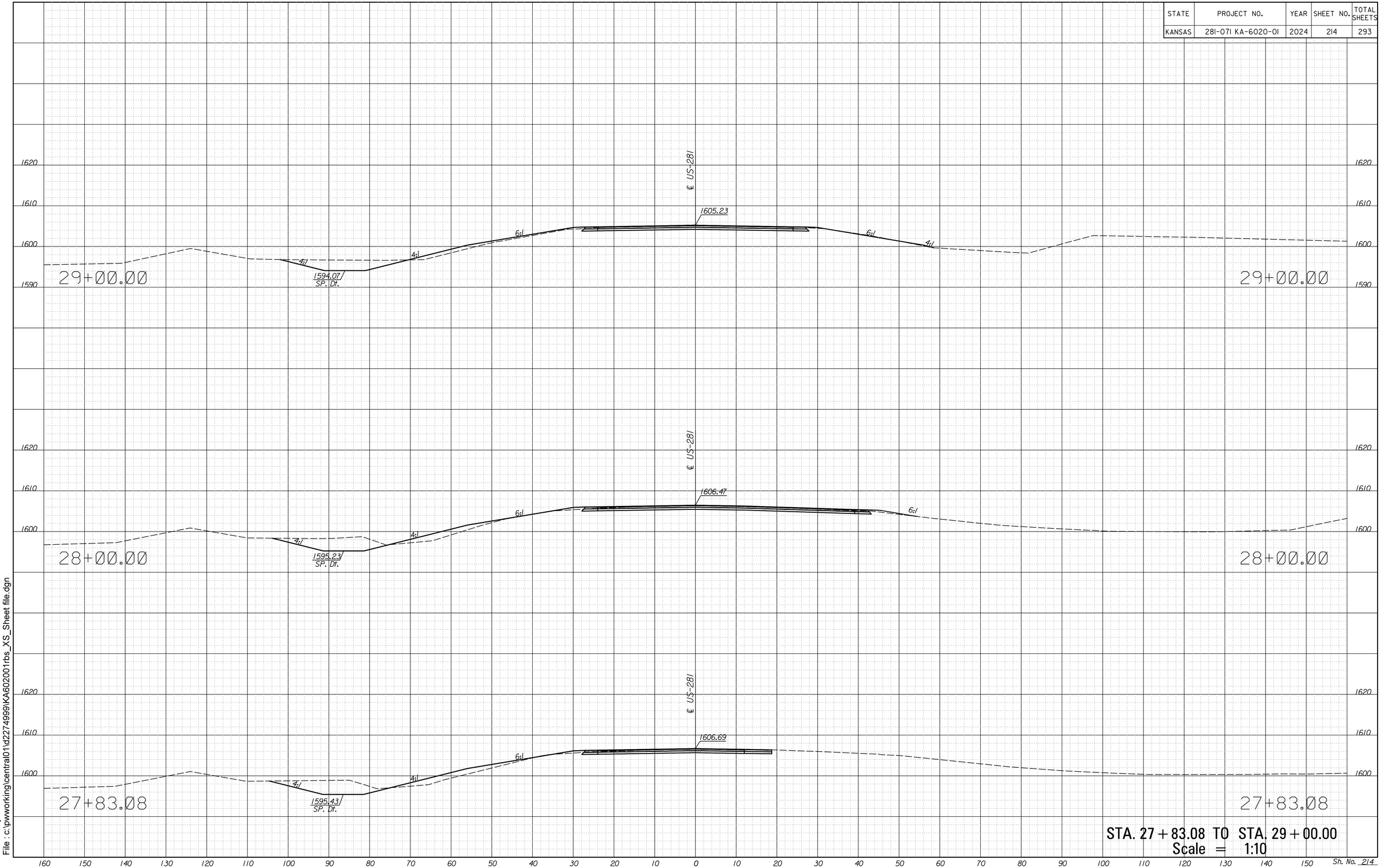


STA. 26 + 56.42 TO STA. 27 + 00.00
Scale = 1:10

Sh. No. 213

Drawn By: MDELEON Plotted: 07-11-24
File: c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	214	293



STA. 27 + 83.08 TO STA. 29 + 00.00

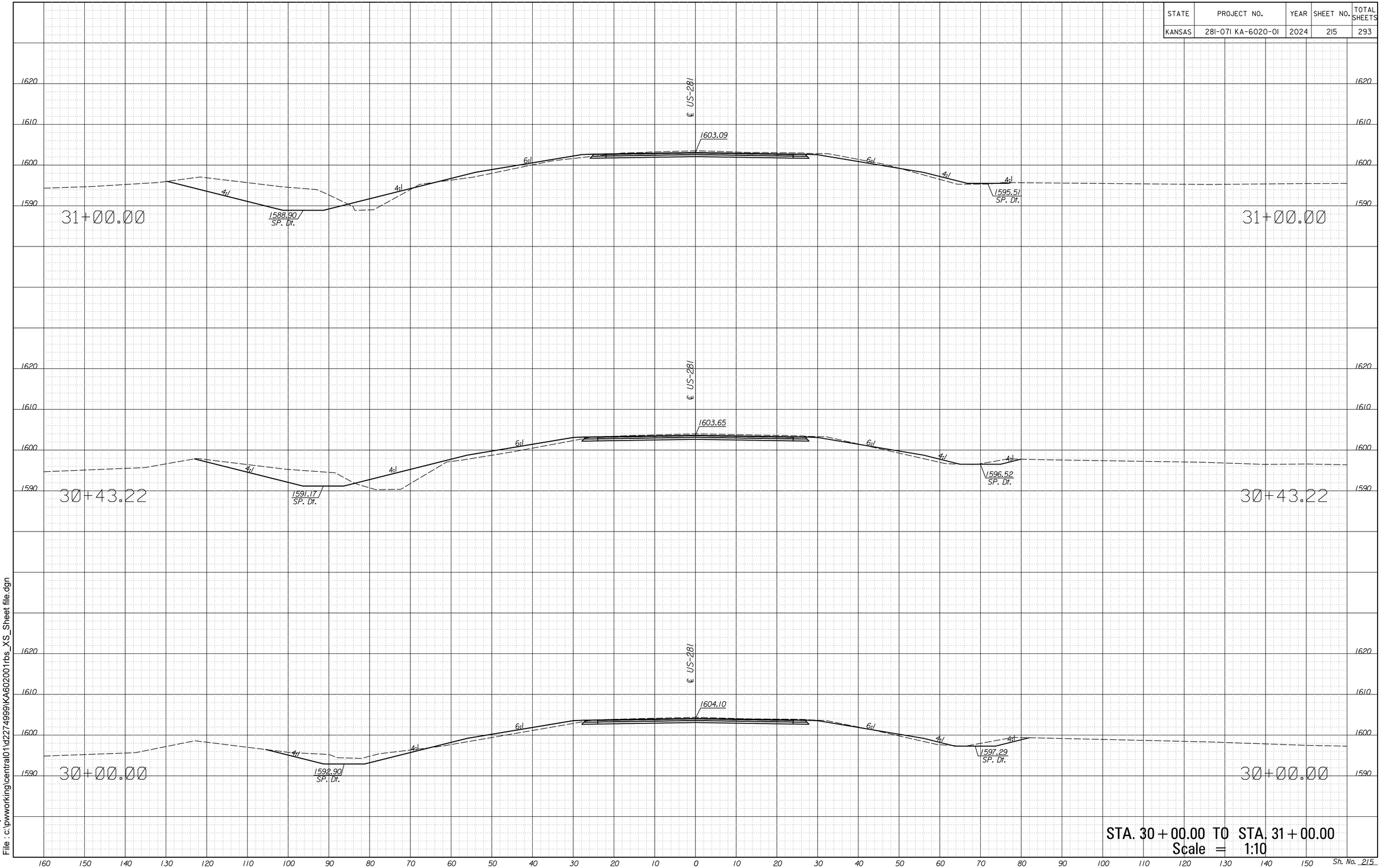
Scale = 1:10

Sh. No. 214

Drawn By: MDELEON Plotted: 07-11-24

File: c:\pwworking\central01\d2274999\KA6020001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	215	293

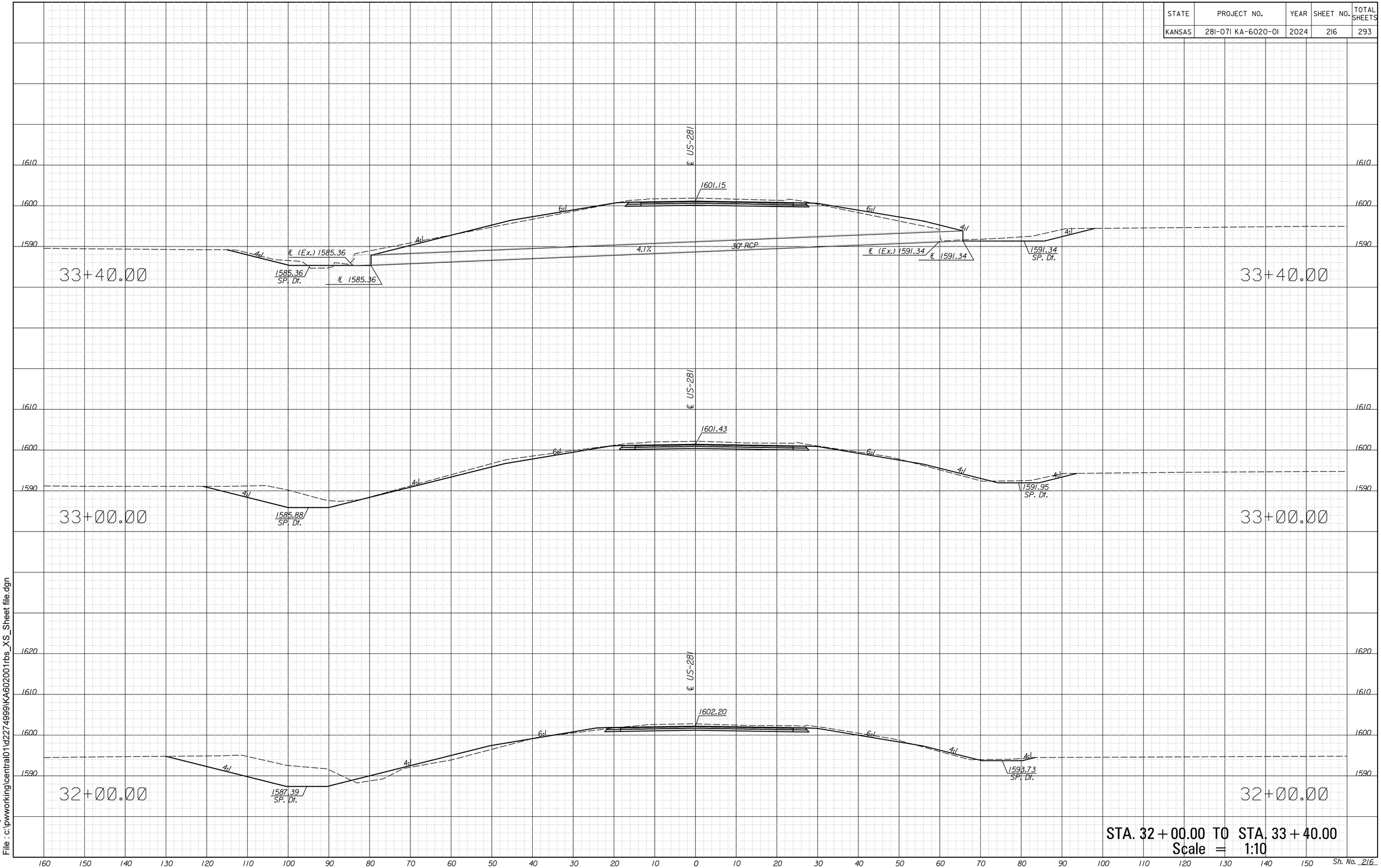


STA. 30 + 00.00 TO STA. 31 + 00.00
Scale = 1:10

Sh. No. 215

Drawn By: MDELEON
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn
Plotted :07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	216	293

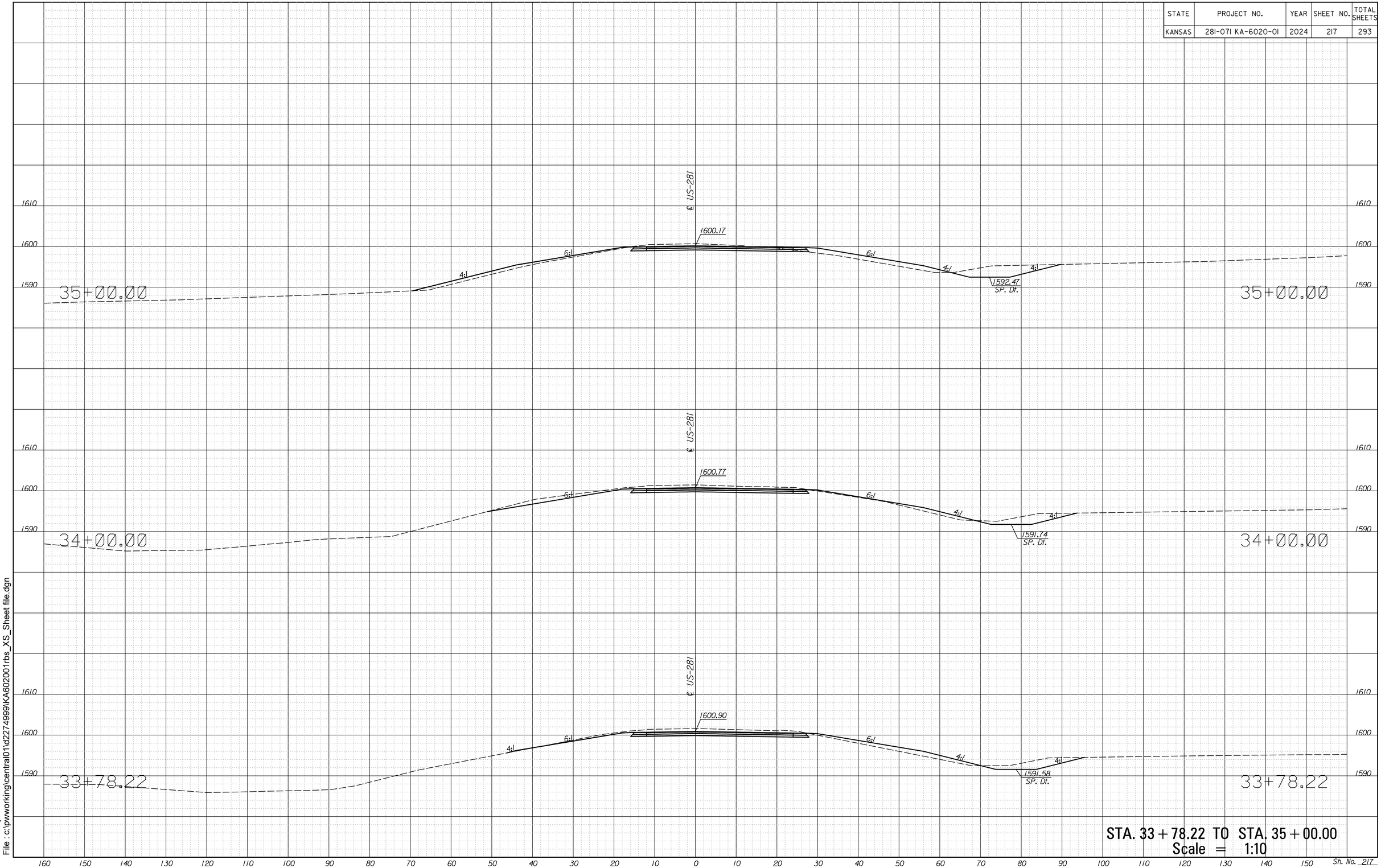


STA. 32 + 00.00 TO STA. 33 + 40.00
Scale = 1:10

Sh. No. 216

Drawn By: MDELEON
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn
Plotted :07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	217	293

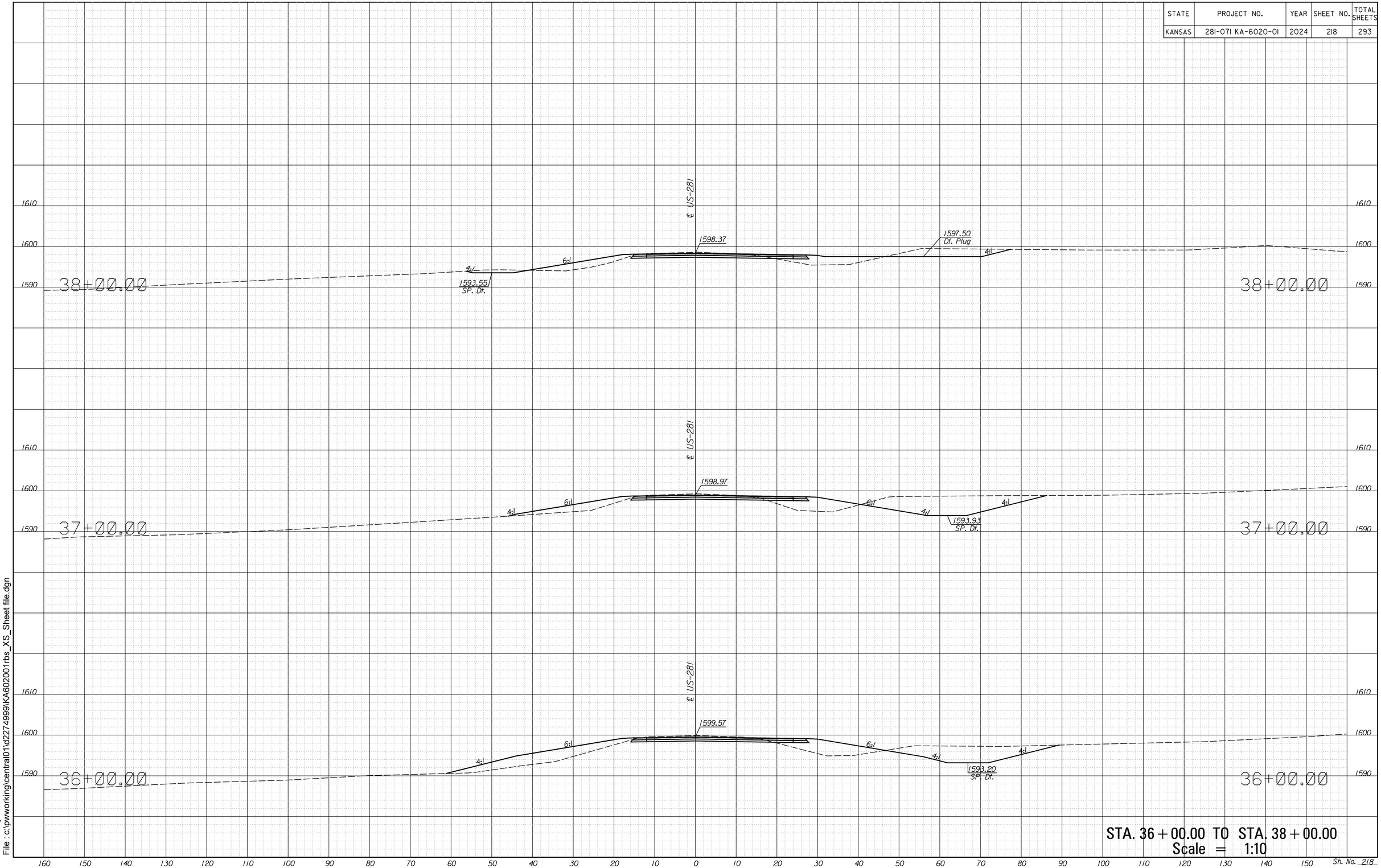


STA. 33 + 78.22 TO STA. 35 + 00.00
Scale = 1:10

Sh. No. 217

Drawn By: MDELEON Plotted: 07-11-24
File: c:\pwworking\central01\d2274999\KA6020001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	218	293



STA. 36 + 00.00 TO STA. 38 + 00.00

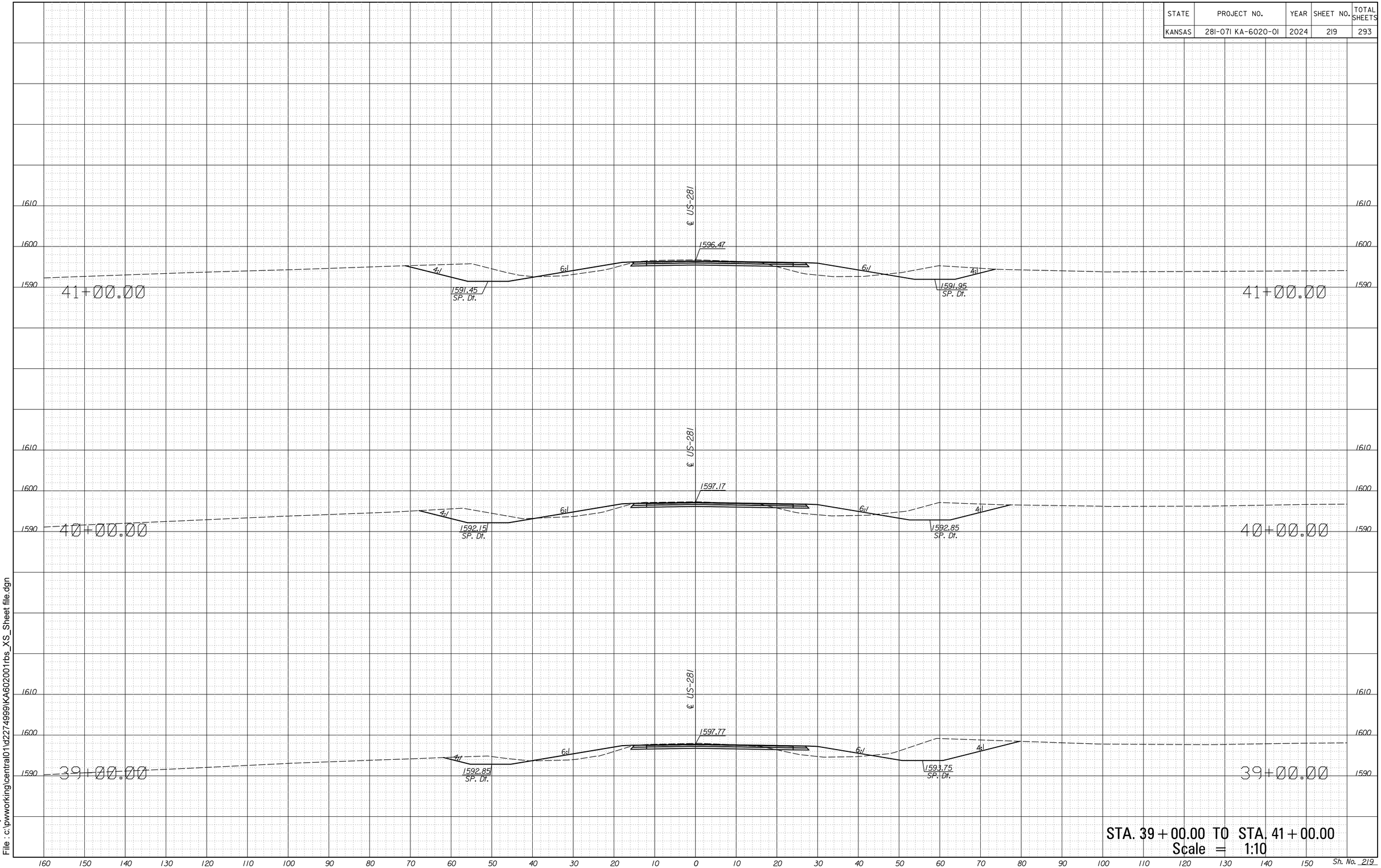
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Sh. No. 218

Drawn By: MDELEON Plotted: 07-11-24

File: c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	219	293

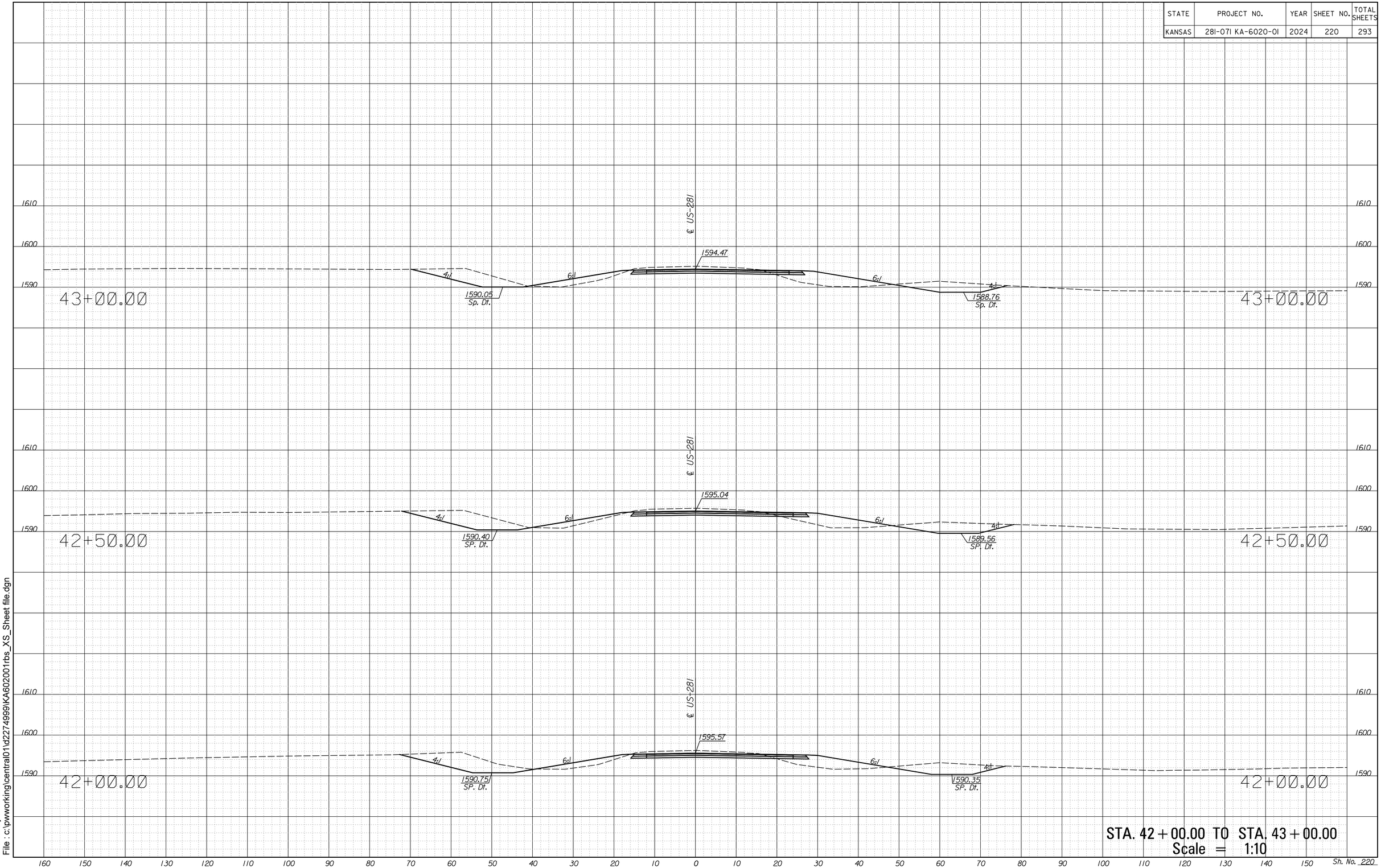


STA. 39 + 00.00 TO STA. 41 + 00.00
Scale = 1:10

Sh. No. 219

Drawn By: MDELEON Plotted: 07-11-24
File: c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	220	293

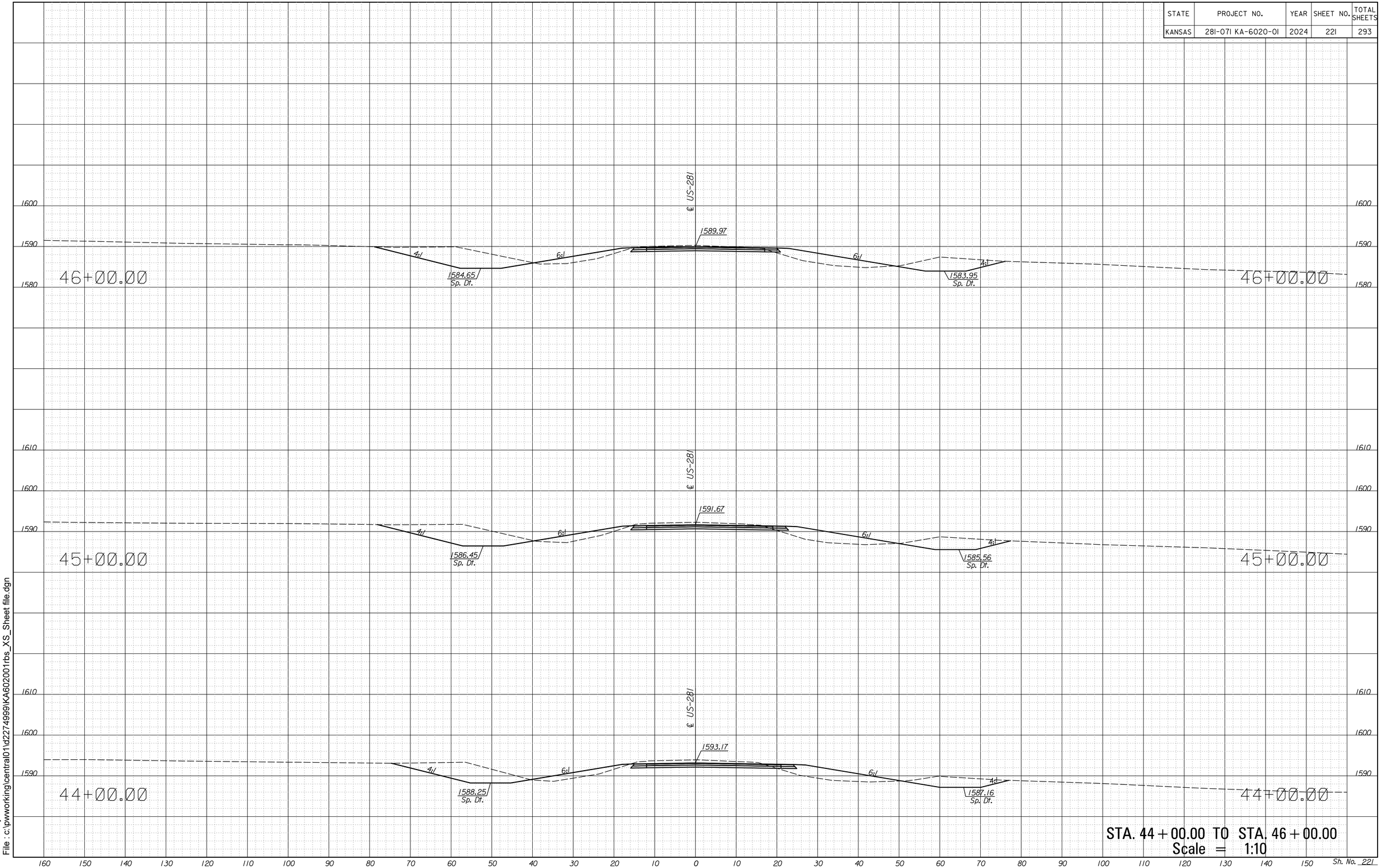


STA. 42 + 00.00 TO STA. 43 + 00.00
Scale = 1:10

Sh. No. 220

Drawn By: MDELEON Plotted: 07-11-24
File: c:\pwworking\central01\d2274999\KA6020001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	221	293

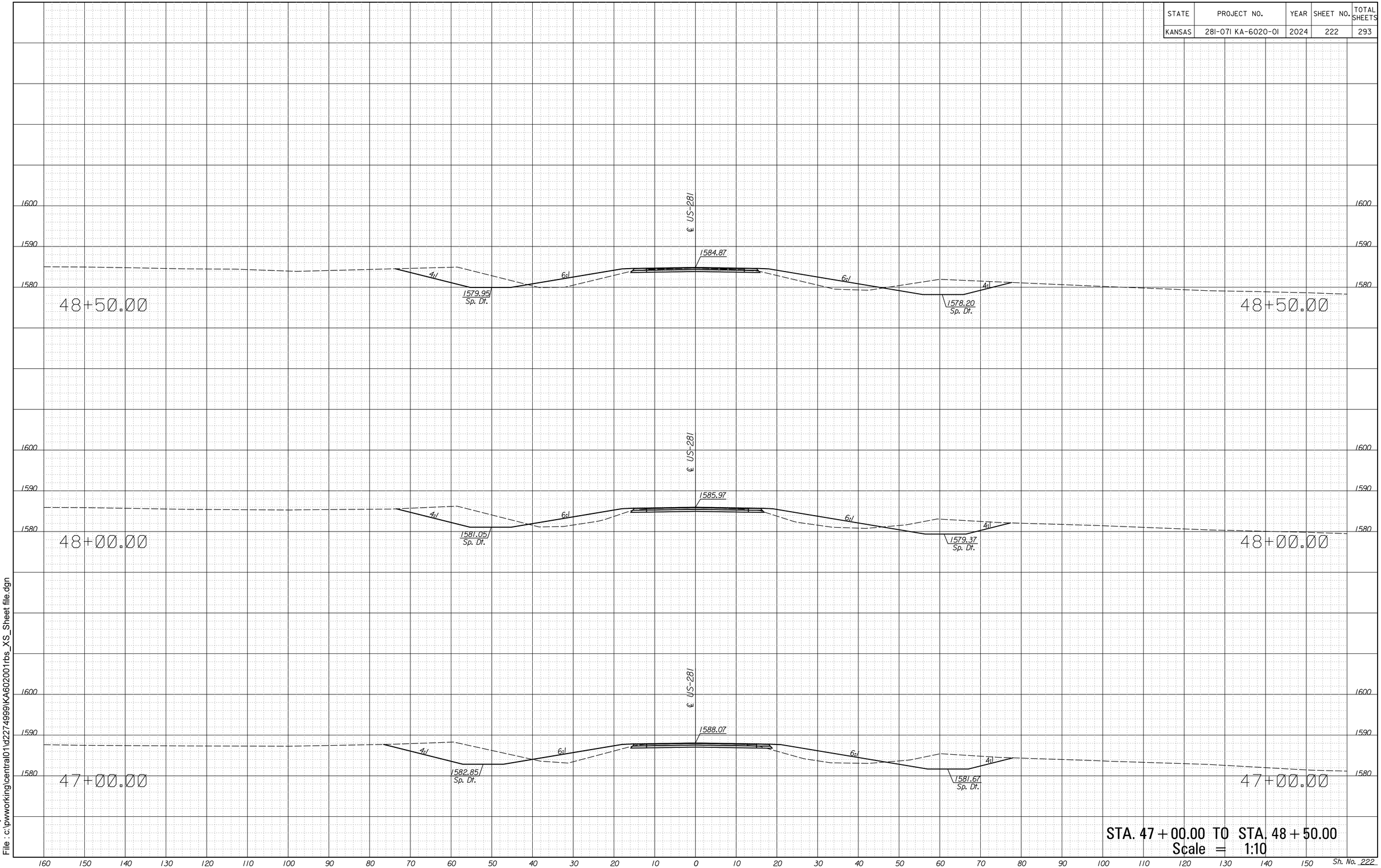


STA. 44 + 00.00 TO STA. 46 + 00.00
Scale = 1:10

Sh. No. 221

Drawn By: MDELEON
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn
Plotted :07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	222	293



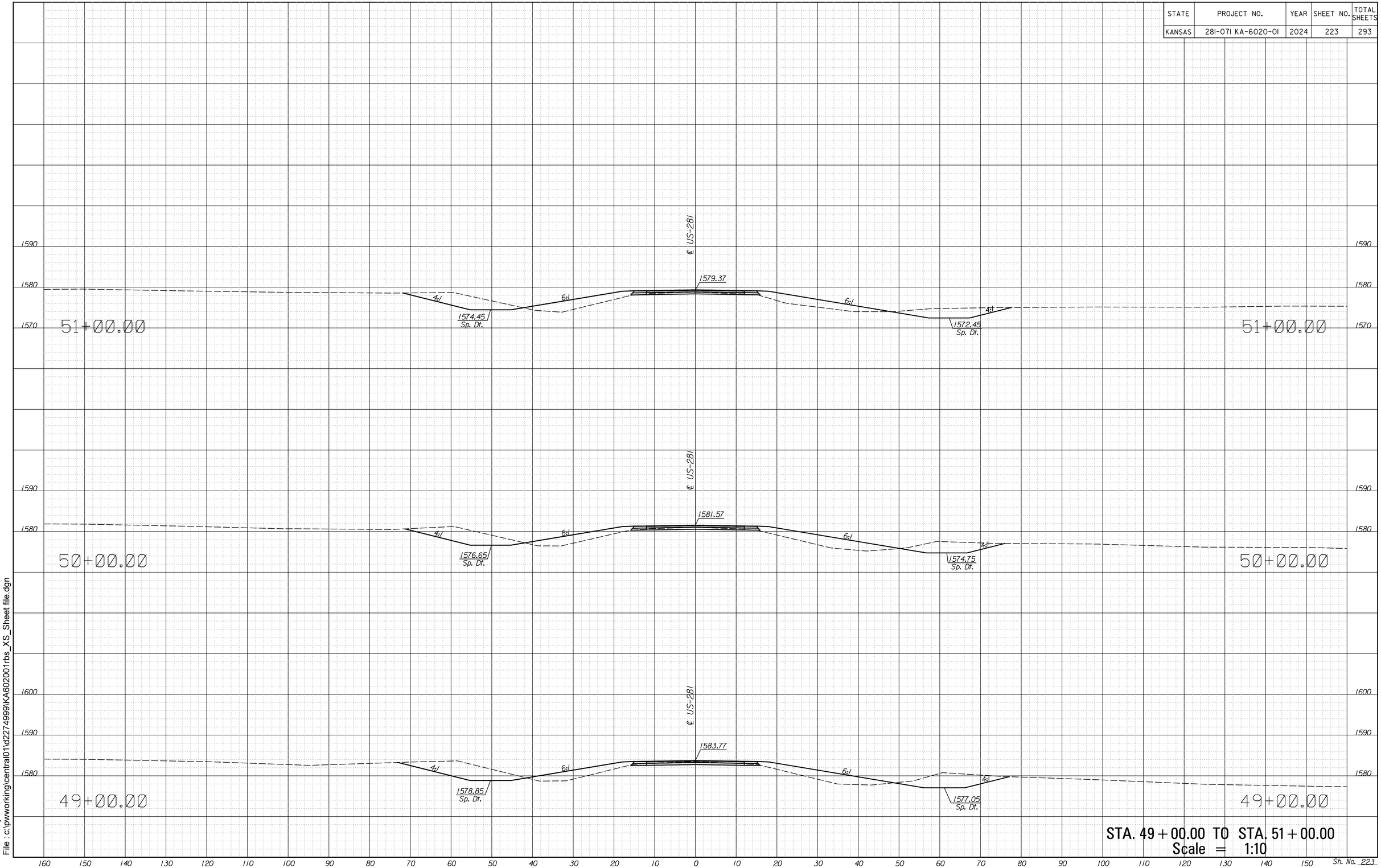
STA. 47 + 00.00 TO STA. 48 + 50.00

Scale = 1:10

Sh. No. 222

Drawn By: MDELEON
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn
Plotted :07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	223	293



STA. 49 + 00.00 TO STA. 51 + 00.00

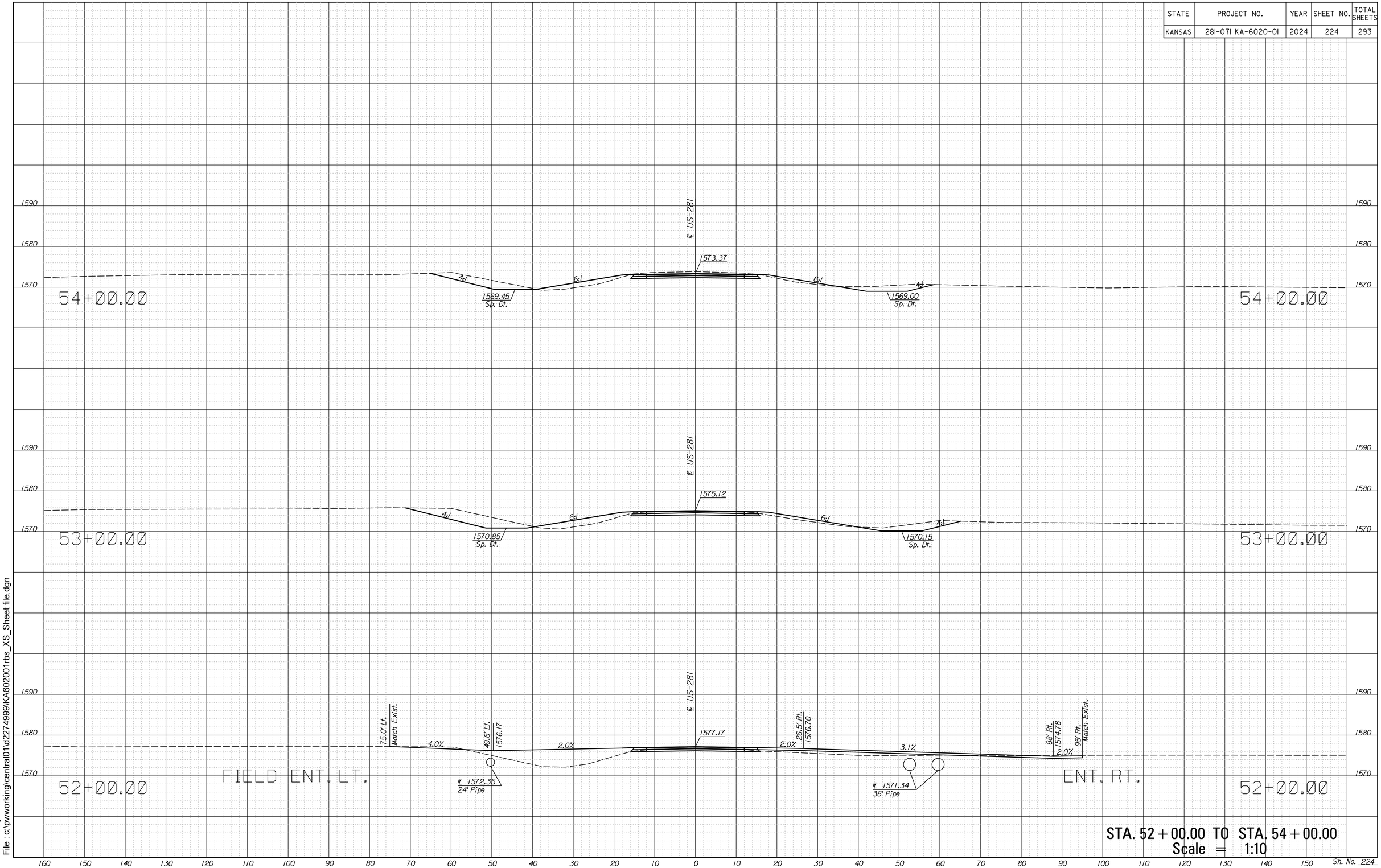
Scale = 1:10

Sh. No. 223

Drawn By : MDELEON Plotted : 07-11-24

File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	224	293

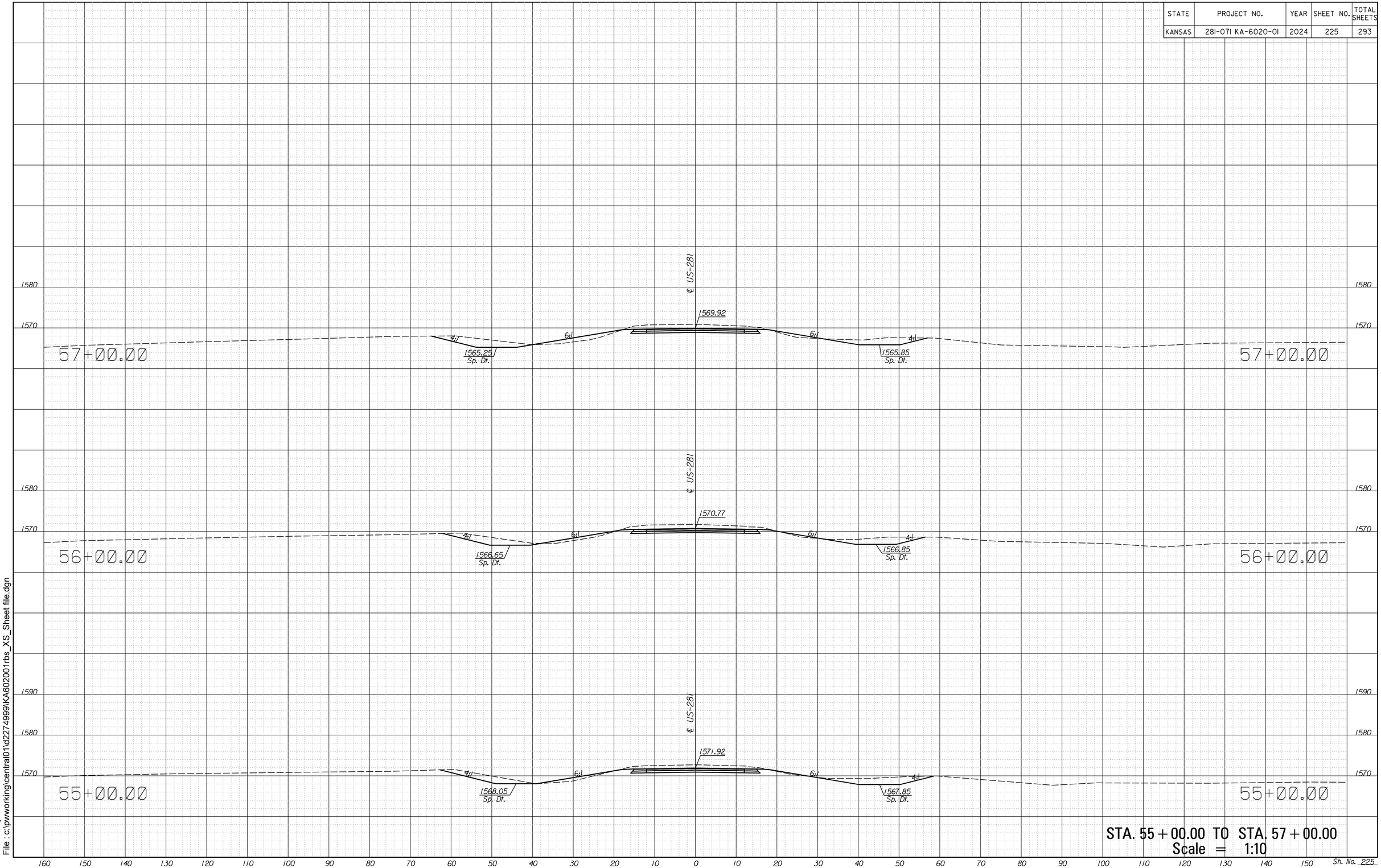


STA. 52 + 00.00 TO STA. 54 + 00.00
Scale = 1:10

Sh. No. 224

Drawn By: MDELEON Plotted: 07-11-24
File: c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	225	293



STA. 55 + 00.00 TO STA. 57 + 00.00

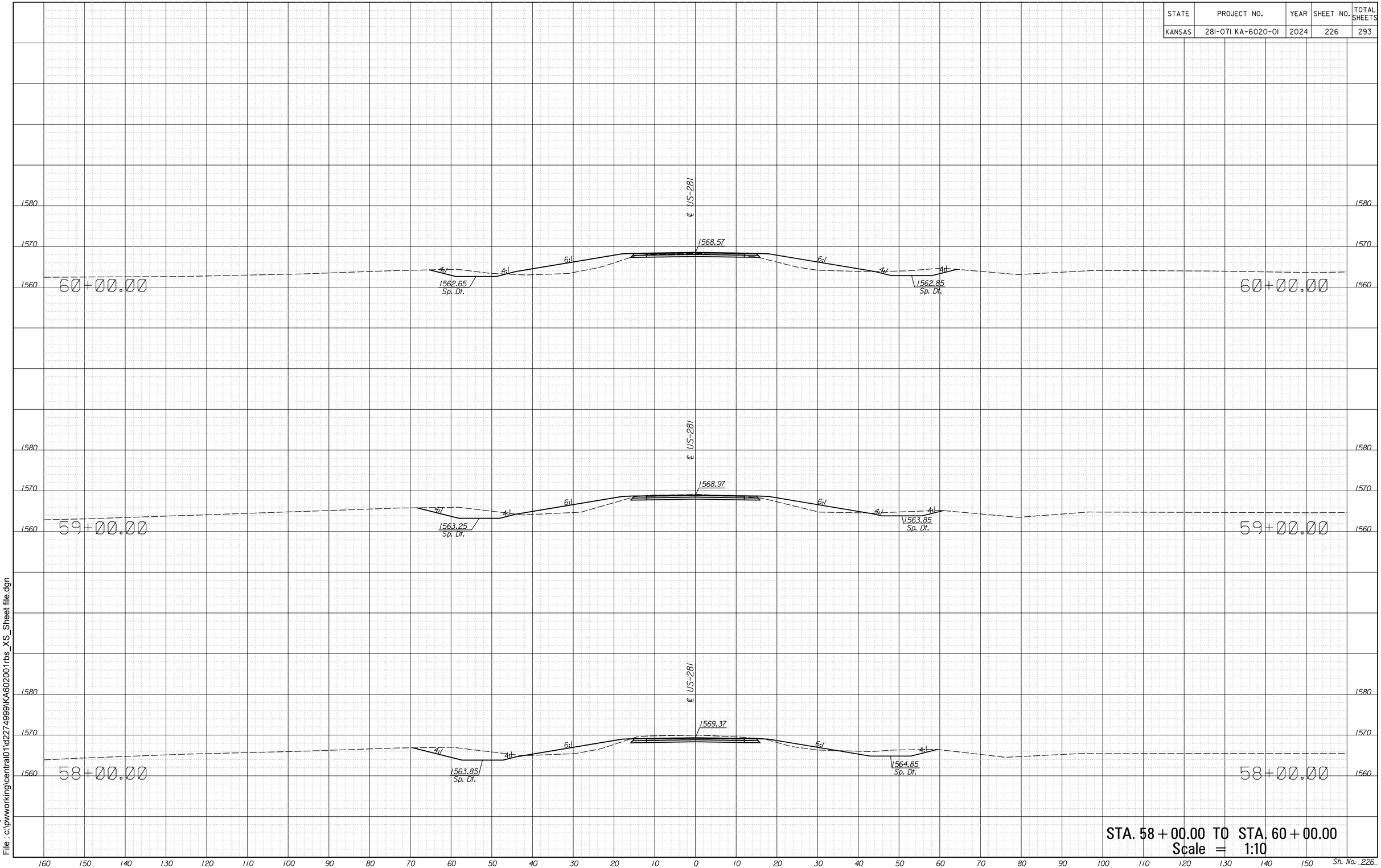
Scale = 1:10

Sh. No. 225

Drawn By : MDELEON Plotted : 07-11-24

File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	226	293



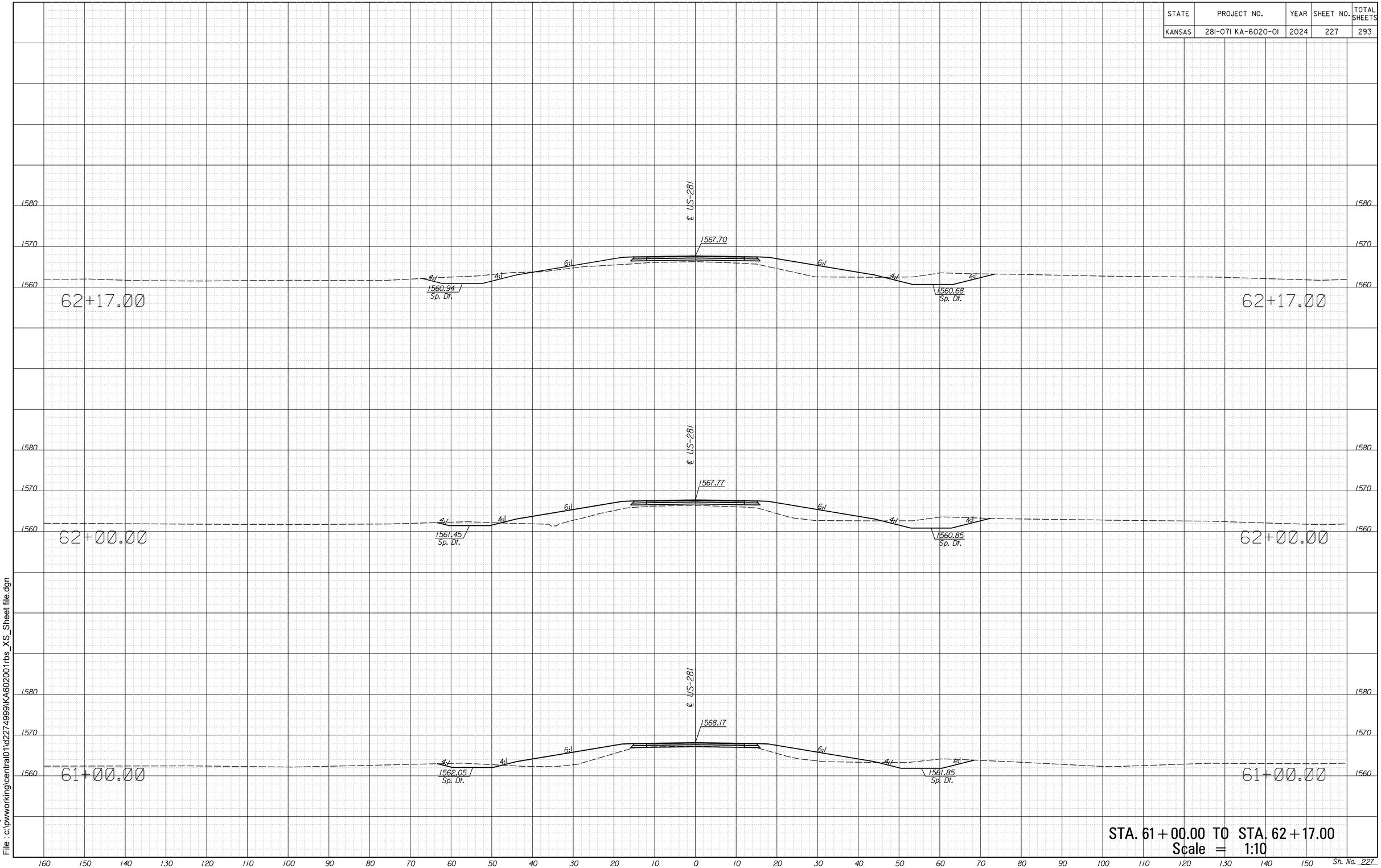
STA. 58 + 00.00 TO STA. 60 + 00.00

Scale = 1:10

Sh. No. 226

Drawn By: MDELEON
File : c:\pwworking\central01\d2274999\KA6020001rbs_XS_Sheet file.dgn
Plotted :07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	227	293

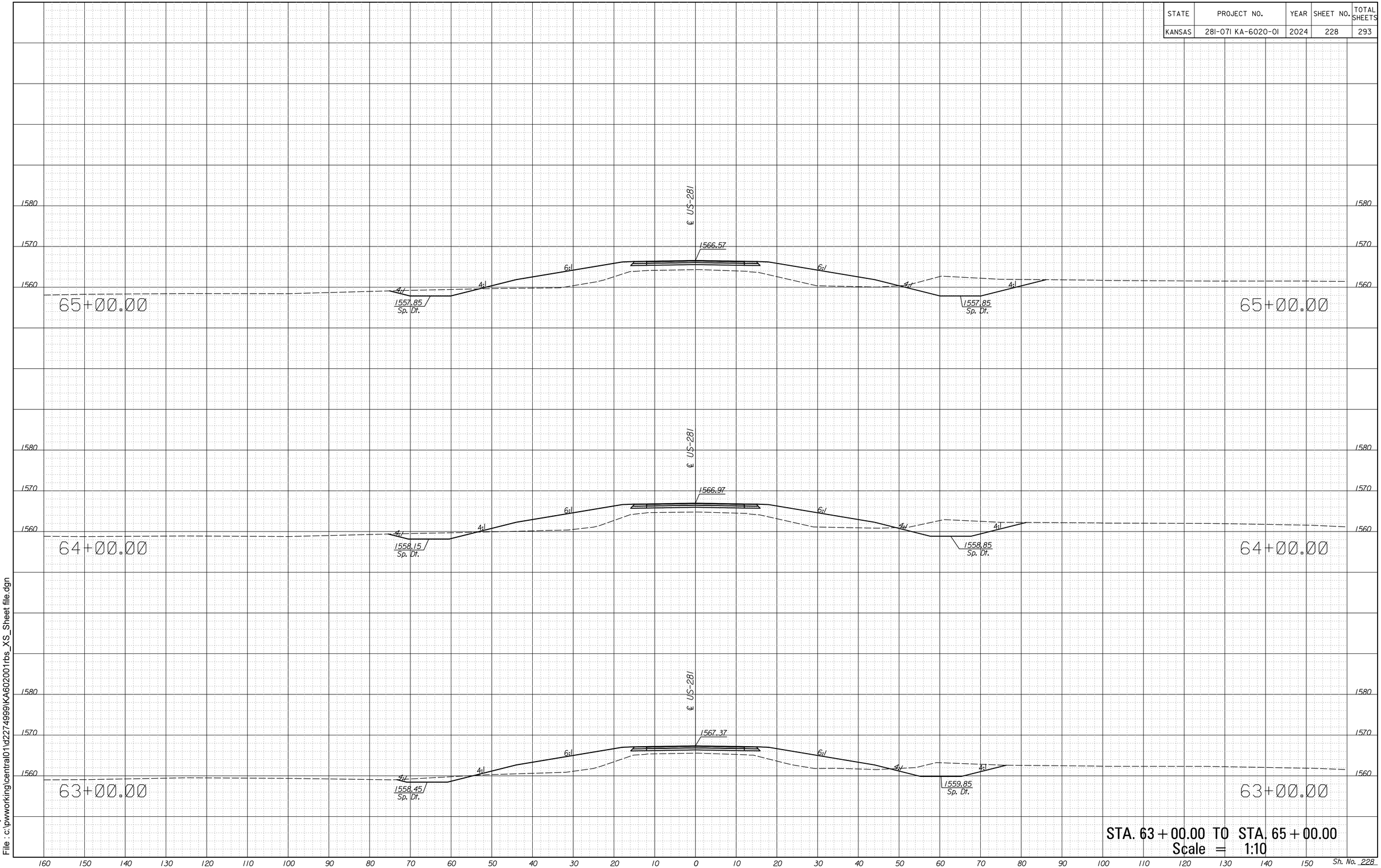


STA. 61+00.00 TO STA. 62+17.00
Scale = 1:10

Sh. No. 227

Drawn By: MDELEON
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn
Plotted :07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	228	293

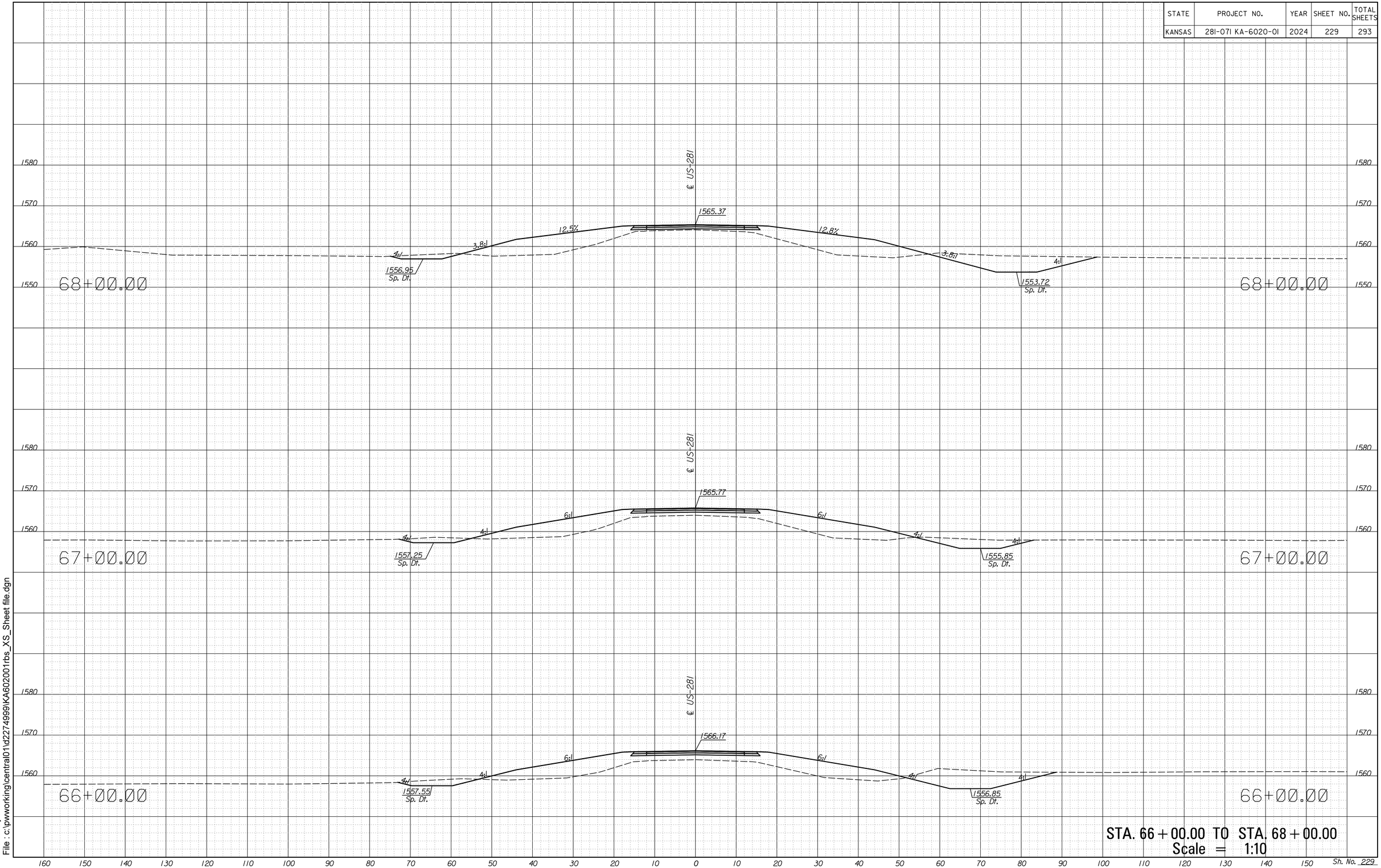


STA. 63 + 00.00 TO STA. 65 + 00.00
Scale = 1:10

Sh. No. 228

Drawn By: MDELEON Plotted: 07-11-24
File: c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	229	293



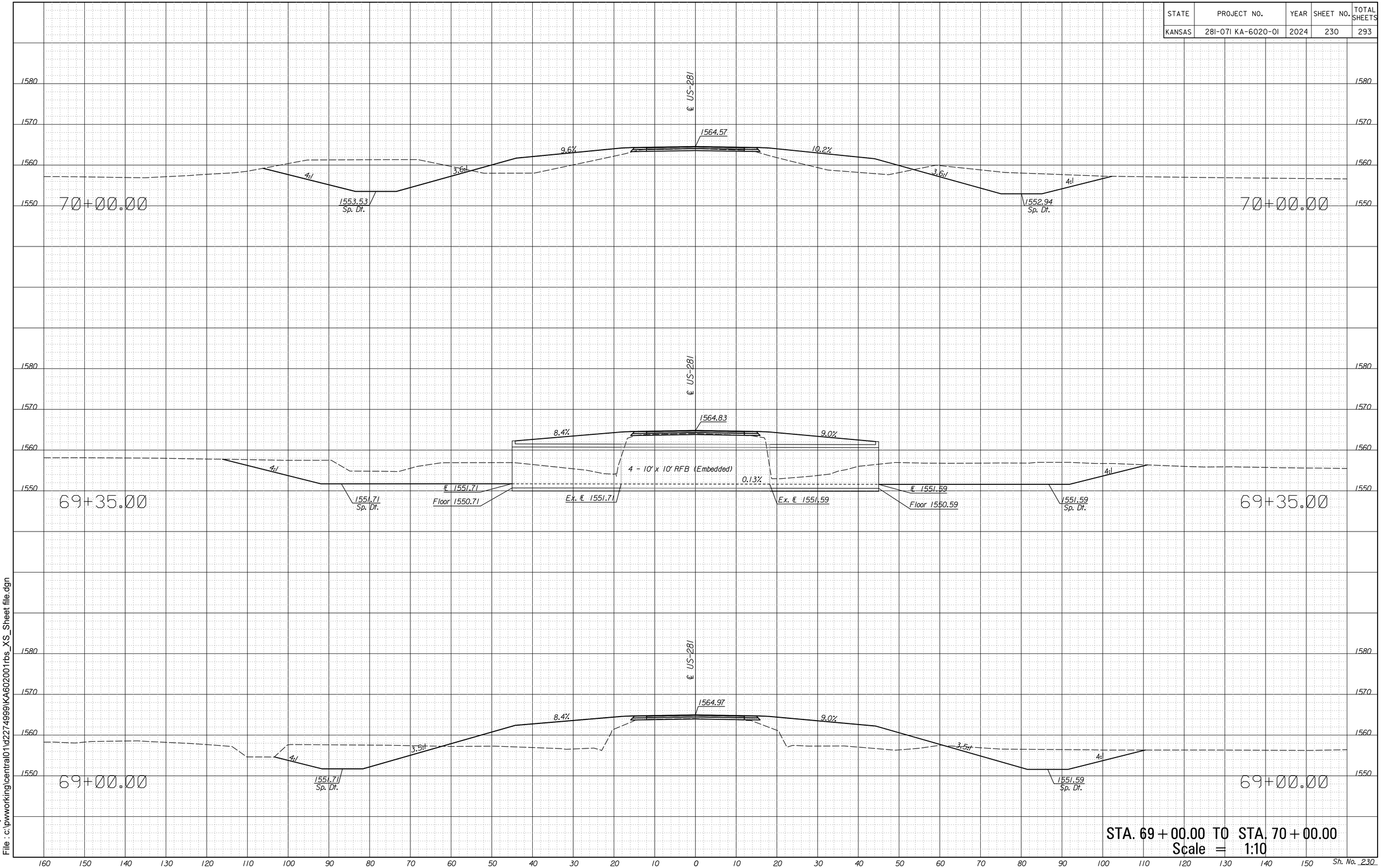
STA. 66 + 00.00 TO STA. 68 + 00.00

Scale = 1:10

Sh. No. 229

Drawn By: MDELEON
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn
Plotted :07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	230	293

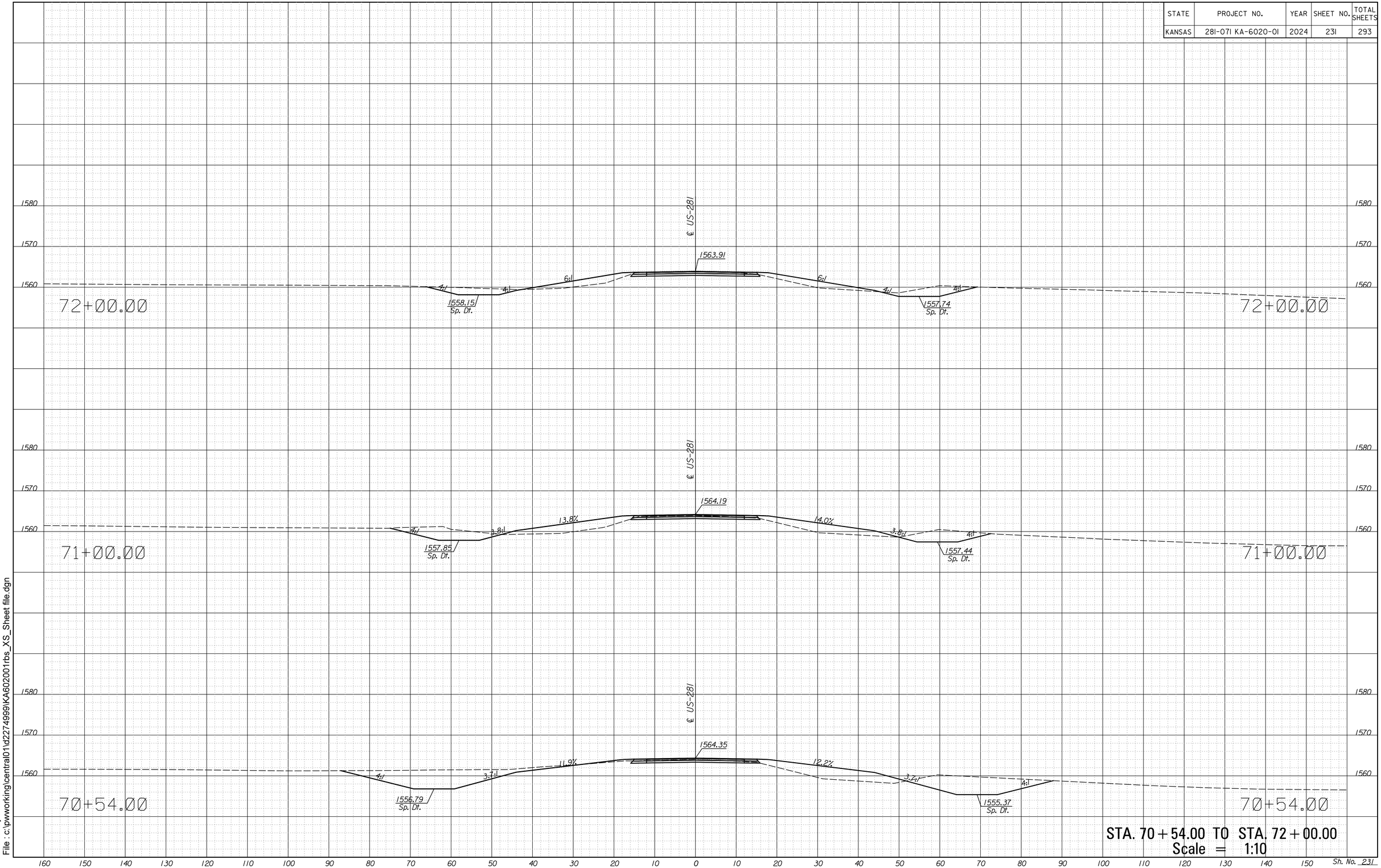


STA. 69 + 00.00 TO STA. 70 + 00.00
Scale = 1:10

Sh. No. 230

Drawn By: MDELEON
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn
Plotted :07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	231	293

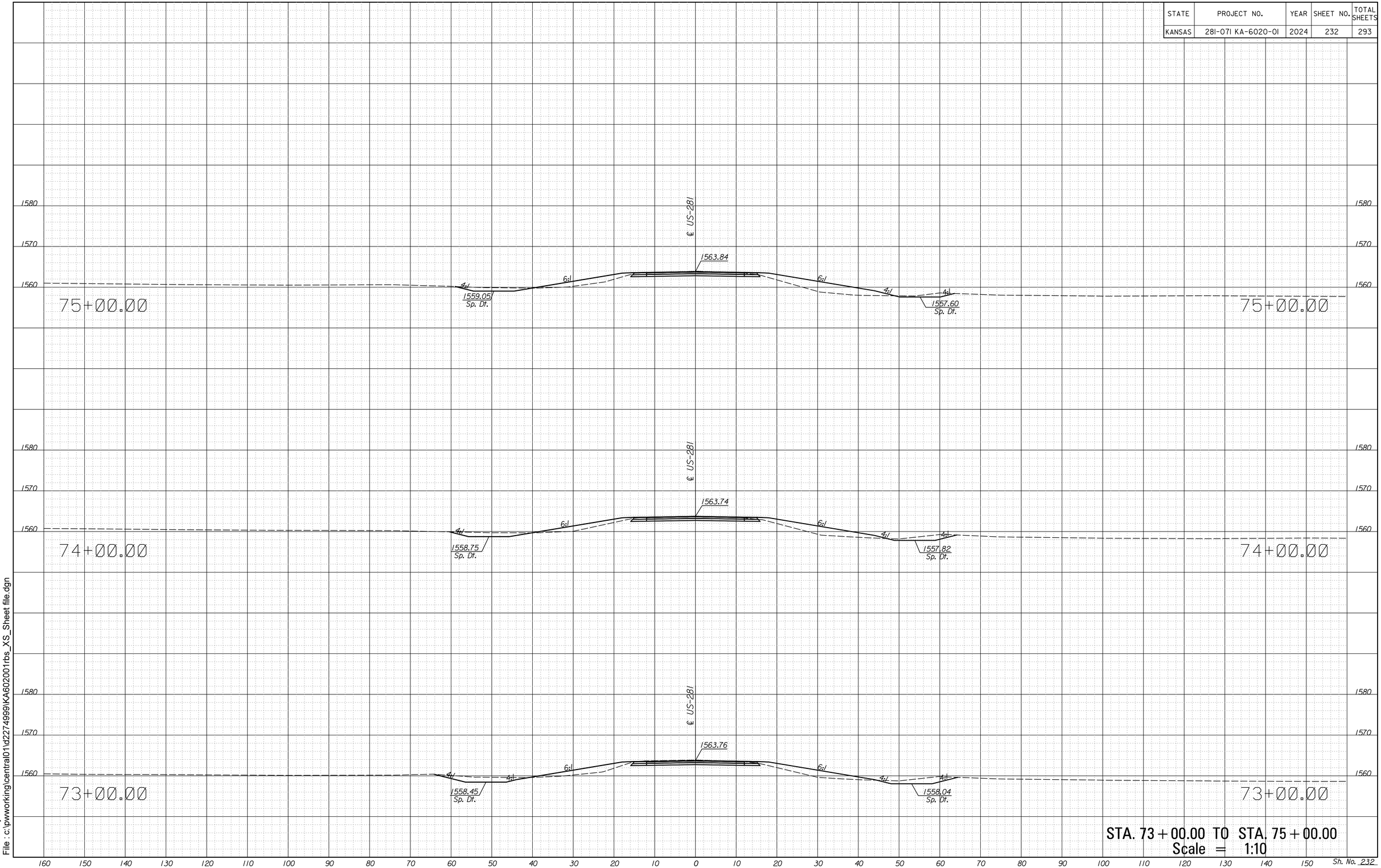


STA. 70 + 54.00 TO STA. 72 + 00.00
Scale = 1:10

Sh. No. 231

Drawn By: MDELEON
File : c:\pwworking\central01\d2274999\KA6020001rbs_XS_Sheet file.dgn
Plotted :07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	232	293

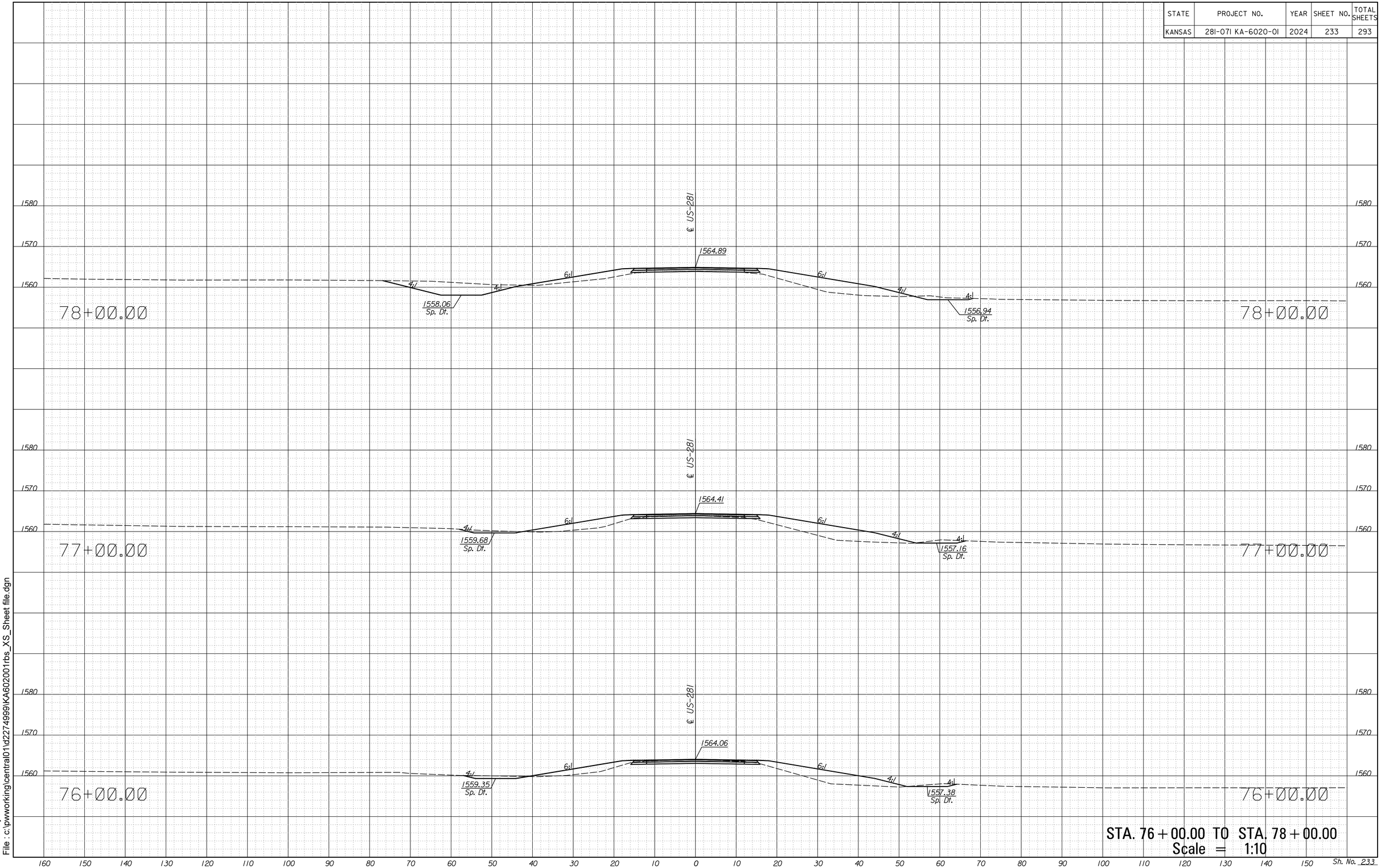


STA. 73 + 00.00 TO STA. 75 + 00.00
Scale = 1:10

Sh. No. 232

Drawn By: MDELEON Plotted: 07-11-24
File: c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	233	293

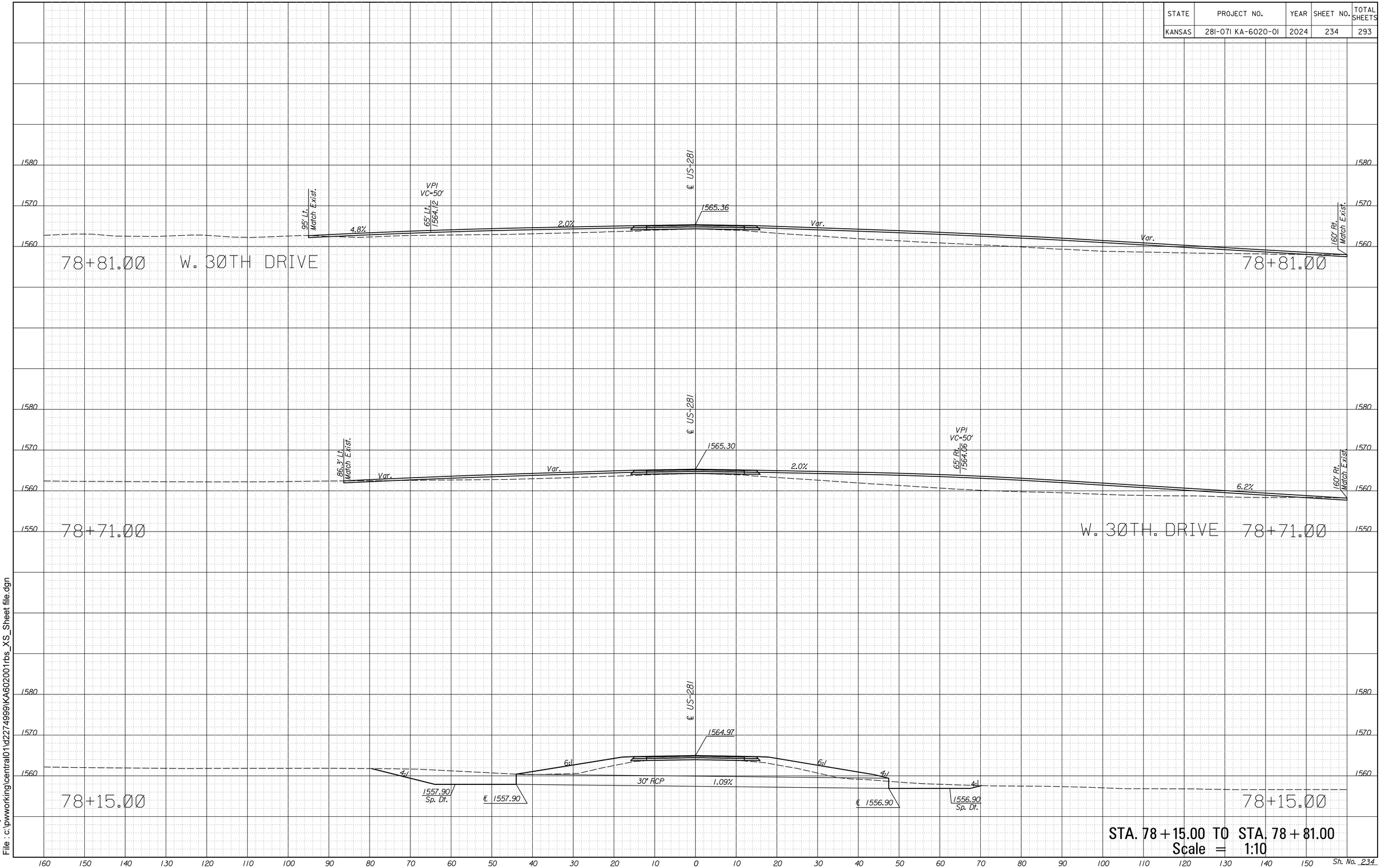


STA. 76 + 00.00 TO STA. 78 + 00.00
Scale = 1:10

Sh. No. 233

Drawn By: MDELEON Plotted: 07-11-24
File: c:\pwworking\central01\d2274999\KA6020001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	234	293



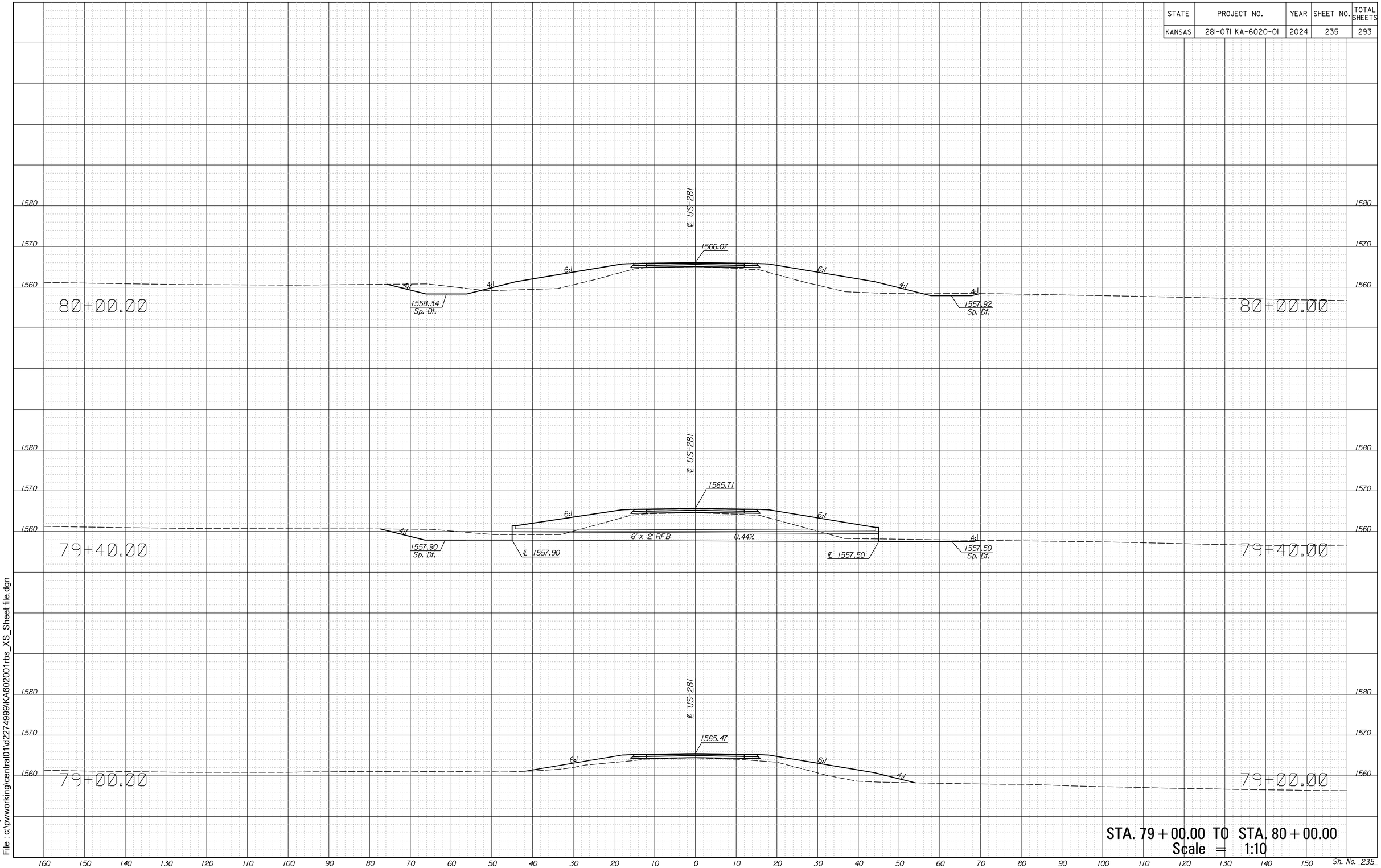
STA. 78+15.00 TO STA. 78+81.00

Scale = 1:10

Sh. No. 234

Drawn By: MDELEON
Plotted: 07-11-24
File: c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	235	293

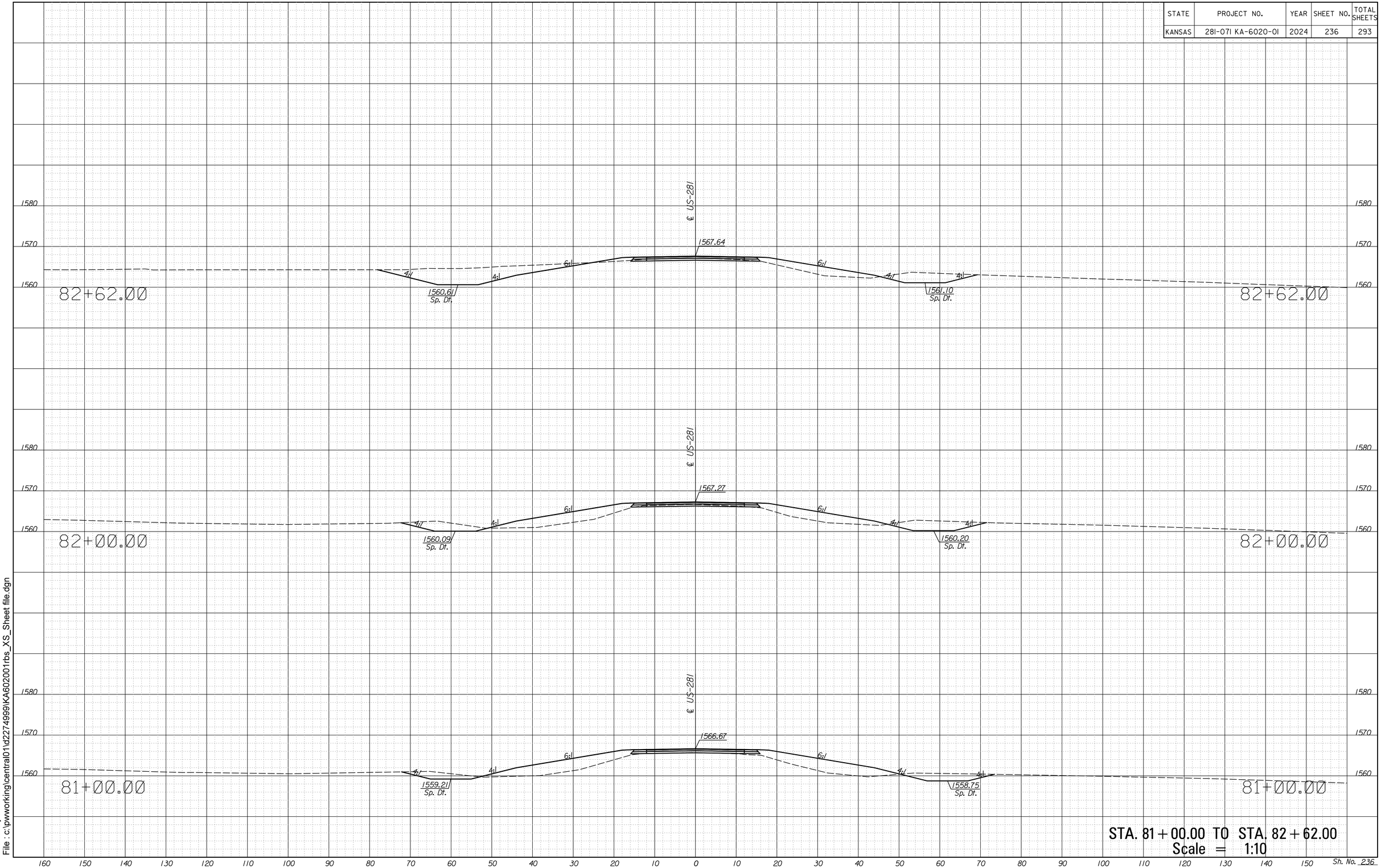


STA. 79 + 00.00 TO STA. 80 + 00.00
Scale = 1:10

Sh. No. 235

Drawn By: MDELEON Plotted: 07-11-24
File: c:\pwworking\central01\d2274999\KA6020001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	236	293

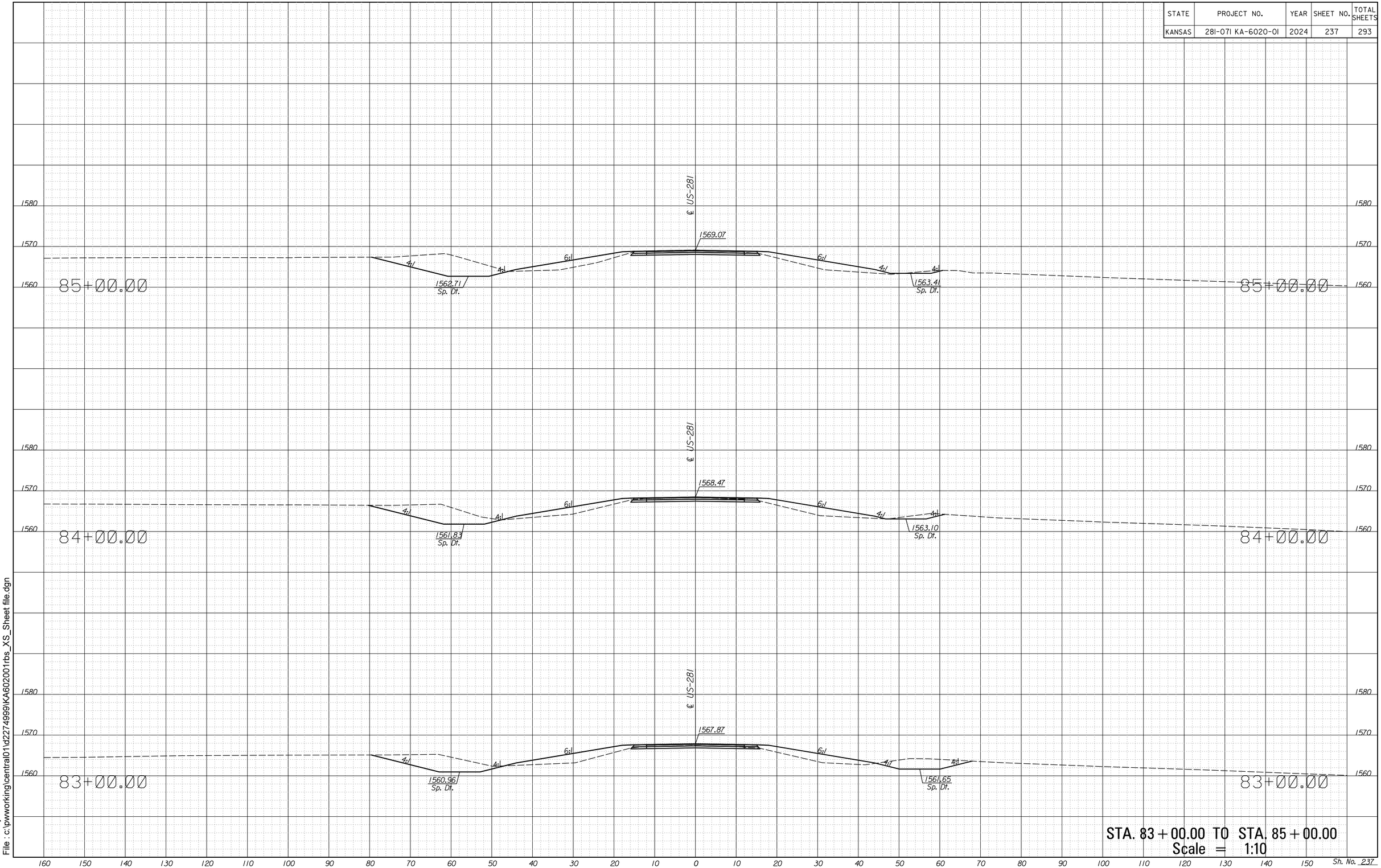


STA. 81+00.00 TO STA. 82+62.00
Scale = 1:10

Sh. No. 236

Drawn By: MDELEON
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn
Plotted :07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	237	293

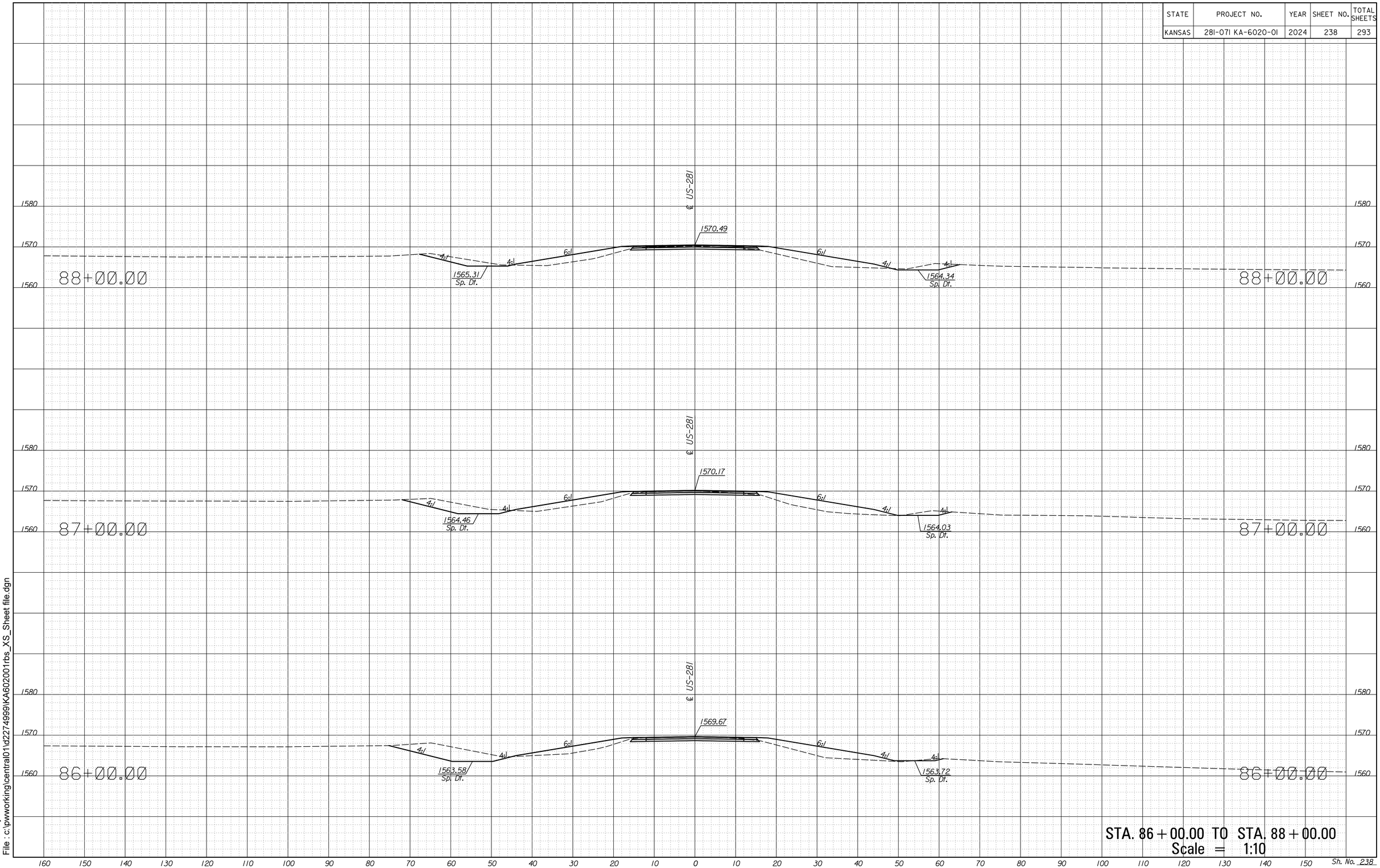


STA. 83 + 00.00 TO STA. 85 + 00.00
Scale = 1:10

Sh. No. 237

Drawn By: MDELEON Plotted: 07-11-24
File: c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	238	293

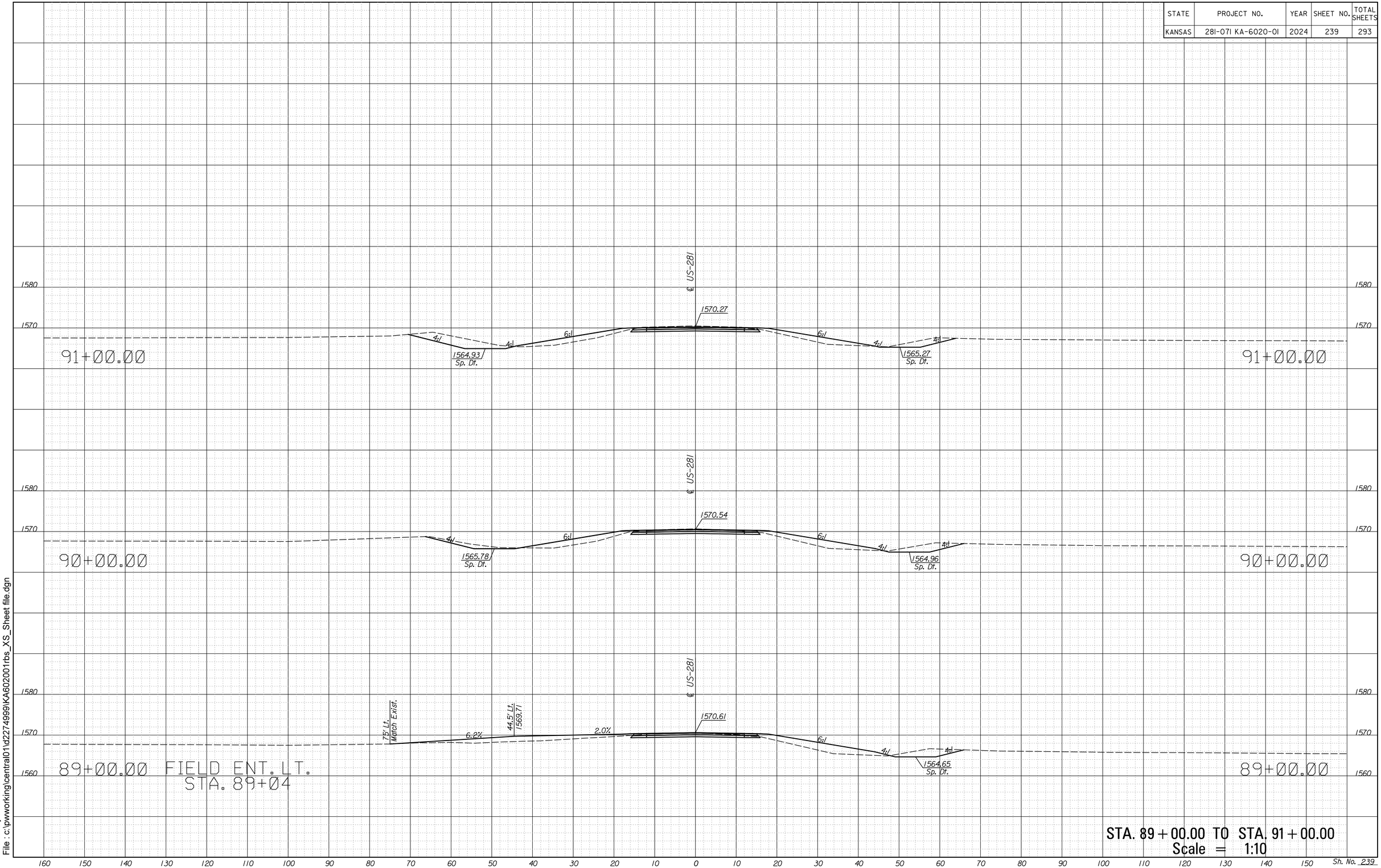


STA. 86 + 00.00 TO STA. 88 + 00.00
Scale = 1:10

Sh. No. 238

Drawn By: MDELEON
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn
Plotted :07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	239	293



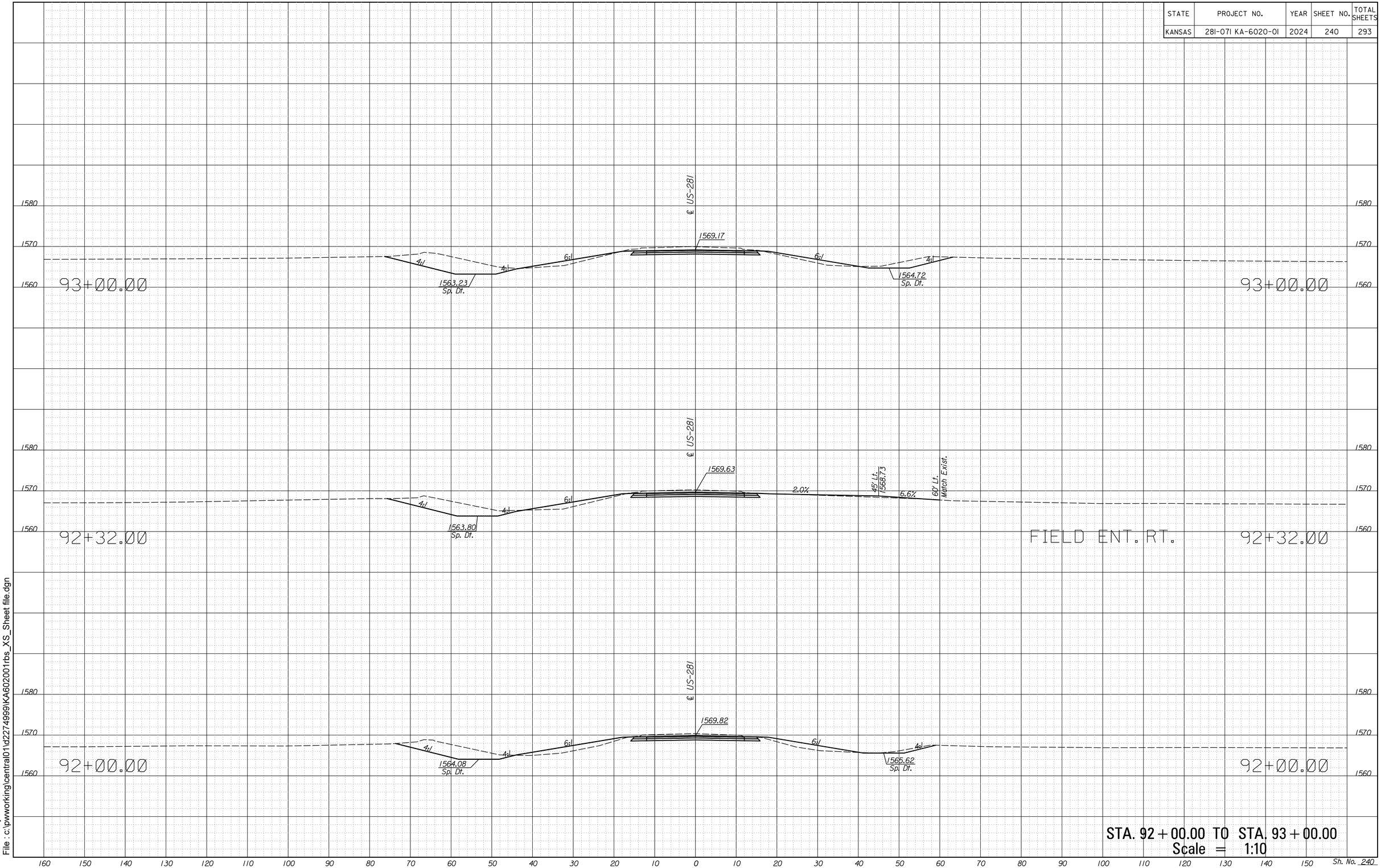
STA. 89 + 00.00 TO STA. 91 + 00.00

Scale = 1:10

Sh. No. 239

Drawn By : MDELEON
Plotted : 07-11-24
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	240	293

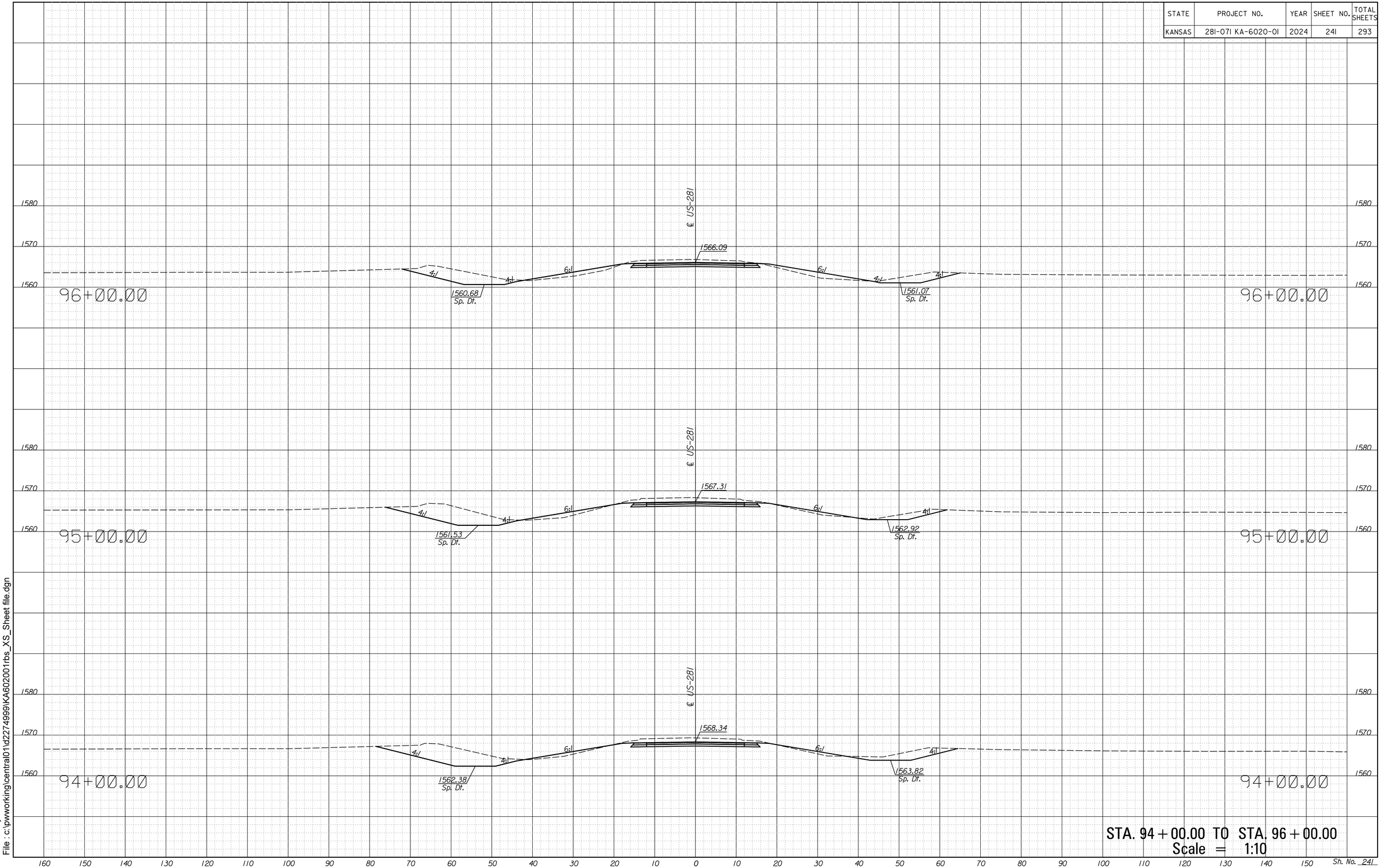


STA. 92 + 00.00 TO STA. 93 + 00.00
Scale = 1:10

Sh. No. 240

Drawn By: MDELEON Plotted: 07-11-24
File: c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	241	293

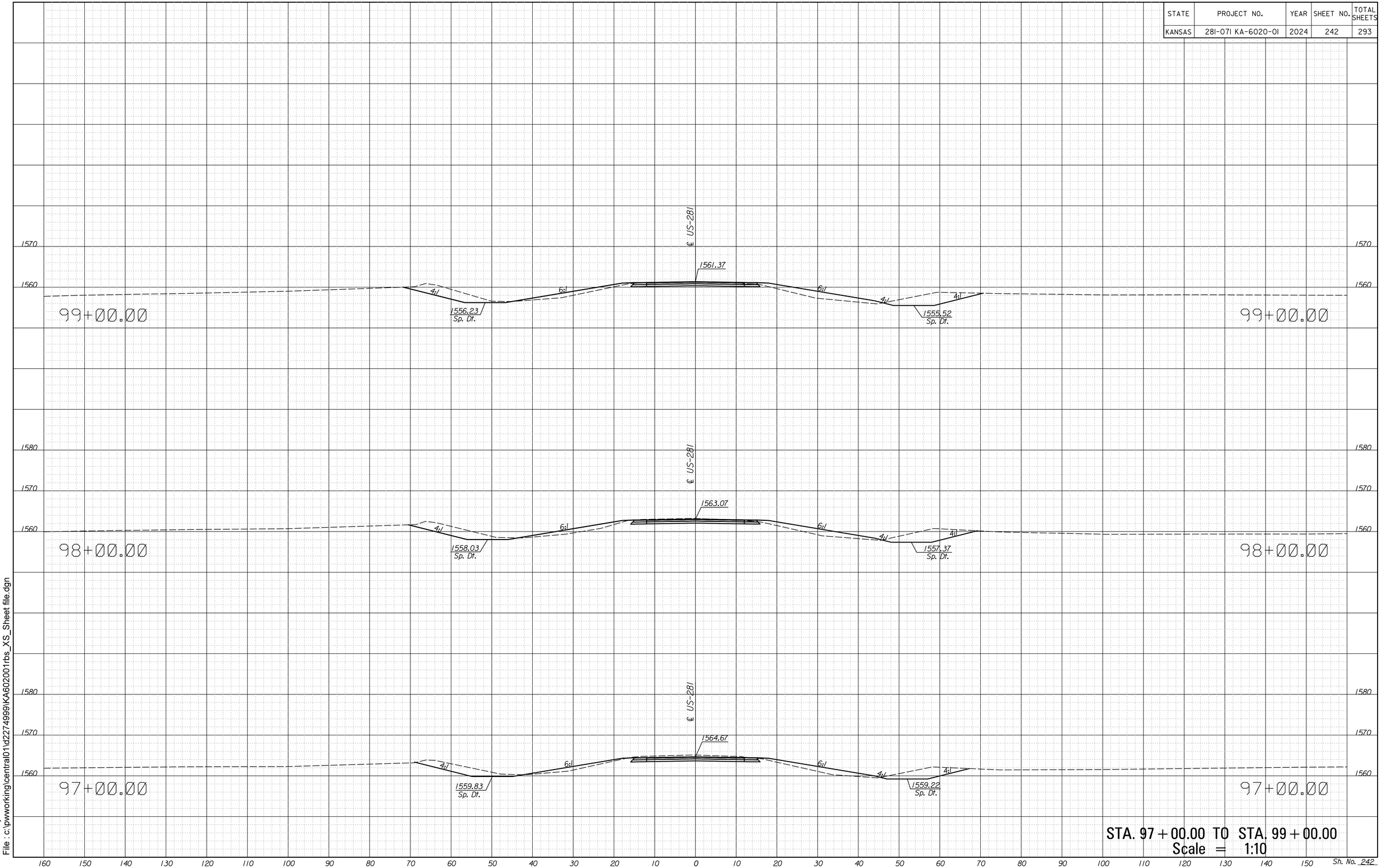


STA. 94 + 00.00 TO STA. 96 + 00.00
Scale = 1:10

Sh. No. 241

Drawn By: MDELEON Plotted: 07-11-24
File: c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	242	293

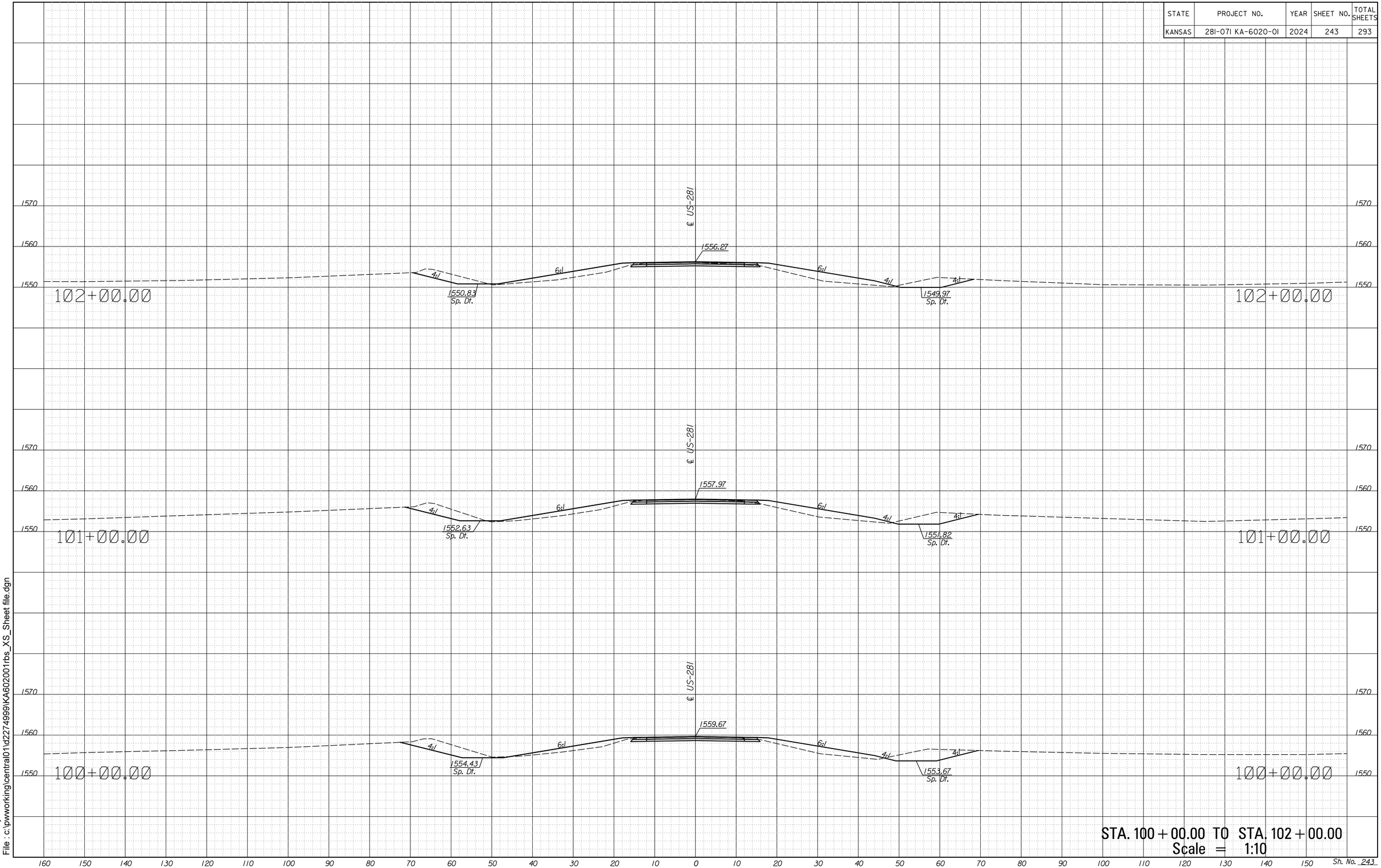


STA. 97 + 00.00 TO STA. 99 + 00.00
Scale = 1:10

Sh. No. 242

Drawn By: MDELEON Plotted: 07-11-24
File: c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	243	293

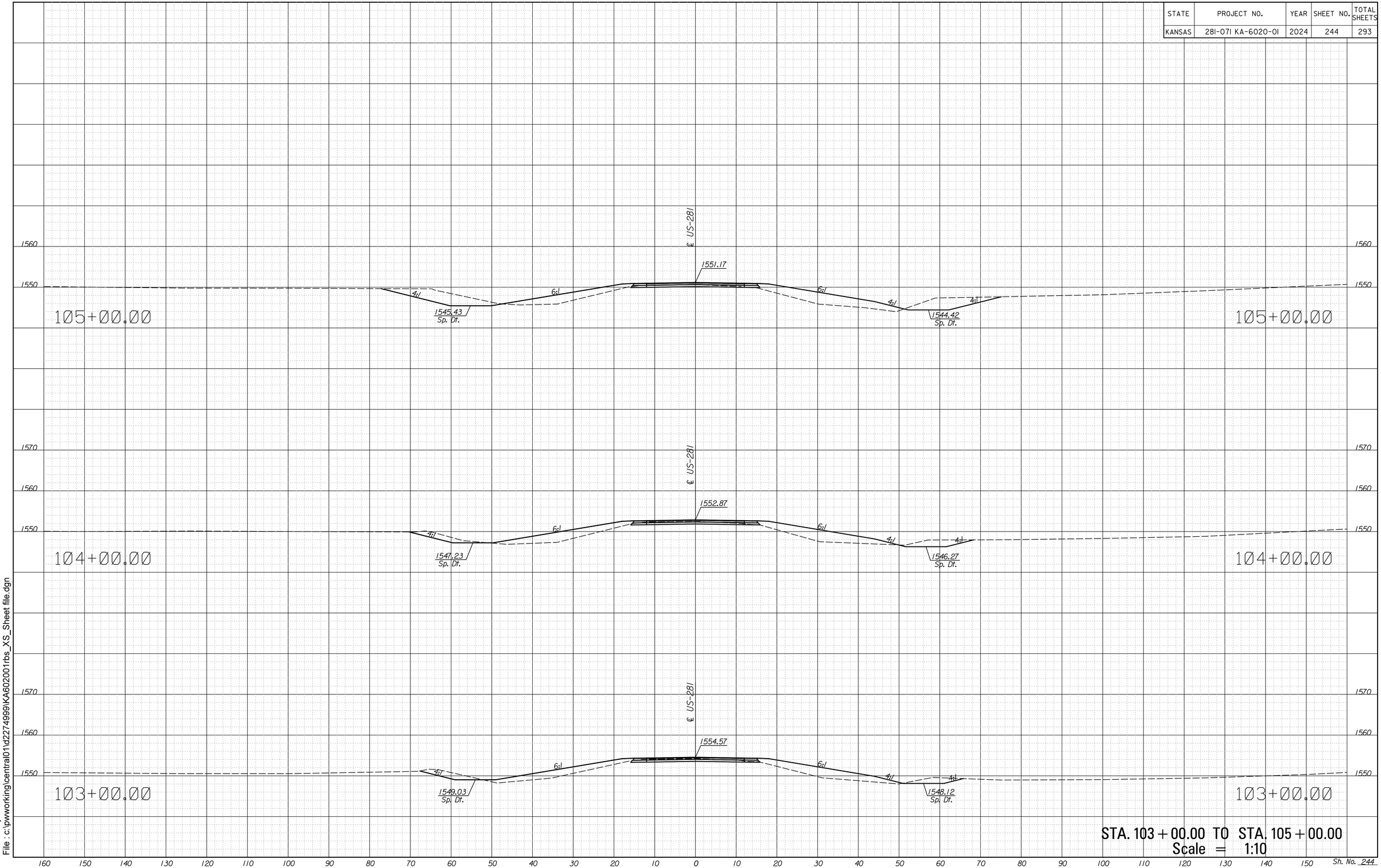


STA. 100 + 00.00 TO STA. 102 + 00.00
Scale = 1:10

Sh. No. 243

Drawn By: MDELEON
File: c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn
Plotted: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	244	293



STA. 103 + 00.00 TO STA. 105 + 00.00

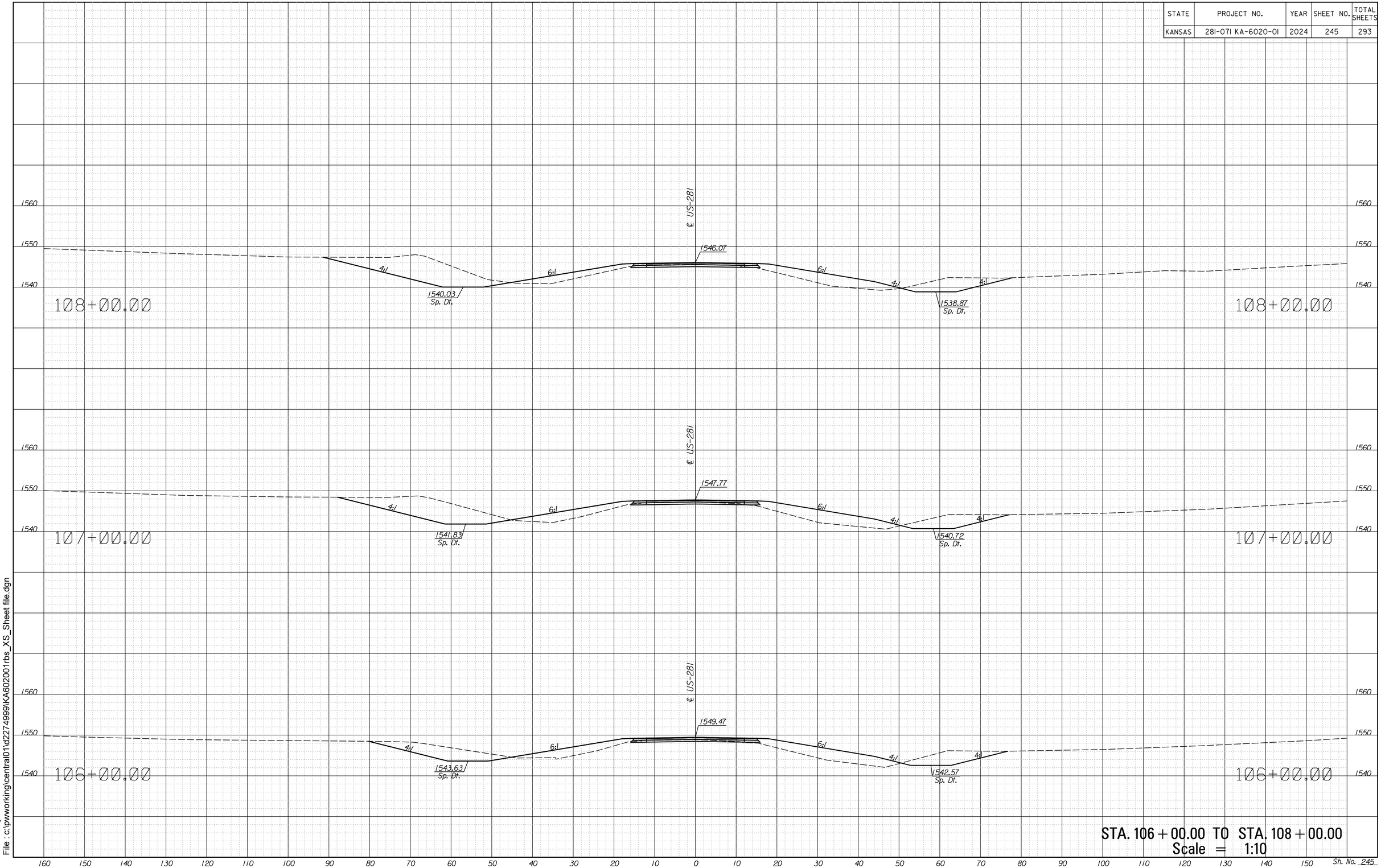
Scale = 1:10

Sh. No. 244

Drawn By: MDELEON Plotted: 07-11-24

File: c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	245	293

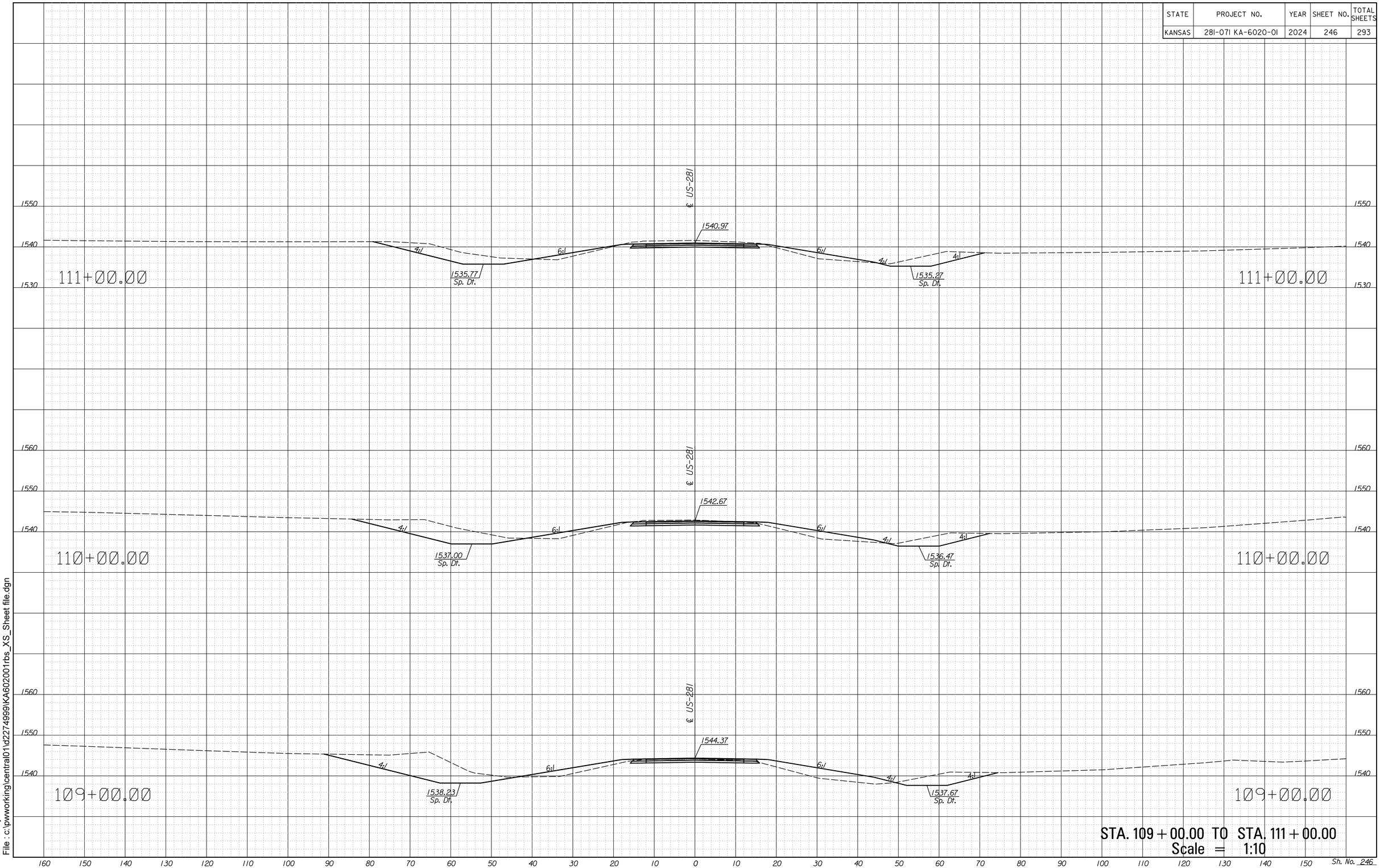


STA. 106 + 00.00 TO STA. 108 + 00.00
Scale = 1:10

Sh. No. 245

Drawn By: MDELEON
File: c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn
Plotted: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	246	293

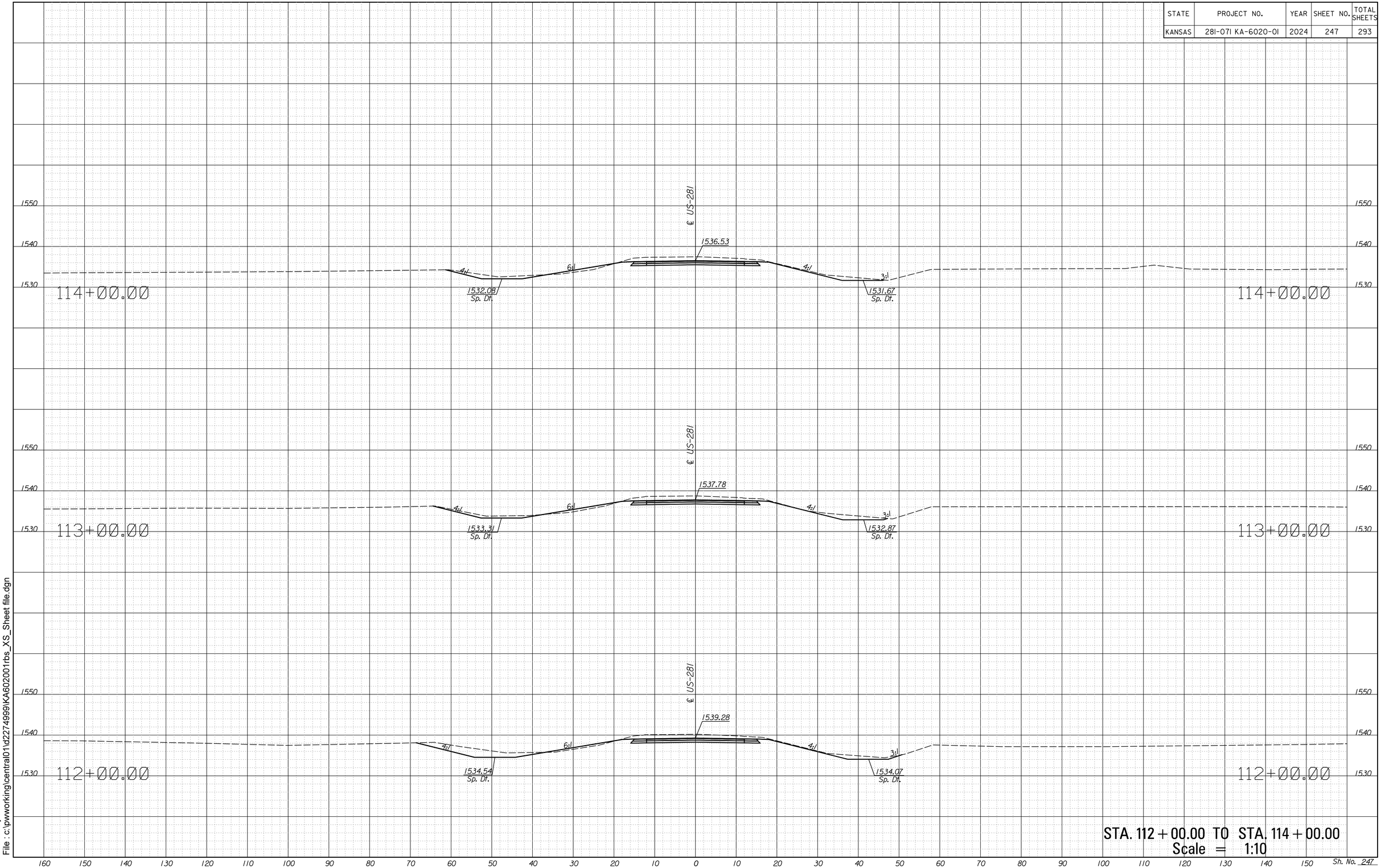


STA. 109 + 00.00 TO STA. 111 + 00.00
Scale = 1:10

Sh. No. 246

Drawn By: MDELEON Plotted: 07-11-24
File: c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	247	293

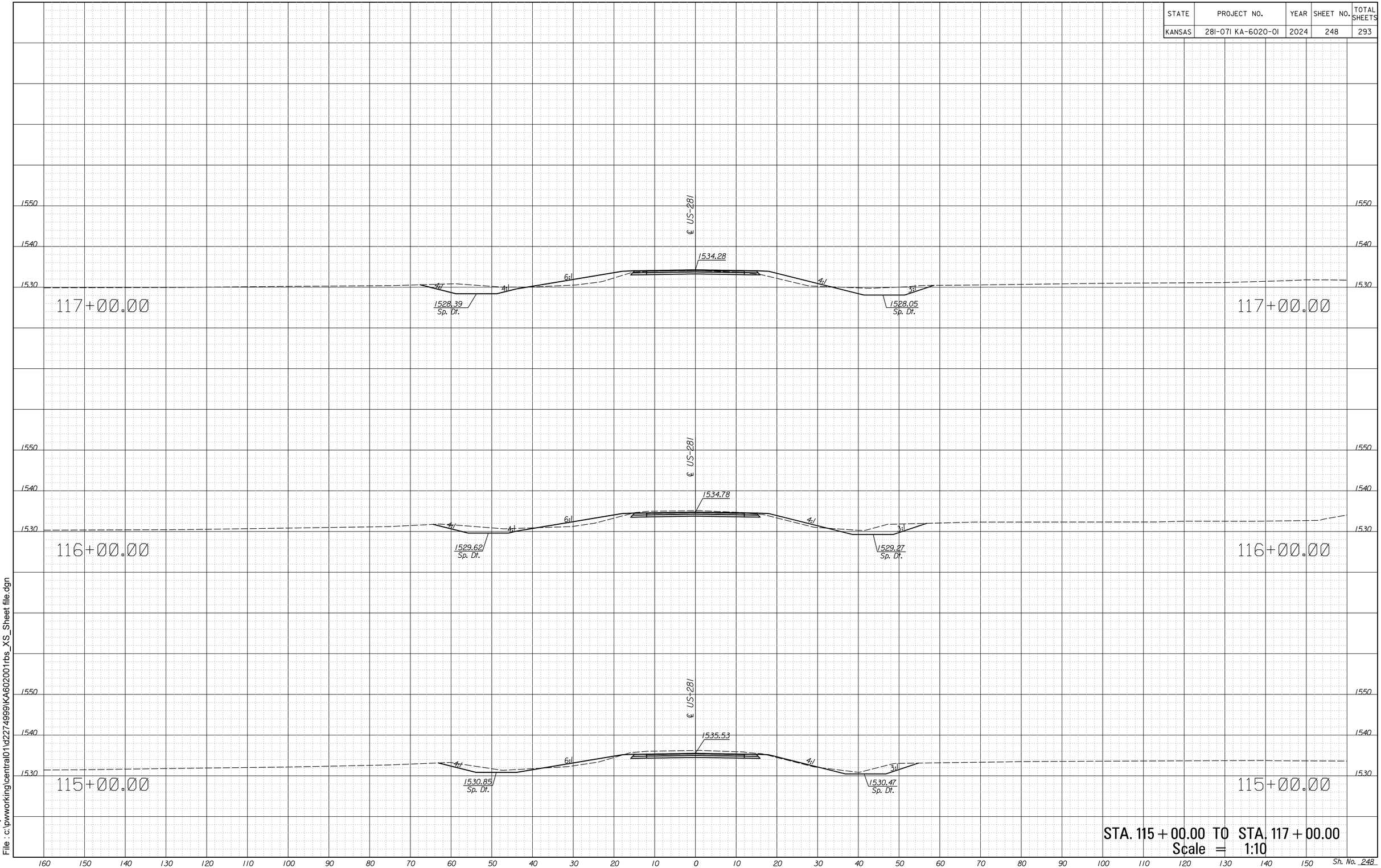


STA. 112 + 00.00 TO STA. 114 + 00.00
Scale = 1:10

Sh. No. 247

Drawn By: MDELEON
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn
Plotted :07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	248	293

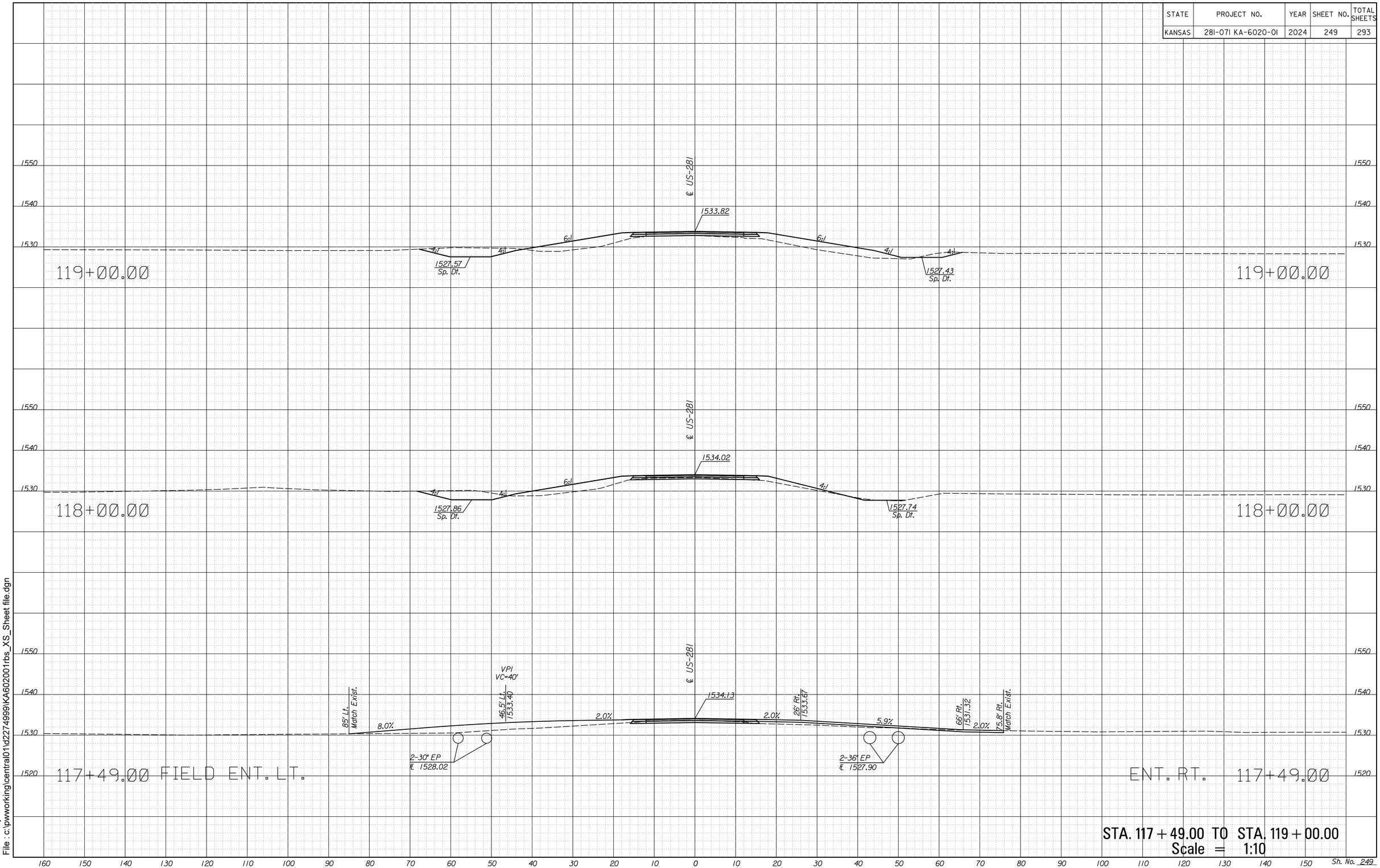


STA. 115 + 00.00 TO STA. 117 + 00.00
Scale = 1:10

Sh. No. 248

Drawn By: MDELEON Plotted: 07-11-24
File: c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	249	293

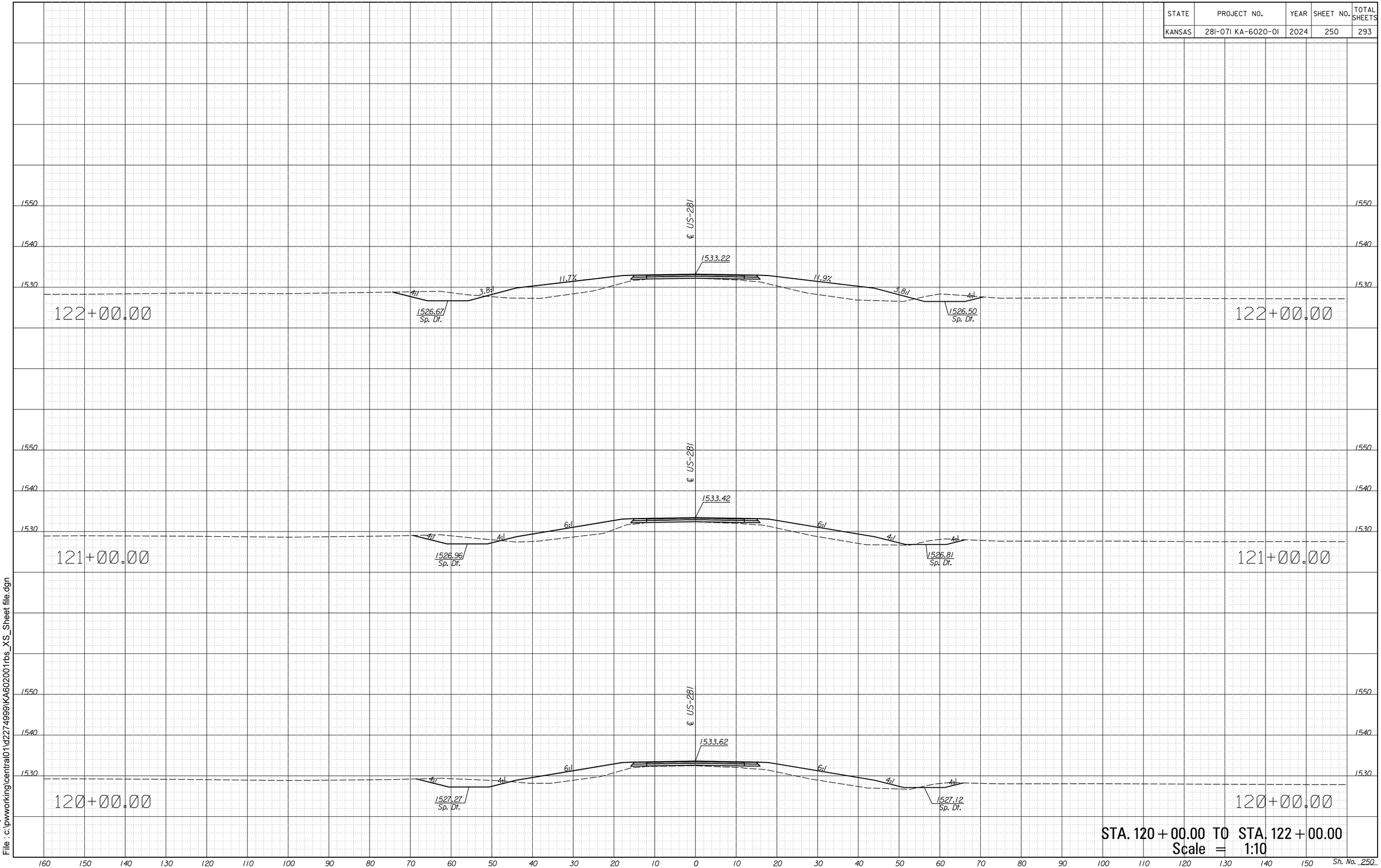


STA. 117 + 49.00 TO STA. 119 + 00.00
Scale = 1:10

Sh. No. 249

Drawn By : MDELEON Plotted : 07-11-24
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	250	293



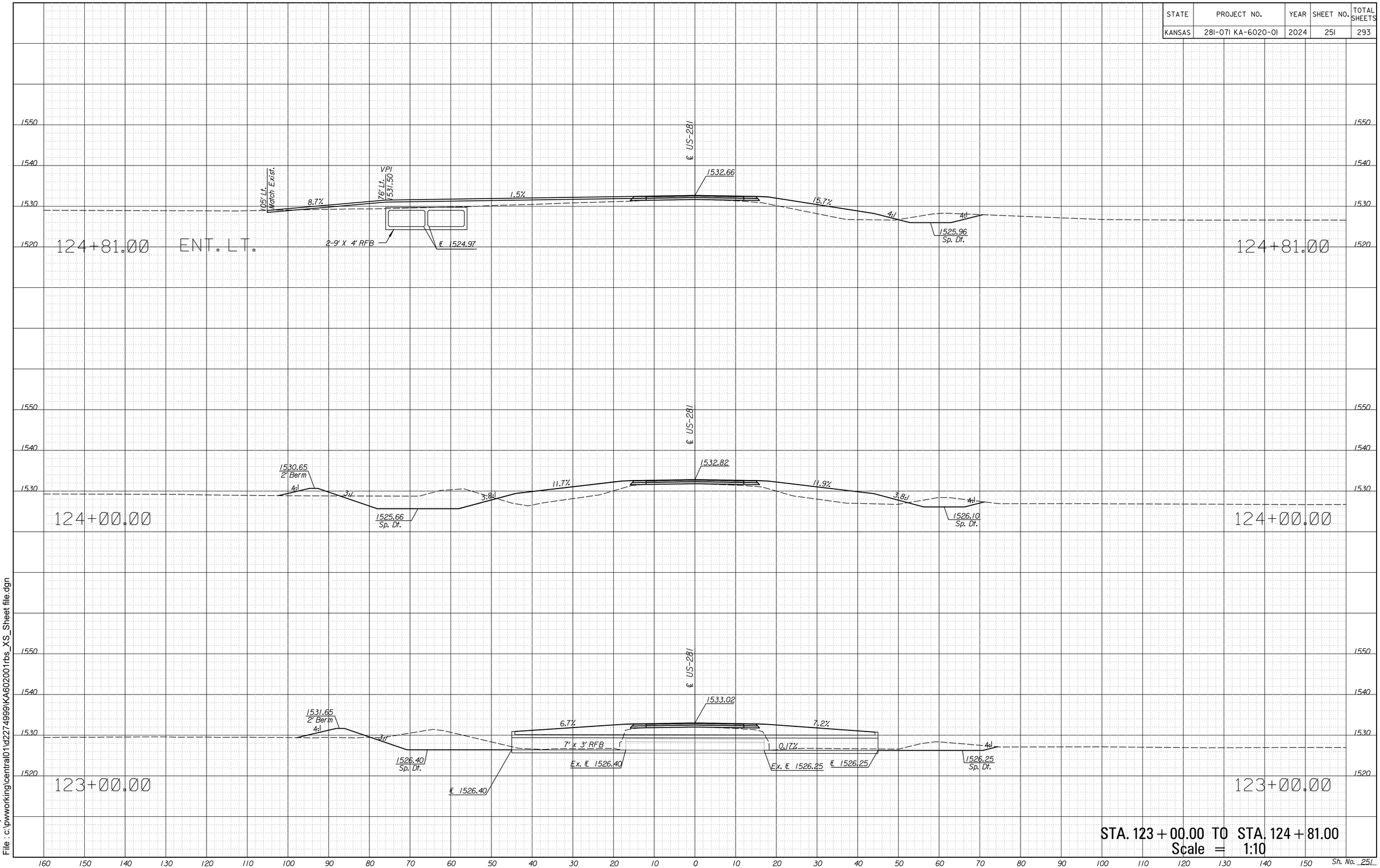
STA. 120 + 00.00 TO STA. 122 + 00.00

Scale = 1:10

Sh. No. 250

Drawn By: MDELEON
File : c:\pwworking\central01\d2274999\KA6020001rbs_XS_Sheet file.dgn
Plotted :07-11-24

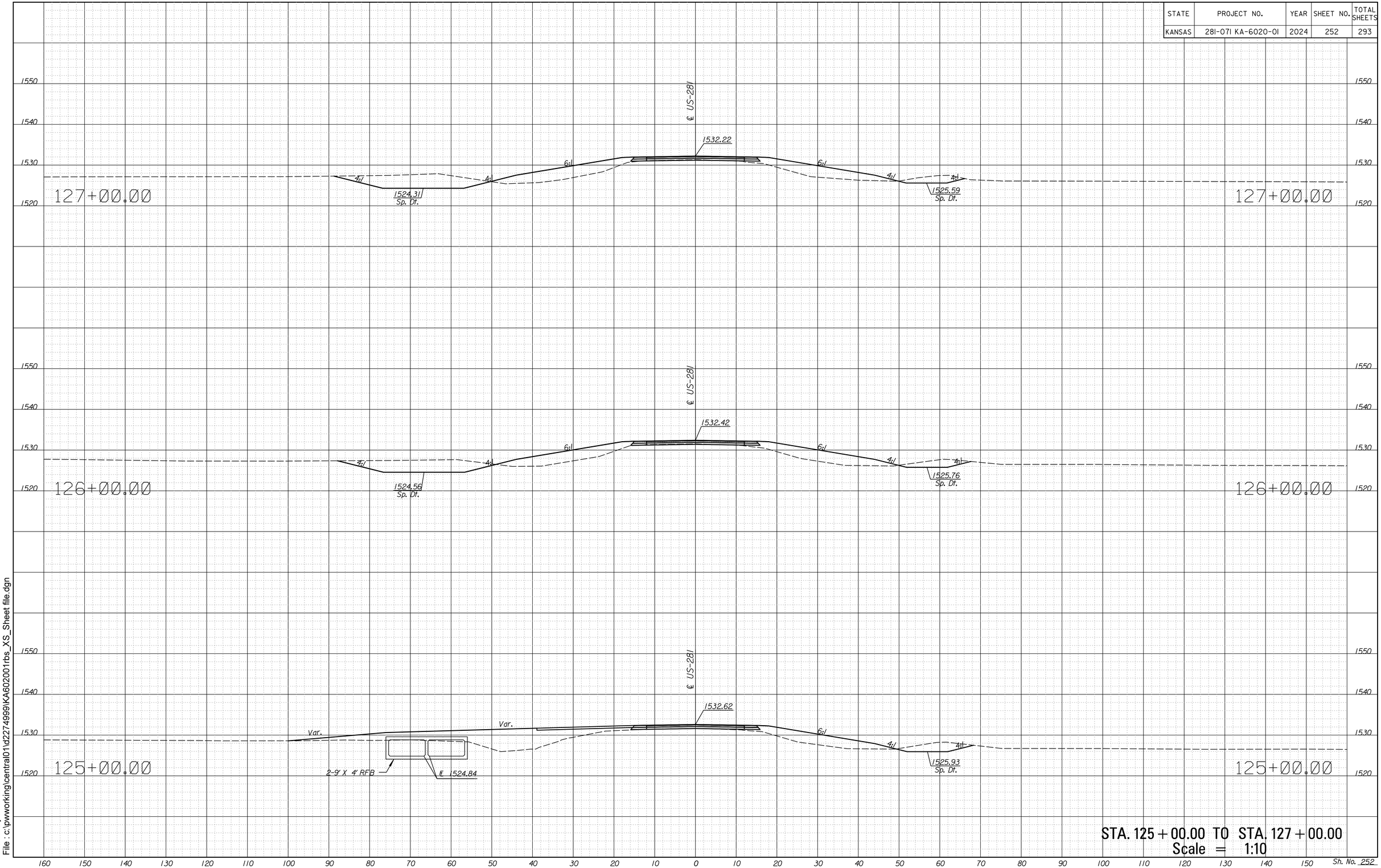
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	251	293



Drawn By : MDELEON Plotted : 07-11-24
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STA. 123 + 00.00 TO STA. 124 + 81.00
Scale = 1:10

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	252	293

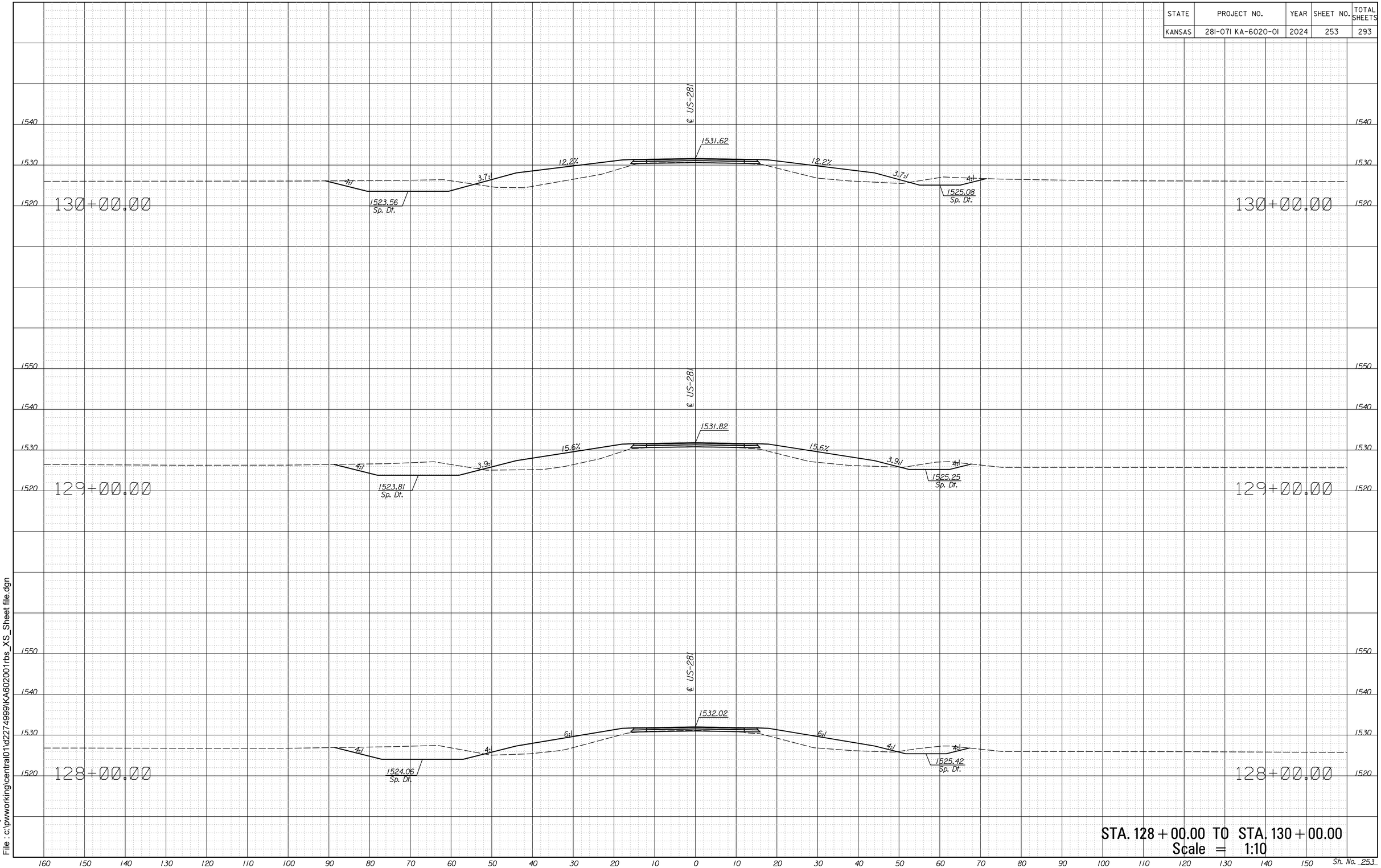


STA. 125 + 00.00 TO STA. 127 + 00.00
Scale = 1:10

Sh. No. 252

Drawn By: MDELEON Plotted: 07-11-24
File: c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	253	293

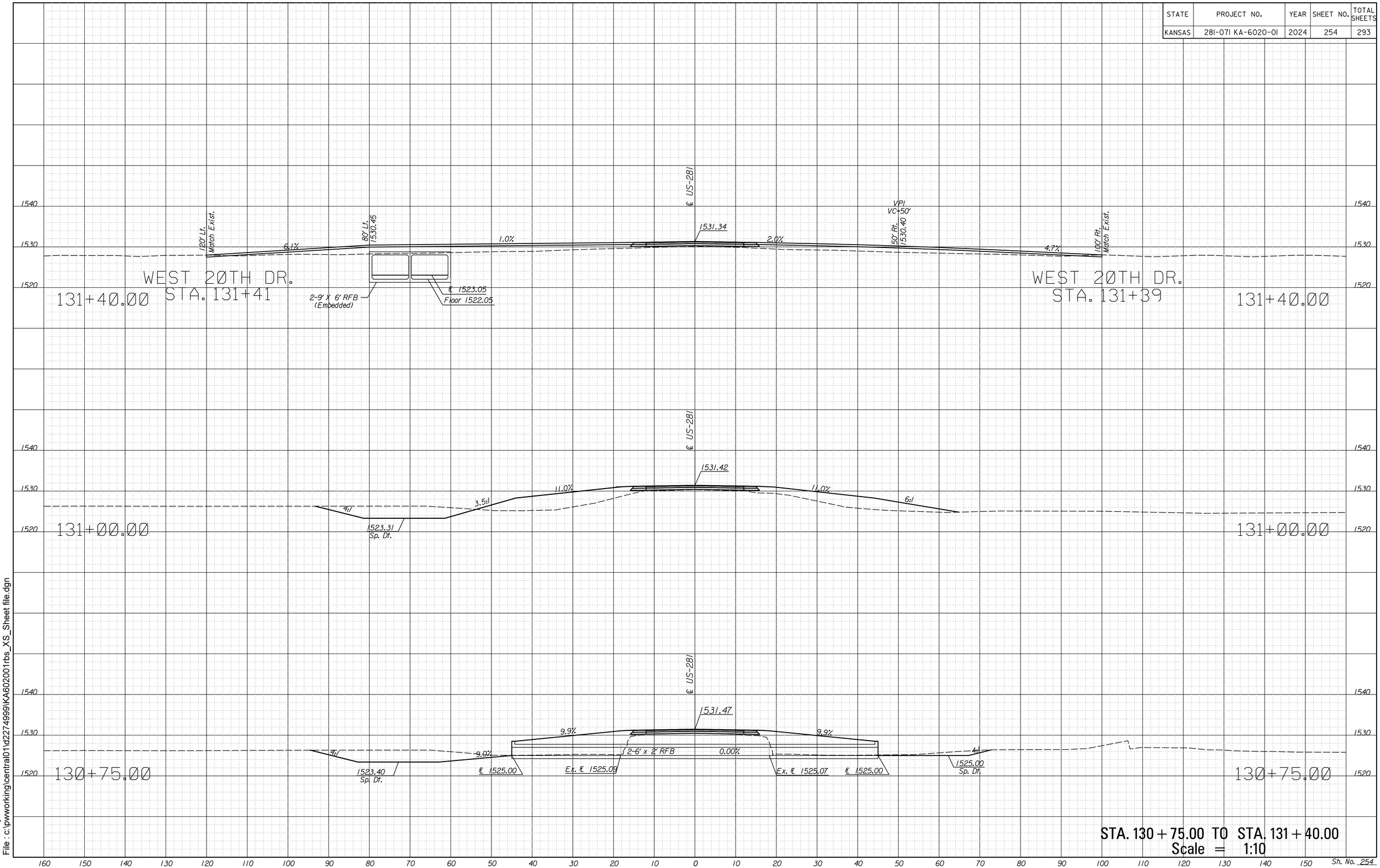


STA. 128 + 00.00 TO STA. 130 + 00.00
Scale = 1:10

Sh. No. 253

Drawn By: MDELEON
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn
Plotted :07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	254	293

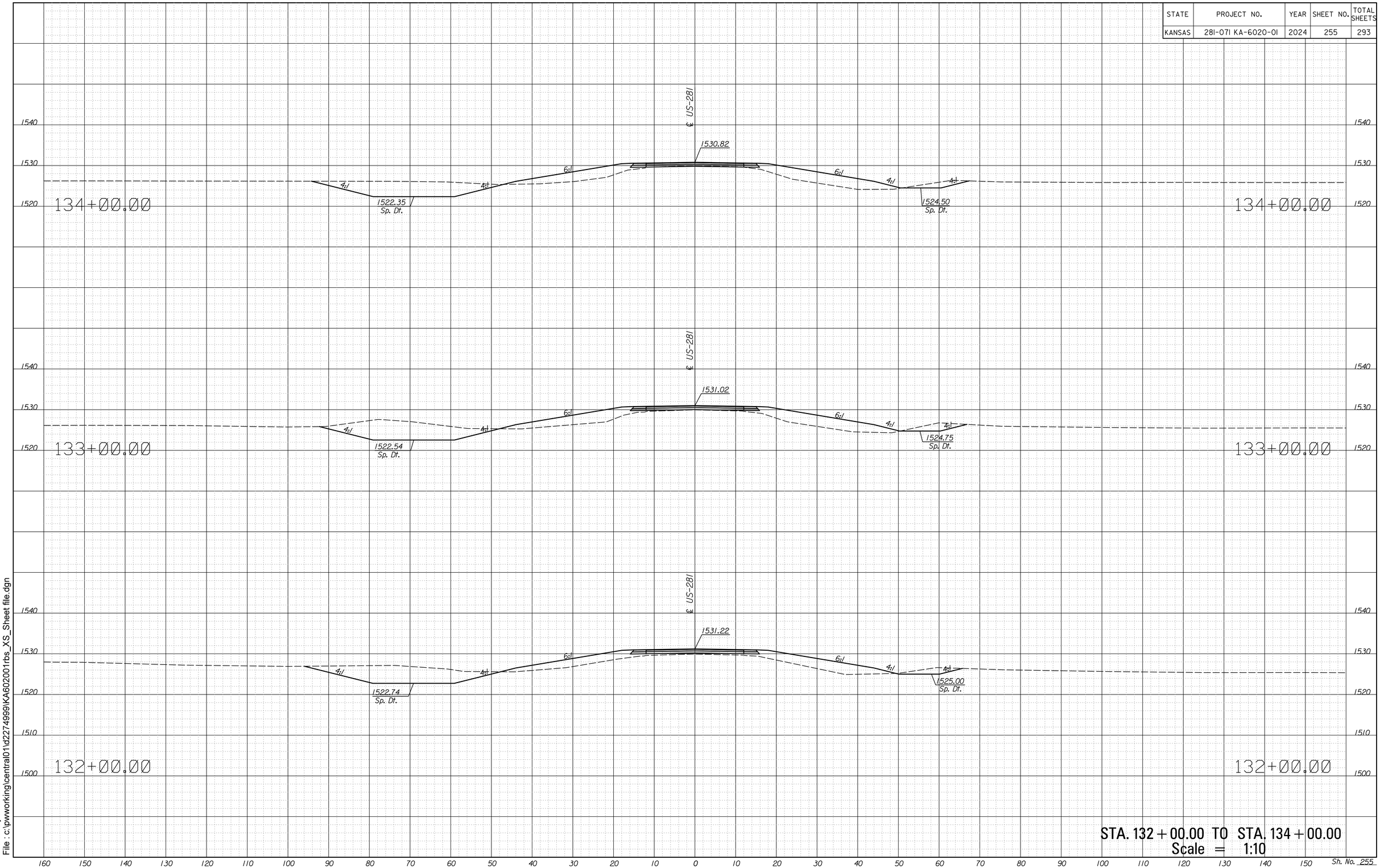


STA. 130 + 75.00 TO STA. 131 + 40.00
Scale = 1:10

Sh. No. 254

Drawn By: MDELEON
File: c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn
Plotted: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	255	293



STA. 132 + 00.00 TO STA. 134 + 00.00

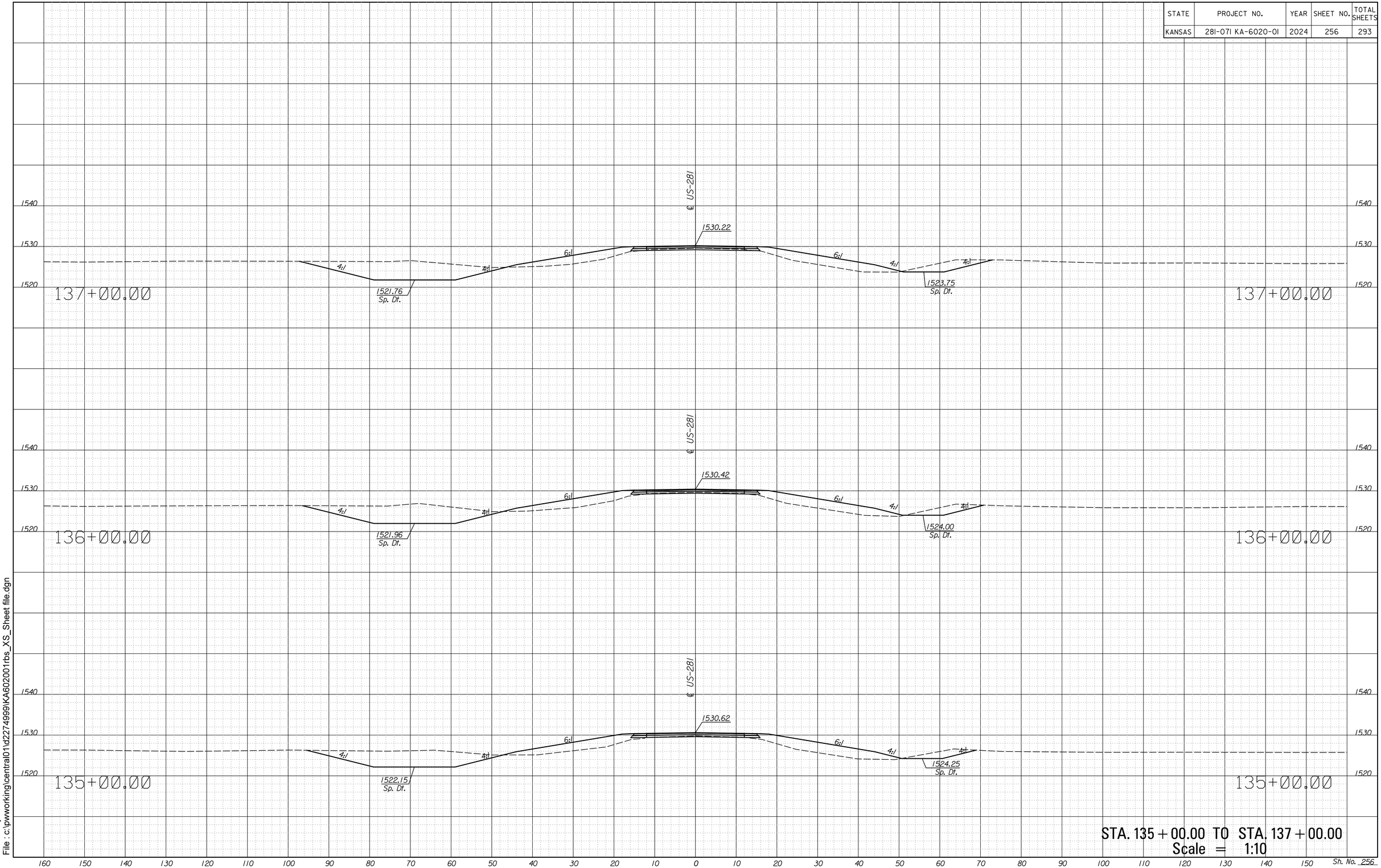
Scale = 1:10

Sh. No. 255

Drawn By : MDELEON Plotted : 07-11-24

File : c:\pwworking\central01\d2274999\KA6020001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	256	293

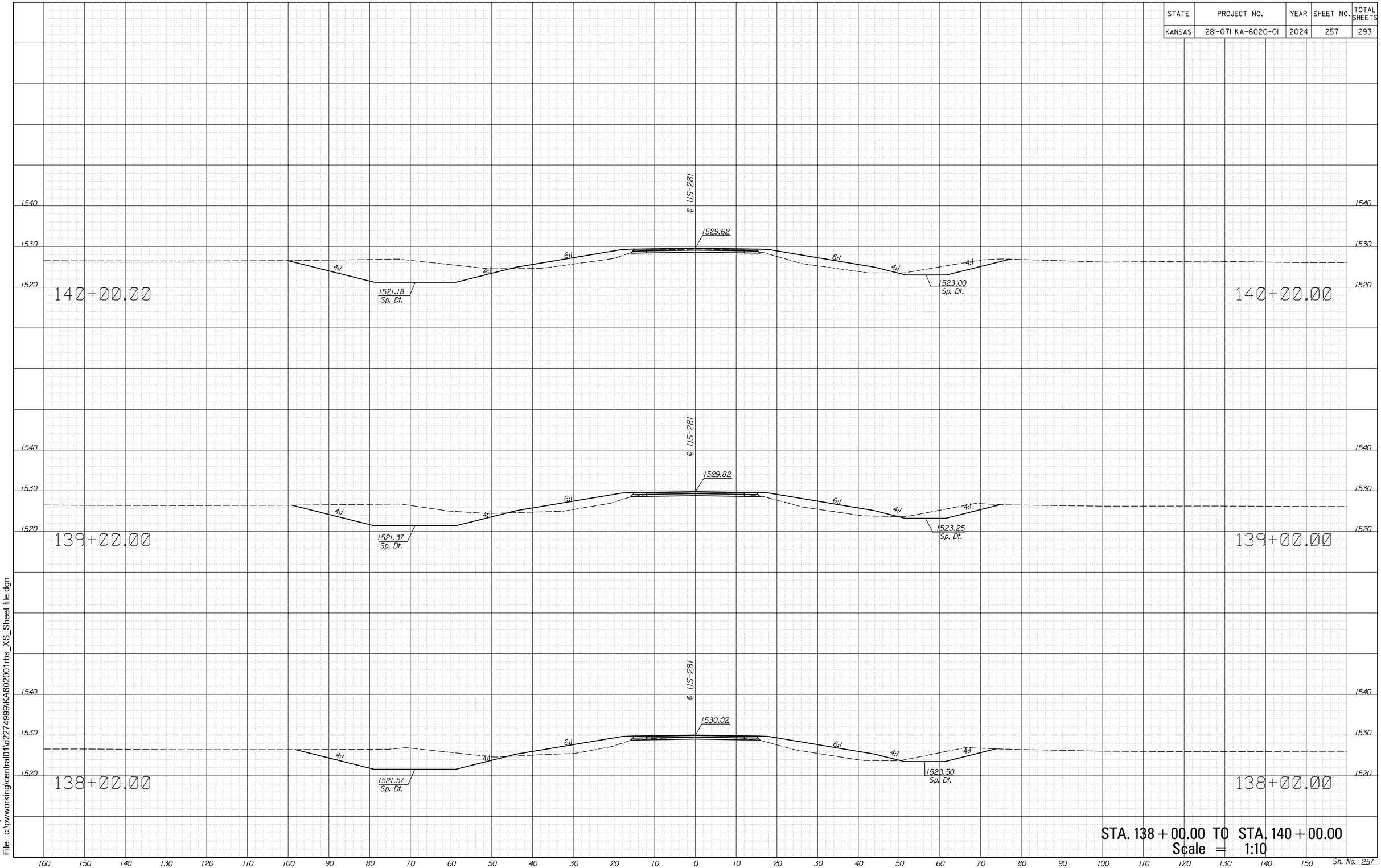


Drawn By: MDELEON Plotted: 07-11-24
File: c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STA. 135+00.00 TO STA. 137+00.00
Scale = 1:10

Sh. No. 256

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	257	293

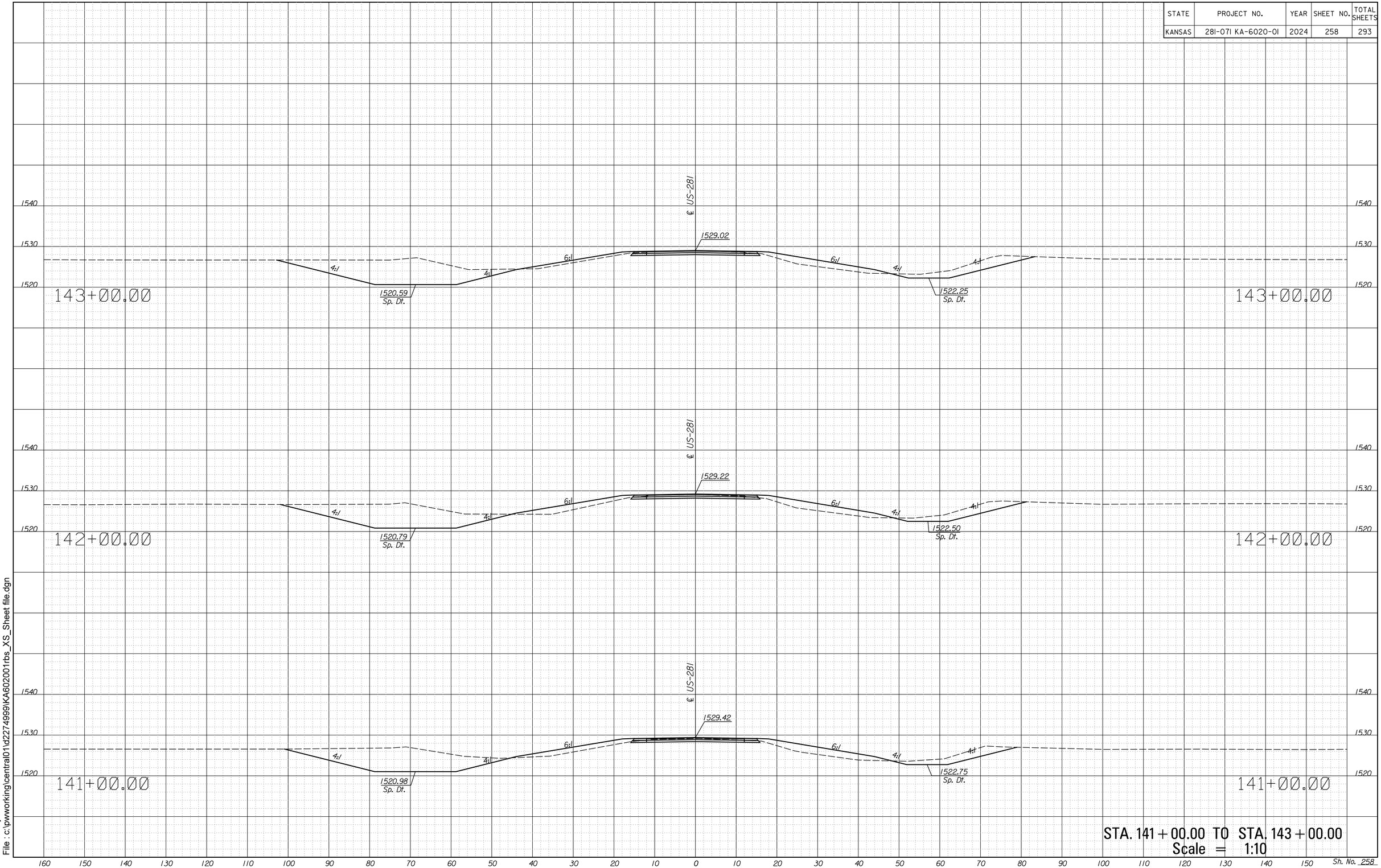


STA. 138 + 00.00 TO STA. 140 + 00.00
Scale = 1:10

Sh. No. 257

Drawn By: MDELEON Plotted: 07-11-24
File: c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	258	293

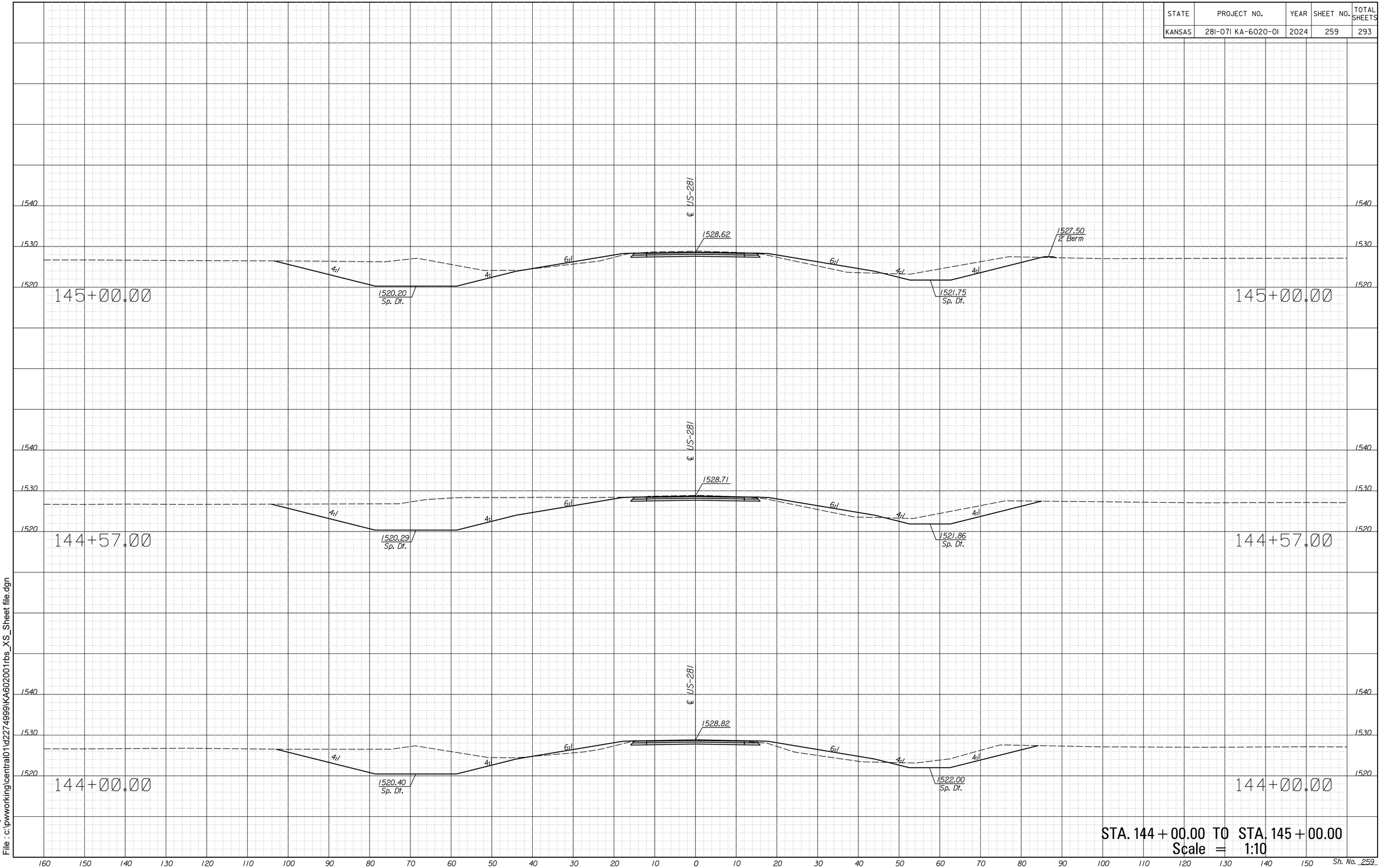


STA. 141 + 00.00 TO STA. 143 + 00.00
Scale = 1:10

Sh. No. 258

Drawn By: MDELEON
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn
Plotted :07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	259	293



STA. 144 + 00.00 TO STA. 145 + 00.00

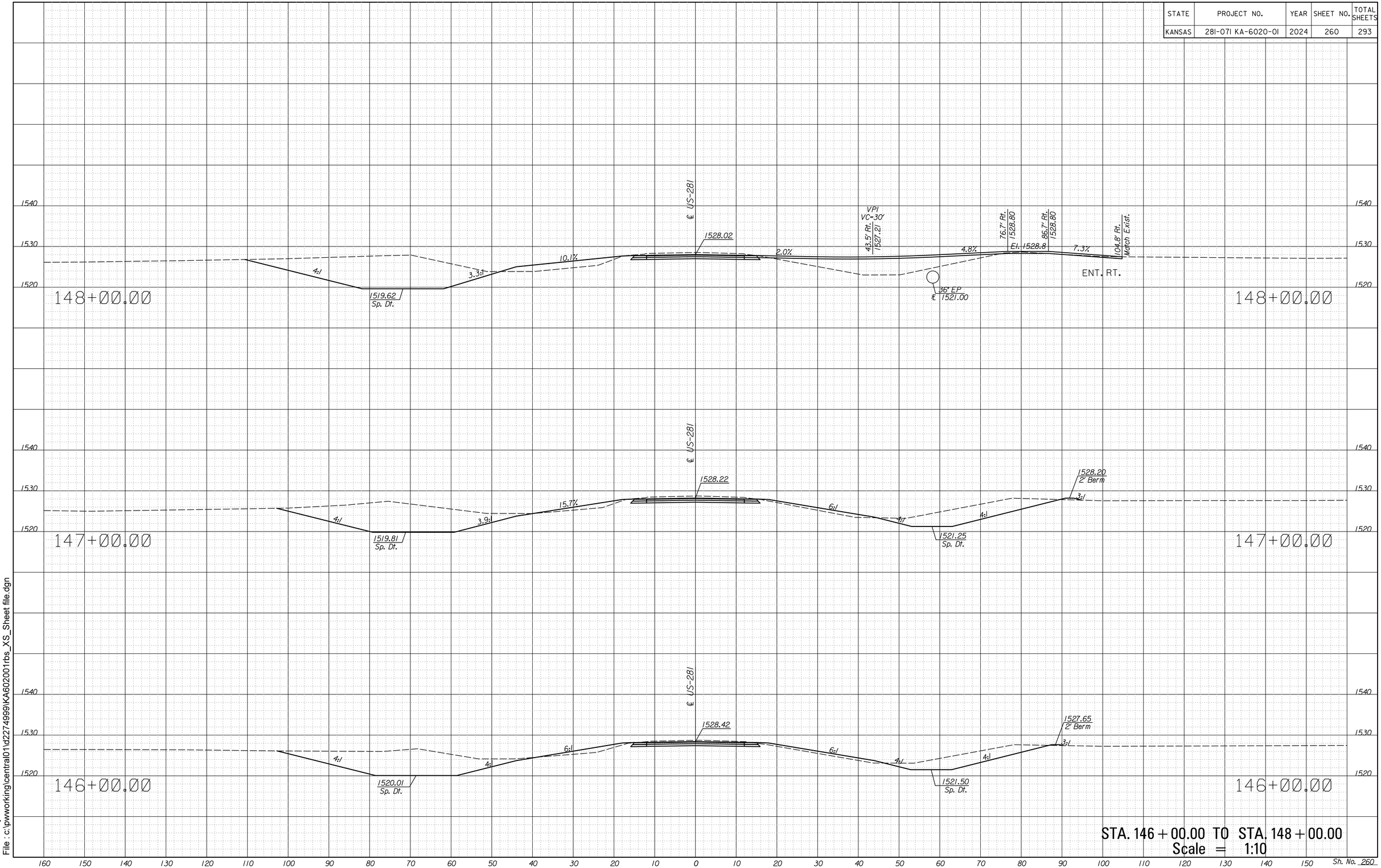
Scale = 1:10

Sh. No. 259

Drawn By: MDELEON Plotted: 07-11-24

File: c:\pwworking\central01\d2274999\KA6020001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	260	293

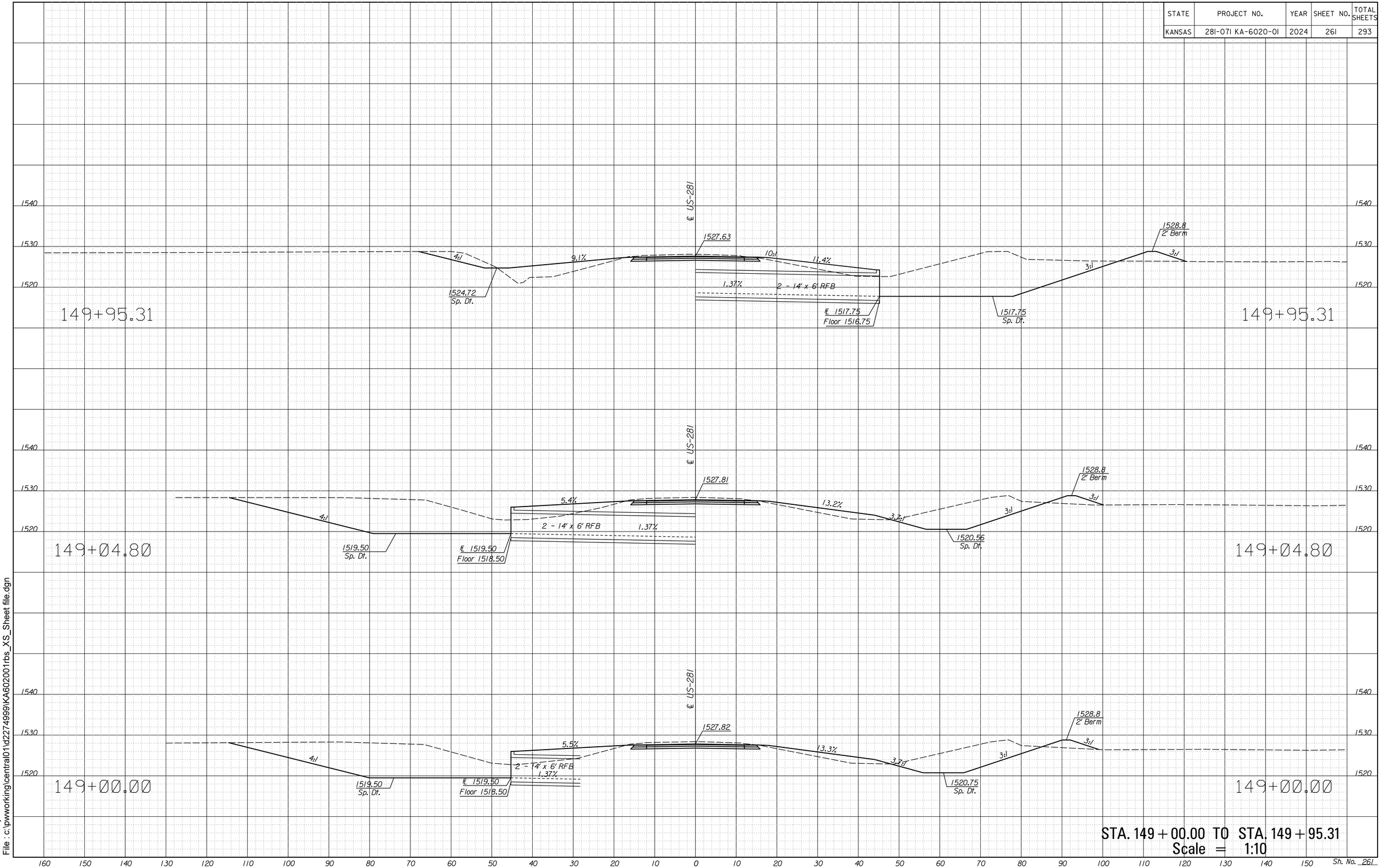


Drawn By: MDELEON Plotted: 07-11-24
File: c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STA. 146+00.00 TO STA. 148+00.00
Scale = 1:10

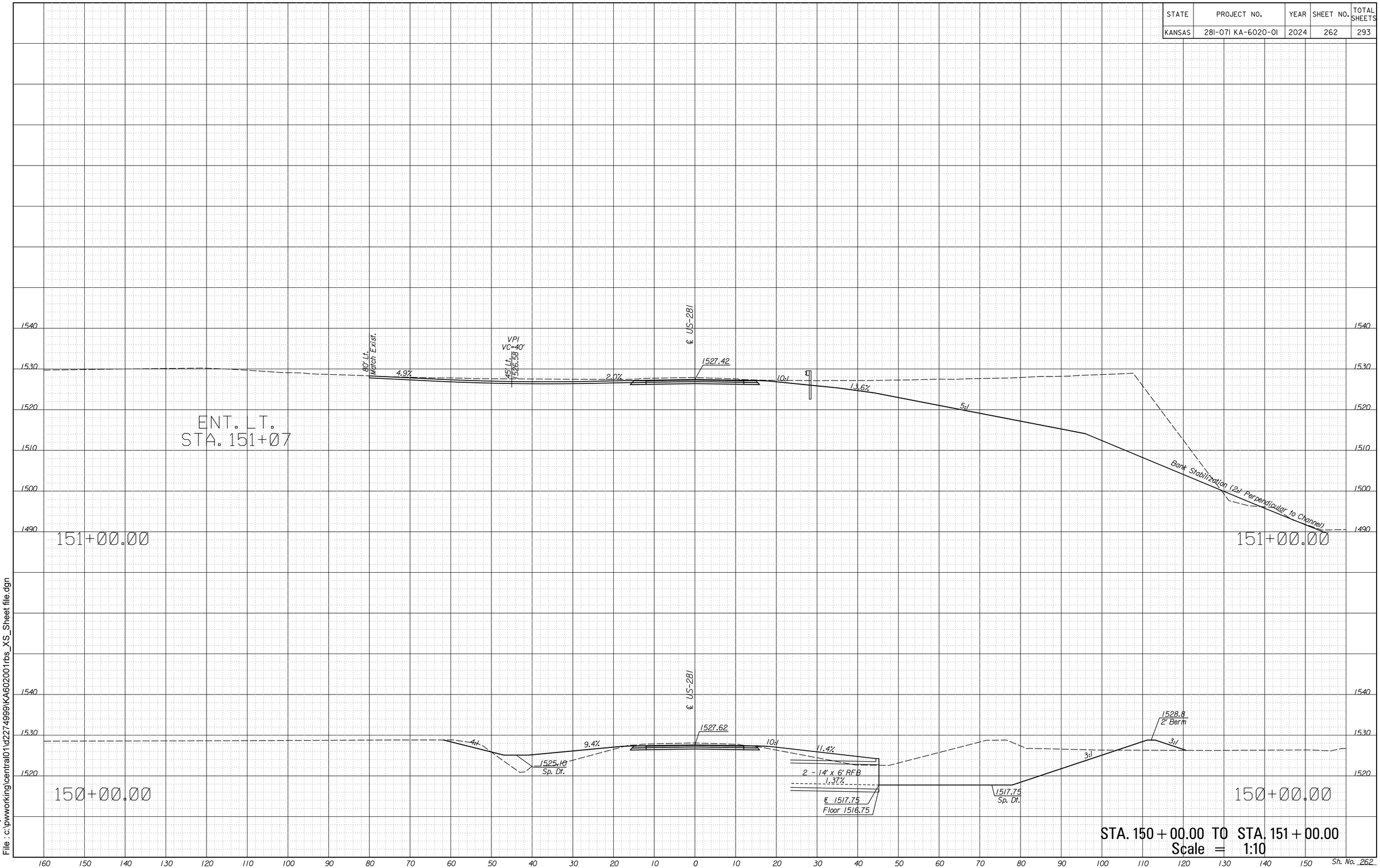
Sh. No. 260

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	261	293



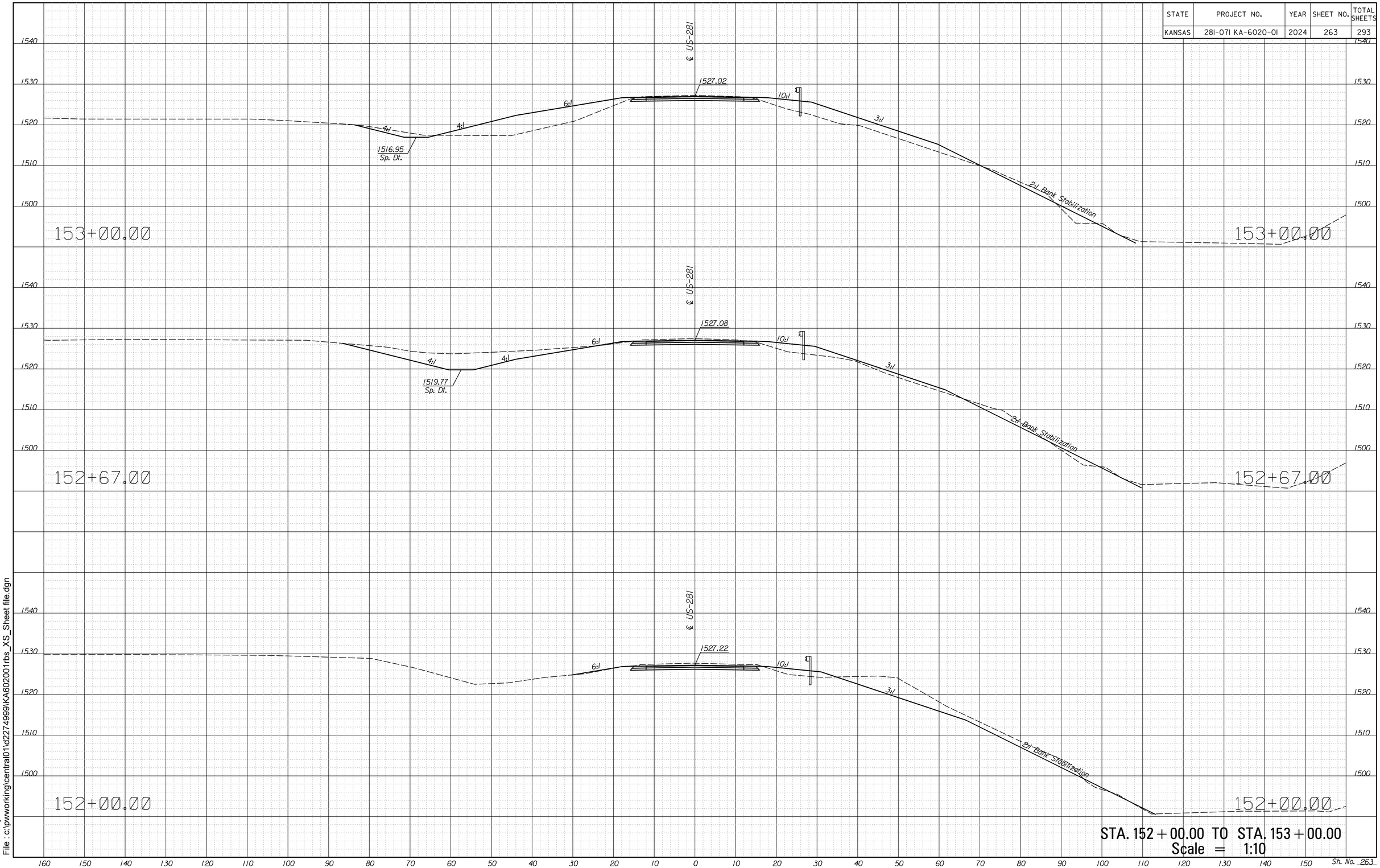
Drawn By: MDELEON Plotted: 07-11-24
File: c:\pwworking\central01\d2274999\KA6020001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	262	293



Drawn By : MDELEON Plotted : 07-11-24
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	263	293

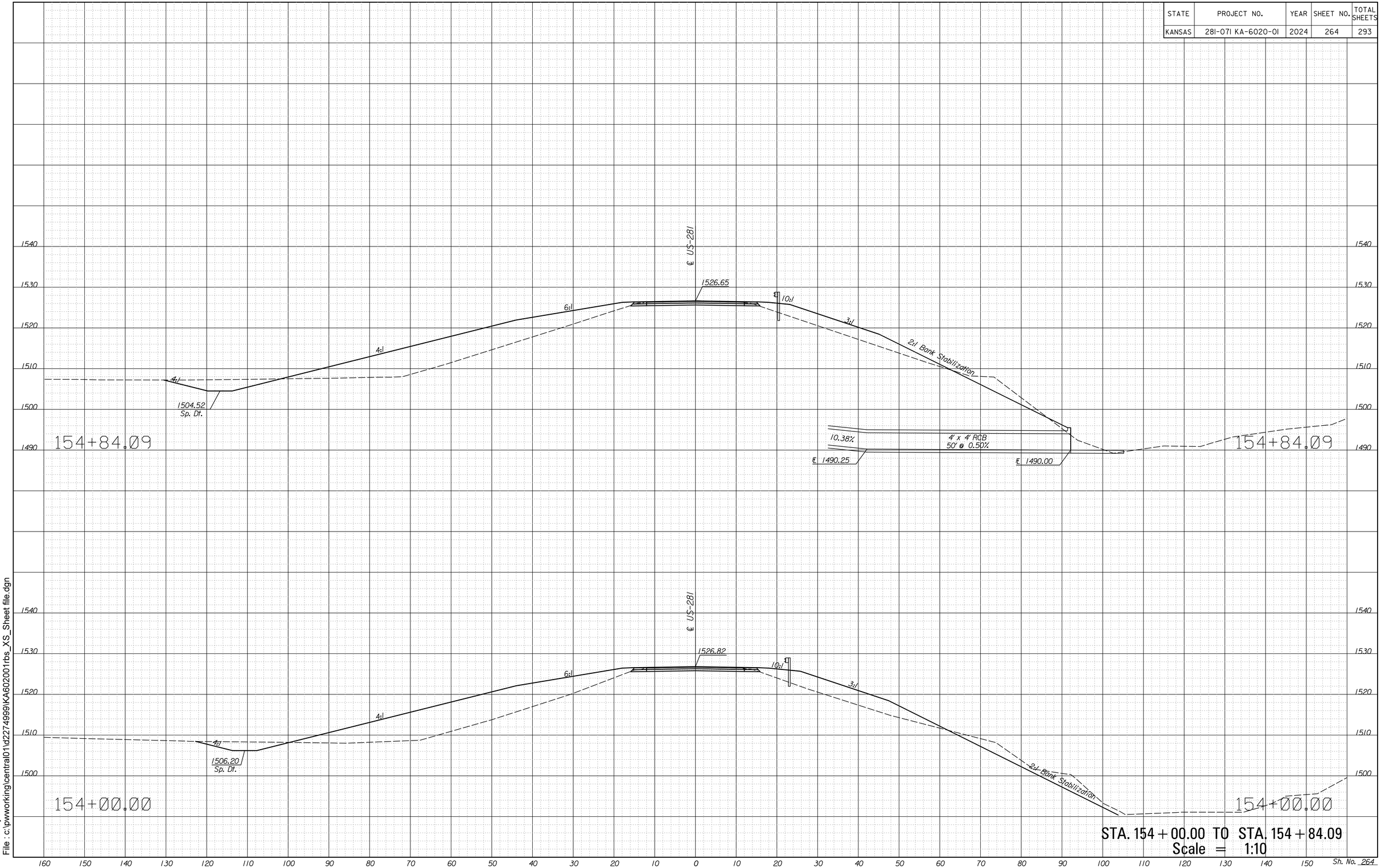


STA. 152 + 00.00 TO STA. 153 + 00.00
Scale = 1:10

Sh. No. 263

Drawn By : MDELEON Plotted : 07-11-24
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	264	293



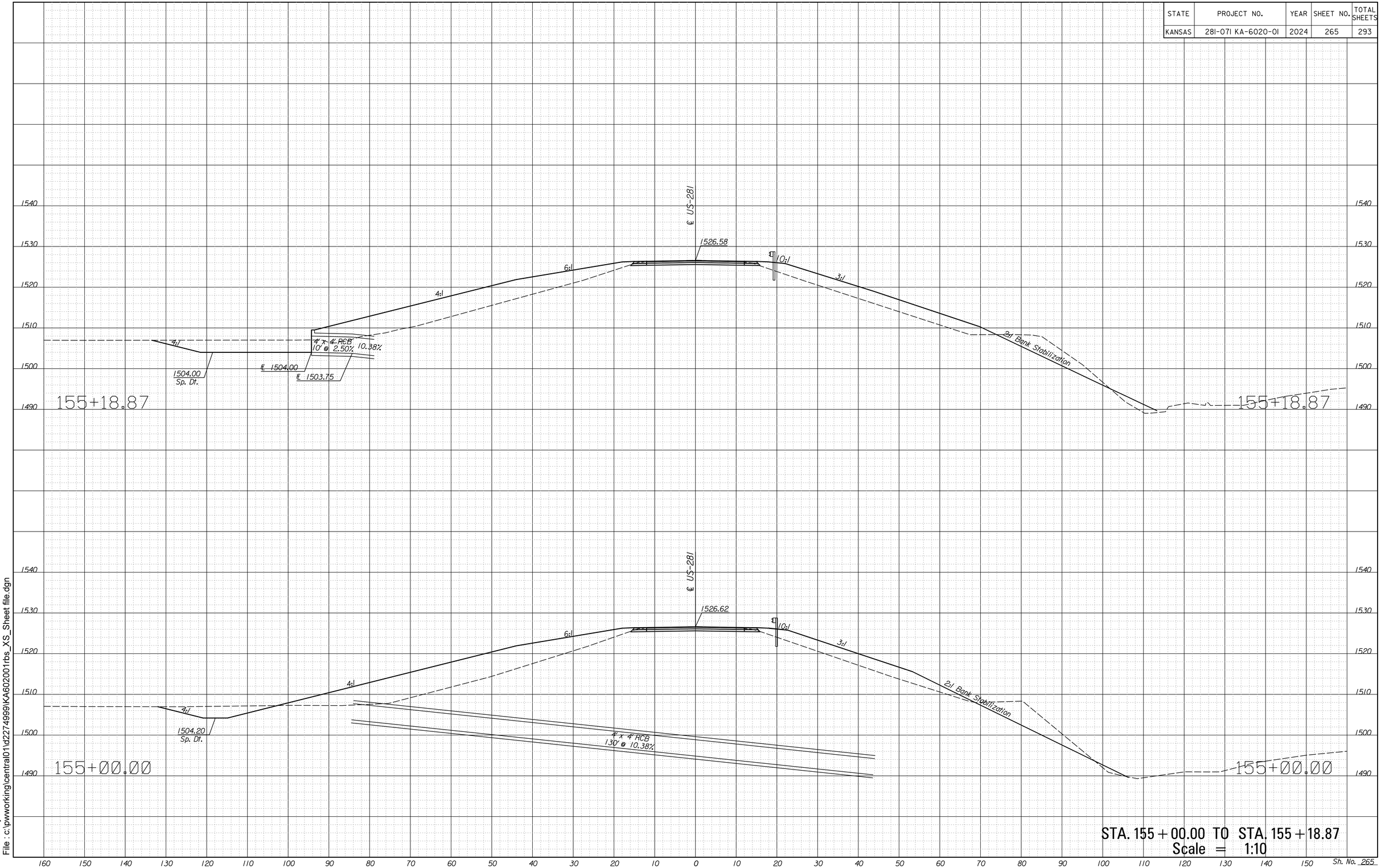
STA. 154 + 00.00 TO STA. 154 + 84.09

Scale = 1:10

Sh. No. 264

Drawn By: MDELEON
File: c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn
Plotted: 07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	265	293

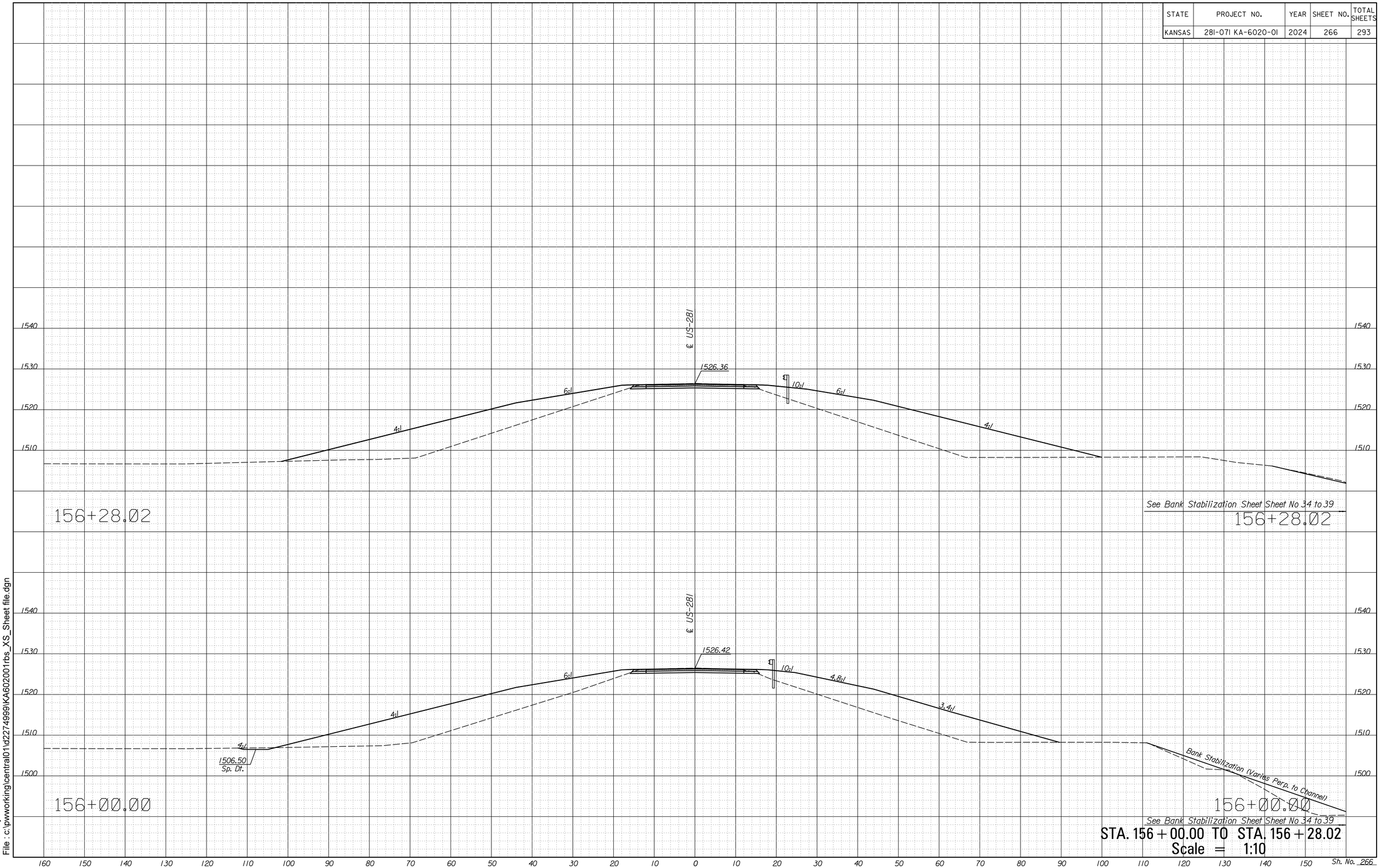


Plotted : 07-11-24
Drawn By : MDELEON
File : c:\pwworking\central01\d2274999\KA6020001rbs_XS_Sheet file.dgn

STA. 155 + 00.00 TO STA. 155 + 18.87
Scale = 1:10

Sh. No. 265

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	266	293



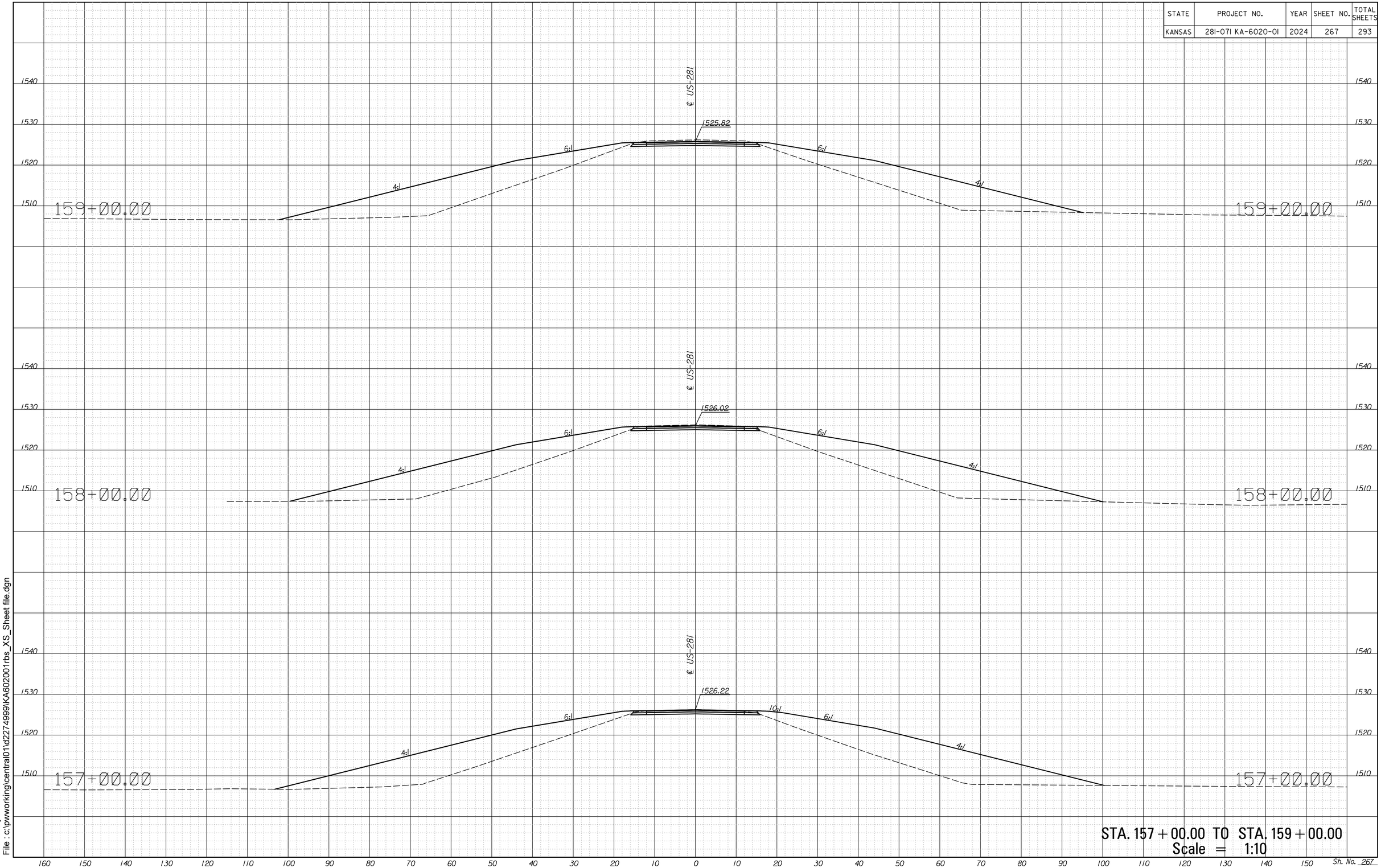
STA. 156+00.00 TO STA. 156+28.02

Scale = 1:10

Sh. No. 266

Drawn By : MDELEON
Plotted : 07-11-24
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	267	293

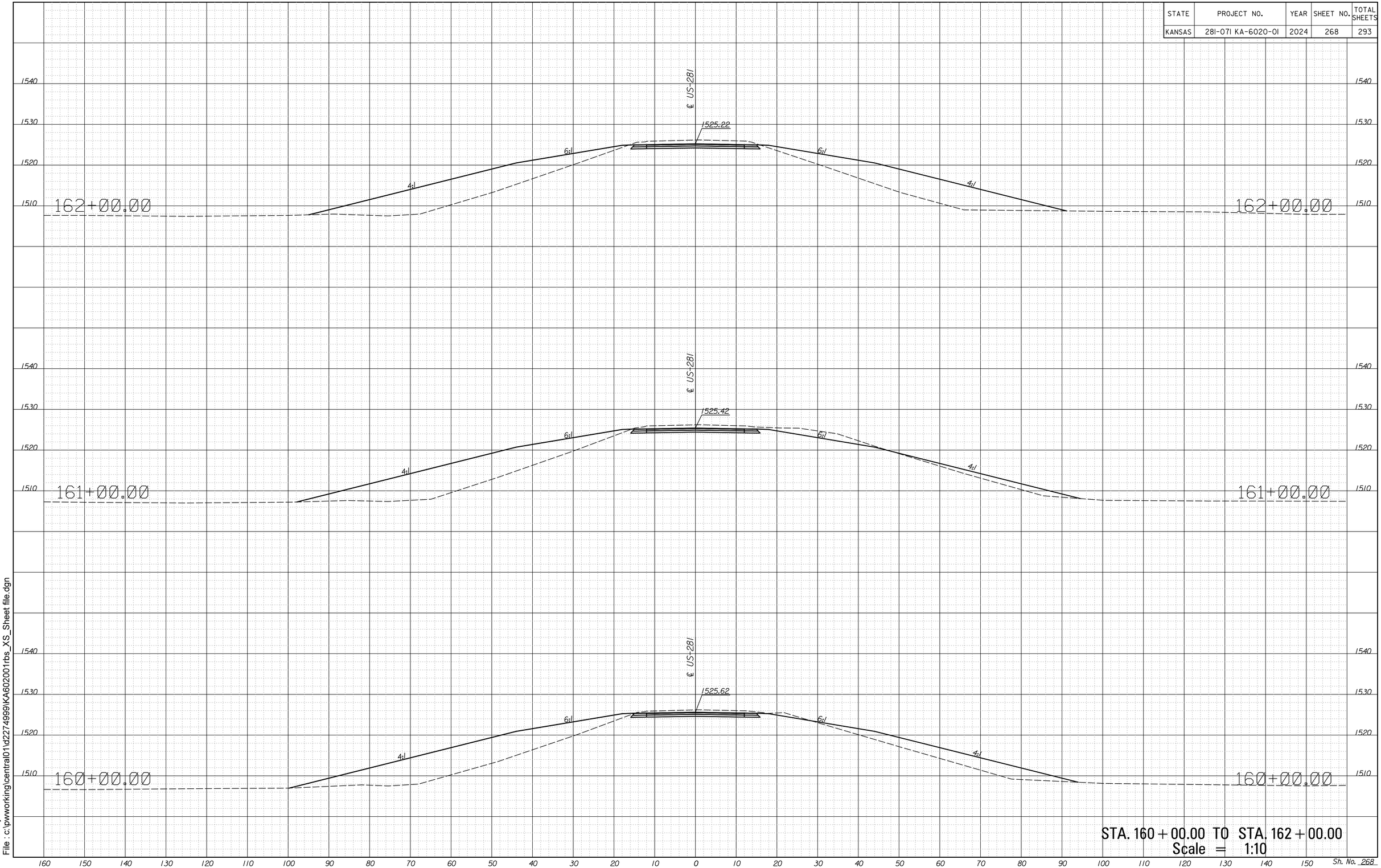


STA. 157 + 00.00 TO STA. 159 + 00.00
Scale = 1:10

Sh. No. 267

Drawn By : MDELEON
Plotted : 07-11-24
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	268	293

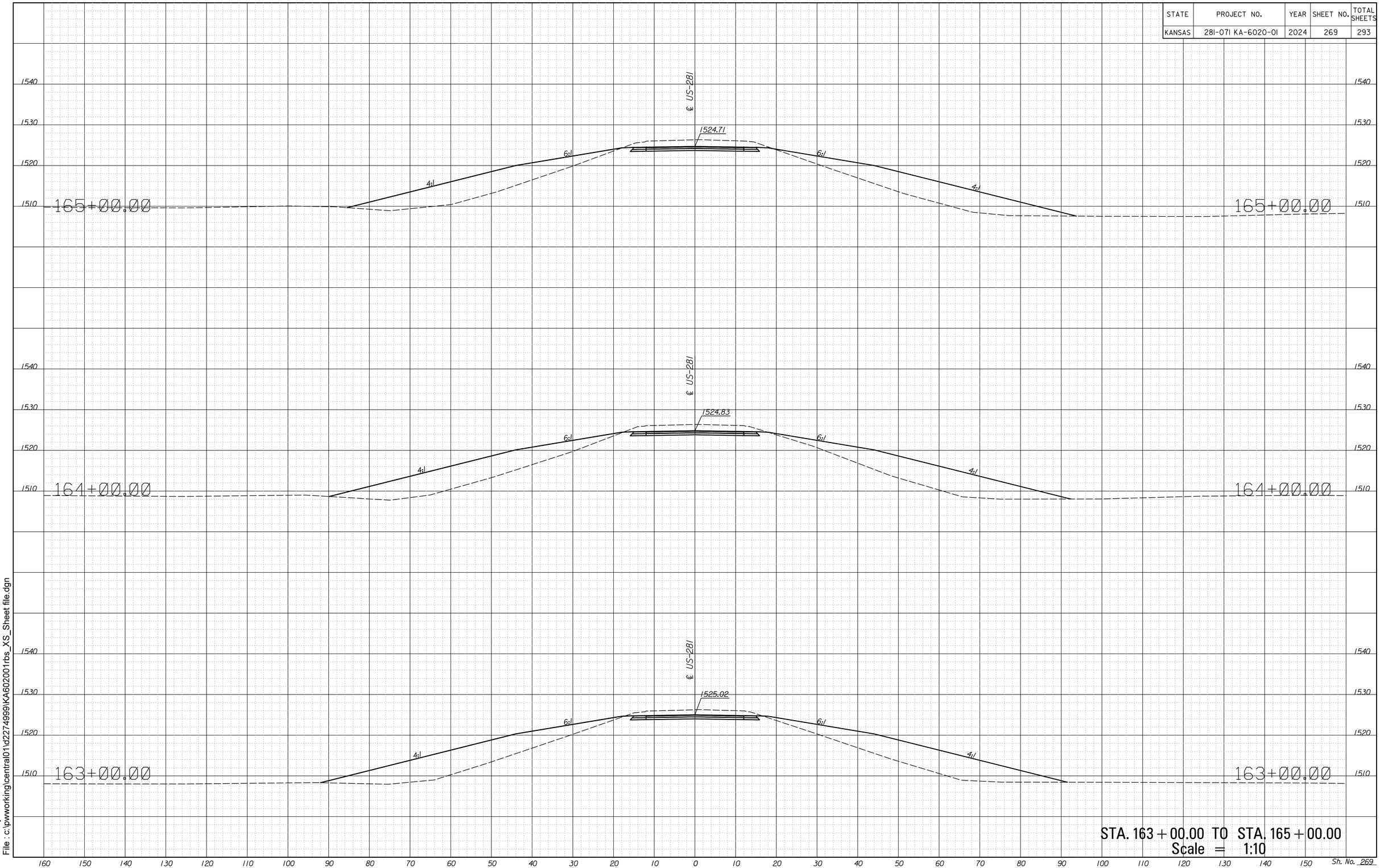


Drawn By : MDELEON Plotted : 07-11-24
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STA. 160 + 00.00 TO STA. 162 + 00.00
Scale = 1:10

Sh. No. 268

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	269	293

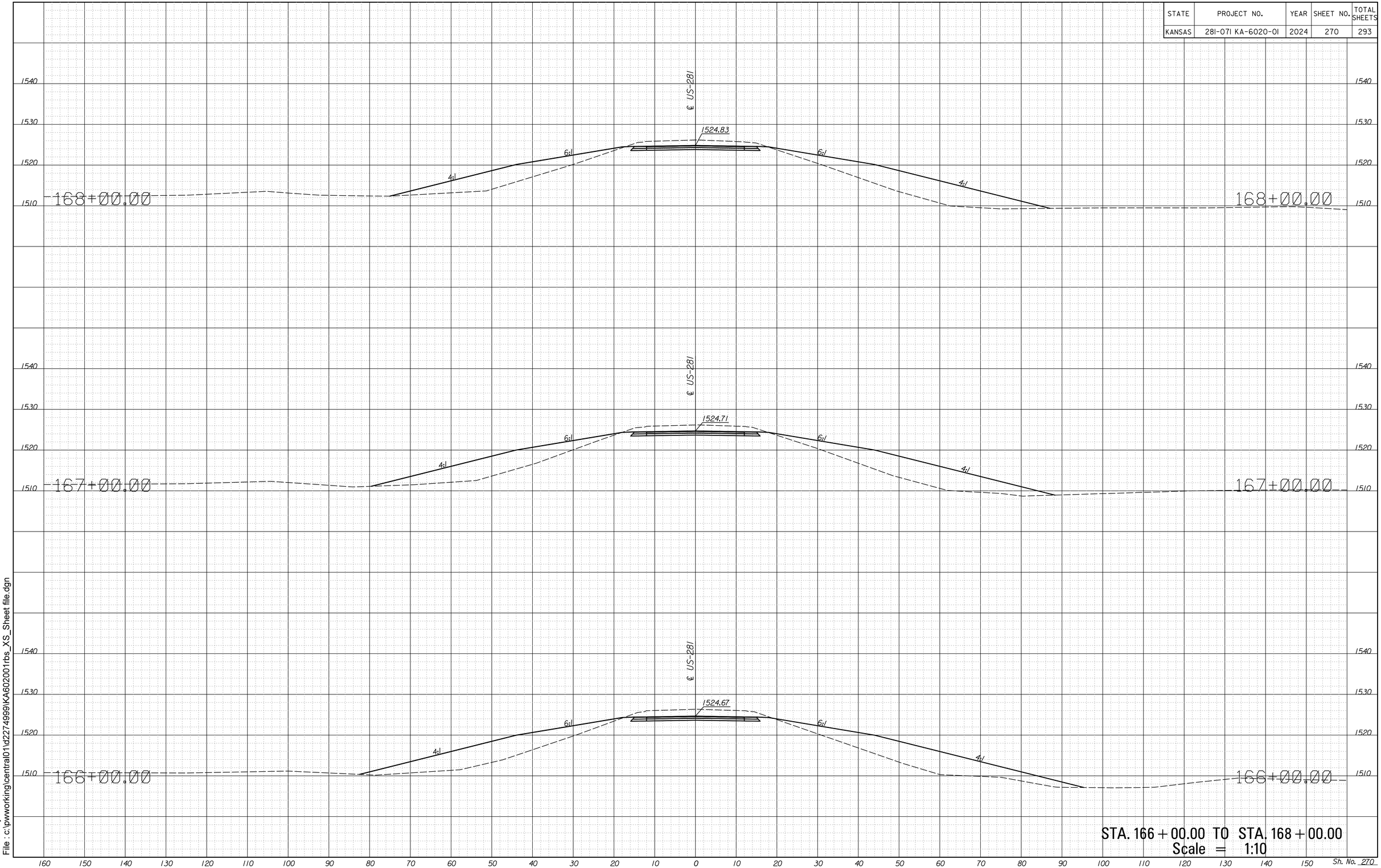


STA. 163 + 00.00 TO STA. 165 + 00.00
Scale = 1:10

Sh. No. 269

Drawn By : MDELEON
Plotted : 07-11-24
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	270	293

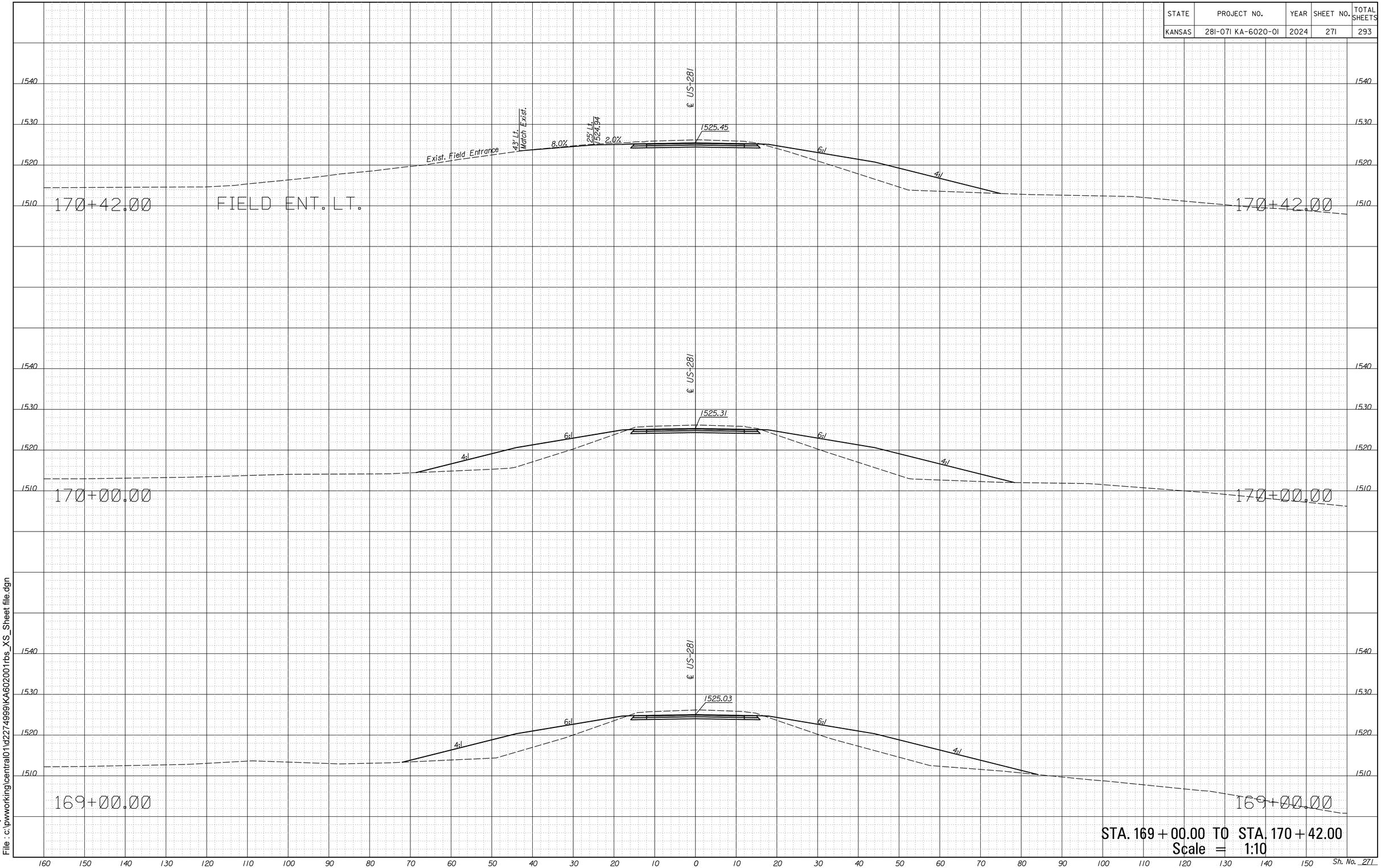


STA. 166 + 00.00 TO STA. 168 + 00.00
Scale = 1:10

Sh. No. 270

Drawn By: MDELEON
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn
Plotted :07-11-24

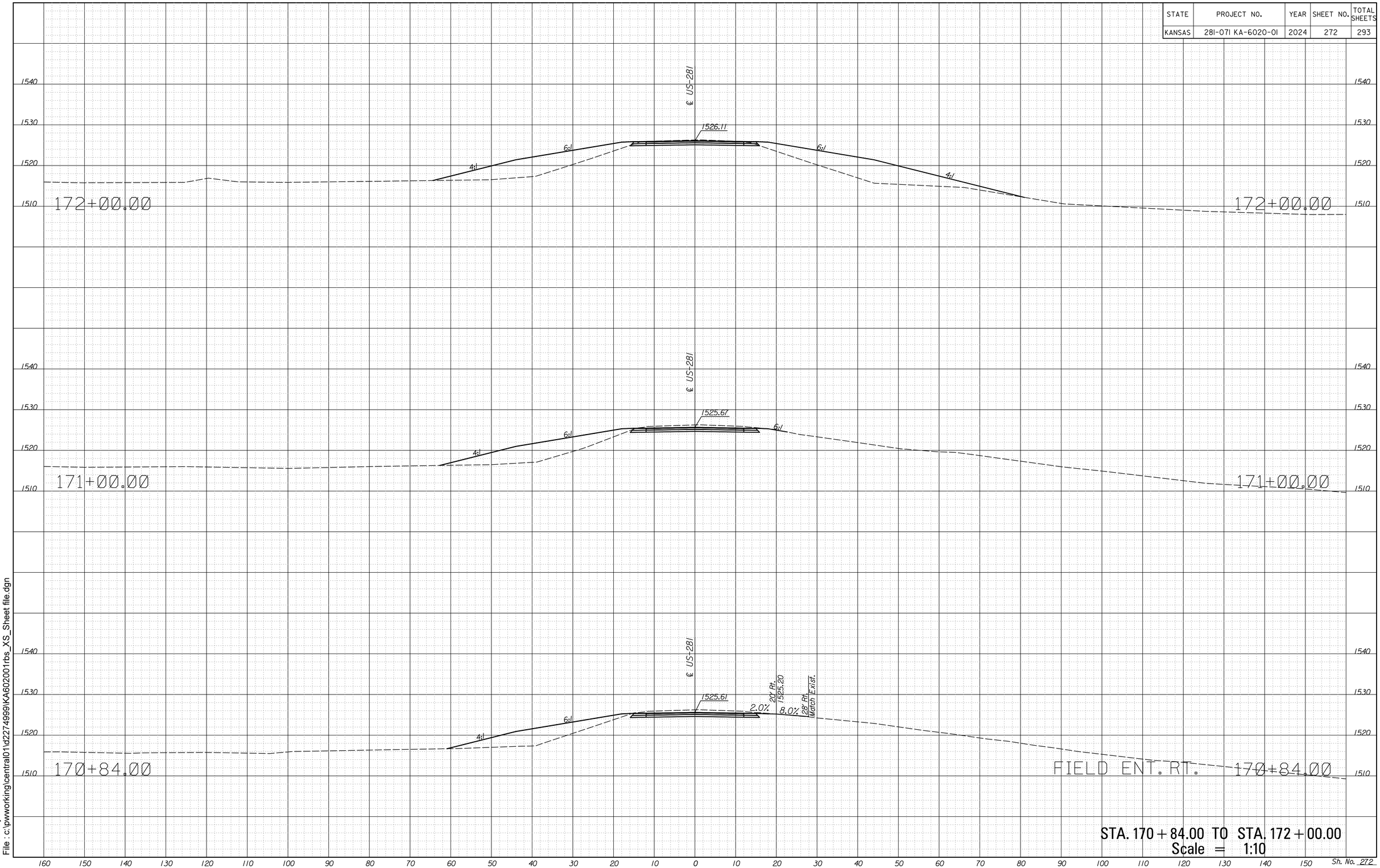
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	271	293



Drawn By: MDELEON Plotted: 07-11-24
File: c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

Sh. No. 271

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	272	293



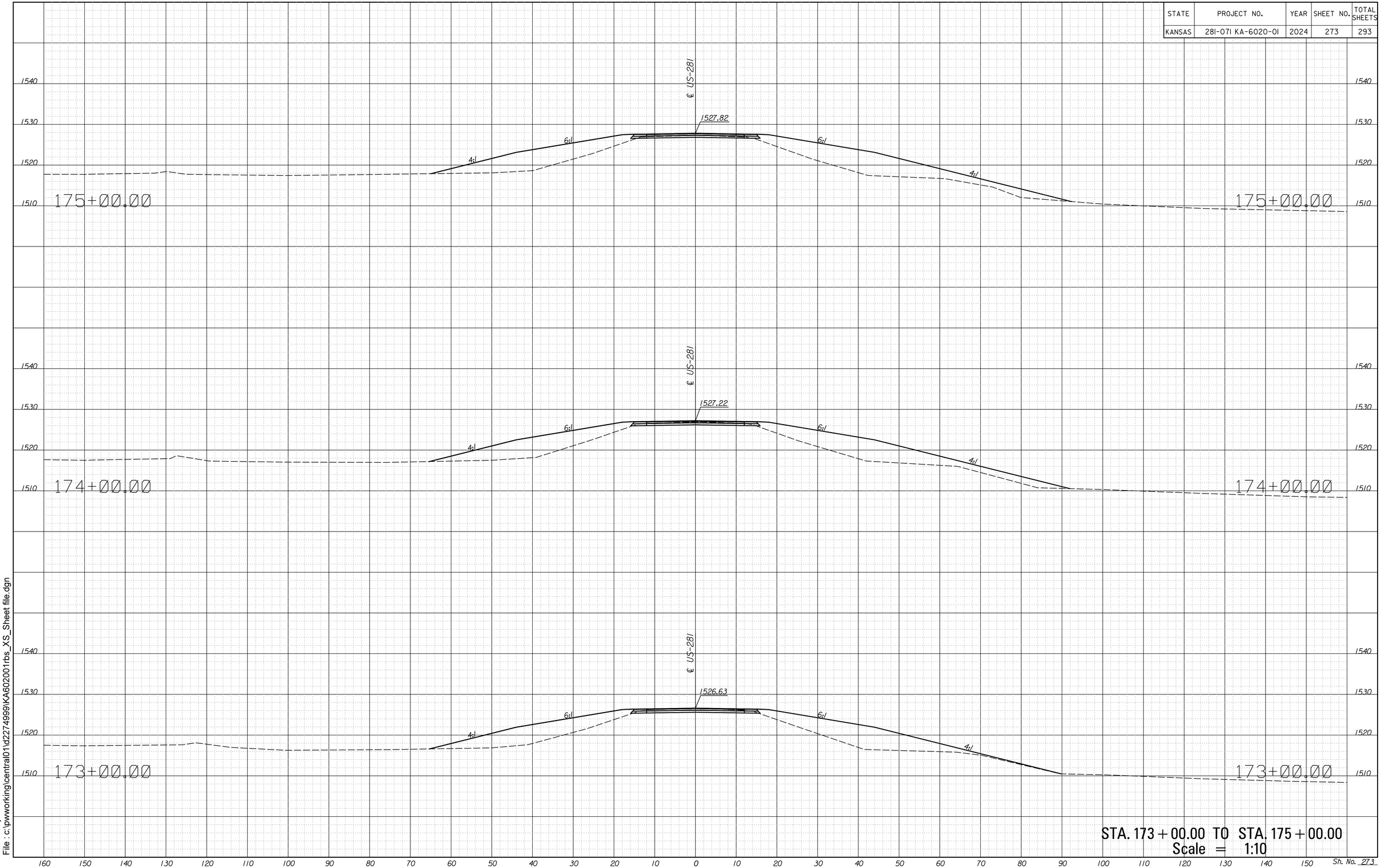
STA. 170 + 84.00 TO STA. 172 + 00.00

Scale = 1:10

Sh. No. 272

Drawn By : MDELEON
Plotted : 07-11-24
File : c:\pwworking\central01\d2274999\KA6020001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	273	293

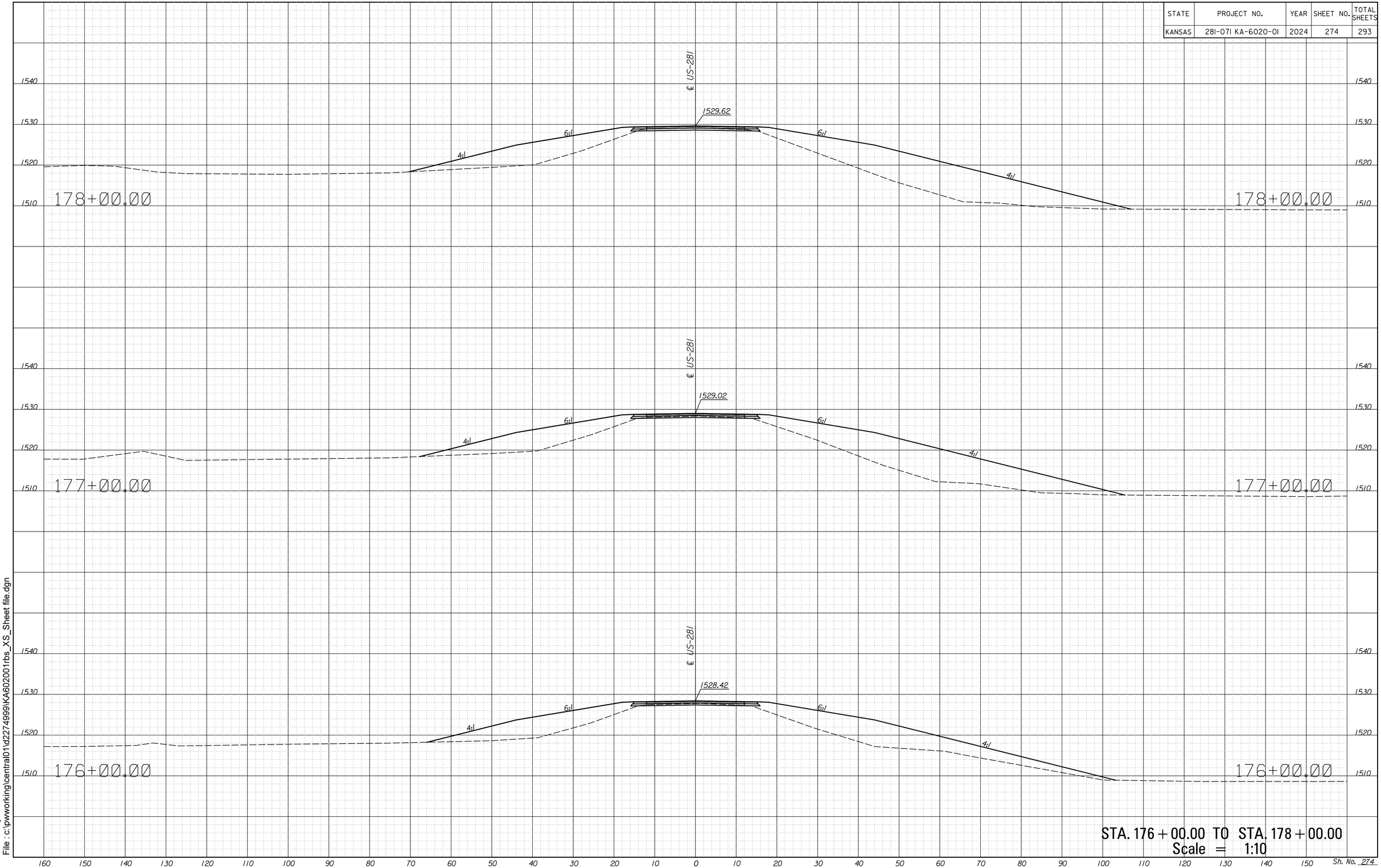


STA. 173 + 00.00 TO STA. 175 + 00.00
Scale = 1:10

Sh. No. 273

Drawn By: MDELEON
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn
Plotted :07-11-24

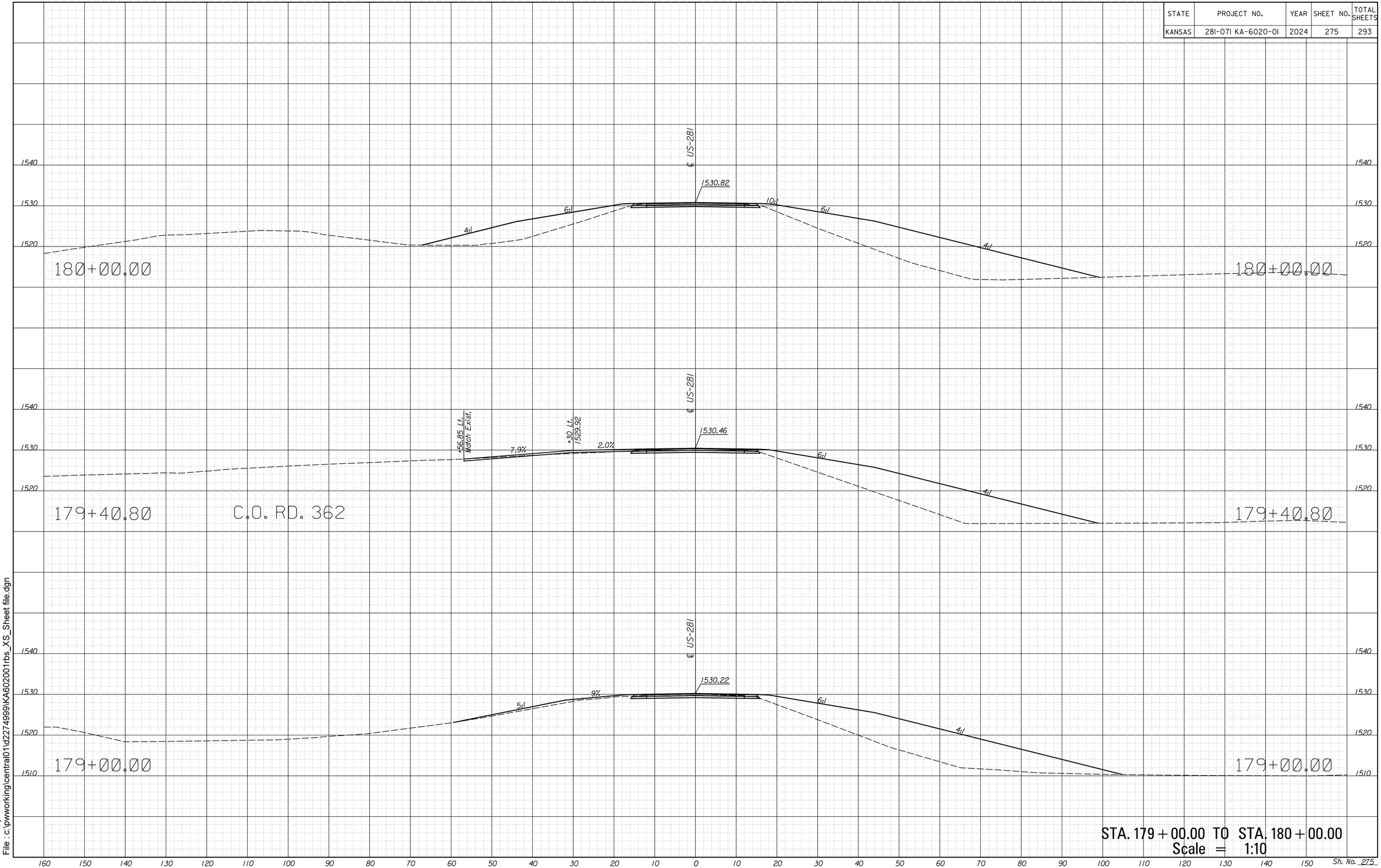
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	274	293



Drawn By: MDELEON Plotted: 07-11-24
File: c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

Sh. No. 274

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	275	293

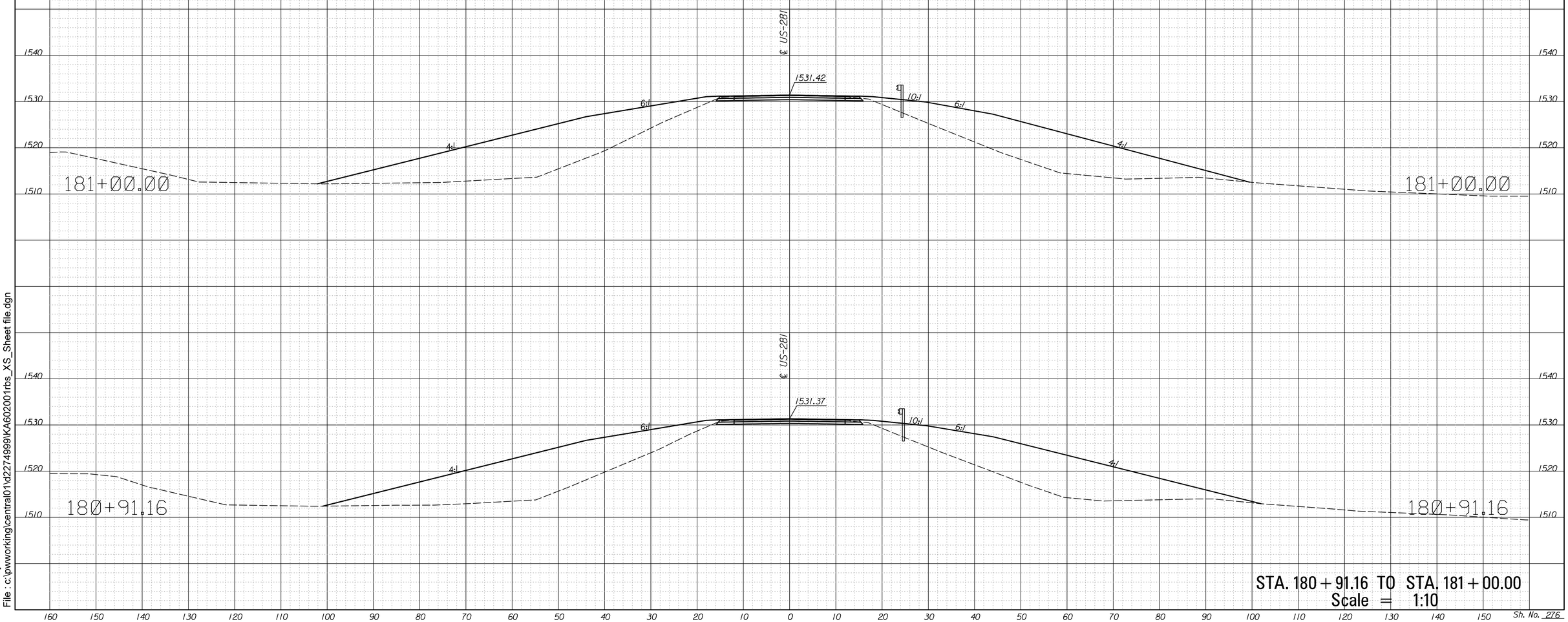


STA. 179 + 00.00 TO STA. 180 + 00.00
Scale = 1:10

Sh. No. 275

Drawn By: MDELEON
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn
Plotted :07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	276	293



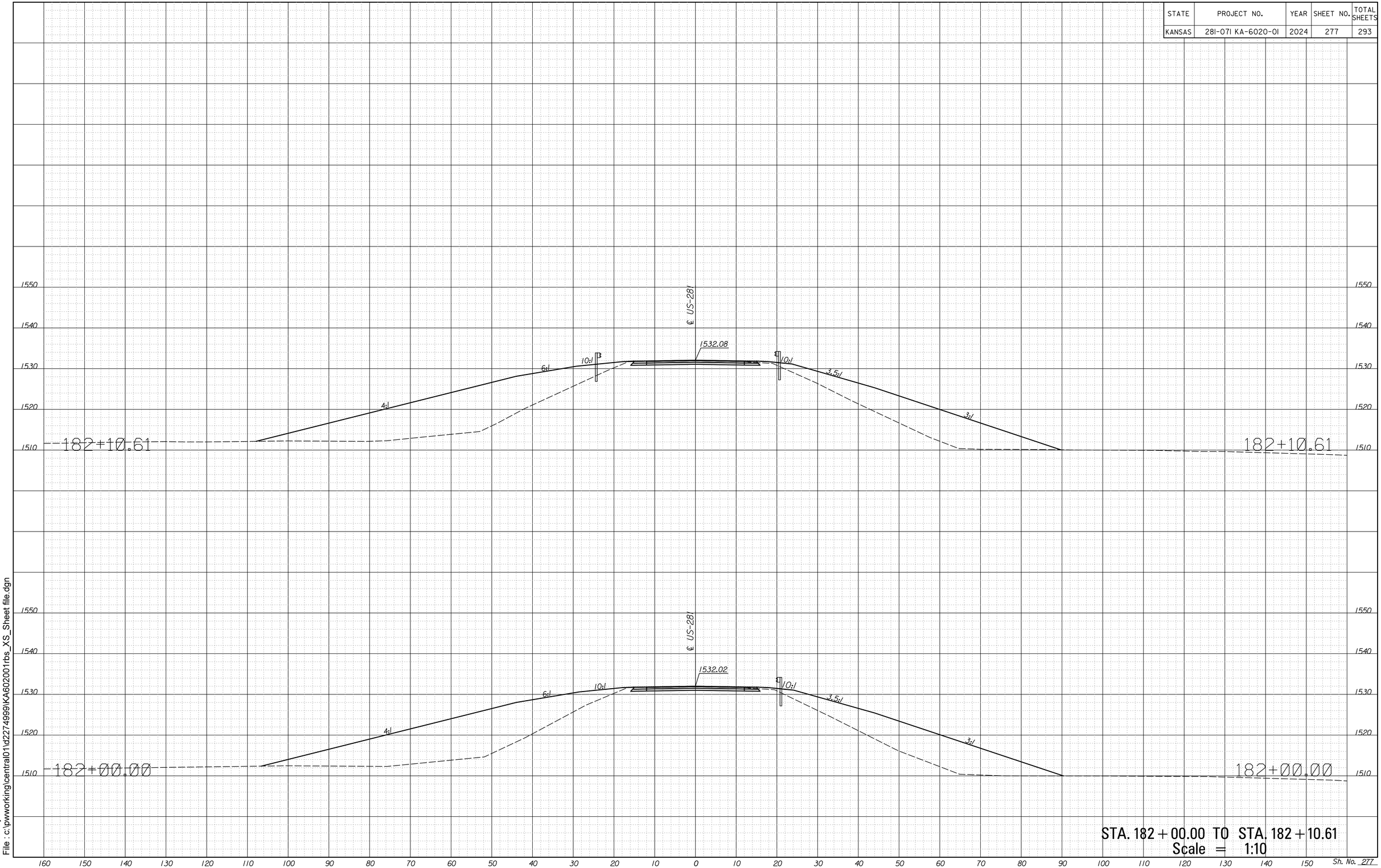
STA. 180 + 91.16 TO STA. 181 + 00.00

Scale = 1:10

Sh. No. 276

Drawn By : MDELEON
Plotted : 07-11-24
File : c:\pwworking\central01\d2274999\KA6020001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	277	293

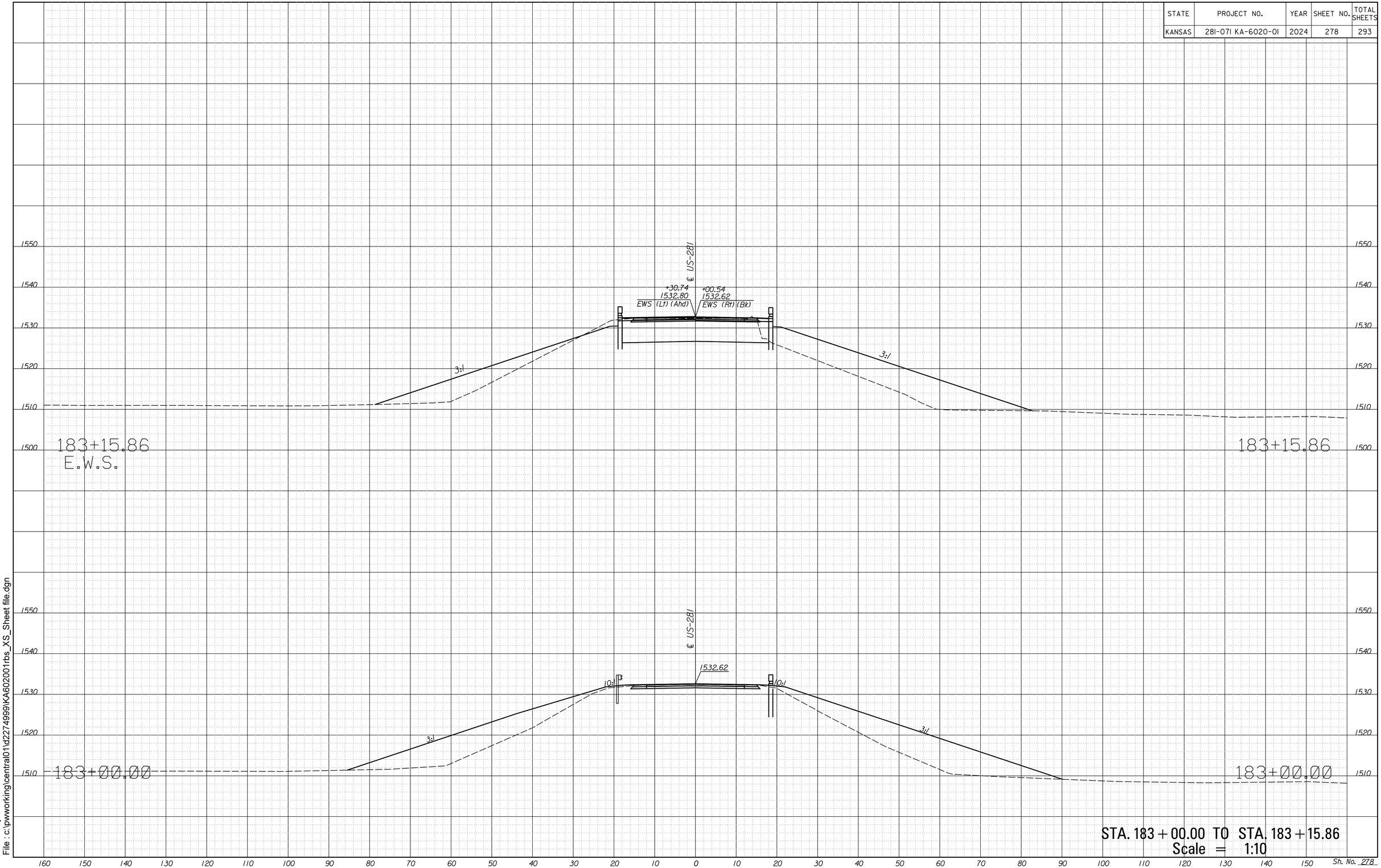


STA. 182 + 00.00 TO STA. 182 + 10.61
Scale = 1:10

Sh. No. 277

Drawn By : MDELEON
Plotted : 07-11-24
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	278	293

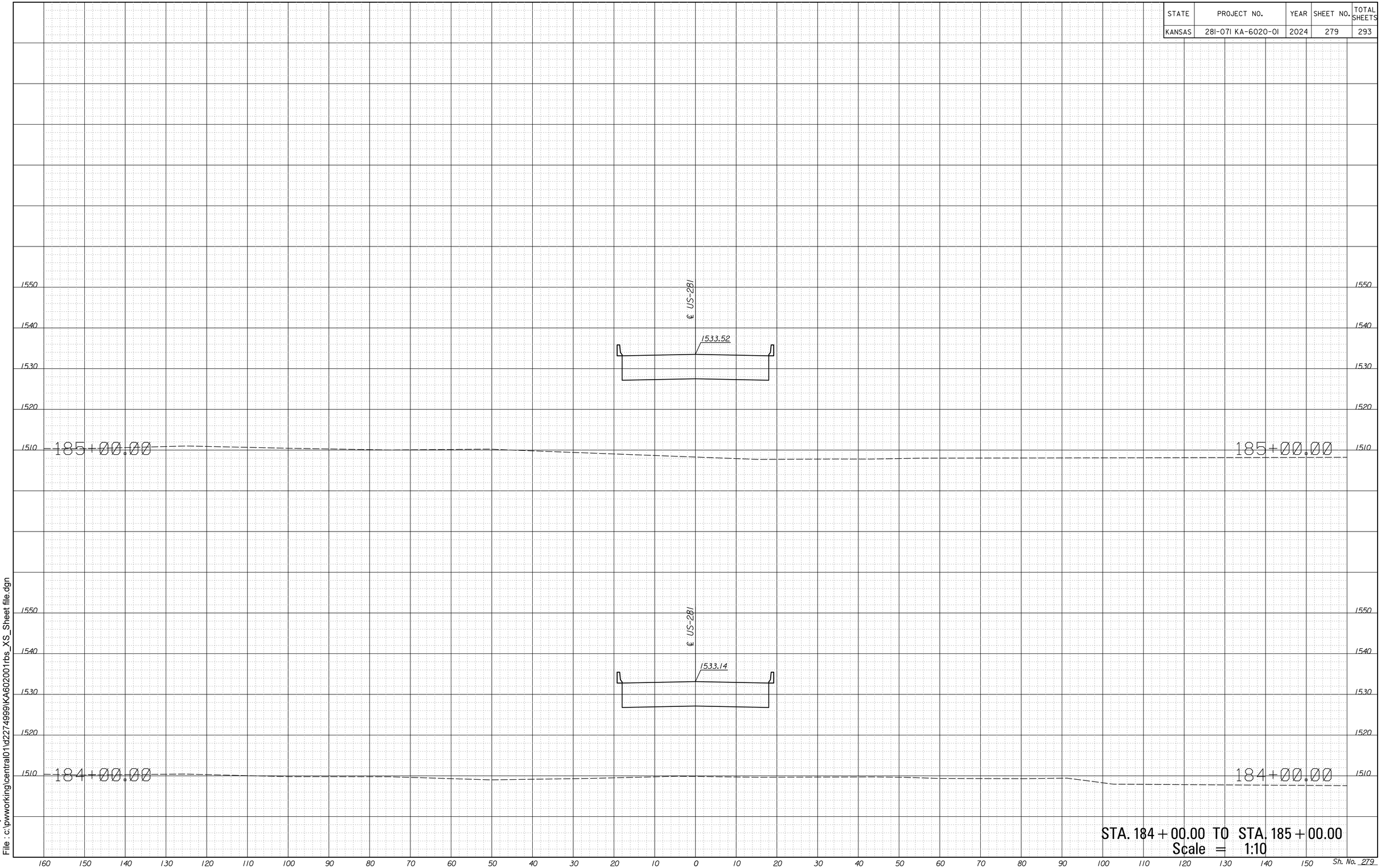


Drawn By: : MDELEON Plotted : 07-11-24
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STA. 183 + 00.00 TO STA. 183 + 15.86
Scale = 1:10

Sh. No. 278

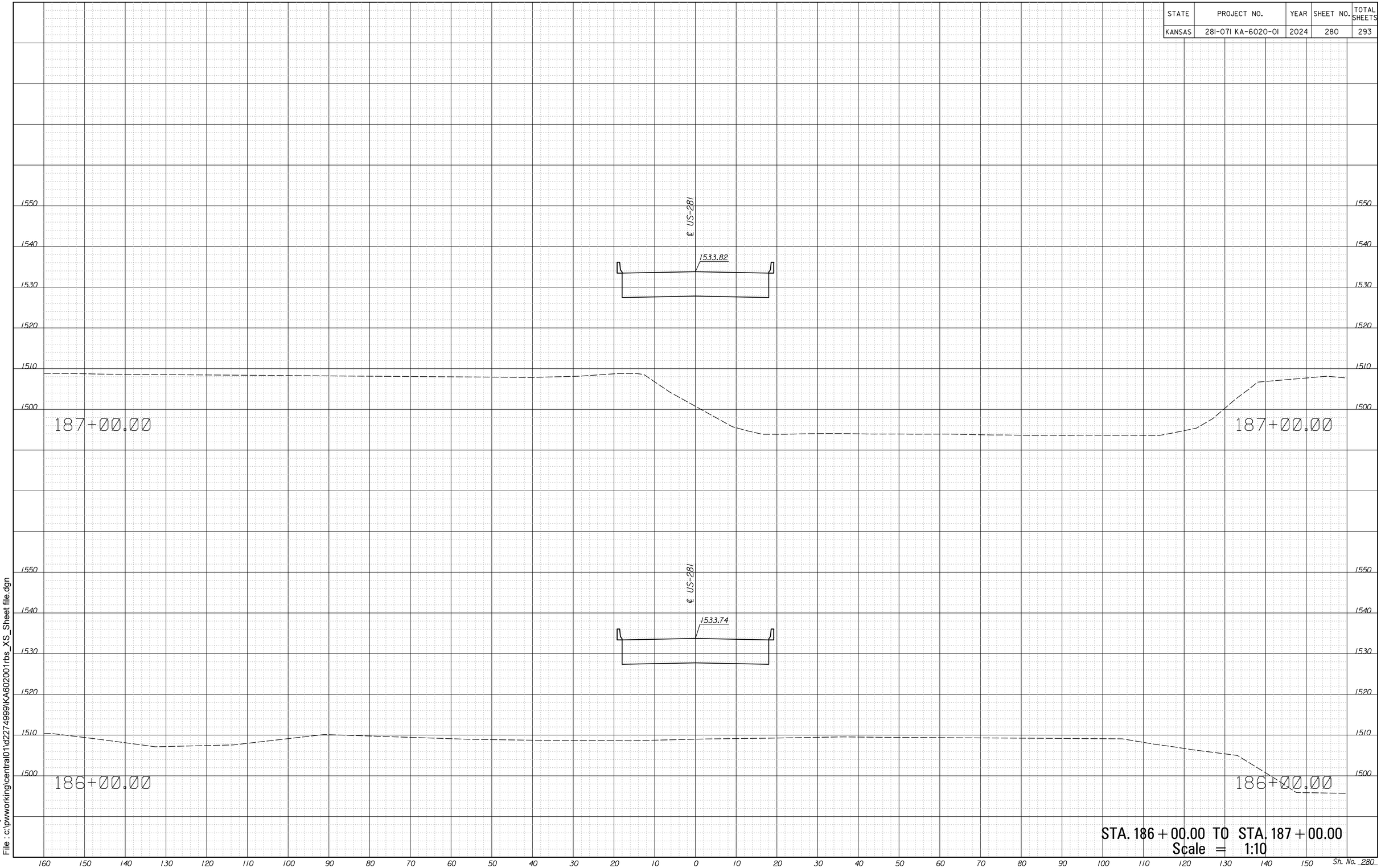
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	279	293



Drawn By: MDELEON
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn
Plotted :07-11-24

STA. 184 + 00.00 TO STA. 185 + 00.00
Scale = 1:10

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	280	293

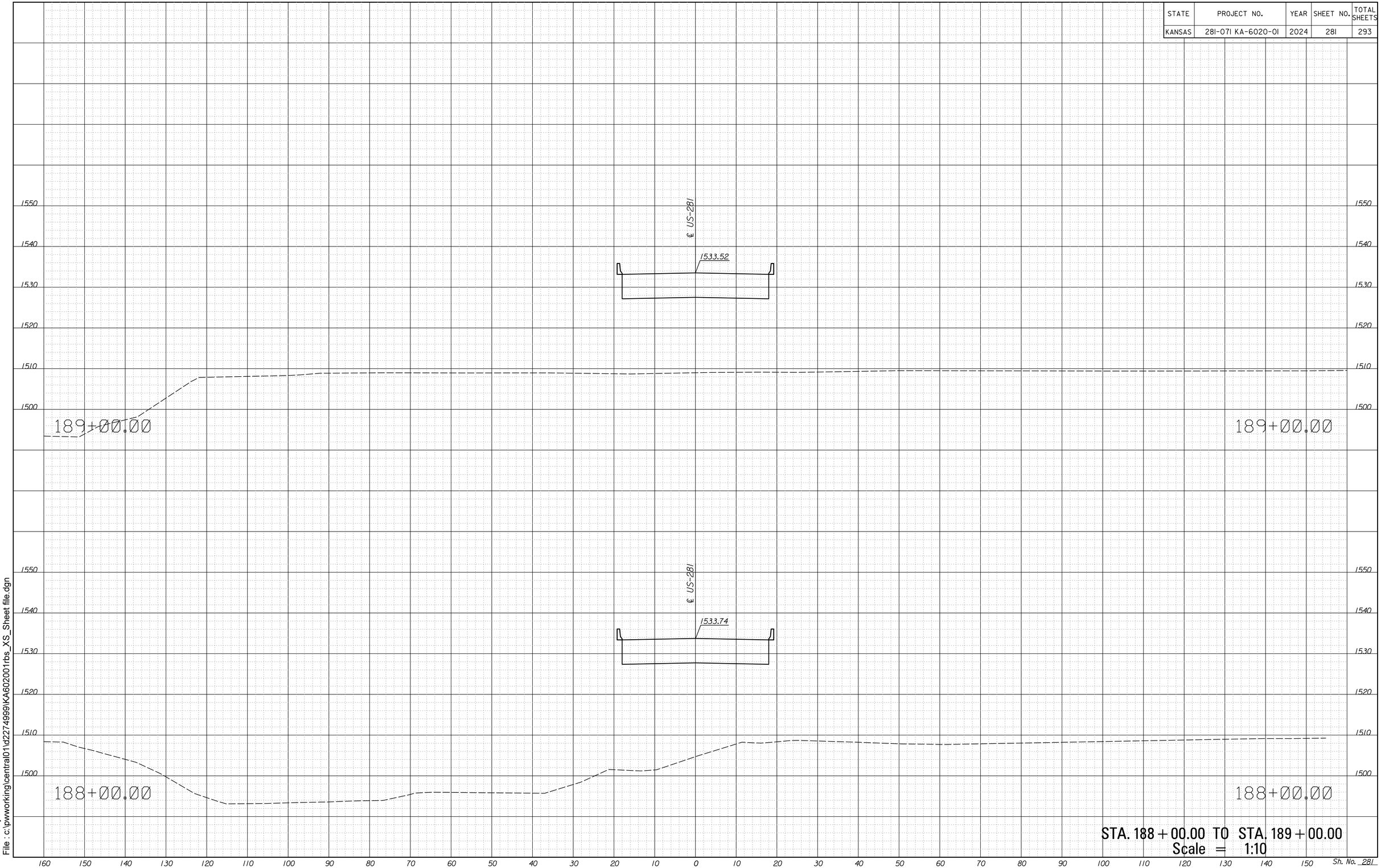


STA. 186 + 00.00 TO STA. 187 + 00.00
Scale = 1:10

Sh. No. 280

Drawn By : MDELEON
Plotted : 07-11-24
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	281	293

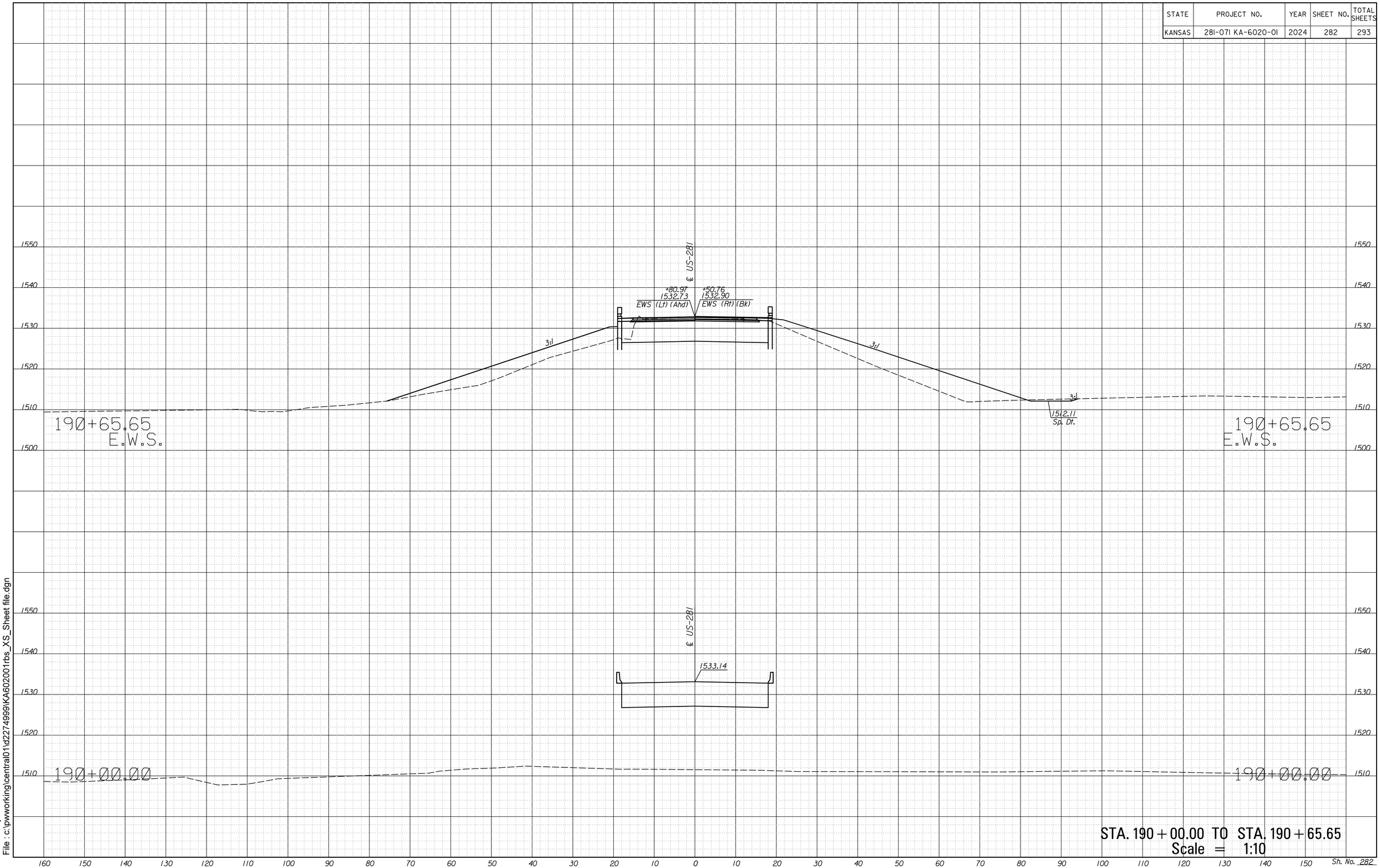


STA. 188 + 00.00 TO STA. 189 + 00.00
Scale = 1:10

Sh. No. 281

Drawn By : MDELEON
Plotted : 07-11-24
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	282	293

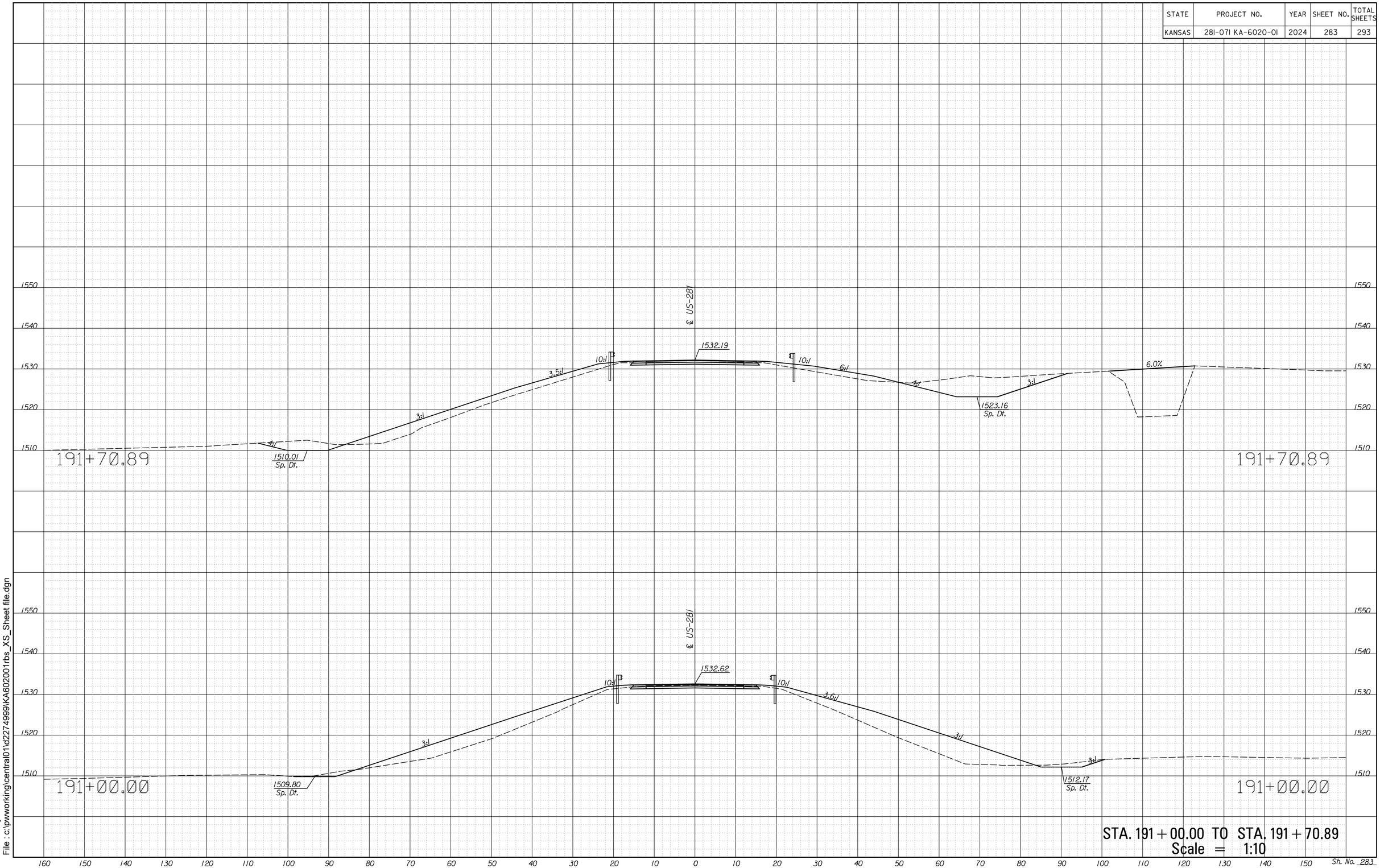


STA. 190 + 00.00 TO STA. 190 + 65.65
Scale = 1:10

Sh. No. 282

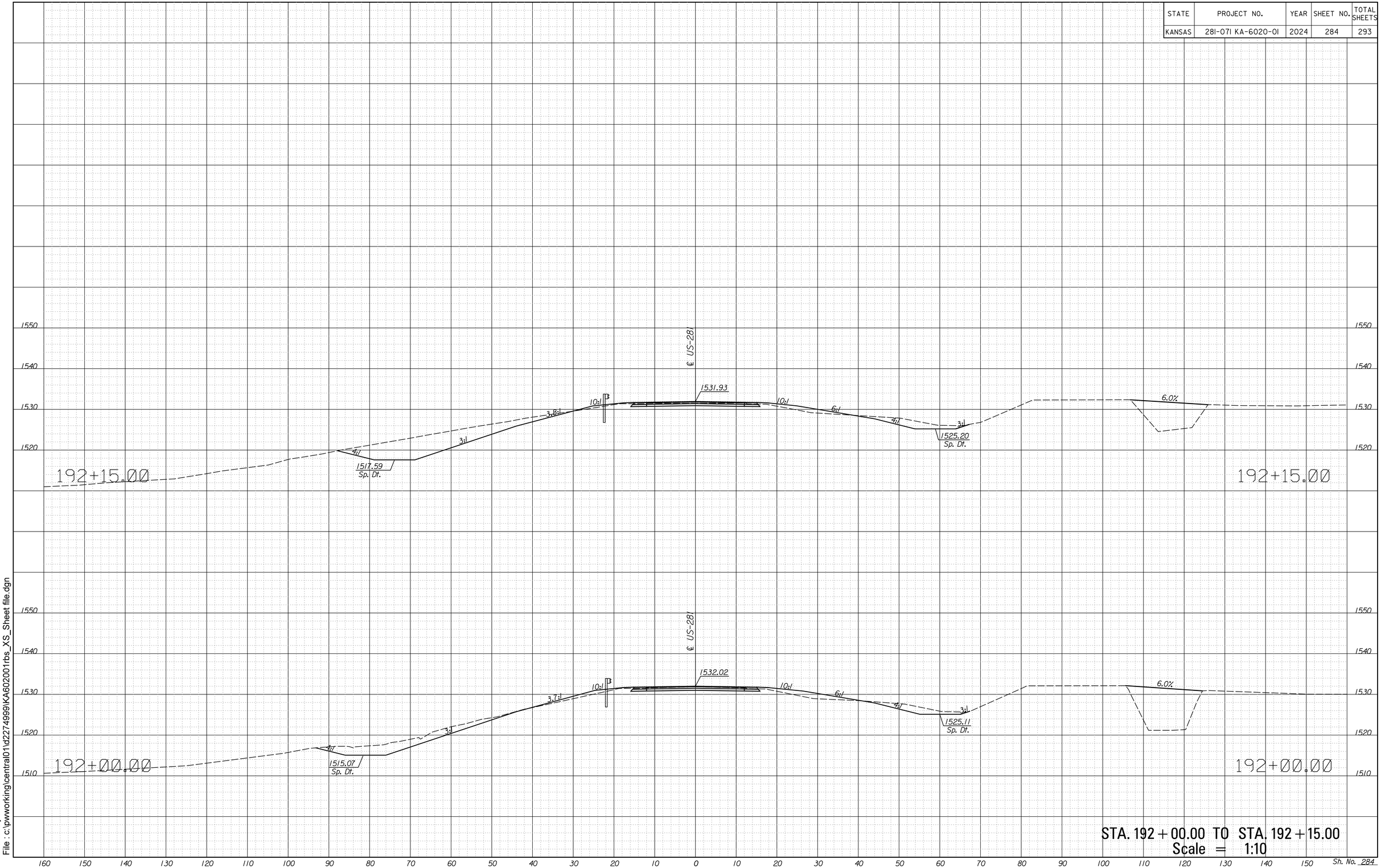
Drawn By : MDELEON Plotted : 07-11-24
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	283	293



Drawn By : MDELEON Plotted : 07-11-24
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	284	293

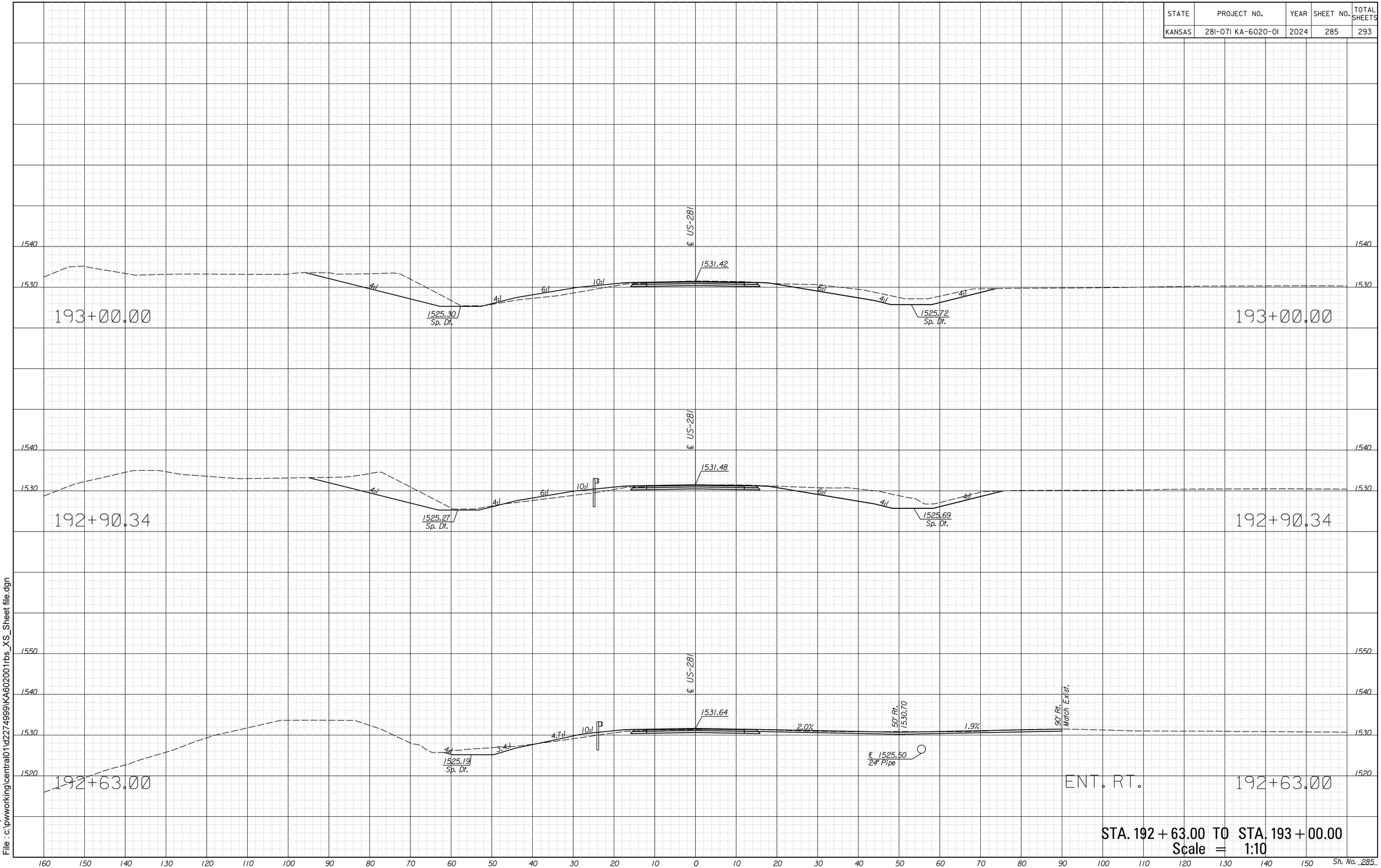


STA. 192+00.00 TO STA. 192+15.00
Scale = 1:10

Sh. No. 284

Drawn By : MDELEON Plotted : 07-11-24
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	285	293



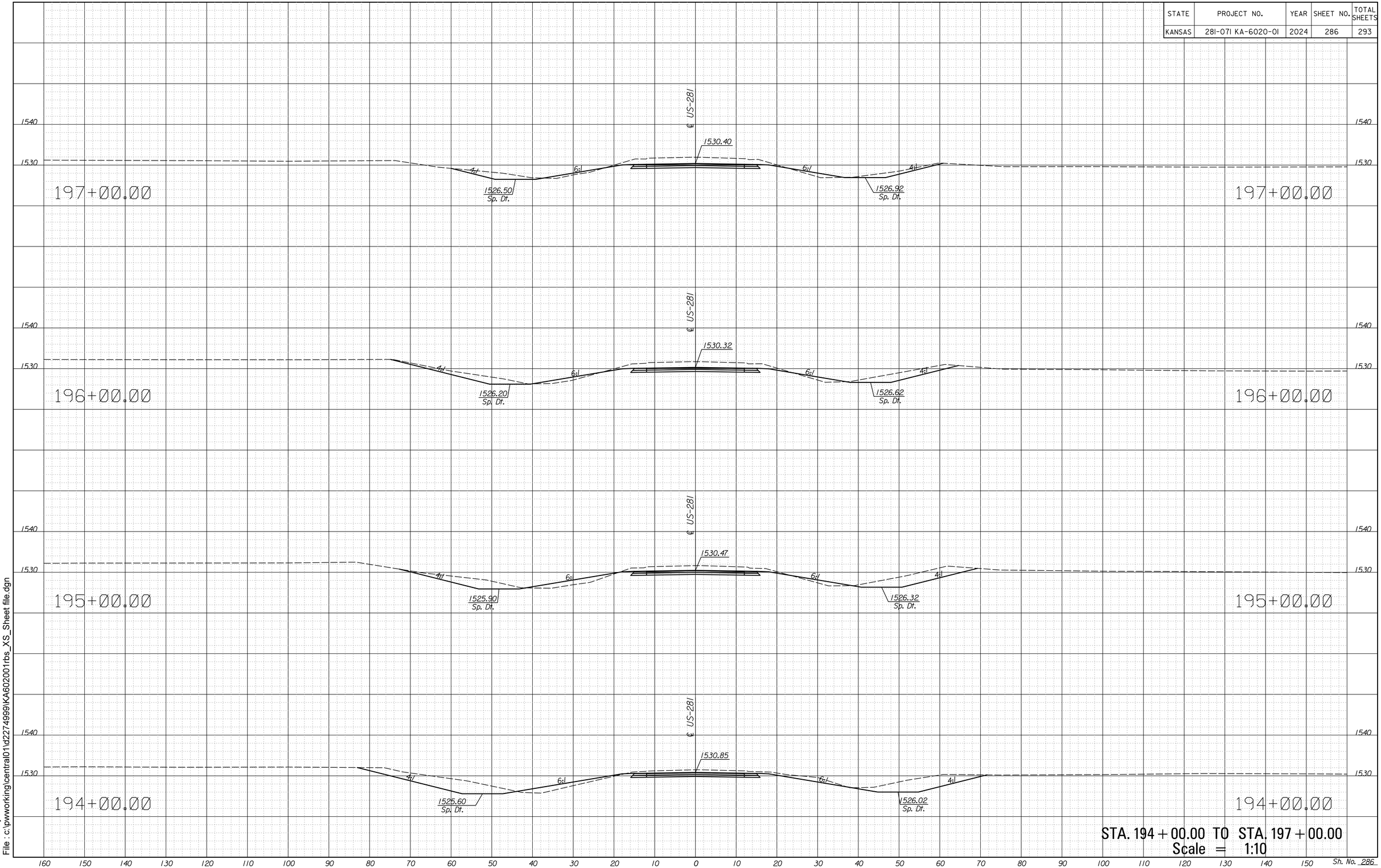
STA. 192 + 63.00 TO STA. 193 + 00.00

Scale = 1:10

Sh. No. 285

Drawn By: MDELEON
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn
Plotted :07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	286	293



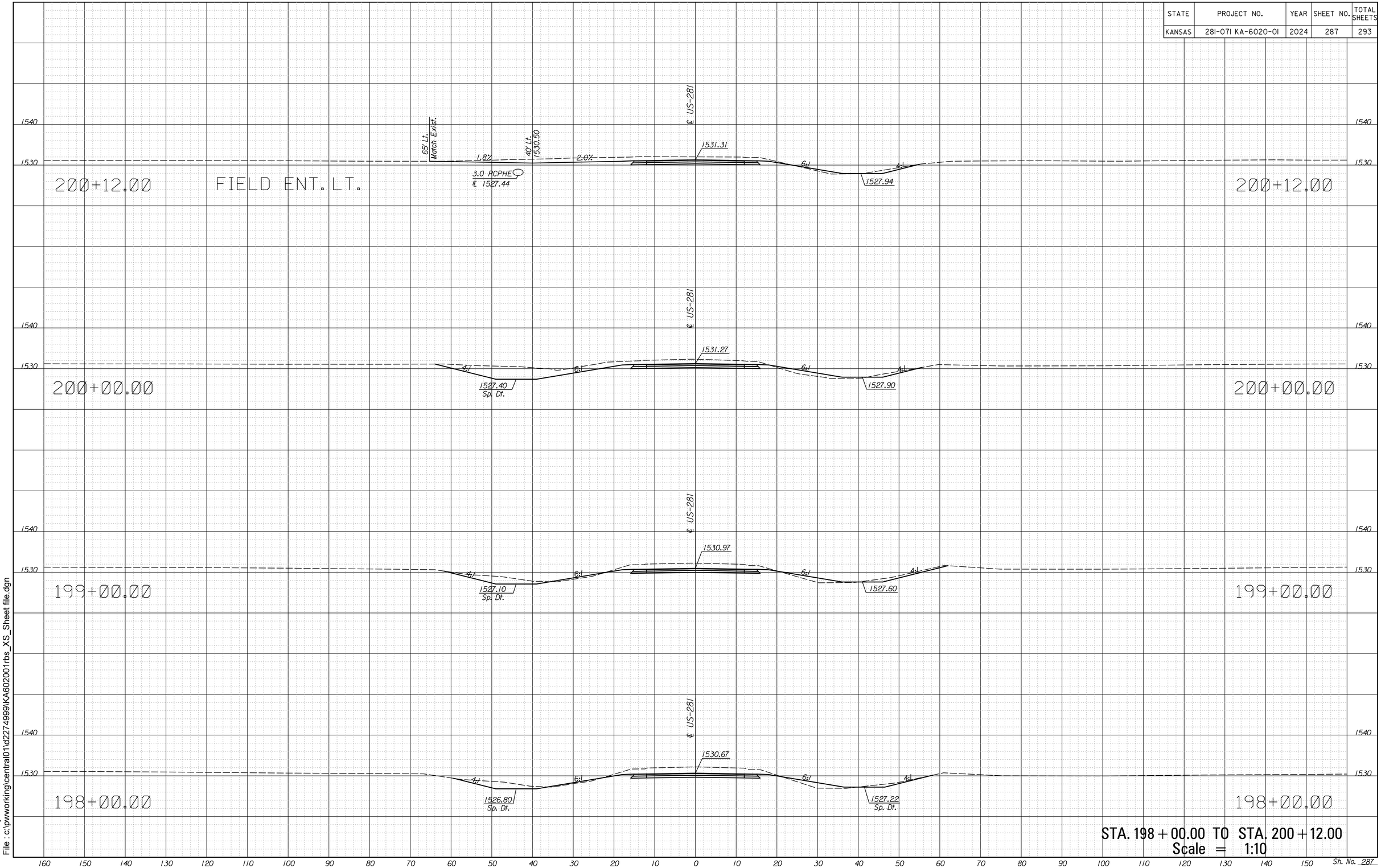
STA. 194 + 00.00 TO STA. 197 + 00.00

Scale = 1:10

Sh. No. 286

Drawn By : MDELEON
Plotted : 07-11-24
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	287	293

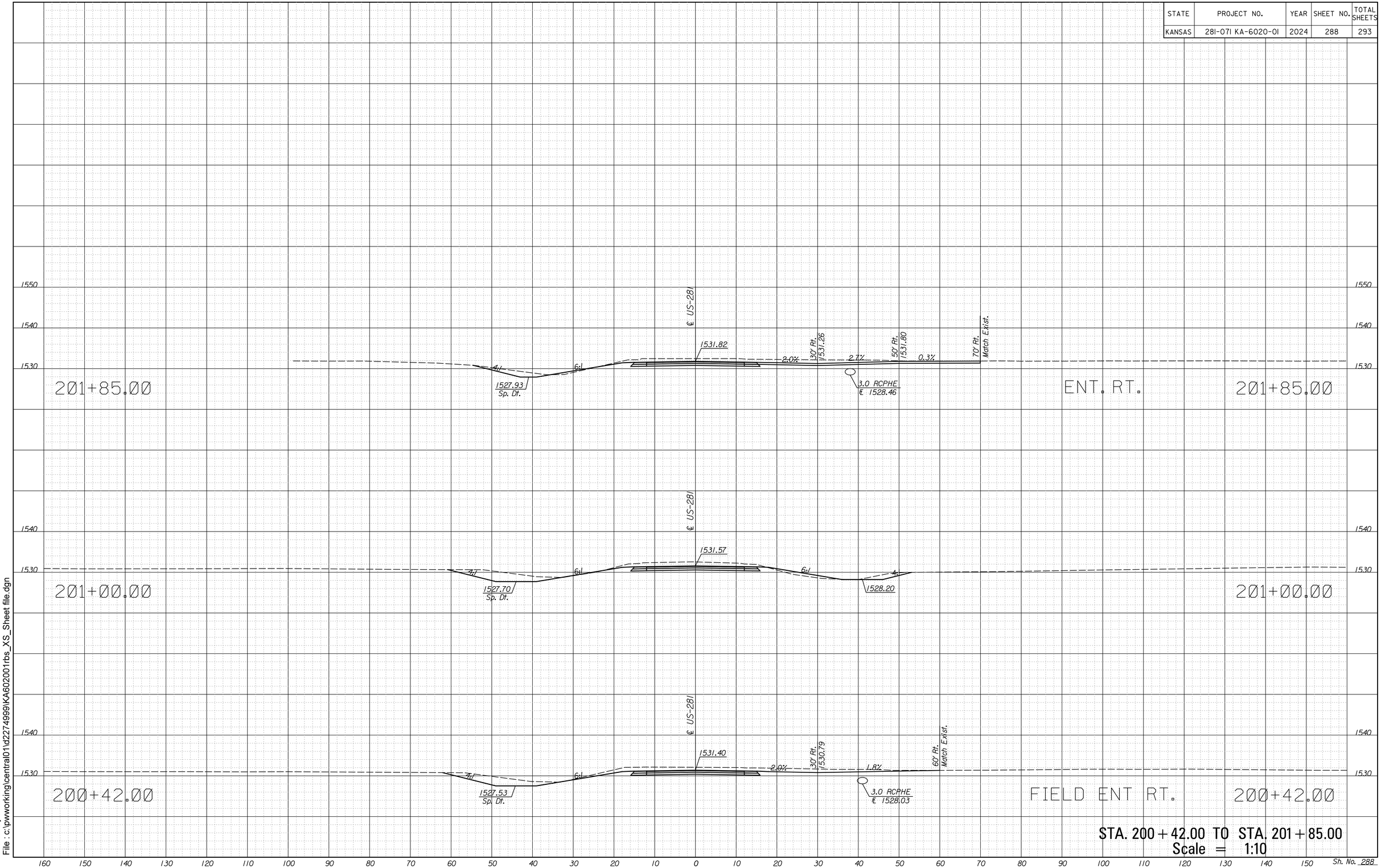


STA. 198 + 00.00 TO STA. 200 + 12.00
Scale = 1:10

Sh. No. 287

Drawn By : MDELEON
Plotted : 07-11-24
File : c:\pwworking\central01\d2274999\KA6020001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	288	293



STA. 200 + 42.00 TO STA. 201 + 85.00

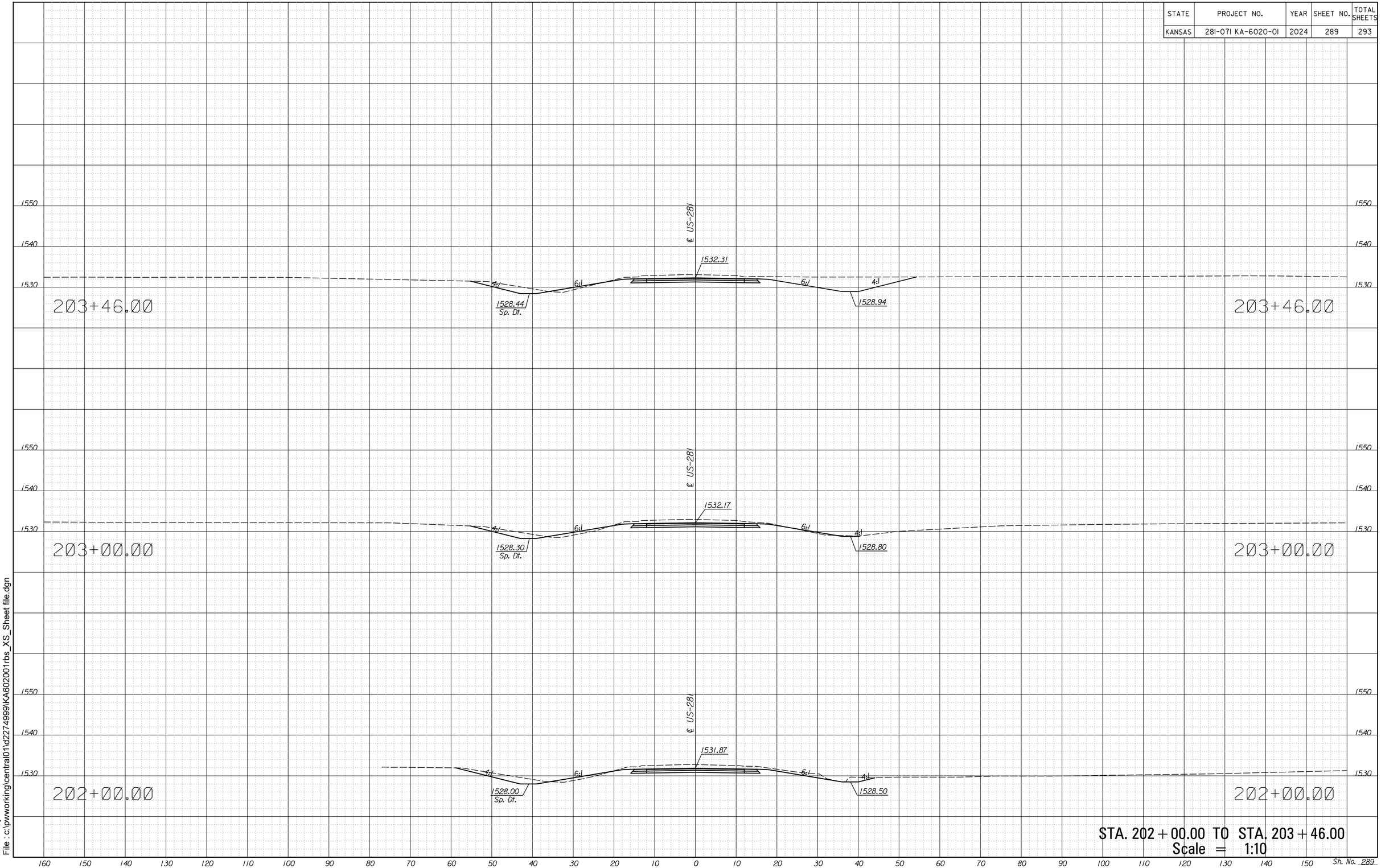
Scale = 1:10

Sh. No. 288

Drawn By : MDELEON Plotted : 07-11-24

File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	289	293

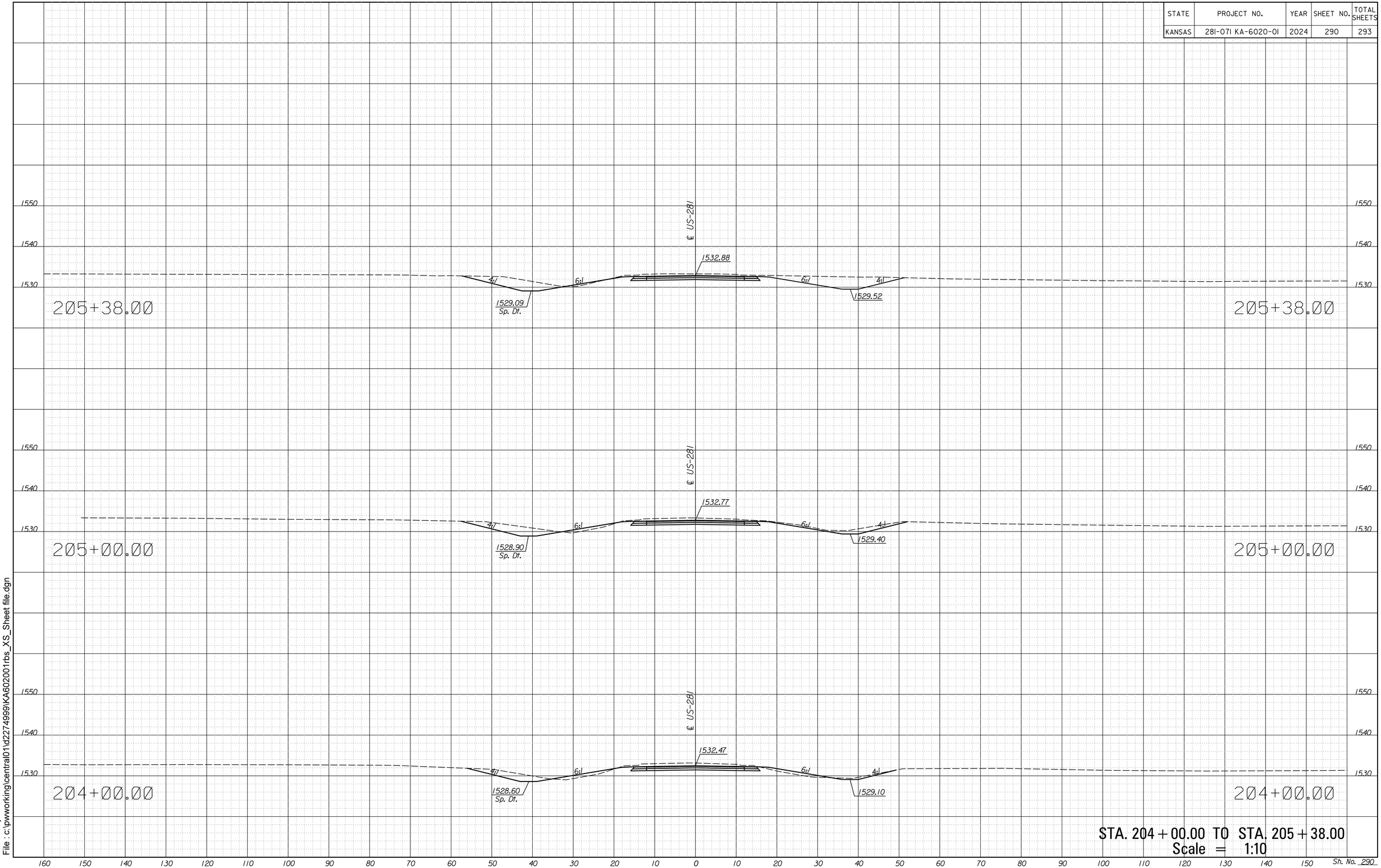


STA. 202 + 00.00 TO STA. 203 + 46.00
Scale = 1:10

Sh. No. 289

Drawn By: MDELEON Plotted: 07-11-24
File: c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	290	293

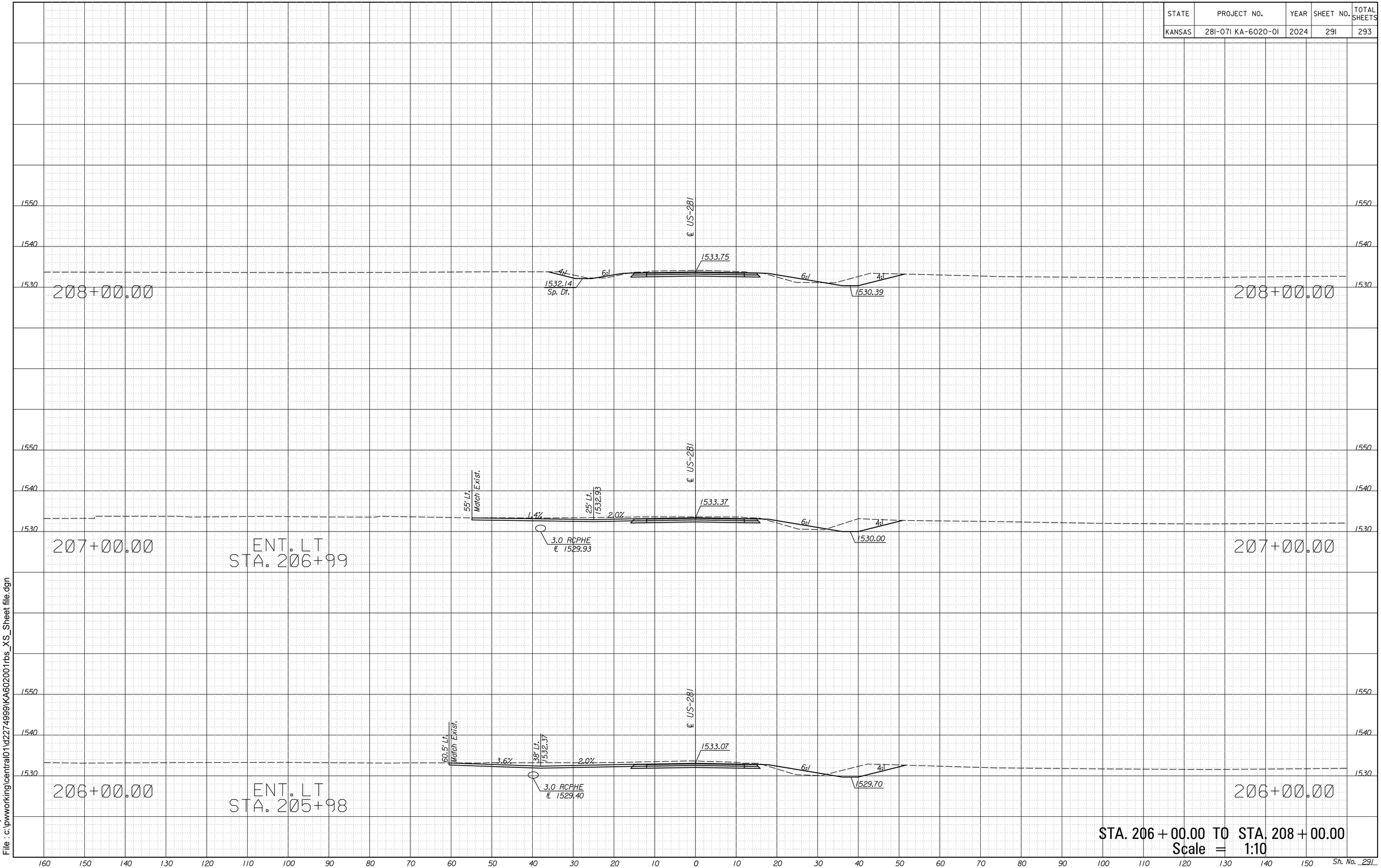


STA. 204 + 00.00 TO STA. 205 + 38.00
Scale = 1:10

Sh. No. 290

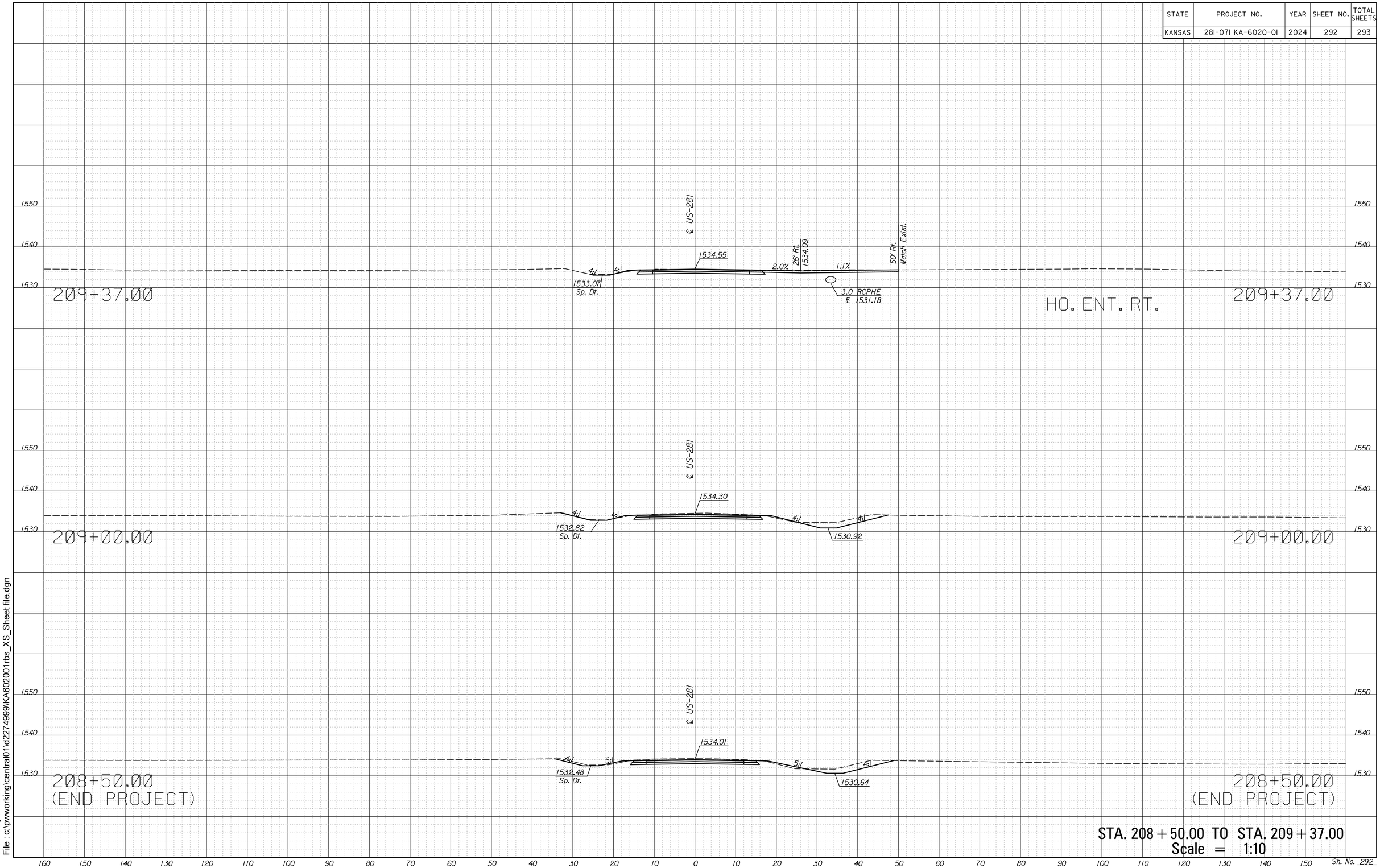
Drawn By: MDELEON Plotted: 07-11-24
File: c:\pwworking\central01\d2274999\KA6020001rbs_XS_Sheet file.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	291	293



Drawn By: MDELEON
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn
Plotted :07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	292	293

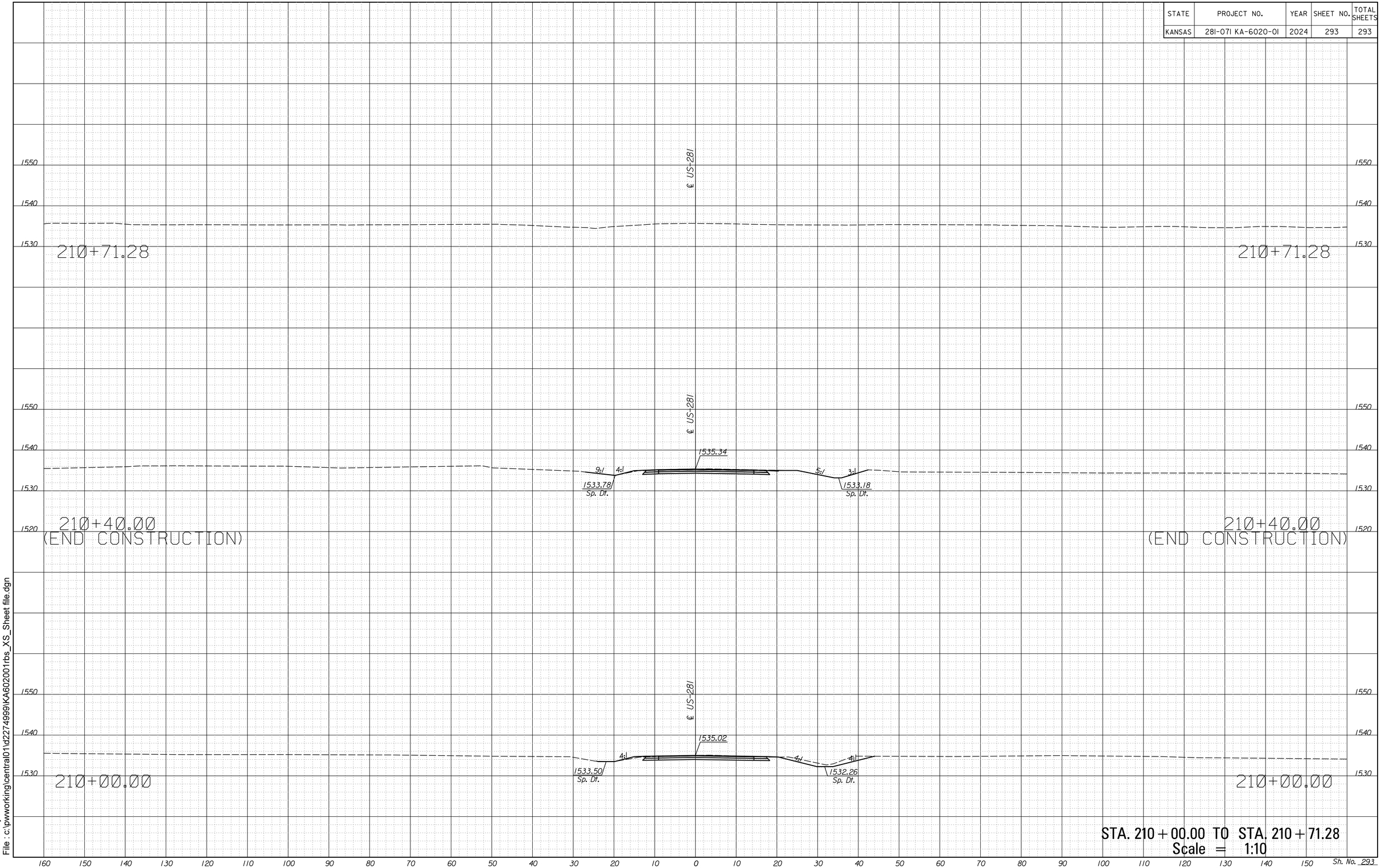


STA. 208 + 50.00 TO STA. 209 + 37.00
Scale = 1:10

Sh. No. 292

Drawn By: MDELEON
File : c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn
Plotted :07-11-24

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	281-071 KA-6020-01	2024	293	293



STA. 210+00.00 TO STA. 210+71.28
Scale = 1:10

Sh. No. 293

Drawn By: MDELEON
File: c:\pwworking\central01\d2274999\KA602001rbs_XS_Sheet file.dgn
Plotted: 07-11-24