STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	1	44
F.A. NO.	BRO-C523(301)			

INDEX OF SHEETS

STATE OF KANSAS

DEPARTMENT OF TRANSPORTATION
PLAN AND PROFILE OF PROPOSED

71 C-5233-01

FEDERAL AID PROJECT

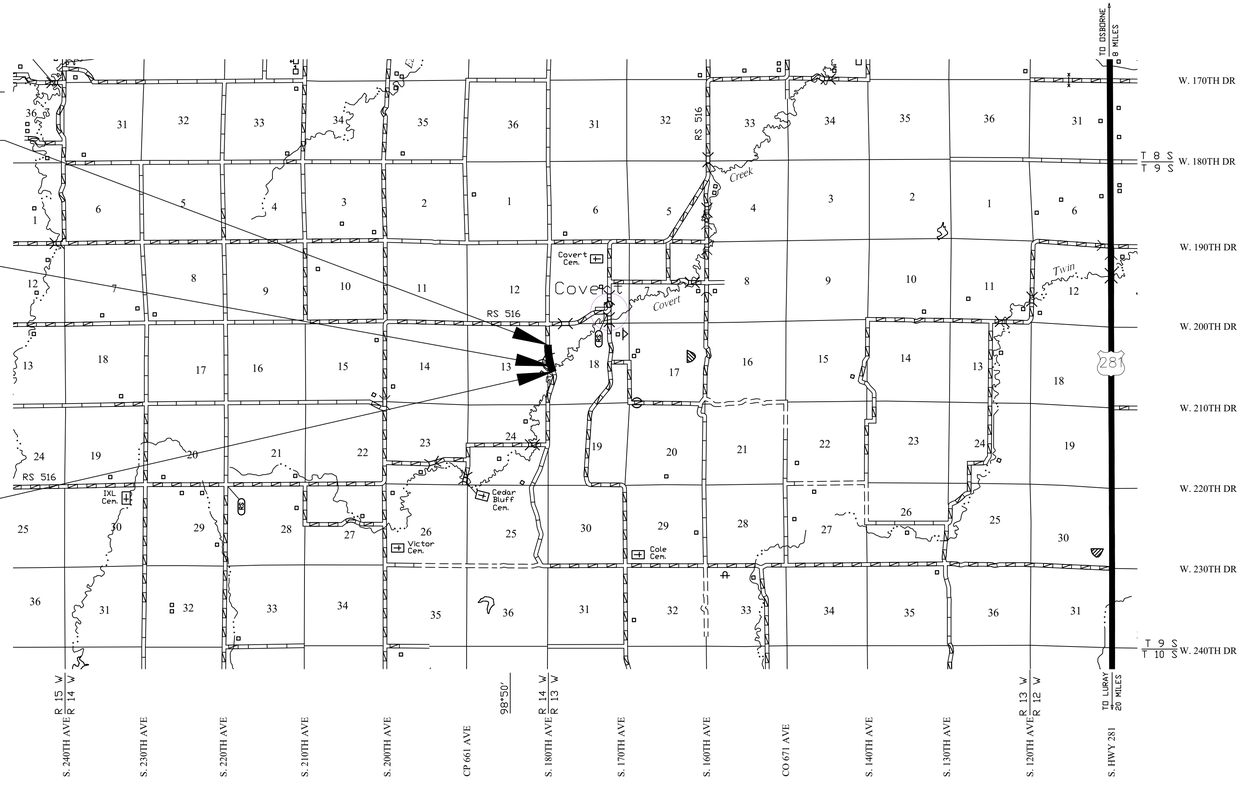
OSBORNE COUNTY

GRADING
BRIDGE
SEEDING

STA 507+50 END
K.D.O.T. Proj. No. 71 C-5233-01

STA 502+95
Br. No. 000710661004006
55' Steel Stringer Bridge
w/28'-6" Bridge Width

STA 500+00 BEGIN
K.D.O.T. Proj. No. 71 C-5233-01

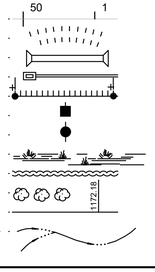


DESIGN DESIGNATION

AADT(2014)	15
AADT(2033)	20
DHV	
D	
T	
V	35 mph
C of A	None
Clear Zone	10 feet

CONVENTIONAL SIGNS

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



GROSS LENGTH OF PROJECT	750.00	FT.	
EXCEPTIONS	0.00	FT.	
ADDITIONS	0.00	FT.	
NET LENGTH OF PROJECT	750.00	FT.	0.142 MILES
NET LENGTH OF BRIDGES	55.00	FT.	0.010 MILES
NET LENGTH OF ROAD	695.00	FT.	0.132 MILES

JORDAN G. DETTMER
LICENSED
24421
09/16/2024
KANSAS
PROFESSIONAL ENGINEER

PLANS PREPARED BY:
PENCO ENGINEERING, P.A.
PLAINVILLE, KANSAS

RECOM. FOR APPROVAL-DATE

TERRY NICHOLS
ROAD & BRIDGE SUPERVISOR

Approved: Sep 17, 2024
Date

State Transportation Engineer

By:

Interim Chief, Bureau of Local Projects

KANSAS DEPARTMENT OF TRANSPORTATION

Note: This project will be closed to all traffic during construction.

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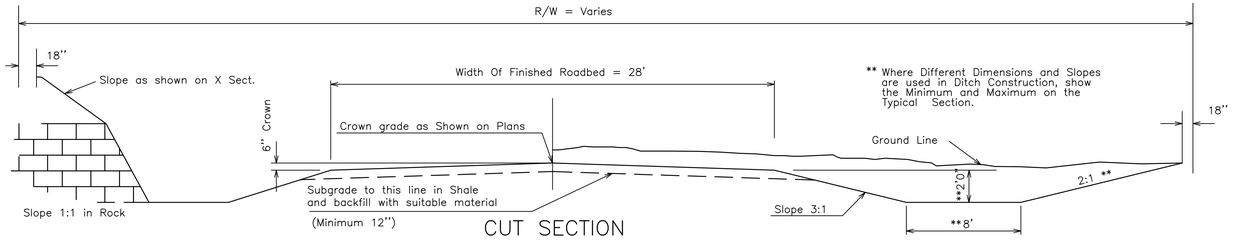
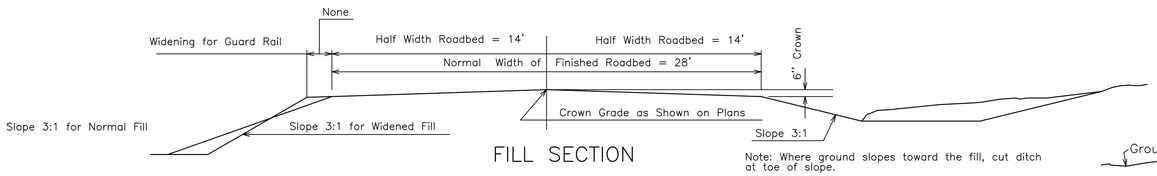
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	2	44



CUT SECTION

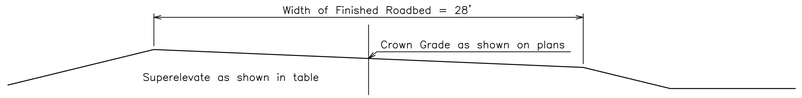
NOTE: For overbreakage in limestone, sandstone or shale see Special Provisions



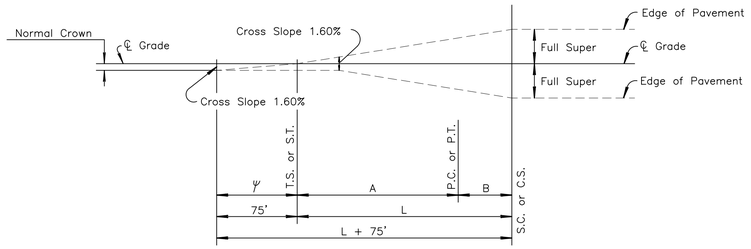
FILL SECTION

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

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

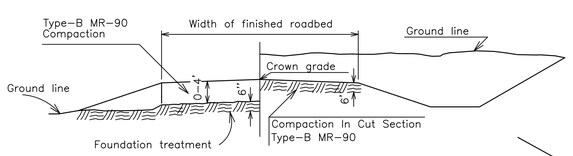


SUPERELEVATED SECTION



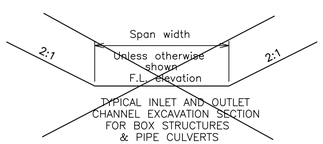
PROFILE SHOWING METHOD OF ATTAINING SUPERELEVATION

Sta. P.I. Curve	Radius	Design Speed	Super %	Transition – (Lin.Ft.)		
				L	A	B
501+04+87 (Back)	400.00	35 m.p.h.	0.0			
505+09.65 (Back)	400.00	40 m.p.h.	0.0			

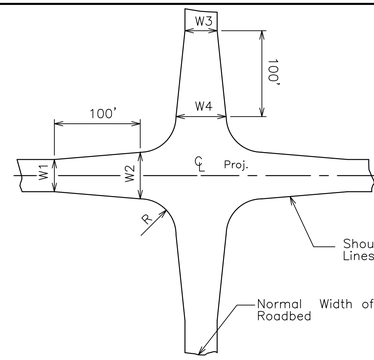


ALL EMBANKMENT SHALL BE COMPACTED EXCEPT DITCHPLUGS AND WASTE BERMS.

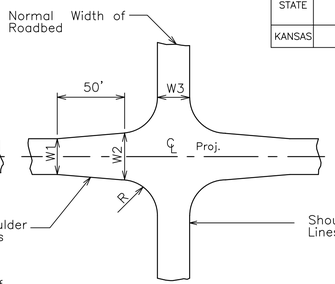
FOUNDATION TREATMENT AND COMPACTION OF EARTHWORK



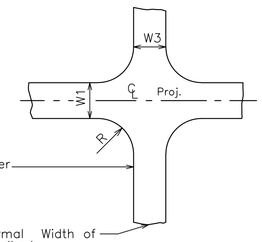
TYPICAL INLET AND OUTLET CHANNEL EXCAVATION SECTION FOR BOX STRUCTURES & PIPE CULVERTS



TYPE–A

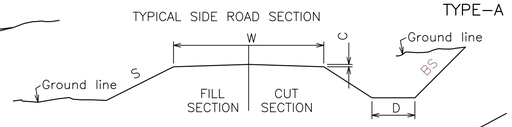


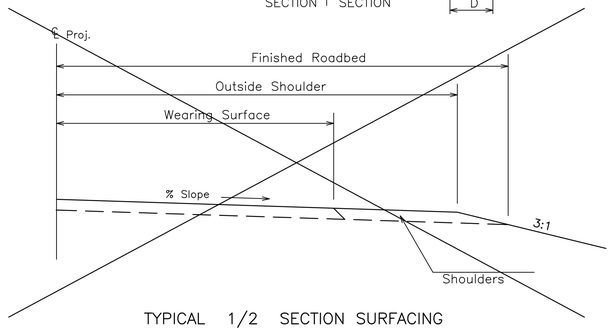
TYPE–B



TYPE–C

TYPICAL INTERSECTION DETAILS

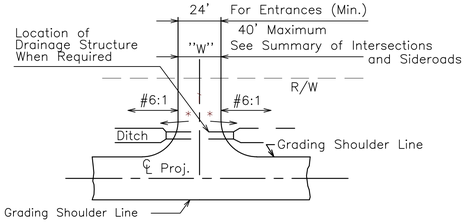




TYPICAL 1/2 SECTION SURFACING

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

Light–Type surfacing by Osborne County with their own forces and funds.

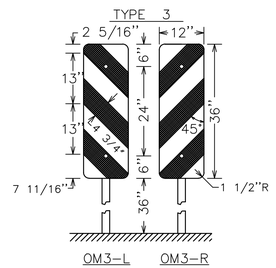


TYPICAL SIDE ROAD OR ENTRANCE DETAIL

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

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

OBJECT MARKER



SUMMARY OF OBJECT MARKERS AND SIGNS						
STATION TO STATION	SIDE	TYPE OF STRUCT.	TYPE OF SIGN	OBJECT MARKER TYPE	OBJECT MARKER NO.	REMARKS
502+66	Rt.	Bridge	Obj. Marker	*OM–3	2	South Approach
503+24	Lt.	Bridge	Obj. Marker	*OM–3	2	North Approach
Total					2	
ØAs you face bridge end from approach						
*Back–to–Back [Sign(s) on Both Sides of Post]						

GENERAL NOTES

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

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

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

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

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

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

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

KANSAS DEPARTMENT OF TRANSPORTATION

TYPICAL GRADING SECTION

~~LP907~~

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

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STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	3	44

POT Ref.
1. Office Set
2. Sta. 498+00.00
3. No other ties available
N=644700.76, E=5455456.63

PI Ref.
1. Office Set
2. Sta. 501+04.87 (Back)
3. No other ties available
N=644869.28, E=5455202.57

PI Ref.
1. Office Set
2. Sta. 505+09.65 (Back)
3. No other ties available
N=645221.68, E=5454996.88

POT Ref.
1. Office Set
2. Sta. 508+00.00
3. No other ties available
N=645512.49, E=5455152.16

Project ℄ Curve Data #1
Project ℄ PC Sta. 500+11.88
Project ℄ PI Sta. 501+04.87 (Back)
Project ℄ PI Sta. 500+11.88 (Ahead)
Project ℄ PT Sta. 501+94.61
Δ = 26°10'24"
Da = 14°19'25"
R = 400.00'
T = 92.99'
L= 182.73
e = None

Project ℄ Curve Data #2
Project ℄ PC Sta. 502+86.24
Project ℄ PI Sta. 505+09.65 (Back)
Project ℄ PI Sta. 504+70.33 (Ahead)
Project ℄ PT Sta. 506+93.74
Δ = 58°22'12"
Da = 14°19'26"
R = 400.00'
T = 223.41'
L= 407.50'
e = None

E 1/16 Cor NE 1/4 Sec 13, T9S, R14W Ref.
1. 5/8" Rebar w/Pink plastic cap stamped "PENCO CLS-42" 0.5' Deep
2. Mag nail & CLS-42 washer set in the top of a corner fence post 37.1' SE
3. Mag nail & CLS-42 washer set in the top of a corner fence post 42.4' SW
4. Mag nail & CLS-42 washer set in the top of a gate fence post 44.0' NW
5. Inline w/℄ Travelway N-S
6. N=646394.78, E=5455221.45

E 1/4 Cor of Sec 13, T9S, R14W Ref.
1. 5/8" Rebar w/Pink plastic cap stamped "PENCO CLS-42"
0.2' Exposed as a witness corner 80.0' South of the true corner.
2. No other ties available
3. N=645068.544, E=5455231.30

E 1/16 Cor SE 1/4 of Sec 13, T9S, R14W Ref.
1. 7"x5" Limstone w/5/8" Rebar w/Pink plastic cap stamped
"PENCO CLS-42" 0.3' South of center 1.0' Deep
2. 60d nail & CLS-42 washer set in the West face of a 2.0'
diameter elm tree 25.6' N
3. 60d nail & CLS-42 washer set in the Northwest face of a 1.0'
diameter elm tree 11.4' NE
4. 60d nail & CLS-42 washer set in the West face of a 1.5'
diameter elm tree 12.2' SE
5. Old fence line running N-SE 13' W
6. Approximate base position of a downed 2.5' diameter Oak
tree laid over to the Southeast 4' NE
7. Green "T"-post set on the North face of the stone 0.5' N
8. N=643736.34, X=5455235.06

BM #1 5/8" Rebar w/green "PENCO CONTROL" cap 1' West of Gate Post, 14' Rt.
Sta. 496+50, Elev.=1779.00
N=644626.90, E=5455593.58

BM #2 Mag Nail in Top of SE Wing Wall Pile, 73' Lt.
Sta. 502+46, Elev.=1773.71
N=644956.89, E=5455066.65

BM #3 Mag Nail in Top of NW Wing Wall Pile, 109' Lt.
Sta. 502+58, Elev.=1773.68
N=644948.70, E=5455029.59

BM #4 5/8" Rebar w/green "PENCO CONTROL" cap 1' West of Gate Post, 70' Lt.
Sta. 511+44 Elev.=1796.96
N=645848.30, E=5455252.71

PROJECT CONTROL

PENCO ENGINEERING, P.A.
PLAINVILLE, KANSAS

DESIGNED BY: JGD	SCALE: As Shown
DRAWN BY: MRH	PROJ. NO.: 71 C-5233-01
CHECKED BY: JJD	DATE: 2024

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	4	44

Sta. 502+52, 91' Lt. Remove
Br. No. 000710661004005
21' Span RCSS Bridge
w/17.1 Rdwy.
Demolition Category A

Sta. 502+95 Construct
Br. No. 000710661004006
55' Span Bridge
w/28'-6" Bridge Width
No Falsework plans Required

Sta. 502+95 = Ch. Sta. 10+00 Construct
Channel Excavation 100' Lt. & 100' Rt. ℄

Sta. 500+00 BEGIN
K.D.O.T. Proj. No. 71 C-5233-01

Sta. 507+50 END
K.D.O.T. Proj. No. 71 C-5233-01

Tamela L. Schultze Living Trust
Kim A. Topham
N ½ NE ¼, SW ¼ NE ¼, E ½ NW ¼, S ½
Section 13, T09S, R14W
Cultivation/Pasture

Elmer & Myrna Schlegel
SE ¼ NE ¼
Section 13, T09S, R14W
Cultivation/Pasture

Elmer & Myrna Schlegel
NW ¼, W ½ E ½, NE ¼ NE ¼, NW ¼ SW ¼
Section 18, T09S, R13W
Cultivation/Pasture

Elmer & Myrna Schlegel
NW ¼, W ½ E ½, NE ¼ NE ¼, NW ¼ SW ¼
Section 18, T09S, R13W
Cultivation/Pasture

E 1/16 Cor SE ¼ Section Line Sta. 488+27.79

Quarter Section Line Sta. 502+60.00

Section Line Sta. 514+86.27

E 1/16 Cor NE ¼ Section Line

E ¼ Corner
Sec. 13, T09S, R14W

501+32.36 R/W=Temp. Const. Esmt. 55.50' Lt.
N=644863.41 E=5455148.10

500+43.45 R/W 36.36' Lt.
N=644807.73 E=5455232.04

499+99.97 Exist. R/W=R/W 25.00' Lt.
N=644790.46 E=5455276.17

500+00.02 Exist. R/W=R/W 25.00' Rt.
N=644832.16 E=5455303.76

501+20.98 R/W 43.99' Rt.
N=644918.51 E=5455231.73

502+59.23 R/W=Temp. Const. Esmt. 125.27' Rt.
N=645068.54 E=5455231.30

503+04.67 R/W=Temp. Const. Esmt. 50.01' Rt.
N=645068.04 E=5455144.89

504+00.00 R/W=Temp. Const. Esmt. 50.00' Rt.
N=645145.83 E=5455115.32

504+76.56 Temp. Const. Esmt. 174.92' Rt.
N=645218.54 E=5455230.19

502+57.29 Temp. Const. Esmt. 165.57' Lt.
N=644920.26 E=5454981.10

503+72.48 R/W=Temp. Const. Esmt. 131.49' Lt.
N=645066.84 E=5454949.25

503+51.32 R/W=Temp. Const. Esmt. 56.02' Lt.
N=645067.32 E=5455029.08

504+83.17 R/W=Temp. Const. Esmt. 50.69' Rt.
N=645217.78 E=5455105.88

505+50.00 R/W 40.00' Rt.
N=645277.41 E=5455098.05

506+61.10 R/W 56.52' Lt.
N=645411.84 E=5455036.06

507+50.00 R/W 55.00' Lt.
N=645494.29 E=5455080.09

507+50.00 Exist. R/W=R/W 25.00' Lt.
N=645480.16 E=5455106.55

507+50.00 Exist. R/W=R/W 25.00' Rt.
N=645456.61 E=5455150.66

PC: 500+11.88
PT: 501+94.61
PC: 502+86.24
PT: 506+93.74

Project Centerline
Construction Limits
Temp. Const. Esmt.
Section Line
Existing R/W 25' Lt. ℄
Existing R/W 25' Rt. ℄
Exist. T/W
Trib. to Covert Creek
Temp. Const. Esmt.
BM #1
BM #2
BM #3
OHP
NEX-TECH

BM #1 5/8" Rebar w/green "PENCO CONTROL" cap 1' West of Gate Post, 14' Rt.
Sta. 496+50, Elev.=1779.00
N=644626.90, E=5455593.58

BM #2 Mag Nail in Top of SE Wing Wall Pile, 73' Lt.
Sta. 502+46, Elev.=1773.71
N=644956.89, E=5455066.65

BM #3 Mag Nail in Top of NW Wing Wall Pile, 109' Lt.
Sta. 502+58, Elev.=1773.68
N=644948.70, E=5455029.59

BM #4 5/8" Rebar w/green "PENCO CONTROL" cap 1' West of Gate Post, 70' Lt.
Sta. 511+44 Elev.=1796.96
N=645848.30, E=5455252.71

50' 0 50' 100'
Graphic Scale in Feet
Scale: 1"= 50' Plan
Contour Interval = 2'

RIGHT-OF-WAY DETAILS

PENCO ENGINEERING, P.A.
PLAINVILLE, KANSAS

DESIGNED BY: JGD	SCALE: As Shown
DRAWN BY: MRH	PROJ. NO.: 71 C-5233-01
CHECKED BY: JJD	DATE: 2024

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STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	5	44

See Sheet No. 3 for Project Control Details
See Sheet No. 4 for Alignment and Right-of-Way Details.

Utilities

Power: Rolling Hills Electric Co.
Mankato, KS 66956
1-7851378-3151

Telephone: Nex-Tech/Rural Telephone Co.
Lenora, KS 67645
1-877-567-7872

PROJECT SURVEY CONTROL
PROJECT COORDINATE SYSTEM: KRCS
HORIZONTAL DATUM: NAD83(2011) Kansas Regional Coordinate System Zone 4 Hays, using Geoid 18(Consus)

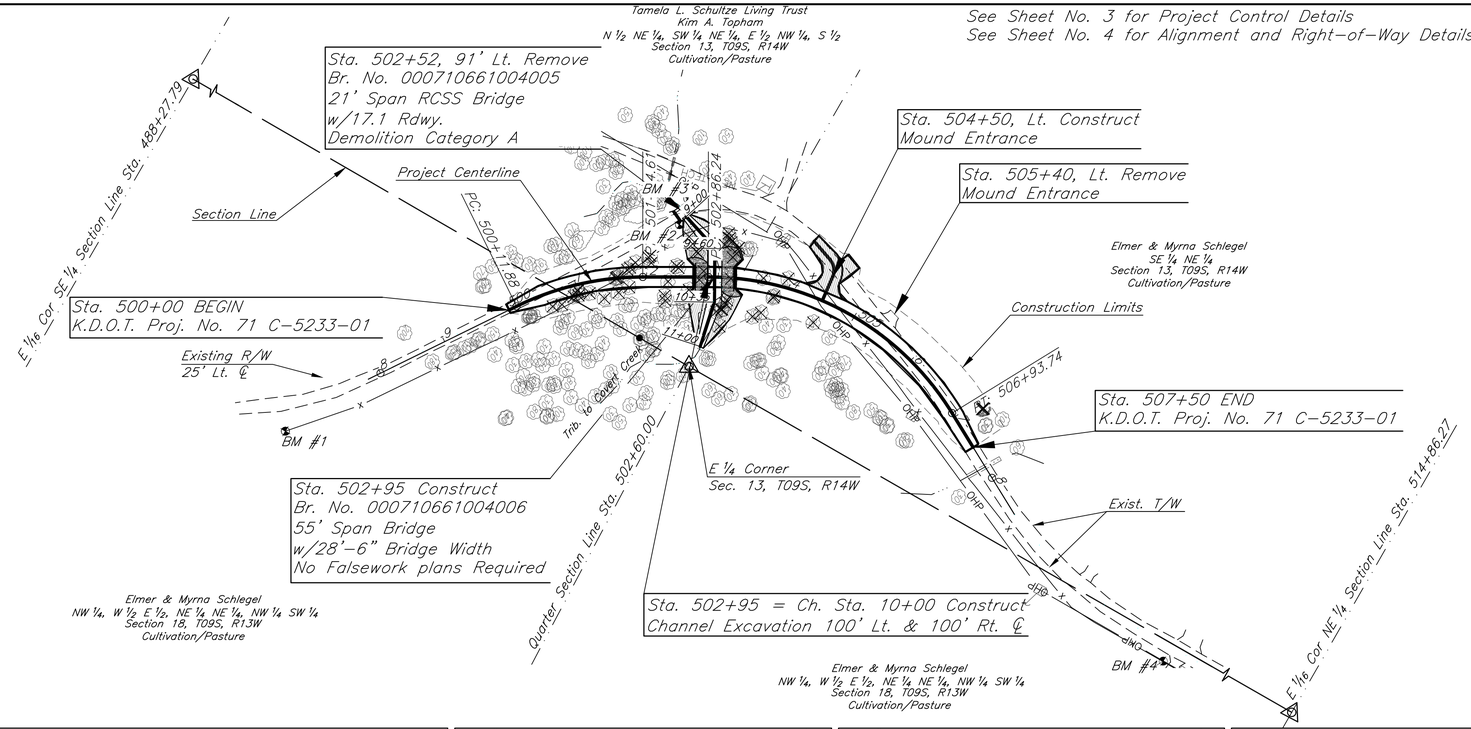
VERTICAL DATUM: North American Vertical Datum (NAVD) 1988

DATUM BENCHMARK: 5/8" Rebar w/Green plastic cap designated as BM #4 Sta. 511+44, 70' Lt. Project ℄, 1' west of gate post = 1796.96.

NOTE: The Contractor shall remove the existing 21' span RCSS bridge (Br. No. 000710661004005) with 17.1' rdwy. width. All materials shall become property of the Contractor and shall be removed from the site.

Existing Bridge consists of: concrete deck, abutments, wingwalls, and steel guardrail.

The Contractor shall excavate the channel prior to construction of the bridge.

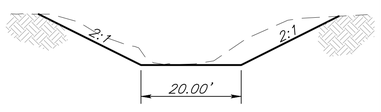


BM #1 5/8" Rebar w/green "PENCO CONTROL" cap 1' West of Gate Post, 14' Rt.	BM #2 Mag Nail in Top of SE Wing Wall Pile, 73' Lt.	BM #3 Mag Nail in Top of NW Wing Wall Pile, 109' Lt.	BM #4 5/8" Rebar w/green "PENCO CONTROL" cap 1' West of Gate Post, 70' Lt.
Sta. 496+50, Elev.=1779.00	Sta. 502+46, Elev.=1773.71	Sta. 502+58, Elev.=1773.68	Sta. 511+44 Elev.=1796.96
N=644626.90, E=5455593.58	N=644956.89, E=5455066.65	N=644948.70, E=5455029.59	N=645848.30, E=5455252.71

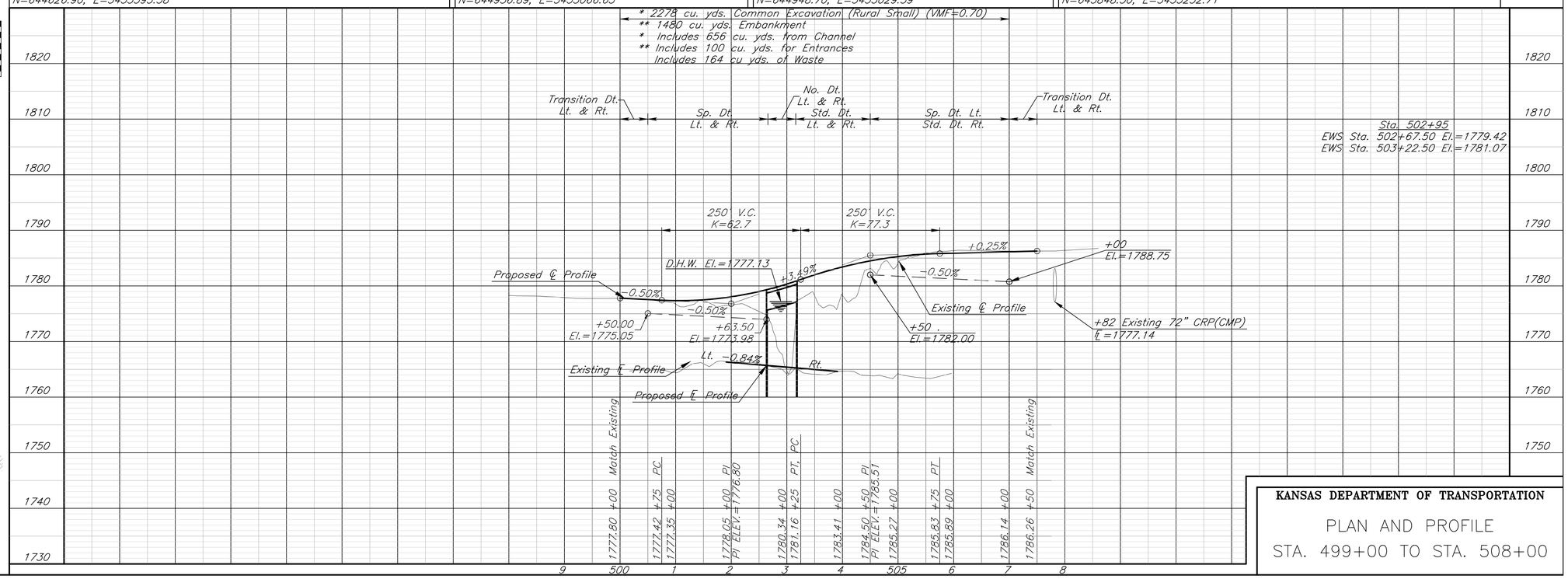
Note: All disposal sites must be approved by the Kansas Department of Health and Environment. Material either stockpiled or disposed of in a flood plain would require a Kansas State Board of Agriculture permit. Any material dumped in waters of the United States or wetlands is subject to U.S. Corps of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

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

Borrow areas provided by the Contractor shall be approved by the Engineer as to suitability of material and location. Special care shall be taken in this approval to minimize the increase of siltation and turbidity of streams, lakes, and reservoirs and to avoid interference with the movement of migratory fish. Areas which, in the opinion of the Engineer, may leave an unsightly appearance to the project will not be approved.



TYPICAL CHANNEL SECTION
Sta. 9+75 to Sta. 10+25



KANSAS DEPARTMENT OF TRANSPORTATION

PLAN AND PROFILE

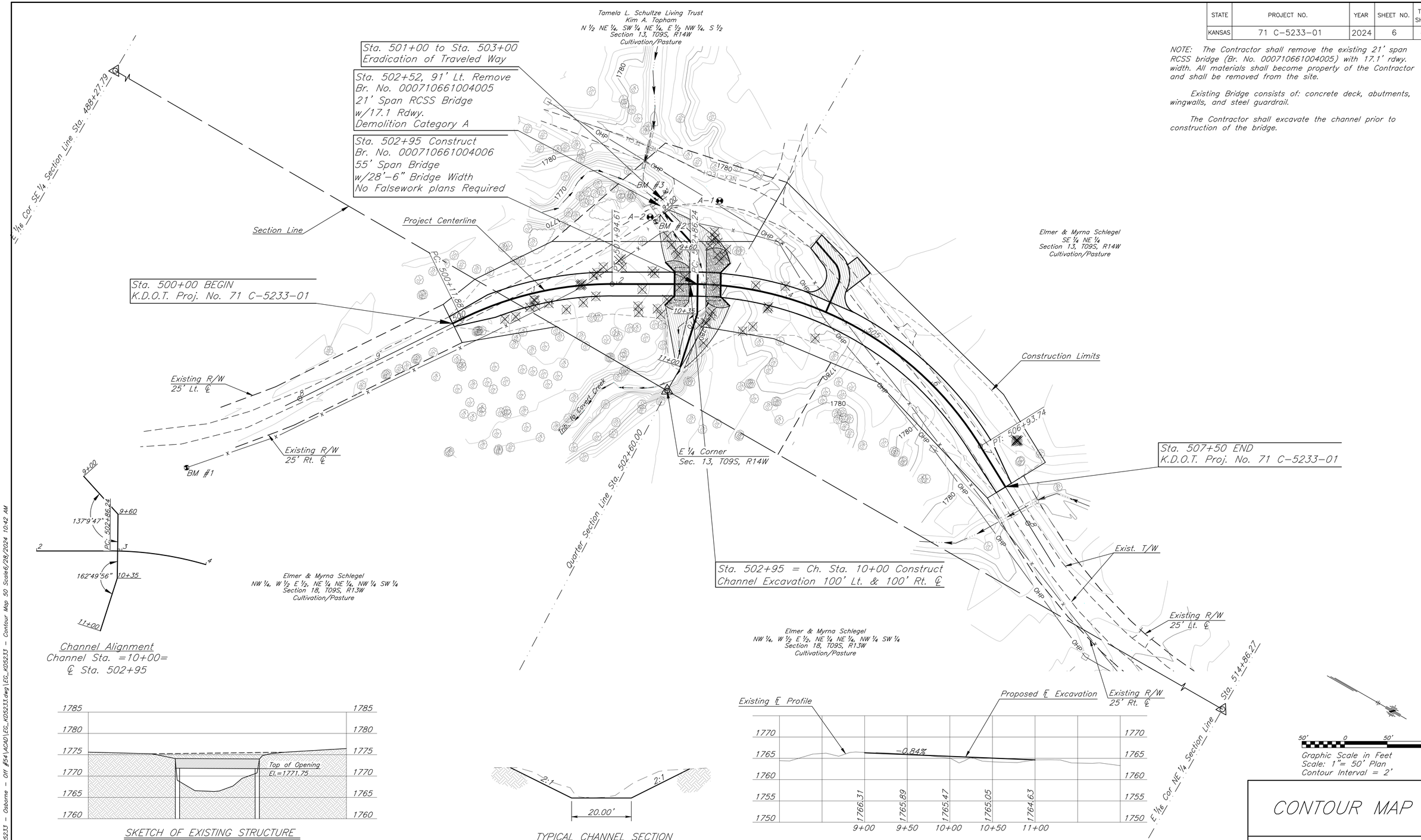
STA. 499+00 TO STA. 508+00

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	6	44

NOTE: The Contractor shall remove the existing 21' span RCSS bridge (Br. No. 000710661004005) with 17.1' rdwy. width. All materials shall become property of the Contractor and shall be removed from the site.

Existing Bridge consists of: concrete deck, abutments, wingwalls, and steel guardrail.

The Contractor shall excavate the channel prior to construction of the bridge.



Channel Alignment
Channel Sta. =10+00=
℄ Sta. 502+95

SKETCH OF EXISTING STRUCTURE
Existing Waterway Opening = 73 sq. ft.
Sta. 502+52, 91' Lt.

TYPICAL CHANNEL SECTION
Sta. 9+60 to Sta. 10+35

CHANNEL PROFILE & GRADE

BM #1 5/8" Rebar w/green "PENCO CONTROL" cap 1' West of Gate Post, 14' Rt.
Sta. 496+50, Elev.=1779.00
N=644626.90, E=5455593.58

BM #2 Mag Nail in Top of SE Wing Wall Pile, 73' Lt.
Sta. 502+46, Elev.=1773.71
N=644956.89, E=5455066.65

BM #3 Mag Nail in Top of NW Wing Wall Pile, 109' Lt.
Sta. 502+58, Elev.=1773.68
N=644948.70, E=5455029.59

BM #4 5/8" Rebar w/green "PENCO CONTROL" cap 1' West of Gate Post, 70' Lt.
Sta. 511+44 Elev.=1796.96
N=645848.30, E=5455252.71

CONTOUR MAP

PENCO ENGINEERING, P.A.
PLAINVILLE, KANSAS

DESIGNED BY: JJD	SCALE: As Shown
DRAWN BY: MRH	PROJ. NO.: 71 C-5233-01
CHECKED BY: JGD	DATE: 2024

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STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	7	44

SUMMARY OF QUANTITIES

Item / Location	Excavation Class I (yd³)	Excavation Class II (yd³)	Concrete Grade (4.0) AE (yd³)	Reinforcing Steel (Grade 60) (lbs)	Structural Steel ASTM A709 Grade 36 (lbs)	Structural Steel ASTM A709 Grade 50W (lbs)	Bridge Handrail (Metal) (Lin. Ft.)	Slope Protection (Shot Rock) (yd³)	Pile (Steel) HP10x42 (Lin. Ft.)	Pile (Corrugated Metal Sheet) (Sq. Ft.)	Contractor Furnished PDA (Each)
Abutment No. 1	69.7	0.0			2347	1617		58	380	1235	1
Abutment No. 2	69.7	0.0			2347	1617		77	370	1235	
Superstructure			38.7	6870		43,512	125				
Total	139	0.0	38.7	6870	4694	46,746	125	135	750	2470	1

GENERAL NOTES

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

CONCRETE: Concrete Grade 4.0 (AE) shall be used throughout. Bevel all exposed edges with a ¾" triangular molding unless otherwise noted.

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

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

BRIDGE EXCAVATION: Elevation 1768.47 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.

SLOPE PROTECTION (Shot Rock): Place Slope Protection (Shot Rock) to the limits and thicknesses shown on the plans or as directed by the Engineer. Place geotextile fabric under the rock/rubble embankment on the berm and berm slopes.

PILING: Piling Shall meet ASTM A572. Drive all piling to penetrate or bear upon the shale 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 58 Tons
Abutment No. 2 58 Tons

As a minimum drive each pile to the load and penetration, but in no case shall the pile be driven to more than 110% of Pile Driving Formula Driving Load.

STEEL SHEET PILING: Structural steel for sheet piling shall meet ASTM A570, Galvanized. Corner connections are subsidiary to bid item "Piles (Steel Sheet)". Welded or mechanical piling splices are only allowed with the Engineer's approval. Variation in the sheet pile alignment may be allowed with the approval of the Engineer. Use only "tamping" compaction equipment within five feet of the sheet piling. [Painting of steel sheet piling is not required.] See KDOT Specifications.

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

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

REINFORCING: All dimensions in Bending Diagrams are out to out of bar. All other dimensions relative to reinforcing steel are to ℄ of bar unless otherwise noted.

STRUCTURAL STEEL: Beams, stiffeners, and diaphragms shall meet the requirements for ASTM A709 Grade 50W.

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

BOLTED CONNECTIONS: Girder Connections: Use ¾" diameter heavy hex structural bolts for the member connections. Use 1 3/16" diameter bolt holes. Do not ream during field erection. Accurately align all connections by driving 1 3/16" diameter drift pins in all corners. See KDOT Specifications.

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

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

BRIDGE HANDRAIL (METAL): Bridge Handrail (Metal) shall be paid for by the linear foot from center of post to center of post. Payment shall be for all metal rail, materials, welding, labor and incidentals needed to complete the work.

CONTRACTOR FURNISHED PDA: Use the Pile Driving Analyzer equipment at the locations shown on the Construction Layout. Use Pile Driving Analyzer equipment and methods compliant with KDOT Special Provision. The piling shall remain in place as permanent piling. Drive the piling to the resistance value of 89 Tons.
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 Owner's designated Engineer may request that the Pile Driving Analyzer (PDA) equipment be used.

ERECTION PLANS: This is a Category A Structure. Submit detailed Erection Plans to the Field Engineer per KDOT Specifications. A Licensed Professional Engineer is not required.

PAINTING: No Painting Required.

NUT ROTATION FROM THE SNUG FIT CONDITION	
Bolt Length	Rotation
Up to and including 4 bolt diameters	1/3
Over 4 bolt diameters to 8 bolt diameters	1/2
Over 8 bolt diameters to 12 bolt diameters	2/3

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

LFD RATING FACTORS		
Truck \ Rating Level	Inventory	Operating
H20 (20T)		
Type 3 (25T)	1.40	2.34
HS20 (36T)	1.06	1.76
Type 3S2 (36T)	1.46	2.43
Type 3-3 (40T)	1.58	2.64
NRL (40T)		1.49
2002 LFD Rating, 17th Edition AASHTO		

LRFR RATING FACTORS		
Truck \ Rating Level	Inventory	Operating
HL-93 Loading	1.03	1.33
NRL		1.26
2011 Manual for Bridge Evaluation		

DESIGN DATA

DESIGN LOADING: HL-93 A.A.S.H.T.O. Specifications, 2020 Edition and latest interim. Specifications, Load, and Resistance Factor Design.

UNIT STRESSES:

Concrete (Grade 4.0) (AE)	f'c = 4.0 ksi
Reinforcing Steel (Grade 60)	fy = 60,000 psi
Structural Steel ASTM A709 Gr. 36	fy = 36 ksi
Structural Steel ASTM A709 Gr. 50W	fy = 50 ksi
Pile (Steel) ASTM A572 Gr. 50	fy = 50 ksi

LRFD PILE DESIGN LOAD:

Design Loading (Tons/Pile)	Strength I	Service	Phi	PDA Load
Abutment 1&2	58	36	0.65	89

BRIDGE HANDRAIL (METAL): Steel guardrail bridge rail as shown is only intended for use on low volume local roads and does not meet the AASHTO Specifications for KDOT requirements for a 10 kip load

Construction Requirements

Contractor shall complete the following items:

1. Deck may be struck off with a Razorback vibrating screed or equivalent.
2. Abutment and wing sheet piling shall be 7 gauge, Galv.
3. Install 125 ft. of Guardrail and Buffer End Terminals. Apply 18"x18" retroreflective sheeting to the buffer end terminal after installation.
4. Abutments shall be backfilled and compacted (Type B MR-90) to tie-rod elevations prior to installation of tie-rods.
5. Provide and Install Signing Object Marker (Type 3), w/2, 10'-0", 2lbs./ft., "U" channel galvanized posts. Object Markers shall be back-to-back on post at approach corners. Two object markers per post.
6. Stay in place decking forms may be used.

See Specifications for other details.

NO.	DATE	REVISIONS	BY	APP'D
1				

KANSAS DEPARTMENT OF TRANSPORTATION

BR. NO 000710661004006 STA. 502+95

SUMMARY OF QUANTITIES & GENERAL NOTES
55 FOOT SIMPLE STEEL BEAM
(28 FOOT NOMINAL ROADWAY)

PROJ. NO. 71 C-5233-01 OSBORNE CO.

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

KDOT Graphics Certified 04-19-2016

KDOT Graphics Certified

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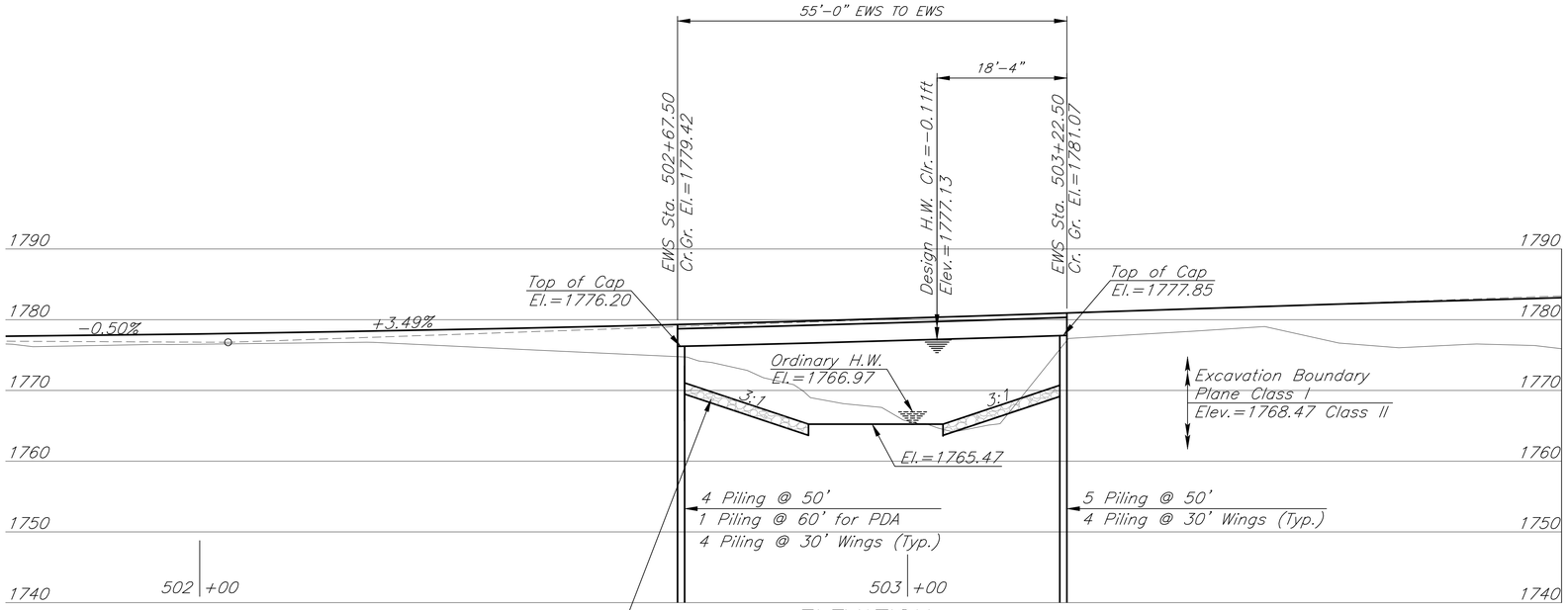
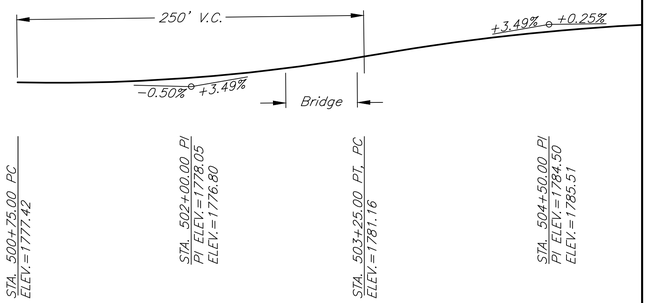
$TIME$
$FILE$

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	8	44



ELEVATION

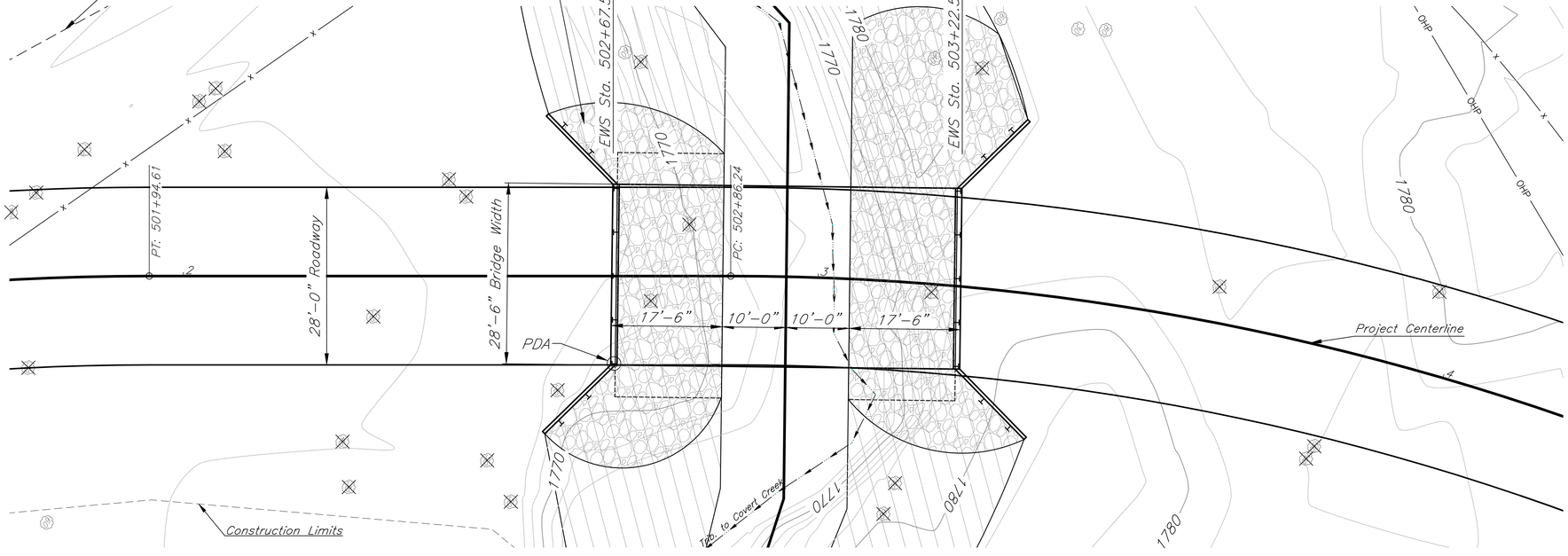
55' Steel Stringer Bridge w/8" Concrete Deck Pile Bent Abutments, 28' Rdwy.



VERTICAL CURVE DATA

DRAINAGE DATA

Drainage Area	20.2 Sq. Mi.
Design Frequency	25 Years
Design Discharge (Q_{25})	1601 cfs
Design High Water Elevation	1777.13 ft.
Design Backwater	-0.11 ft.
Design Backwater Elevation	1777.17 ft.
Overtopping Elevation (Sta. 501+05)	1777.35 ft.
Overtopping Discharge (Q_{50})	2256 cfs
Overtopping Frequency	50 Years
Discharge at Q_{100}	3054 cfs
Backwater at Q_{100}	-0.09 ft.
Backwater Elevation at Q_{100}	1780.38 ft.
Historic High Water Elevation	Unknown ft.
Ordinary High Water Elevation	1766.97 ft.
Total Waterway Provided	485 Sq. Ft.
Design Waterway Provided	479 Sq. Ft.
Estimated O.H.W. Discharge	80 cfs



PLAN

0 10' 20'

Graphic Scale in Feet

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 000710661004006 ℄ Sta. 502+95

CONSTRUCTION LAYOUT

Proj. No. 71 C-5233-01 Osborne Co.

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

BM #2 Mag Nail in Top of SE Wing Wall Pile, 73' Lt.
Sta. 502+46, Elev.=1773.71
N=644956.89, E=5455066.65

BM #3 Mag Nail in Top of NW Wing Wall Pile, 109' Lt.
Sta. 502+58, Elev.=1773.68
N=644948.70, E=5455029.59

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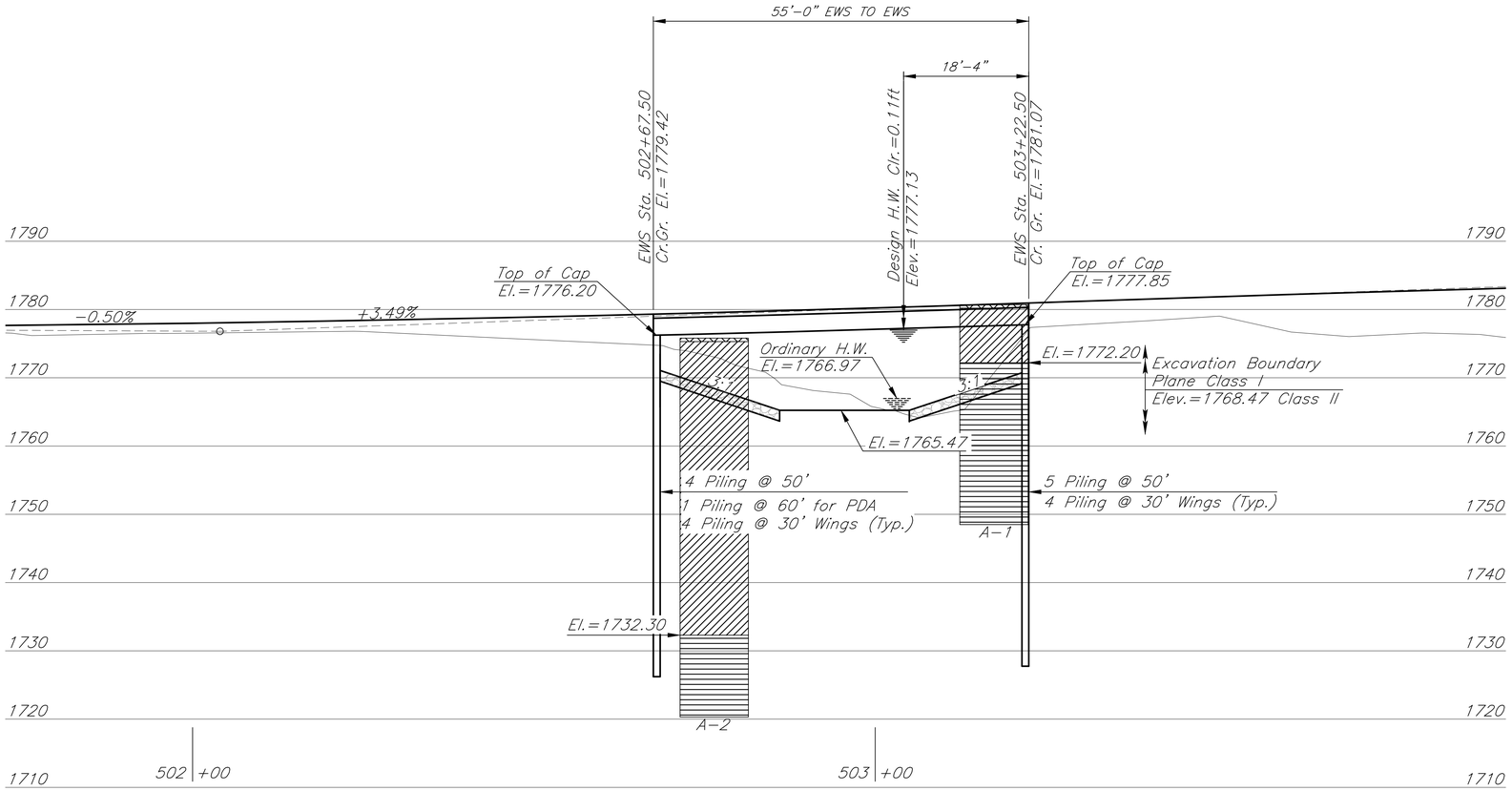
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	9	44

STANDARD GEOLOGICAL SYMBOLS

Shale

Lean Clay

Gravel Road



ELEVATION

55' Steel Stringer Bridge w/8" Concrete Deck Pile Bent Abutments, 28' Rdwy.

BM #2 Mag Nail in Top of SE Wing Wall Pile, 73' Lt.
Sta. 502+46, Elev.=1773.71
N=644956.89, E=5455066.65

BM #3 Mag Nail in Top of NW Wing Wall Pile, 109' Lt.
Sta. 502+58, Elev.=1773.68
N=644948.70, E=5455029.59

See Sheet No. 6 for Boring Locations.

0 10' 20'

Graphic Scale in Feet

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 000710661004006 ℄ Sta. 502+95

GEOLOGY

Proj. No. 71 C-5233-01 Osborne Co.

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

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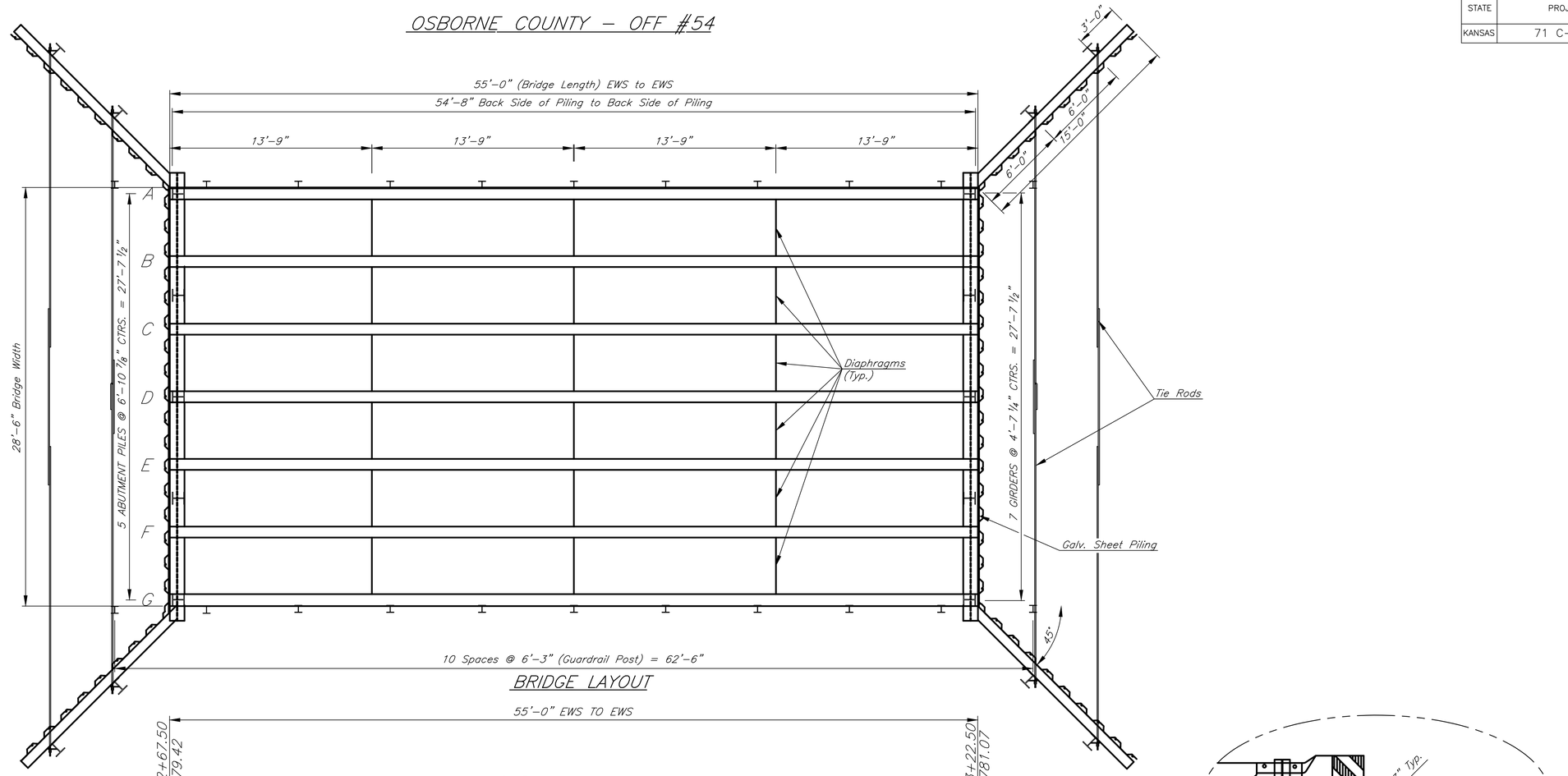
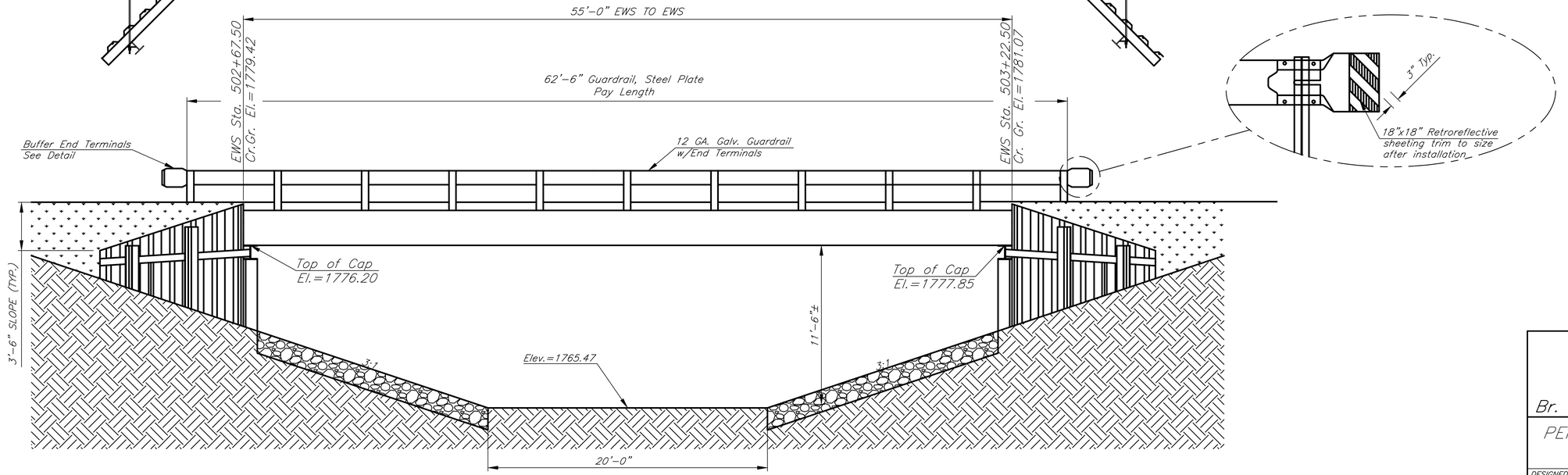
KANSAS	71 C-5233-01	2024	10	44

OSBORNE COUNTY – OFF #54



BRIDGE LAYOUT



BRIDGE ELEVATION

55'–0" X 28'–6"
Single Span Bridge
Concrete Deck
Br. No. 000710661004006

PENCO ENGINEERING, P.A.
PLAINVILLE, KANSAS

DESIGNED BY: JGD	SCALE: As Shown
DRAWN BY: MRH	PROJ. NO.: 71 C-5233-01
CHECKED BY: JJD	DATE: 2024

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STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
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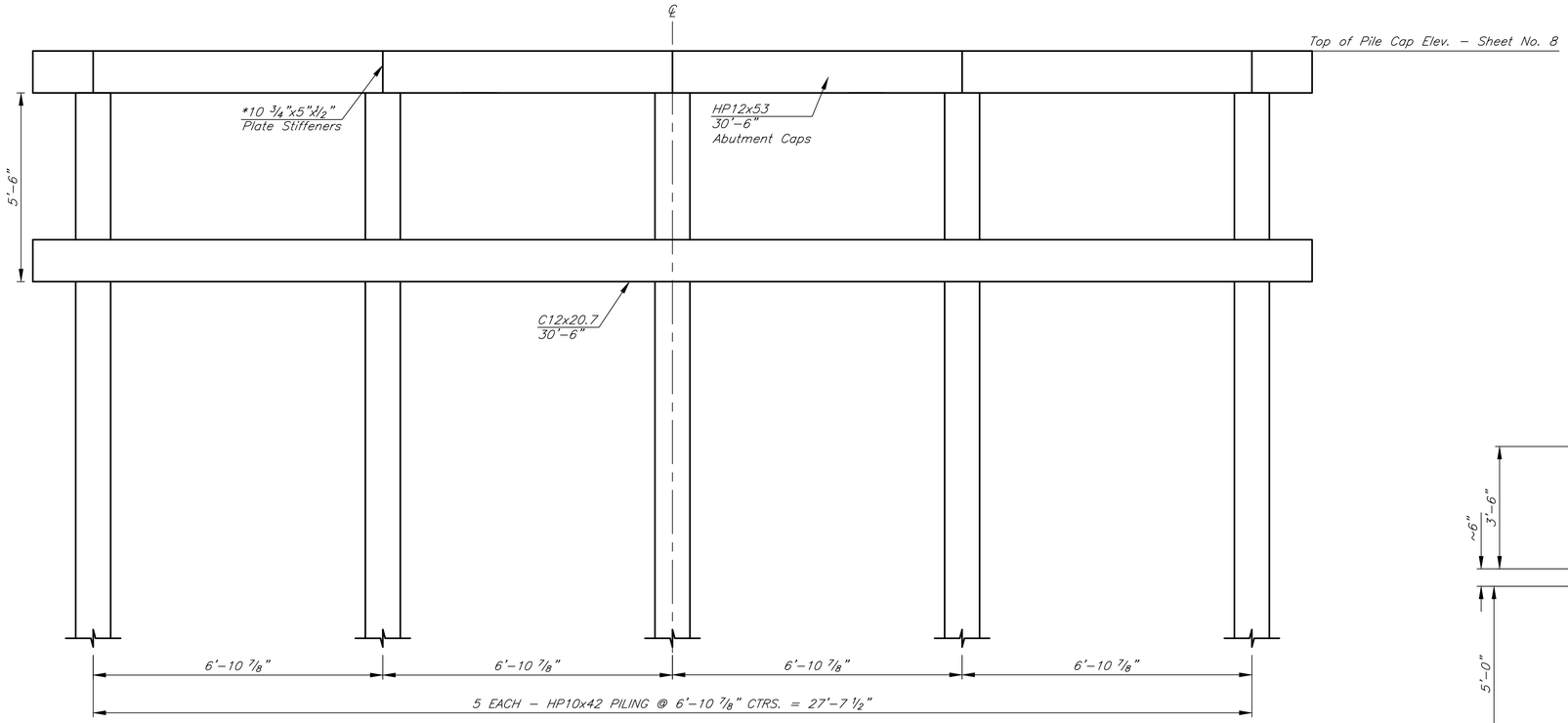
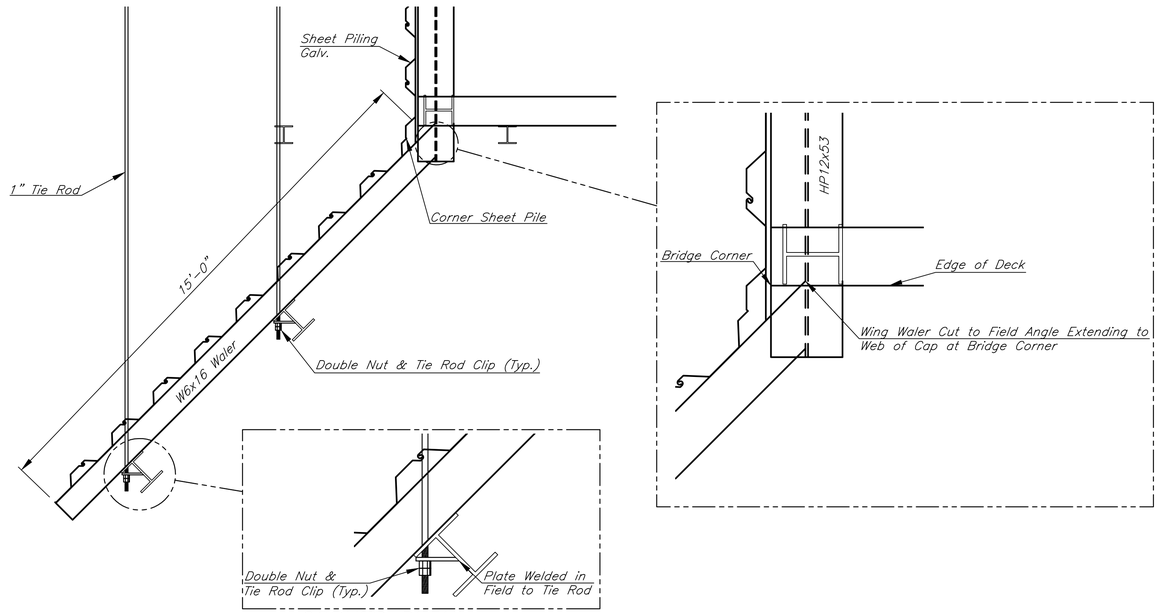
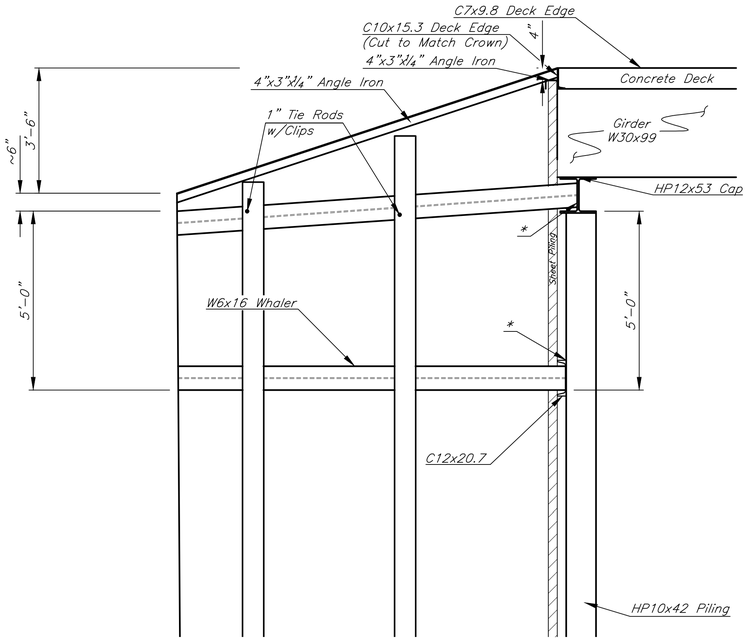


ELEVATION
(LOOKING FORWARD WITH STATIONING)



CORNER DETAIL

Note: Tie-Rod should be installed above waler on pile furthest from the bridge and below waler on pile closest to the bridge.



ABUTMENT SECTION

*Cut to Fit.

Abutment Details
Br. No. 000710661004006

PENCO ENGINEERING, P.A.
PLAINVILLE, KANSAS

DESIGNED BY: JGD	SCALE: As Shown
DRAWN BY: MRH	PROJ. NO.: 71 C-5233-01
CHECKED BY: JJD	DATE: 2024

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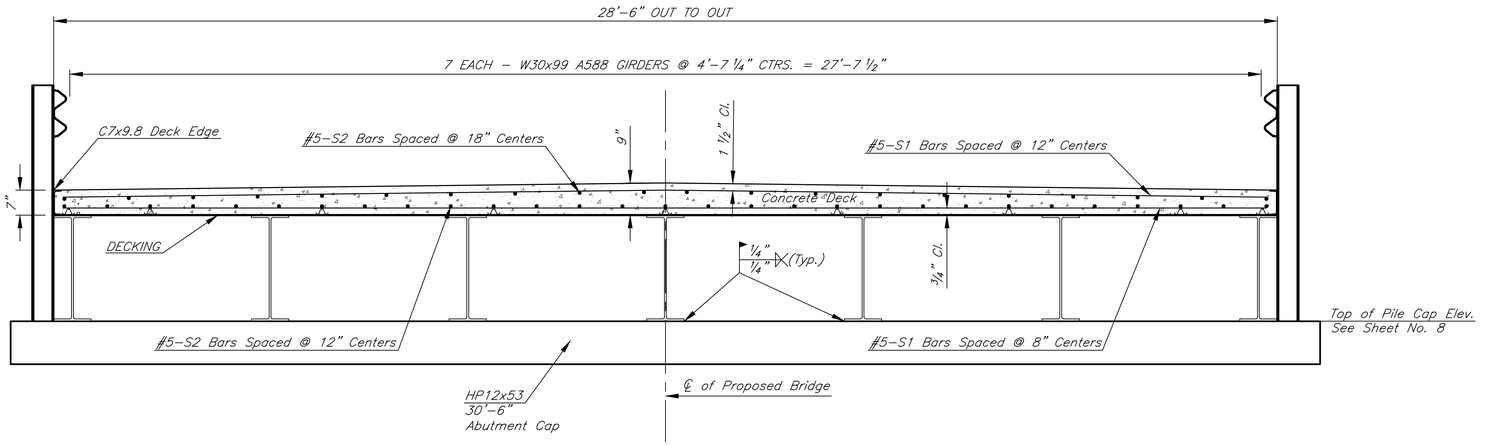
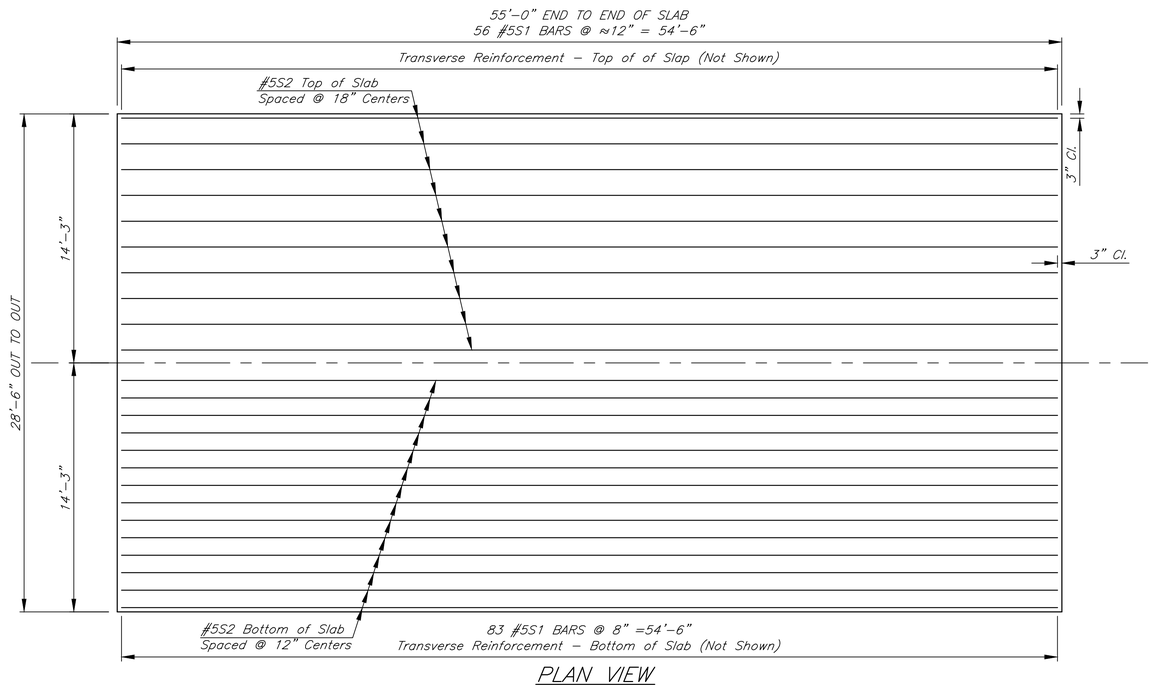
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	12	44



TYPICAL SECTION



PLAN VIEW

BILL OF REINFORCING STEEL
Grade 60

Straight Bars				Bent Bars			
Mark	Size	Number	Length	Mark	Size	Number	Length
S1	#5	139	28'-2"				
S2	#5	49	54'-6"				

Slab Details
Br. No. 000710661004006

PENCO ENGINEERING, P.A.
PLAINVILLE, KANSAS

DESIGNED BY: JGD	SCALE: As Shown
DRAWN BY: MRH	PROJ. NO.: 71 C-5233-01
CHECKED BY: JJD	DATE: 2024

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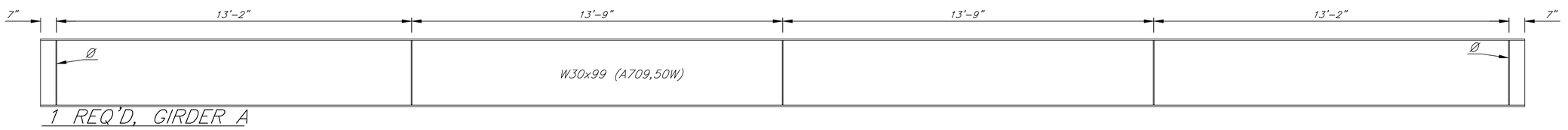
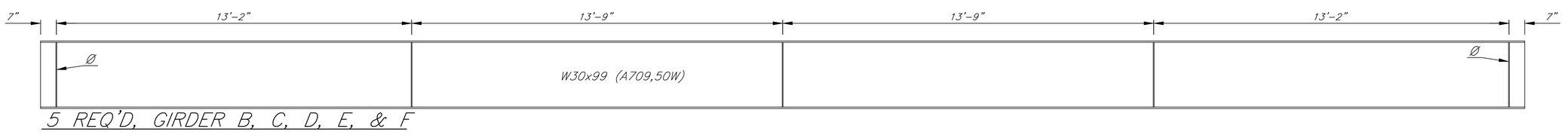
OSBORNE COUNTY – OFF #54

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C–5233–01	2024	13	44



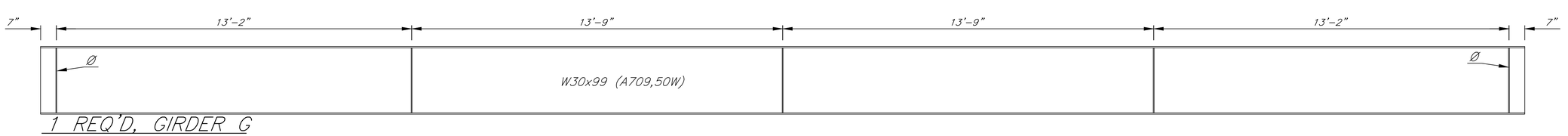
1 REQ'D, GIRDER A

N.S. F.S.



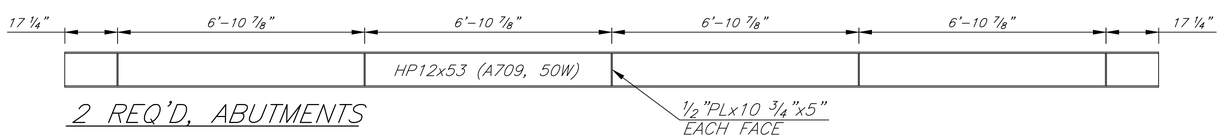
5 REQ'D, GIRDER B, C, D, E, & F

N.S. F.S.



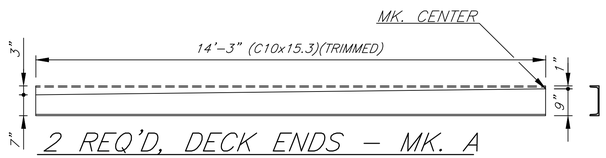
1 REQ'D, GIRDER G

N.S. F.S.

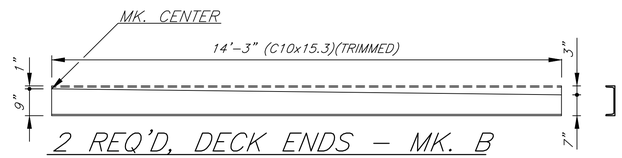


2 REQ'D, ABUTMENTS

N.S. F.S.



2 REQ'D, DECK ENDS – MK. A



2 REQ'D, DECK ENDS – MK. B

Ø Note: Bearing stiffener only, holes not required, each surface.

Girder Details
Br. No. 000710661004006

PENCO ENGINEERING, P.A.
PLAINVILLE, KANSAS

DESIGNED BY: JGD	SCALE: As Shown
DRAWN BY: MRH	PROJ. NO.: 71 C–5233–01
CHECKED BY: JJD	DATE: 2024

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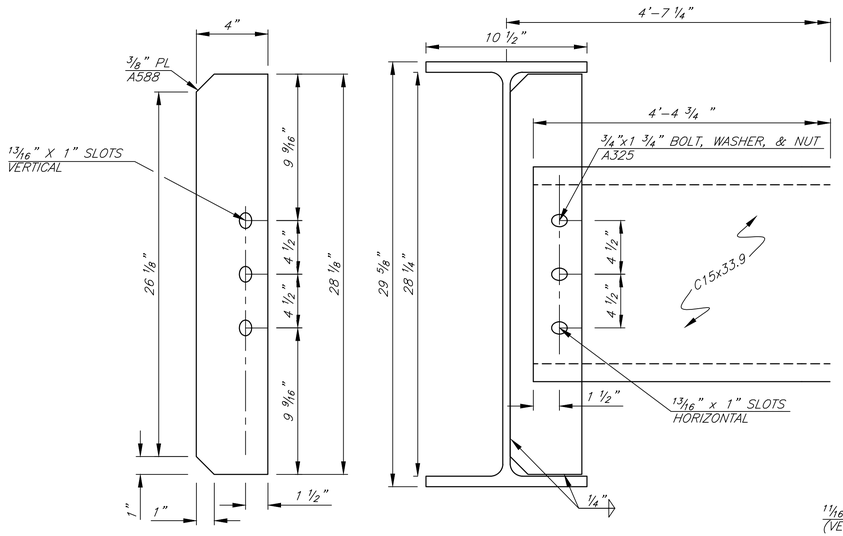
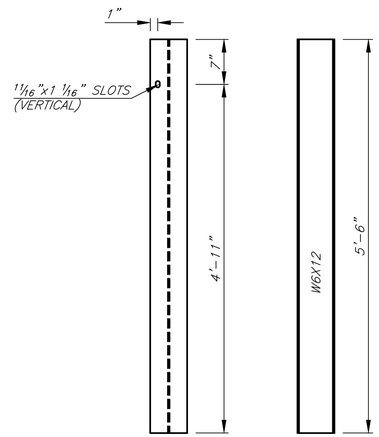
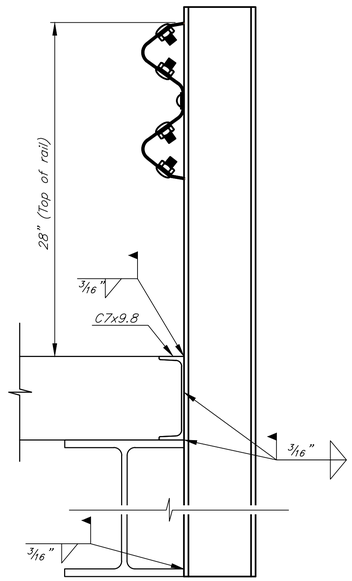
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C–5233–01	2024	14	44



DIAPHRAGM DETAIL



18 REQ'D RAIL POST GALV.
4 @ 6'–6" Ends



RAIL ATTACHMENT DETAIL

MATERIAL LIST

NO.	MATERIAL	LENGTH	DESCRIPTION	REMARKS
9	HP10x42	50'-0"	Abutment Piling	A572
1	HP10x42	60'-0"	Abutment Piling, PDA	A572
8	HP10x42	30'-0"	Wing Piling	A572
2	HP12x53	30'-6"	Abutment Caps	A709,Grade 50W
78	Sheet Pile	22'-0"	7 Gauge, Galv.	A570, Galv.
4	45° Sheet Pile Corners	22'-0"	7 Gauge, Galv.	A570, Galv.
2	C12x20.7	30'-6"	Abutment Waler	A709, Grade 36
16	1/2" PL x 5"	10 3/4"	Abutment Cap Stiffeners	A709, Grade 36
8	1" Tie Rod	20'-0"	Abut. Tie Rod	A709, Grade 36 (6" Thread One End, 16 Nuts)
2	1" Tie Rod	12'-0"	Abut. Tie Rod	A709, Grade 36
2	1" Tie Rod	5'-0"	Abut. Tie Rod	A709, Grade 36
8	1/2" PL x 5"	4"	Tie Rod Clips	A709, Grade 36
8	W6x16	16'-0"	Wing Waler	A709, Grade 36
7	W30x99	55'-0"	Girders	A709, Grade 50W, **1" Camber**
18	C15x33.9	4'-4 3/4"	Diaphragms	A709, Grade 50W
36	3/8" PL x 4"	2'-4 1/8"	Diaphragm Stiffeners	A709, Grade 50W
28	3/8" PL x 4"	2'-4 1/8"	Stiffeners	A709, Grade 50W
108	3/4" Dia Bolts	1 3/4"	Diaphragms	A325 (With Nuts & Washers)
4	C7x9.8	27'-6"	Deck Edge	A709, Grade 50W
4	C10x15.3	14'-3"	Deck EWS	A709, Grade 50W (Cut to Match Crown)
4	L4x3x1/4"	31'-0"	Abut. Sheet Pile Cap	A709, Grade 36
139	#5 Rebar	28'-2"	Transverse Reinf.	Grade 60
49	#5 Rebar	54'-6"	Longitudinal Reinf.	Grade 60
178	3/4" slab bolsters	5'-0"		Spaced @ approximately 4'
4	W6x12	6'-6"	Rail Post (ends)	A709, Grade 36, Galv.
18	W6x12	5'-6"	Rail Post	A709, Grade 36, Galv.
4	12 Gauge W Beam	25'-0"	Guardrail	Galv.
2	12 Guage W-Beam	12'6"	Guardrail	Galv.
4	Buffer End Terminals	4'-0"	End Terminals	Galv.
64	Nuts & Bolts	5/8" x 1 1/4"	W beam connections	Galv.

*Wing sheet piling may be tapered from 22'–0" to 18'–6" lengths.

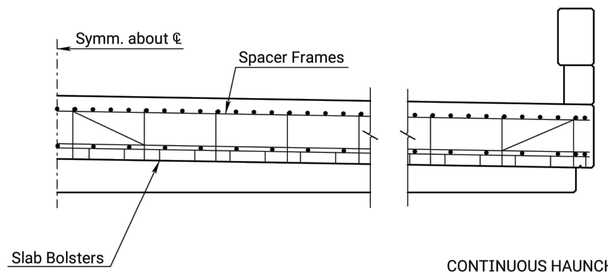
Material List
Fabrication Details
Br. No. 000710661004006

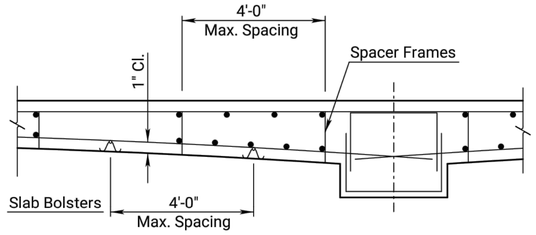
PENCO ENGINEERING, P.A.
PLAINVILLE, KANSAS

DESIGNED BY: JGD	SCALE: As Shown
DRAWN BY: MRH	PROJ. NO.: 71 C–5233–01
CHECKED BY: JJD	DATE: 2024

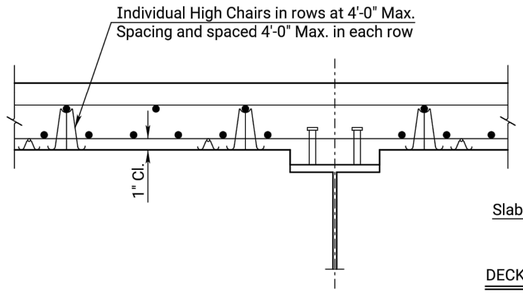
X:\oc2\kdot\K05233 – Osborne – Off #54\ACAD\Bridge Details Osborne.dwg 5/14/2024 1:40 PM

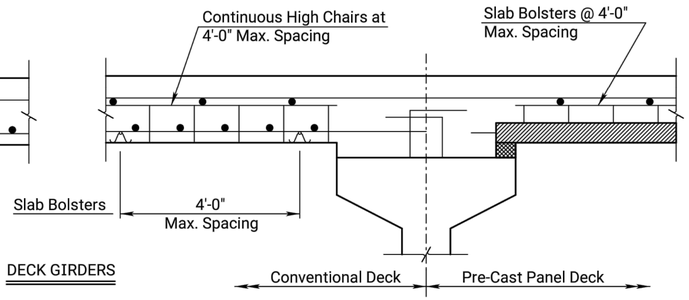
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	15	44



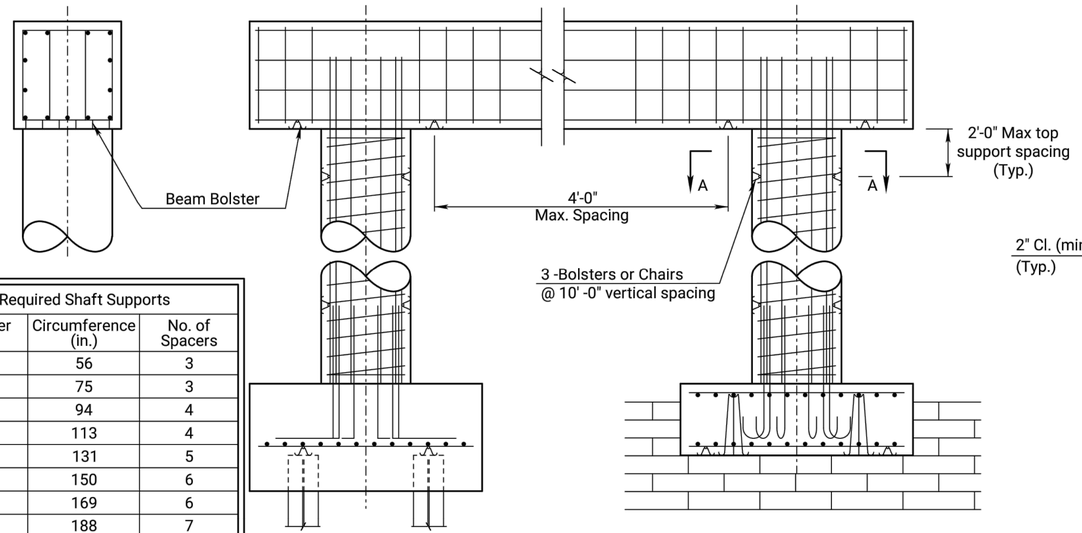


CONTINUOUS HAUNCHED SLAB



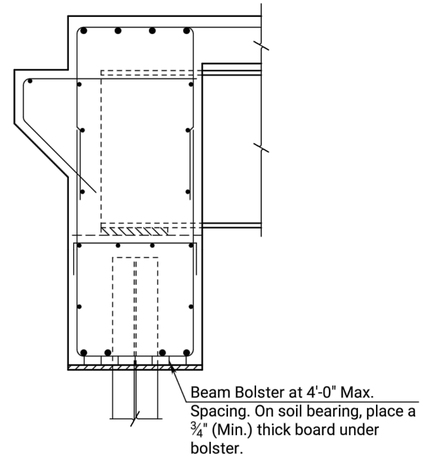


DECK GIRDERS

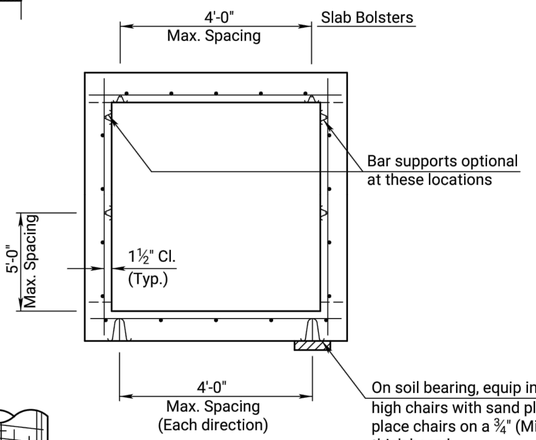


PIER

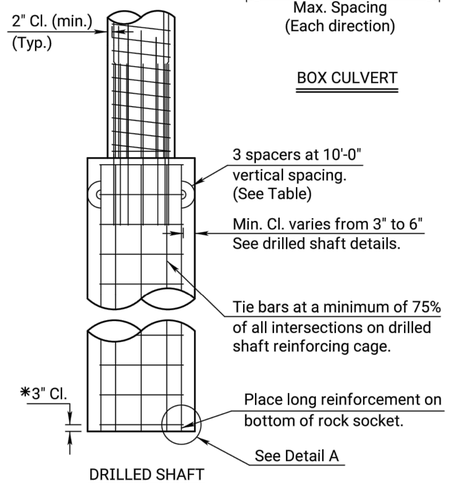
Required Shaft Supports		
Diameter (in.)	Circumference (in.)	No. of Spacers
18	56	3
24	75	3
30	94	4
36	113	4
42	131	5
48	150	6
54	169	6
60	188	7
66	207	7
72	226	8
78	244	9
84	263	9
90	282	10
96	301	11
102	320	11
108	339	12



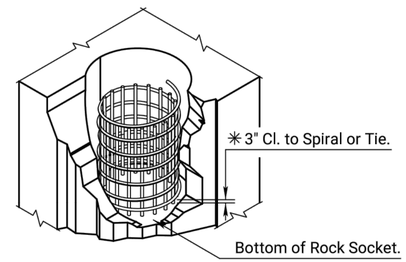
ABUTMENT



BOX CULVERT

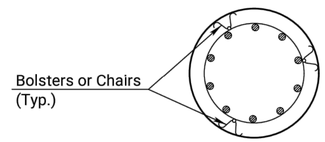


DRILLED SHAFT



DETAIL A

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



SECTION A-A

GENERAL NOTES

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

Use only the following types of bar supports:

1) Wire Bar Supports:

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

2) Plastic Bar Supports

3) Supplementary bars

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

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

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

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

Use proper height supports to maintain the distance between the reinforcing and the formed surface or the top surface of deck slabs within ¼" of that indicated on the plans.

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

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

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

NO.	DATE	REVISIONS	BY	APP'D
05	11-10-10	Column Bar Supports Required	J.P.J.	T.L.F.
04	12-01-05	Drilled Shaft Spiral Steel Placement	J.P.J.	K.F.H.
03	08-21-00	Added Pre-Cast Panel Detail	R.A.M.	K.F.H.

KANSAS DEPARTMENT OF TRANSPORTATION

SUPPORTS AND SPACERS FOR REINFORCING STEEL

BR120

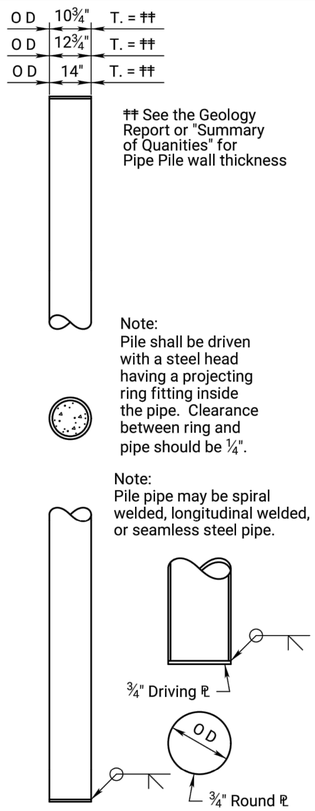
FHWA APPROVAL		11-17-10	APP'D.	Terry L. Fleck	
DESIGNED	R.A.M.	DETAILED	R.A.A.	QUANTITIES	TRACED R.A.A.
DESIGN CK.	L.R.R.	DETAIL CK.	R.A.M.	QUAN.CK.	TRACE CK. R.A.M.

KDOT Graphics Certified 06-20-2022

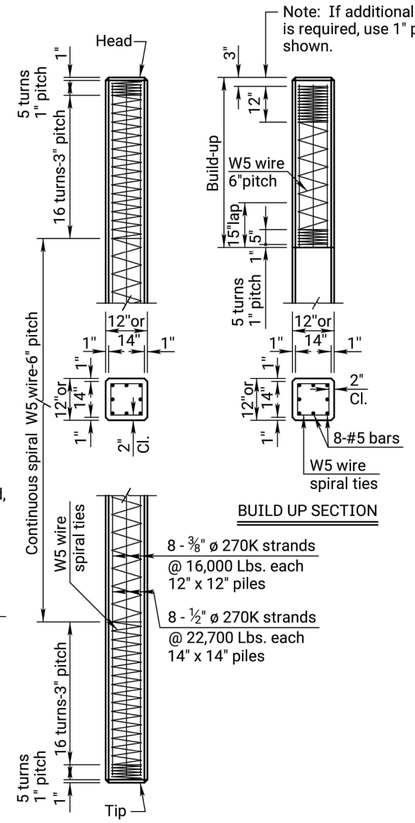
KDOT Graphics Certified

Plotted by : KDOT#CADD.Support_ks.gov 25-JUN-2022 00:07
File : br120.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	16	44

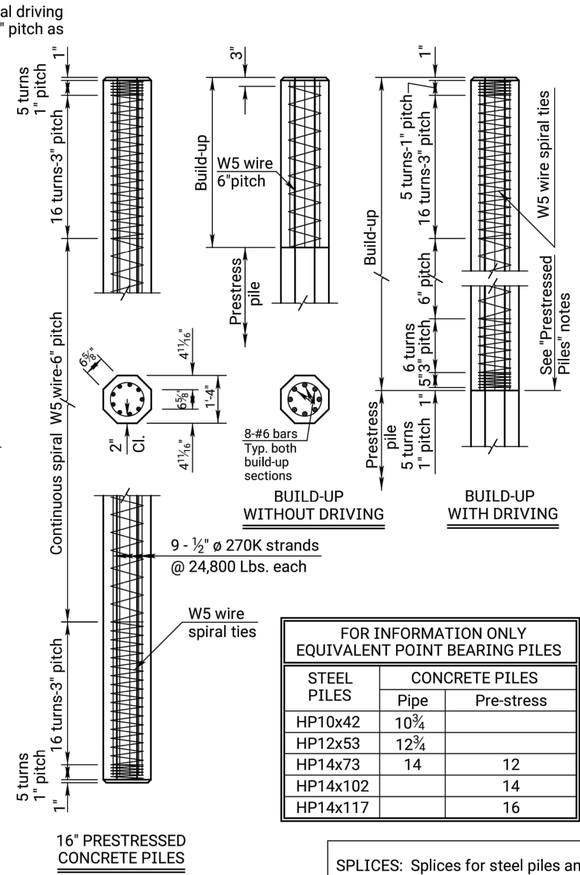


PLAIN ROUND
CAST-IN-PLACE CONCRETE PILES



12" OR 14"
PRESTRESSED
CONCRETE PILES

BUILD UP SECTION

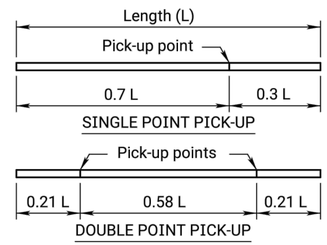


16" PRESTRESSED
CONCRETE PILES

BUILD-UP
WITHOUT DRIVING

BUILD-UP
WITH DRIVING

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



PICK-UP POINTS FOR PRESTRESSED PILING

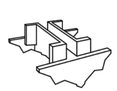
Max. length - 55' single point pick-up
Max. length - 80' double point pick-up

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

Outside Flange

Inside Flange

SHELL PILE POINT



H-Pile Point

CAST STEEL PILE POINT

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

Weld Symbology Definition

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

Lay full penetration root weld from beveled side of splice.

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

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

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

GENERAL NOTES

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

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

ALTERNATE METHODS: Method of attachment of a pile to build-up may be by any of the following methods:

1. Cut off at least 2'-0" of pile and expose a minimum of 2'-0" of strands.
2. Cast 8-#6, or 8-#5 bars (equally spaced) into pile head. All bars shall extend into pile head and project from pile head a minimum of 2'-0".
3. Drill 8 holes in pile head (equally spaced) for installation of 8 grouted dowel bars of same size and length as in 2.
4. Provide cored holes for bars as in 3.

No bars or strands are to extend from head of pile or build-up into footing or pile cap unless approved by the Engineer.

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

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

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

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

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

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

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

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

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

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

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

Use only low hydrogen E7018, 7016, or 7015 series welding rod (electrode) for all welding applications during pile splicing.

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

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

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

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

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

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

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

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

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

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

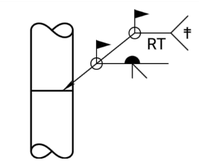
MILL TEST REPORTS: Steel piles test reports and steel shell test reports shall comply with the Standard Specifications.

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

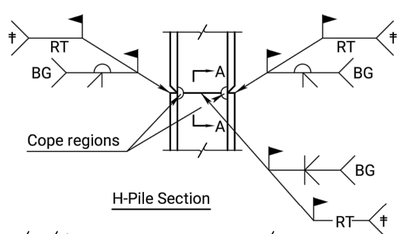
For integral pile bent abutments and piers, if a pile splice is required, do not locate the pile splice within a region extending 2'-0" above and 10'-0" below the bottom of the concrete web wall. For abutments, locate the pile splice at least 10'-0" below top of fill.

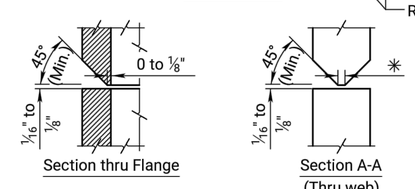
With the approval of the Engineer, one splice per bent may be allowed in the region described above without testing. If additional splices are anticipated, based on the geology, the Contractor prior to driving, will locate the splice so that the splice will not fall within the regions described above.

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



Pipe Section





✳ Minimum as required by welding process.

BG = Backgouge

PILE SPLICE DETAILS

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

KANSAS DEPARTMENT OF TRANSPORTATION

STANDARD PILE DETAILS

BR110

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

KDOT Graphics Certified 06-20-2022

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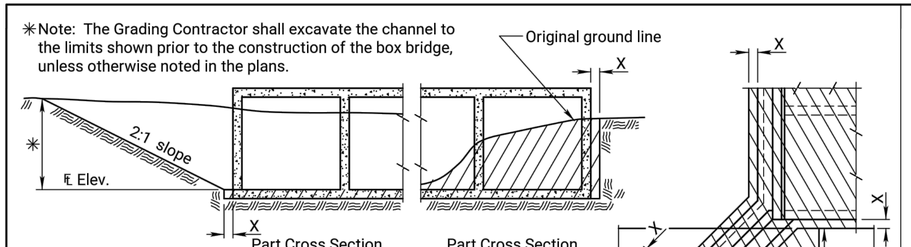
Plotted by : KDOT#CADD.Support_ks.gov 25-JUN-2022 00:07
File : br110.dgn

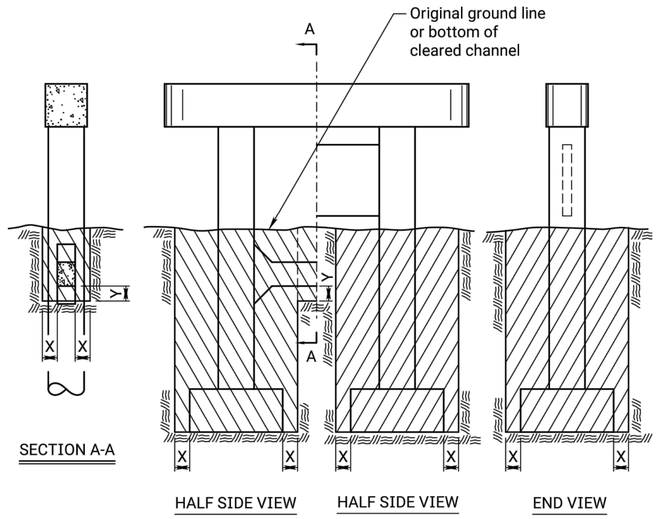
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	17	44

✳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.



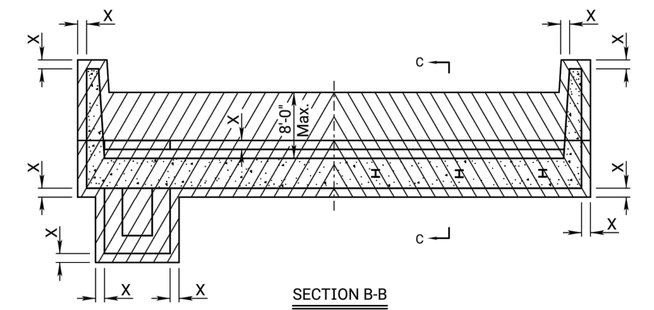
EXCAVATION DETAILS FOR REINFORCED CONCRETE BOX CULVERT

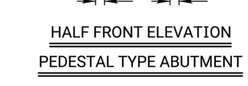
Note: Excavation for culverts less than bridge length and the additional excavation for "Embedded Structures" shall not be paid for as Class III Excavation, but shall be subsidiary to Grade 4.0 Concrete.



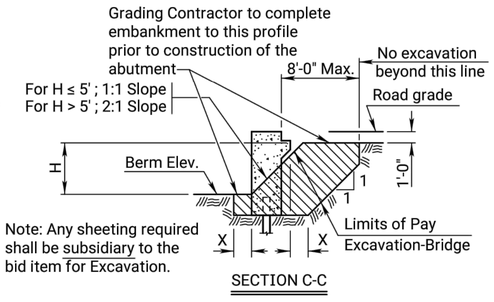
EXCAVATION DETAILS FOR TYPICAL PIERS

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



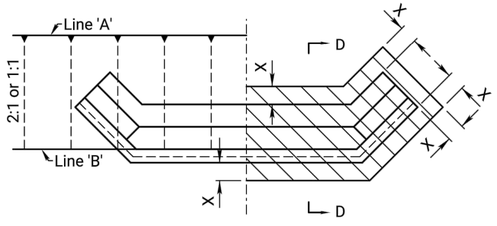


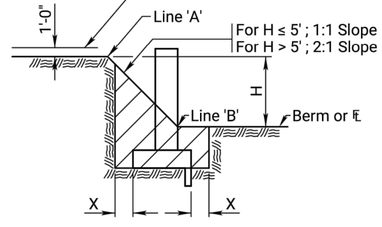
Note: Bridge Contractor shall finish the embankment and berms after the construction of the abutment and dispose of any excess material as approved by the Engineer.



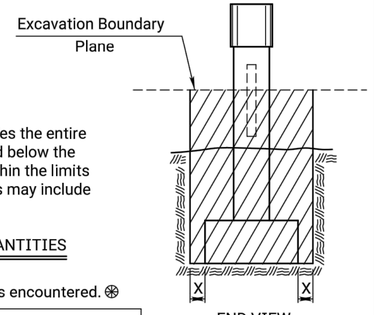
EXCAVATION DETAILS FOR TYPICAL ABUTMENTS

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





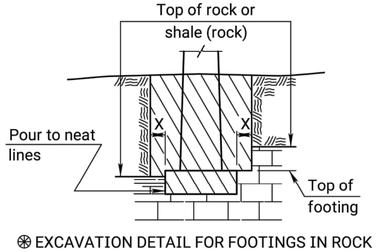
EXCAVATION DETAILS FOR ABUTMENTS WITH FLARED WINGWALLS



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

CLASS II EXCAVATION QUANTITIES

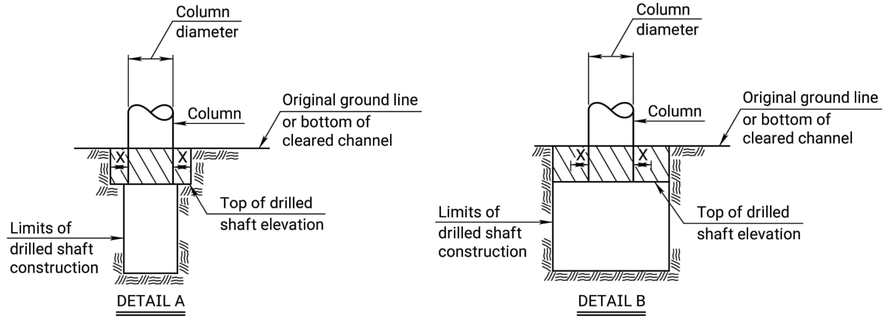
See detail when rock or shale (rock) is encountered. ❀



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

(Piers and Abutments)

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



DRILLED SHAFT DETAILS

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

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

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

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

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

NO.	DATE	REVISIONS	BY	APP'D
06	08-15-12	Embedment Excavation Subsidiary	J.P.J.	T.L.F.
05	05-15-12	Revised Wing Excavation	J.P.J.	T.L.F.
04	03-03-10	Revised Wing Excavation	J.P.J.	T.L.F.

KANSAS DEPARTMENT OF TRANSPORTATION

BRIDGE EXCAVATION (LRFD)

BR100B

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

KDOT Graphics Certified 06-20-2022

KDOT Graphics Certified

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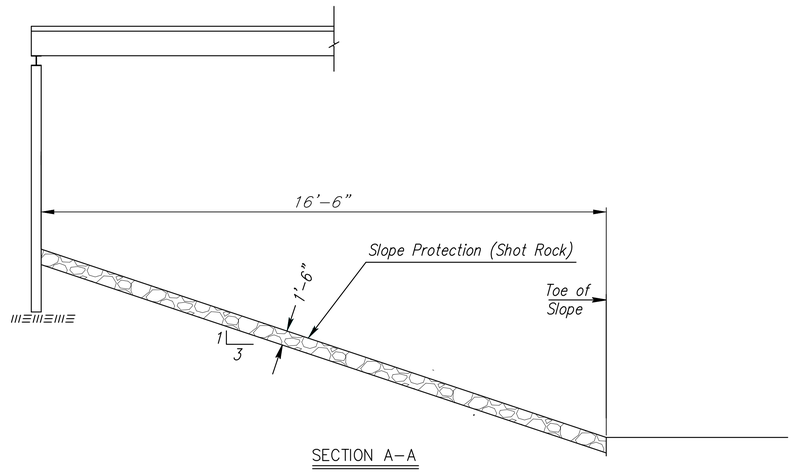
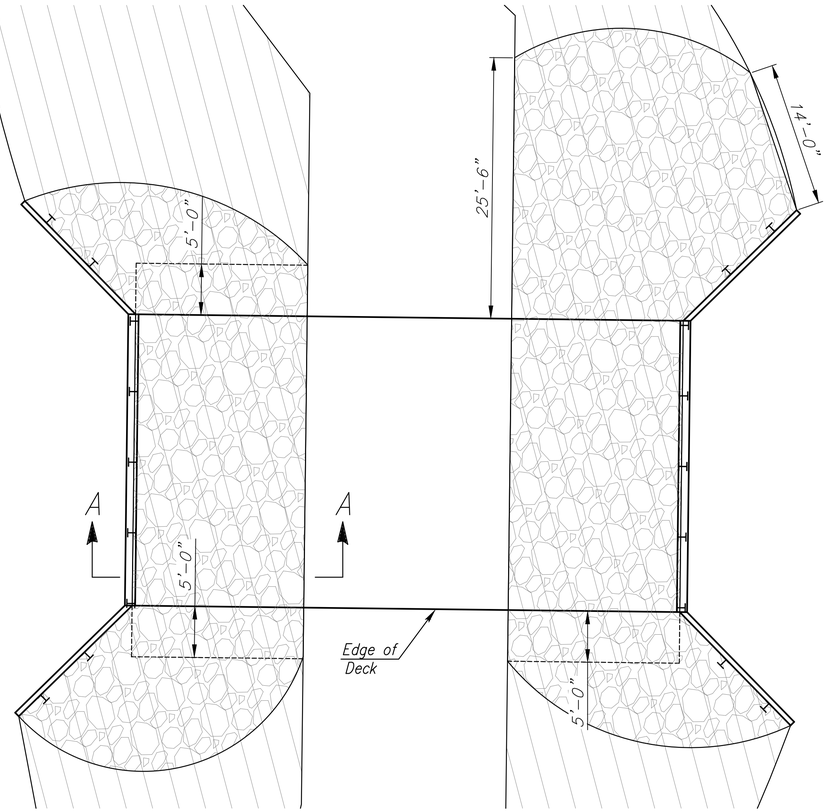
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	18	44



SECTION A-A



GENERAL NOTES

1. Limits of slope protection are as shown and centered along centerline of the slab.
2. Excavation and grading for placement of slope protection and all work shall be subsidiary to slope protection.
3. 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.
4. The maximum size of the shot rock will be limited to a thickness of 18".

SLOPE PROTECTION (Shot Rock)			
Sta.	to Sta.	Side	Cu. Yds.
9+81	10+19	Rt.	58
9+60	10+19	Lt.	77
TOTAL			135

QUANTITIES For Information Only		
		Geotextile Fabric Sq. Yds.
		285

NO.	DATE	REVISIONS	BY	APP'D

BRIDGE BERM AND
SLOPE PROTECTION
FLARED WINGWALL ABUTMENT

FHWA APPROVAL		APP'D	
DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN. CK.	CADD CK.

X:\ac2\kdot\KD5233 - Osborne - Off #54\ACAD\EG_KD5233.dwg\EG_KD5233 - Slope Protection 6/28/2024 10:44 AM

ERADICATION OF TRAVELED WAY

Sta. to Sta.	Side	Station
Sta. 501+00 to 503+00	Lt.	2.00
Total		2.00

EARTHWORK

Sta. to Sta.		Excavation yd³			Compaction yd³	
		Rock	Contractor Furnished	Common		Type B MR-90
500+00	507+50			1622		1231
9+00	11+00			656		149
Entrances						100
TOTAL				2278		1480

REMOVAL OF EXISTING STRUCTURES

(For Information Only)

Station	Side	Type
502+52	91' Lt.	21' Span RCSS Bridge
		w/17.1' Rdwy.
		Br. No. 000710661004005

REMOVAL OF LARGE TREES

(For Information Only)

Size(Circumference)	No.
180"	4
150"	2
120"	1
110"	2
100"	8
90"	1
80"	4
60"	6
50"	12
40"	9
30"	9

RECAPITULATION OF ROAD QUANTITIES

ITEMS	QUANTITY	UNITS
Field Office and Laboratory (Type C)	1	EACH
Mobilization	Lump Sum	LSUM
Mobilization (DBE)	Lump Sum	LSUM
Removal of Existing Structures	Lump Sum	LSUM
Curing Environment	Lump Sum	LSUM
Clearing and Grubbing	Lump Sum	LSUM
Common Excavation (Rural Small)	2278	CUYD
Eradication of Traveled Way	2	STA
Compaction of Earthwork (Type B)(MR-90)	1480	CUYD
Water (Grading)(Set Price)	1	MGAL
*Signing Object Marker (Type 3)(Double)	2	EACH
Temporary Surfacing Material (Aggregate)(Set Price)	1	CUYD

NOTE:

For Recapitulation of Bridge Quantities, See Sheet No. 7.
For Temporary Erosion and Pollution Control Quantities, See Sheet No. 20.
For Summary of Seeding Quantities, See Sheet No. 30.
For Traffic Control Quantities, See Sheet No. 39.
Construction Staking by County's Consultant.

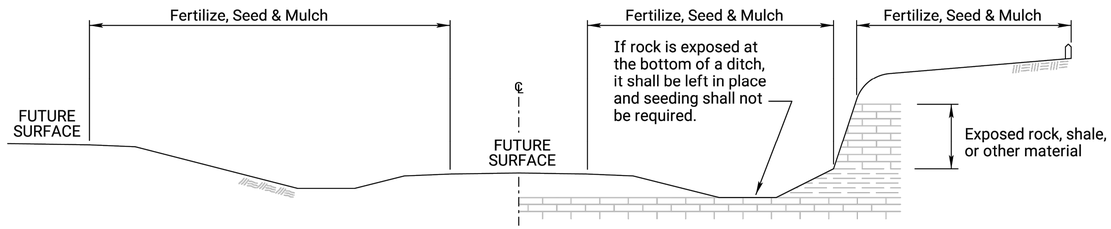
*Includes 2, 10'-0", 2 lbs./ft., "U" channel galvanized posts, w/OM-3R & OM-3L on each face.

PENCO ENGINEERING, P.A.

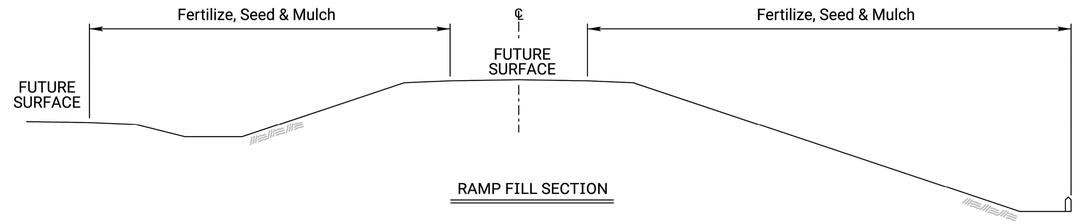
SUMMARY OF QUANTITIES

DESIGNED BY: JGD	SCALE: As Shown
DRAWN BY: MRH	PROJ. NO.: 71 C-5233-01
CHECKED BY: JJD	DATE: 2024

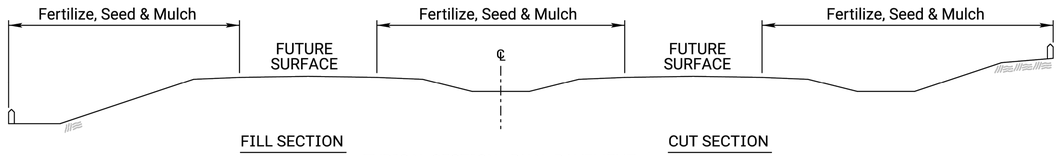
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	20	44



RAMP CUT SECTION



RAMP FILL SECTION



FILL SECTION CUT SECTION

TYPICAL SECTION - DUAL PAVEMENT

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

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

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

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

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

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

GENERAL NOTES

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

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

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

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

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

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

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

SUMMARY OF SEEDING / EROSION CONTROL QUANTITIES

P.L.S. RATE/ ACRE		ACRES		BID ITEM	QUANTITY	UNIT
CLT	SL/CH	CLT	SL/CH			
150		1.50		Temporary Fertilizer (16-20-0)	225.0	LB
20		1.50		Temporary Seed (Canada Wildrye)	30.0	LB
45		1.50		Temporary Seed (Grain Oats)	67.5	LB
45		1.50		Temporary Seed (Sterile Wheatgrass)	67.5	LB
	47.8		0.19	Soil Erosion Mix	9.1	LB
				Erosion Control (Class 1, Type C)	930	SQ YD
				Erosion Control (Class 2, Type E)		SQ YD
				Sediment Removal (Set Price)	1	CU YD
				Synthetic Sediment Barrier		LF
				Temporary Berm (Set Price)	1	LF
				Temporary Ditch Check (Rock)	25	CU YD
				Temporary Inlet Sediment Barrier		EACH
				Temporary Sediment Basin		CU YD
				Temporary Slope Drain		LF
				Temporary Stream Crossing		EACH
				Biodegradable Log (9")		LF
				Biodegradable Log (12")		LF
				Biodegradable Log (20")	580	LF
				Filter Sock (✱✱✱✱)		LF
				Geotextile (Erosion Control)	500	SQ YD
				Silt Fence		LF
				SWPPP Design †	1	LS
				SWPPP Inspection †	18	EACH
				Water Pollution Control Manager †	18	EACH
900 lbs / acre		1.31		Mulch Tacking Slurry	1769	LB
2 tons / acre		1.31		Mulching	3.9	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. (Mulch and slurry mulch estimated calculations are as follows: Mulch = Acres of Seeding x 1.5 x 2 Tons/acre; Mulch Tacking Slurry = Acres of Seeding x 1.5 x 900 lbs/acre) The estimated quantity includes mulching associate with both temporary and permanent seeding operations. The total mulch and mulch tacking slurry requirements shall be determined in the field. The bid item for mulching and much 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)
1.0	Seed (Blue Grama Gass)(Lovington)	0.19
24.5	Seed (Buffalo Grass)(Treated)	4.65
6.3	Seed (Side Oats Grama Grass)(El Reno)	1.20
10	Seed (Sterile Wheatgrass)(Regreen/Quickguard)	1.90
6.0	Seed (Western Wheatgrass)(Barton)	1.14
47.8	Total (lb)	9.08

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

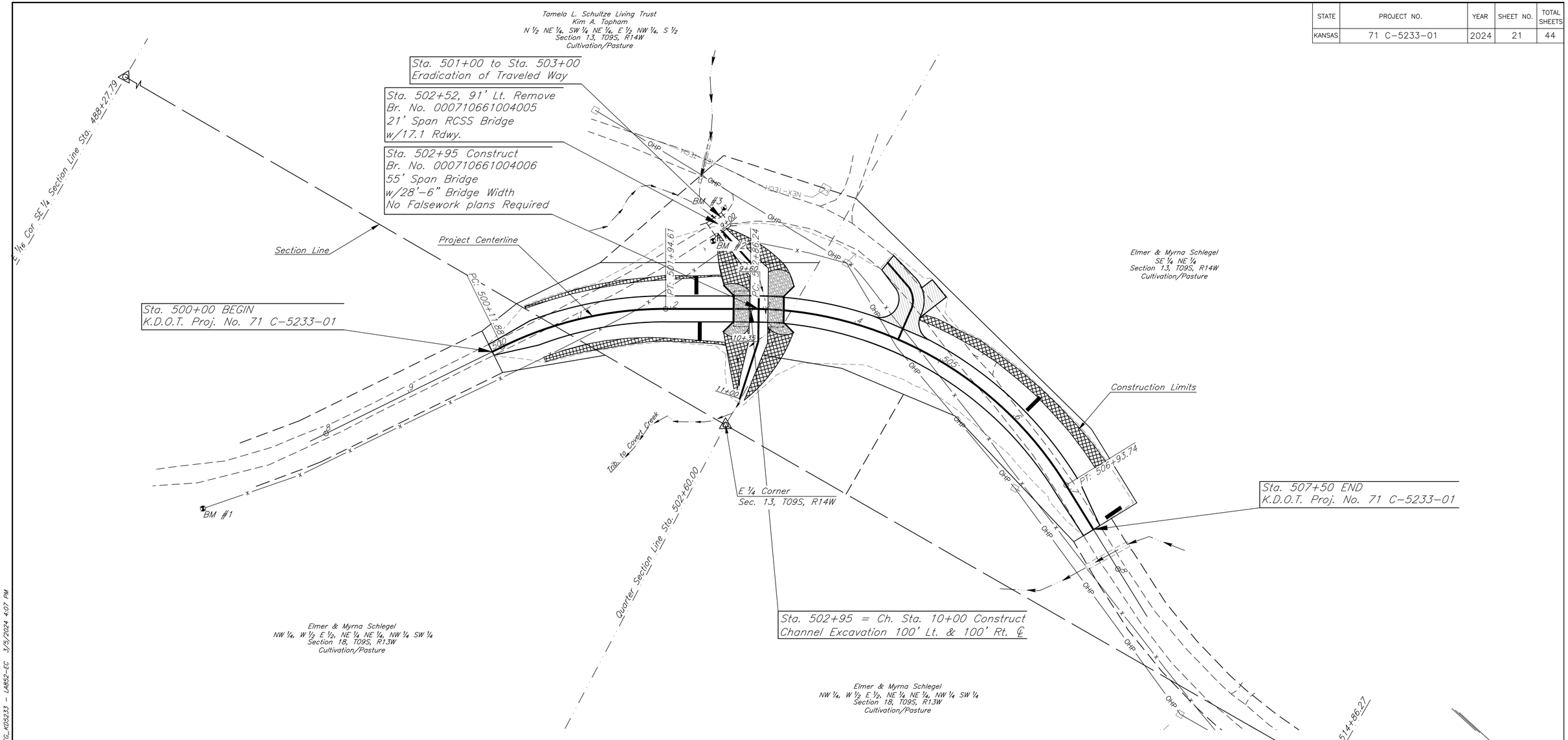
LA852A

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 06-18-2022

KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	21	44



EROSION CONTROL- CLASS 1, TYPE C

STATION TO STATION	SIDE	LENGTH	WIDTH	SQ YARD
500+50 to 502+43	LT.	193'	VARIES	80
500+50 to 502+43	RT.	193'	VARIES	114
504+62 to 507+00	LT.	238'	VARIES	283
9+00 to 9+60	LT.	60'	VARIES	89
9+00 to 9+75	RT.	75'	VARIES	119
10+25 to 11+00	LT.	75'	VARIES	139
10+25 to 11+00	RT.	75'	VARIES	106
TOTAL EROSION CONTROL (CLASS 1, TYPE C) =				930

EROSION CONTROL- CLASS 2, TYPE E

STATION TO STATION	SIDE	LENGTH	WIDTH	SQ YARD
TOTAL EROSION CONTROL (CLASS 2, TYPE E) =				

EROSION CONTROL- CLASS 1, TYPE C

EROSION CONTROL- CLASS 2, TYPE E

BIODEGRADABLE LOG (20")

ENTRANCE

SLOPE PROTECTION (SHOT ROCK)

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

EROSION CONTROL SEEDING-SODDING

LA852A-EC

FHWA APPROVAL			01/04/2006	APP'D		Scott H. Shields	
DESIGNED	MRM	DETAILED	MRM	QUANTITIES		TRACED	MRM
DESIGN CK.	SHS	DETAIL CK.	SHS	QUAN. CK.		TRACE CK.	SHS

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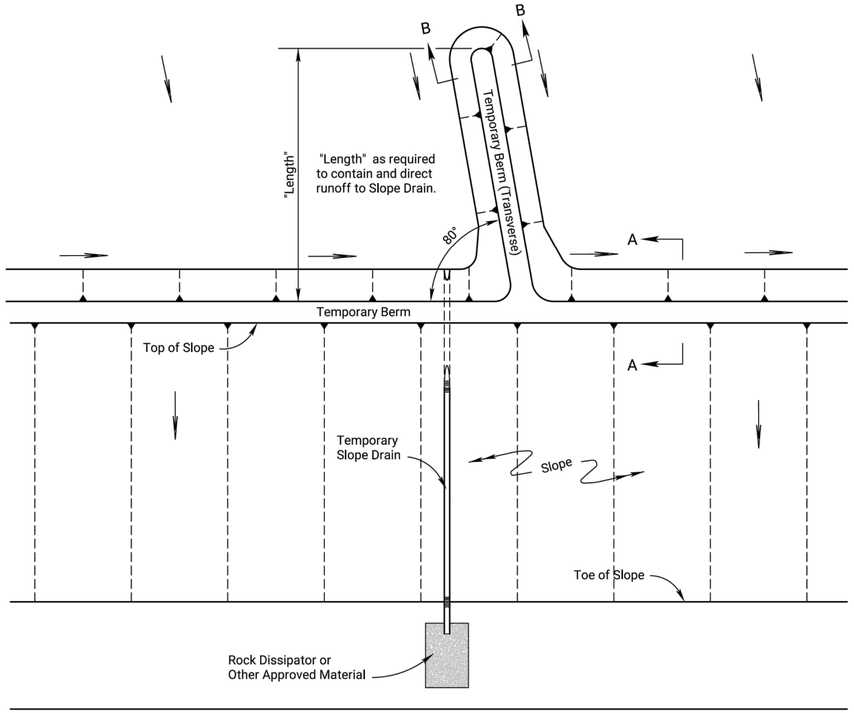
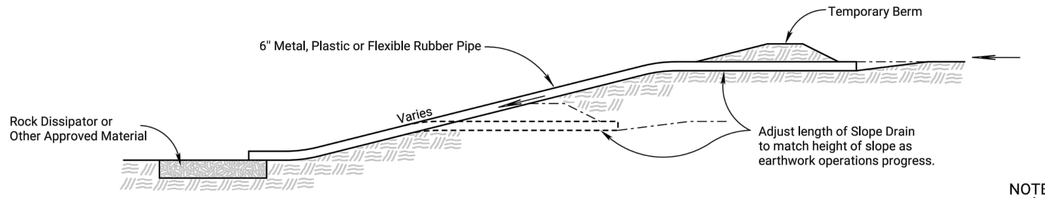
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	22	44



TYPICAL PLAN VIEW OF TEMPORARY BERM AND TEMPORARY SLOPE DRAIN

NO SCALE



TYPICAL PROFILE OF TEMPORARY SLOPE DRAIN

NO SCALE

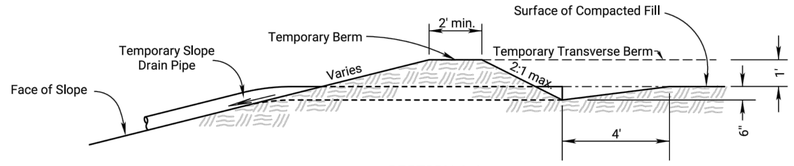
NOTES:

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

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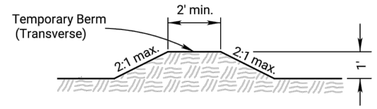
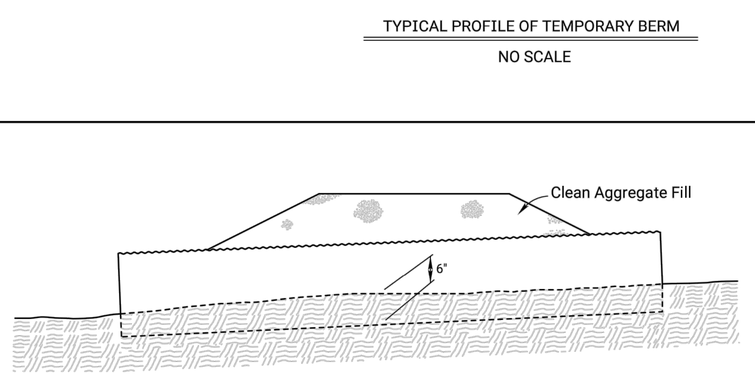


SECTION B-B

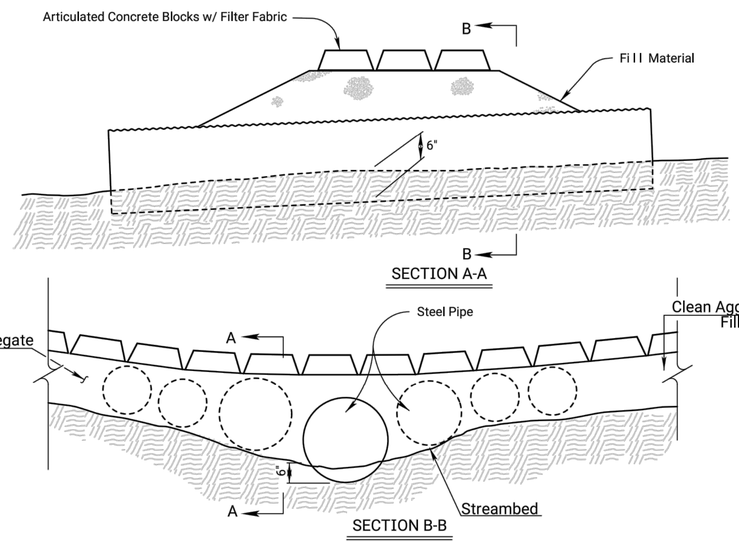
NO SCALE



SECTION B-B

TYPICAL PROFILE OF TEMPORARY BERM

NO SCALE



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.

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.

TEMPORARY STREAM CROSSING (AGGREGATE)

NO SCALE

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

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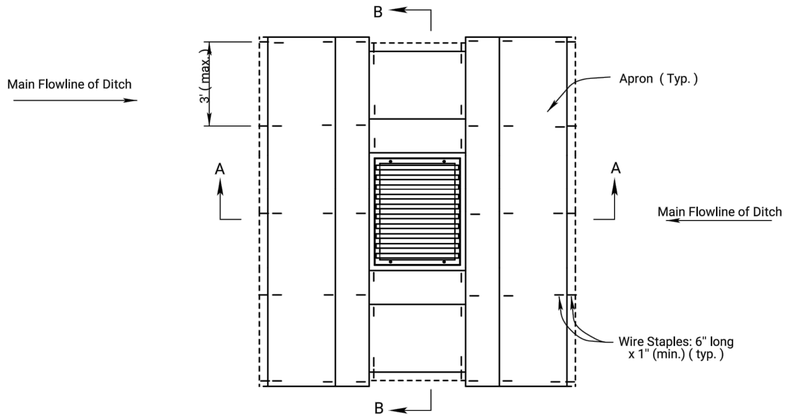
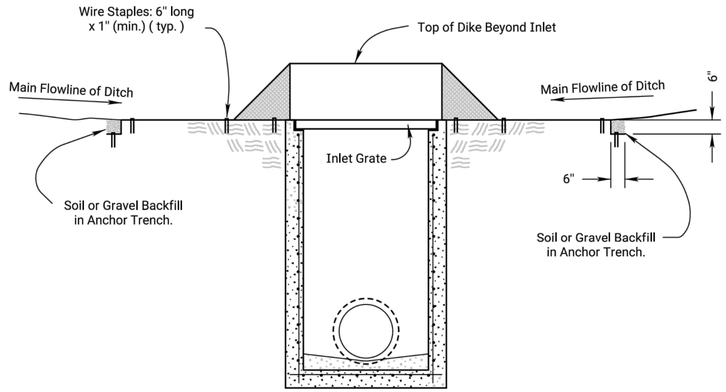
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	23	44



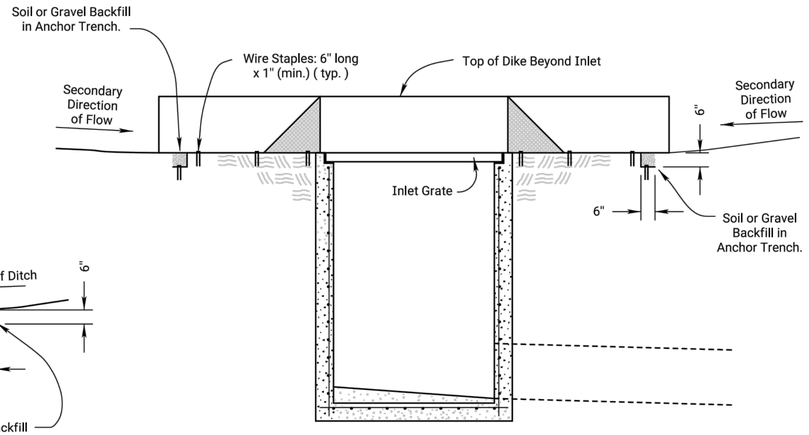
PLAN

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

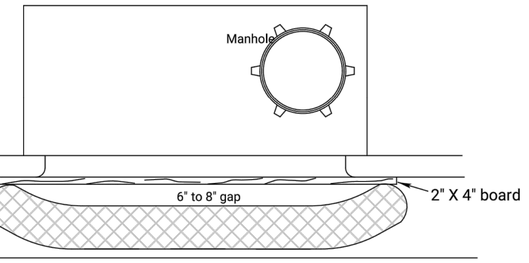
NO SCALE



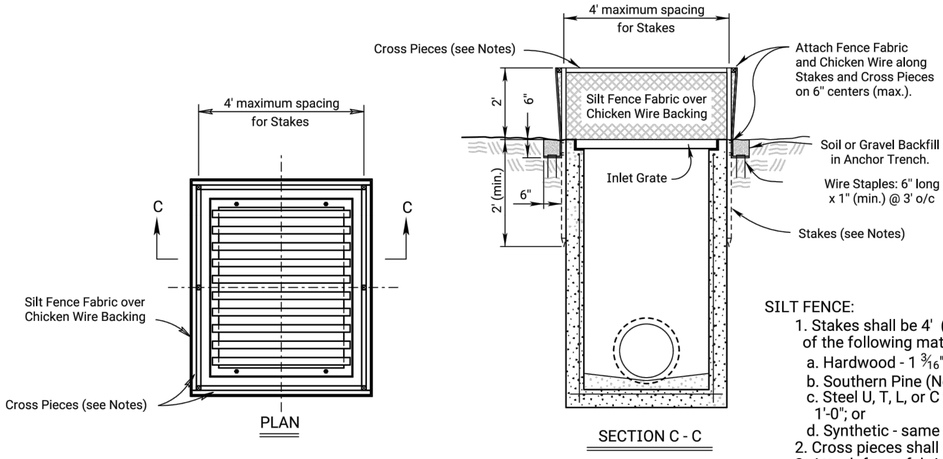
SECTION A - A



SECTION B - B



CURB INLET PROTECTION



PLAN

SECTION C - C

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

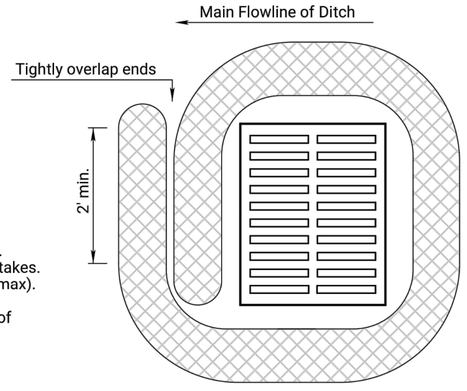
NO SCALE

SILT FENCE:

1. Stakes shall be 4' (min.) long and of one of the following materials:
   a. Hardwood - 1 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.

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

Rock = approximately 1" to 2" diameter



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

BIODEGRADABLE LOG/FILTER SOCK
DROP INLET PROTECTION

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

Stake every 4'

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

Material Requirements
Use 100% shredded mulch or other non-compost biodegradable material as fill for logs.
No compost or fines.
No hay or straw.
Do not use material which prohibits water infiltration.
Log Mesh: Use mesh with ¼" openings or larger. Mesh must allow water infiltration but also hold fill material in place.

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

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION AND POLLUTION CONTROL, TEMPORARY INLET SEDIMENT BARRIER (SILT FENCE) TEMP. INLET SEDIMENT BARRIER (T.S.D.) LA852C

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

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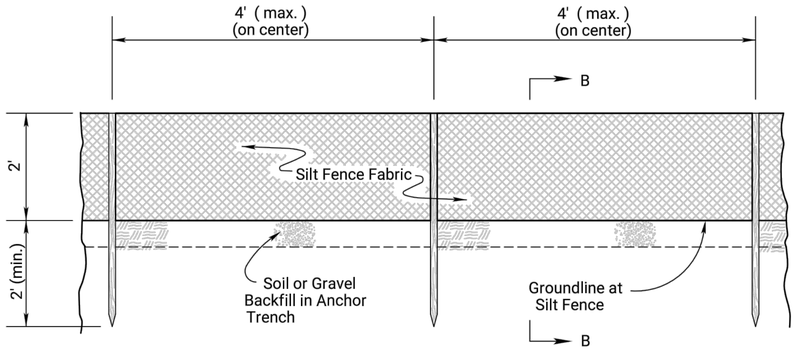
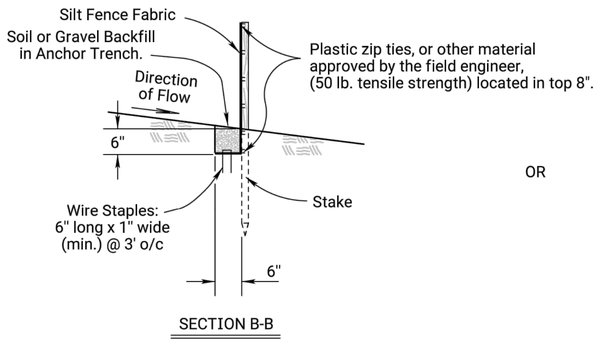
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	24	44



TYPICAL ELEVATION

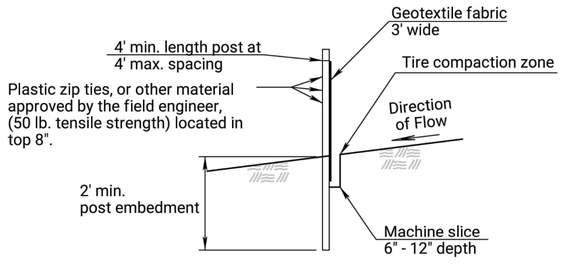
SILT FENCE BARRIER

NO SCALE



SECTION B-B

OR



SECTION B-B

INSTALLATION NOTES

SILT FENCE:

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

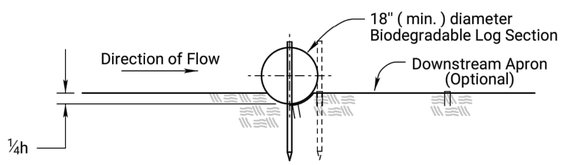
1. Place biodegradable logs or filter sock tightly together minimum overlap of 18".
2. Wood stakes shall be 2" x 2" (nom.).
3. Refer to plan sheets to estimate length of biodegradable log and filter sock required.
4. Each log or sock (except compost filter socks) should be keyed into the ground at a 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

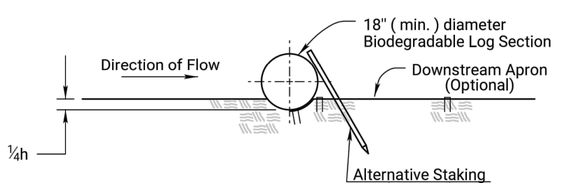
Slope Gradient	PRODUCT: 9" Sediment Log or 8" Filter Sock (ft)	12" Sediment Log or 12" Filter Sock (ft)	20" Sediment Log or 18" Filter Sock (ft)
≤4H:1V	40	60	80
3H:1V	30	45	60

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

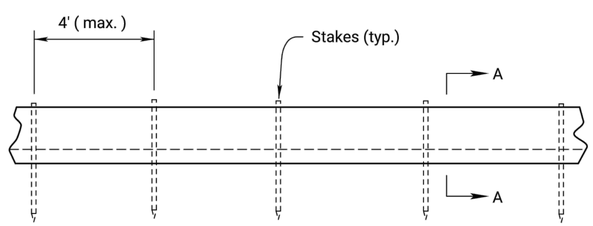


SECTION A - A



ALT. DETAIL

OPTIONAL



TYPICAL ELEVATION

BIODEGRADABLE LOG SLOPE INTERRUPTIONS

OR Filter Sock

GENERAL NOTES

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

NO.	DATE	REVISIONS	BY	APP'D
03	06-28-16	Revised Standard	R.A.	S.H.S.
02	03-01-15	Revised Standard	R.A.	S.H.S.
01	06-01-13	Revised Standard	M.R.M.	S.H.S.

KANSAS DEPARTMENT OF TRANSPORTATION

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

LA852D

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

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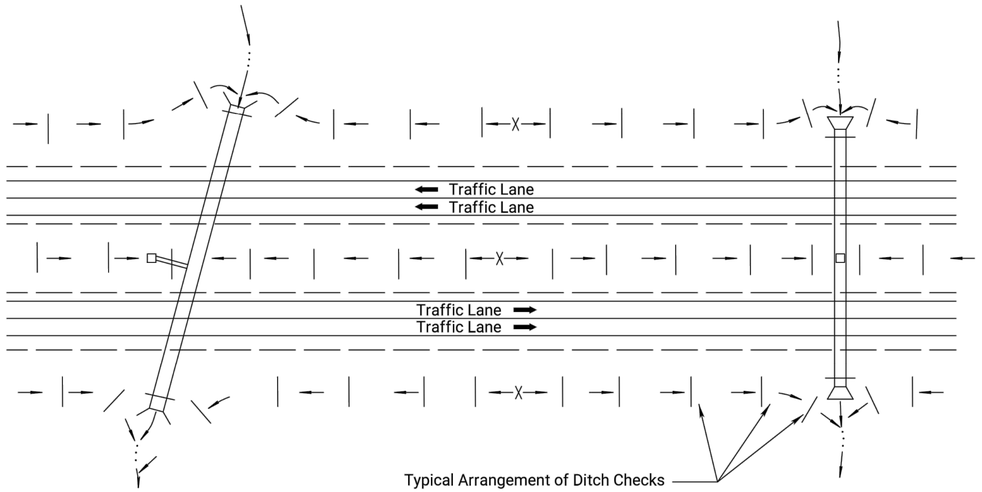
File : la852d.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	25	44



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

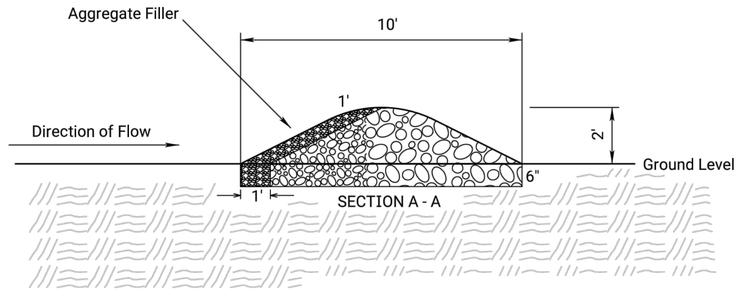
FHWA APPROVAL		09-14-16	APP'D.	Scott H. Shields			
DESIGNED	S.H.S.	DETAILED	R.A.A.	QUANTITIES		TRACED	R.A.A.
DESIGN CK.	S.H.S.	DETAIL CK.	S.H.S.	QUAN.CK.		TRACE CK.	S.H.S.

KDOT Graphics Certified 06-18-2022

KDOT Graphics Certified

Plotted by : KDOT#CADD.Support_ks.gov 1-JUL-2022 00:14
File : la852e.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C–5233–01	2024	26	44



TYPICAL ELEVATION

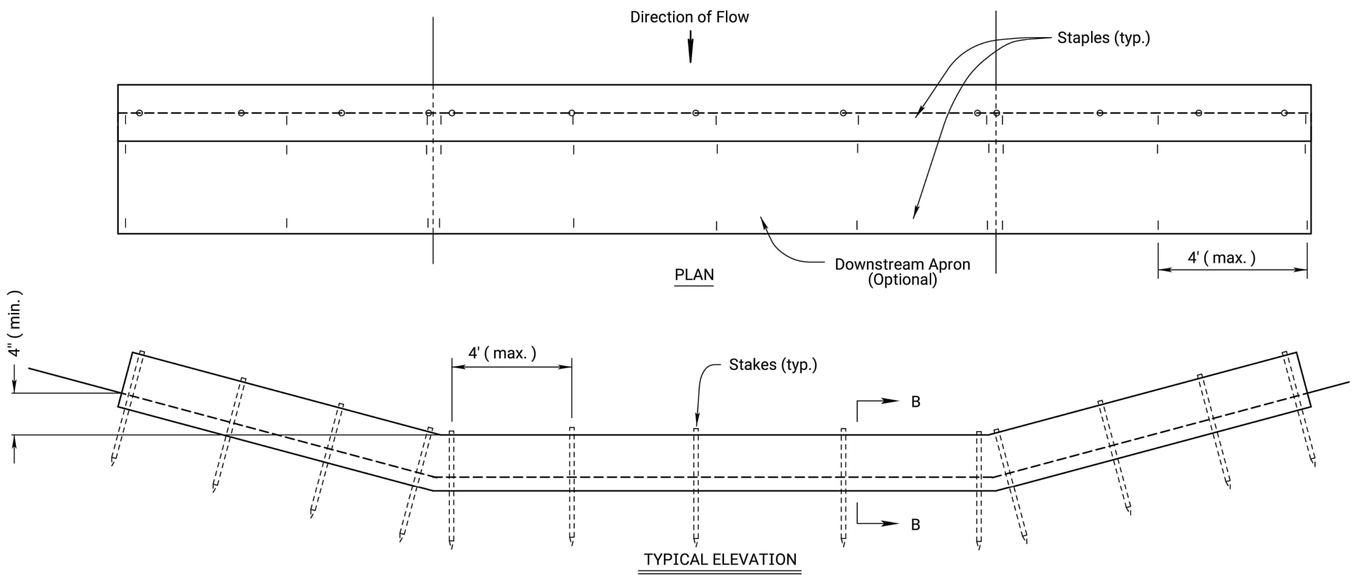
ROCK DITCH CHECK

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.

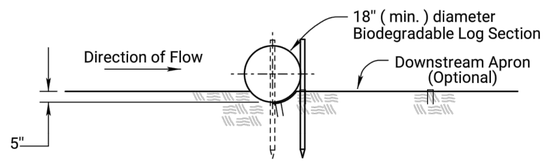


TYPICAL ELEVATION

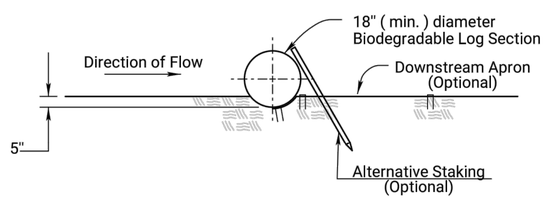
BIODEGRADABLE LOG DITCH CHECK

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.

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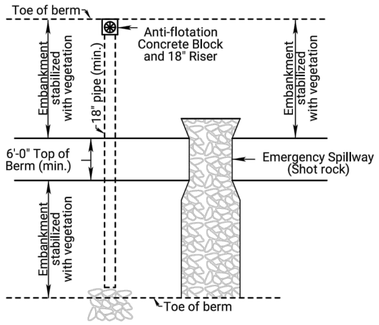
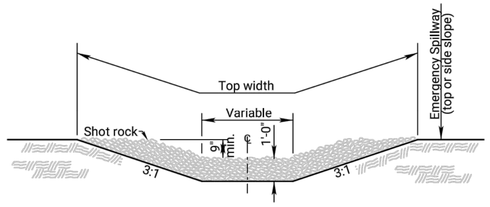
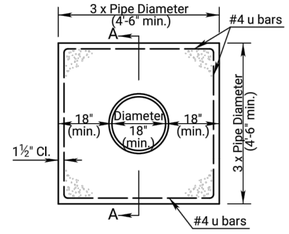
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	27	44



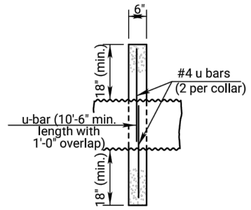
SEDIMENT STORAGE BASIN (PLAN)



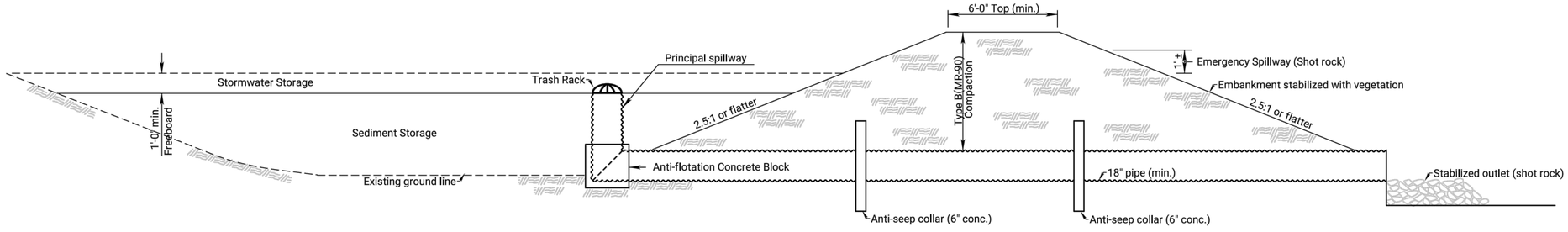
CROSS SECTION (EMERGENCY SPILLWAY)



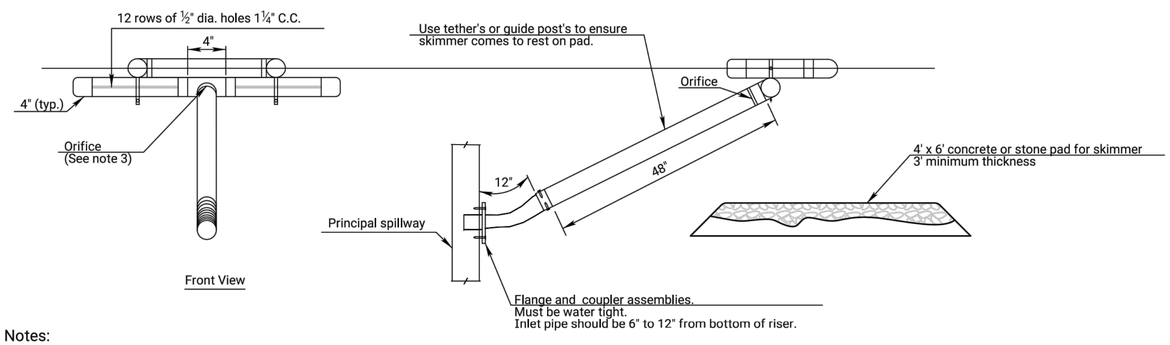
CONCRETE ANTI-SEEP COLLAR



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.

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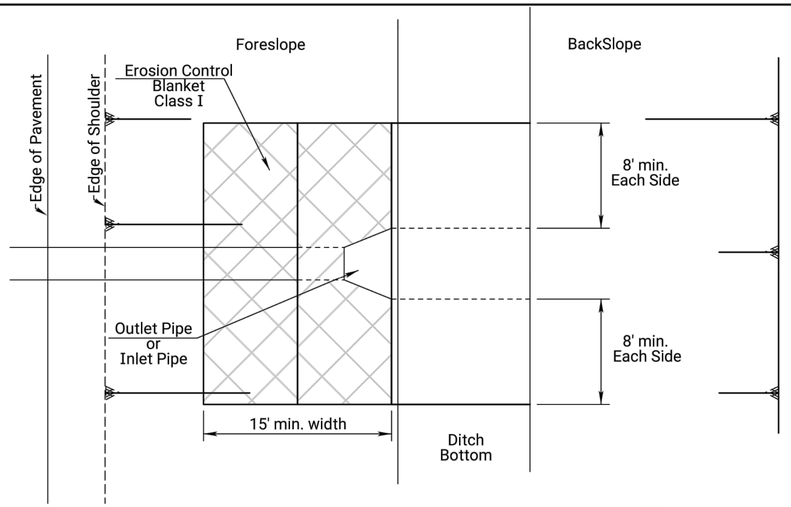
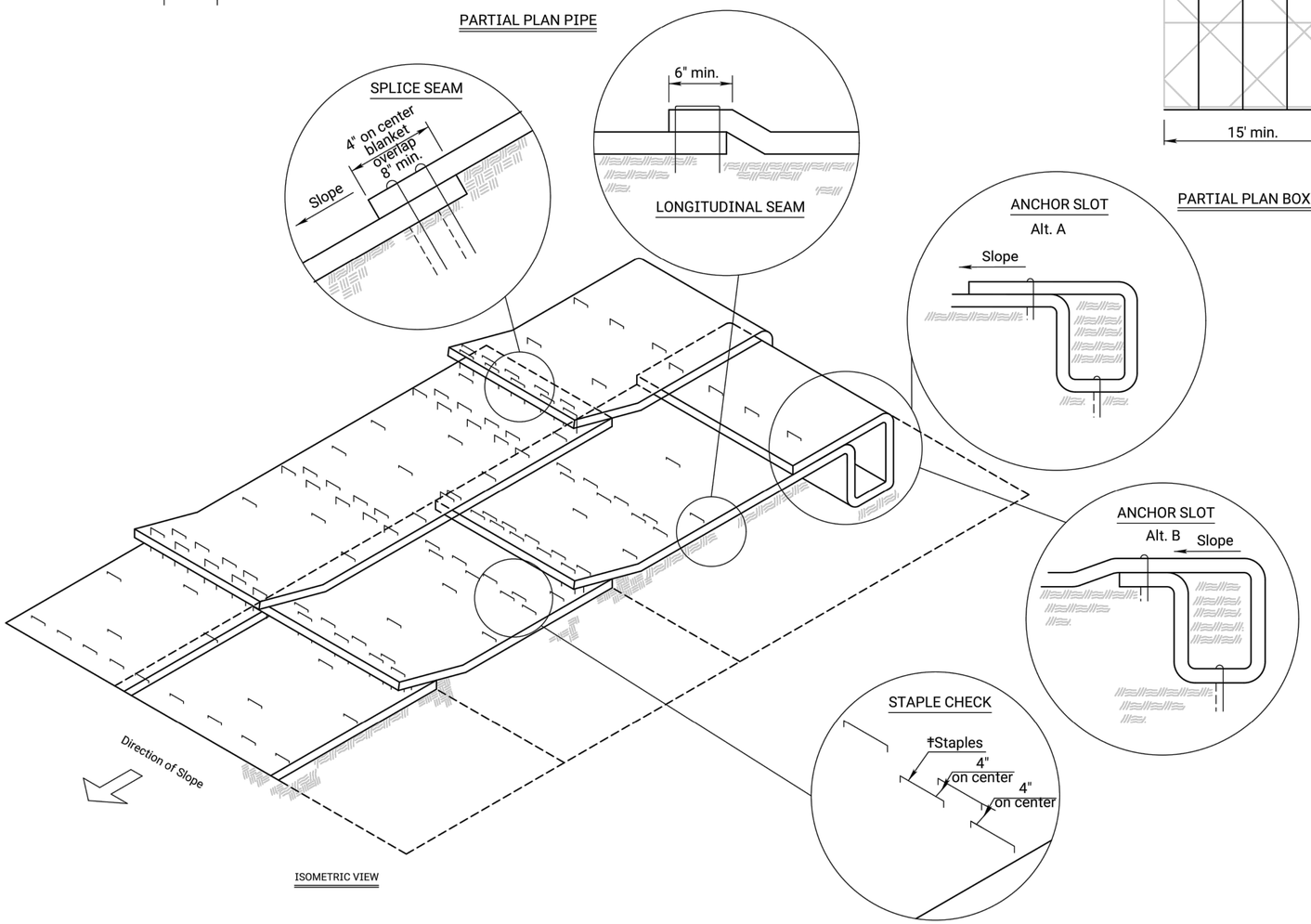
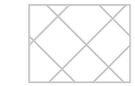
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	28	44



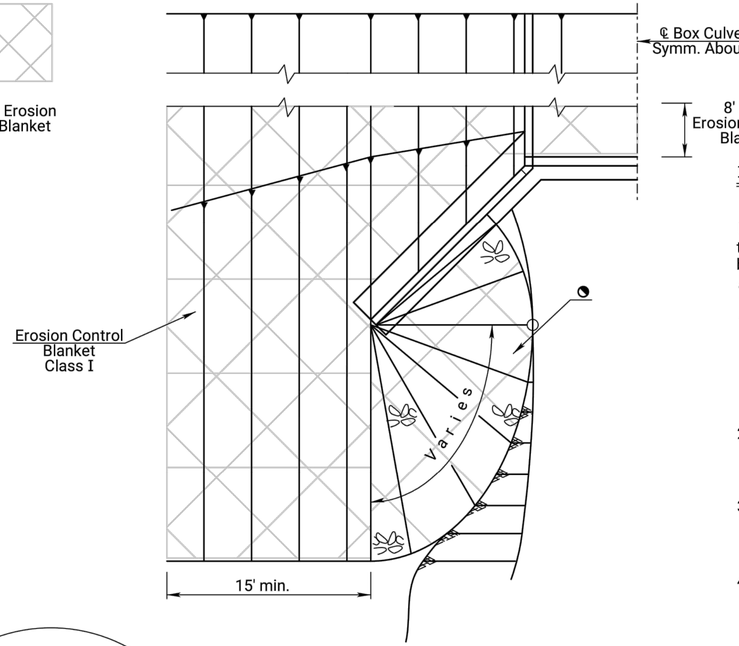
PARTIAL PLAN PIPE



ISOMETRIC VIEW



Limits of Erosion Control Blanket



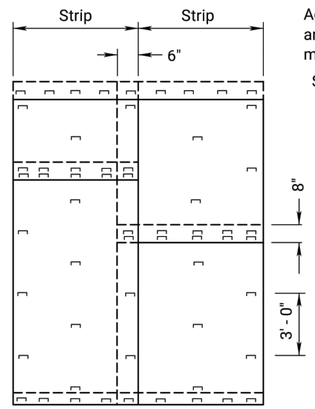
PARTIAL PLAN BOX CULVERT

◔ 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.

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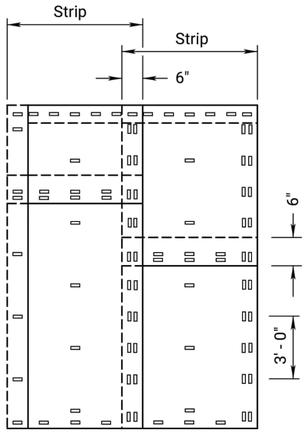
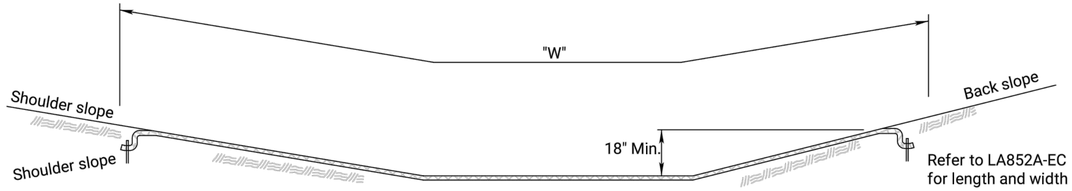
File : la855.dgn

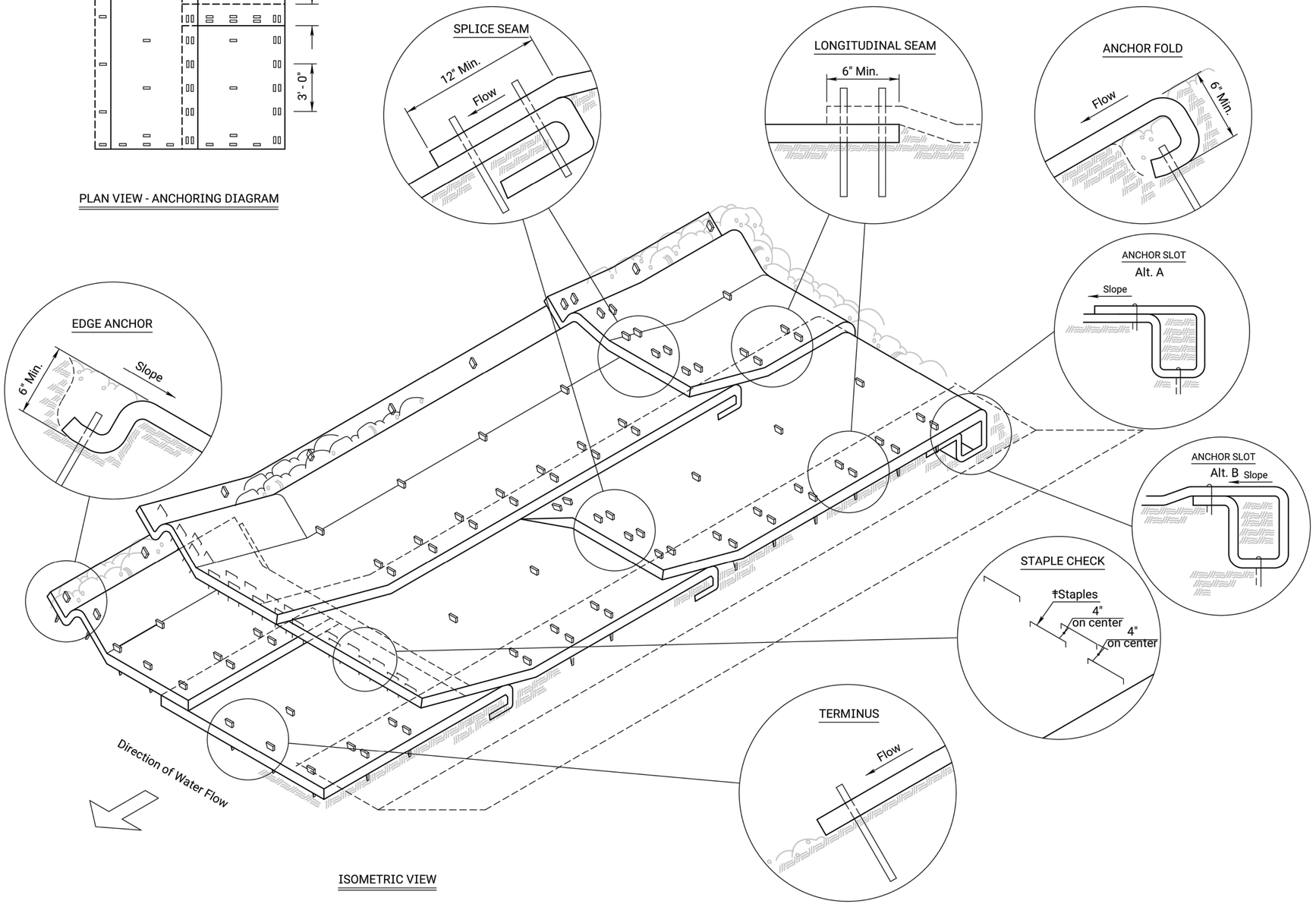
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	29	44



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

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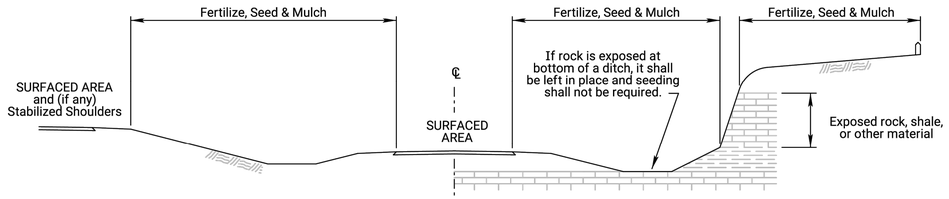
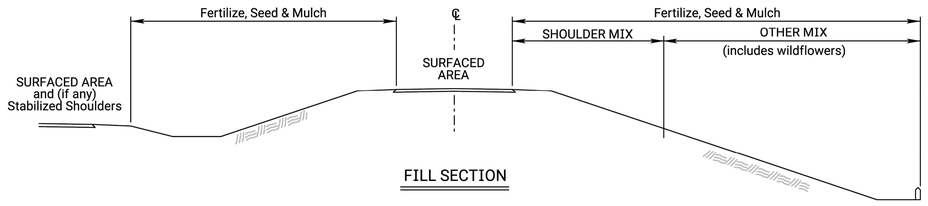
File : la856.dgn

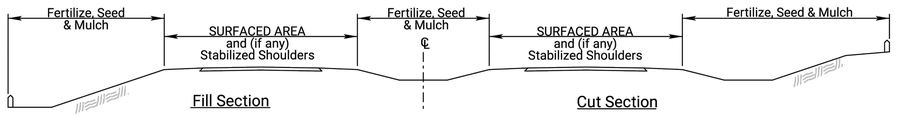
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	30	44



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.

NATIVE WILDFLOWER MIX 1

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

NATIVE WILDFLOWER MIX 2

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

Package and deliver the wildflower seed separately from the grass seed mix. Package and deliver the Tall Drop Seed separately from the grass seed and the wildflower mix. Place the grass seed (except Tall Drop Seed) in the large seed box and drill (cover) seed ⅛" -¼". Place the wildflower seed in a separate seed box and drill (cover) seed 1/16" maximum. Place the Tall Drop Seed in a separate (third) seed box and place the seed (using the seed drill) on the soil surface.

OPTION: Broadcast Tall Drop Seed on the soil surface.

SUMMARY OF SEEDING QUANTITIES

P.L.S. RATE/ACRE SHLDR	P.L.S. RATE/ACRE OTHER	ACRES SHLDR	ACRES OTHER	BID ITEM	QUANTITY	UNIT
50		1.31		Fertilizer (16-20-0)	66	LBS
1		1.31		Seed (Blue Grama Grass Seed)(Lovington)	1.3	LBS
24.5		1.31		Seed (Buffalo Grass Seed)(Treated)	32.1	LBS
6.3		1.31		Seed (Side Oats Grama Grass Seed)(El Reno)	8.3	LBS
10		1.31		Seed (Sterile Wheatgrass)(Regreen/Quick Guard)	13.1	LBS
6		1.31		Seed (Western Wheatgrass Seed)(Barton)	7.9	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

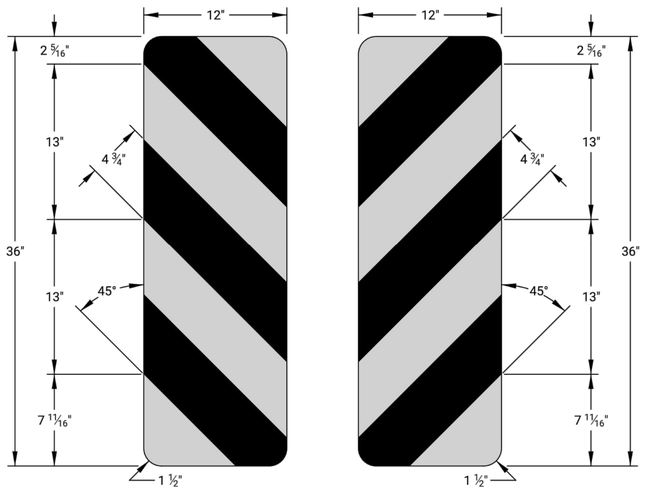
PERMANENT SEEDING
SUMMARY OF SEEDING QUANTITIES

LA850

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

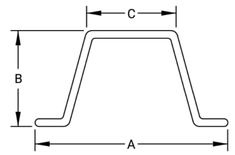
KDOT Graphics Certified 06-17-2022

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	31	44



OM3-L

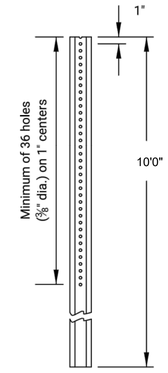
OM3-R



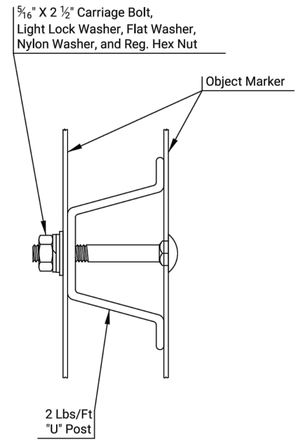
DIMENSIONS	
A	3 1/8
B	1 17/32
C	1 1/4

(Dimensions are nominal)

2 lb/ft "U" POST



PUNCHING DETAILS



MOUNTING DETAILS

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

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

The object markers shall be covered with Type IV or better High Intensity yellow retroreflective sheeting.

TYPE 3 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 TYPE 3 OBJECT MARKERS (BACK TO BACK)

~~TE417~~ 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.	

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File : te417.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	32	44

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
02	10-01-19	Changed notes	D.D.G.	E.W.N.
01	07-23-10	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 07-01-03

FHWA APPROVAL			10-01-19	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 05-24-2022

KDOT Graphics Certified

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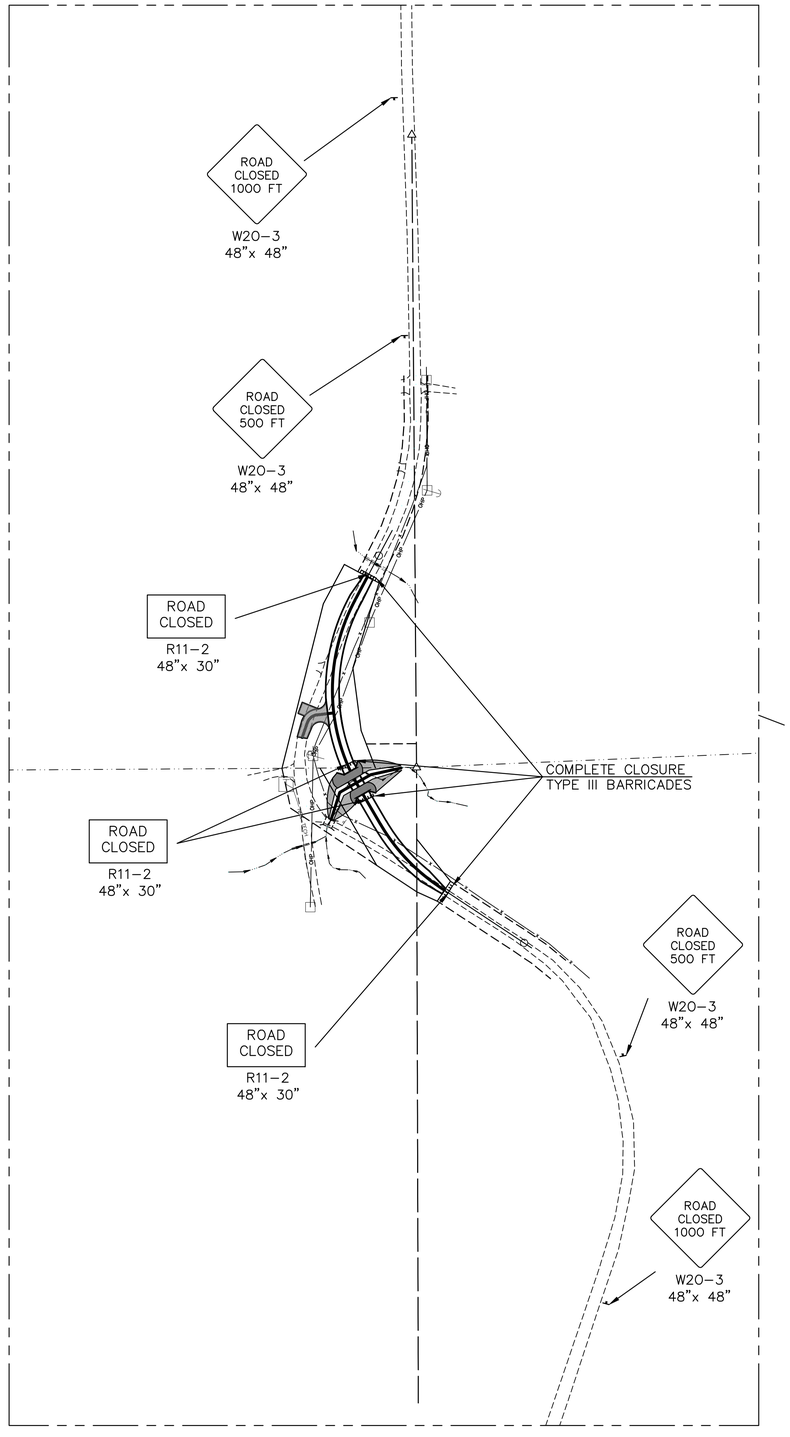
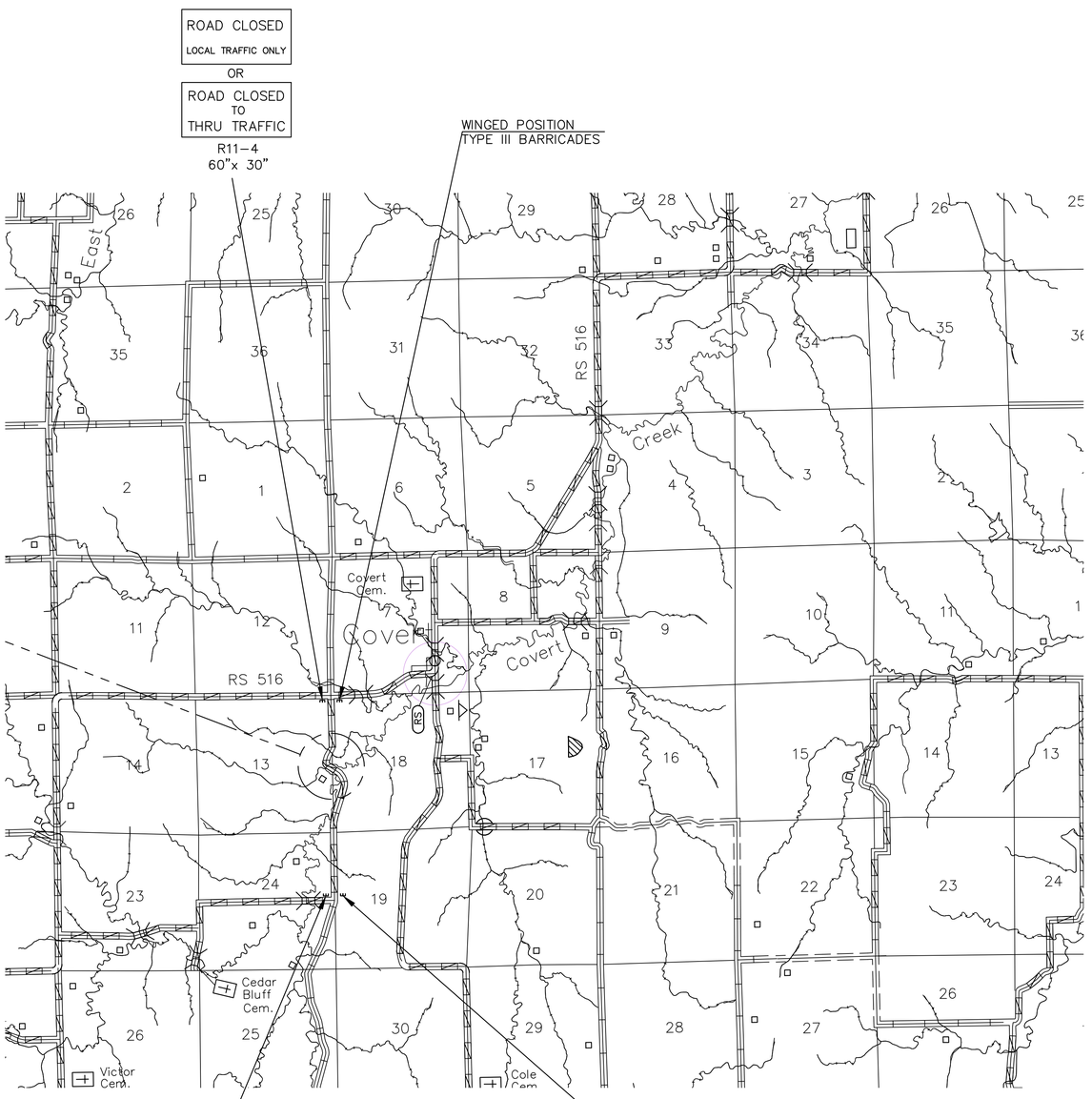
File : te590.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	33	44

NOTE: REFER TO SHEET NO. 34–39 FOR ADDITIONAL INFORMATION AND DETAILS.





No Scale

TRAFFIC CONTROL PLAN

PENCO ENGINEERING, P.A.
PLAINVILLE, KANSAS

DESIGNED BY: JJD	SCALE: As Shown
DRAWN BY: MRH	PROJ. NO.: 71 C-5233-01
CHECKED BY: BRD	DATE: 2024

X:\ac2\kdot\KD5233 - Osborne - 011 #54\ACAD\Traffic Control.dwg\Traffic Control - Layout1 2/16/2024 7:38 AM

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.

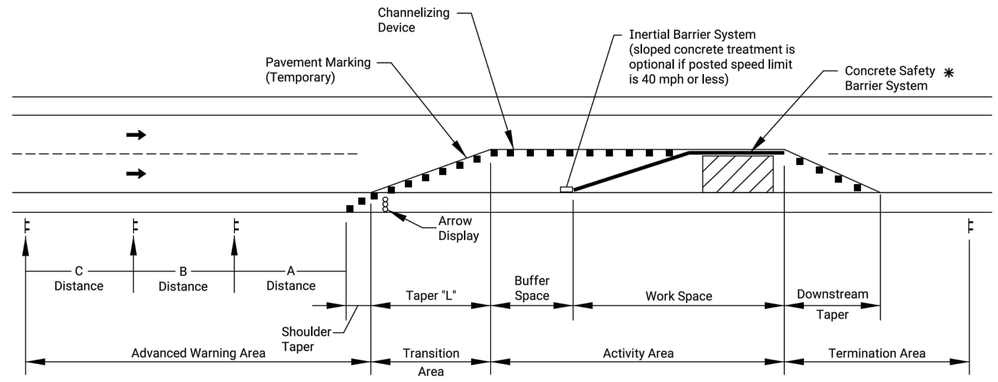
4) When existing pedestrian facilities are disrupted, closed, or relocated, the temporary facilities shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility.

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.

Plotted by : KDOT#CADD.Support_ks.gov 4-JUN-2022 00:01
File : te700.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	34	44



TYPICAL WORK ZONE COMPONENTS

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

Minimum advance warning sign spacing (in feet):

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

✳ Posted speed prior to work starting

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

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

Taper Formulas:

L = WS for speeds of 45 MPH or more

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

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

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

Channelizer Placement:

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

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

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

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

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

Buffer Space

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

✳ Posted speed prior to work starting

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

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

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

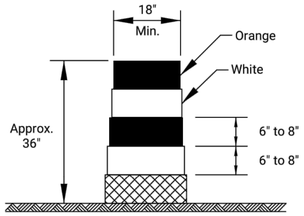
KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL GENERAL NOTES

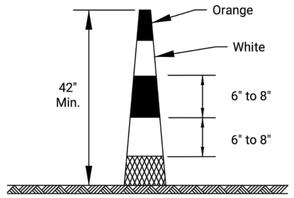
TE700

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

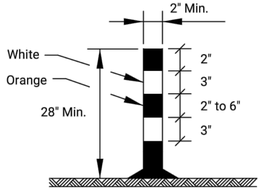
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	35	44



DRUM

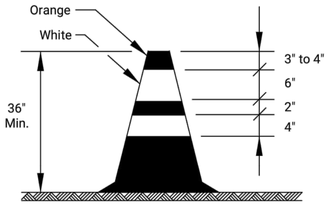


CONICAL DELINEATOR

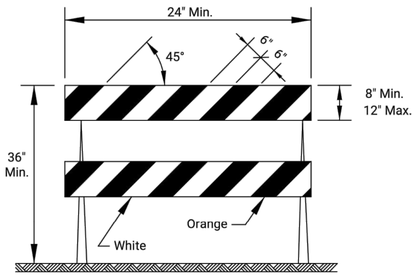


TUBULAR MARKER

Striping as shown for up to 42".

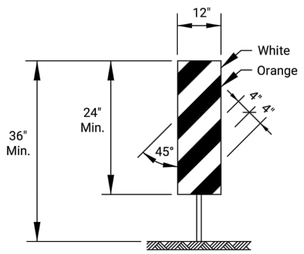


TRAFFIC CONE



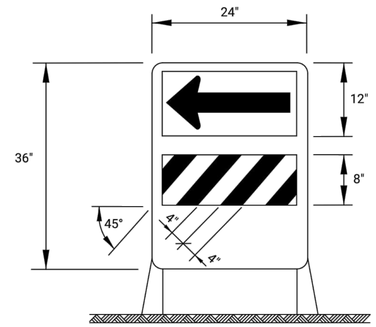
TYPE 2 BARRICADE

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



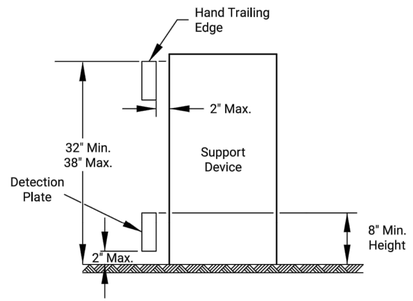
VERTICAL PANEL

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



DIRECTION INDICATOR BARRICADE

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



PEDESTRIAN CHANNELIZER

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

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

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

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL CHANNELIZING DEVICES

TE702

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

KDOT Graphics Certified 05-24-2022

KDOT Graphics Certified

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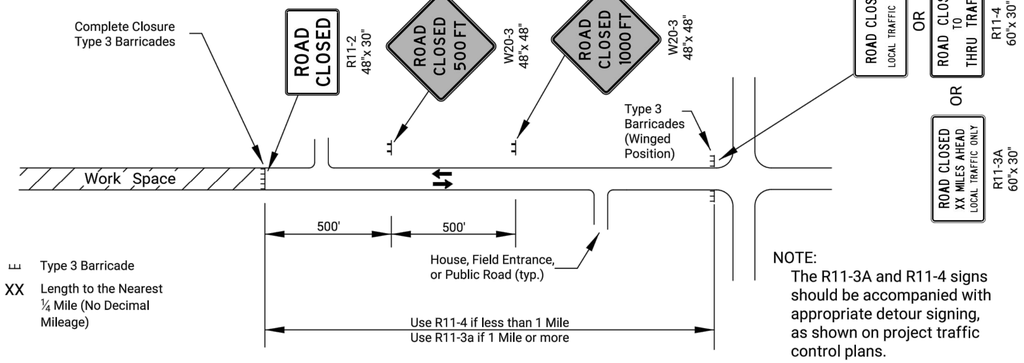
File : te702.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	36	44

Note: Signs shown for one approach to work zone.



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

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

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

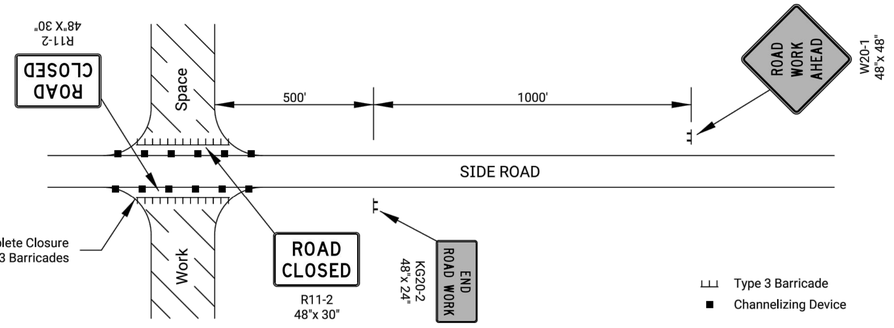


FIGURE 2: TYPICAL SIGNING FOR SIDE ROAD OPEN

Note: Signs shown for one approach to work zone.

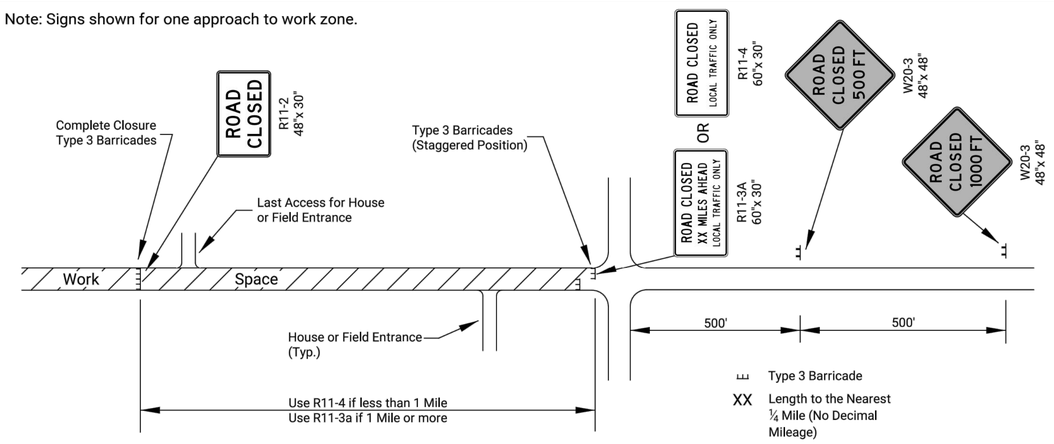


FIGURE 3: TYPICAL SIGNING FOR ROAD CLOSURE - LOCAL TRAFFIC ACCESS

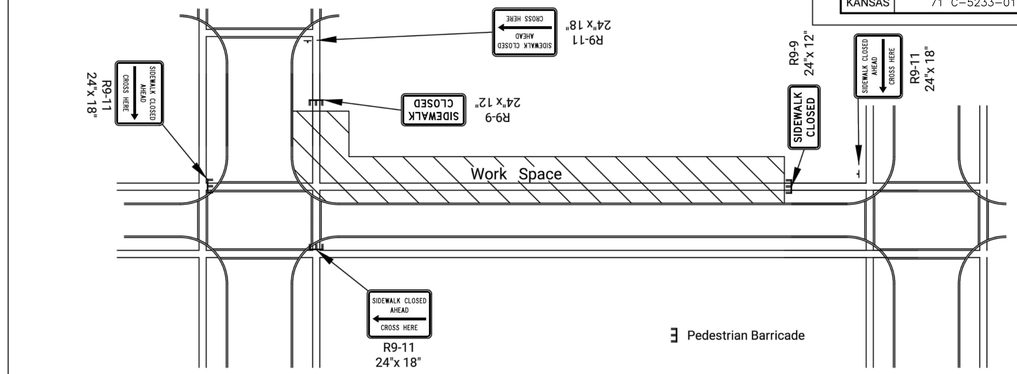
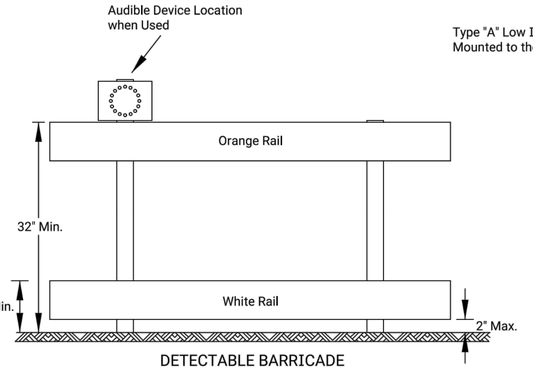
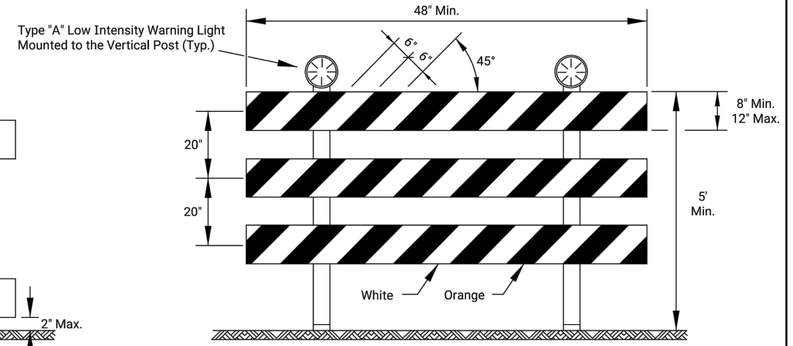


FIGURE 4: TYPICAL SIGNING FOR SIDEWALK CLOSED WITH OPPOSITE SIDEWALK AVAILABLE



DETECTABLE BARRICADE

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



TYPE 3 BARRICADE WITH LIGHTS

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

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

ROAD CLOSED GENERAL NOTES

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

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

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

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

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

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL CLOSURES

TE704

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

KDOT Graphics Certified 05-24-2022

KDOT Graphics Certified

Plotted by : KDOT#CADD.Support_ks.gov 4-JUN-2022 00:02
File : te704.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	37	44

SIGN LAYOUT INFORMATION

KG20-2 — Std. Size Expwy/Freeway: 6" C, 48"x 24"

KG20-5 — Std. Size Expwy/Freeway: 6" C, 48"x 24"

KM4-20 — Std. Size: 3" C, 24"x 6" — Expwy/Freeway: 6" C, 48"x 12"

W7-3a — Mileage to be Determined by the Engineer.

W8-15 — Std. Size Expwy/Freeway: 8" D, 48"x 48"

W8-7 — Std. Size Expwy/Freeway: 8" D, 48"x 48"

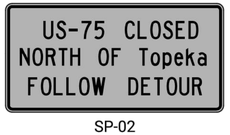
W8-15p — Std. Size Expwy/Freeway: 30"x 24"

W8-17 — Std. Size Expwy/Freeway: 48"x 48"

W8-11 — Std. Size Expwy/Freeway: 8" D, 48"x 48"

W8-17P (Optional) — Std. Size Expwy/Freeway: 30"x 24"

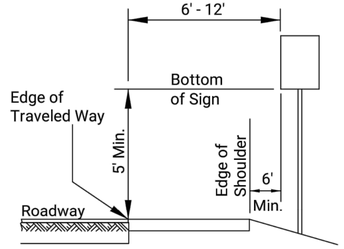
SP-01 (Special Sign) — Std. Size: 6" C — Expwy/Freeway: 10" D



SP-02 (Special Sign)

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

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

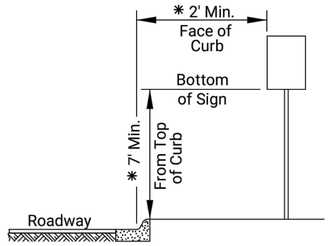


RURAL

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

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

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



URBAN

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

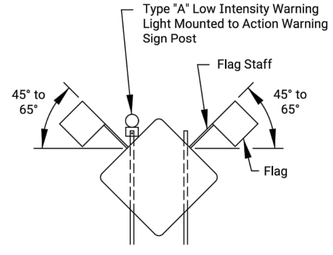
2) Neither portable nor permanent sign supports should be located on sidewalks or areas designated for pedestrian or bicycle traffic.

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

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

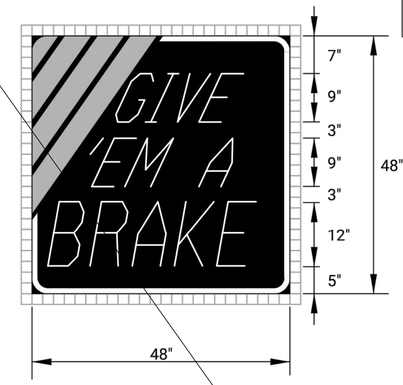
5) Large signs having an area exceeding 50 square feet installed on multiple breakaway posts shall be mounted a minimum of 7' above the ground.

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



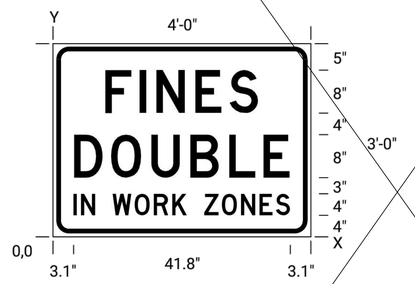
When the sign width is equal to or greater than 9', three or more wood posts may be used with a minimum of 4' between the centerline of each post. All signs less than 9' in width shall use a maximum of two wood posts.

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



KI-104a

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



KI-105a

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

Dimensions in inches — Spacings are to start of next letter

Y FONT	LETTER SPACINGS															HT LEN
23.0 D	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

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL SIGN INFORMATION

~~TE710~~

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

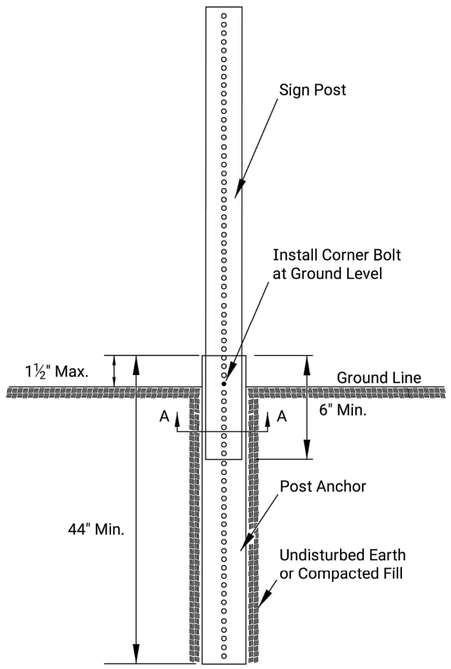
KDOT Graphics Certified 05-24-2022

KDOT Graphics Certified

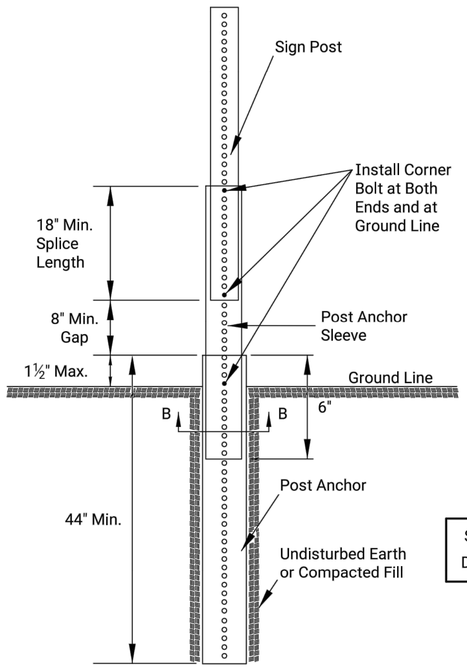
Plotted by : KDOT#CADD.Support_ks.gov 4-JUN-2022 00:04
File : te710.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	38	44

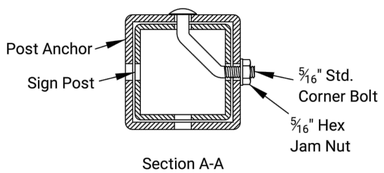
PERFORATED SQUARE STEEL TUBE (P.S.S.T.) POST SETUP



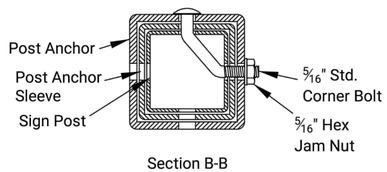
P.S.S.T. Detail



Telescoping P.S.S.T. Detail



Section A-A

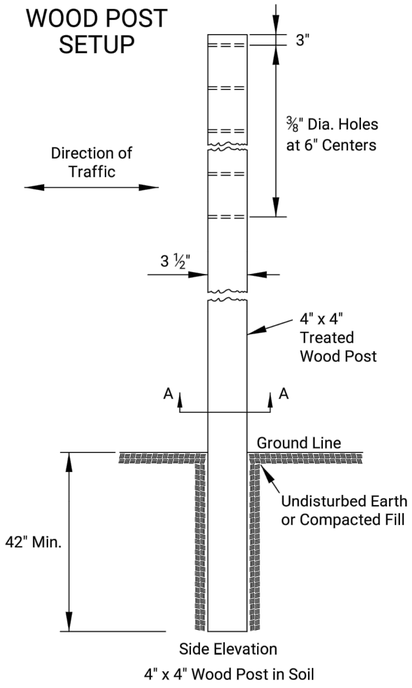


Section B-B

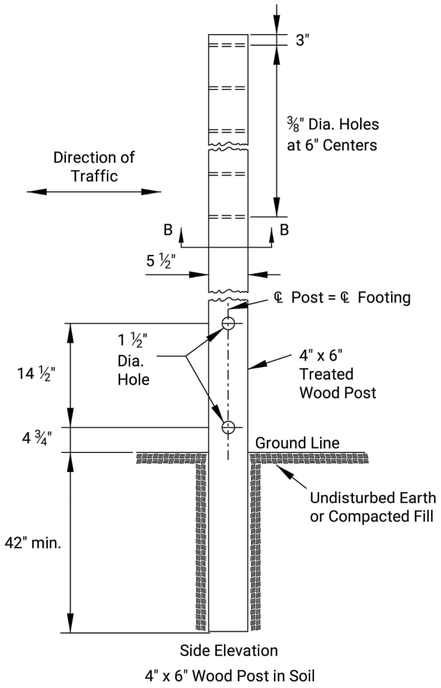
Details for 2", 2 ¼", or 2 ½" sign posts

Place bolts in the same corner along each sign post.

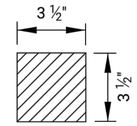
WOOD POST SETUP



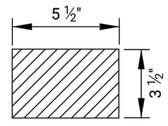
Side Elevation
4" x 4" Wood Post in Soil



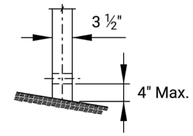
Side Elevation
4" x 6" Wood Post in Soil



Section A-A



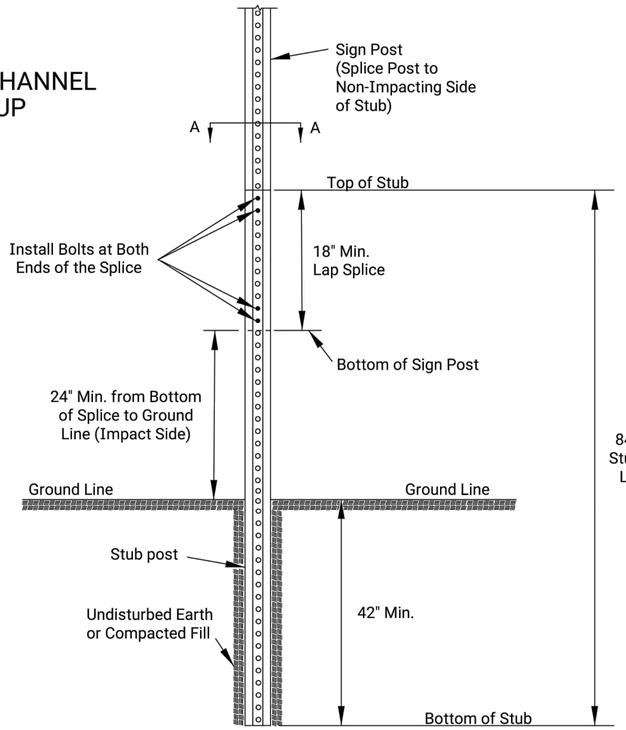
Section B-B



Front Elevation

See TE710 for Additional Details and Requirements

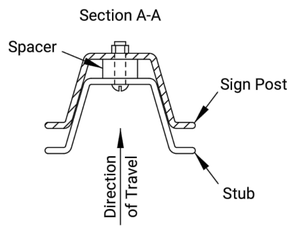
3 LB/F U-CHANNEL SETUP



Notes:

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

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



NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL SIGN POSTS

TE712

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

KDOT Graphics Certified 05-24-2022

KDOT Graphics Certified

Plotted by : KDOT#CADD.Support_ks.gov 4-JUN-2022 00:05
File : te712.dgn

SUMMARY OF TRAFFIC CONTROL DEVICES (EACH)

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

SUMMARY OF TRAFFIC CONTROL DEVICES (EACH PER DAY)

✳ Quantity most used on the project at any one time

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

Barricades ✳	
Type 3 (4' to 12')	Pedestrian
16	

Channelizing Devices ✳		
Fixed	Portable	Pedestrian

Lighted Devices ✳	
Work Zone Warning Light (Type "A" Low Intensity)	20
Work Zone Warning Light (Red Type "B" High Intensity)	
Arrow Display	
Portable Changeable Message Sign	

Recapitulation of Quantities		
Item	Quantity	Unit
Work Zone Signs (0 to 9.25 Sq.Ft.)		Each Per Day
Work Zone Signs (9.26 to 16.25 Sq.Ft.)		Each Per Day
Work Zone Signs (16.26 Sq.Ft. & Over)		Each Per Day
Work Zone Barricades (Type 3 - 4' to 12')		Each Per Day
Work Zone Barricades (Pedestrian)		Each Per Day
Channelizer (Fixed)		Each Per Day
Channelizer (Portable)		Each Per Day
Channelizer (Pedestrian)		Each Per Day
Work Zone Warning Light (Type "A" Low Intensity)		Each Per Day
Work Zone Warning Light (Red Type "B" High Intensity)		Each Per Day
Arrow Display		Each Per Day
Portable Changeable Message Sign		Each Per Day
Pavement Marking (Temporary)		
4" Solid (Type I)		Sta./Line
4" Solid (Type II)		Sta./Line
4" Broken (8.0') (Type I)		Sta./Line
4" Broken (8.0') (Type II)		Sta./Line
4" Broken (3.0') (Type I)		Sta./Line
4" Broken (3.0') (Type II)		Sta./Line
4" Dotted Extension (Type I)		Sta./Line
4" Dotted Extension (Type II)		Sta./Line
Solid (Line Masking Tape)		Sta./Line
Broken (Line Masking Tape)		Sta./Line
Symbol (Type I)		Each
Symbol (Type II)		Each
Flexible Raised Pavement Marker (4" Broken (8.0'))		Sta./Line
Flexible Raised Pavement Marker (4" Broken (3.0'))		Sta./Line
Pavement Marking Removal		Lin. Ft.
Work Zone Sign (Special) (16.25 Sq. Ft. & Less)		Each
Work Zone Sign (Special) (16.26 Sq. Ft. & More)		Each
Rigid Raised Pavement Marker (Type I)		Each
Rigid Raised Pavement Marker (Type II)		Each
Traffic Signal Installation (Temporary)		Lump Sum
Traffic Control (Initial Set Up)		Lump Sum
Traffic Control	Lump Sum	Lump Sum
Flagger (Set Price)	1	Hour

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL SUMMARY OF DEVICES RECAPITULATION OF QUANTITIES

TE795

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

KDOT Graphics Certified 05-24-2022

KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	40	44

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STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	41	44

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STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	42	44

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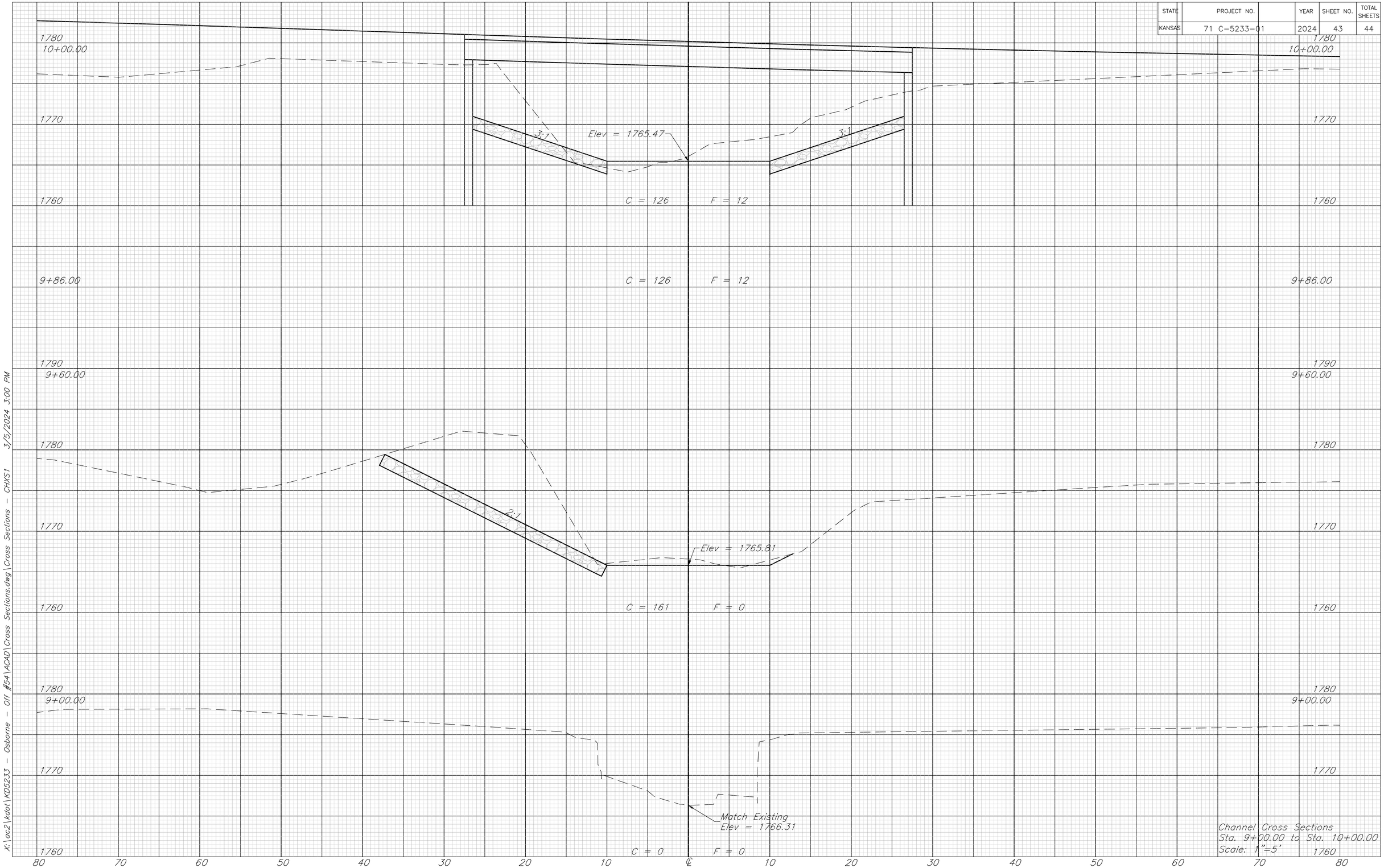
KANSAS	71 C-5233-01		2024	43	44



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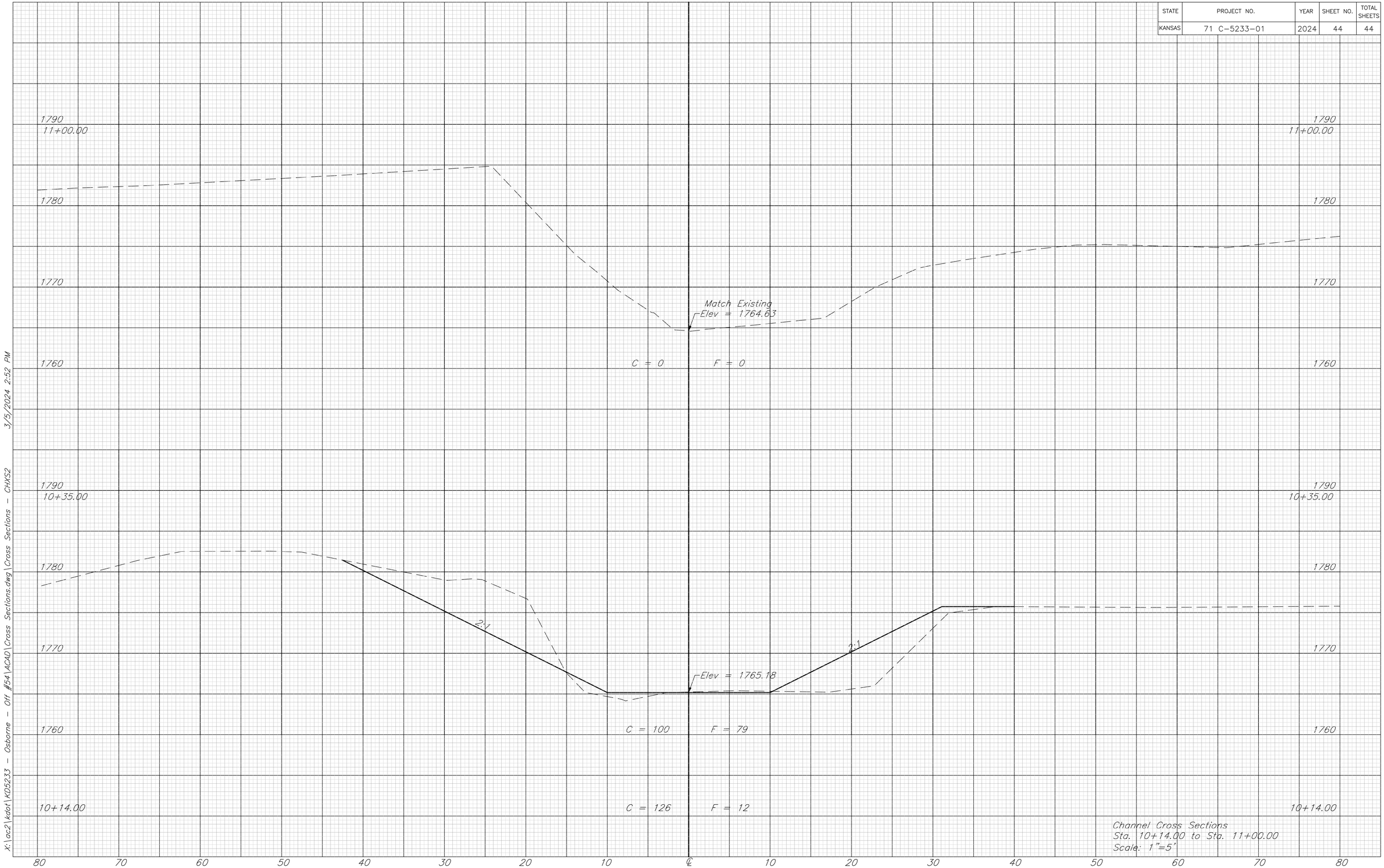
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	71 C-5233-01	2024	44	44



Channel Cross Sections
Sta. 10+14.00 to Sta. 11+00.00
Scale: 1"=5'

3/5/2024 2:52 PM
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