STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	1	253

STATE OF KANSAS

DEPARTMENT OF TRANSPORTATION

PROJ. NO. 70–89 KA–6808–01
FEDERAL PROJ. NO. ACBRF–A680(801)

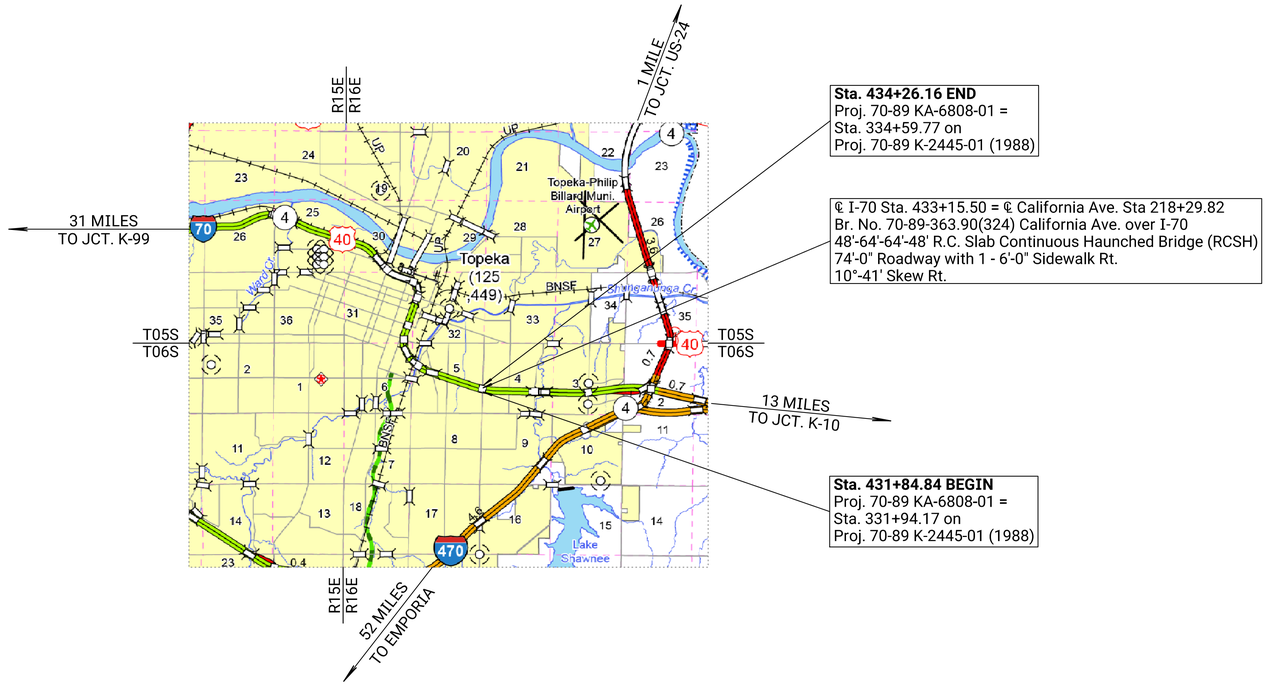
PLAN AND PROFILE OF PROPOSED STATE HIGHWAY

FEDERAL AID PROJECT
SHAWNEE COUNTY
I–70

GRADING & SURFACING (CONCRETE)
BRIDGE
LIGHTING
SEEDING
SIGNING & PAVEMENT MARKING

INDEX OF SHEETS

1	TITLE SHEET
2	SIGNATURE SEAL SHEET
3 – 5	TYPICAL SECTIONS
6	FOUNDATION TREATMENT & COMPACTION OF EARTHWORK
7	SALVAGED TOPSOIL
8	GENERAL NOTES
9–10	PLAN AND PROFILE (I-70)
11–12	PLAN AND PROFILE (CALIFORNIA AVE.)
13–14	INTERSECTION DETAILS
15	PAVING DETAILS
16–25	PAVEMENT DETAILS
26–28	INLETS AND MANHOLE DETAILS
29–30	STORM SEWER DETAILS
31	SCHEDULE OF INLETS AND MANHOLES
32	PIPE INSTALLATION DETAILS
33–40	GUARDRAIL SHEETS
41–46	CONCRETE SAFETY BARRIER
47–48	END SECTIONS
49	MISCELLANEOUS PIPE CULVERT DETAILS
50	DRAINAGE DATA SHEET
51	SUMMARY OF PIPE CULVERT
52– 71	BRIDGE NO. 70-89-363.90 (324)
72	BRIDGE EXCAVATION
73	STANDARD PILE DETAILS
74	SUPPORTS AND SPACERS FOR REINFORCING STEEL
75	BRIDGE BERM AND SLOPE PROTECTION
76	SUMMARY OF QUANTITIES
77	PROJECT SURFACING
78–86	TEMPORARY EROSION AND POLLUTION CONTROL
87–89	SEEDING
90–125	ITS
126–133	LIGHTING
134–146	PAVEMENT MARKING
147–169	SIGNING
170–178	OVERHEAD SIGN STRUCTURE PLANS AND DETAILS
179–214	CONSTRUCTION SEQUENCE
215–236	TRAFFIC CONTROL
237– 241	CONCRETE SAFETY BARRIER (TEMPORARY)
242	INERTIAL BARRIER
243–246	CROSS SECTIONS (I-70)
247–253	CROSS SECTIONS (CALIFORNIA AVE.)



Sta. 434+26.16 END
Proj. 70-89 KA-6808-01 =
Sta. 334+59.77 on
Proj. 70-89 K-2445-01 (1988)

℄ I-70 Sta. 433+15.50 = ℄ California Ave. Sta 218+29.82
Br. No. 70-89-363.90(324) California Ave. over I-70
48'-64'-64'-48' R.C. Slab Continuous Haunched Bridge (RCSH)
74'-0" Roadway with 1 - 6'-0" Sidewalk Rt.
10°-41' Skew Rt.

Sta. 431+84.84 BEGIN
Proj. 70-89 KA-6808-01 =
Sta. 331+94.17 on
Proj. 70-89 K-2445-01 (1988)

N

1" = 1 Mile

I-70 DESIGN DESIGNATION

AADT(2027)	46,200
AADT(2047)	63,000
DHV	10%
D	60%
T	11%
V	65 mph
C of A	Full
Clear Zone	32 Ft.

SE CALIFORNIA AVE. DESIGN DESIGNATION

AADT(2027)	11,600
AADT(2047)	14,500
DHV	11%
D	60%
T	4%
V	35 mph
C of A	None
Clear Zone	16 Ft.

CONVENTIONAL SIGNS

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

GROSS LENGTH OF PROJECT	241.32	FT. (Includes Equations)	
EXCEPTIONS	NONE		
NET LENGTH OF PROJECT	241.32	FT.	0.046 MILES
NET LENGTH OF BRIDGES	0	FT.	0.000 MILES
NET LENGTH OF ROAD	241.32	FT.	0.046 MILES

NOTE:
I-70 Traffic to be carried on ramps around construction.
City Traffic to be carried by detour around construction. See Sh. No. 215 for detour details

Approved: Dec 17, 2025
Date

State Transportation Engineer

By:

Chief, Bureau of Road Design

KANSAS DEPARTMENT OF TRANSPORTATION

	DATE	BY
		J. Lilak (B&W)
	2024	R. Kraus (B&W)
	2025	P. Dettering (B&W) / B. Sheehy (B&W) / E. Salas (B&W) / T. Bradshaw (B&W)
	2025	G. Gonzales (Road) / K. Peterson (Bridge)
	2025	

SURVEY
CADD TECHNICIAN
DESIGNERS
SQUAD

Plotted by : BGS01485 16-DEC-2025 11:45
File : ka680801-tit-02.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	2	253

BRIAN HAROLD ARMSTRONG LICENSED #14683 12/16/2025 KANSAS PROFESSIONAL ENGINEER Name: Brian H. Armstrong Co. Name: Bartlett & West Plan Section: 1-51, 76-89, 134-169, 179-253	DAVID ANDREW STRAATMANN LICENSED 25170 12/17/2025 KANSAS PROFESSIONAL ENGINEER THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY. Name: David Straatmann Co. Name: Bartlett & West Plan Section: 52-75	SHIVRAJ S. PATIL LICENSED 27012 12-16-2025 KANSAS PROFESSIONAL ENGINEER Name: Shivraj S. Patil Co. Name: GFT Plan Section: 90-125	JENNIFER L. McVEY LICENSED 20057 12/16/25 KANSAS PROFESSIONAL ENGINEER Name: Jennifer McVey Co. Name: Bartlett & West Plan Section: 126-133	KAREN M.S. PETERSON LICENSED 17957 KANSAS PROFESSIONAL ENGINEER Dec 16, 2025 Name: Karen M.S. Peterson Co. Name: KDOT Plan Section: 170-178			

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

KANSAS DEPARTMENT OF TRANSPORTATION

Signature Seal Sheet

RD048

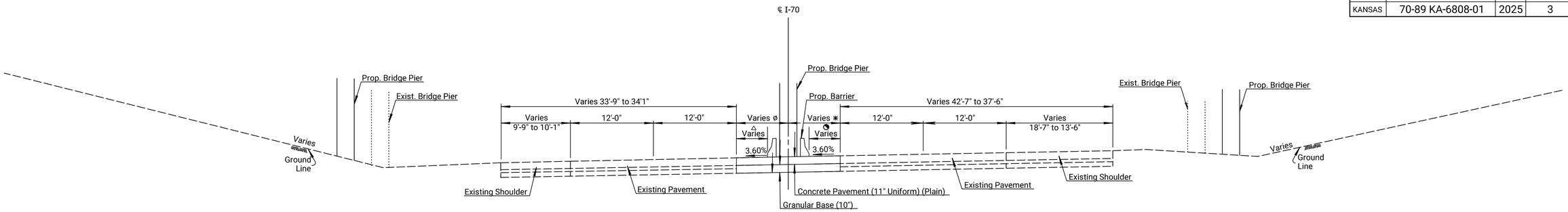
FHWA APPROVAL		APP'D.	Scott W. King
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 07-28-2025 Sh. No. 2

KDOT Graphics Certified

Plotted by : BGS01485 17-DEC-2025 12:12
File : 0102_ka680801rss048-01.dgn

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	3	253

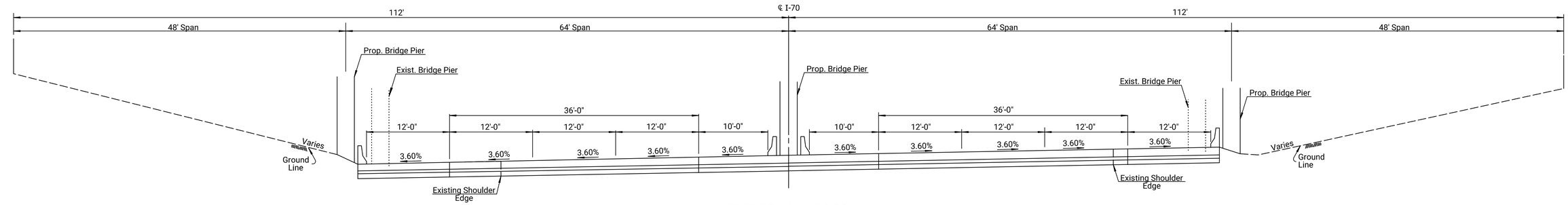


4-LANE I-70 SECTION

STA. 431+84.84 to 434+26.16

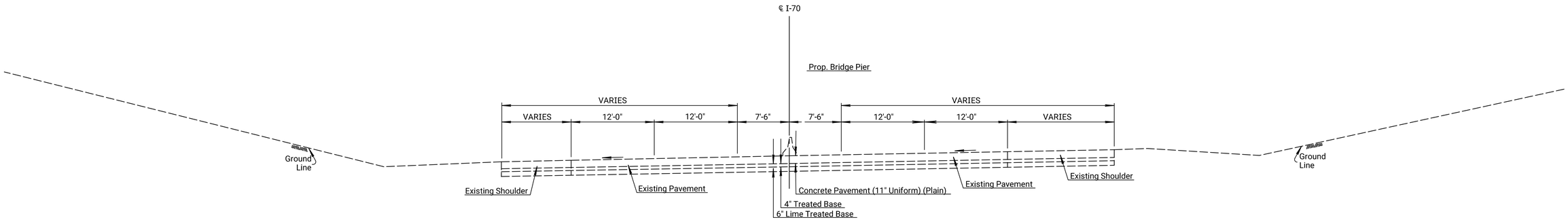
Note:
✳ Varies 6'-6" to 6'-9"
ø Varies 7'-3" to 6'-11"
◔ Varies 5'-8" to 3'-6"
△ Varies 6'-2" to 4'-1"

See plan and cross sections for variations.



FUTURE 6-LANE I-70 TYPICAL SECTION

(This typical section represents a potential future improvement and is shown for information only)



EXISTING 4-LANE I-70 TYPICAL SECTION

STA. 431+84.84 to 434+26.16

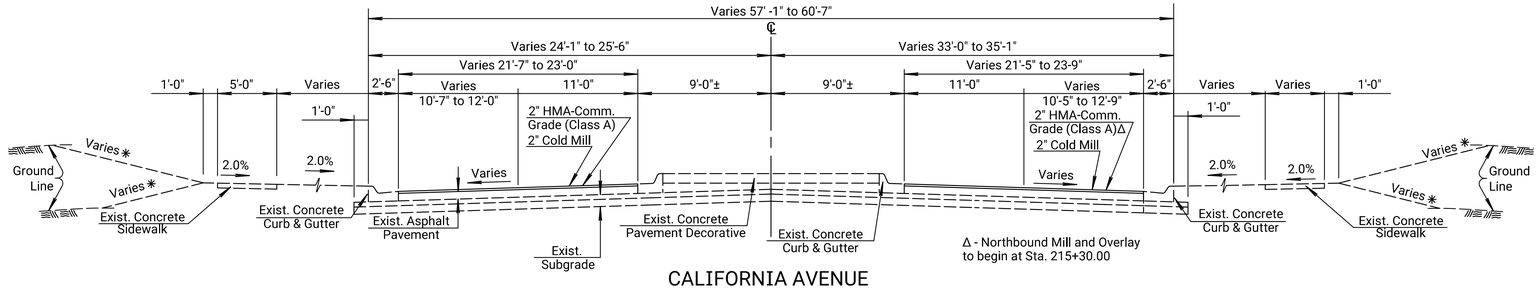
KANSAS DEPARTMENT OF TRANSPORTATION

I-70

TYPICAL SECTIONS

Plotted by : BGS01485 16-DEC-2025 11:47
File : ka680801rts-100.dgn

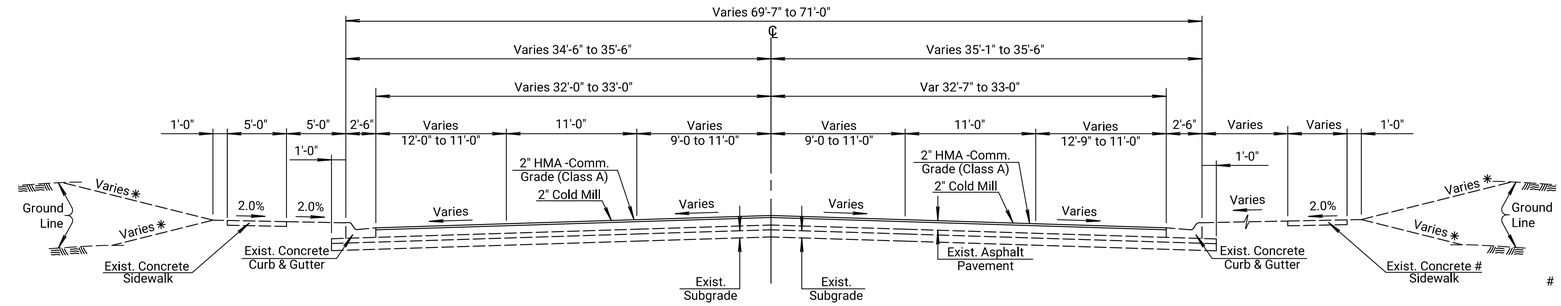
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	4	253



Δ - Northbound Mill and Overlay to begin at Sta. 215+30.00

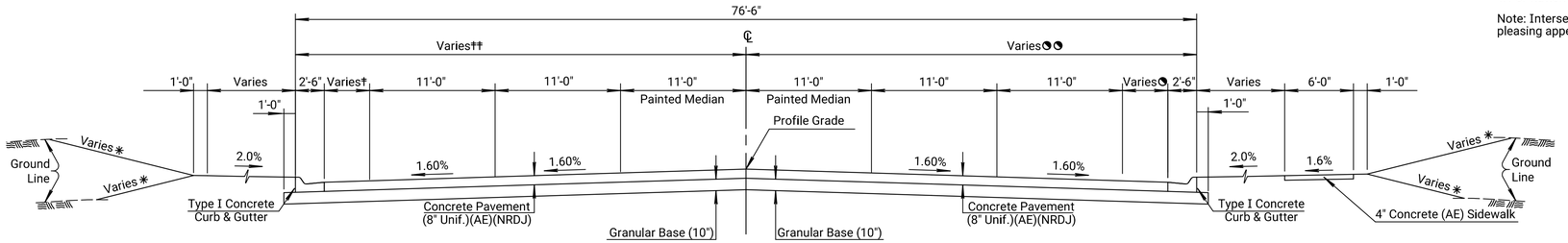
CALIFORNIA AVENUE
2" MILL AND OVERLAY
OVER EXISTING 5-LANE SECTION
WITH CENTER MEDIAN

STA. 215+00.00 TO 215+60.50



CALIFORNIA AVENUE
2" MILL AND OVERLAY
OVER EXISTING 5-LANE SECTION
WITH CENTER TURN LANE

STA. 215+60.50 TO 216+30.28



5-LANE SECTION WITH TURN LANE AND PAINTED MEDIAN

STA. 216+30.28 TO 216+76.48

STA. 219+83.91 TO 220+30.00

\# Reconstruct Sidewalk with 6' wide and 4" thick Concrete (AE) Sidewalk from Sta. 216+16.49 to Sta. 216+30.28 Rt.

◔ Varies from 0'-0" @ Sta. 216+30.28 to 0'-9" @ Sta. 216+76.48
Varies from 0'-9" @ Sta. 219+83.91 to 0'-0" @ Sta. 220+30.00

◔◔ Varies from 35'-6" @ Sta. 216+30.28 to 36'-3" @ Sta. 216+76.48
Varies from 36'-3" @ Sta. 219+83.91 to 35'-6" @ Sta. 220+30.00

† Varies from 0'-0" @ Sta. 216+30.28 to 4'-9" @ Sta. 216+76.48
Varies from 4'-9" @ Sta. 219+83.91 to 0'-0" @ Sta. 220+30.00

†† Varies from 35'-6" @ Sta. 216+30.28 to 40'-3" @ Sta. 216+76.48
Varies from 40'-3" @ Sta. 219+83.91 to 35'-6" @ Sta. 220+30.00

øTBD To Be Determined

✳ Dimensions and slopes for standard ditches and fills. Slopes are typically 4:1 or flatter. See plan and cross sections for variations.

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

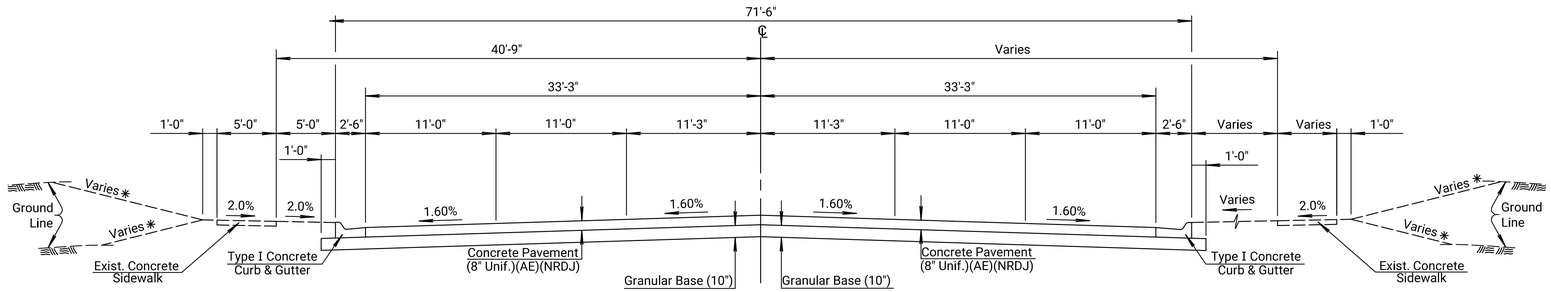
KANSAS DEPARTMENT OF TRANSPORTATION

SE CALIFORNIA AVE.

TYPICAL SECTIONS

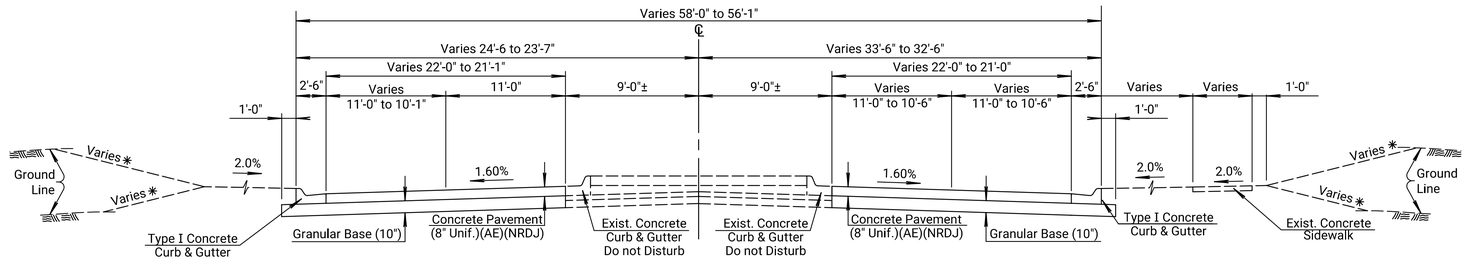
Plotted by : BGS01485 16-DEC-2025 11:48
File : ka680801rts-101.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	5	253



5-LANE SECTION WITH CENTER TURN LANE

STA. 220+30.00 TO 220+91.13



4-LANE SECTION WITH CENTER MEDIAN

STA. 220+91.13 TO 221+50.00 △

△ Reconstruct Median from Sta. 220+91.13 to 221+00.90 See Detail

◔ Varies from 0'-0" @ Sta. 216+30.28 to 0'-9" @ Sta. 216+76.48
Varies from 0'-9" @ Sta. 219+83.91 to 0'-0" @ Sta. 220+30.00

◔◔ Varies from 35'-6" @ Sta. 216+30.28 to 36'-3" @ Sta. 216+76.48
Varies from 36'-3" @ Sta. 219+83.91 to 35'-6" @ Sta. 220+30.00

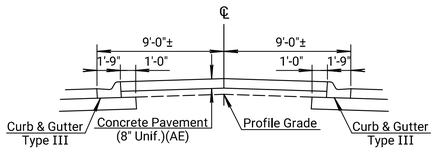
† Varies from 0'-0" @ Sta. 216+30.28 to 4'-9" @ Sta. 216+76.48
Varies from 4'-9" @ Sta. 219+83.91 to 0'-0" @ Sta. 220+30.00

†† Varies from 35'-6" @ Sta. 216+30.28 to 40'-3" @ Sta. 216+76.48
Varies from 40'-3" @ Sta. 219+83.91 to 35'-6" @ Sta. 220+30.00

øTBD To Be Determined

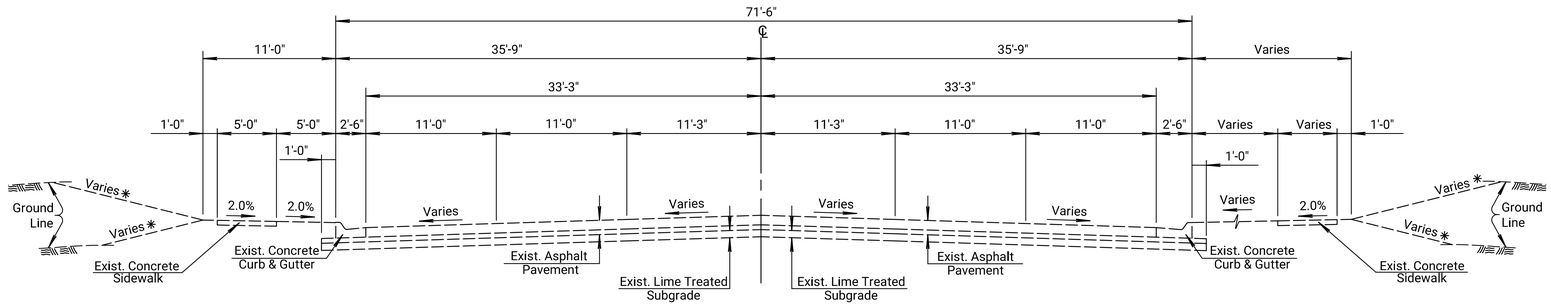
✳ Dimensions and slopes for standard ditches and fills. Slopes are typically 4:1 or flatter. See plan and cross sections for variations.

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



CENTER MEDIAN DETAIL △

STA. 220+91.13 TO 221+00.90



CALIFORNIA AVENUE EXISTING 5-LANE SECTION WITH CENTER TURN LANE FOR INFORMATION ONLY

STA. 216+30.28 TO 216+53.26
STA. 220+28.32 TO 220+31.71

KANSAS DEPARTMENT OF TRANSPORTATION

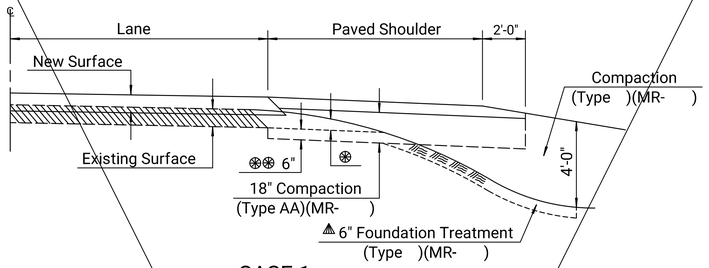
SE CALIFORNIA AVE.

TYPICAL SECTIONS

Plotted by : BGS01485 16-DEC-2025 11:48
File : ka680801rts-102.dgn

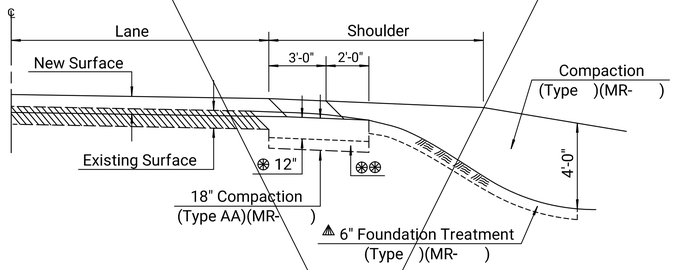
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	6	253

REHABILITATION



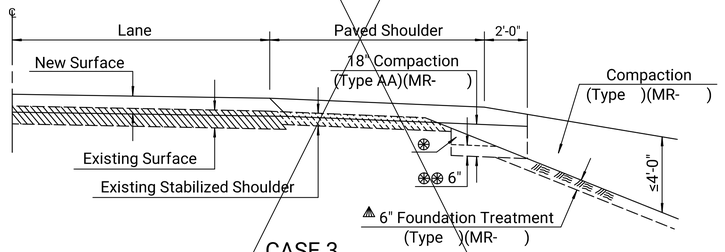
CASE 1

Overlay with Paved Shoulder



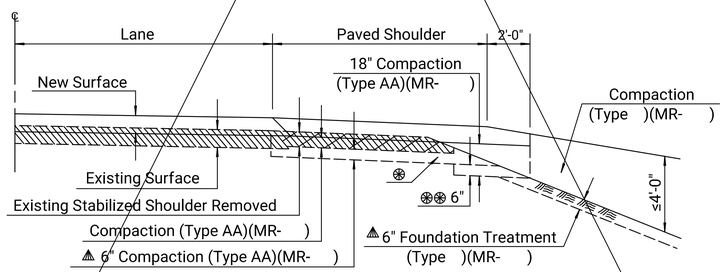
CASE 2

Overlay with Composite Shoulder



CASE 3

Overlay with Existing Paved Shoulder



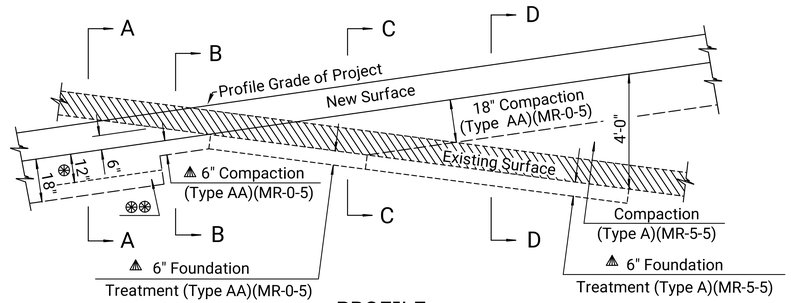
CASE 4

Overlay with Shoulder Replacement

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

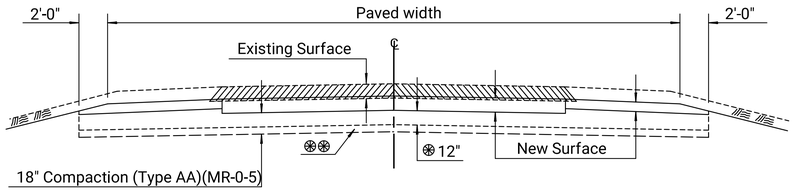
Note: These are 4 general cases. Specific compaction requirements are determined on a project-by-project basis.

RECONSTRUCTION



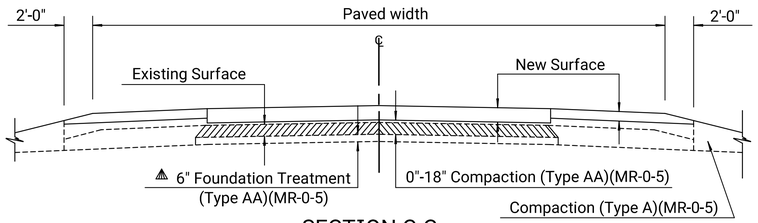
PROFILE

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

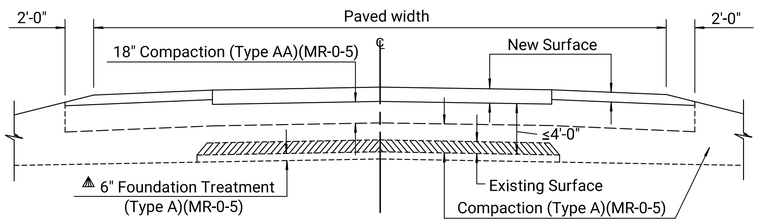


SECTION A-A

SECTION B-B

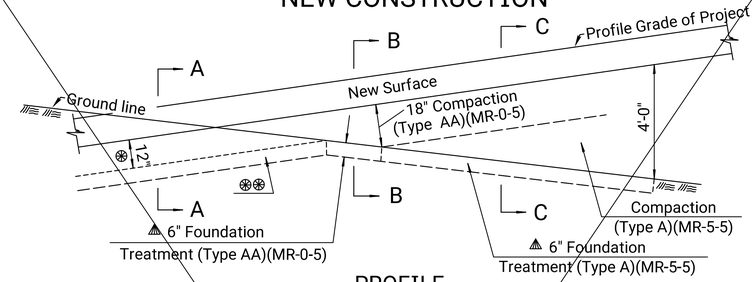


SECTION C-C



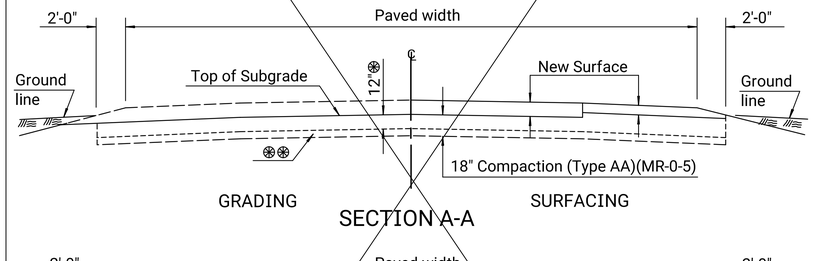
SECTION D-D

NEW CONSTRUCTION

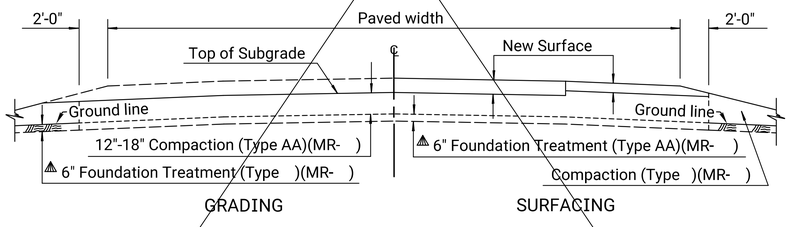


PROFILE

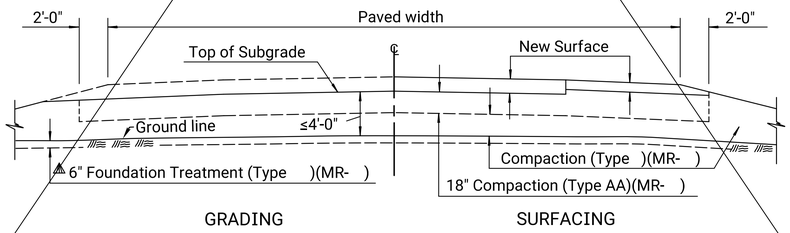
⊛ Excavation thru Cuts not Subgraded
⊛⊛ The lower 6" of Compaction is subsidiary.
⚠ Compaction of this material shall be subsidiary.



SECTION A-A



SECTION B-B



SECTION C-C

General Note

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

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

NO.	DATE	REVISIONS	BY	APP'D
05	10-17-11	Revised General Note	S.W.K.	J.O.B.
04	01-05-10	Added additional subsidiary comp.	S.W.K.	J.O.B.
03	02-16-05	Redrawn, Rev. Recon. Sec. C-C & D-D	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

FOUNDATION TREATMENT & COMPACTION OF EARTHWORK

RD605

FHWA APPROVAL	12-05-11	APP'D.	James O. Brewer
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

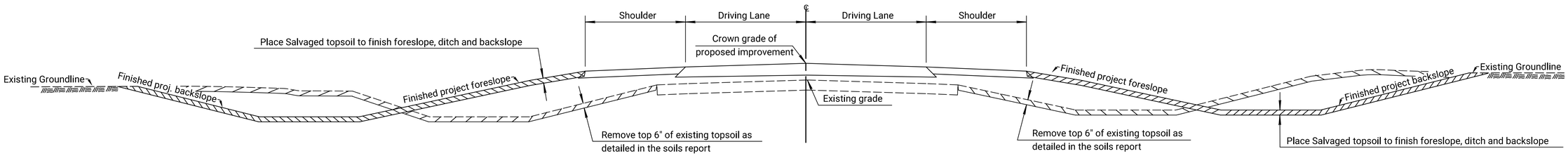
Sh. No. 6

Plotted by : BGS01485 16-DEC-2025 11:49
File : ka680801rss605.dgn

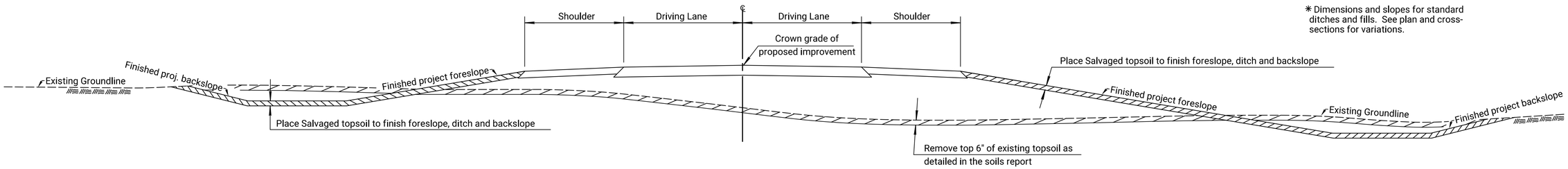
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	7	253

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

GENERAL NOTE
Adjust the cut and fill sections to accommodate the placement of the salvaged topsoil such that after placement the cross section will be at the final grade as shown on the plans.
Salvaging, Stockpiling and Placing Topsoil bid as "Salvaged Topsoil" in Square Yards. See KDOT Standard Specifications for details.
Soften and round the intersection of all slope lines for pleasing appearance.



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

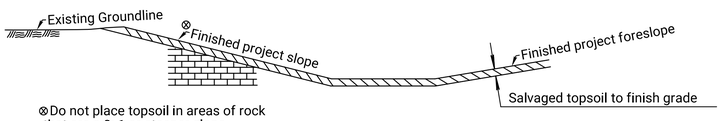


✳ Dimensions and slopes for standard ditches and fills. See plan and cross-sections for variations.

LEGEND
Topsoil to be Salvaged
Placement of Salvaged Topsoil

NEW ROADWAY ALIGNMENT
(Removal and Placement of Salvaged Topsoil)

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



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

CUT SECTION

NO.	DATE	REVISIONS	BY	APP'D
01	12-16-09	Initial Release	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

SALVAGED TOPSOIL

RD599A

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

Plotted by: BGS01485 16-DEC-2025 11:49
File: ka680801rss599a.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	8	253

GENERAL NOTE

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

SOIL FOR EMBANKMENT CONSTRUCTION: ALL SOIL USED IN THE TOP 18 INCHES OF THE EMBANKMENT SHALL CONFORM TO THE FOLLOWING REQUIREMENTS: $10 \le PI \le 30$ AND $20 \le LL \le 50$. SOILS WHICH CONTAIN SUBSTANTIAL ORGANIC MATERIAL, SUCH AS THOSE CLASSIFIED AS OL OR OH ACCORDING TO THE UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D2487) SHOULD NOT BE USED TO CONSTRUCT THE EMBANKMENT OR SUBGRADE. THE ORGANIC MATERIAL MAY BE USED AS SELECT SOIL TO CAP THE SIDESLOPES OF THE EMBANKMENT.

A GROSS VMF OF 0.74 WAS USED TO COMPUTE EARTHWORK QUANTITIES FOR THIS PROJECT. THIS FACTOR INCLUDES QUANTITIES FOR INITIAL CONSOLIDATION AND SETTLEMENT.

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

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

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

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

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

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

WHERE EASEMENTS ARE SHOWN ON RAILROAD RIGHT OF WAY, THE CONTRACTOR SHALL BE REQUIRED TO WORK AROUND AND NOT DISTURB THE RAILROAD COMMUNICATION OR SIGNAL POLES OR LINES.

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

EXISTING TREES THAT ARE TO REMAIN IN PLACE ARE TO BE PROTECTED SUCH THAT CONSTRUCTION EQUIPMENT WILL NOT DAMAGE THEM AND THAT MATERIAL WILL NOT BE STOCKPILED WITHIN THE DRIP LINE OF THEM.

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

THE FIELD SURVEY INFORMATION SHOWN ON THE PLANS REPRESENTS THE EXISTING TOPOGRAPHY CONDITIONS AS BEST AS COULD BE DETERMINED AT THE TIME OF THE SURVEY. DIFFERENCES IN THE VERTICAL AND HORIZONTAL CONTROL BETWEEN THE ORIGINAL PLANS AND THE NEW SURVEY COULD RESULT IN THE FIELD ADJUSTMENT OF TRANSITION LENGTHS AT LOCATIONS WHERE THE NEW CONSTRUCTION IS TO MATCH EXISTING FEATURES AND PROFILE GRADES.

EXISTING SIGNS AND SIGN STRUCTURES FOR REMOVAL BY THE CONTRACTOR WILL BECOME THE PROPERTY OF THE CONTRACTOR AND BE REMOVED FROM THE PROJECT SITE. THE REMOVAL OF THESE ITEMS ARE SUBSIDIARY TO THE BID ITEM "REMOVAL OF EXISTING STRUCTURES."

EXISTING GUARDRAIL FOR REMOVAL BY THE CONTRACTOR WILL BECOME THE PROPERTY OF THE CONTRACTOR AND BE REMOVED FROM THE PROJECT SITE. THE REMOVAL OF THESE ITEMS ARE SUBSIDIARY TO THE BID ITEM "REMOVAL OF EXISTING STRUCTURES."

EXISTING PAVEMENT MILLINGS WILL BECOME THE PROPERTY OF THE CONTRACTOR AND BE REMOVED FROM THE PROJECT SITE. THE REMOVAL OF THESE ITEMS ARE SUBSIDIARY TO THE BID ITEM "MILLINGS."

ALL SAW CUTS SHALL BE FULL DEPTH OR AS APPROVED BY THE ENGINEER AND SHALL NOT BE PAID FOR DIRECTLY, BUT SHALL BE SUBSIDIARY TO OTHER BID ITEMS IN THE CONTRACT.

CONTRACTOR TO MAINTAIN ACCESS TO PROPERTY OWNERS AT ALL TIMES AS DIRECTED BY THE ENGINEER.

THE CONTRACTOR SHALL COMPLETE SIDEWALK CONSTRUCTION PRIOR TO OPENING PROPOSED IMPROVEMENTS TO THE PUBLIC.

DRIVEWAYS, SIDEWALKS, AND OTHER AREAS DAMAGED BY THE CONTRACTOR SHALL BE RESTORED AT THE CONTRACTOR'S EXPENSE TO A CONDITION EQUAL OR BETTER THAN EXISTING BEFORE THE DAMAGE OCCURRED.

THE EXISTING PIPES, EXISTING INLETS, EXISTING GUARDRAIL, MILLINGS, AND PAVEMENT TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND REMOVED FROM THE SITE.

DRAINAGE STRUCTURES WHICH ARE TO REMAIN, WHETHER EXTENDED OR NOT, WILL BE CLEANED OUT BY THE CONTRACTOR AS DIRECTED BY THE ENGINEER. THIS WORK SHALL BE PAID FOR UNDER THE BID ITEM "CLEANING OF EXISTING STRUCTURES."

CONSTRUCTION VEHICLES ARE NOT TO PARK IN PRIVATE PARKING LOTS UNLESS THE CONTRACTOR HAS MADE ARRANGEMENTS WITH THE PROPERTY OWNER AND PROVIDED THE ENGINEER WITH A COPY OF THE WRITTEN AGREEMENT BETWEEN THE PROPERTY OWNER AND THE CONTRACTOR ALLOWING THE USE OF THE PRIVATE PROPERTY BY THE CONTRACTOR. THE CONTRACTOR SHALL BE SOLELY LIABLE FOR ANY COMPENSATION RESULTING FROM SUCH AN AGREEMENT AND WILL NOT BE REIMBURSED.

POLICE, FIRE, MED-ACT AND SCHOOL BUS COMPANIES SHALL BE NOTIFIED 48 HOURS PRIOR TO CLOSING ANY STREET. CITY OF TOPEKA AND SHAWNEE COUNTY SHALL BE NOTIFIED 48 HOURS IN ADVANCE OF CLOSURES.

ALL CONSTRUCTION METHODS AND MATERIALS USED IN THE CONSTRUCTION OF THE IMPROVEMENTS COVERED BY THESE PLANS SHALL BE IN ACORDANCE WITH THE KANSAS DEPARTMENT OF TRANSPORTATION (KDOT) STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION (2015 EDITION) AND WITH CITY CODES, ORDINANCES, AND DESIGN STANDARDS ON FILE AT THE CITY OF TOPEKA, KANSAS.

TO ENSURE SAFETY, EVERGY SHALL BE NOTIFIED 30 DAYS PRIOR TO THE START OF CONSTRUCTION WORK ADJACENT TO OR UNDER TRANSMISSION LINES SO THAT AN INSPECTOR CAN BE ASSIGNED TO THE JOB TO DETERMINE THE EXTENT OF WORK TO BE PERFORMED TO ENSURE ALL SAFETY REQUIREMENTS ARE MET. CONTACT BRIAN DAMME AT (785) 845-9676, PRIOR TO STARTING WORK.

PROJECT SURVEY CONTROL

Horizontal Project Datum
NAD 1927
CAF = 0.9999173

Vertical Project Datum
NGVD 1929

Datum Bench Mark:
City Benchmark CTBM #229
NGVD 1929 Elev = 956.94

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

UTILITIES

Communications
Cox Communications
931 SW Henderson
Topeka, KS 66615
Glen Cahoon
(785)-215-6707

Traffic
City of Topeka (COT Traffic)
1515 SW Saline
Topeka, KS 66618
(785)-251-6101

Power
Evergy Energy (Evergy)
818 S Kansas Ave.
Topeka, KS 66612
Scott Schlageck
(785)-575-6014

Gas
Kansas Gas Service Co. (KGS)
200 E 1st Ave.
Topeka, KS 66603
Justin Clements
(913)-599-8980

Sanitary Sewer
City of Topeka (COT)
620 SE Madison St.
Topeka, KS 66603
(785)-368-3111

Storm Sewer
City of Topeka (COT)
620 SE Madison St.
Topeka, KS 66603
(785)-368-3111

Water
City of Topeka (COT)
620 SE Madison St.
Topeka, KS 66603
(785)-368-3111

NO.	DATE	REVISIONS	BY	APP'D
01	06-06-23	Initial Release	A.L.R.	D.D.T.

KANSAS DEPARTMENT OF TRANSPORTATION

GENERAL NOTES SHEET

RD040

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

Plotted by : PDD00855 16-DEC-2025 16:35
File : ka680801rd-040.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	9	253

P.O.T. ℄ I-70 Sta. 405+36.18 =
P.O.T. ℄ Sta. 129+03.37 = I-70 Sta. 305+57.04
Project 70-89 K-2445-01/IR-BHI-5 (166)362 Dated 1988 =
℄ I-70 Sta. 305+57.63 on Project 70-89-I 070-5(45)363 (1959)
N. 264,947.032 E. 2,664,811.877
1. Found Rivet and KDOT Washer, Flush with Surface in Bridge Deck On Indiana Ave.
2. Found Plus Cut In Concrete Hand Rail Base 21.99' SSE
3. Found Plus Cut In Concrete Hand Rail Base 20.60' ENE
4. Found Plus Cut In Concrete Hand Rail Base 19.89' W

P.C. ℄ I-70 Sta. 426+59.10
N. 264,386.115 E. 2,666,860.555
1. Point Not Set

P.O.C. ℄ I-70 Sta. 433+15.50 =
P.O.T. ℄ SE California Ave. Sta. 218+29.82
N. 264,161.441 E. 2,667,476.626
1. Set Plus Cut On Bridge Deck on SE California Ave.
2. Set Plus Cut on Sidewalk of Bridge 47.05' NW
3. Set Plus Cut on Sidewalk of Bridge 41.08' SE
4. Set Plus Cut on Sidewalk of Bridge 41.37' SE
5. Set Plus Cut on Sidewalk of Bridge 46.81' NE

P.I. ℄ Sta. 435+47.95 (BK) = 435+33.89 (AHD) =
P.O.S.T. ℄ Sta. 435+48.02 On Project 70-89 KA-1266-02 (2011)=
P.I. ℄ Sta. 159+15.19 Project 70-89 K-2445-01/IR-BHI-5 (1988)=
P.I. ℄ Sta. 335+70.31 (BK) = 335+56.20(AHD) On Project 70-89-I 070-5(45) 363 (1959)
N. 264,122.119 E. 2,667,476.646
1. Found ⅝" Rebar and 2" KDOT Aluminum Cap, 1.5' Below Surface
2. South Edge of Asphalt, East Bound I-70 26.20' N
3. Set Mag Nail in Top of Guard Rail Post 136.51' W
4. Set Mag Nail in the SE Face of a Power Pole 143.60' SW
5. Set Mag Nail in the S Face of S Sign Post (Merge Sign) 167.20' E

P.T. ℄ I-70 Sta. 444+22.74
N. 264,063.158 E. 2,668,577.769
1. Point Not Set

P.O.T ℄ I-70 Sta. 452 +98.29 = P.O.T. ℄ Sta. 176+79.59 =
P.O.T. ℄ Sta. 353+19.09 On Project 70-89 K-2445-01 (1988) =
Sta. 353+19.51 On Project 70-89-I 070(45) 363 (1959)
N. 264,063.158 E. 2,668,577.769
1. Found Plus Cut on Golden Ave. Bridge Deck
2. Found NGS Brass Disk Stamped Golden No. 2 1970 16.12' W
3. Found Stem and Concrete Imprint (Disk Missing) at Location For NCS Disk Golden 1970 17.59' E
4. NW Corner of Bridge on Golden Ave. Over I-70 113.44' NNW
5. NE Corner of Bridge on Golden Ave. Over I-70 113.54' NNE

℄ I-70 Sta. 433+15.50 =
℄ California Ave. Sta. 218+29.82 Remove Existing Br. No. 70-89-363.90 (039)
1@49', 2 @59', 1@44' Reinforced Concrete Voided Slab, Continuous (RVSC)
70'-2" Roadway with 4'-0" Sidewalk Lt. & Rt.
10°41' Skew Rt.

℄ I-70 Sta. 433+15.50 =
℄ California Ave. Sta. 218+29.82 Construct Proposed Br. No. 70-89-363.90(324)
48'-64'-64'-48 Reinforced Concrete Slab, Continuous, Haunched (RCSH)
74'-0" Roadway with 1 - 6'-0" Sidewalk Rt.
10°41' Skew Rt.

Scale 1"=50'

TOPEKA CEMETERY ASSOCIATION, PART OF EAST 1/2 SEC.5, T12S, R16E

+84.31 Exist. R/W = Exist. A/C 330.74' Lt. ℄

+67.68 Exist. R/W = Exist. A/C 262.07' Lt. ℄

Exist. R/W & A.C.

Sawcut

TFMCOMM INC. LOT 1, 2, AND PART OF LOT 3 RML SUBDIVISION

+98.87 Exist. R/W = Exist. A/C 353.98' Lt. ℄

Power Line

KANSAS PARDISE PLAZA, LLC PART OF SW 1/4 SEC. 4, T12S, R16E

+70.39 Exist. R/W = Exist. A/C 143.70' Lt. ℄

℄ Ramp C

℄ Ramp D

Const. Limits

℄ I-70 Sta. 433+00.15, Off. -69.77 Lt.
Install 8.5 Sq. Ft x 192' CRP (RCPHE)
See Sh. No. 29, 32,47 , 50, 51

STA. 431+84.84 BEGIN
Proj. 70-89 KA-6808-01
= Sta. 331+94.17 On
Proj. 70-89 K-2445-01 (1988)

Curve Data I-70
PI Sta. (Bk.) = 435+47.95
PI Sta. (Ahd.) = 435+33.89
Δ = 17°38'11" (LT)
D = 01°00'00"
R = 5729.58'
T = 888.85'
L = 1763.63'
E = 68.53'
Super = 3.60%

Sta. 436+78.80 End Construction

PC 426+59.10

425 430 435 440

℄ I-70

℄ Sta. 433+15.50 I-70 =
℄ Sta. 218+29.82 California Ave.

Sta. 429+50.28 Begin Construction

STA. 434+26.16 END
Proj. 70-89 KA-6808-01
= Sta. 334+59.77 On
Proj. 70-89 K-2445-01 (1988)

℄ I-70 Sta. 432+34.45, Off 73.63' Rt.
Reset 24" x 16.0' CRP (Exist. 24" RCP)
Reset End Section
See Sh. No. 29, 32,51 ,

℄ I-70 Sta. 434+09.97, Off. 72.43' Rt.
Reset 24" x 16.0' CRP (Exist. 24" RCP)
Reset End Section
See Sh. No. 29, 32,51 ,

Overhead Power

Fiber Optic - Topeka Traffic

℄ Ramp A

℄ Ramp B

℄ SE California Ave.

+89.57 Exist. R/W = Exist. A/C 129.08' Rt. ℄

+19.37 Exist. R/W = Exist. A/C 135.39' Rt. ℄

SE REPUBLICAN AVE.

+18.97 Exist. R/W = Exist. A/C 304.15' Rt. ℄

+89.19 Exist. R/W = Exist. A/C 265.22' Rt. ℄

+92.89 Exist. R/W = Exist. A/C 289.92' Rt. ℄

JOHN C. DAVIDSON ODD LOTS 9 - 45 EAST LAWN SUBDIVISION

KEMPER TRUST LOTS 10 - 12 BANTA SUBDIVISION

JESUS FLORES, Et. Al. LOT 6 BANTA SUBDIVISION

CRAIG WOLFE, ET. AL. LOT 8, BANTA SUBDIVISION

BRIDAR, LLC LOT 7, BANTA SUBDIVISION

RUBEN G. MUNOZ, ET. AL. LOT 6, BANTA SUBDIVISION

JAMES JASPER, ET. AL. LOT 5, BANTA SUBDIVISION

RICHARD COOK LOT 4, BANTA SUBDIVISION

GONZALO BALTAZAR LOT 3, BANTA SUBDIVISION

JOHN A. DAVIDSON LOT 2, BANTA SUBDIVISION

COZY HOMES, LLC LOT 1, BANTA SUBDIVISION

+51.07 Exist. R/W = Exist. A/C 223.34' Rt. ℄

TOPEKA CEMETERY ASSOCIATION PART OF SE 1/4, SEC.5, T12S, R16E

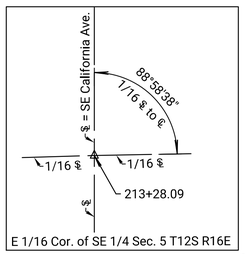
+97.59 Exist. R/W = Exist. A/C 256.74' Rt. ℄

JUSTIN LYNN HURD AND NICOLE D. HOLT LOT 20, CALIFORNIA ACRES PART OF SE 1/4, SEC.5, T12S, R16E

+72.54 Exist. R/W = Exist. A/C 302.32' Rt. ℄

+21.15 Exist. R/W = Exist. A/C 329.07' Rt. ℄

RANDY E. JR. WHEAT PART OF SE 1/4, SEC.5, T12S, R16E BOOK:3492, PAGE:655



E 1/16 Cor. of SE 1/4 Sec. 5 T12S R16E

SE Cor. Sec. 5, T12S, R16E
N 262, 331.591 E 2,667,477.654
1. Existing 1" Bar Center Punched in Valve Box Intersection of SE 21 St & SE California
2. SE California Ave. ℄ Sta. 199+99.88 6.75' W
3. Found Cut "X" in Traffic light Base 59.14' NW
4. Found Cut "X" in Traffic light Base 66.79' SW
5. Found Cut "X" in Traffic light Base 63.93' SE
6. Found Cut "X" in SW Corner of Traffic Light Base 65.60' NE

W ⅛ Cor., SE ¼, Sec. 5, T12S, R16E
N 263,582.620 E 2,664,805.280
1. Found ⅝" Rebar Flush with Surface with No Cap (#1919 SE Indiana Ave.)
2. Existing Traveled Way of SE Indiana Ave. (Running N to S) 15.75' E
3. Existing Traveled Way of SE 19th St. (Running E) 32.00' S
4. Set Mag Nail in the N Face of Power Pole 9.99' WSW
5. Top Center of Fire Hydrant 33.78' ENE
6. NE Corner of Block Retaining Wall 37.17' NNW
7. Center of Manhole 44.72' SSE

E ⅛, SE ¼, Sec. 5, T12S, R16E
N 263,659.714 E 2,667,476.869
1. Existing 2½" Disk in Valve Box (Cap is Illegible)(Near SE 13th St. & SE California)
2. I-70 ℄ Sta. 433+15.50; Initial Tangent Angle (℄ to ℄) = 100°39'52" 501.73' S
3. I-70 (Bk) Tangent ℄ Sta. 433+25.71; SE (℄ (Bk) Tan to ℄) = 72°46'18" 462.41' S
4. At SE California Ave. ℄ P.I. Sta. 213+28.09
5. Found Cut "X" in Top of Curb in SW Curb Return of Entrance 36.50' WSW
6. Found Cut "X" in Curb Inlet 62.17' NE
7. Found Cut "X" in Top of Curb 57.50' NW
8. Found Cut "X" in Curb Inlet 61.48' SE

E ¼ Cor. Sec. 5, T12S, R16E
N 264,988.681 E 2,667,476.227
1. Found ½" Rebar, 6" Below Surface (Near #1010 SE California Ave.)
2. I-70 ℄ Sta. 433+15.50; Initial Tangent Angle (℄ to ℄) = 100°39'52" 827.24' N
3. I-70 (Bk) Tangent ℄ Sta. 433+25.71; SE (℄ (Bk) Tan to ℄) = 72°46'18" 866.56' N
4. At SE California Ave. ℄ P.I. 226+57.06
5. Center of Existing Chainlink Corner Post 50.37' E
6. Found Cut "X" in End of Curb Return of N Drive Entrance 60.74' SSE
7. Found Nail and Bottle Cap in S Face of Power Pole 26.68' W
8. Found Nail and Washer in W Face of Power Pole 96.12' NNE
9. Traveled Way of SE California Ave. 0.70' E

BM #123A 4 Ft. T-Post, Flush with Surface on N side of ramp to I-70 W.B. from California Ave.
Sta. 427+52.15 Lt. 188.27' Elev. 937.12

BM #124A Square cut at the NW Corner of a curb inlet, W R/W California Ave., N side of ramp to I-70 W.B.
Sta. 432+16.97 Lt. 300.54' Elev. 962.47'

BM #CTBM 229(Datum BM) Brass Disk Stamped City of Topeka Engineering 229, at SE Cor. of Bridge on California Ave.
Sta. 433+75.55 Rt. 110.31' Elev. 956.94'

BM #125A 4-Ft. T-Post, Flush with Surface on N. Side of I-70 W.B. off ramp to California Ave.
Sta. 438+24.43 Lt. 162.58' Elev. 953.60'

BM #126A Square Cut on S. Side of Concrete Overhead Sign Base.
Sta. 444+75.36 Lt. 61.82' Elev. 966.03'

KANSAS DEPARTMENT OF TRANSPORTATION

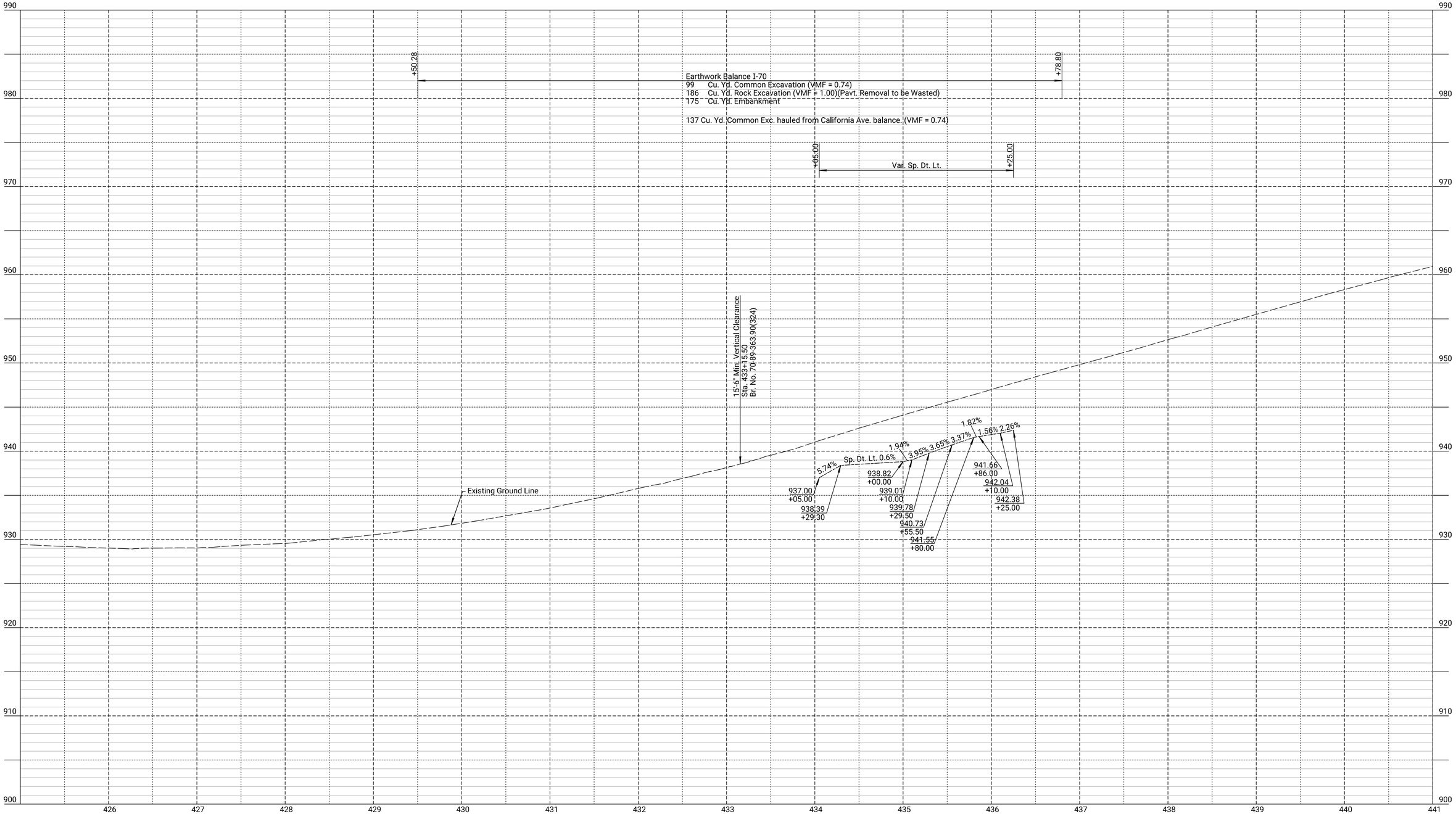
I-70 PLAN

STA. 425+00 TO STA. 441+00

	BY	DATE
REFERENCES NOTED	R. Kraus (B&W)/E. Salas (B&W)	2025
REFERENCES CHECKED	B. Sheehy (B&W)	2025

Plotted by : BGS01485 16-DEC-2025 11:50
File : ka680801rpl-01.dgn

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	10	253



KANSAS DEPARTMENT OF TRANSPORTATION

I-70 PROFILE

STA. 425+00 TO STA. 441+00

Plotted by : BGS01485 16-DEC-2025 11:51
File : ka680801rpr-01.dgn

P.I. ℄ SE California Ave. 210+00.00
N 263,331.718 E 2,667,483.813
1. Set ⅝" Rebar and Aluminum Cap stamped Bartlett & West KA 6808-01 CL CALI AVE 210+00.00, 3" below surface
2. Set plus cut on top of curb, 39.64' NE
3. Set plus cut on top of curb, 39.62' SE
4. Set plus cut on top of curb, 37.38' SW
5. Set plus cut on top of curb, 40.82' NW

P.I. ℄ SE California Ave. 212+49.85
N 263,581.474 E 2,667,476.915
1. Set ⅝" Rebar and Aluminum Cap stamped Bartlett & West KA 6808-01 CL CALI AVE 212+49.85 3" below surface
2. Set plus cut at center of curb inlet, 41.17' NW
3. Found plus cut at center of curb inlet, 39.52' NE
4. Set plus cut on top of curb, 36.40' SW
5. Set plus cut on top of curb, 37.44' SE

P.I. ℄ SE California Ave. 213+28.09
N 263,659.714 E 2,667,476.869
1. Found 2½" Disk in valve box, not readable, at the E 1/16th Corner, SE ¼ Section 5 T12S R16E
2. Found plus cut on top of curb
3. Found plus cut on curb inlet
4. Found plus cut on top of curb
5. Found plus cut on curb inlet

P.O.T ℄ SE California Ave. 217+90.49
N 264,122.113 E 2,667,476.646
1. Set epoxy mag nail on top, east edge concrete median on bridge deck
2. Set plus cut on sidewalk of Bridge, 42.47' SW
3. Set plus cut on sidewalk of Bridge, 39.49' NW
4. Set plus cut on sidewalk of Bridge, 44.01' SE
5. Set plus cut on sidewalk of Bridge, 39.63' NE

P.O.T ℄ SE California Ave. 218+29.82
N 264,161.441 E 2,667,476.627
1. Set plus cut on Bridge Deck
2. Set plus cut on sidewalk of Bridge, 47.05' NW
3. Set plus cut on sidewalk of Bridge, 41.08' SW
4. Set plus cut on sidewalk of Bridge, 41.37' SE
5. Set plus cut on sidewalk of Bridge, 46.81' NE

P.O.T. ℄ SE California Ave. 222+85.00
N 264,616.625 E 2,667,476.407
1. Set ⅝" Rebar and Aluminum Cap stamped Bartlett & West KA 6808-01 ℄ CALI AVE 222+85.00, flush with surface, north end concrete island
2. Set plus cut north end concrete island, 13.56' N
3. Set plus cut on concrete island, 18.31' S
4. Set plus cut on top of curb, 32.60' W
5. Set plus cut on top of curb, 32.36' E

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	11	253

P.I. ℄ SE California Ave. 226+57.06
N 264,988.681 E 2,667,476.227
1. Found ½" Rebar, 6" below surface
2. Center chain link fence corner post, 50.37' E
3. X cut in end of curb return, 60.74' SSE
4. Nail and bottle cap in south face of a power pole, 26.68' W
5. Nail and washer in West Face of a power pole, 96.12' NNE
6. Travel-way California Avenue, 0.70' E

Scale: 1'=50'

DATE	BY
2024	R. Kraus/E. Salas (B&W)
2024	B. Sheehy (B&W)

REFERENCES NOTED

REFERENCES CHECKED

+48.00 Exist. R/W = Exist
A/C 372.06' Lt. ℄

JUSTIN LYNN HURD AND NICOLE D. HOLT
LOT 20, CALIFORNIA ACRES
PART OF SE 1/4,
SEC.5, T12S, R16E

℄ I-70

Ramp A

+62.41 Exist. R/W = Exist
A/C 203.49' Lt. ℄

Exist. R/W & A.C.

RANDY E. JR. WHEAT
PART OF SE 1/4,
SEC.5, T12S, R16E
BOOK: 3402, PAGE:655

Ramp C

+58.64 Exist. R/W = Exist
A/C 275.61' Lt. ℄

Exist. R/W & A.C.

CB-1
Sta. 219+87.50 , 33.6' Rt.
Install Type 22 Curb Inlet (L=6')
Install 15" x 19' SS (RCP)(E)
With End Section
See Sh. No. 27, 29, 30, 32, 47

TOPEKA CEMETARY ASSOCIATION,
PART OF EAST 1/2
SEC.5, T12S, R16E

Sta. 221+39.70 , 34.3' Lt.
Adjust Inlet Top to Match
Prop. Curb Elev.
See Sh. No. 14

+79.11 Exist. R/W = Exist
A/C 60.00' Lt. ℄

+29.11 Exist. R/W
40.00' Lt. ℄

+29.11 Exist. R/W
30.00' Lt. ℄

AGUSTIN ANTONIO MARTINEZ
LOTS 6,
CALIFORNIA ACRES

VF TRUST
LOTS 4 & 5,
CALIFORNIA ACRES

+74.17 Exist. R/W
47.50' Lt. ℄

Sta. 213+56.98 Begin Construction

CENTRAL STATES COMMERCIAL RESIDENTIAL INVESTMENT GROUP, LLC.
LOTS 1-3,
CALIFORNIA ACRES

PI 212+49.85

PI 213+28.09

1/16 ℄

+05.32 Exist. R/W = Exist
A/C 55.02' Lt. ℄

Exist. R/W

Gas Line

Water Line

Fiber Optic - Topeka Traffic

℄ Sta. 433+15.50 I-70 =
℄ Sta. 218+29.82 California Ave.

Sta. 216+15.00, 33.0' Lt.
Install Type 22 Curb Inlet (L=8')
Install 15" x 28' SS (RCP)(E)
with End Section
See Sh. No. 27, 29, 30, 32, 47

CB-3

Overhead Power

Const. Limits

Sawcut

℄ SE California Ave.

N00°01'40"W (GRID)

215

220

℄ Proposed Improvement ℄

Sawcut

℄ SE California Ave.

Water Line

Exist. R/W

+59.03 Exist. R/W = Exist
A/C 49.00' Rt. ℄

+11.72 Exist. R/W = Exist
A/C 50.98' Rt. ℄

+80.59 Exist. R/W = Exist
A/C 50.18' Rt. ℄

Gas Line

Exist. R/W

+99.16 Exist. R/W
50.00' Rt. ℄

SE 13th St.

SE 11th St.

Exist. R/W

Exist. R/W

Sta. 221+50.00 End Construction

+58.34 Exist. R/W
50.08' Rt. ℄

CENTRAL STATES COMMERCIAL RESIDENTIAL INVESTMENT
BLOCK 1 EVEN LOTS 2 - 18
BELL VIEW ADDITION

℄ 212+00.00
2667478.291 E
263531.642 N

PARKDALE, LLC
PART OF SW 1/4
SEC.4, T12S, R16E

KEMPER TRUST
LOTS 10 - 12,
BANTA SUBDIVSION

Const. Limits

Const. Limits

Sta. 216+27.00, 33.0' Rt.
Install Type 22 Curb Inlet (L=8')
Install 15" x 26' SS (RCP)(E)
with End Section
See Sh. No. 27, 29, 30, 32, 47

CB-2

+50.42 Exist. R/W = Exist
A/C 203.76' Rt. ℄

Const. Limits

Const. Limits

Sta. 221+50.00 End Construction

+98.33 Exist. R/W = Exist
A/C 50.10' Rt. ℄

TFMCOMM INC.
LOT 2, AND PART OF LOT 3
RML SUBDIVISION

+13.26 Exist. R/W = Exist
A/C 130.00' Rt. ℄

Exist. R/W

Exist. R/W

Power Line

JESUS FLORES, ET. AL.
LOT 9,
BANTA SUBDIVSION

CRAIG WOLFE, ET. AL.
LOT 8,
BANTA SUBDIVSION

BRIDAR, LLC
LOT 7,
BANTA SUBDIVSION

RUBEN G. MUNOZ, ET. AL.
LOT 6,
BANTA SUBDIVSION

JAMES JASPER, ET. AL
LOT 5,
BANTA SUBDIVSION

RICHARD COOK

JOHN C. DAVIDSON
ODD LOTS 9 - 45
EAST LAWN SUBDIVISION

Exist. R/W & A.C.

Ramp B

Ramp D

Exist. R/W & A.C.

Sta. 221+42.10 , 32.5' Rt.
Adjust Inlet Top to Match
Prop. Curb Elev.
See Sh. No. 14

+89.98 Exist. R/W = Exist
A/C 234.47' Rt. ℄

+26.15 Exist. R/W = Exist
A/C 369.93' Rt. ℄

Power Line

KANSAS PARDISE PLAZA, LLC
PART OF SW 1/4
SEC. 4, T12S, R16E

Water Line

JOE KNERNSCHIELD
BLOCK 1, EVEN LOTS 20 - 24
AND ODD LOTS 13 - 23
BLOCK 2, PART OF EVEN LOTS 14 - 24
BELL VIEW ADDITION

LEGEND

- Mill & Overlay
- Pavement Reconstruction
- Sidewalk Reconstruction
- Sidewalk Removal

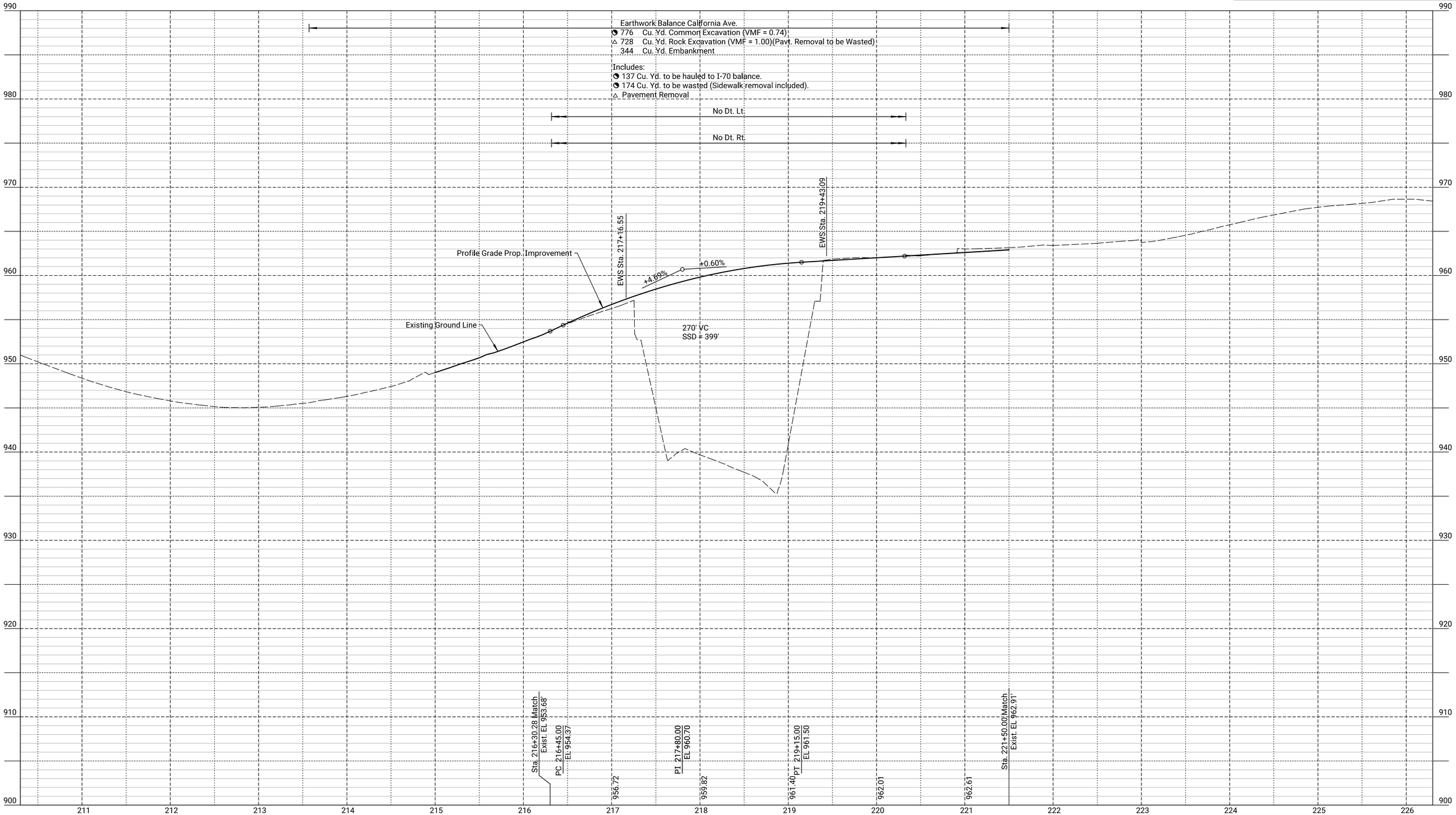
KANSAS DEPARTMENT OF TRANSPORTATION

SE CALIFORNIA AVE. PLAN

STA. 211+00 TO STA. 226+00

Plotted by : BGS01485 16-DEC-2025 11:51
File : ka680801rpl-02.dgn

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	12	253



KANSAS DEPARTMENT OF TRANSPORTATION

SE CALIFORNIA AVE. PROFILE

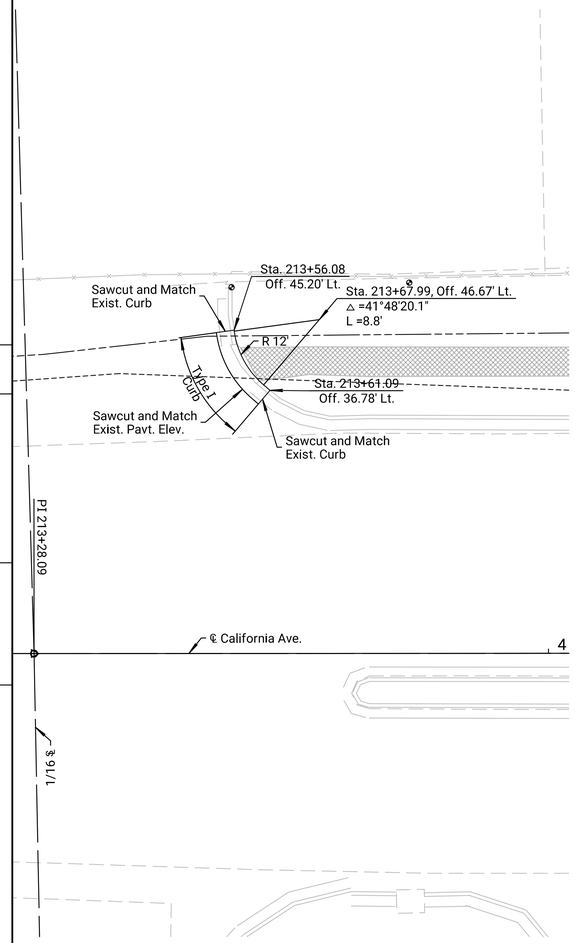
STA. 211+00 TO STA. 226+00

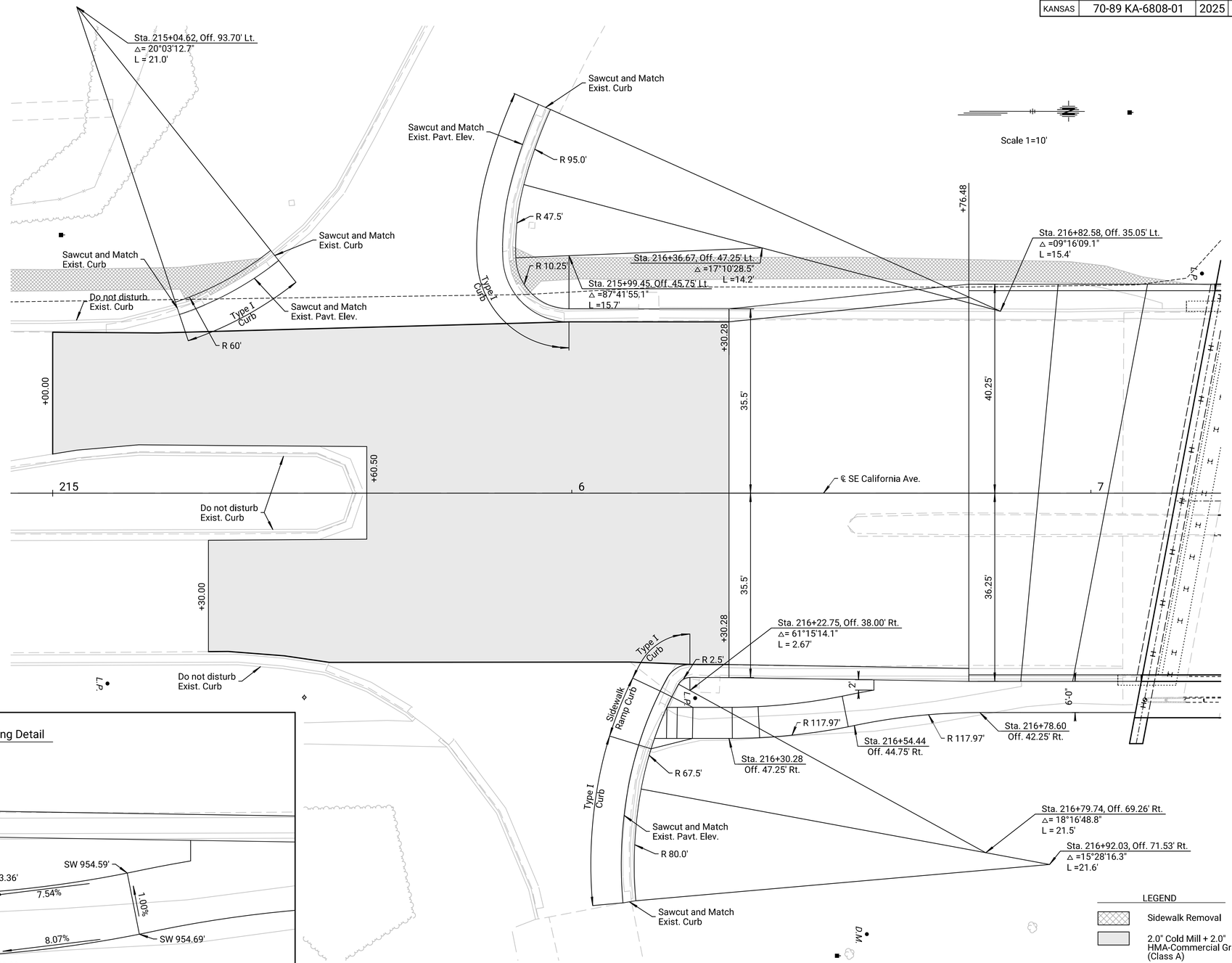
Plotted by : BGS01485 16-DEC-2025 11:52
File : ka6808001rpr-02.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	13	253

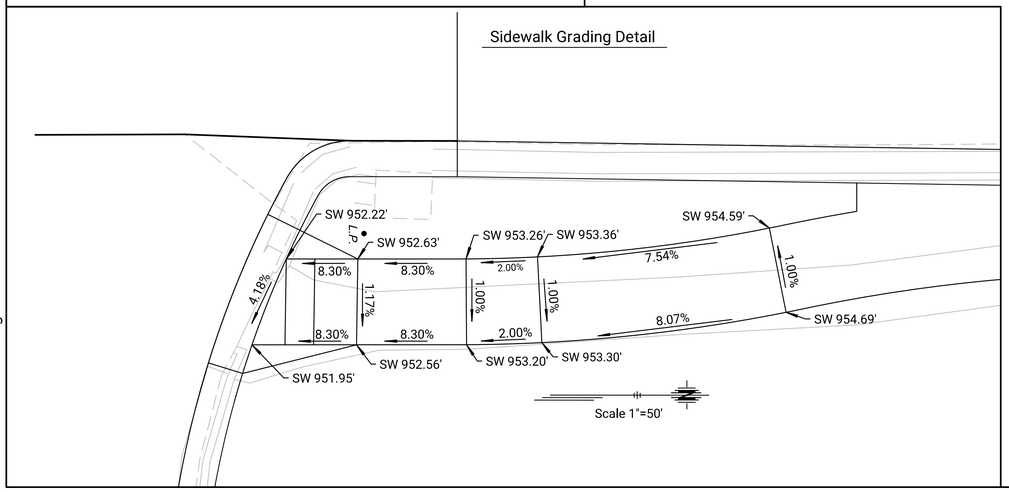
DATE
BY
REFERENCES NOTED
REFERENCES CHECKED

Type I Curb at 213+38 Lt. Entrance





Sidewalk Grading Detail



KANSAS DEPARTMENT OF TRANSPORTATION

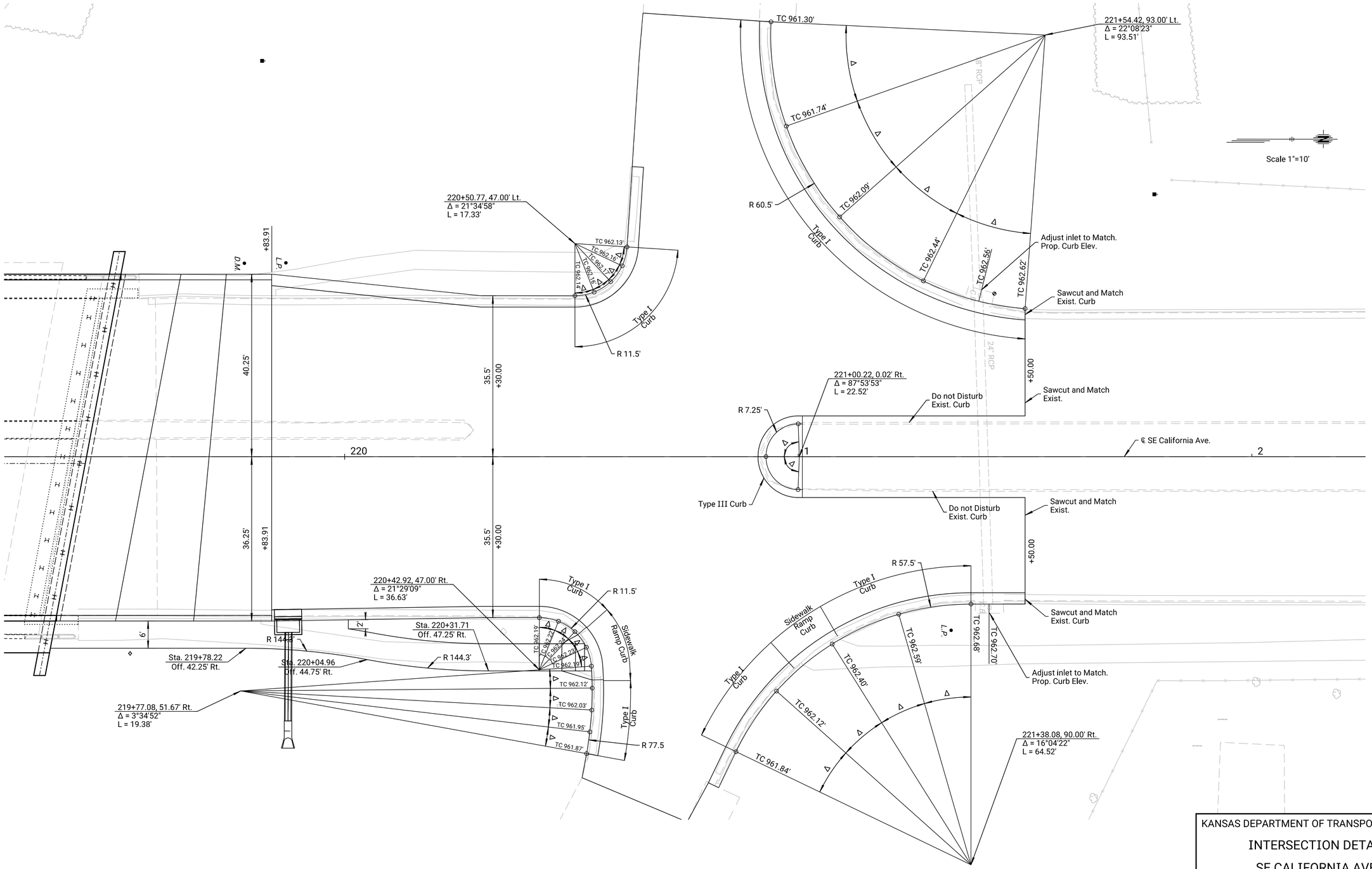
INTERSECTION DETAIL

SE CALIFORNIA AVE.

Plotted by : BGS01485 16-DEC-2025 11:52
File : ka680801rid-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	14	253

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED



KANSAS DEPARTMENT OF TRANSPORTATION

INTERSECTION DETAIL

SE CALIFORNIA AVE.

Plotted by : BGS01485 16-DEC-2025 11:53
File : ka6808001rid-02.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	15	253

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED

Scale: 1'=10'

32" x 18" CMP

18" RCP

24" RCP

13'-1" | 11'-0" | 11'-0" | 11'-0" | 12'-11" | 7'-10"

12' | 11.5'

9'-10" | 12'-10" | 12'-0" | 7'-9" | 10'-0"

11'-0" | 11'-0" | 11'-0" | 11'-0"

10'-6" | 10'-6"

10.5' | 10.5'

15'-0" | 12'-0" | 11'-2" | 11'-10"

13'-2" | 15'-0" | 8'-10" | 5'-2" | 4'-7½"

D.M. +83.91 L.P.

+50.00

9 | 220 | 1 | 2

Elev. 961.24' | Elev. 961.47' | Elev. 961.41' | Elev. 961.65' | Elev. 961.63' | Elev. 961.74' | Elev. 961.72' | Elev. 961.61' | Elev. 961.83' | Elev. 961.84' | Elev. 961.80'

221+12.87, 43.02' Lt. Elev. 961.80'

220+63.89, 32.80' Lt. Elev. 961.88'

220+87.38, 31.91' Lt. Elev. 961.98'

221+38.23, 30.00' Lt. Elev. 962.08'

220+58.51, 33.00' Lt. Elev. 961.87'

220+75.88, 32.35' Lt. Elev. 961.91'

221+00.09, 31.44' Lt. Elev. 962.00'

Elev. 962.09' | Elev. 962.12' | Elev. 961.97' | Elev. 962.01' | Elev. 962.07' | Elev. 962.14' | Elev. 962.18' | Elev. 962.30' | Elev. 962.39' | Elev. 962.35' | Elev. 962.06' | Elev. 962.12' | Elev. 962.24' | Elev. 962.35' | Elev. 962.37' | Elev. 962.24' | Elev. 962.34' | Elev. 962.46' | Elev. 962.54'

Sawcut & Match Exist.

℄ SE California Ave.

Elev. 962.18' | Elev. 962.22' | Elev. 962.32' | Elev. 962.44' | Elev. 962.48' | Elev. 962.03' | Elev. 962.06' | Elev. 962.15' | Elev. 962.25' | Elev. 962.30' | Elev. 962.37'

Sawcut & Match Exist.

220+50.77, 38.00' Rt. Elev. 961.89'

Elev. 962.03' | Elev. 961.93' | 220+71.80, 34.02' Rt. Elev. 962.01' | 220+85.43, 33.38' Rt. Elev. 962.07' | 221+14.90, 30.00' Rt. Elev. 962.21' | Elev. 962.10' | Elev. 962.16' | 220+99.89, 32.70' Rt. Elev. 962.13' | 220+58.09, 34.84' Rt. Elev. 961.92' | Elev. 962.03' | Elev. 961.94' | Elev. 961.88' | Elev. 961.73' | Elev. 961.76' | Elev. 961.60' | Elev. 961.59' | Elev. 961.80' | Elev. 961.88'

SW 962.04' | SW 962.15' | SW 962.19' | SW 962.13' | SW 961.88' | SW 961.97'

KANSAS DEPARTMENT OF TRANSPORTATION

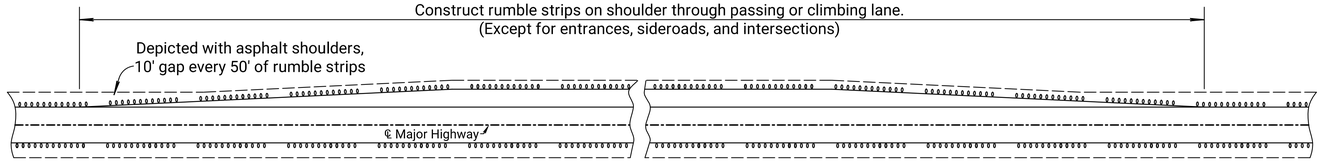
INTERSECTION DETAIL

SE CALIFORNIA AVE.

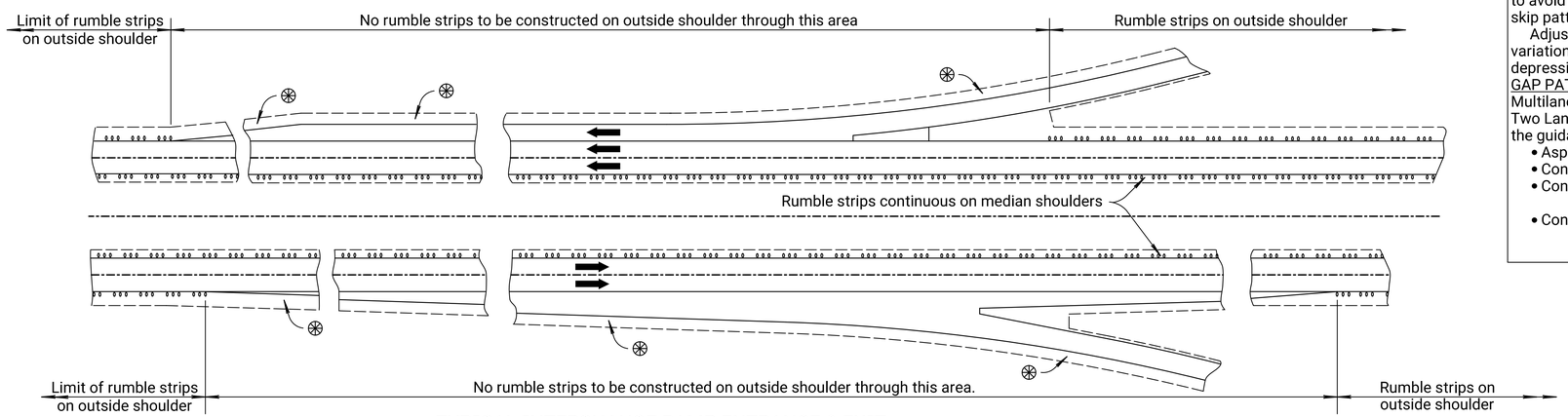
Plotted by : BGS01485 16-DEC-2025 11:54
File : ka680801rid-03.dgn

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

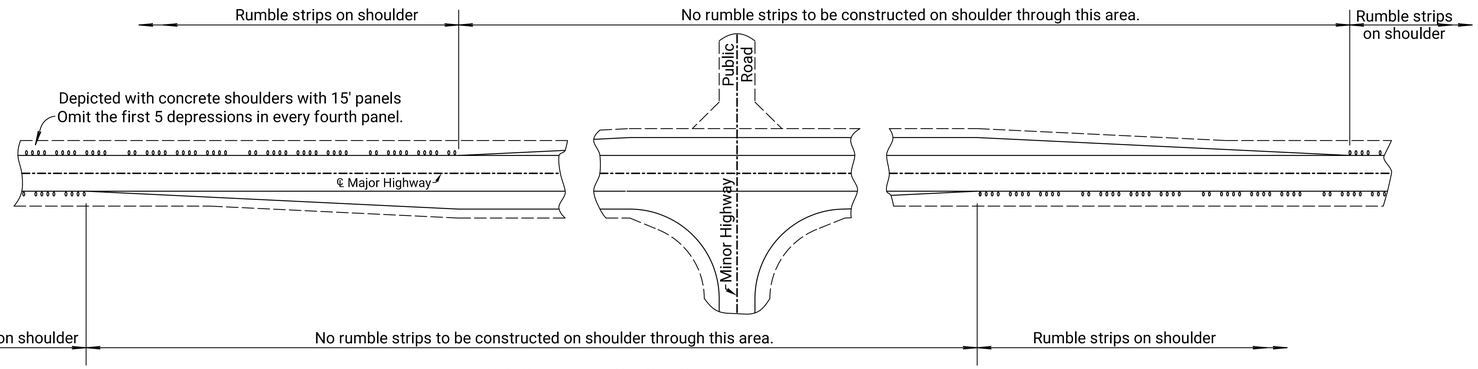
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	16	253



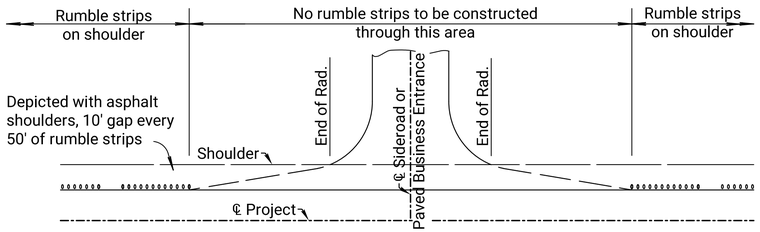
TYPICAL PASSING OR CLIMBING LANES



TYPICAL INTERCHANGE RAMP ENTRANCE & EXIT

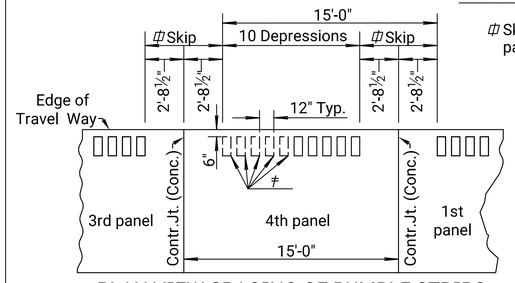


TYPICAL INTERSECTION



MINOR SIDEROAD OR ENTRANCE

RUMBLE STRIP LAYOUTS

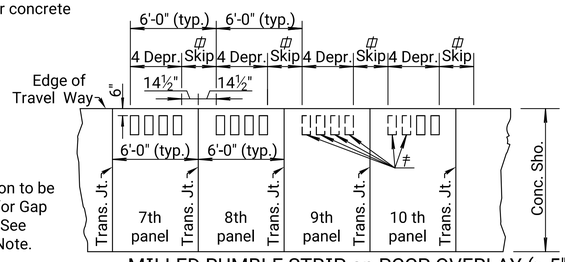


PLAN VIEW-SPACING OF RUMBLE STRIPS

≠See General Note for gap information for bicyclists accomodations.

Skip pattern for concrete pavement.

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



MILLED RUMBLE STRIP on PCCP OVERLAY (≥ 5")

≠See General Note for gap information for bicyclists accomodations.

GENERAL NOTES:

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

See typical sections for other surfacing and shoulder details.

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

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

⊛ Construct rumble strips on directional ramps and tapers.

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

SKIP PATTERN:

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

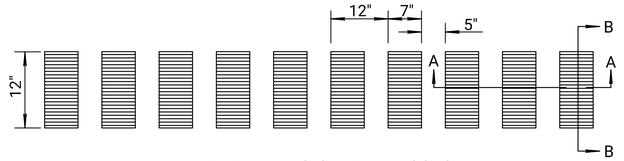
Adjust the number of depressions when concrete pavement contraction joint spacing is less than 15'-0". No variation in spacing between depressions is permitted. Clearance is 2'-0" (min.) to 3'-0" (max.) between the edge of depression and contraction joint. Center each group of depressions between contraction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

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

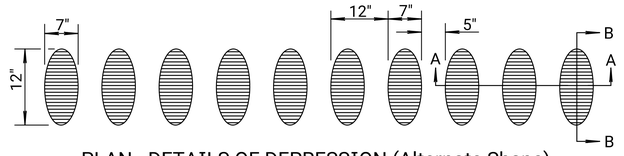
Multilane Divided Higways: Rumble strips will not have a gap pattern.

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

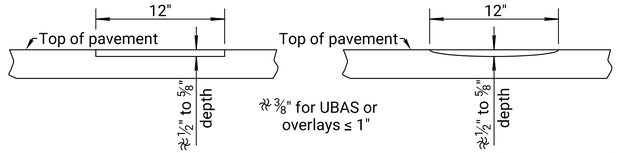
- Asphalt Shoulder: 10' gap provided every 50' of rumble strips
- Concrete Shoulder with 15' Joint Spacing: Omit the first 5 depressions in every fourth panel
- Concrete Shoulder with 6' Joint Spacing: Omit all the depressions in the 9th panel and the first 2 depressions in the 10th panel.
- Concrete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



PLAN - DETAILS OF DEPRESSION

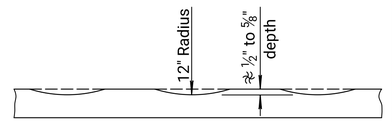


PLAN - DETAILS OF DEPRESSION (Alternate Shape)



SECTION B-B

SECTION B-B (ALT. SHAPE)



SECTION A-A
(Typical for both shapes)

NO.	DATE	REVISIONS	BY	APP'D
09	12-20-23	Depth note for UBAS and Overlays	A.L.R.	D.D.T.
08	03-17-21	Gap patterns to accomodate bicyclists	A.L.R.	S.W.K.
07	07-17-17	Revised notes & new sideroad label	A.L.R.	S.W.K.

KANSAS DEPARTMENT OF TRANSPORTATION

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

RD707

FHWA APPROVAL	03-20-24	APP'D.	Debbie D. Tanking
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 03-25-2024

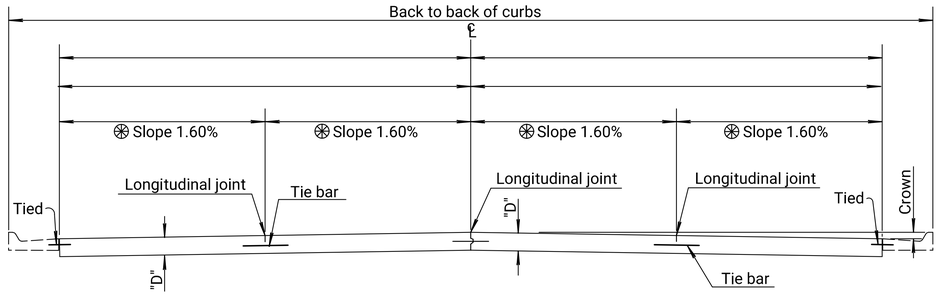
KDOT Graphics Certified

Sh. No. 16

Plotted by : BGS01485 16-DEC-2025 11:54
File : ka680801rss707.dgn

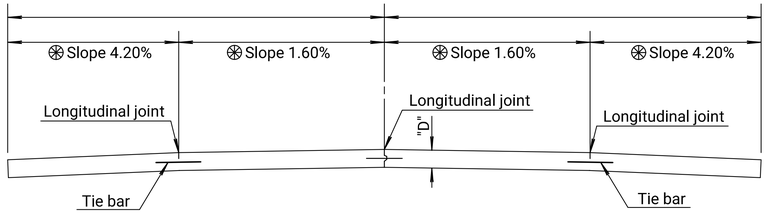
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	17	253

Note: Designer to add applicable dowel sizes.



For Curb & Gutter details
See Standard Drawing RD635.

TRANSVERSE SECTION
(4-LANE WITH CURB & GUTTER)



TRANSVERSE SECTION
(2-LANE WITH SHOULDERS)

Normal cross slopes. See Typical Section or Cross Sections for variations.

GENERAL NOTE

Epoxy coat all deformed tie bars that are straight. Patch any damage to the epoxy coating in accordance with the Standard Specifications.

Use billet steel Grade 40 reinforcing for deformed tie bars that require bending, may be epoxy coated at the Contractor's option.

Place pressure relief joint at the end of the bridge approach pavement slab (no bars through joint). For details of pressure relief joint see Standard Drawing RD712.

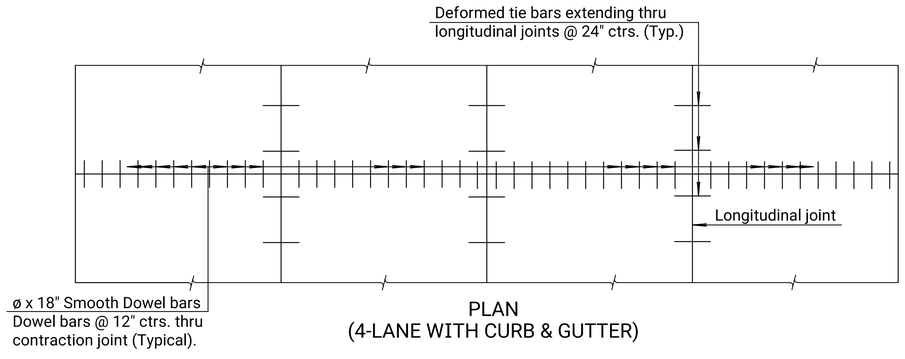
Use load transfer devices as shown in details at all construction joints on mainline pavement unless otherwise noted. Shoulder contraction joints have no dowels unless specifically shown on the plans.

Fill all sawed joints on the project in accordance with the Standard Specifications with the exception of those joints in pavement constructed over Cement or Asphalt Treated Base.

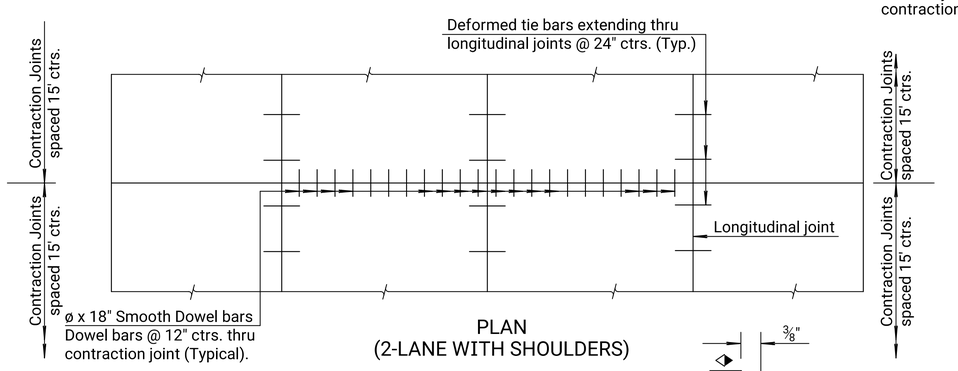
Use single saw cut, ⅛" wide, joint in pavement constructed over Cement or Asphalt Treated Base (Non-Sealed Joint Sawcut). Use single saw cut, ⅛" wide, joint for shoulder pavement adjacent to mainline pavement constructed over Asphalt or Cement Treated Base (Non-Sealed Joint Sawcut). See detail this sheet.

Shape all keyed joints similar to section of recessed form leg as shown on this sheet.

Evenly space tie bars along the length of slab with no tie bar within 12" of contraction joint. All longitudinal joints are tied.



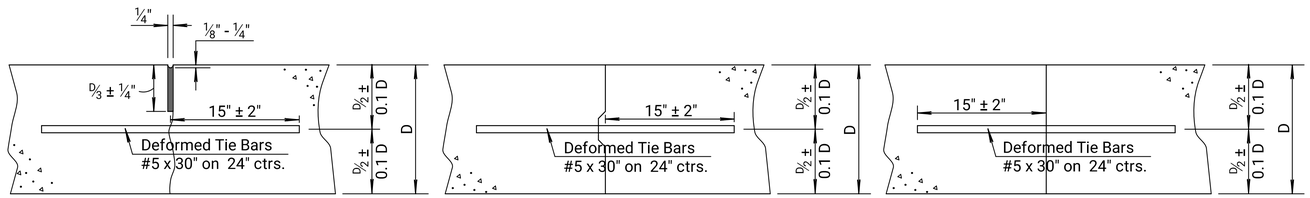
PLAN
(4-LANE WITH CURB & GUTTER)



PLAN
(2-LANE WITH SHOULDERS)

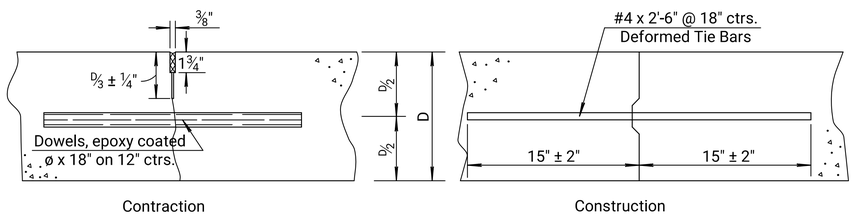
DOWEL SIZE	
D (in.)	Diameter
6 < D < 9	1"
9 ≤ D < 11	1¼"
D ≥ 11	1½"

PAVEMENT DEPTH
D= 11" (I-70)
8" (California Ave.)



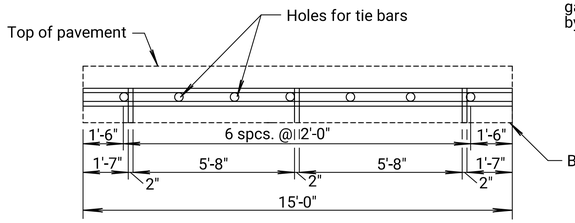
Note: For longitudinal construction joints the contractor has the option of using either the keyed or butt type. Place deformed tie bars mid-depth of the shoulder.

LONGITUDINAL JOINTS



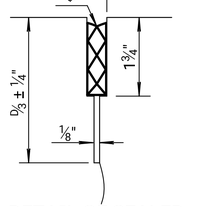
TRANSVERSE JOINTS

Note: Construct contraction joints at plan locations or at the Engineer's direction.
When necessary to interrupt continuous placement for a substantial length of time or at the end of a day's paving, the Contractor has the option of ending placement at a contraction joint or with a construction joint located a minimum of five (5) feet from a contraction joint. Construct either joint type by placing a header at the end of the pour or by paving past the joint location. After the concrete has hardened, saw joint and drill holes for tie bars or dowels.



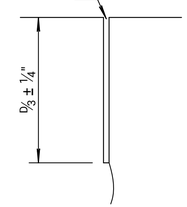
METAL STRIP FOR
LONGITUDINAL CONSTRUCTION JOINT

To be used only against forms, do not extend through contraction joints.
For automated placement tie bars are spaced at uniform 24" centers.
Use snap-in leg or other approved design in lieu of welded leg.



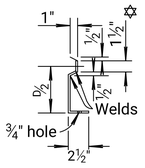
DETAIL OF SEALED
JOINT SAWCUT

Make an initial ⅛" saw cut (D/3 ± ¼" depth); the second ⅜" saw cut is a separate operation done after concrete has gained sufficient strength to avoid spalling as determined by the Engineer.



DETAIL OF NON-SEALED
JOINT SAWCUT

Make only the initial ⅛" saw cut after concrete has gained sufficient strength to avoid spalling as determined by the Engineer.



SECTION OF
RECESSED
FORM LEG

NO.	DATE	REVISIONS	BY	APP'D
19	05-17-13	Revised Note, Longitudinal Joints	S.W.K.	J.O.B.
18	03-21-12	Revised Table, Dowel Size	S.W.K.	J.O.B.
17	01-09-12	Added Detail, Non Sealed Joint	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

CONCRETE PAVEMENT DOWEL JOINTED NON-REINFORCED

RD708

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

KDOT Graphics Certified 05-16-2022

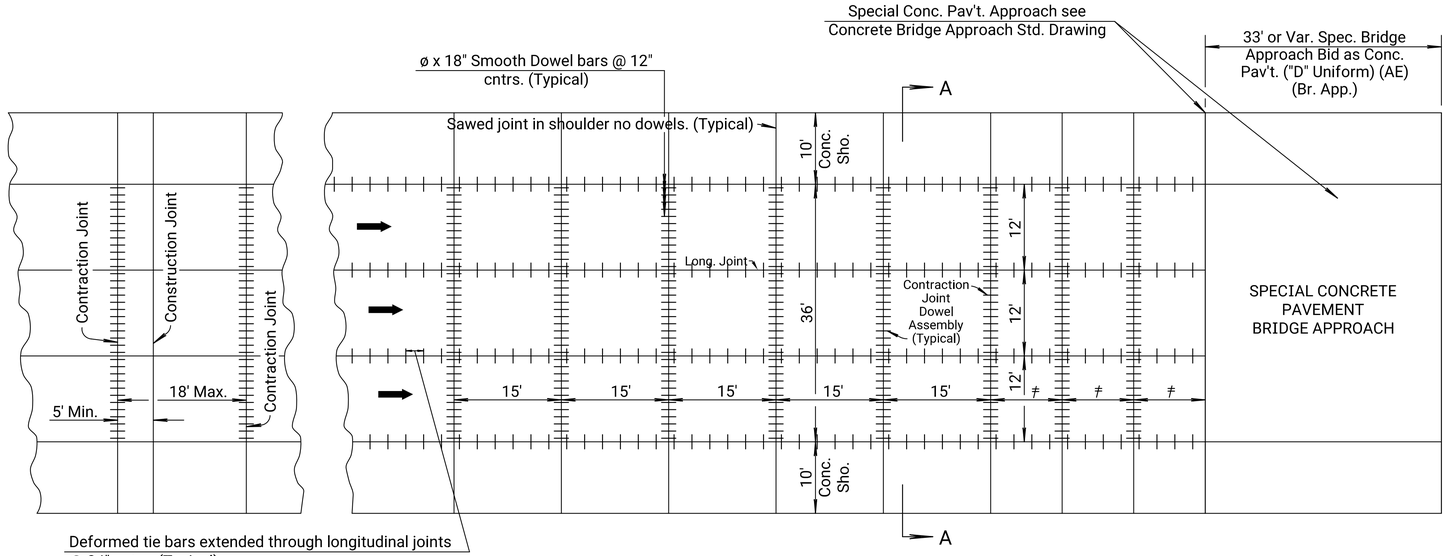
Sh. No. 17

KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 15:45
File : ka680801rss708.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	18	253

Note to Designer: Designer will add applicable dowel sizes and pavement depth "D".



≠ If necessary adjust the spacing of the joint sequence (3 slabs) preceding bridge approach pavement in order to establish slab lengths of no less than 10 ft.

DOWEL SIZE	
D (in.)	Diameter
6 < D < 9	1"
9 ≤ D < 11	1¼"
D ≥ 11	1½"

PAVEMENT DEPTH

D= 8"

JOINT LEGEND

Tied Butt

Tied Keyed

GENERAL NOTE

Epoxy coat all deformed tie bars that are straight. Patch any damage to the epoxy coating in accordance with the Standard Specifications.

Use billet steel Grade 40 reinforcing for deformed tie bars that require bending, may be epoxy coated at the Contractor's option.

Place pressure relief joint at the end of the bridge approach pavement slab (no bars thru joint). For details of pressure relief joint see Standard Drawing RD712.

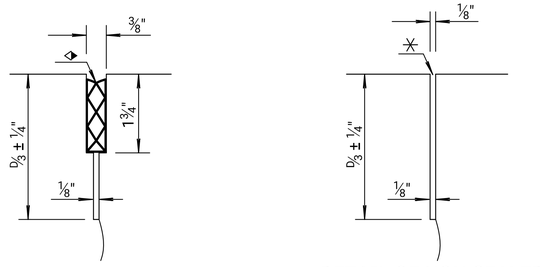
◈ Use load transfer devices as shown in details at all contraction joints on mainline pavement unless otherwise noted. Shoulder contraction joints have no dowels unless specifically shown on the plans.

✳ Fill all sawed joints on the project in accordance with the Standard Specifications with the exception of those joints in pavement constructed over Cement or Asphalt Treated Base.

Use single saw cut, ⅛" wide, joint in pavement constructed over Cement or Asphalt Treated Base (Non-Sealed Joint Sawcut). Use single saw cut, ⅛" wide, joint for shoulder pavement adjacent to mainline pavement constructed over Asphalt or Cement Treated Base (Non-Sealed Joint Sawcut). See detail this sheet.

Shape all keyed joints similar to section of recessed form leg as shown on this sheet.

Evenly space tie bars along the length of the slab with no tie bar within 12" of contraction joint. All longitudinal joints are tied.



DETAIL OF SEALED JOINT SAWCUT

Make an initial ⅛" saw cut (D/3 ± ¼" depth); the second ⅜" saw cut is a separate operation done after concrete has gained sufficient strength to avoid spalling as determined by the Engineer.

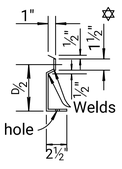
DETAIL OF NON-SEALED JOINT SAWCUT

Make only the initial ⅛" saw cut after concrete has gained sufficient strength to avoid spalling as determined by the Engineer.

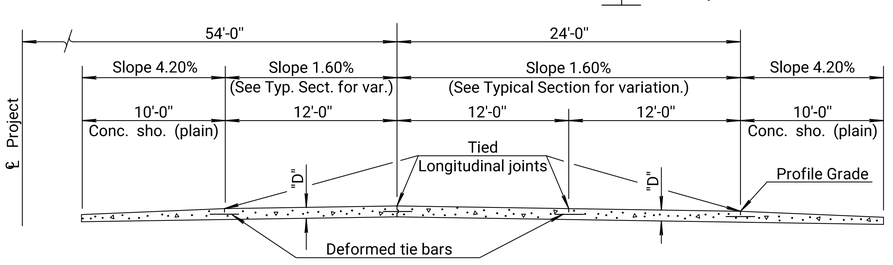
METAL STRIP FOR LONGITUDINAL KEYED CONSTRUCTION JOINT

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

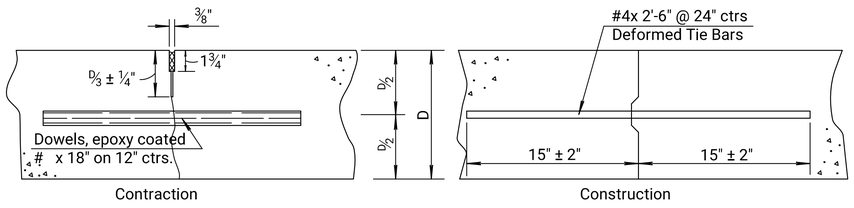
✡ Use snap-in leg or other approved designs in lieu of welded leg.



SECTION OF RECESSED FORM LEG



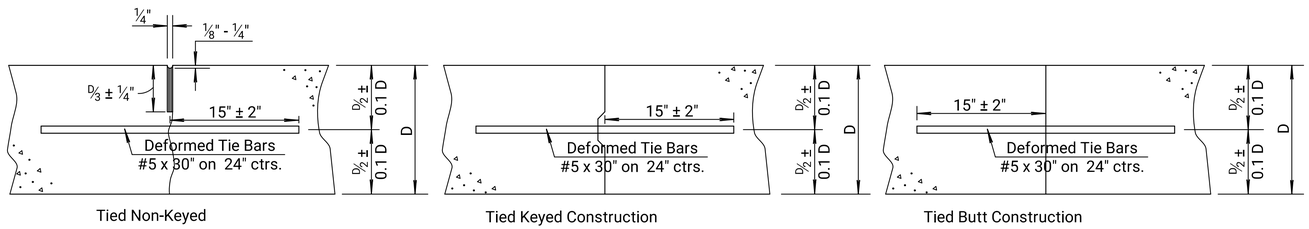
SECTION A-A TRANSVERSE SECTION



TRANSVERSE JOINTS

Note: Construct contraction joints at plan locations or at the Engineer's direction.

When necessary to interrupt continuous placement for a substantial length of time or at the end of a day's pour, the Contractor has the option of ending placement at a contraction joint or with a construction joint located a minimum of five (5) feet from a contraction joint. Construct either joint type by placing a header at the end of the pour or by paving past the joint location. After the concrete has hardened, saw joint and drill holes for tie bars or dowels.



LONGITUDINAL JOINTS

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

NO.	DATE	REVISIONS	BY	APP'D
11	05-17-13	Revised Note, Longitudinal Joints	S.W.K.	J.O.B.
10	03-21-12	Rev. Table & Add. Det., Non-Seal. Joint	S.W.K.	J.O.B.
09	08-18-10	Revised Dowel Sizes & Notes	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

CONCRETE PAVEMENT (NRDJ) MULTI-LANE with CONCRETE SHOULDERS

RD709

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

KDOT Graphics Certified 11-13-2024

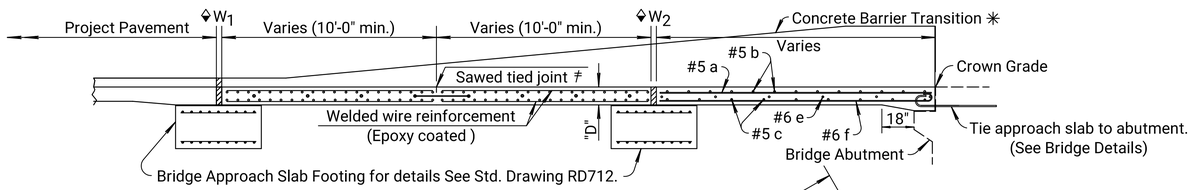
KDOT Graphics Certified

Sh. No. 18

Plotted by : BGS01485 16-DEC-2025 11:55
File : ka680801rss709.dgn

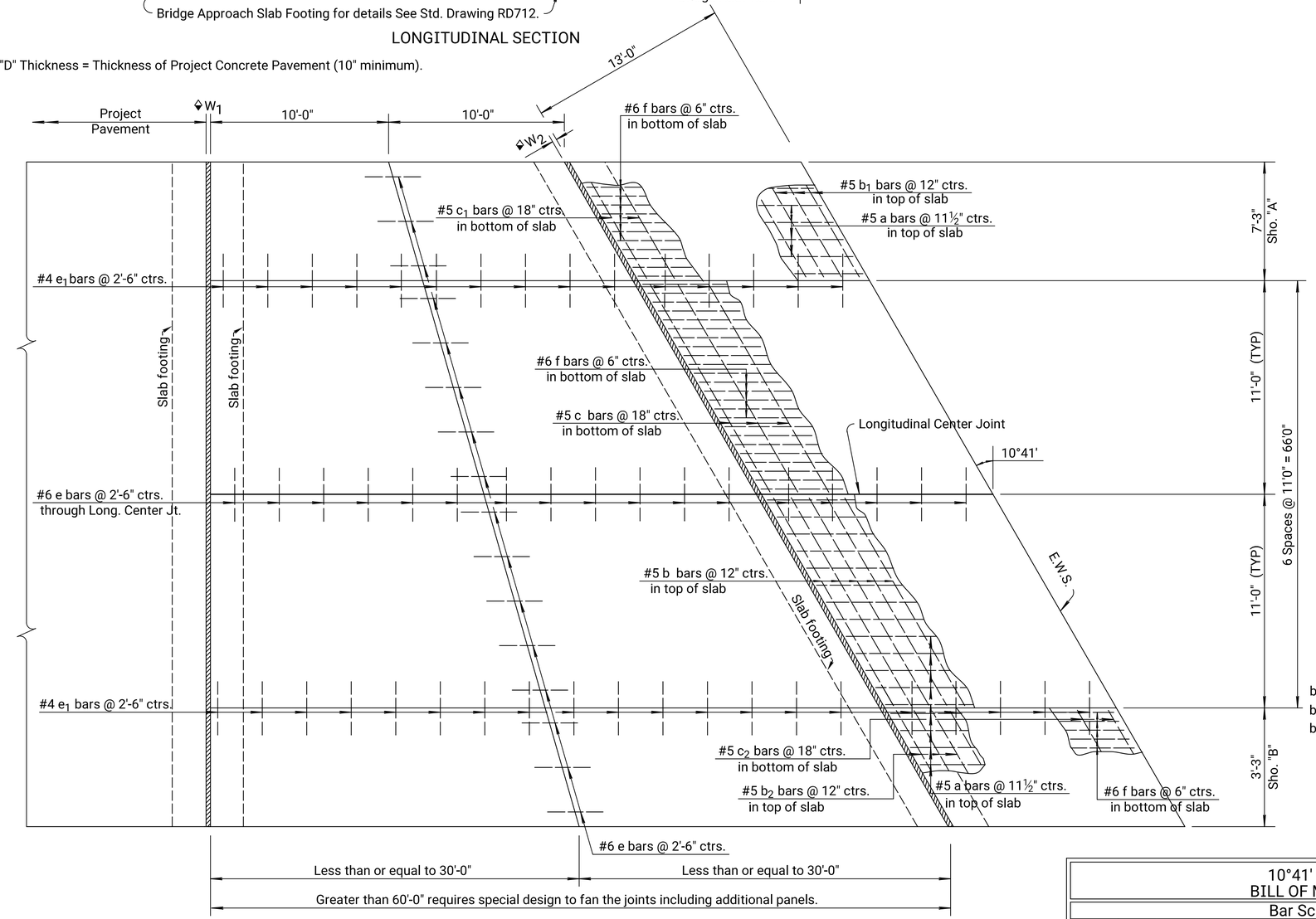
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	19	253

Note to Designer: The designer shall be responsible for designating pavement thickness and computing reinforcing steel and concrete quantities and dimensions necessary to complete this sheet.



LONGITUDINAL SECTION

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



PLAN VIEW

(No Scale)

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

⊗ Measured along the Expansion/Pressure Relief Joint.

✳ For details of Concrete Barrier Transition, See Sh. No. 45.

♦ W_1 and W_2 for Expansion/Pressure Relief Joint width and details See Standard Drawing RD712.

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

GENERAL NOTE

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

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

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

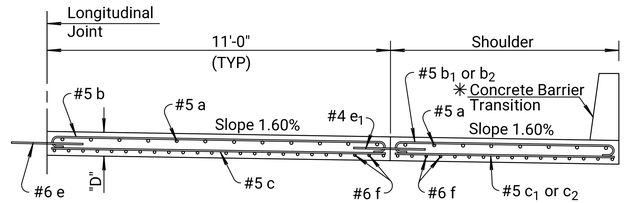
All reinforcing steel shall be epoxy coated.

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

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

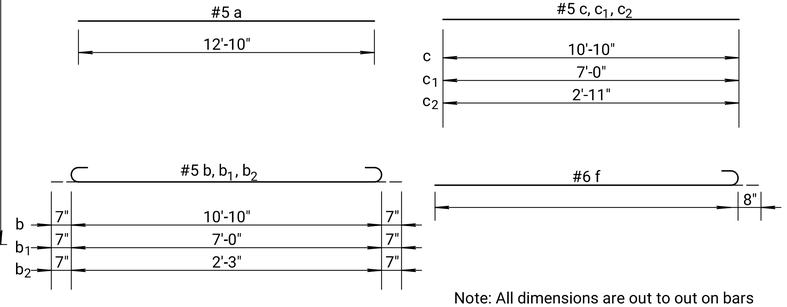
Standard reinforcing bar hooks in accordance with the latest ACI specifications shall be used throughout.

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



TYPICAL PART SECTION

(No Scale)



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

BENDING DIAGRAMS

10°41' Skew
BILL OF MATERIALS

Bar Schedule

Bar	a	b	b_1	b_2	c	c_1	c_2	e	e_1	f	
No.	83	84	14	14	60	9	9	86	32	154	
Size	#5	#5	#5	#5	#5	#5	#5	#6	#4	#6	
Length	12'-10"	12'-0"	8'-2"	4'-1"	10'-10"	7'-0"	2'-11"	3'-0"	3'-0"	13'-6"	

Reinforcing Steel (Grade 60) (Epoxy Coated)	6690 lbs.
Concrete Pavement (10" Unif.)(AE)(Br. App.)	343.8 Sq. Yds.
Expansion Jt. Membrane Sealant ⊗	78 Lin. Ft.
Pressure Relief Jt. Membrane Sealant	77 Lin. Ft.

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

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

KANSAS DEPARTMENT OF TRANSPORTATION

CONCRETE BRIDGE APPROACH PAVEMENT SKEWED APPROACH

~~RD714~~ 10°41' Skew

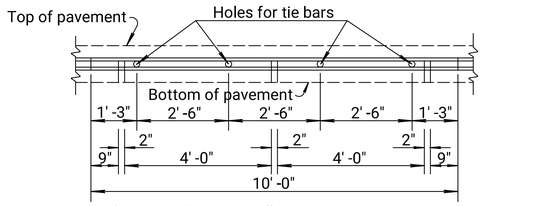
FHWA APPROVAL	05-21-13	APP'D.	James O. Brewer
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 09-19-2025

KDOT Graphics Certified

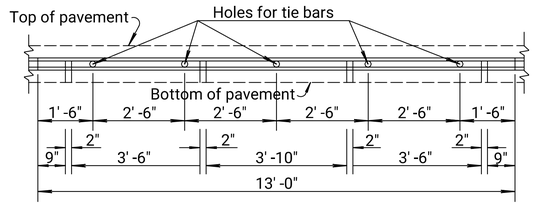
Plotted by : BGS01485 16-DEC-2025 11:55
File : ka680801rss714.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	20	253



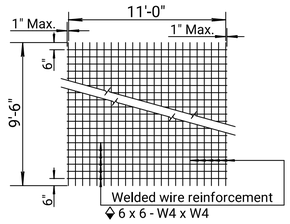
To be used only against forms. Shall not extend through contraction joints.

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



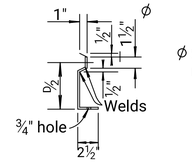
To be used only against forms. Shall not extend through contraction joints.

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



TYPICAL SHEET OF WELDED WIRE REINFORCEMENT
FOR SPECIAL BRIDGE APPROACH PAVEMENT

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



SECTION OF RECESSED
FORM LEG

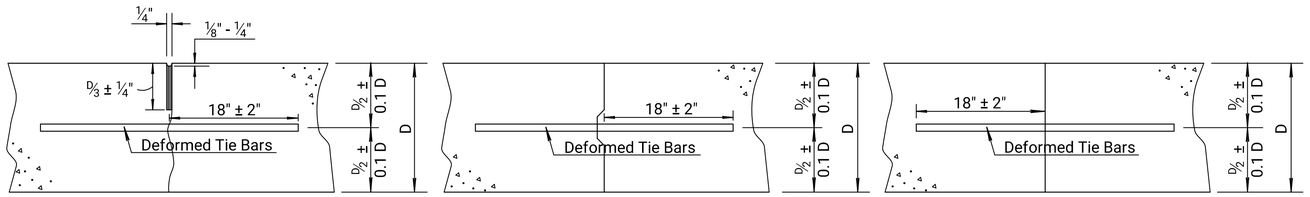
ϕ Snap-in leg or other approved designs may be used in lieu of welded leg.



DETAIL OF LAP FOR WELDED WIRE REINFORCEMENT

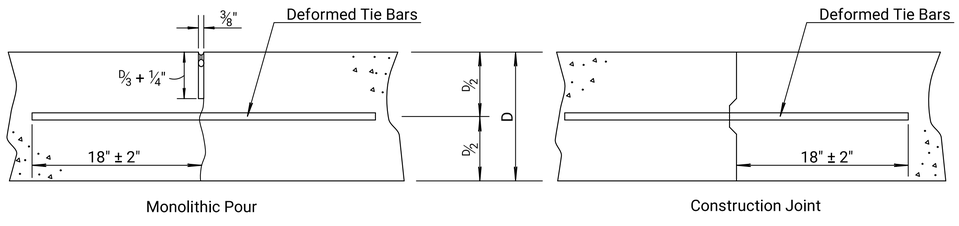
The lap shall extend beyond the first transverse or bag wire of each sheet.

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



LONGITUDINAL JOINTS

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



TRANSVERSE JOINTS

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

GENERAL NOTES

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

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

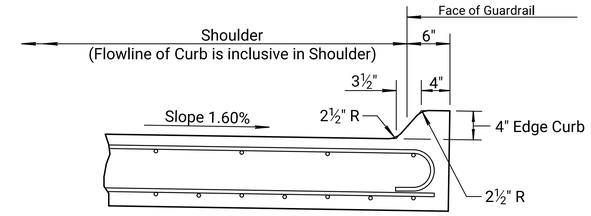
At each planned transverse joint location, a 4 to 6 inch wide strip of the pavement surface shall be protected from the texturing operation to provide a transverse textureless surface centered over the joint sawcut.

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

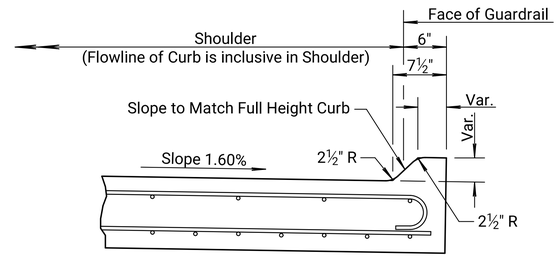
The 4 inch edge curb shall be constructed integral with the approach slab shoulder.

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

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

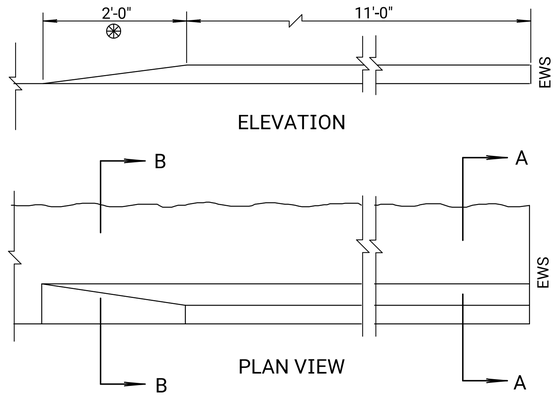


SECTION A-A



SECTION B-B

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



4" EDGE CURB DETAIL

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

KANSAS DEPARTMENT OF TRANSPORTATION

MISCELLANEOUS DETAILS
FOR CONCRETE
BRIDGE APPROACH PAVEMENT

RD711

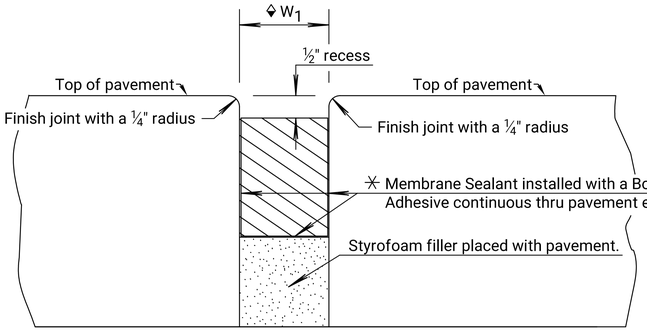
FHWA APPROVAL	10-23-13	APP'D.	James O. Brewer
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

Sh. No. 20

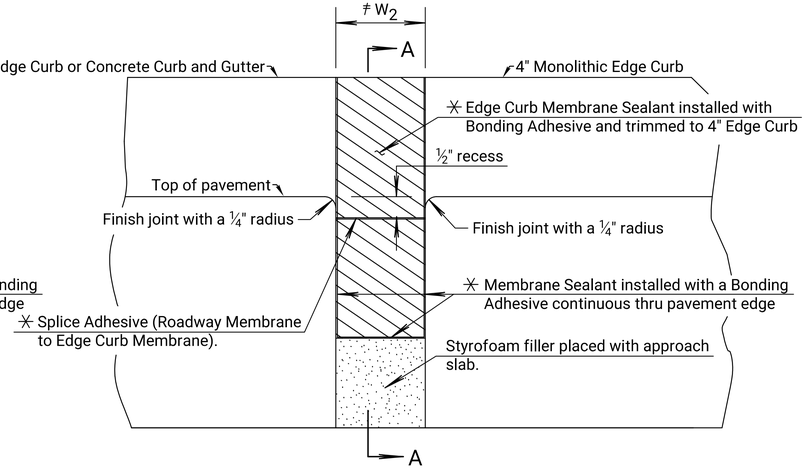
Plotted by : BGS01485 16-DEC-2025 11:56
File : ka680801rss711.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	21	253

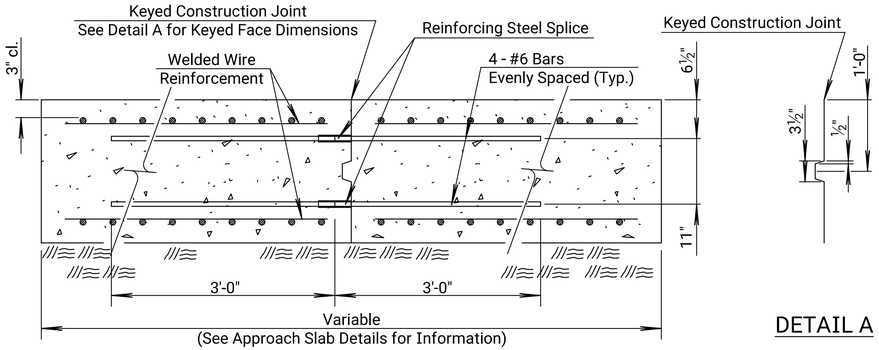
Note to Designer: For Membrane Sealant Expansion Joint on Non-skewed Bridges the maximum length of expansion is: 380' for Steel Bridges, 410' for Concrete Bridges.



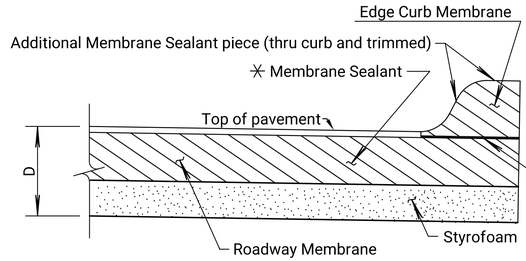
ELEVATION PRESSURE RELIEF JT.



ELEVATION EXPANSION JT.



DETAIL A



SECTION A-A

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

GENERAL NOTES

EXPANSION/PRESSURE RELIEF JOINTS

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

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

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

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

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

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

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

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

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

Use splice materials and methods recommended by the Manufacturer.

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

BRIDGE APPROACH SLAB FOOTING

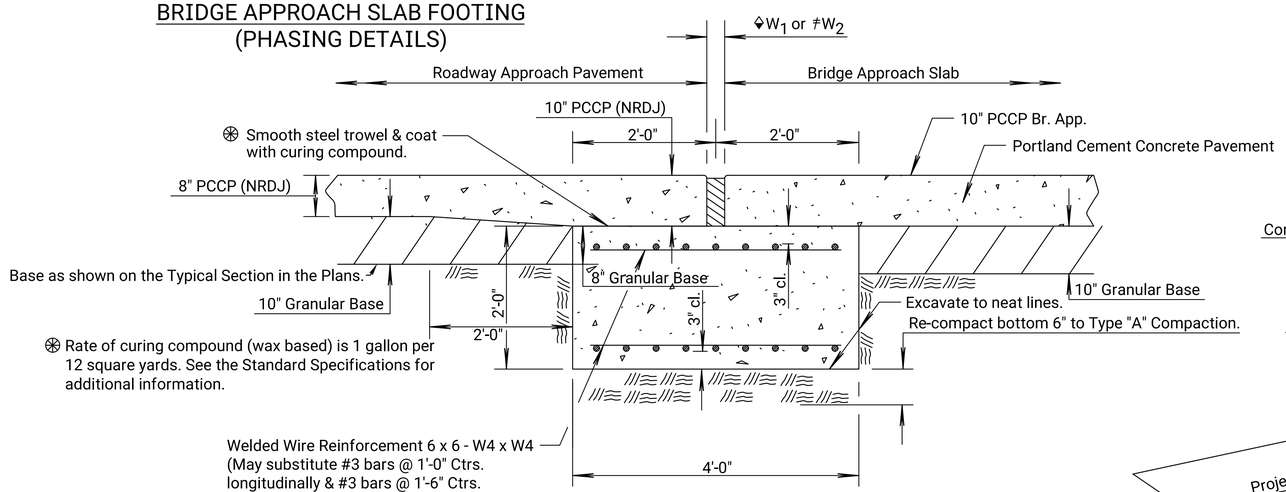
Pay for the Bridge Approach Slab Footing at the unit price bid per cubic yard for "Bridge Approach Slab Footing". This price will be full compensation for furnishing all materials and labor including Concrete Grade 4.0 (AE) Pavement, Reinforcing Steel (Gr. 60) (Epoxy Coated), excavation, Type "A" Compaction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

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

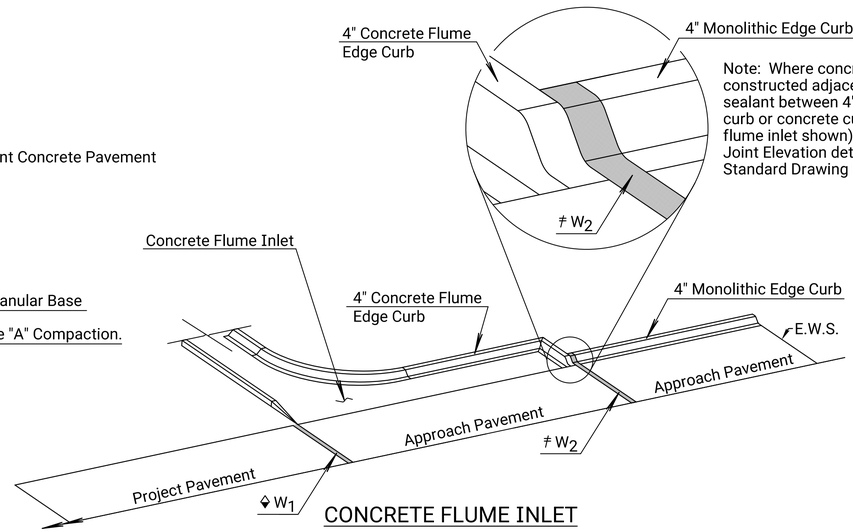
℉ Average Ambient Temperature over previous 24 hours.

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

BRIDGE APPROACH SLAB FOOTING
(PHASING DETAILS)



BRIDGE APPROACH SLAB FOOTING



CONCRETE FLUME INLET

(Membrane Sealant Placed Through Edge Curb Detail)

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

LEGEND

Membrane Sealant

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

KANSAS DEPARTMENT OF TRANSPORTATION

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

~~RD712~~

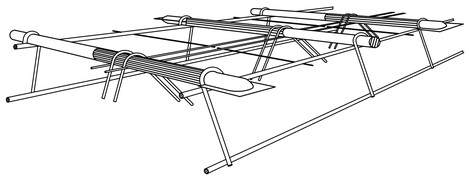
FHWA APPROVAL	02-01-16	APP'D.	Scott W. King
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 09-11-2025 Sh. No. 21

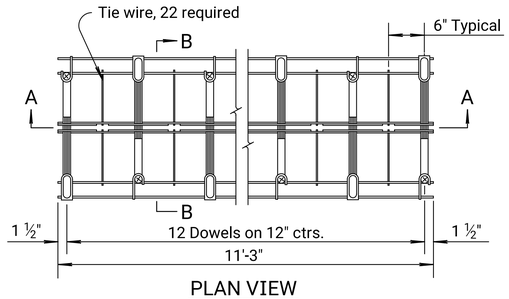
KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 11:56
File : ka680801rss712.dgn

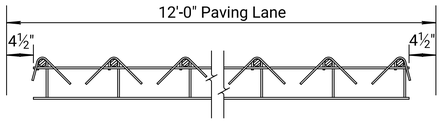
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	22	253



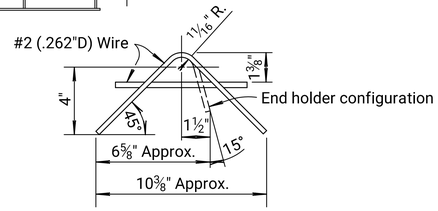
PERSPECTIVE VIEW

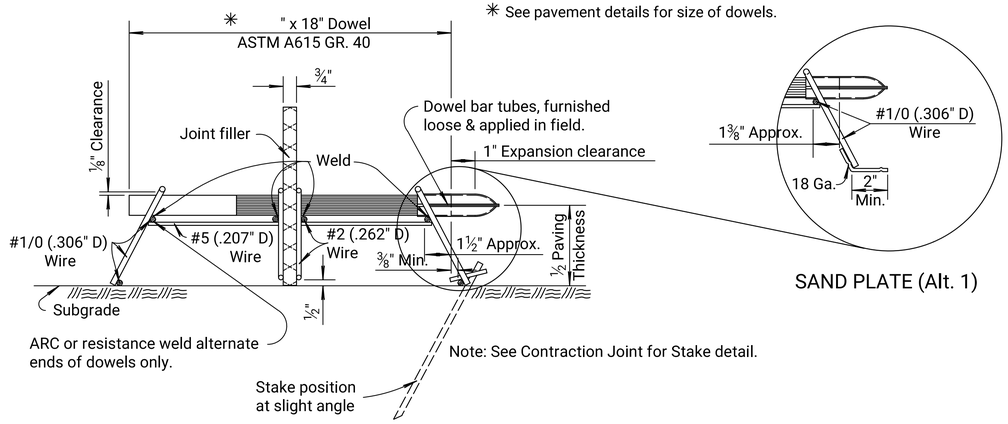


PLAN VIEW



SEC. A-A





SEC. B-B

EXPANSION JOINT

GENERAL NOTE

Coat each dowel bar with an epoxy coating that meets the standard specifications. Uniformly apply the powdered epoxy coating according to accepted practices and the coating manufacturer's recommendations. The coating need not be applied to the end faces of the bars and will not be required within 2" of the end which will be fixed in the supporting bracket by welding.

Cut the dowel bars to length in such a manner to result in no appreciable deformation of the ends.

Dowel Baskets

Wire sizes shown are minimum required.

Stake baskets to subgrade as shown. Use ramset or similar type fastener with clip when subgrade condition requires it.

Sides held together with tie wire, allowing quick separation of sides and insertion of expansion material, provided in the field.

Use one length of Preformed Expansion Joint filler (Type B), or other approved material as determined by the Engineer, cut to fit crown and subgrade for each lane of pavement as expansion joint filler.

Stretch a string line between the pavement forms along the center line of the joint.

Visually inspect bond breaker was applied to the dowel bars in accordance with KDOT's Standard Specifications prior to placing concrete pavement.

Carefully level the entire joint assembly so that the dowels are parallel to the slab surface and free to slide in the dowel holders. Replace any coating scraped off the dowels during assembly.

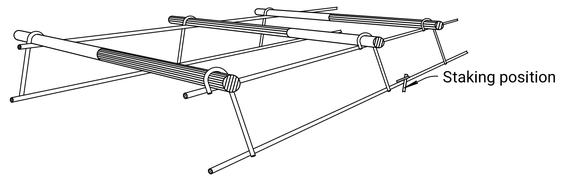
Check each completed contraction joint assembly to be certain the vertical plane of the joint will be perpendicular to the finished surface of the slab and at a right angle with the center line of the slab unless otherwise shown on the plans. Check the dowels to be certain they are level and will remain in a position parallel with the finished surface of the slab.

Place concrete over and adjacent to the joint in accordance with the requirements of the Standard Specifications.

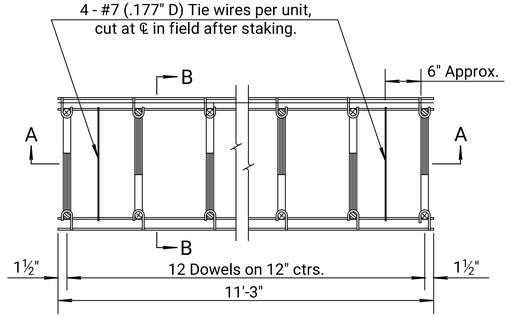
After completion of machine finishing, floating, and straight edging the surface, carefully remove the concrete over the filler and edge the joint with an edger of the proper size.

Install expansion joint material in the field.

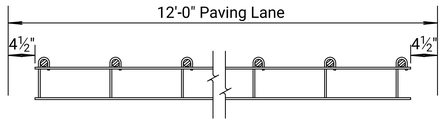
Alternative designs may be used in lieu of the type shown as approved by the Engineer.



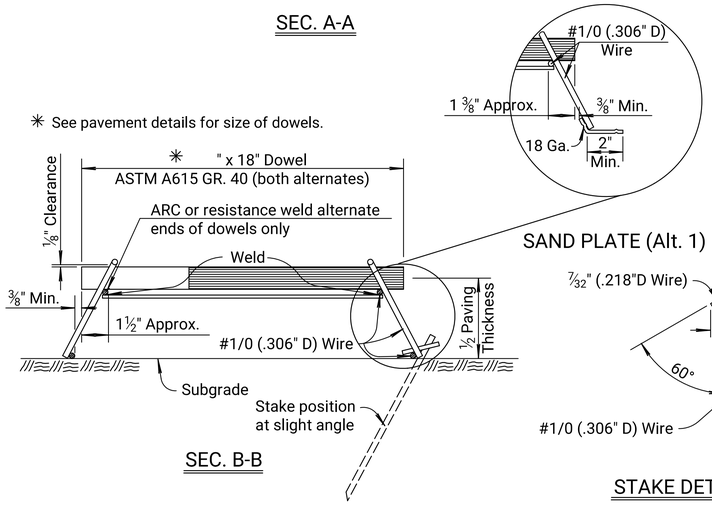
PERSPECTIVE VIEW



PLAN VIEW

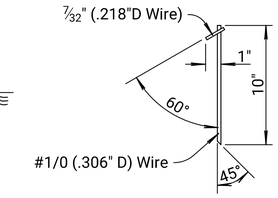


SEC. A-A



SEC. B-B

CONTRACTION JOINT



STAKE DETAIL

(6 Pieces minimum required)

GENERAL NOTE

Coat each dowel bar with an epoxy coating that meets the standard specifications. Uniformly apply the powdered epoxy coating according to accepted practices and the coating manufacturer's recommendations. The coating need not be applied to the end faces of the bars and will not be required within 2" of the end which will be fixed in the supporting bracket by welding.

Cut the dowel bars to length in such a manner to result in no appreciable deformation of the ends.

Dowel Baskets

Wire sizes shown are minimum required.

Stake baskets to subgrade as shown. Use ramset or similar type fastener with clip when subgrade condition requires it.

Stretch a string line between the pavement forms along the center line of the joint. Carefully mark the position of the joint so the saw cut will coincide with the center line of the joint.

Visually inspect bond breaker was applied to the dowel bars in accordance with KDOT's Standard Specifications prior to placing concrete pavement.

Carefully level the entire joint assembly so that the dowels are parallel to the slab surface and free to slide in the dowel holders. Replace any coating scraped off the dowels during assembly.

Check each completed contraction joint assembly to be certain the vertical plane of the joint will be perpendicular to the finished surface of the slab and at a right angle with the center line of the slab unless otherwise shown on the plans. Check the dowels to be certain they are level and will remain in a position parallel with the finished surface of the slab.

Place concrete over and adjacent to the joint in accordance with the requirements of the Standard Specifications.

Alternative designs may be used in lieu of the type shown as approved by the Engineer.

NO.	DATE	REVISIONS	BY	APP'D
09	06-03-15	Rem. Opt., Mechanical Placement	T.T.R.	S.W.K.
08	02-15-06	Chg. Grade 60 to Grade 40 Steel	S.W.K.	J.O.B.
07	05-05-04	Revision on Epoxy coating	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

CONTRACTION & EXPANSION JT. DOWEL ASSEMBLIES

RD735

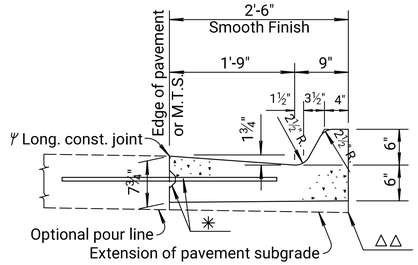
FHWA APPROVAL	03-30-16	APP'D.	Scott W. King
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 05-18-2022

Sh. No. 22

KDOT Graphics Certified

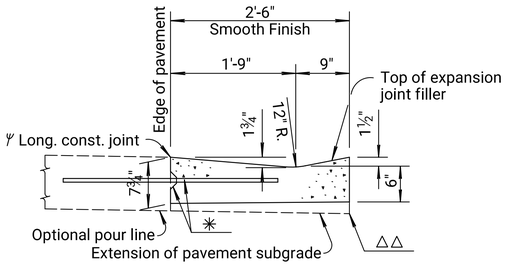
Plotted by : BGS01485 16-DEC-2025 11:57
File : ka680801rss735.dgn



TYPICAL SECTION

Note: Conc. C.&G. I contains 0.060 cu. yds. Conc. Grade 3.0 (AE) per lin.ft.

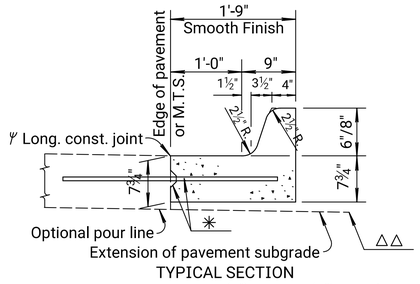
COMBINED CURB & GUTTER - TYPE I (2'-6" WIDTH)



TYPICAL SECTION

Note: Conc. C.&G. II contains 0.053 cu. yds. Conc. Grade 3.0 (AE) per lin.ft.

COMBINED CURB & GUTTER - TYPE II (2'-6" WIDTH)



TYPICAL SECTION

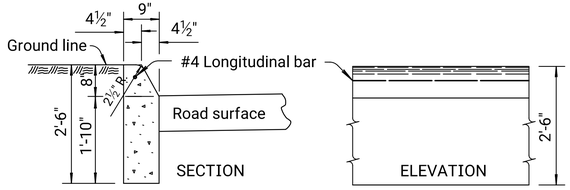
Note: Conc. C.&G. III contains 0.054 (8") & 0.051 (6") cu. yds. Conc. Grade 3.0 (AE) per lin. ft.

COMBINED CURB & GUTTER - TYPE III (1'-9" WIDTH)

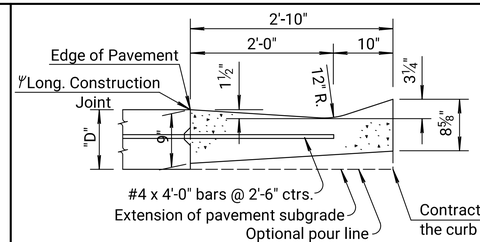
✳ Longitudinal construction joint and #4 x 3'-0" bars @ 2'-6" ctrs., where concrete pavement is constructed.

△△ Contractor has the option of thickening the curb and gutter as shown.

Note: Use Concrete Grade 3.0 (AE) throughout.
All exposed edges shall be finished with an edging tool.
Place a 1" Preformed Expansion Joint Filler (Nonextruding, Type B) at a spacing not to exceed 250'.

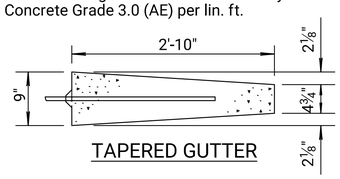


PROTECTION CURB 8"

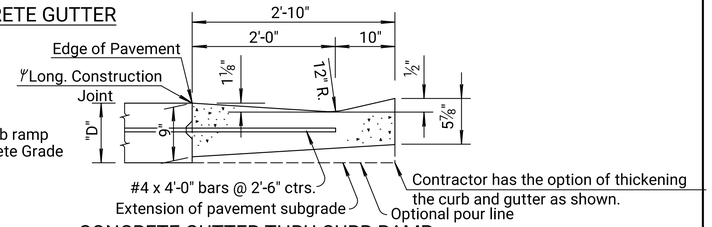


CONCRETE GUTTER

Note: Concrete gutter contains 0.065 cu. yds. Concrete Grade 3.0 (AE) per lin. ft.

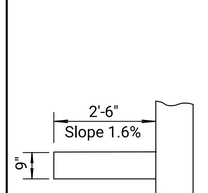


TAPERED GUTTER

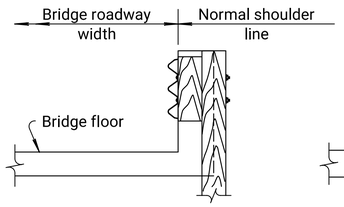


Note: Concrete gutter thru curb ramp contains 0.065 cu. yds. Concrete Grade 3.0 (AE) per lin. ft..

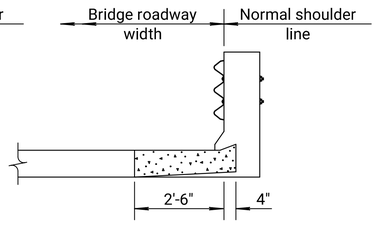
CONCRETE GUTTER THRU CURB RAMP



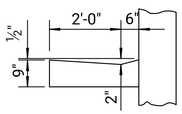
SECTION B-B



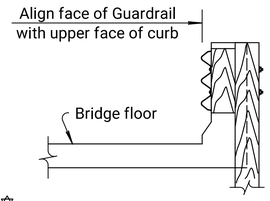
CONTROL POINT FOR FULL WIDTH ROADWAY BRIDGE



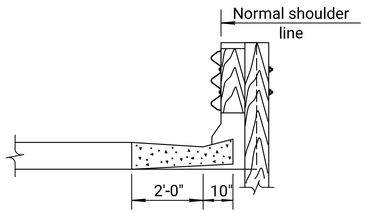
GUTTER NEAR E.W.S.



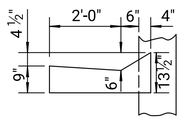
SECTION C-C



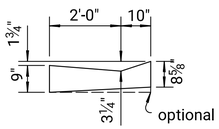
✡ CONTROL POINT FOR BRIDGE WITH SAFETY TYPE CURB



FULL GUTTER SECTION

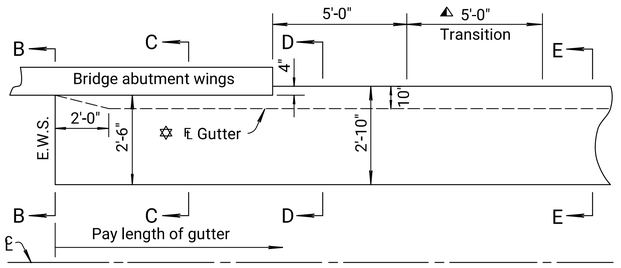


SECTION D-D



SECTION E-E

At locations where the centerline grade is relatively flat and the pavement grade is such that the gutter will direct drainage onto the bridge, the flowline depth may be reduced as directed by the Engineer to facilitate drainage.



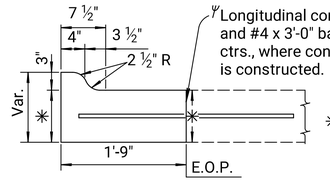
TYPICAL GUTTER @ BRIDGE ENDS

(Drawn for down grade end and "U" Type Abutments)

Note: Shaping of gutter is to be Subsidiary to "Gutter (AE)".

◭ Transition gutter to standard 2'-10" gutter section.

FOR RETROFIT OF BRIDGE APPROACHES WITH GUTTER



✳ Note: Thickness to match adjacent pavement.

COMBINED CURB AND GUTTER (SPECIAL) (1'-9" WIDTH)

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	23	253

GENERAL NOTE

Combined curb and gutter or gutter adjoining concrete pavement may, at the contractor's option, be constructed either monolithically or separately, using either the mix used in the concrete pavement or Concrete Grade 3.0 (AE). The combined curb and gutter or gutter shall have the same section as shown on the plans. If constructed monolithically, the longitudinal joint and tie bars shall be omitted from the combined curb and gutter or gutter. Pavement Joints shall be continued through curb or gutter and no other planes of weakness will be required. Joints in the combined curb and gutter or gutter are to be filled with the same material as used for the pavement joints.

Expansion joints in the combined curb and gutter are to be placed opposite expansion joints in the pavement.

Where combined curb and gutter or gutter does not abut concrete pavement or concrete base course, omit tie bars and place a 1" Preformed Expansion Joint Filler (Type B) cut to the dimensions of the combined curb and gutter or gutter, at a spacing not to exceed 250' and at the ends of curb returns. Planes of weakness shall be constructed at 10'-0" intervals.

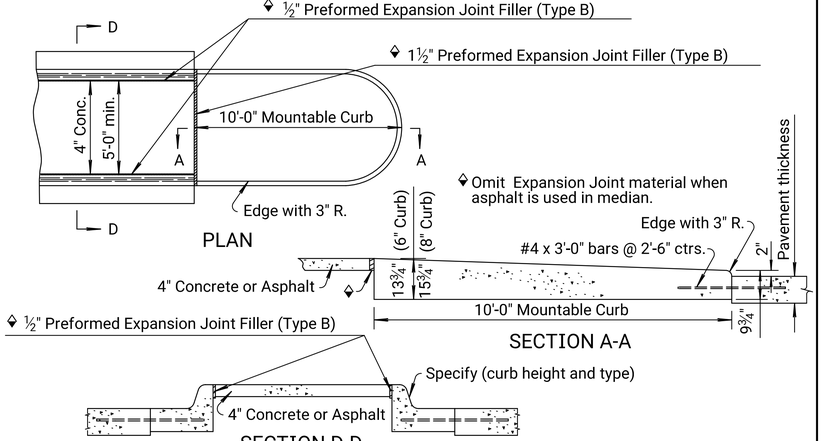
A 4' length of transition from normal gutter section to the tapered gutter section shall be used at the ends of each run of gutter except where the gutter abuts a curb, such as at the end of a bridge. Inlets shall be located so as not to fall within this transition section.

Where pressure relief joint is placed across the pavement, and gutter or curb and gutter is continued on for more than 10', use 4"x4" membrane sealant installed with bonding adhesive through gutter section, shaped to fit gutter or curb and gutter. See Std. Drawing RD712.

For expansion joint treatment where combined curb and gutter or gutter abuts a bridge wing on a U-type abutment see bridge drawings.

Longitudinal joints shall be sawed and sealed with joint sealant, see Standard Specifications.

℄ If constructed monolithically, the longitudinal joint is not required.



Note: Expansion joints shall be placed in concrete median as follows. In long runs expansion joints Expansion joints in the median shall match expansion joints in the curb and gutter with a maximum spacing of 125'. Plane of weakness in the median shall match plane of weakness in curb and gutter.

TYPICAL NOSE DETAILS FOR RAISED MEDIANS

Note: Additional Concrete Grade 3.0 (AE) needed to complete median nose shall be subsidiary to the bid item "Combined Curb & Gutter".

NO.	DATE	REVISIONS	BY	APP'D
20	02-23-17	Det., Conc. Gutter Thru Curb Ramp	T.T.R.	S.W.K.
19	01-29-13	Added Detail, Comb. C&G (Sp.)	S.W.K.	J.O.B.
18	08-13-12	Revised General Note	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

CURB, GUTTER AND COMBINED CURB & GUTTER

RD635

FHWA APPROVAL	03-07-17	APP'D.	Scott W. King
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 05-27-2022

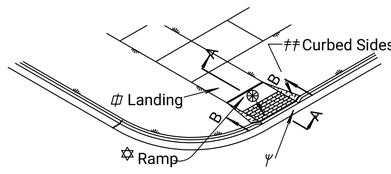
Sh. No. 23

KDOT Graphics Certified

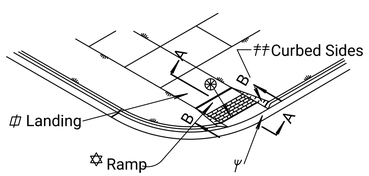
Plotted by : BGS01485 16-DEC-2025 11:57
File : ka680801rss635.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	24	253

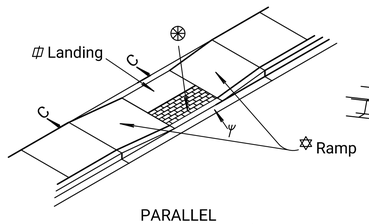
Note to Designer: Placing newly constructed curb ramps through curb radii should be avoided wherever practicable. The use of Parallel Curb Ramp Thru Curb Radius (Alt. Type 2) should be avoided wherever practicable. Review locations of fixed objects. Placing fixed objects in conflict with sidewalk and ramps should be avoided. Fixed objects may include, but are not limited to, fire hydrants, utility cabinets, drainage structures, manholes, inlets, signal poles, and utility poles.



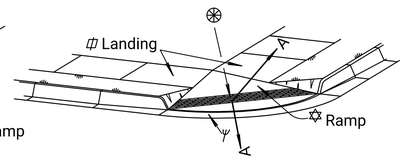
PERPENDICULAR
CURB RAMP (TYPE I)



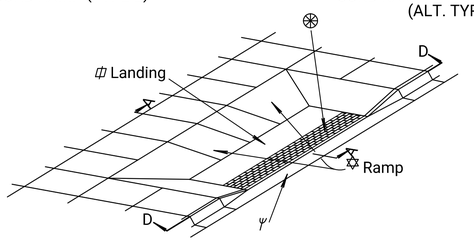
PERPENDICULAR
CURB RAMP THRU CURB RADIUS
(ALT. TYPE I)



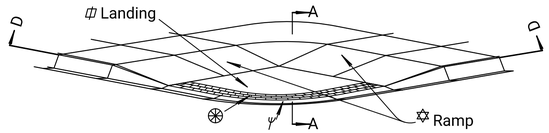
PARALLEL
CURB RAMP (TYPE 2)



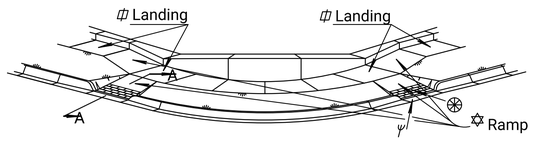
PARALLEL
CURB RAMP THRU CURB RADIUS
(ALT. TYPE 2)



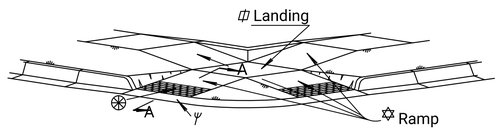
BLENDED TRANSITION
(TYPE 3)



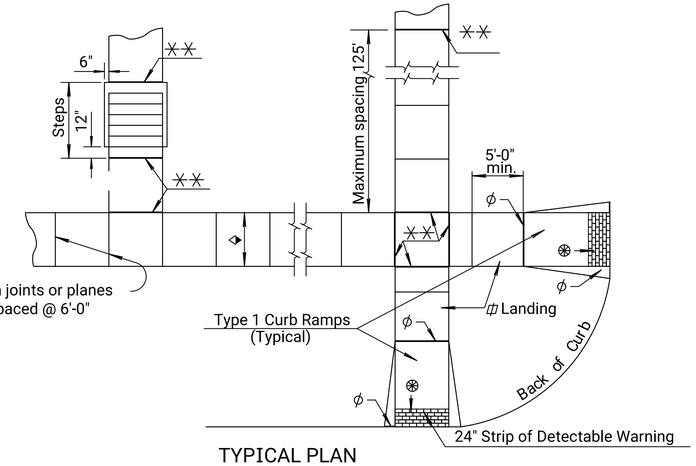
BLENDED TRANSITION
THRU CURB RADIUS (ALT. TYPE 3)



COMBINATION PERPENDICULAR/PARALLEL
CURB RAMP (TYPE 4)



COMBINATION PERPENDICULAR/PARALLEL
CURB RAMP (ALT. TYPE 4)



TYPICAL PLAN

ϕ Expansion Joint (¾" Redwood board) placed at either back of curb line, at sidewalk back of curb line, or at sidewalk line. Alternate expansion joint material may be used as approved by the Engineer.

⚹⚹ Expansion joint (¾" Redwood board) located as shown. Alternate expansion joint material may be used as approved by the Engineer.

⧫ The minimum width of newly constructed sidewalk is 5'-0". Where existing conditions prohibit the use of 5'-0" wide sidewalk, 4'-0" wide sidewalk may be used. Where sidewalk width is less than 5'-0" construct 5'-0" x 5'-0" passing spaces located at 200' intervals (max) as shown in the Passing Space Detail. In general, where new sidewalk is constructed parallel or adjacent to a roadway the sidewalk running slopes will match the grade of the adjacent roadway.

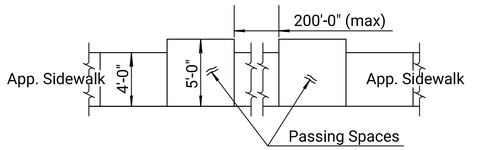
✡ New construction ramp running slopes are 5% (min) to 8.3% (max). Ramp slopes for blended transitions are 5% or flatter. The maximum allowable ramp cross slope is 2% or flatter. Match the ramp width to the width of the approach sidewalk. Curb ramp lengths will vary with curb height. Curb ramp lengths are 5'-0" (min) to 15'-0" (max). All other ramp lengths are 5'-0" (min) to 30'-0" (max). Where roadway grades are relatively flat and curb ramp lengths will exceed 15'-0", ramps may be constructed in succession to tie into existing sidewalk. Maintain ramp slopes and dimensions as previously stated and install a landing between successive ramp runs.

⎅ Use a landing slope of 2% or flatter. Landings are the same width as ramps and adjacent sidewalk with a length measured in the direction of the street crossing of 5'-0" (min). Landings are not required where the ramp running slope is 5% or flatter.

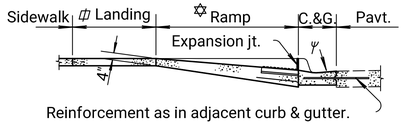
ψ Use a counter slope of 5% or flatter at the base of curb ramps. Refer to Standard Drawing RD725A for additional curb and gutter details.

⊛ Detectable warning installation is typical and required on Perpendicular Ramps (Type 1), Parallel Ramps (Type 2), Blended Transitions (Type 3), median ramp crossings with widths greater than or equal to 6'-0", and other locations as shown in the plans. Install detectable warnings parallel to pedestrian travel except where otherwise shown in the plans. See Standard Drawing RD725A for additional details.

‡‡ Use flared sides in place of curbed sides as shown in Flared Side Alt. when not located adjacent to landscaping, street furniture, chains, fencing, or railing. Curbed sides are not permitted within the pedestrian access route. See PROWAG for pedestrian access route definition.

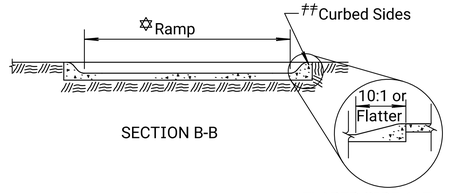


PASSING SPACE
DETAIL



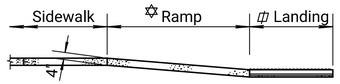
Reinforcement as in adjacent curb & gutter.

SECTION A-A

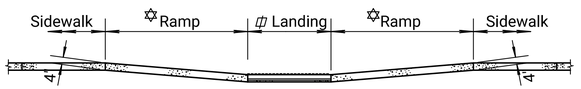


SECTION B-B

FLARED SIDE ALT.



SECTION C-C



SECTION D-D

GENERAL NOTES

Construct sidewalk and ramps in accordance with the current Public Rights of Way Accessibility Guidelines (PROWAG).

The details depicted here may not be appropriate for all locations. Construct to meet this criteria on all roadway alteration projects as defined by the Department of Justice/ Department of Transportation Joint Technical Assistance on ADA Title II Requirements. For an existing sidewalk facility where the sidewalk will be replaced, replace sidewalk in accordance with PROWAG.

Details shown on this sheet apply to newly constructed and existing sidewalk and ramps where roadway alteration projects take place. See KDOT's Standard Specifications for additional information.

Provide ramps at all corners of street intersections where there is an existing or proposed sidewalk and curb. Provide curb ramps at mid-block walk locations for hospitals, medical centers, and athletic stadiums.

Locate ramps as shown on the plans or as directed by the Engineer.

Do not place drainage structures in line with ramps except where existing drainage structures are being utilized in the new construction. Ramp locations should take precedence over the location of drainage structures. Where existing manhole access lids are located on ramps within the area of the detectable warnings and the manhole lid cannot be removed or relocated; install a lid with a detectable warning surface in accordance with PROWAG. Limit drainage across ramps where practicable.

Construct ramps with uniform grade free of sags and short grade changes.

Place ¾" Redwood expansion joints flush with the surface at a maximum spacing of 125'. Place ¾" Redwood expansion joints at sidewalk junctions, see plan details. Where sidewalk abuts a curb place ¾" Redwood board expansion joint flush with the surface.

Place ½" premolded (Type B or C) joint filler where sidewalk is parallel and adjacent to a rigid surface.

⚠ Place sidewalk shown to be constructed in back of an entrance 6" thick with welded wire mesh reinforcement. Gauge and spacing of wires are the same as entrance pavement (See Reinforcement Diagram). The bid item will be "Sidewalk Construciton" either with or without air entrainment. Macro fiber reinforcement may be substituted for welded wire. See KDOT's Standard Specifications for additional information. Slope sidewalk toward the street at 2% or flatter. Slope or depress sidewalk where necessary to fit alleys and entrances, see plans for details.

Contractor may opt to use Concrete Grade 3.0 (AE) throughout for construction of steps, but all work and materials are paid for under the bid item "Grade 3.0 Conc. (Misc.)".

All work and materials needed to construct sidewalk will be paid for under the bid item "Sidewalk Construction".

All work and materials needed to construct ramps will be paid for under the bid item "Sidewalk Ramps".

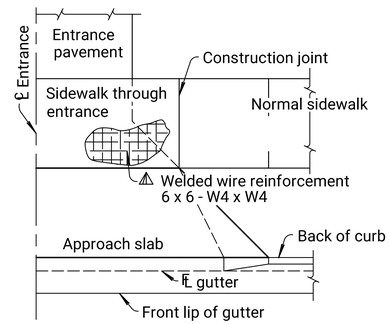
See Standard Drawing RD725A for additional information.

Ramps shall be present at each end of a crosswalk.

For handrails with steps see Standard Drawing RD725B for details.

For handrails with ramps see Standard Drawing RD725C for details.

For alley and entrance pavement see Standard Drawing RD726 for details.



REINFORCEMENT DIAGRAM
SIDEWALK THROUGH ENTRANCE

NO.	DATE	REVISIONS	BY	APP'D
13	10-31-17	Joint Filler Type C Added	A.L.R.	S.W.K.
12	02-23-17	Rev. Ramp Typ., Gen. Note, & Details	T.T.R.	S.W.K.
11	10-17-11	Revised General Note	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

SIDEWALKS, RAMPS, & STEPS

RD725

FHWA APPROVAL	03-05-18	APP'D.	SCOTT W. KING
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

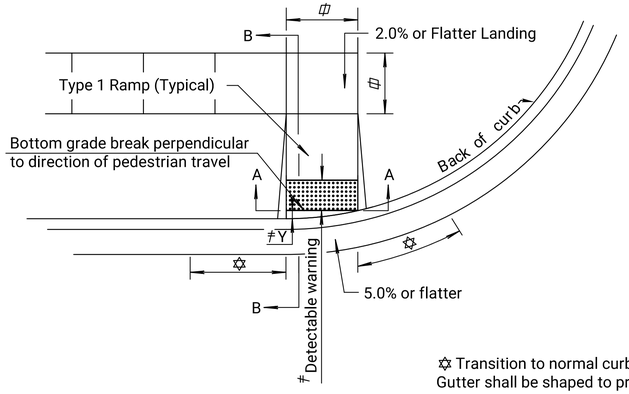
KDOT Graphics Certified 11-13-2024

Sh. No. 24

KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 11:58
File : ka680801rss725.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	25	253

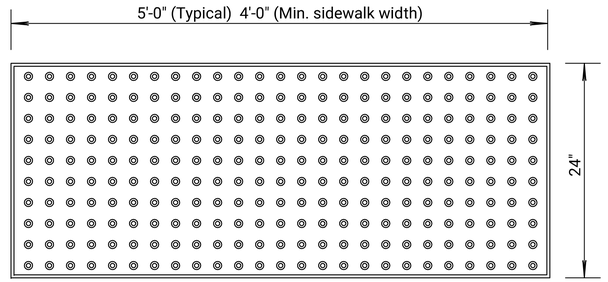


TYPICAL PLAN

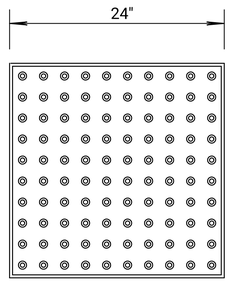
✡ Transition to normal curb and gutter section. Gutter shall be shaped to provide positive drainage.

⌀ See Standard Drawing No. RD725 for additional details.

≠ When the dimension "Y" from the back of curb to the bottom ramp grade break is greater than 5'-0" or the ramp is not located through a curb radius, place detectable warning at the back of curb. Otherwise, place detectable warning at the bottom grade break as shown.



ϒ COMPOSITE PANEL with TRUNCATED DOMES



ϒ PRESTRESSED RAMP PANEL with TRUNCATED DOME SURFACE

GENERAL NOTES

Construct sidewalk and ramps in accordance with the current Public Rights of Way Accessibility Guidelines (PROWAG).

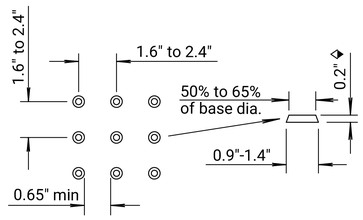
Details depicted here may not be appropriate for all locations. Design to meet this criteria on all roadway alteration projects as defined by the Department of Justice/ Department of Transportation Joint Technical Assistance on ADA Title II Requirements. For an existing sidewalk facility where the sidewalk will be replaced, replace sidewalk according to this drawing to the maximum extent feasible.

Install detectable warning surfaces at all ramp locations unless otherwise shown. Do not install detectable warning surfaces through residential driveway crossing locations. Use Paving Brick, Prestressed or Composite Panel (Truncated Dome Surface) units that meet the requirements of the Standard Specifications and comply with PROWAG. Use a contrasting color paving brick or panel to adjacent surfaces. Where existing manhole access lids are located on ramps within the area of the detectable warnings and the manhole lid cannot be removed or relocated, install a lid with a detectable warning surface in accordance with PROWAG.

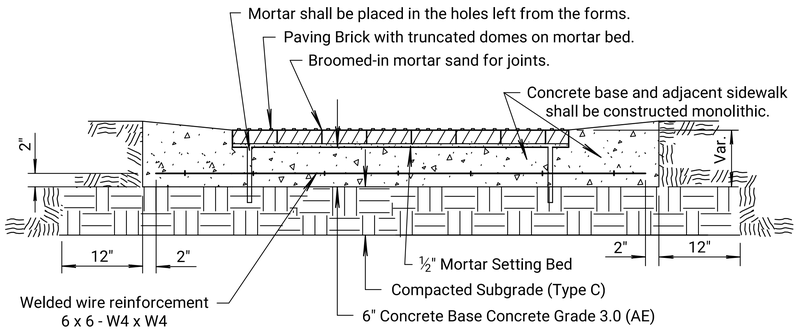
Cover the ramp width and 24" length with truncated dome surface, see examples Standard Drawing RD725 & RD725A. Saw cut (only) bricks or panels with not less than 25% of a full brick or panel installed. Place Truncated Dome Bricks or Panels to align parallel in the direction of pedestrian travel unless otherwise shown in the plans.

Prestressed or Composite Panels are installed in fresh concrete, Paver Bricks require mortar bed and mortar sand, see KDOT's Standard Specifications for information.

All work and materials needed to install detectable warnings will be paid for under the bid item "Sidewalk Ramps (Detectable Warning)".

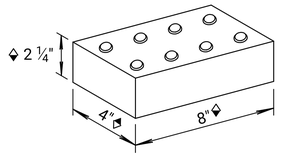


TRUNCATED DOME DIMENSIONS for SQUARE PATTERN (Parallel Alignment)

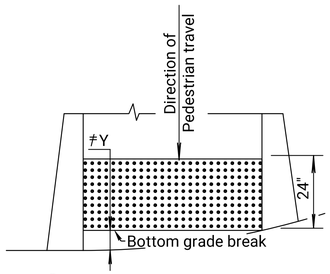


TYPICAL SECTION OF PAVER BRICK
SECTION A-A

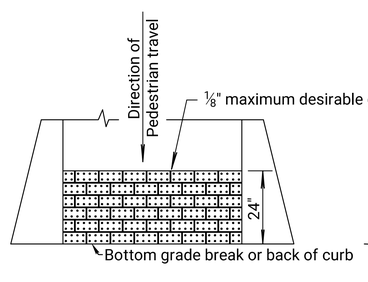
♦ These dimensions are nominal.



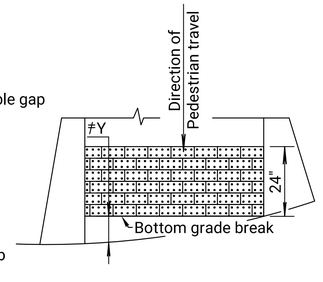
ϒ PAVER BRICK WITH TRUNCATED DOME SURFACE



⊗ CURB RADIUS DETAILS
Cut Prestressed Ramp Panels to fit.



▬ STRAIGHT CURB DETAILS

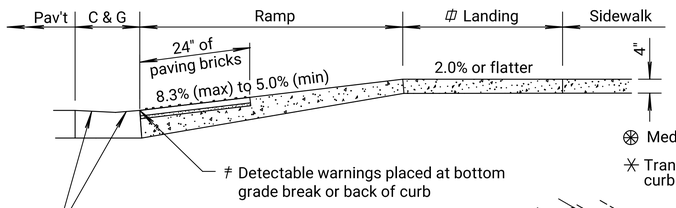


▬ CURB RADIUS DETAILS

▬ Installation shown for paving brick is running bond, use of other patterns is allowed with Engineer approval. Rotation 90° of Running Bond pattern is allowed to reduce space between bricks on curb radius installation, keep this space to a minimum. Place truncated domes on bricks in parallel alignment to pedestrian travel as shown.

⊗ Curb radius or greater than 5' ramp width will require more than one panel as approved by the Engineer. Limit number of panels installed at each site. Layouts shown are for example and may vary in the field.

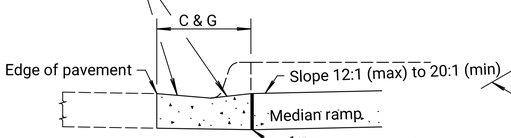
ϒ Acceptable with no mixing of types within an installation.



SECTION B-B

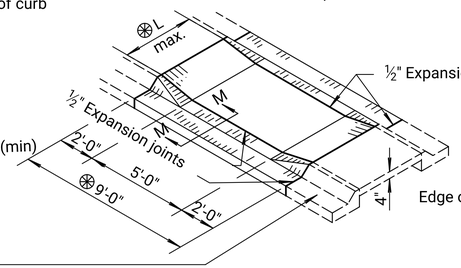
⊛ Median ramp crossing limits will be paid for as "Sidewalk Ramp."

⚹ Transition Combined Curb & Gutter Type III (AE) through curb ramp as shown.



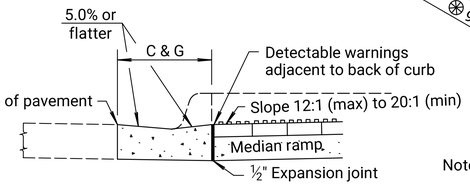
SECTION M-M

⚹ Combined Curb & Gutter Type II (AE) unless shown otherwise on plans.

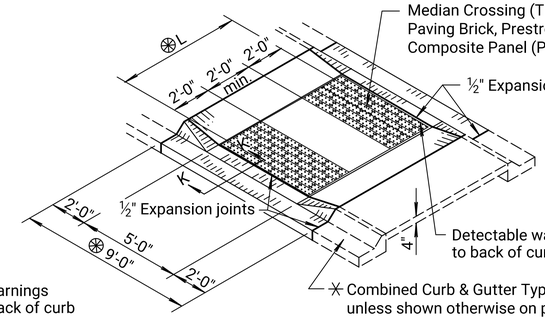


NARROW MEDIAN RAMP CROSSING
(L < 6'-0")

Note: A Median Ramp Crossing shall be constructed at Crosswalk locations. Do not install detectable warnings on narrow median ramp crossings.

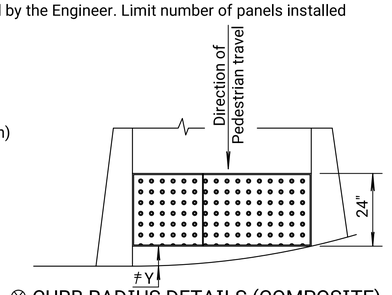


SECTION K-K



WIDE MEDIAN RAMP CROSSING
(L ≥ 6'-0")

Note: A Median Ramp Crossing shall be constructed at Crosswalk locations. Wider median islands will result in a 2' minimum gap between the detectable warning areas.



⊗ CURB RADIUS DETAILS (COMPOSITE)

Where truncated domes are placed through a curb radius, cut radius from 3'-0" long composite panel.

NO.	DATE	REVISIONS	BY	APP'D
05	02-23-17	Rev. Gen. Note & Panel Det.	T.T.R.	S.W.K.
04	02-10-10	Added Composite Panel	S.W.K.	J.O.B.
03	08-15-05	Added Prestressed Ramp Panel alt.	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

AUXILIARY DETAILS FOR SIDEWALK & STEPS

RD725A

FHWA APPROVAL	03-07-17	APP'D.	Scott W. King
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

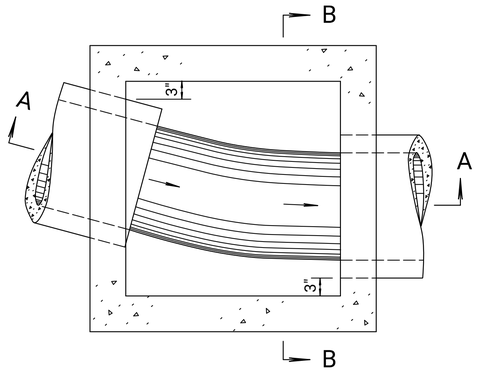
KDOT Graphics Certified 05-18-2022

Sh. No. 25

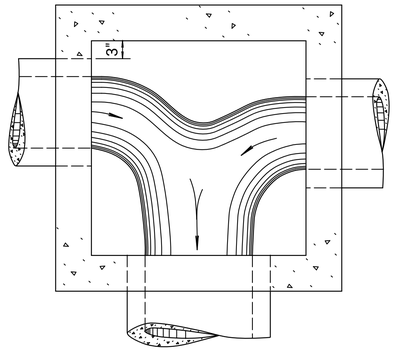
KDOT Graphics Certified

Plotted by: BGS01485 16-DEC-2025 11:58
File : ka680801rss725a.dgn

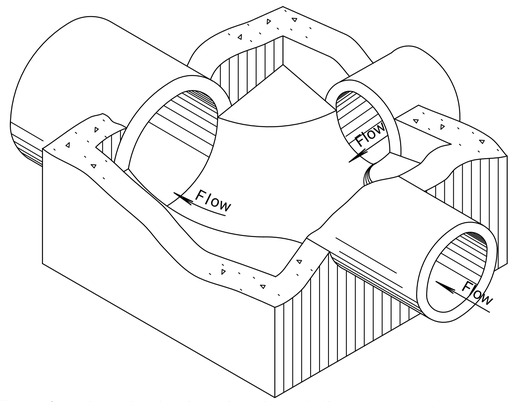
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	26	253



PLAN - FLOOR (Example I)



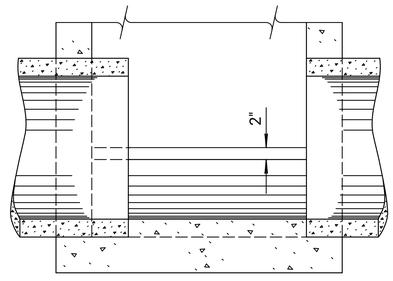
PLAN - FLOOR (Example III)



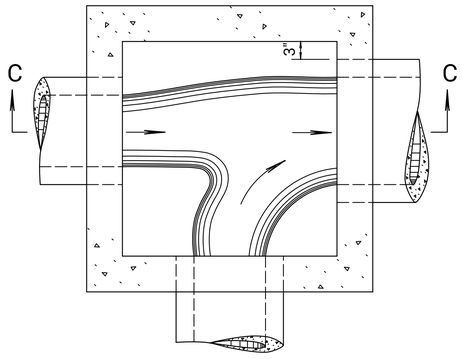
Floor of manhole shall be shaped as shown in the examples to increase hydraulic efficiency.

ISOMETRIC VIEW (Example IV)

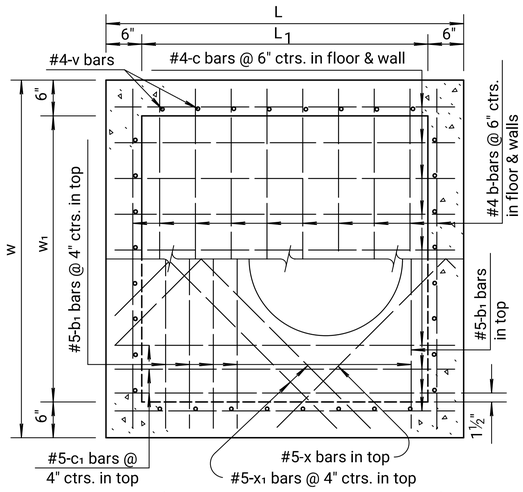
Note: Use Concrete Grade 3.0 throughout. All exposed edges shall be finished with an edging tool.
At the contractors option Concrete Grade 3.0 (AE) or mix used in concrete pavement may be used throughout.
In general, pipes will enter and leave manhole at various positions. Where possible bend bars around pipes.
Floor of manhole shall be shaped as shown in various "EXAMPLES" with unreinforced Concrete Grade 3.0.
Manhole opening and steps, where used, shall be placed to afford easy access to top of shaped invert. Top reinforcing bars shall be adjusted accordingly.
All castings shall be gray iron and shall comply with the KDOT Standard Specifications.
No deductions in concrete quantities shall be made for pipe openings or additions to concrete quantities shall be made for shaping floor of manholes.
The top of the manhole shall be sloped slightly to approximately fit the ground line or other condition as directed by the Engineer.
Dimensions and weights of cast iron as shown on this sheet are minimum. Larger dimensions and/or heavier weights of cast iron may be used.
The Contractor has the option of using precast manholes, as approved by the Engineer.
Steps shall be installed in all manholes when specified in the plans or when "H" is equal to or greater than six feet. Steps shall comply with the requirements of the KDOT Standard Specification.



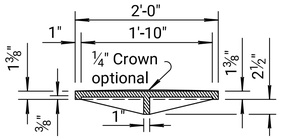
SECTION A-A (Example I)

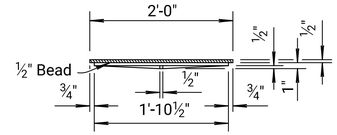


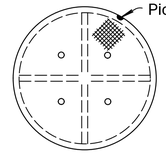
PLAN - FLOOR (Example IV)



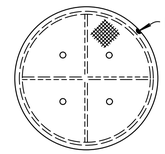
PLAN (Showing top & floor reinf.)





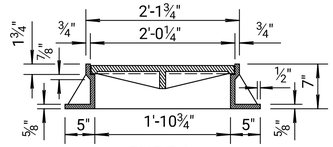


NOTE: All manhole castings are cast iron. Weight of castings includes no allowance for fillets and overruns.

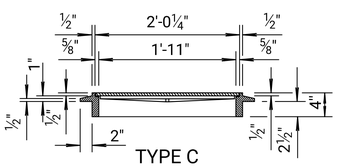


MANHOLE COVER TYPE A & B
(Weight=134 lbs.; without ¼" Crown= 125 lbs.)

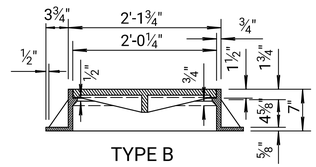
MANHOLE COVER TYPE C
(Weight= 64 lbs.)



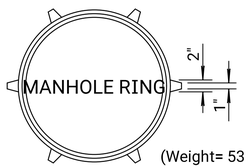
TYPE A



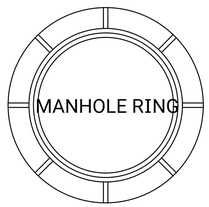
TYPE C



TYPE B

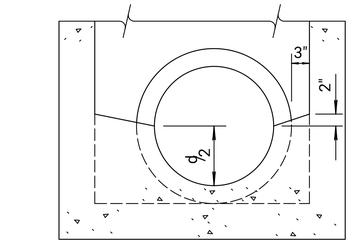


(Weight= 53 lbs.)

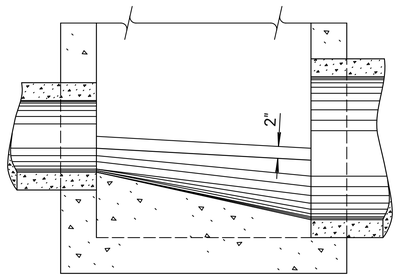


(Type A Ring= 192 lbs., Type B Ring= 198 lbs.)

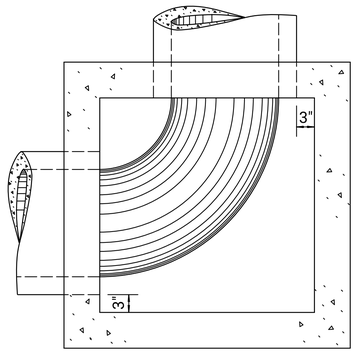
HEAVY TYPE
MANHOLE COVER AND RING
Note: Either Type A or Type B may be used.



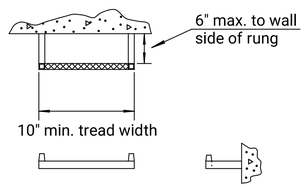
SECTION B-B (Example I)



SECTION C-C (Example IV)

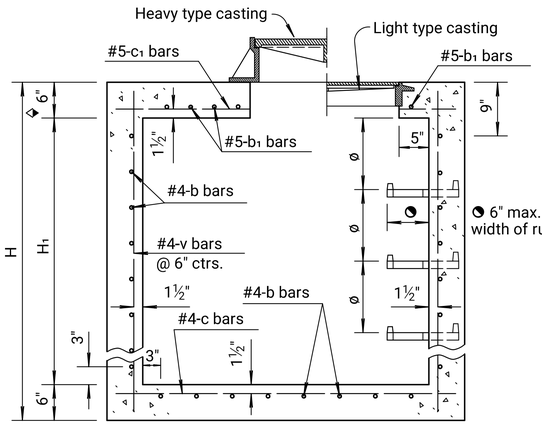


PLAN - FLOOR (Example II)



STEP DETAILS

ø Steps shall be uniformly spaced. Spacing shall be 12" minimum and 16½" maximum.



◆ Where dimension "L" or "W" is greater than 6'-0" use 8" slab thickness.

SECTION (Exclusive of floor shaping)

✳ LIGHT TYPE
MANHOLE COVER & RING
✳Rings with four equally spaced lugs will be permitted.

NO.	DATE	REVISIONS	BY	APP'D
32	07-17-17	Changed step dimensions	A.L.R.	S.W.K.
31	01-28-05	Changed Class to Grade concrete	S.W.K.	J.O.B.
30	12-12-97	Revised step spacing	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

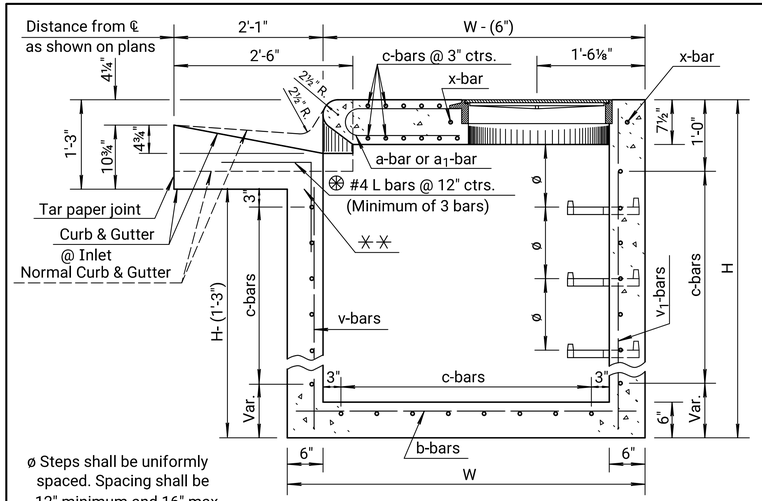
REINFORCED
CONCRETE MANHOLE

RD633

FHWA APPROVAL		08-09-17	APP'D.	Scott W. King
DESIGNED	DETAILED	QUANTITIES	TRACED	
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.	

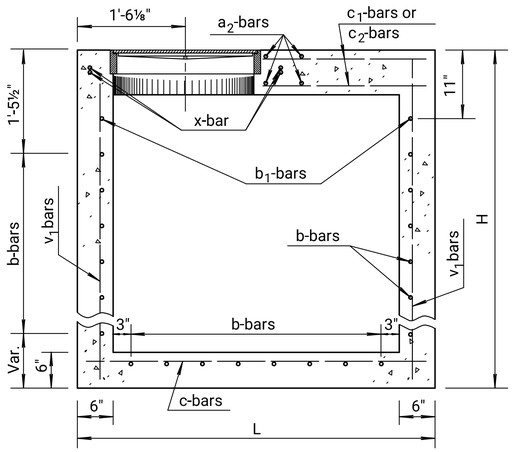
Plotted by : BGS01485 16-DEC-2025 11:59
File : ka680801rss633.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	27	253

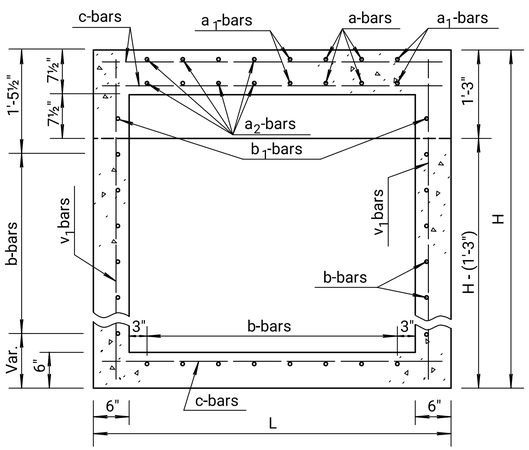


ø Steps shall be uniformly spaced. Spacing shall be 12" minimum and 16" max.

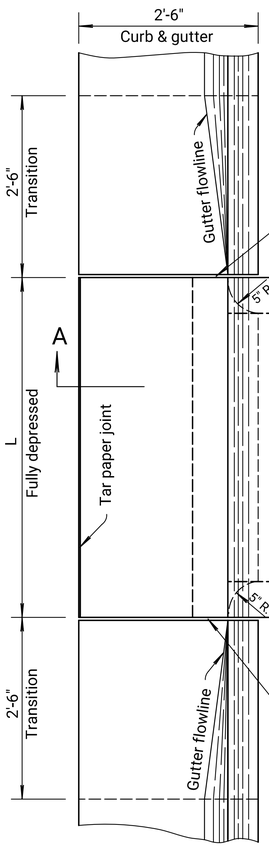
SECTION A-A



SECTION B-B



SECTION C-C



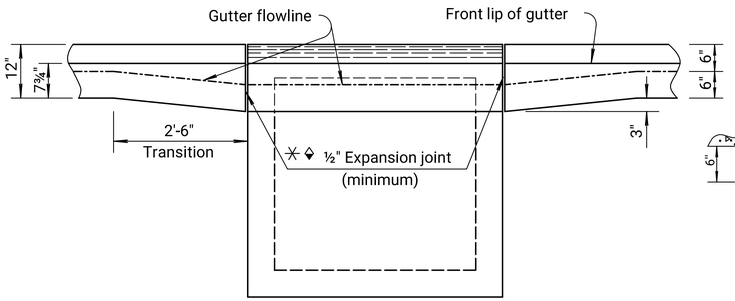
⊛ At the contractor's option, gutter may be constructed continuous, L bars omitted, and a ½" Expansion joint installed between gutter and face of inlet and between curb and side of inlet with a tar paper joint between bottom of gutter and top of wall. In this method of construction, the inlet shall be completely free of the gutter and curb.

♦ ½" Expansion joint (minimum)

♦ ½" Expansion joint (minimum)

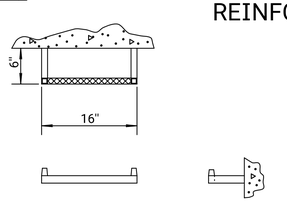
♦ Hot or cold poured joint sealing compound, or premolded Expansion Joint Filler (Type B or C).

PLAN

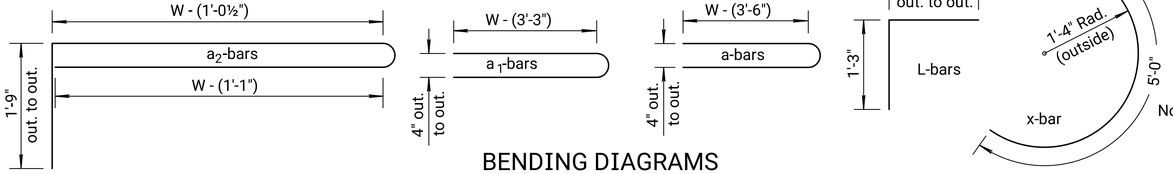


ELEVATION

Note: Transition gutter from normal depth of 6" to 9" at inlet in 2'-6". Curb and Gutter sections shall be shaped as shown where required by the installation of curb inlets. This work will be subsidiary to other bid items.



STEP DETAILS

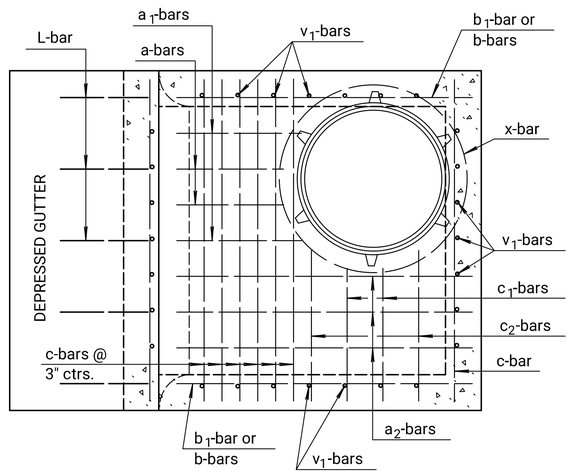


BENDING DIAGRAMS

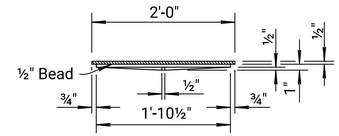
Note: Reinforcing steel for L bars is not included in the steel quantity and is subsidiary to the other inlet items.

GENERAL NOTES

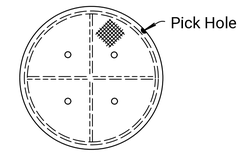
Use Concrete Grade 3.0 throughout. All exposed edges shall be finished with an edging tool.
At the contractors option Concrete Grade 3.0 (AE) or mix used in concrete pavement may be used throughout.
In general, pipes will enter and leave manhole at various positions. Where possible bend bars around pipes.
Floor of manhole to be shaped as shown in various "EXAMPLES" with unreinforced Concrete Grade 3.0.
Manhole opening and steps, where used, shall be placed to afford easy access to top of shaped invert. Top reinforcing bars to be adjusted accordingly.
All castings shall be gray iron and shall comply with the KDOT Standard Specifications.
When so ordered by the Engineer, the top of the manhole shall be sloped slightly to approximately fit the ground line or other conditions.
Dimensions and weights of cast iron as shown on this sheet are minimum. Larger dimensions and/or heavier weights of cast iron may be used.
Steps shall be installed in all storm sewer inlets when specified in the plans or when "H" is equal to or greater than six feet. Steps shall comply with the KDOT Standard Specification.
No reduction in concrete quantities shall be made for pipe openings.
When directed by the Engineer, a small opening in the back of the inlet shall be provided in order to drain a low area. Reinforcing bars shall extend through the opening. No reduction in concrete quantities will be made for this opening.
No addition in concrete quantities shall be made for shaping floor of inlet.
No reduction in pay length of curb, gutter, or curb & gutter will be made through the inlet area.
The weight of castings includes no allowance for fillets and overruns.
Curb and Gutter sections shall be shaped as shown where required by the installation of curb inlets. This work shall be subsidiary to other bid items.
See sheet entitled "Reinforcing Steel for Inlets and Manholes" for details and quantities.
For additional notes and details on Light Type Cast Iron Manhole Cover and Ring Type C and Cast Iron Steps, see Standard Drawing RD633 "Reinforced Concrete Manhole".
All reinforcing steel shall be #4 at 6" centers except where noted. Minimum clear distance to reinforcement shall be 1½".

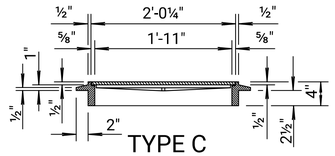


REINFORCING STEEL TOP VIEW

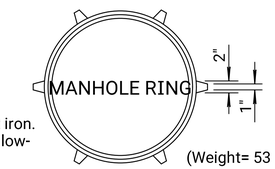


MANHOLE COVER TYPE C
(Weight= 64 lbs.)





TYPE C



NOTE: All manhole castings are cast iron. Weight of castings includes no allowance for fillets and overruns.

(Weight= 53 lbs.)

✳ LIGHT TYPE
MANHOLE COVER & RING

✳ Rings with four equally spaced lugs will be permitted.

NO.	DATE	REVISIONS	BY	APP'D
07	10-31-17	Joint Filler Type C Added	A.L.R.	S.W.K.
06	01-28-05	Changed Class to Grade concrete	S.W.K.	J.O.B.
05	12-11-97	Revised step spacing	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

TYPE 22
CURB INLET

RD646

FHWA APPROVAL	03-05-18	APP'D.	Scott W. King
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

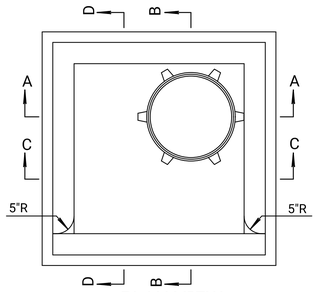
KDOT Graphics Certified 08-19-2024

KDOT Graphics Certified

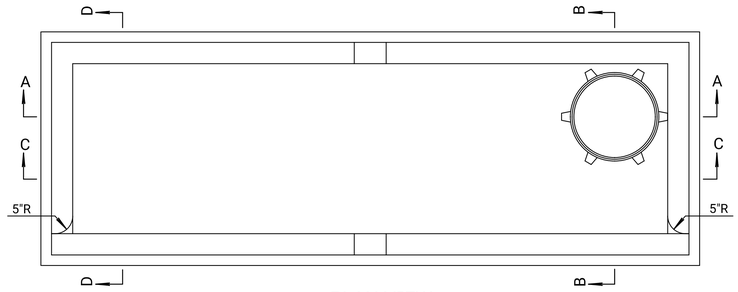
Sh. No. 27

Plotted by : BGS01485 16-DEC-2025 11:59
File : ka680801rss646.dgn

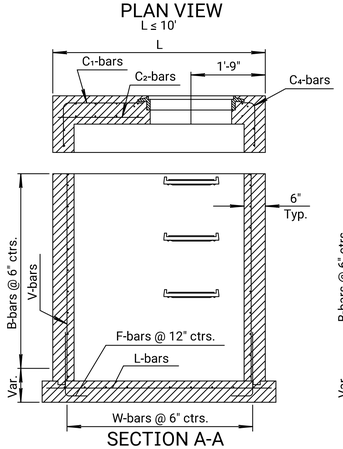
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	28	253



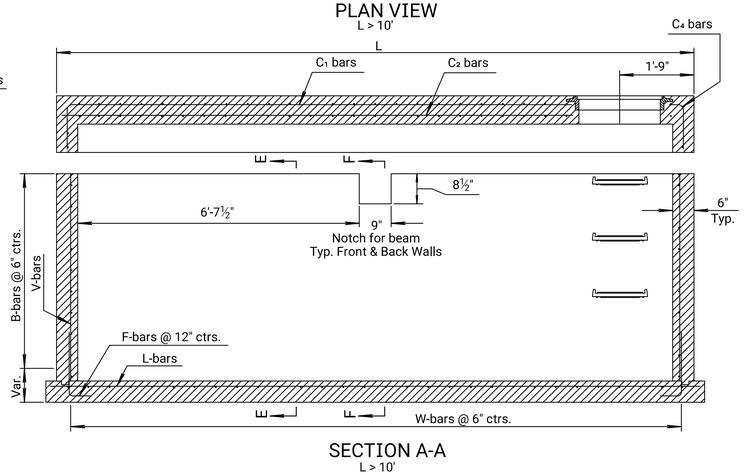
PLAN VIEW
L ≤ 10'



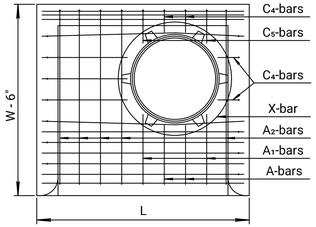
PLAN VIEW
L > 10'
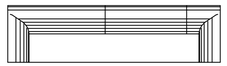


SECTION A-A
L ≤ 10'



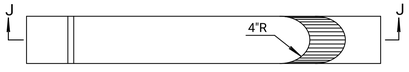
SECTION A-A
L > 10'



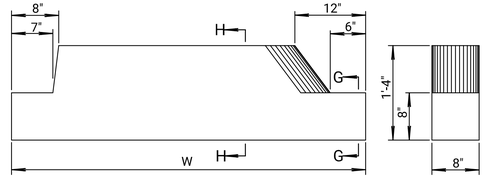
INLET TOP REINFORCING



INLET TOP FRONT ELEVATION

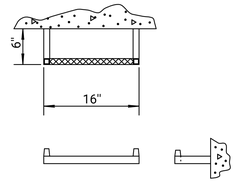


PLAN VIEW



ELEVATION

END VIEW



STEP DETAILS

GENERAL NOTES

Use Concrete Grade 3.0 (f'c ≥ 3000 psi) throughout. All exposed edges shall be finished with an edging tool.

Manhole opening and steps, where used shall be placed to afford easy access to top of shaped invert.

All castings shall be grey iron and shall comply with the KDOT Standard Specifications.

When so ordered by the Engineer, the top of the manhole shall be sloped slightly to approximately fit the ground line or other conditions.

Dimensions and weights of cast iron as shown on this sheet are minimum. Larger dimensions and/or heavier weights of cast iron may be used. The weight of castings includes no allowance for fillets and overruns.

Steps shall be installed in all storm sewer inlets when specified in the plans when "H" is equal to or greater than six feet. Steps shall comply with the KDOT Standard Specification.

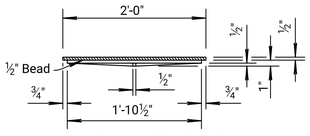
No reduction in pay length of curb, gutter, or curb & gutter will be made through the inlet area. Curb and Gutter sections shall be shaped as shown where required by the installation of curb inlets. This work shall be subsidiary to other bid items.

For additional notes and details on Light Type Cast Iron Manhole Cover and Ring Type C and Cast Iron Steps, see Standard Drawing RD633 "Reinforced Concrete Manhole".

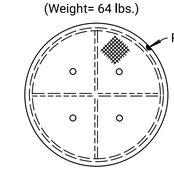
All reinforcing steel shall be #4 at 6" centers except where noted. Minimum clear distance to reinforcement shall be 1½".

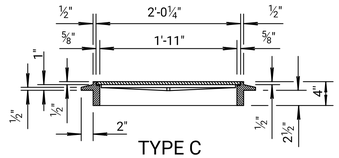
Floor of inlet shall be shaped as shown in various "Examples" on Reinforced Concrete Manhole Standard Drawing RD633. Concrete used for shaping shall be unreinforced Concrete Grade 3.0 or concrete pavement mix.

The Contractor shall determine pipe locations in the field prior to ordering Type 22 Precast Inlets, to insure proper positioning of pipe openings.

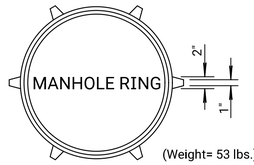


MANHOLE COVER TYPE C
(Weight= 64 lbs.)



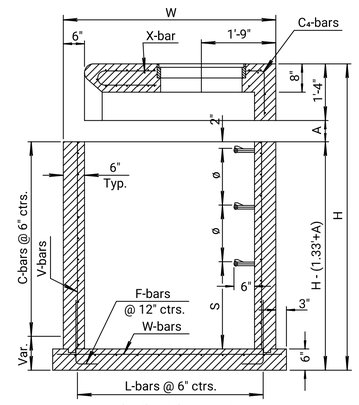


TYPE C



(Weight= 53 lbs.)

✳ LIGHT TYPE
MANHOLE COVER & RING



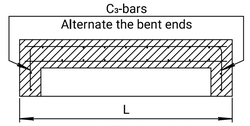
SECTION B-B

ø Steps shall be uniformly spaced. Spacing shall be 12" minimum and 16½" maximum.

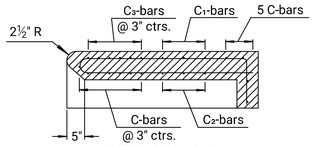
NOTES

"A" Adjustment space, 6" maximum. (Contractor's option, 1" to 6") Allows top to be adjusted to finished curb height, or slope top as may be required.

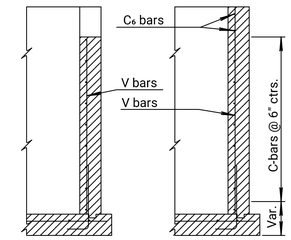
"S" maximum = 2'-3" + ½ x ID of outlet pipe.



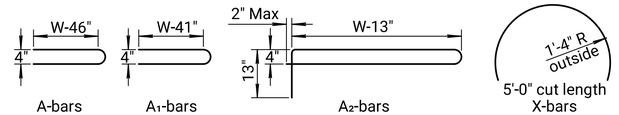
SECTION C-C



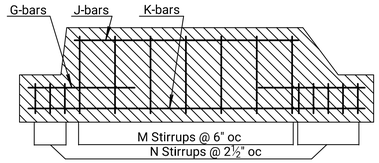
SECTION D-D



SECTION F-F SECTION E-E



BENDING DIAGRAMS

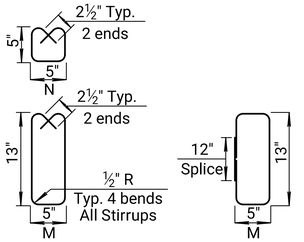


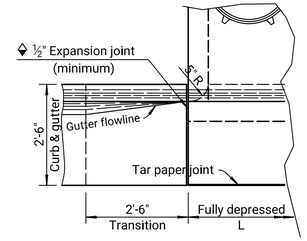
SECTION J-J



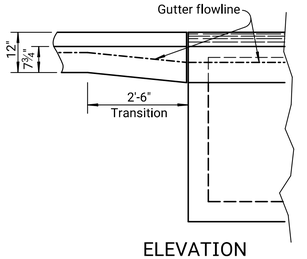
SECTION H-H SECTION G-G

CENTER BEAM DETAILS





PLAN



ELEVATION

DETAILS OF GUTTER TRANSITION

✳ Rings with four equally spaced lugs will be permitted.

NO.	DATE	REVISIONS	BY	APP'D
03	01-28-05	Changed Class to Grade concrete	R.J.S.	J.O.B.
02	11-12-98	Added concrete strength	R.J.S.	J.O.B.
01	12-16-97	Revised step spacing	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

TYPE 22 PRECAST INLETS

RD649

FHWA APPROVAL	06-10-05	APP'D.	James O. Brewer
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

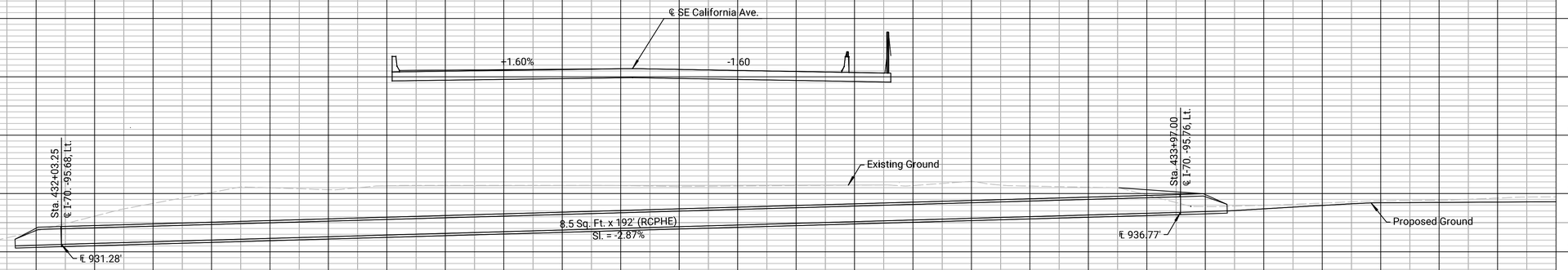
KDOT Graphics Certified 05-16-2022

Sh. No. 28

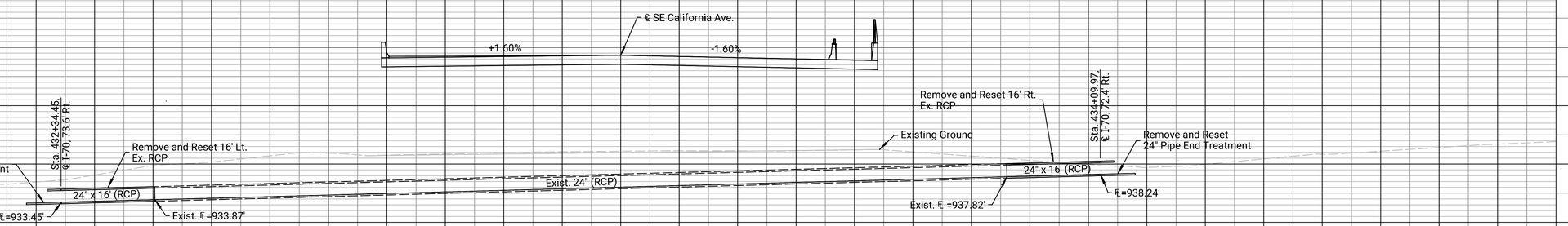
KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 12:00
File : ka680801rss649.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	29	253



WESTBOUND I-70



EASTBOUND I-70

KANSAS DEPARTMENT OF TRANSPORTATION

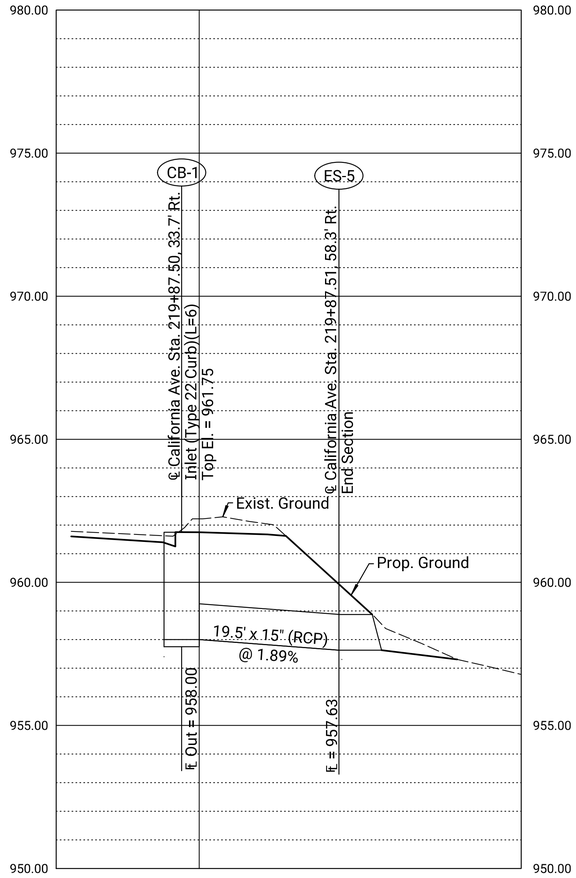
PROPOSED I-70 DRAINAGE

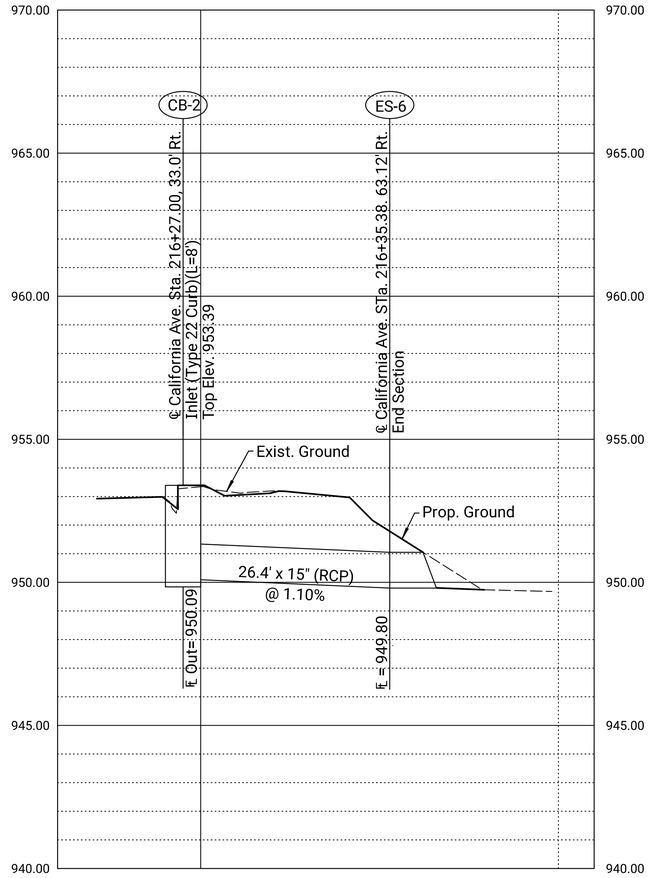
PIPE PROFILES

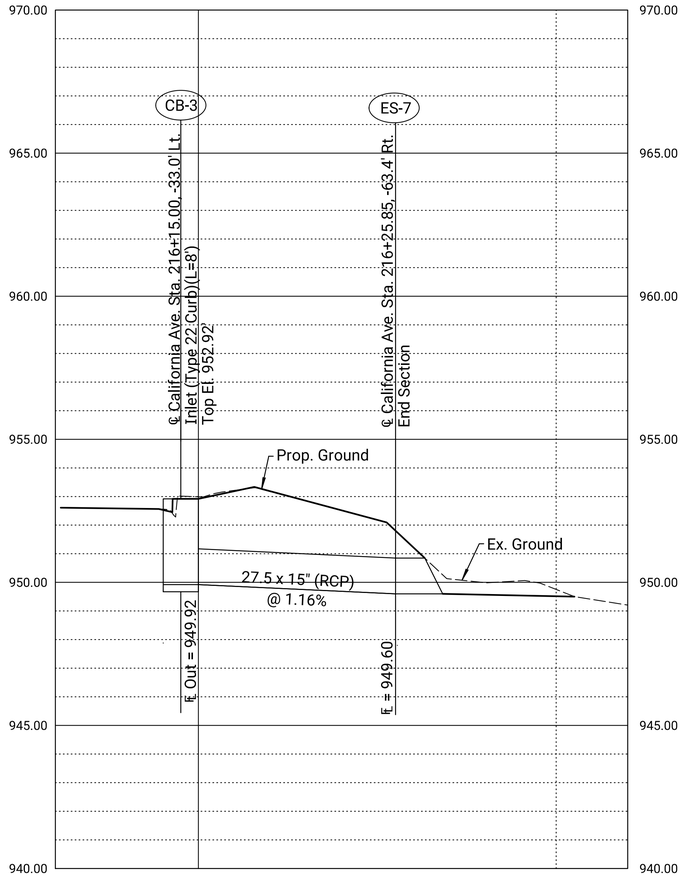
Plotted by : BGS01485 16-DEC-2025 12:00
File : ka6808001rdd-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	30	253

BY	DATE
REFERENCES NOTED	
REFERENCES CHECKED	







Plotted by : BGS01485 16-DEC-2025 12:01
File : ka680801rdd-02.dgn

KANSAS DEPARTMENT OF TRANSPORTATION

STORM SEWER PROFILE

SE CALIFORNIA AVE.

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	31	253

INLET & MANHOLE DATA

ROUTING SEQUENCE FROM	ROUTING SEQUENCE TO	LOCATIONS OF INSTALLATIONS STATION	ROUTE IDENTIFICATION	DISTANCE LEFT/RIGHT	CONSTRUCT OR INSTALL Type 22 Curb Inlet					RAD. (FT.)	G&FA TYPE	L&FA TYPE	DIMENSIONS L (FT.)	W (FT.)	H (FT.)	L_1 (FT.)	W_1 (FT.)	H_1 (FT.)	ELEVATIONS TOP ⊛	FLOOR	INFLOW CONDUITS SIZE DIRECT.	FLOWLINE ELEV.	SIZE DIRECT.	FLOWLINE ELEV.	SIZE DIRECT.	FLOWLINE ELEV.	OUTFLOW CONDUITS SIZE DIRECTION	FLOWLINE ELEV.	FOR INFORMATION ONLY CLASS III EXC. (CU.YD.)	CAST IRON (LBS.)	STRUC. STEEL (LBS.)	REINF. STEEL (LBS.)	CONC.(Misc.) GRADE 3.0 (CU.YD.)	STEPS	REMARKS
CB-1	ES-5	219+87.50	℄ California Ave.	33.7 Rt.	1								6	6	4.00				961.75	957.75							15" E	958.00								
CB-2	ES-6	216+27.00	℄ California Ave.	33.0' Lt.	1								8	6	3.50				953.34	949.84							15" E	950.09								
CB-3	ES-7	216+15.00	℄ California Ave.	33.0' Lt.	1								8	6	3.25				952.92	949.67							15" W	949.92								
TOTALS					3																															

CONDUIT DATA

ROUTING SEQUENCE FROM	ROUTING SEQUENCE TO	LOCATIONS OF INSTALLATIONS STATION	ROUTE IDENTIFICATION	DISTANCE LEFT/RIGHT	CONSTRUCT OR INSTALL TYPE OF CONDUIT SIZE	MATERIAL	LENGTH (FEET)	CONDUIT FLOWLINES INFLOW ELEV.	OUTFLOW ELEV.	SEWER EXCAVATION ROCK (Cu.Yd.)	COMMON (Cu.Yd.)	STORM SEWER PIPE (LN. FT.) 15" RCP	END SECTIONS 15" RCP	REMARKS
CB-1	ES-5	219+87.50	℄ California Ave.	33.7 Rt.	15"	RCP	19.5	958.00	957.63			20	1	
CB-2	ES-6	216+27.00	℄ California Ave.	33.0' Lt.	15"	RCP	26.4	950.09	949.80			28	1	
CB-3	ES-7	216+15.00	℄ California Ave.	33.0' Lt.	15"	RCP	27.5	949.92	949.60			28	1	
TOTALS												76	3	

⊛ Note: Top Elevation is located as follows:
1. Manhole - Top of Manhole Ring
2. Curb Inlet - Top of curb.
3. Gutter Inlet - Top back of gutter.
4. Inlet - Manhole, Special - Top of Grate.
5. Ditch Inlet - Top of Concrete at Cover Plate.

NO.	DATE	REVISIONS	BY	APP'D
03	01-28-05	Changed Class to Grade concrete	S.W.K.	J.O.B.
02	05-21-99	Added top elevation location note	R.J.S.	J.O.B.
01	10-08-90	Detailed on CADD	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

SCHEDULE OF INLETS AND MANHOLES

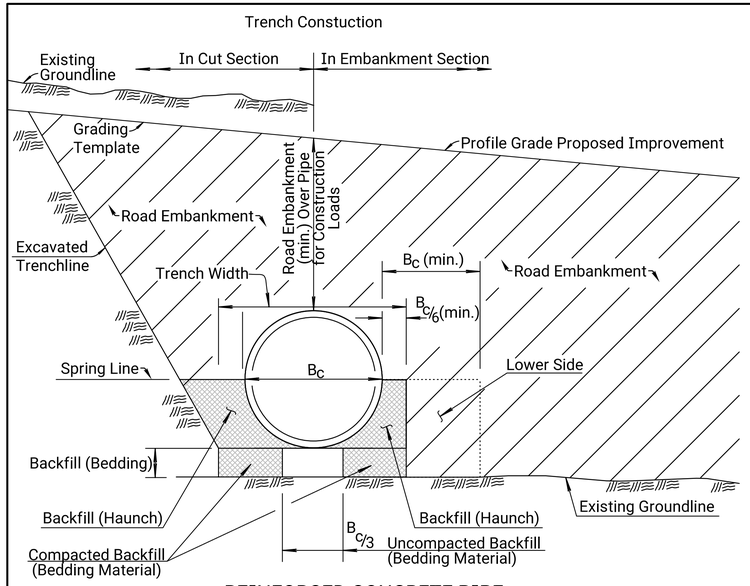
~~RD653C~~

FHWA APPROVAL	06-10-05	APP'D.	James O. Brewer
DESIGNED	DETAILED	QUANTITIES	TRACED B.N.B.
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. R.J.S.

Plotted by : BGS01485 16-DEC-2025 12:01
File : ka680801rss653g.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	32	253

REINFORCED CONCRETE PIPE



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

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

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

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

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

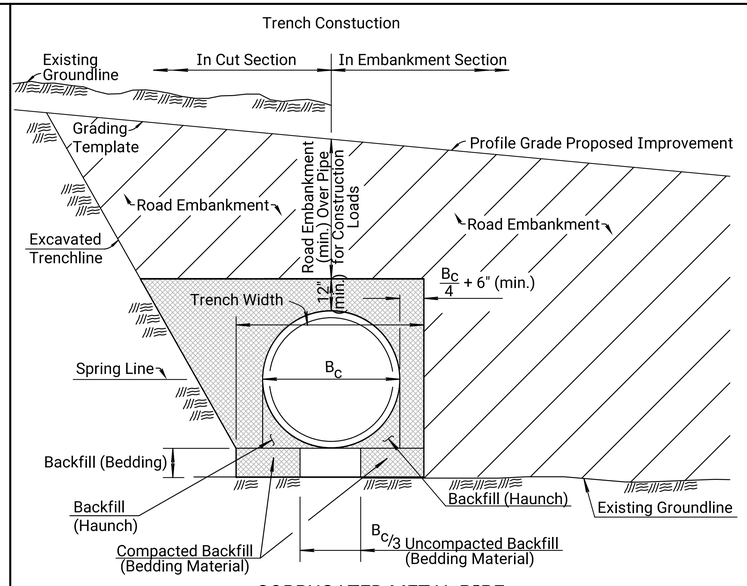
B_C: Outside Pipe Diameter

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

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

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

CORRUGATED METAL PIPE



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

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

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

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

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

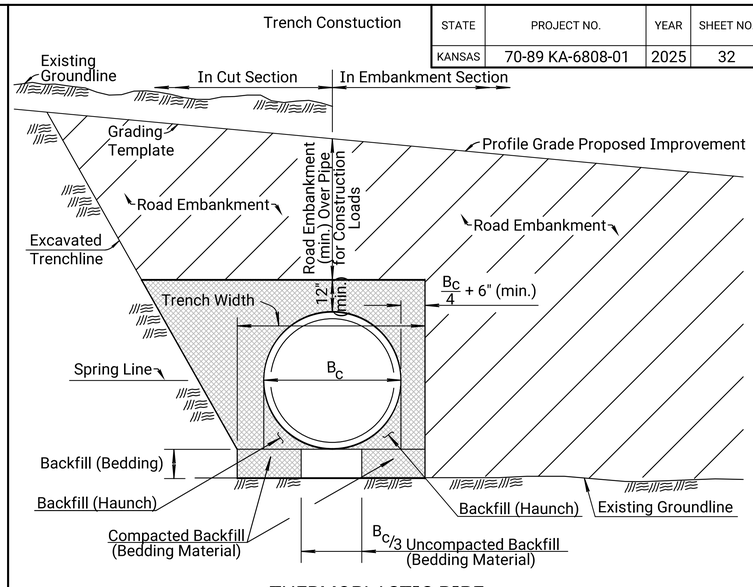
Trench Width: The minimum required trench width is the greater of:
$1.50 \times B_C + 12"$ or $B_C + 16"$

B_C: Outside Pipe Diameter

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

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

THERMOPLASTIC PIPE



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

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

Compacted Backfill Material: Use Type B compaction.

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

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

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

B_C: Outside Pipe Diameter

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

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

GENERAL NOTES

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

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

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

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

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

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

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

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

KANSAS DEPARTMENT OF TRANSPORTATION

PIPE INSTALLATION DETAILS

RD658

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

KDOT Graphics Certified 06-10-2022

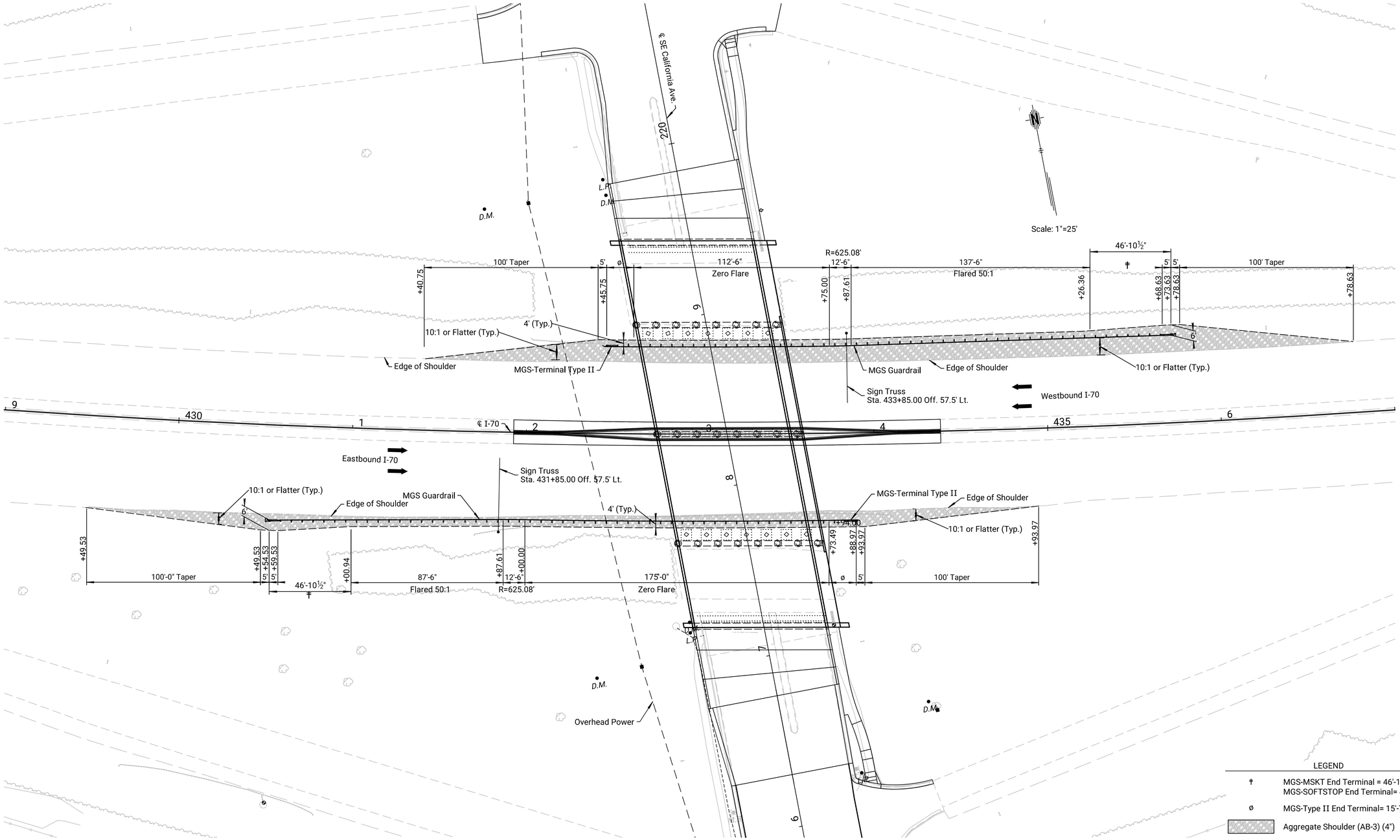
Sh. No. 32

KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 12:02
File : ka680801rss658.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	33	253

DATE	BY	REFERENCES NOTED REFERENCES CHECKED



LEGEND

ǂ	MGS-MSKT End Terminal = 46'-10½" or MGS-SOFTSTOP End Terminal= 46'-10½"
ø	MGS-Type II End Terminal= 15'-7.5"
	Aggregate Shoulder (AB-3) (4")

KANSAS DEPARTMENT OF TRANSPORTATION

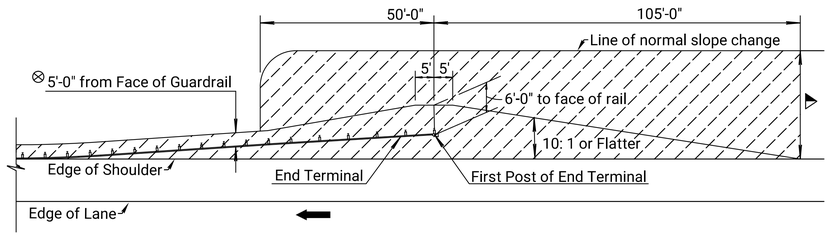
GUARDRAIL LAYOUT SHEET

Plotted by : BGS01485 16-DEC-2025 12:02
File : ka680801rgr-01.dgn

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

GUARDRAIL CLEAR AREA

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



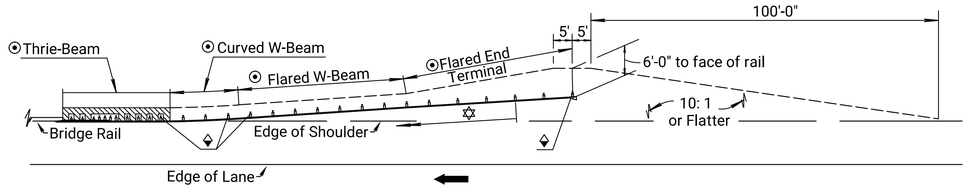
Keep Area Free of Stockpiled Material, Equipment, or Other Obstacles, Such as Temporary Signs, Regardless of Crash Worthiness. This Clear Area Extends 105 Feet in Advance of and 50 Feet behind the First Post of the Guardrail End Terminal and Then, in Order to Maintain Full Post Spacing, Continues 5 Feet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

Normal Project Side Slope.

Deflection Distance for Normal Post Spacing

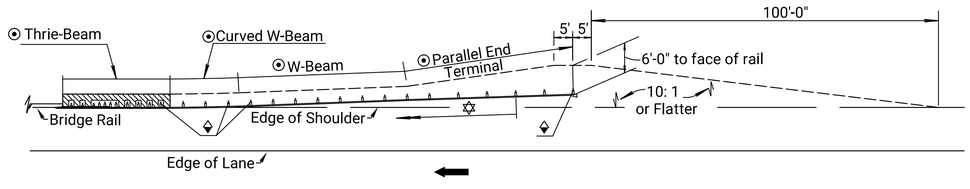
FLARED GUARDRAIL DETAIL

Applies to CGS AND MGS
(MGS Shown)



PARALLEL GUARDRAIL DETAIL

Applies to CGS AND MGS
(MGS Shown)



See Guardrail Layout Sheets for Details

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

Length of Need (Begins at Post 3)

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	34	253

GENERAL NOTES

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

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

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

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

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

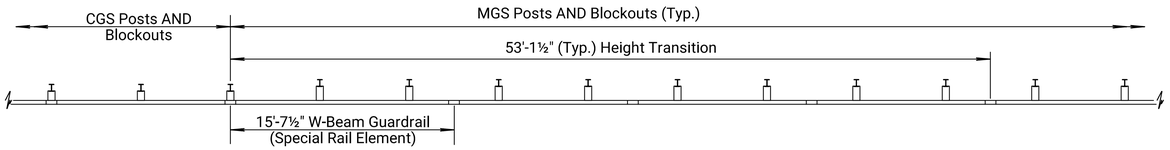
Lap w-beam and thrie-beam guardrail splices, in the direction of permanent traffic, even where temporary traffic may be carried in the opposite direction of the final traffic configuration. Lap end terminal splices per the Manufacturer's Installation Manual in the direction of permanent traffic, even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

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

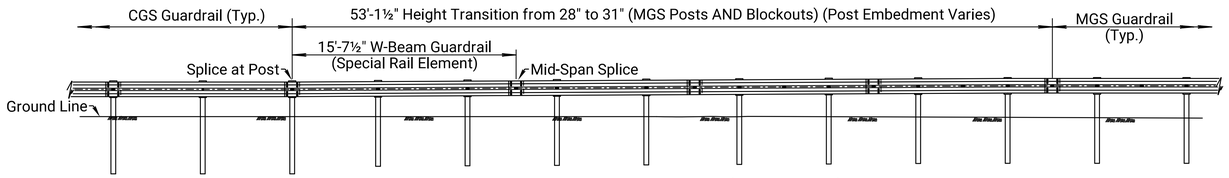
Where pavement with a thickness less than or equal to 8" is encountered during installation, use the details shown on KDOT's 'Guardrail Post Details' Standard Drawings to provide openings in the pavement for the guardrail posts. Where pavement with a thickness greater than 8" or geologic rock is encountered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

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

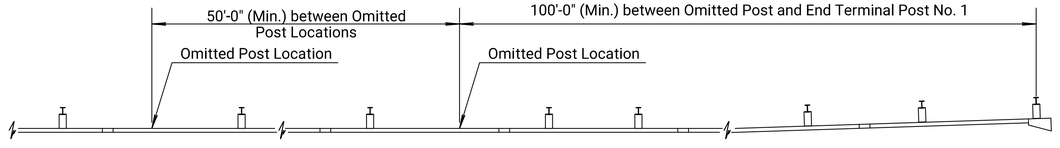
All work and materials required for guardrail end terminal installations are paid for under the bid item for the selected guardrail end terminal. See the table on this sheet for the appropriate end terminal bid item information.



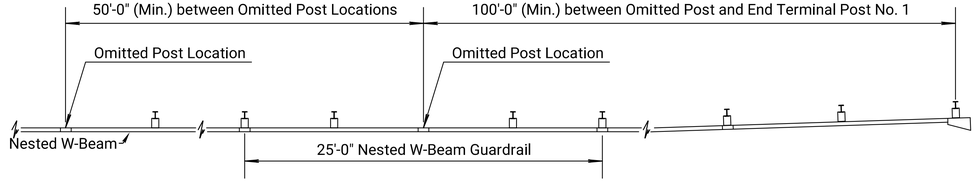
CGS TO MGS TRANSITION DETAILS (PLAN)



CGS TO MGS TRANSITION DETAILS (ELEVATION)



MGS OMITTED POST DETAIL



CGS OMITTED POST DETAIL

MIDWEST GUARDRAIL SYSTEM (MGS) END TERMINALS

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

CONVENTIONAL GUARDRAIL SYSTEM (CGS) END TERMINALS

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

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

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL AUXILIARY DETAILS

RD606

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

KDOT Graphics Certified 05-28-2025

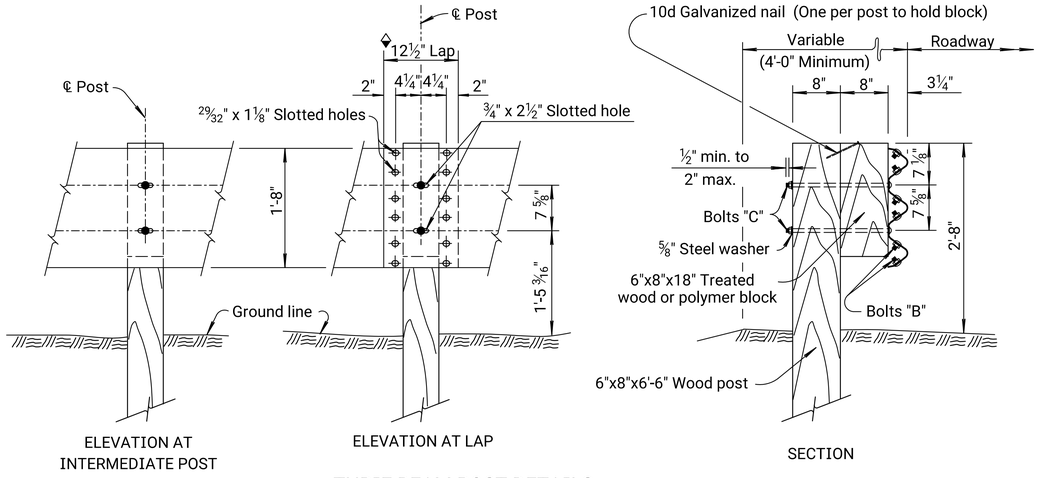
Sh. No. 34

KDOT Graphics Certified

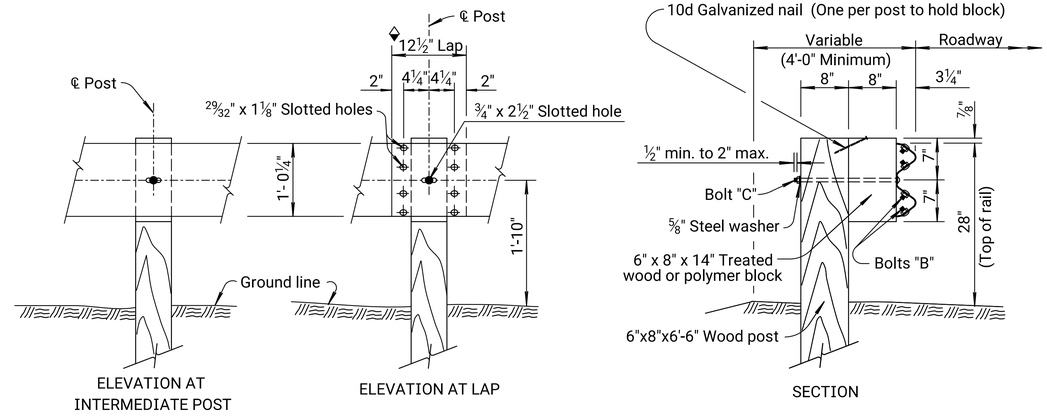
Plotted by : BGS01485 16-DEC-2025 12:03
File : ka6808001rss606.dgn

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

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	35	253

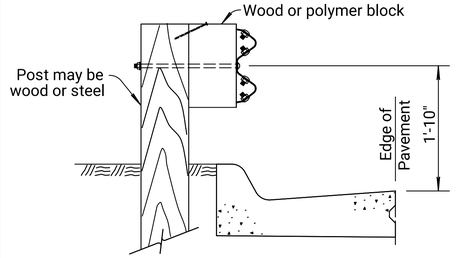


THRIE BEAM POST DETAILS



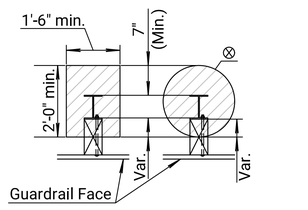
W-BEAM POST DETAILS

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



DETAIL OF PLACEMENT AT CURB

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



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

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

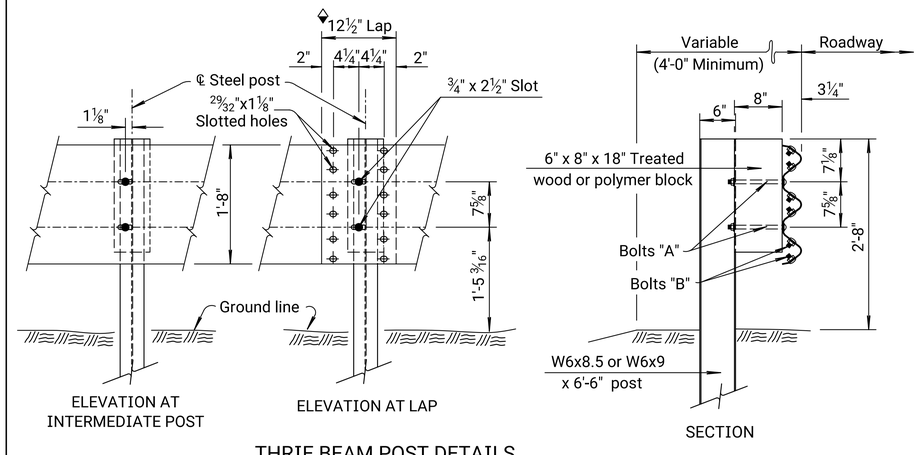
⊗ Diameter may vary from 1'-6" (min.) to 2'-0".

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

WOOD POSTS

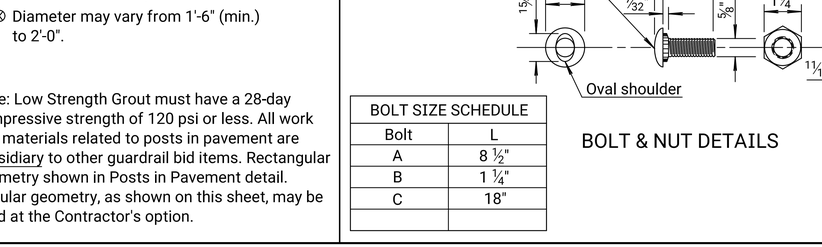
GENERAL NOTES (Wood Posts)

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



THRIE BEAM POST DETAILS

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



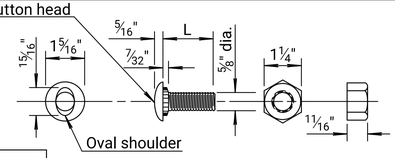
W-BEAM POST DETAILS

STEEL POSTS

GENERAL NOTES (Steel Posts)

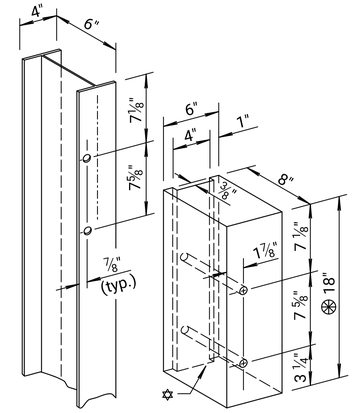
Use grade of steel for steel posts that meets the requirements of the standard specifications. Hot dip galvanize the posts after fabrication, see standard specifications. Use only one post/blockout type within guardrail run, this excludes the guardrail end terminals. For wood/polymer blockout requriements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

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



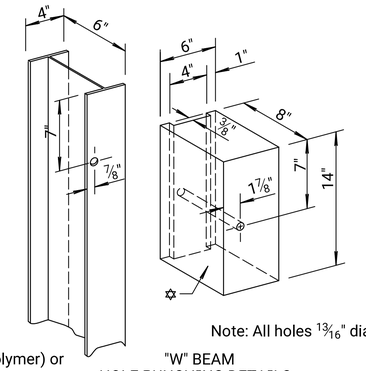
BOLT & NUT DETAILS

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



Note: All holes 13/16" dia.

THRIE BEAM
HOLE PUNCHING DETAILS



Note: All holes 13/16" dia.

✡ Non-Metallic (Polymer) or Treated Wood Block

"W" BEAM
HOLE PUNCHING DETAILS

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

13	09-05-18	Added Det., Post In Pavement	A.L.R.	T.T.R.
12	12-14-10	Revised notes, 28" w-be	S.W.K.	J.O.B.
11	06-30-04	Remove steel blockout and notes	S.W.K.	J.O.B.
NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL POST DETAILS

RD611

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

KDOT Graphics Certified 08-01-2022

Sh. No. 35

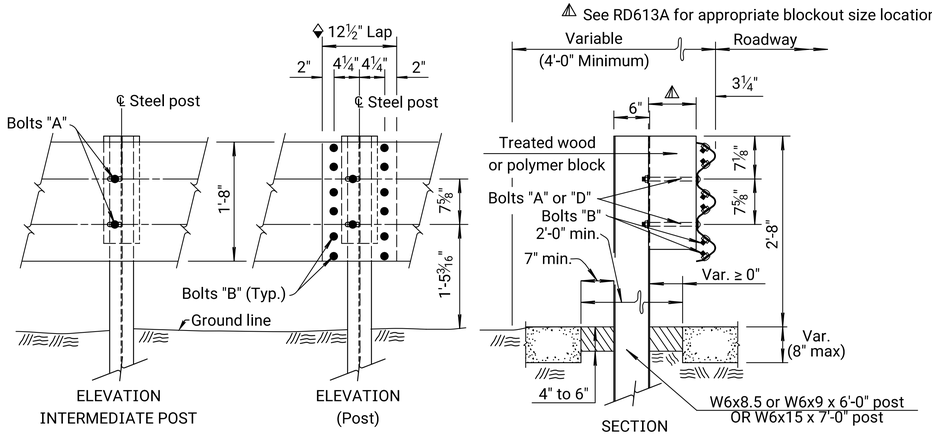
KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 12:03
File : ka680801rss611.dgn

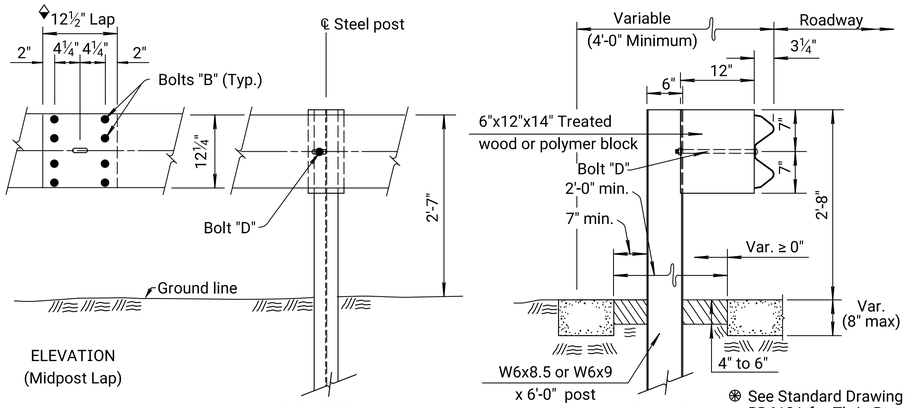
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	36	253

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

⚠ See RD613A for appropriate blockout size location.



THRIE BEAM POST DETAILS/POSTS IN PAVEMENT

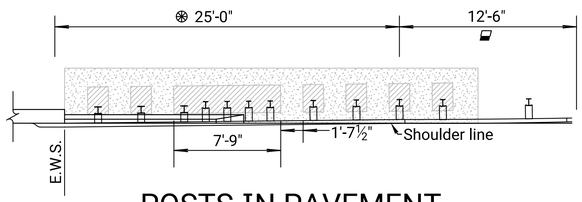


⊛ See Standard Drawing RD613A for Thrie-Beam Transition Section Blockout hole pattern.

✡ Non-Metallic (Polymer) or Treated Wood Block

▭ See Guardrail Layout Sheets for Details.

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

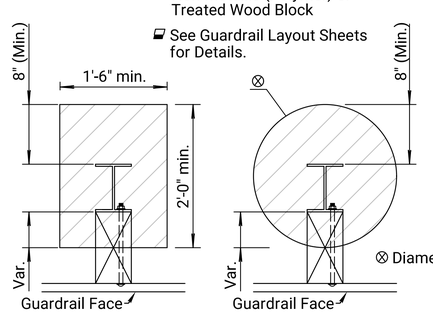


POSTS IN PAVEMENT

(Not to Scale)

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

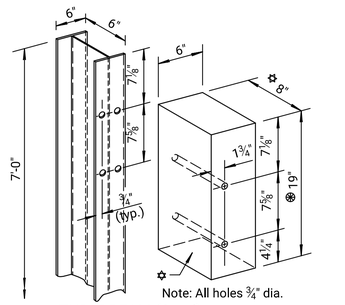
☐ Pavement (Concrete or Asphalt)



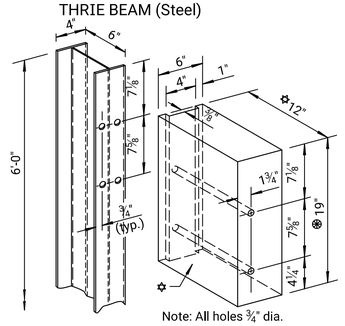
⊗ Diameter may vary from 1'-6" (min.) to 2'-0".

PLAN
(ALTERNATE GEOMETRIES)

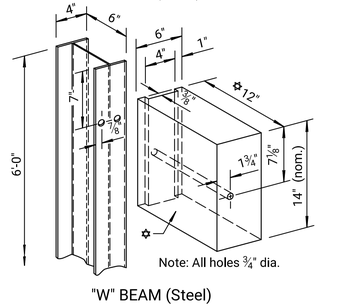
Note: Low Strength Grout must have a 28-day compressive strength of 120 psi or less. All work and materials related to posts in pavement are subsidiary to other guardrail bid items. Rectangular geometry shown in Posts in Pavement detail. Circular geometry, as shown on this sheet, may be used at the Contractor's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



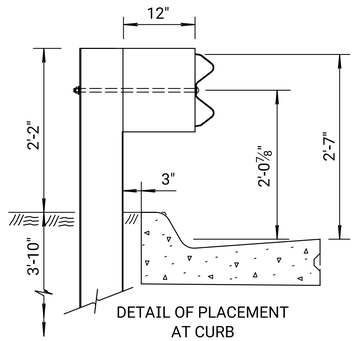
THRIE BEAM (Steel)



THRIE BEAM (Steel)



"W" BEAM (Steel)



DETAIL OF PLACEMENT
AT CURB

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

GENERAL NOTES (Steel Posts)

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

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

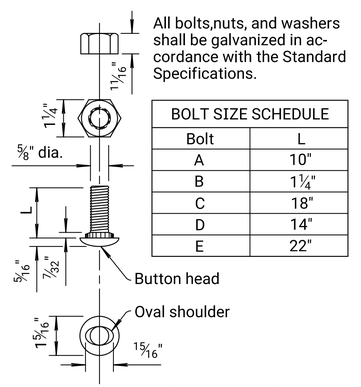
Wood blockouts may be used through the 25'-0" thrie-beam section with wood or polymer blockouts used throughout the remainder of the w-beam installation. The blockout size and material used in the guardrail end terminal may be independent from the remainder of the installation. For wood/polymer blockout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

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

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

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

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



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

BOLT & NUT DETAILS

NO.	DATE	REVISIONS	BY	J.O.B.
5	9-24-15	Separated Steel/Wood Post Details	T.T.R.	S.W.K.
4	11-8-12	Revised Detail, Posts in Pavement	S.W.K.	J.O.B.
3	8-1-12	Revised Note to Designer	S.W.K.	J.O.B.
2	5-24-12	Revised Detail, Posts in Pavement	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL POST (STEEL) (MGS) DETAILS

RD611A

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

KDOT Graphics Certified 03-28-2018

Sh. No. 36

KDOT Graphics Certified

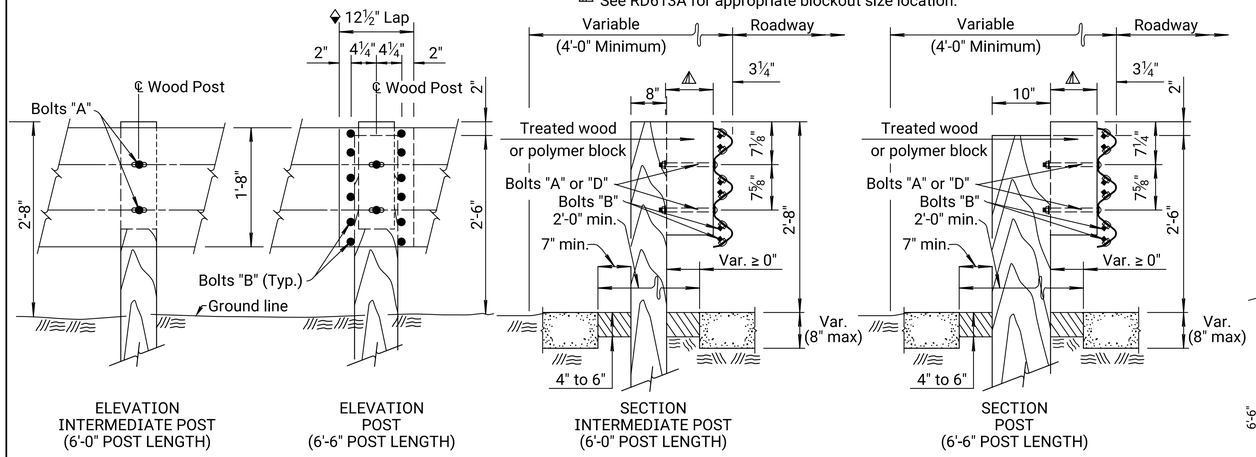
Notes to Designer: For posts installed in pavement thicker than 8" or posts installed in rock formations refer to AASHTO's Roadside Design Guide for details then revise this drawing and all supporting drawings appropriately.

Plotted by : BGS01485 16-DEC-2025 12:04
File : ka680801rss611a.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	37	253

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

⚠ See RD613A for appropriate blockout size location.



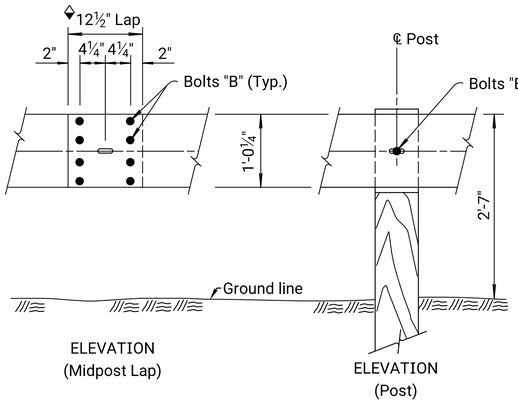
ELEVATION
INTERMEDIATE POST
(6'-0" POST LENGTH)

ELEVATION
POST
(6'-6" POST LENGTH)

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

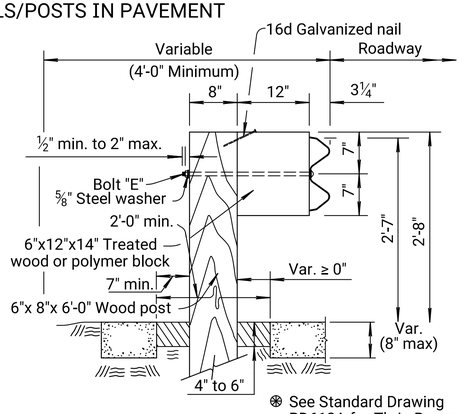
SECTION
POST
(6'-6" POST LENGTH)

THRIE BEAM POST DETAILS/POSTS IN PAVEMENT



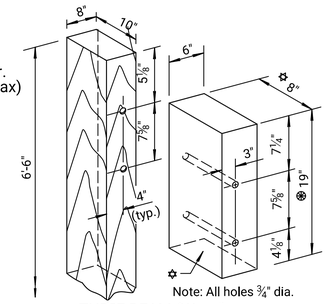
ELEVATION
(Midpost Lap)

ELEVATION
(Post)



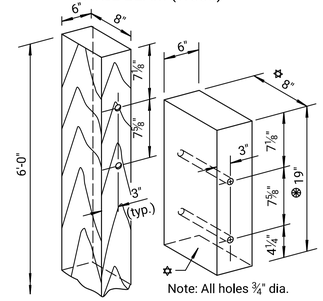
SECTION

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



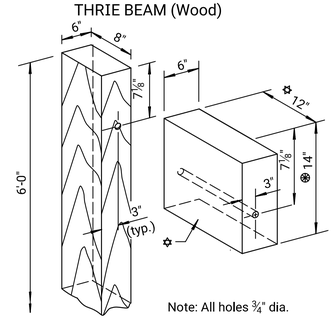
Note: All holes ¾" dia.

THRIE BEAM (Wood)



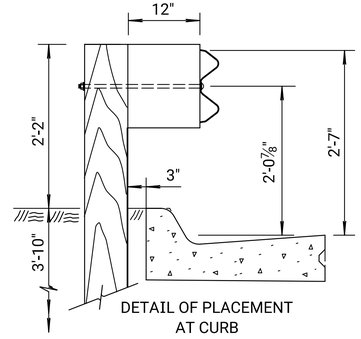
Note: All holes ¾" dia.

THRIE BEAM (Wood)



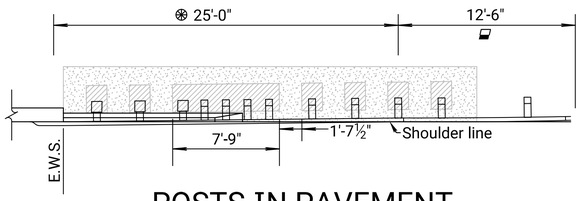
Note: All holes ¾" dia.

"W" BEAM (Wood)



DETAIL OF PLACEMENT
AT CURB

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



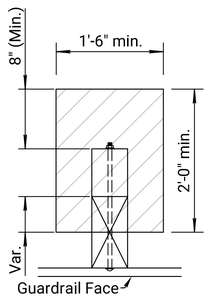
POSTS IN PAVEMENT

(Not to Scale)

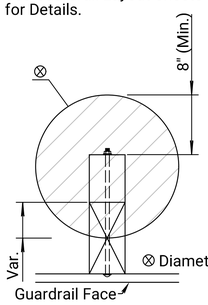
▨ Slurry Grout (Low Strength)
See KDOT's Standard Specifications

☐ Pavement (Concrete or Asphalt)

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



RECTANGULAR GEOMETRY



CIRCULAR GEOMETRY

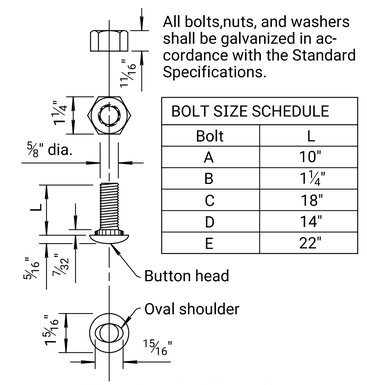
PLAN
(ALTERNATE GEOMETRIES)

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

✡ Non-Metallic (Polymer) or Treated Wood Block

▤ See Guardrail Layout Sheets for Details.

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



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

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

BOLT & NUT DETAILS

GENERAL NOTES (Wood Posts)

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

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

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

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

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

All dimensions are nominal and are subject to manufacturing tolerances.

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

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

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL POST (WOOD) (MGS) DETAILS

RD611B

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

KDOT Graphics Certified 03-28-2018

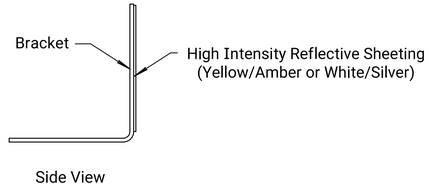
Sh. No. 37

KDOT Graphics Certified

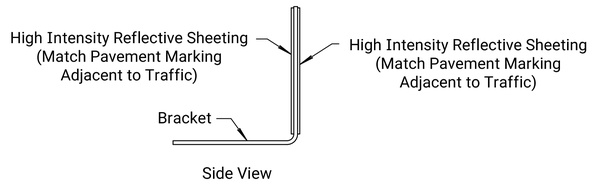
Notes to Designer: For posts installed in pavement thicker than 8" or posts installed in rock formations refer to AASHTO's Roadside Design Guide for details then revise this drawing and all supporting drawings appropriately.

Plotted by : BGS01485 16-DEC-2025 12:04
File : ka680801rss611b.dgn

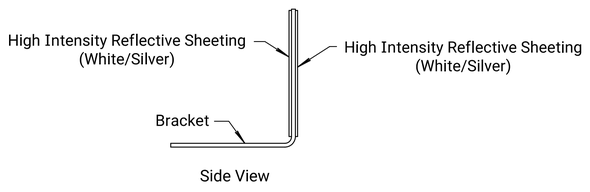
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	38	253



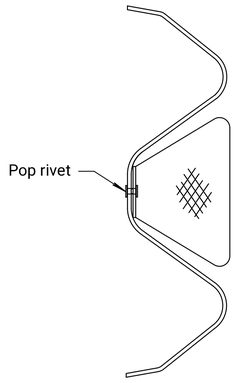
Flexible Marker
One-Way Traffic



Flexible Marker
Median Locations

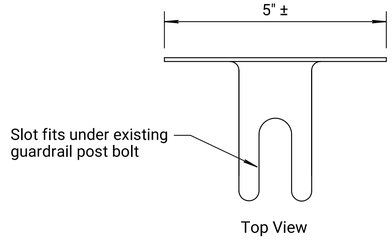


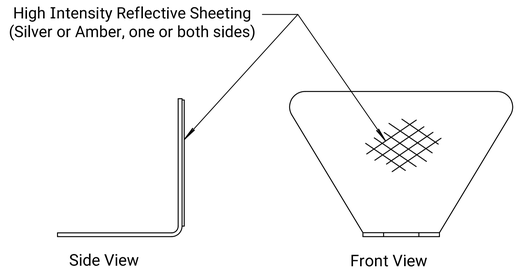
Flexible Marker
Two-Way Traffic



Typical Mounting on W-Beam

Pop rivet attachment to Guardrail when necessary.





Flexible Guardrail Marker

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

GENERAL NOTES

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

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

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

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

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

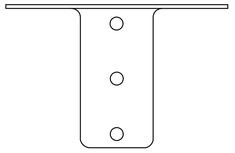
For guardrail located on one-way or divided roadways, use flexible markers with reflective sheeting installed on the approach traffic side of the bracket only. For bridge rail or concrete safety barrier located on the outside edge of one-way or divided roadways, use flexible markers with reflective sheeting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

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

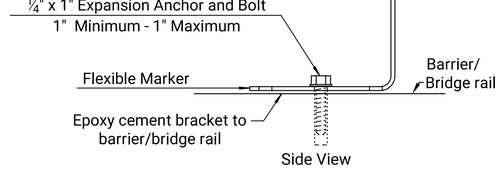
Use zinc or cadmium plated fasteners that comply with Standard Specifications.

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

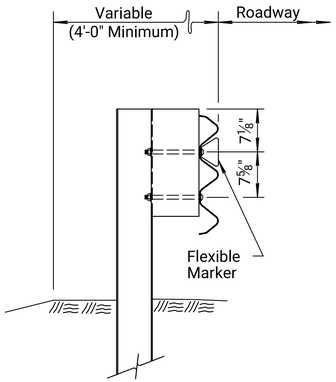
Install flexible markers for the final (permanent) traffic configuration.



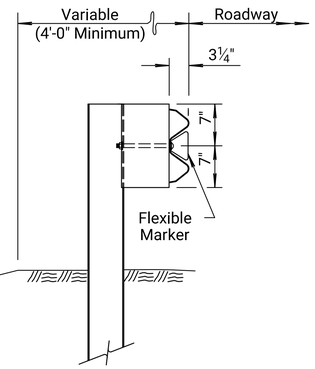
Barrier/Bridge Rail



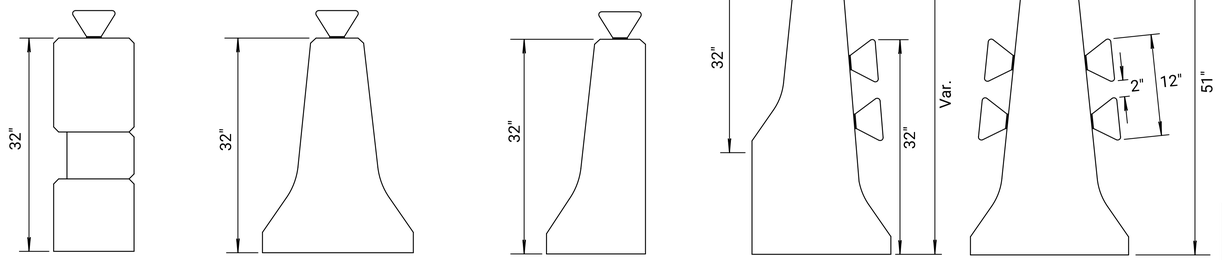
Method of Attaching Flexible
Marker to Barrier/Bridge Rail



THRIE-BEAM GUARDRAIL



W-BEAM GUARDRAIL



CORRAL RAIL | TYPE I CSB | TYPE II CSB or F-SHAPED BRIDGE RAIL | TYPE III CSB | TYPE IV CSB

TYPICAL BARRIER/BRIDGE RAIL MOUNTING DETAILS

NO.	DATE	REVISIONS	BY	APP'D
9	9-11-17	Rev. Det. Markers, Rev. Gen. Note	A.L.R.	S.W.K.
8	11-15-10	Revised notes	S.W.K.	J.O.B.
7	12-21-08	AKT marker or approved equal	S.W.K.	J.O.B.
6	3-10-09	Add. Flexible rem. Button deline	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

MARKER DETAILS FOR GUARDRAIL, BARRIER, AND BRIDGE RAILS

RD610

FHWA APPROVAL	3-15-18	APP'D. Scott W. King	
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

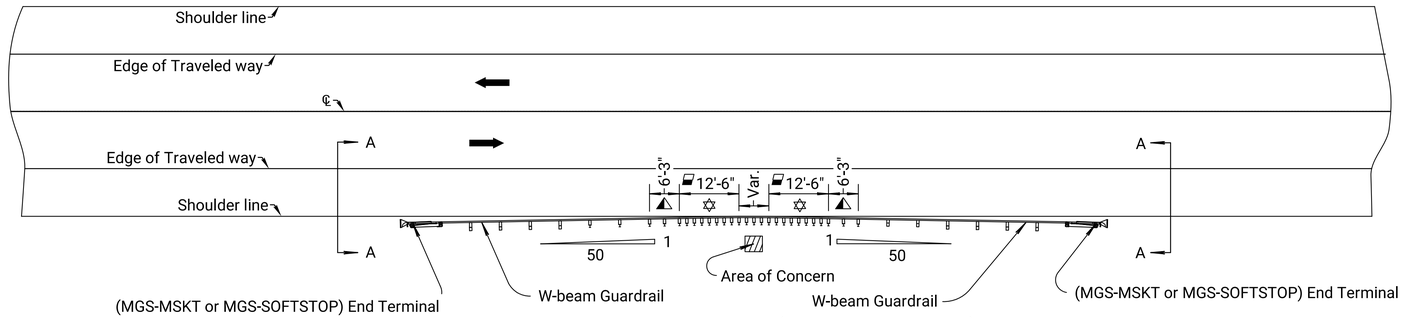
KDOT Graphics Certified 03-16-2018

Sh. No. 38

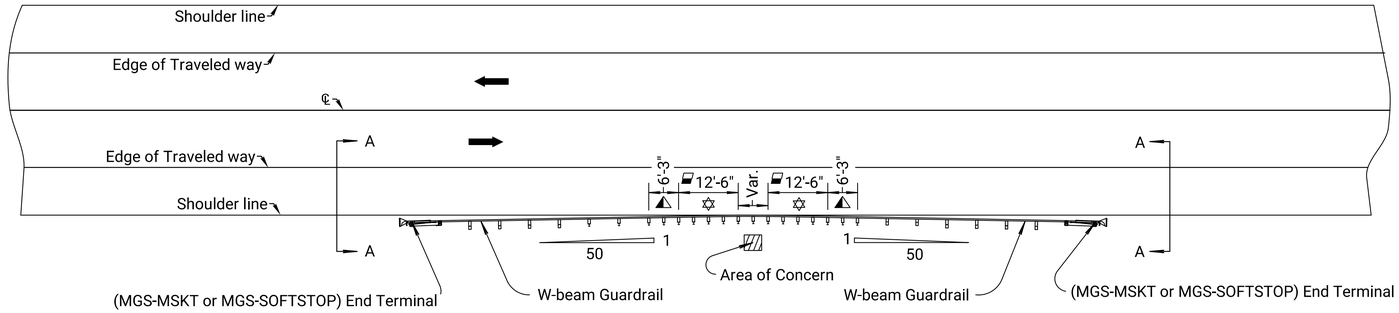
KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 12:04
File : ka680801rss610.dgn

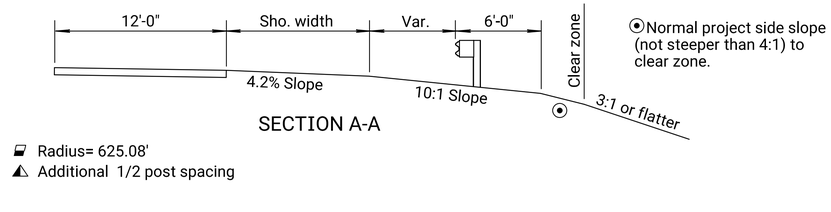
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	39	253



PLAN VIEW TWO LANE (1/4 Post Spacing)

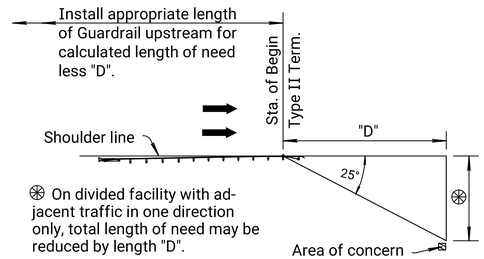


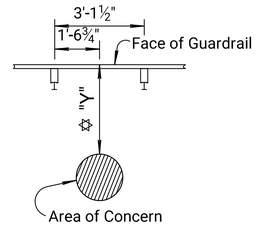
PLAN VIEW TWO LANE (1/2 Post Spacing)



SECTION A-A

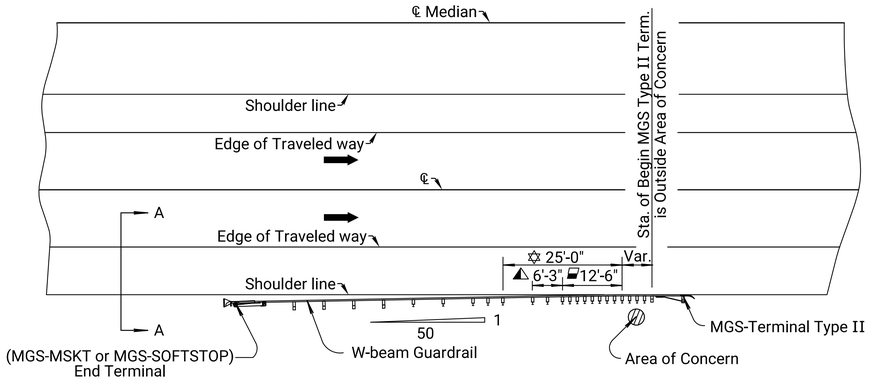
Radius= 625.08'
Additional 1/2 post spacing



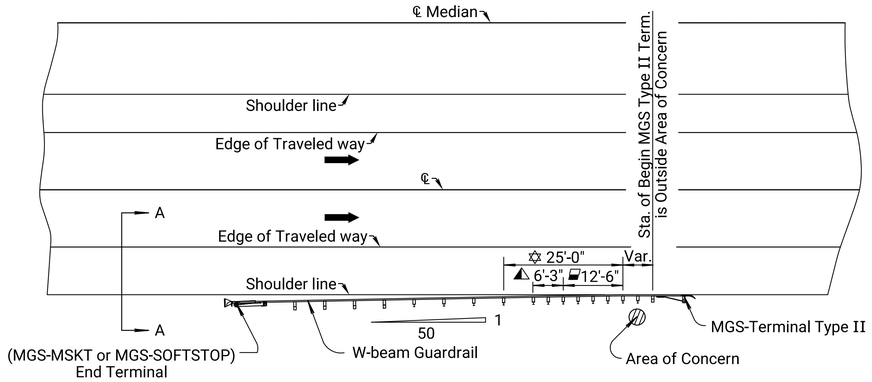


ENLARGEMENT - AREA OF CONCERN

DETAILS OF GUARDRAIL PROTECTION AT ROADSIDE OBSTACLE

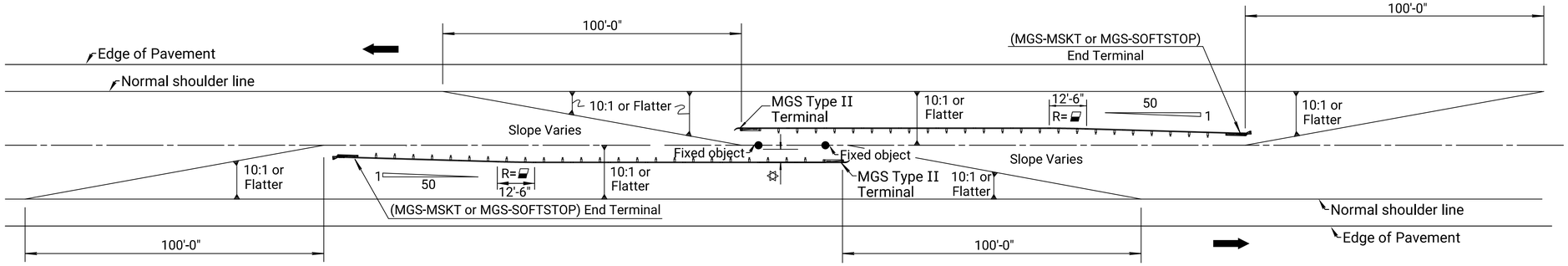


PLAN VIEW FOUR LANE (1/4 Post Spacing)



PLAN VIEW FOUR LANE (1/2 Post Spacing)

✡ GUARDRAIL AT ROADSIDE OBSTACLES	
TYPE	"Y"
Rigid Barrier	< 3'
Full Post Spacing	≥ 5'
1/2 Post Spacing	≥ 4'
1/4 Post Spacing	≥ 3'



MEDIAN PIER PROTECTION (WIDE MEDIAN)

NO.	DATE	REVISIONS	BY	APP'D
03	06-05-18	Added Wide Median Pier Protection Detail	A.L.R.	T.T.R.
02	05-15-17	Removed X-LITE. Added MSKT and SOFTSTOP	A.L.R.	S.W.K.
01	01-25-12	Added Note, Zero Flare Rate	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

(MGS) GUARDRAIL at ROADSIDE OBSTACLE (PARALLEL INSTALLATION)

RD614

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

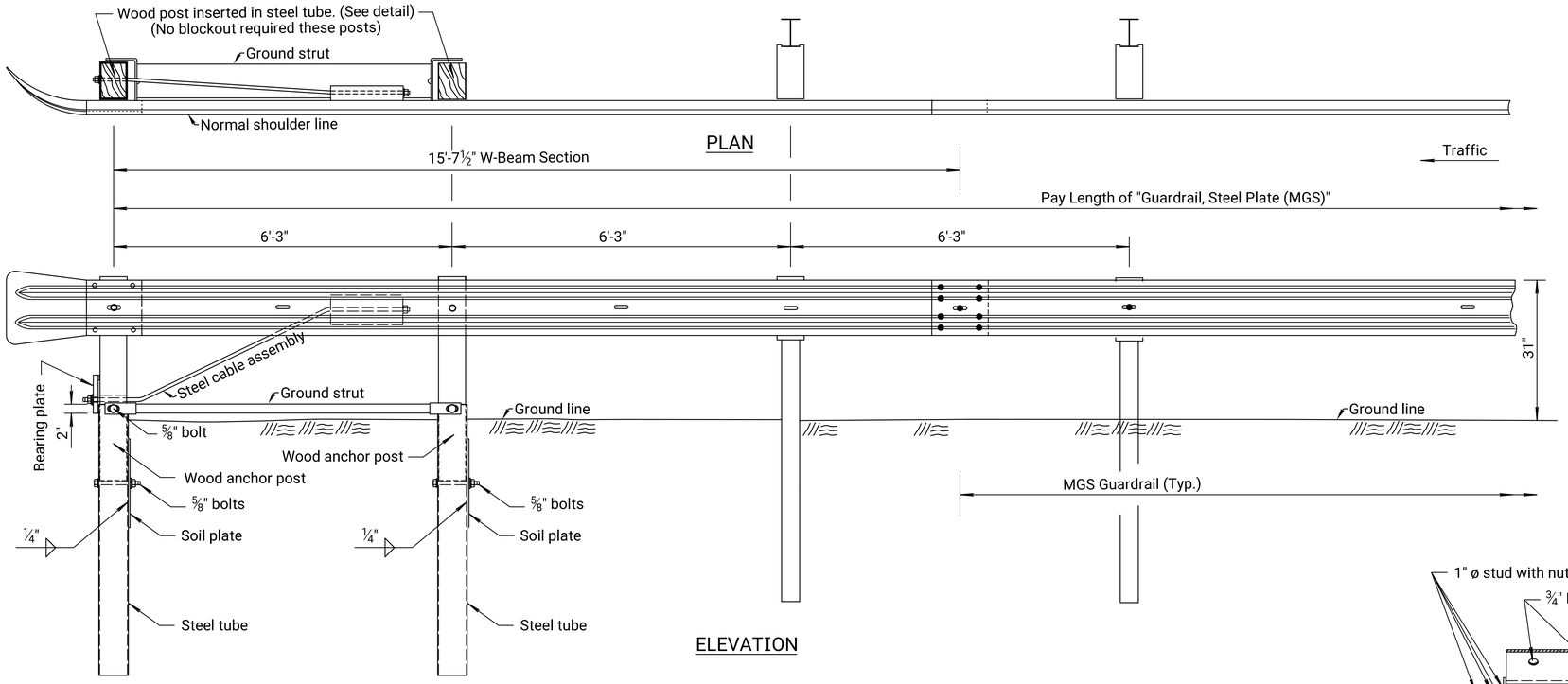
Sh. No. 39

Note to Designer: For zero flare rate applications, flare the last 50'-0" of guardrail at 50:1 (Includes End Terminal).

Plotted by : BGS01485 16-DEC-2025 12:05
File : ka680801rss614.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	40	253

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



GENERAL NOTE

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

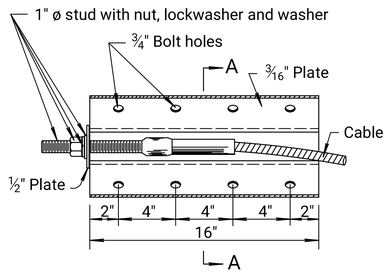
Steel soil tubes may be driven with an approved driving head. Set steel tube and soil plate before installing wood anchor post assembly. Do not drive steel soil tubes with wood post in the tube. Backfill and satisfactorily compact around steel soil tubes placed in drilled holes to prevent tube settlement.

Galvanize all steel parts after fabrication.

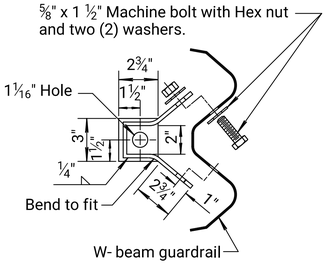
Lap guardrail splices, including terminal connector, in the direction of traffic. Where traffic is temporarily carried in the opposite direction of final configuration, lap rail splices in the direction of the permanent traffic.

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

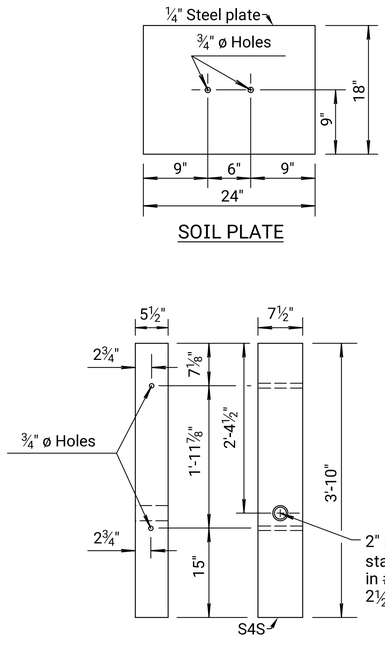
Include MGS Type II end terminal in pay length of "Guardrail, Steel Plate (MGS)".



ANCHOR PLATE

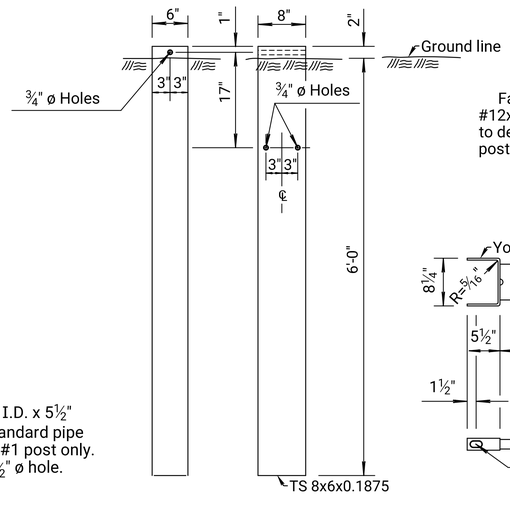


MODIFIED SECTION A-A

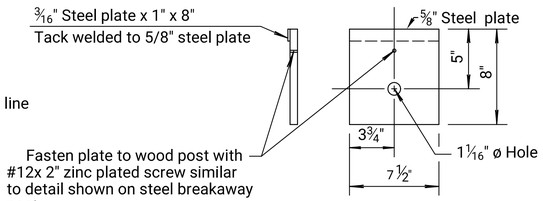


SOIL PLATE

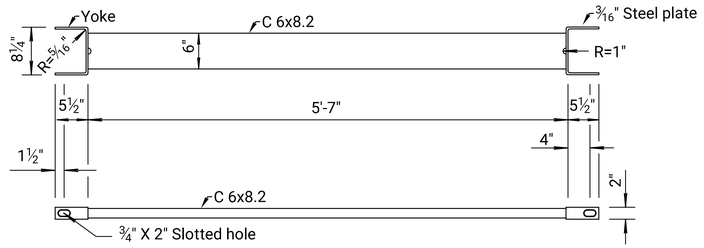
BCT (MGS) WOOD POST



STEEL TUBE

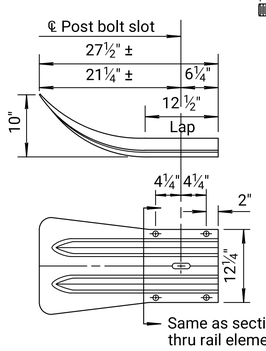


BEARING PLATE



GROUND STRUT

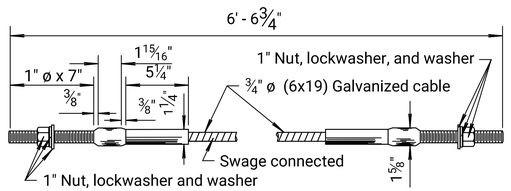
(Strut dimensions shown are typical)



STANDARD END SECTION

(1 each)

(Subsidiary to Steel Plate Guardrail)



CABLE ASSEMBLY (1 each)

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

NO.	DATE	REVISIONS	BY	APP'D
02	01-05-16	Revised Layout, End Terminal	T.T.R.	S.W.K.
01	01-25-12	Revised Dimension, End Terminal	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL END TERMINAL (MGS) TYPE II

RD618A

FHWA APPROVAL		01-06-16	APP'D.	Scott W. King
DESIGNED	DETAILED		QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.		QUAN.CK.	TRACE CK.

KDOT Graphics Certified 05-11-2022

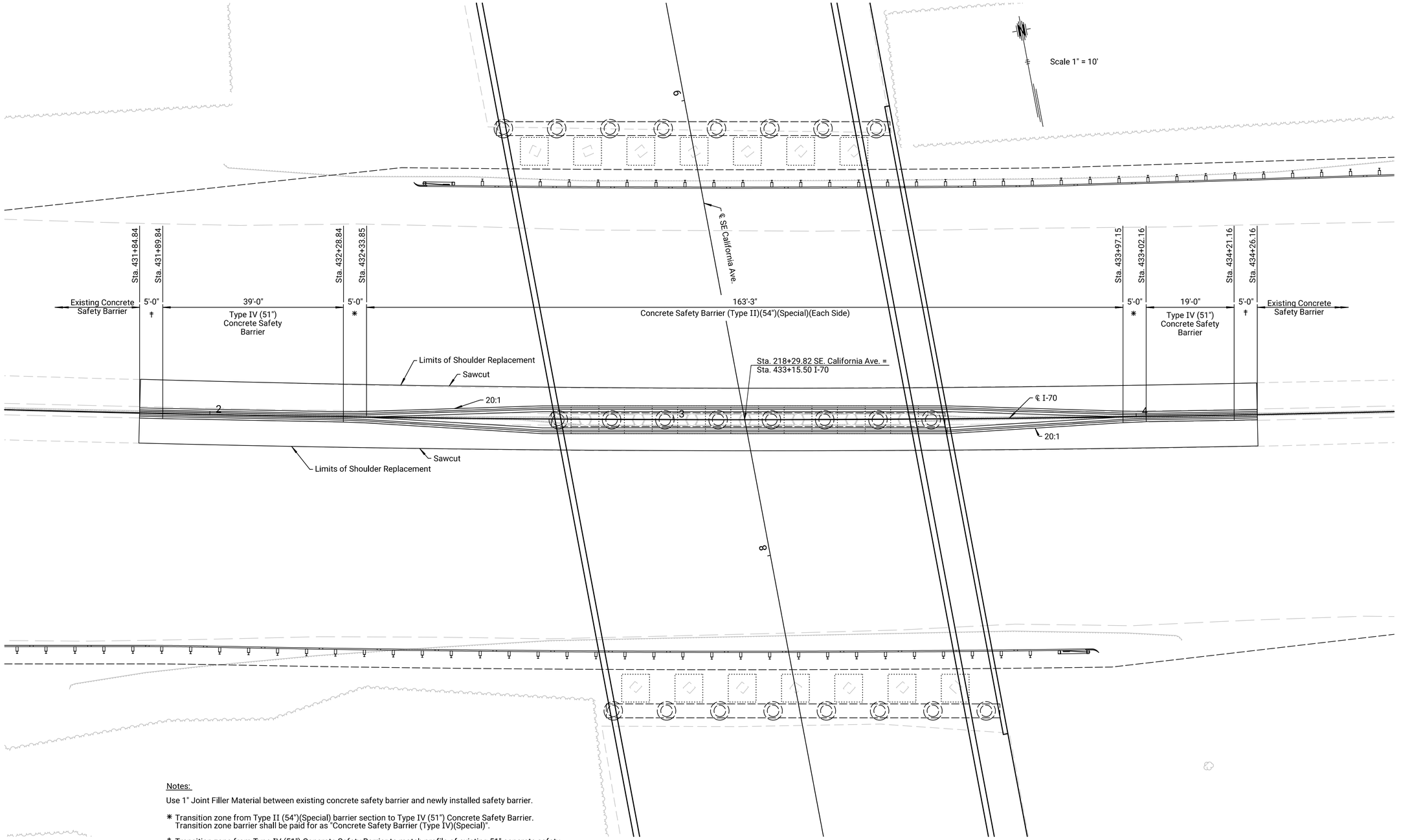
Sh. No. 40

KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 12:05
File : ka680801rss618a.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	41	253

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED



Notes:

Use 1" Joint Filler Material between existing concrete safety barrier and newly installed safety barrier.

✳ Transition zone from Type II (54")(Special) barrier section to Type IV (51") Concrete Safety Barrier. Transition zone barrier shall be paid for as "Concrete Safety Barrier (Type IV)(Special)".

† Transition zone from Type IV (51") Concrete Safety Barrier to match profile of existing 51" concrete safety barrier (Paid as Type IV (51") Concrete Safety Barrier, LNFT.). Contractor to verify existing barrier profile by field measurement and adjust transition as needed with approval of Engineer. See details on "Concrete Safety Barrier Auxiliary Details" sheet for historic plans detail of existing barrier, FOR INFORMATION ONLY.

Match existing I-70 contraction joint locations for median paving.

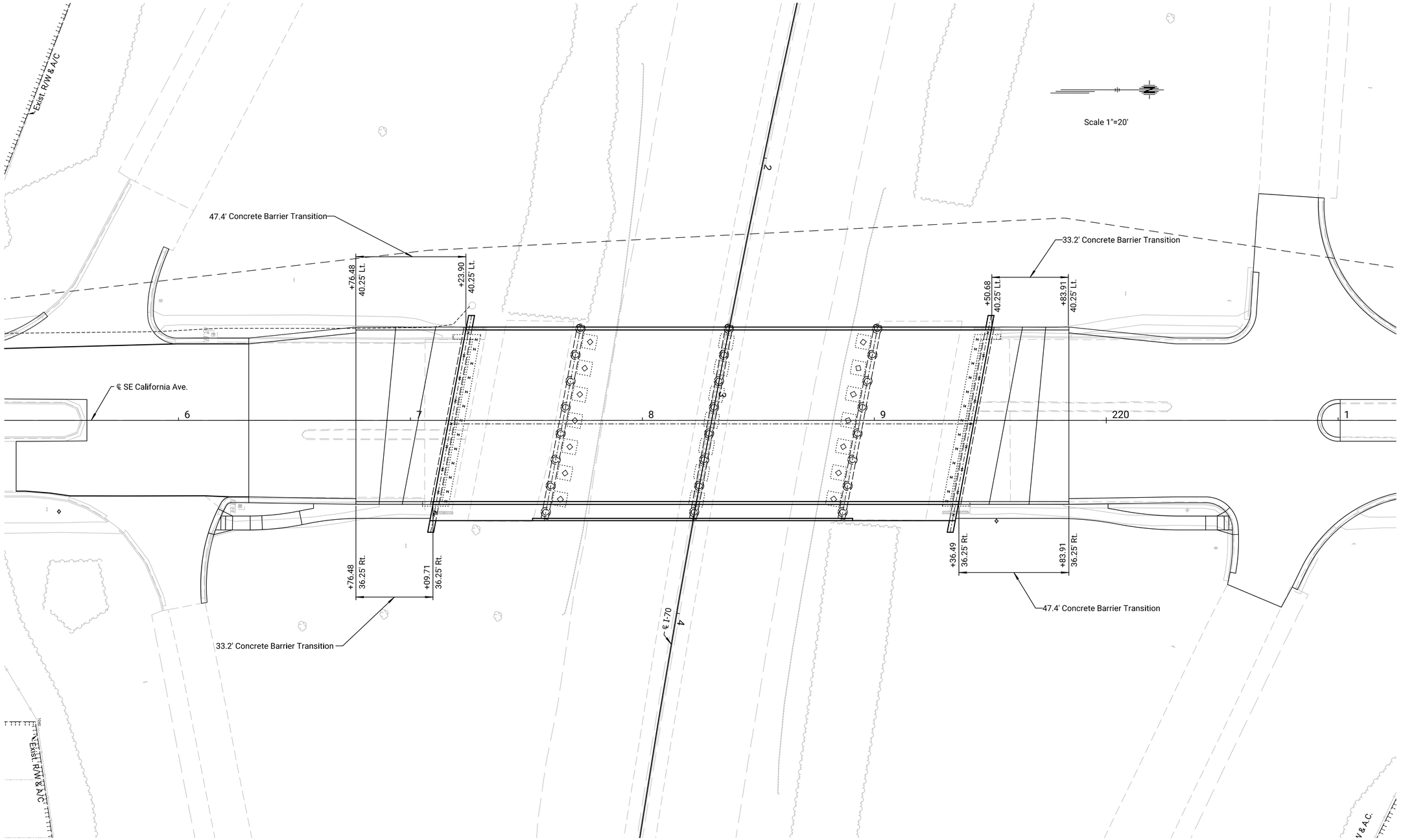
KANSAS DEPARTMENT OF TRANSPORTATION

PERMANENT CONCRETE BARRIER LAYOUT (I-70)

Plotted by : BGS01485 16-DEC-2025 12:06
File : ka680801rsb-100.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	42	253

DATE	BY	REFERENCES NOTED
		REFERENCES CHECKED



Note: For Details of Concrete Barrier transition, See "Concrete Barrier Transition Details" sheet.

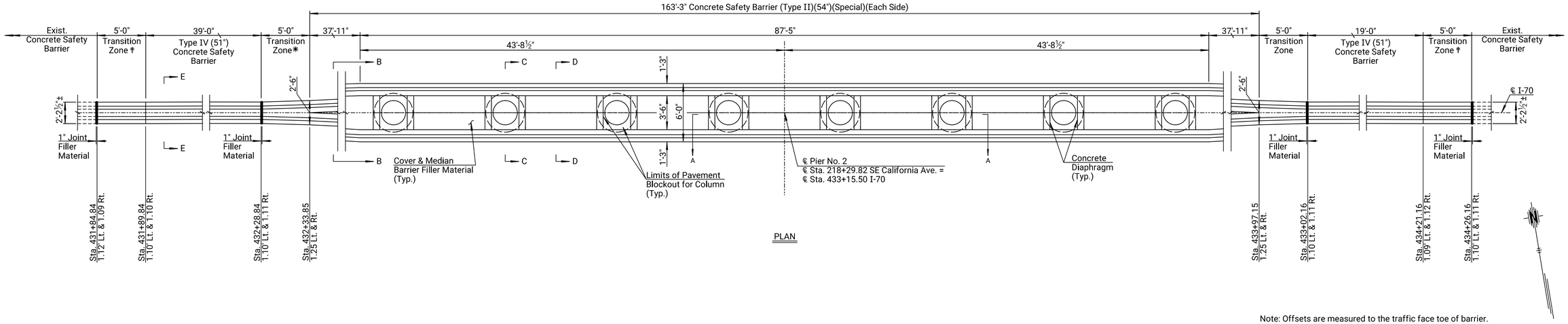
KANSAS DEPARTMENT OF TRANSPORTATION

BARRIER DETAILS

STA. 216+00 TO STA. 221+00

Plotted by : BGS01485 16-DEC-2025 12:06
File : ka680801rsb-101.dgn

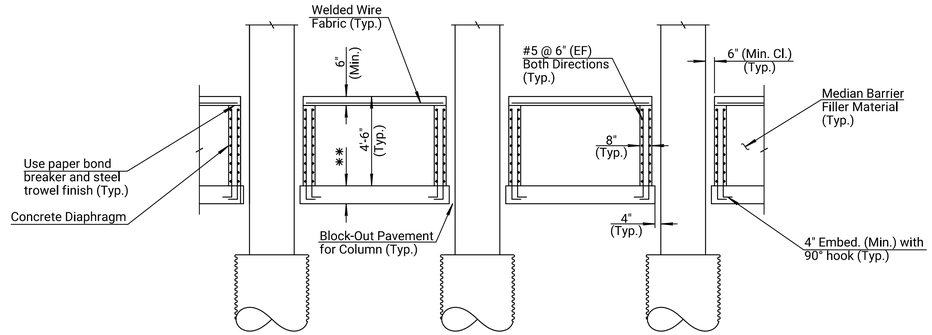
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	43	253



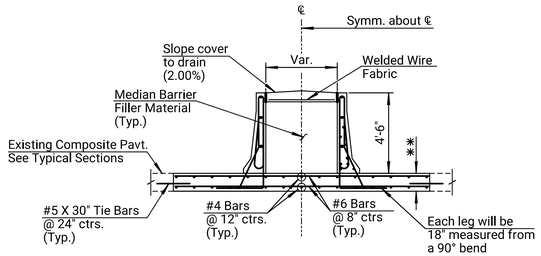
PLAN

Note: Offsets are measured to the traffic face toe of barrier.

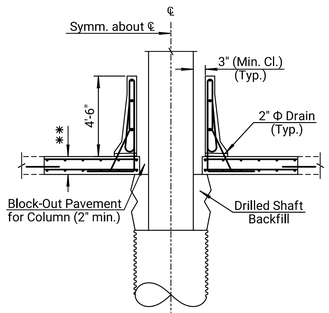
Barrier linework is shown tangent, but is on horizontal curve. See. Sh. No. 9 for curvature.



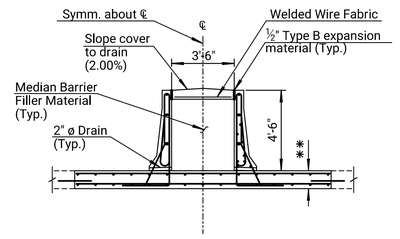
SECTION A-A



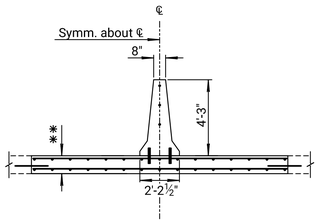
SECTION B-B



SECTION C-C



SECTION D-D



SECTION E-E

Notes:

Pier protection shall be paid for as "Concrete Safety Barrier (Type II)(54")(Special)" per linear foot measured along I-70 centerline. Cost of all reinforcing steel, concrete diaphragms, expansion material, bond breaker and median barrier filler material shall be Subsidiary to "Concrete Safety Barrier (Type II)(54")(Special)".
Concrete Grade 4.0(AE)(SA) shall be used. Reinforcing steel shall conform with the requirements of ASTM A615, Grade 60 and shall be epoxy coated.
See "Pier Protection Details II" sheet for additional Barrier geometry and reinforcing details.
Drains shall be spaced at 12'-0" centers (Min.).
Payment for all reinforcing bars, joint material, median barrier filler material, reflectors and supporting materials associated work, etc., is subsidiary.

Legend:

EF = Each Face
† = Transition zone from Type IV (51") Concrete Safety Barrier to match profile of existing (51") concrete safety barrier (Paid as Type IV (51") Concrete Safety Barrier, LNFT.). Contractor to verify existing barrier profile by field measurement and adjust transition as needed with approval of Engineer. See details on "Concrete Safety Barrier Auxillary Details" sheet for historic plans detail of exixting barrier, FOR INFORMATION ONLY.
* = Trasition zone from Type II (54") (Special) barrier section to Type IV (51") Concrete Safety Barrier. Transition zone barrier from shall be paid for as "Cpncrete Safety Barrier (Type IV)(Special)".
** = See typical section for pavement thickness

KANSAS DEPARTMENT OF TRANSPORTATION

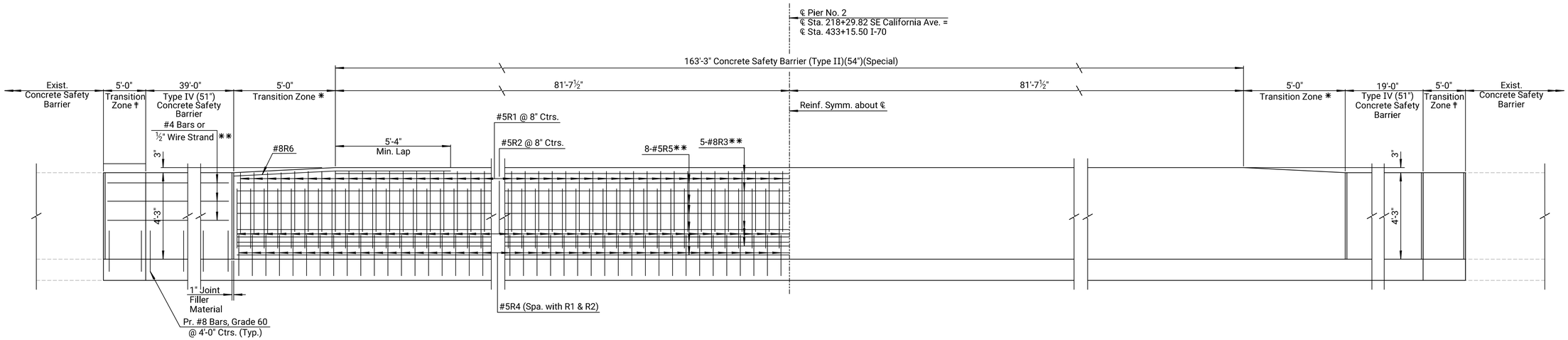
PIER PROTECTION DETAILS I

I-70

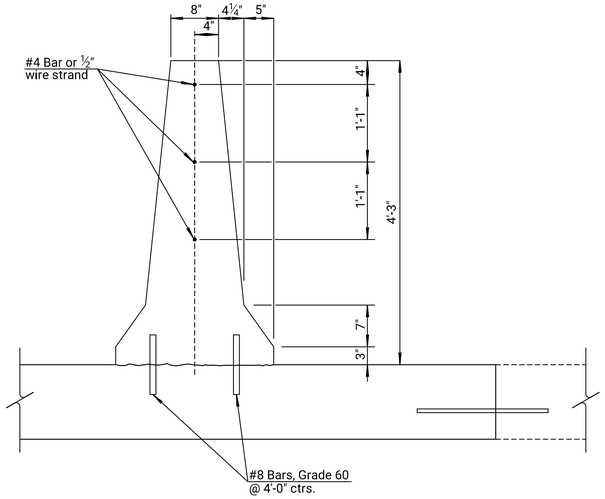
DATE | BY | REFERENCES NOTED | REFERENCES CHECKED

Plotted by : BGS01485 16-DEC-2025 12:07
File : ka680801rsb-103.dgn

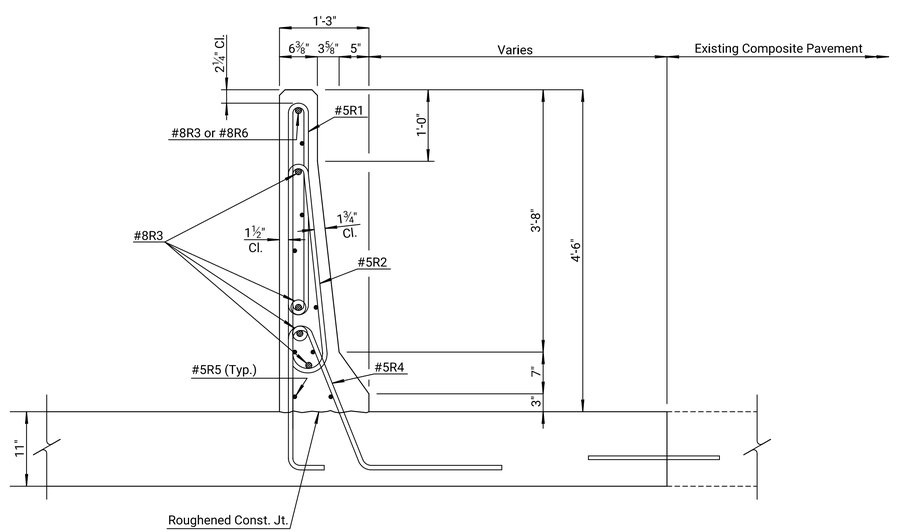
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	44	253



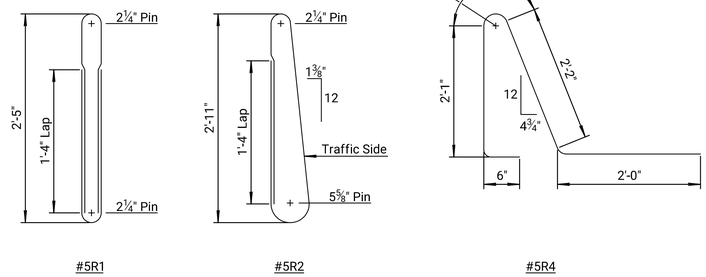
ELEVATION OF CONCRETE BARRIER
(Columns not shown for clarity)
(Traffic face of barrier, looking north)



CONCRETE SAFETY BARRIER (Type IV)(51") - TYPICAL SECTION



CONCRETE SAFETY BARRIER (Type II)(54")(Special) - TYPICAL SECTION
(Longitudinal barrier reinforcing bars that are not identified are #5R5.)



BENDING DIAGRAMS
(All dimensions are out to out of bars)

Notes:

Concrete Grade 4.0(AE)(SA) shall be used. Reinforcing steel shall conform with the requirements of ASTM A615, Grade 60 and shall be epoxy coated.

Legend:

† Transition zone from Type IV (51") Concrete Safety Barrier to match profile of existing (51") concrete safety barrier (Paid as Type IV (51") Concrete Safety Barrier, LNFT.). Contractor to verify existing barrier profile by field measurement and adjust transition as needed with approval of Engineer. See details on "Concrete Safety Barrier Auxillary Details" sheet for historic plans detail of exixting barrier, FOR INFORMATION ONLY.

✳ Trasition zone from Type II (54") (Special) barrier section to Type IV (51") Concrete Safety Barrier. Transition zone barrier from shall be paid for as "Concrete Safety Barrier (Type IV)(Special)".

✳✳ Place as shown in Typical Section

KANSAS DEPARTMENT OF TRANSPORTATION

PIER PROTECTION DETAILS II

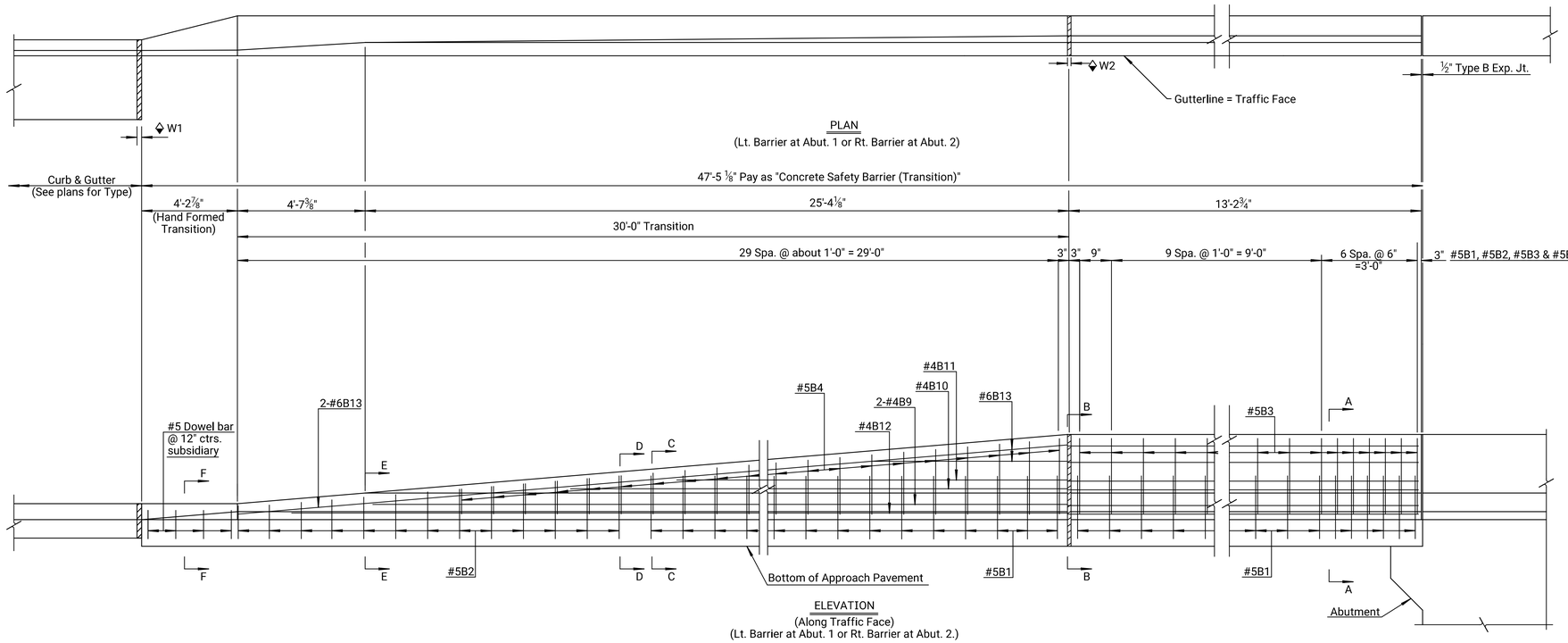
I-70

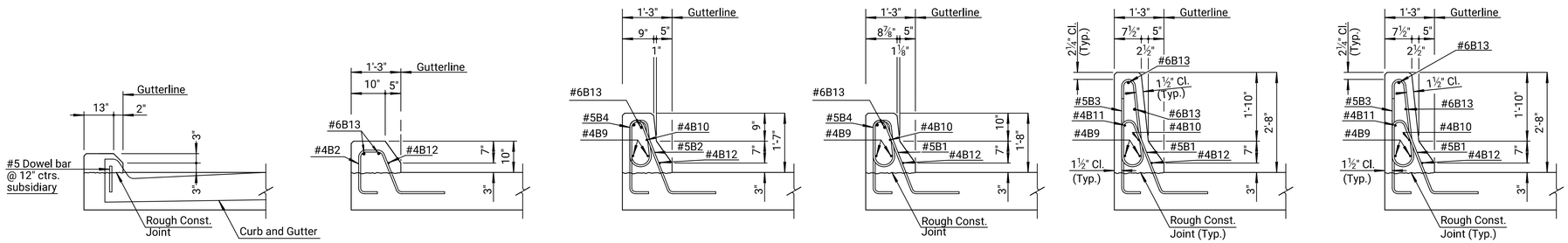
Sh. No. 44

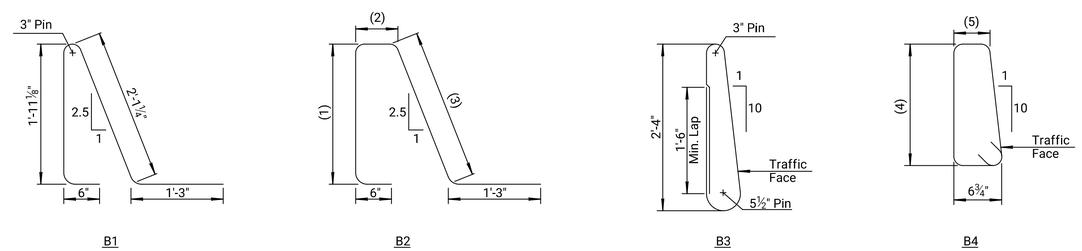
DATE
BY
REFERENCES NOTED
REFERENCES CHECKED

Plotted by : BGS01485 16-DEC-2025 12:07
File : ka680801rsb-104.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	45	253







BENDING DIAGRAMS

BILL OF REINFORCING STEEL EPOXY COATED GRADE 60							
Straight Bars				Bent Bars			
Mark	Size	Number	Length	Mark	Size	Number	Length
B13	#6	4	43'-0"	B1	#5	64	5'-8"
				B2	#5	30	✳
B9	#4	4	40'-2"	B3	#5	34	6'-8"
B10	#4	2	33'-8"	B4	#5	44	✳
B11	#4	2	30'-3"				
B12	#4	2	42'-10"				
Reinforcing Steel (Grade 60)(Epoxy Coated)							1,450 lbs.
Concrete (Grade 4.0)(AE)							6.0 C.Y.

Note: Quantities listed are for Left Barrier at Abutment No. 1 and Right Barier at Abutment No. 2

✳ See Bending Diagram

BENDING DIAGRAM DIMENSIONS								
Mark	DIM.	DIMENSION			LENGTH			NO. EACH
		FIRST	LAST	INCREMENT	FIRST	LAST	INCREMENT	
B2	(1)	10"	1'-10½"	⅞"	3'-10"	5'-7"	1½"	2
	(2)	9"	4"	⅜"				
	(3)	9"	1'-11"	1"				
B4	(4)	9¼"	2'-4"	⅞"	2'-6"	5'-6"	1¾"	2
	(5)	6¼"	4¼"	⅛"				

GENERAL NOTES:

Quantities shown for information only.

All Concrete shall be Grade 4.0 (AE). Bevel all exposed edges with a 3/4" triangular moulding and fillet corners where indicated. All dimensions relative to placement of reinforcing steel are to centerline of bars unless otherwise noted.

Concrete Safety Barrier transition shall be paid for as Concrete Safety Barrier (Transition)" and include all work and material required to build the barrier as detailed on the plans.

For details of Curb and Gutter see Sheet No. 23.

For details and reinforcement of Approach Pavement see Sheet No. 19.

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

UNIT STRESSES:

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

KANSAS DEPARTMENT OF TRANSPORTATION

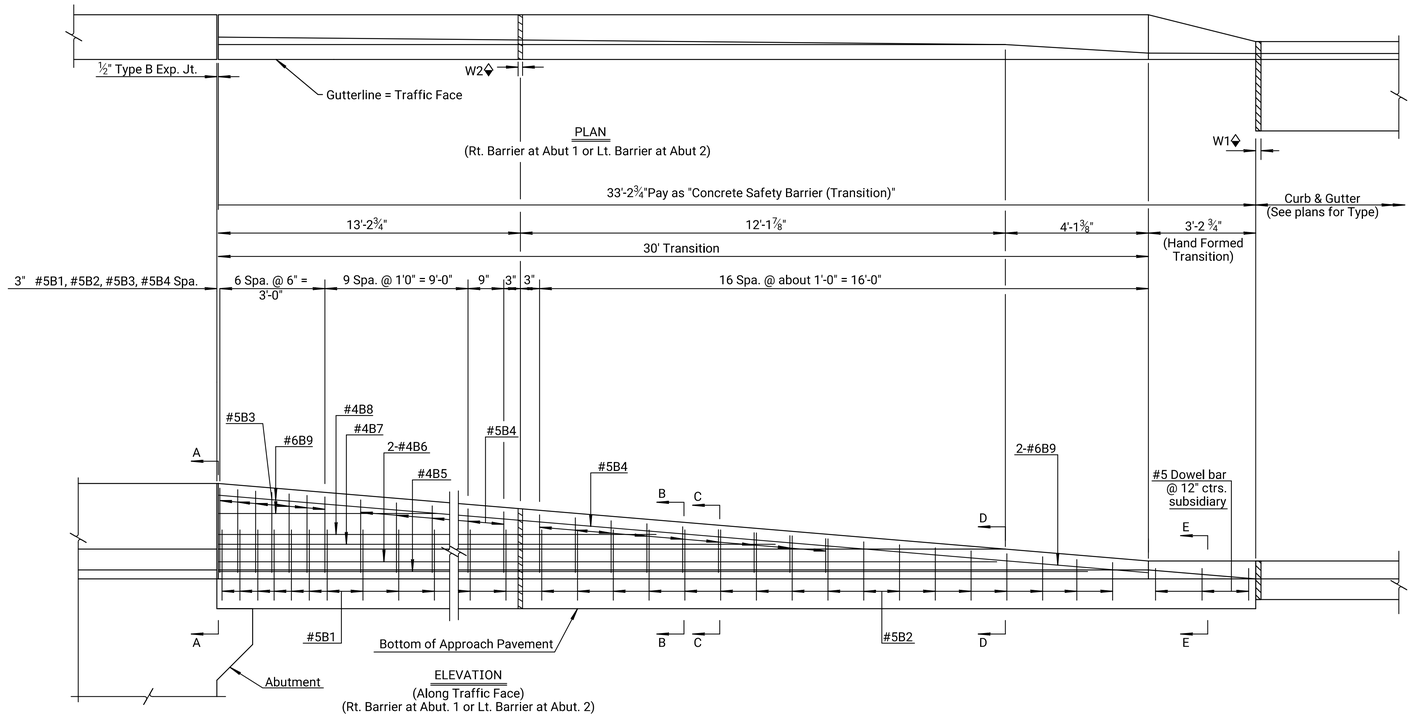
CONCRETE BARRIER TRANSITION DETAILS I

Sh. No. 45

DATE
BY
REFERENCES NOTED
REFERENCES CHECKED

Plotted by : BGS01485 16-DEC-2025 12:08
File : ka680801rsb-102.dgn

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	46	253

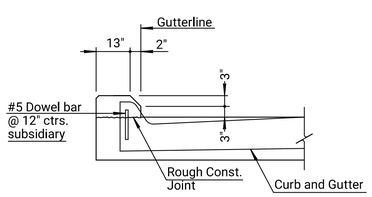


BILL OF REINFORCING STEEL EPOXY COATED GRADE 60

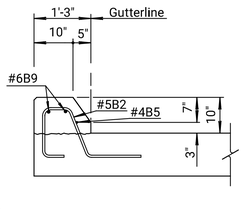
Straight Bars				Bent Bars			
Mark	Size	Number	Length	Mark	Size	Number	Length
B9	#6	4	29'-8"	B1	#5	34	5'-8"
				B2	#5	34	✳
B5	#4	2	28'-8"	B3	#5	14	✳
B6	#4	4	27'-6"	B4	#5	38	✳
B7	#4	2	20'-5"				
B8	#4	2	17'-0"				
Reinforcing Steel (Grade 60)(Epoxy Coated)							960 lbs.
Concrete (Grade 4.0)(AE)							3.0 C.Y.

Note: Quantities listed are for Right Barrier at Abutment No. 1 and Left Barrier at Abutment No. 2

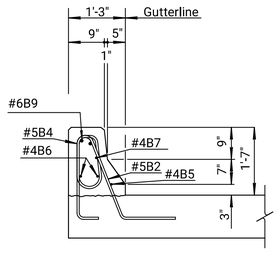
✳ See Bending Diagram



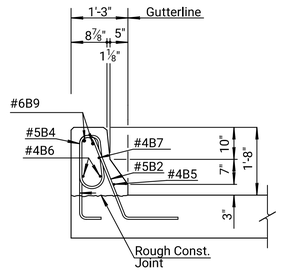
SECTION E-E



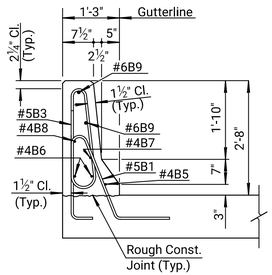
SECTION D-D



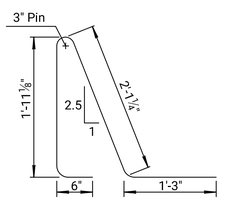
SECTION C-C



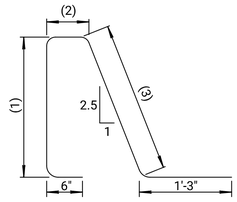
SECTION B-B



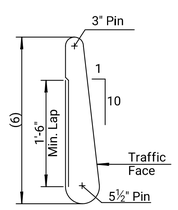
SECTION A-A



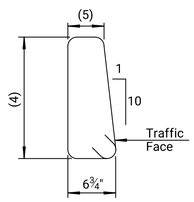
B1



B2



B3



B4

BENDING DIAGRAMS

BENDING DIAGRAM DIMENSIONS

Mark	DIM.	DIMENSION			LENGTH			NO. EACH
		FIRST	LAST	INCREMENT	FIRST	LAST	INCREMENT	
B2	(1)	10"	2'-0"	⅞"	3'-10"	5'-10"	1½"	2
	(2)	9"	4"	5/16"				
	(3)	9⅜"	2'-5/8"	1"				
B3	(6)	2'-1"	2'-4"	½"	6'-2"	6'-8"	1"	2
B4	(4)	9¼"	2'-3/8"	13/16"	2'-7"	4'-11"	1½"	2
	(5)	6¼"	4⅝"	⅛"				

GENERAL NOTES:

Quantities shown for information only.

All Concrete shall be Grade 4.0 (AE). Bevel all exposed edges with a 3/4" triangular moulding and fillet corners where indicated. All dimensions relative to placement of reinforcing steel are to centerline of bars unless otherwise noted.

Concrete Safety Barrier transition shall be paid for as Concrete Safety Barrier (Transition)" and include all work and material required to build the barrier as detailed on the plans.

For details of Curb and Gutter see Sheet No. 23.

For details and reinforcement of Approach Pavement see Sheet No. 19.

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

UNIT STRESSES:

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

KANSAS DEPARTMENT OF TRANSPORTATION

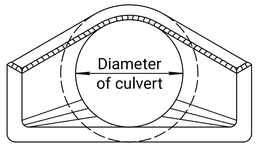
CONCRETE BARRIER TRANSITION DETAILS II

DATE | BY | REFERENCES NOTED | REFERENCES CHECKED

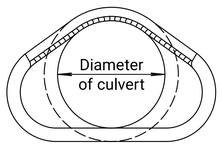
Plotted by : BGS01485 16-DEC-2025 12:08
File : ka680801rsb-102a.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	47	253

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

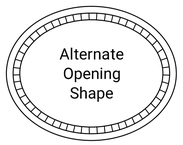


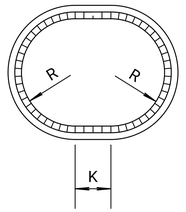
END ELEVATION (TYPE I)



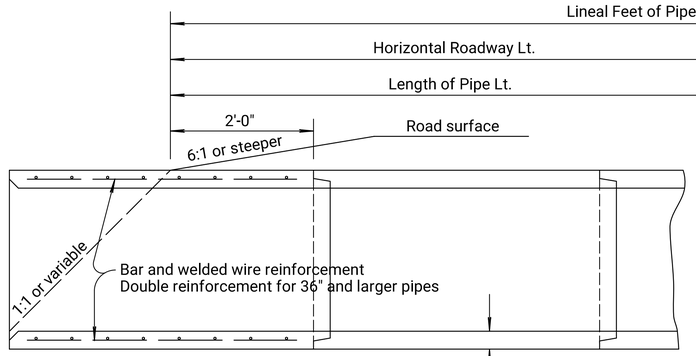
SECTION A-A

Showing rounding of inside edge of end section.

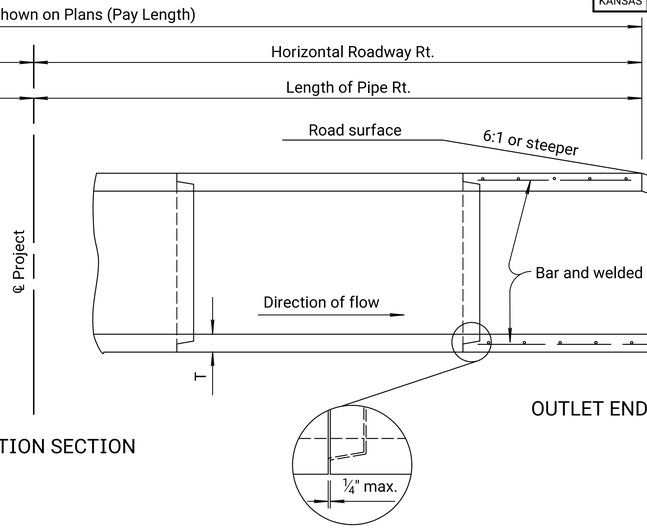




END ELEVATION
(TYPE III)



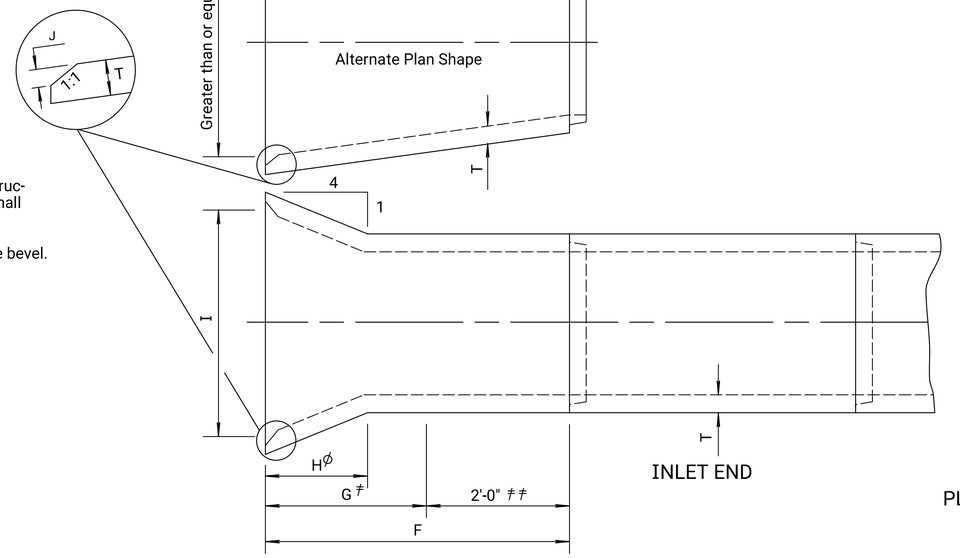
INLET END



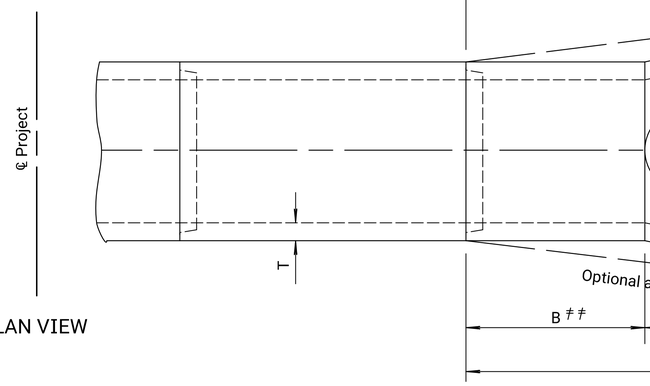
OUTLET END

ELEVATION SECTION

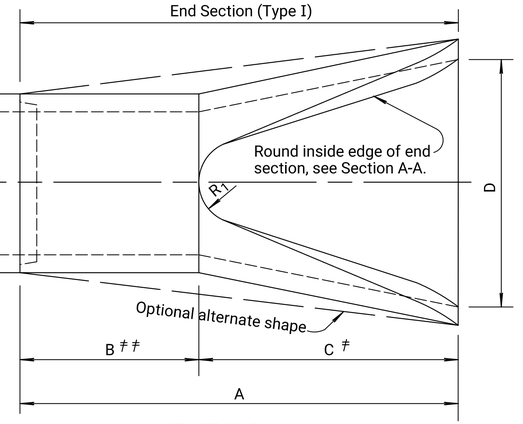
Note: There shall be no payment for gain in length due to joint fit tolerance.



INLET END



PLAN VIEW



OUTLET END

∅ Transition to round pipe.
≠ Paid for as separate item of End Section, except when structures shall bid as alternates. In that case End Sections shall be subsidiary to bid item. "Drainage Structure No. ".
≠≠ Included in pay length of pipe.
⚹ Minimum waterway area is calculated at the inside of the bevel.

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

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

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

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

KANSAS DEPARTMENT OF TRANSPORTATION

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

RD662

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

KDOT Graphics Certified 05-16-2022

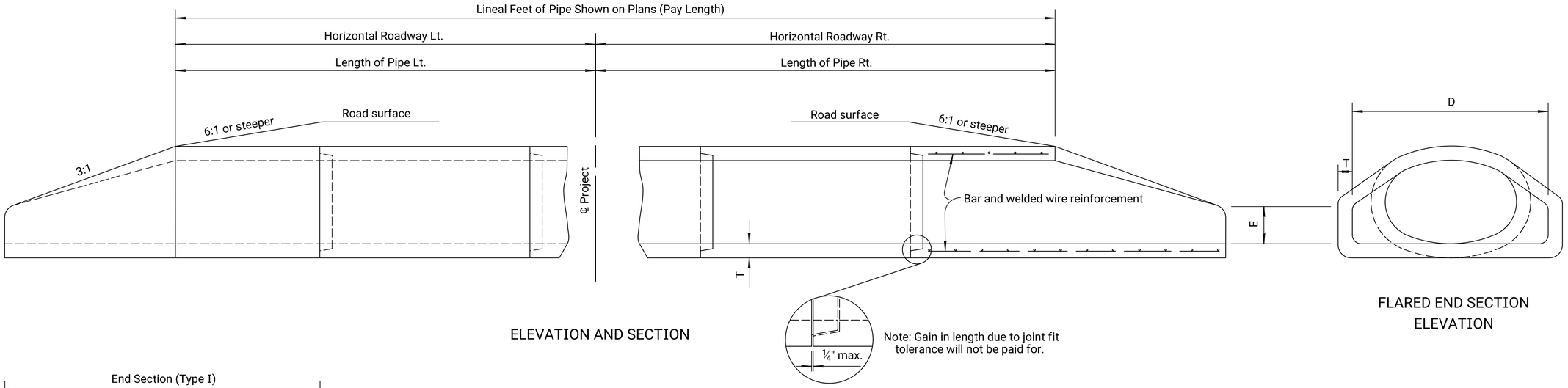
Sh. No. 47

KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 12:09
File : ka680801rss662.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	48	253

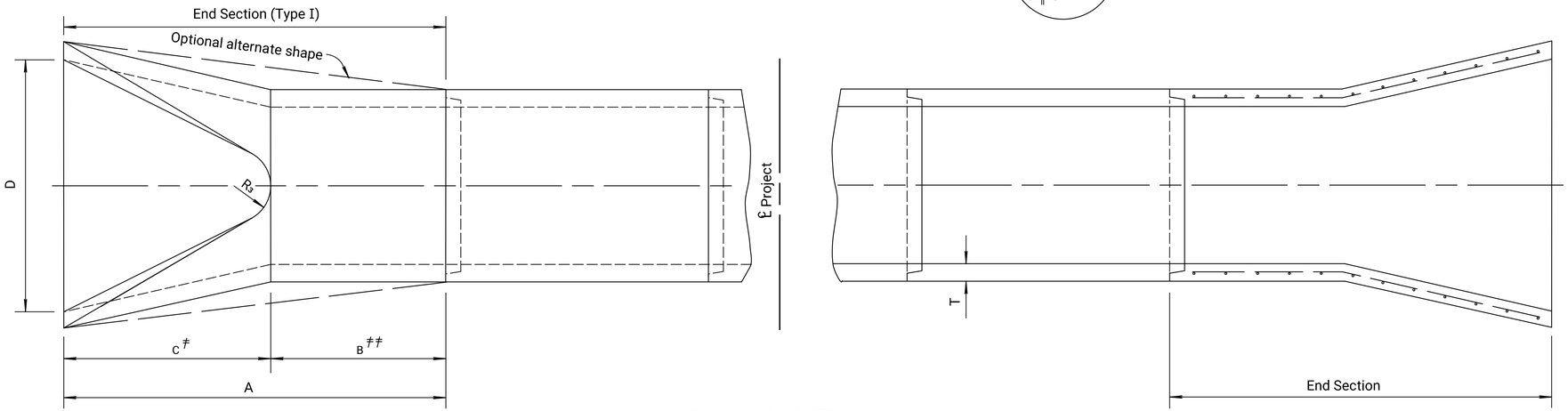
Note to Designer: KDOT Pipe Policy provides guidance in identifying the prohibited and/or restricted uses of CSP, ACSP, PEP, PVCP, CAP & RCP. Provide end sections of the same type and coating as the pipe. Exceptions to this are noted in the Standard Specifications. Refer to the KDOT Design Manual, Volume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



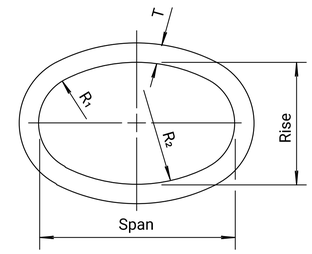
ELEVATION AND SECTION

Note: Gain in length due to joint fit tolerance will not be paid for.

FLARED END SECTION ELEVATION



PLAN AND SECTION



END ELEVATION

END SECTION (TYPE I) NOMINAL DIMENSIONS

Bid Designation Sq. Ft.	Equiv. Dia. (in.)	Min. W.W. Area Sq. Ft.	Span	Rise	Overall Length A	Barrel Length B ≠≠	C≠	D	E	R₁	R₂	R₃	T
1.0 or 1.5	18"	1.8	23"	14"	6'-0"	3'-9"	2'-3"	3'-0"	8"	6"	20"	6"	2¾"
2.0, 2.5 or 3.0	24"	3.3	30"	19"	6'-0"	2'-9"	3'-3"	4'-0"	8½"	8¼"	26¼"	7"	3¼"
4.0	27"	4.1	34"	22"	6'-0"	2'-2"	3'-10"	4'-6"	9"	9¼"	29 17/32"	8"	3½"
5.0	30"	5.1	38"	24"	6'-0"	1'-6"	4'-6"	5'-0"	9½"	10¼"	32¾"	9"	3¾"
6.0	33"	6.3	42"	27"	6'-0"	1'-3"	4'-9"	5'-6"	10⅜"	11 7/16"	36 3/16"	10½"	3¾"
7.0	36"	7.4	45"	29"	8'-0"	3'-0"	5'-0"	6'-0"	11¼"	12¼"	39¼"	12"	4½"
8.5	39"	8.8	49"	32"	8'-0"	3'-0"	5'-0"	6'-3"	12"	13 9/16"	42 21/32"	12½"	4¾"
10.0	42"	10.2	53"	34"	8'-0"	3'-0"	5'-0"	6'-6"	15¾"	14¾"	46"	13"	5"
11.0 or 12.5	48"	12.9	60"	38"	8'-0"	3'-0"	5'-0"	7'-0"	21"	16½"	51¾"	14"	5½"
14.0 or 16.5	54"	16.6	68"	43"	8'-0"	3'-0"	5'-0"	7'-6"	25½"	18 21/32"	58 13/32"	16"	6"

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

≠≠ Included in pay length of pipe.

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

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

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

KANSAS DEPARTMENT OF TRANSPORTATION

CONCRETE END SECTION FOR REINFORCED CONCRETE HORIZONTAL ELLIPTICAL PIPE TYPE I

RD663

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

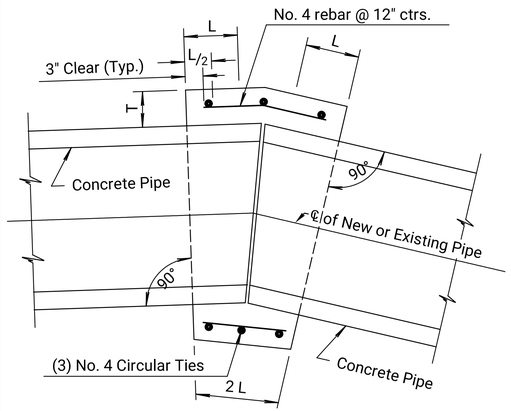
KDOT Graphics Certified 05-16-2022

Sh. No. 48

KDOT Graphics Certified

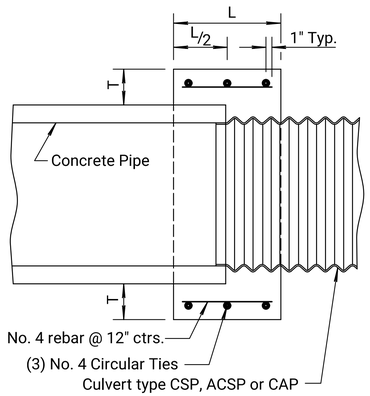
Plotted by : BGS01485 16-DEC-2025 12:09
File : ka6808001rss663.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	49	253



PIPE COLLAR AT CHANGE IN ALIGNMENT

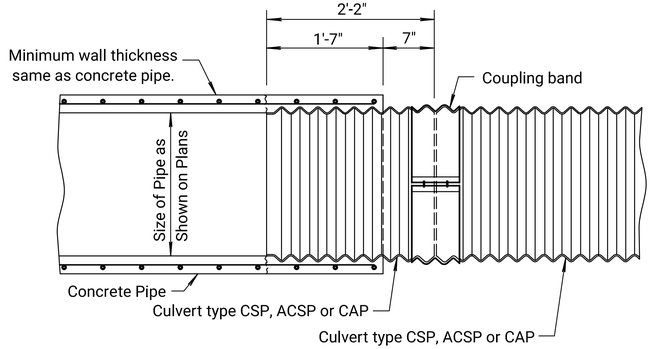
TYPE A COLLAR



PIPE COLLAR AT CHANGE IN PIPE MATERIAL

TYPE B COLLAR

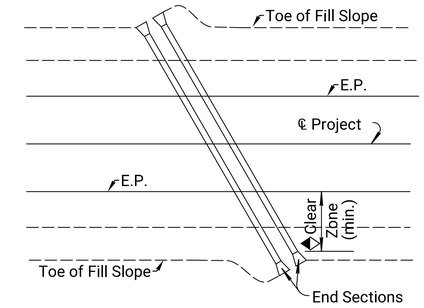
CONCRETE PIPE COLLAR		
Pipe Dia.	L	T
18"	1'-0"	6"
24"	1'-0"	6"
36"	1'-6"	8"
48"	1'-6"	10"
60"	1'-9"	11"



(CONCRETE PIPE CONNECTED TO CORRUGATED METAL PIPE)

TYPE C COLLAR ⚠

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



PLACEMENT OF ROTATED PIPES
RELATIVE TO FILL SLOPE
AND CLEAR ZONE

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

General Notes:

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

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

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

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

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

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

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

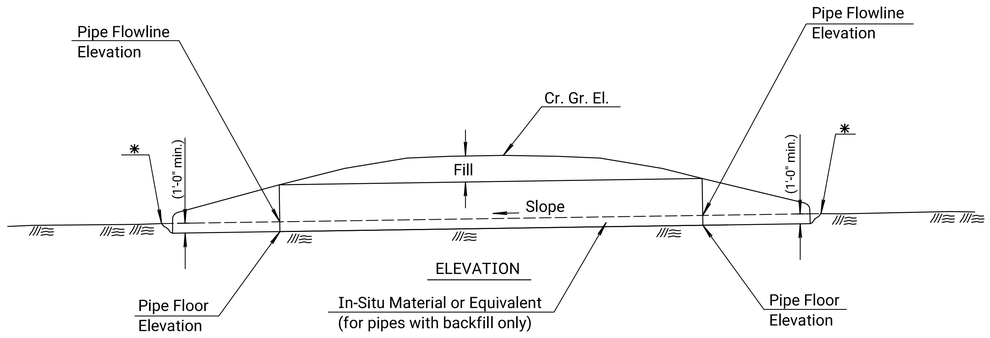
PIPE COLLARS

GENERAL NOTE

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

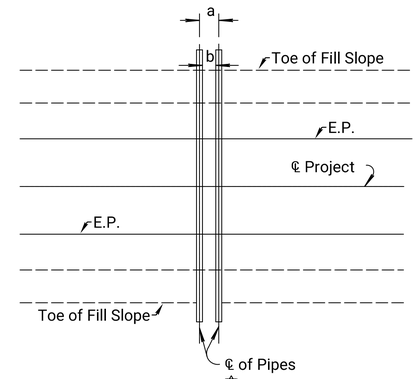
For pipes where the height or rise is less than or equal to 4'-0" install the pipe such that embedment will occur through natural sedimentation. See Pipe Embedment detail shown on this sheet.

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



PIPE EMBEDMENT

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



a = Face width of end section ✡ + 1'.

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

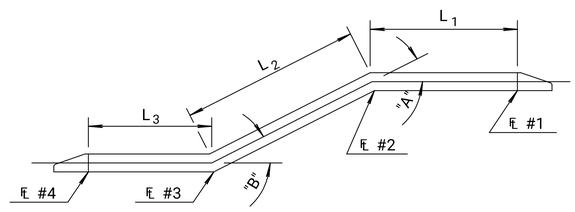
Type I Concrete = D
Type III Concrete = I
Type I CM = W+ 2A
Type III CM = G
Type IV = W+ 2A

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

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

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

MULTIPLE PIPE SPACING



Sketch Along ℄ CRP (CMP)
Broken-Back

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

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

KANSAS DEPARTMENT OF TRANSPORTATION

MISCELLANEOUS
PIPE CULVERT DETAILS

RD668

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

KDOT Graphics Certified 05-02-2022

Sh. No. 49

KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 12:10
File : ka680801rss668.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	50	253

SITE DATA							HYDROLOGY				HYDRAULICS	
DRAINAGE STRUCTURE NUMBER	LOCATION STATION	DRAINAGE AREA NUMBER	DRAINAGE AREA ACREAGE	RECURRENCE INTERVAL YEARS	A. H. W. ELEVATION FEET	REMARKS	METHOD	DATA	Q_{cfs}	REMARKS	H. W. ELEVATION FEET	REMARKS
	℄ I-70 433+00.15		7.2	10	938.86		Rational	Tc = 10 minutes, C = 0.60, I = 6.11	26.5		938.85	

02	10-08-90	Detailed on CADD, no change	R.J.S.	J.O.B.
01	05-29-80	Assigned standard number	W.L.H.	J.O.B.
NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

DRAINAGE DATA SHEET

RD653

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

KDOT Graphics Certified 07-18-2022

Sh. No. 50

KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 12:10
File : ka680801rss653.dgn

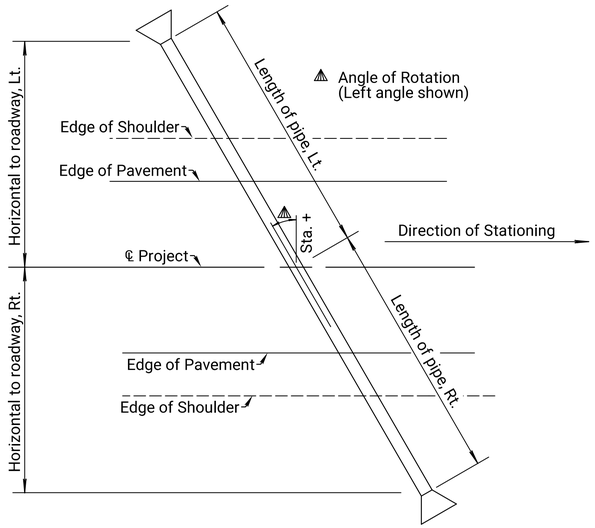
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	51	253

PIPE CULVERT SUMMARY

Station	Type	Size or Bid Designation Sq. Ft.	Crown Grade Elev.	Flow Line		Floor Elev.		Horizontal Roadway		Degree of Rotation	Length of Pipe		Lin. Ft. of Pipe	Height of Fill (max.) Ft.	Concrete Pipe AASHTO Class No.	Pipe Gauge ◔		Pipe Corrugations ◔		Remarks
				Lt.	Rt.	Lt.	Rt.	Lt.	Rt.		Lt.	Rt.				Steel	Alum.	Steel	Alum.	
I-70																				
432+03.25 to 433+97.00	CRP	8.5 Sq. Ft.		931.28	936.77						96	96	192	6.0						
432+34.45 to 434+09.97	CRP	24"		933.45	938.24						16	16	32	3.67						Paid for as Resetting Pipe Culvert and Resetting End Section

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

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



PLAN
(Showing Rotation about ℄)

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

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

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

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

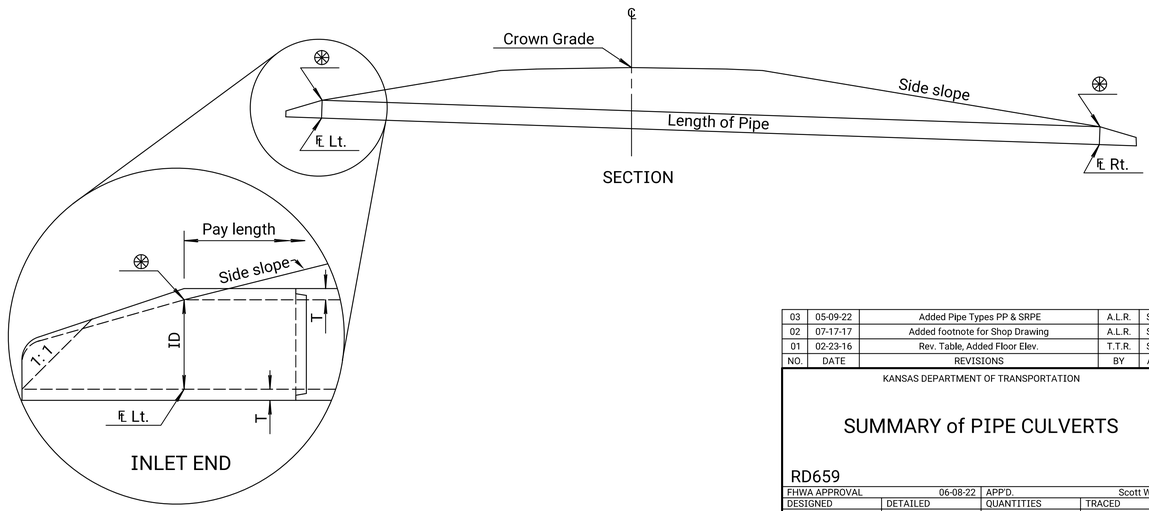
≷ For inside diameter: ≥ 30"

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

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

⅄ Submit Shop Drawing of connection for review

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



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

KANSAS DEPARTMENT OF TRANSPORTATION

SUMMARY of PIPE CULVERTS

RD659

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

KDOT Graphics Certified 12-11-2025

Sh. No. 51

KDOT Graphics Certified

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

Plotted by : BGS01485 16-DEC-2025 12:11
File : ka680801rss659.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	52	253

SUMMARY OF QUANTITIES

Item / Location	Excavation Class III Cu. Yds.	Concrete (Grade 4.0) (AE) (SA) Cu. Yds.	Concrete (Grade 4.0) (AE) Cu. Yds.	Reinforcing Steel (Grade 60) (Epoxy Coated) Lbs.	✳Piles (Steel) (HP 12x53) Lin. Ft.	Pre-Drilled Pile Holes Lin. Ft.	Drilled Shaft (42") (Cased) Lin. Ft.	Sonic Test (Drilled Shaft) (Set Price) Each	Core Hole (Investigative) Lin. Ft.	Bridge Backwall Prot. System Sq. Yds.	Abutment Strip Drain Sq. Yds.	Slope Protection (Aggregate) Cu. Yds.	Bridge Deck Grooving Sq. Yds.	Bridge Handrail (Metal)(1'-0") Lin. Ft.	Fence (Chain Link)(4'-0") (Special Duplex/PVC) Lin. Ft.	Fence (Chain Link)(6'-0") (Special Duplex/PVC) Lin. Ft.
Abutment No. 1	129.0	✳✳		✳✳	180	153				46	37	15				
Pier No. 1	37.7		38.7	7070			120	8	73							
Pier No. 2	41.1		43.9	8050			112	8	71							
Pier No. 3	45.7		47.9	8800			108	8	71							
Abutment No. 2	133.0	✳✳		✳✳	216	189				46	37	20				
Substr. Total	387.0		130.5	23920	396	342	340	24	215	92	74	35				
Superstr. Total		1480.4		373620									1863	227	144	82
Total	387	1480.4	130.5	397540	396 †	342	340	1	215	92	74	35	1863	227	144	82

✳✳ Quantities are included in the Superstr. Total Quantity.

† Summary of Piling

Abutment No. 1 9 @ 20'
Abutment No. 2 9 @ 24'

✳ NOTE: Only steel pile HP12X53 shall be used on this project.

INDEX TO BRIDGE DRAWINGS

Sheet No.	Drawing
50-51	General Notes and Quantities
52	Contour Map
53	Construction Layout
54	Engineering Geology
55-57	Abutment Details
58	Abutment Strip Drain
59	Drilled Shaft Details
60-61	Pier Details
62-63	Superstructure Details
64	Barrier Layout and Curb Details
65	Barrier Details
66	Bridge Handrail Details
67	Pedestrian Fence Details
68	Slab Elevations
69	Bill of Reinforcing Steel and Bending Diagrams
	Standards
70	Bridge Excavation
71	Standard Pile Details
72	Supports and Spacers for Reinforcing Steel
73	Bridge Berm and Slope Protection

GENERAL NOTES

EXISTING STRUCTURE: Plans of the existing structure are on file and available for inspection by qualified bidders at the State Bridge Office, KDOT, Eisenhower State Office Building, 700 SW Harrison, Topeka, KS.

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

BRIDGE EXCAVATION: All excavation shall be Class III. See the Bridge Excavation sheet for the limits of pay excavation.

BACKFILL COMPACTION: Compact backfill at the abutments and piers.

PILING: No driving of the H-Pile shall be undertaken, only placement of the H-Pile after pre-drilling to Elevation 935.0' within the Curzon Limestone Member. Tapping only once to confirm the H-Pile resting on solid limestone to the satisfaction of the Engineer.

PRE-DRILLING: All steel piles will be pre-drilled to within the Curzon Limestone Member, to Elevation 935.0'. Temporary casing shall be used to maintain drill hole cleanliness. Piles shall be set and NOT driven. After the pile has been placed, the annular space around the pile shall be backfilled with concrete (Gr. 3.0) to the top of bedrock. From the top of bedrock, the backfill shall consist of sand or other loose material to within 2 to 3 feet of the surface, per Standard Specification 704. Cost of Concrete (Gr. 3.0) shall be considered subsidiary to the unit cost for "Pre-Drilling".

ABUTMENT STRIP DRAIN: See the General Notes on the "Abutment Strip Drain" sheet.

BRIDGE BACKWALL PROTECTION SYSTEM: See the General Notes on the "Abutment Strip Drain" sheet.

ASBESTOS INFORMATION: Samples of this structure were tested to determine the amount of Asbestos Containing Material (ACM) present in the components. The results are listed below:

Concrete	0%
Date of Report	03/20/2024

For any result above greater than 1%, abatement shall be performed according to KDOT Specifications. Results less than 1% require no abatement.

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

REINFORCING STEEL: All reinforcing steel dimensions are to the centerline of bars unless otherwise noted. All reinforcing steel, except the spiral bars, shall conform to the requirements of ASTM A615, Grade 60. Spiral bars may meet the requirements of either ASTM A615 (Gr. 40 or 60) or AASHTO M32, and are included in the bid item "Reinforcing Steel (Gr. 60)".

Where non-coated bars come in contact with epoxy coated bars, they need not be coated.

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

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

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

DEMOLITION PLANS: This is a Category B Demolition. Submit detailed Demolition Plans to the Field Engineer at least 2 weeks before the demolition meeting. Identify, on the plans, the Demolition Supervisor meeting the requirements of the KDOT Specifications. No Demolition work will begin without approved Demolition Plans. A Licensed Professional Engineer is not required.

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

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

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

HANDRAIL: Construction joints in the rail are not permitted except as shown. Build handrails after the falsework is struck.

TRAFFIC DATA - (324)		
ROUTE	CALIFORNIA AVE.	I-70
AADT (2027)	11,600	46,200
AADT (2047)	14,500	63,000
DHV	11%	10%
D	60/40	60/40
T	4%	11%

LFD & LRFR RATING FACTORS			
Truck / Rating Level		Inventory	Operating
HS-20	(36T)	1.60	2.67
Type HET	(110T)		1.66
2002 LFD Rating. 17th Edition AASHTO			
HL-93 Loading		1.41	1.83
2018 Manual for Bridge Evaluation			

DESIGN DATA

DESIGN SPECIFICATIONS:
Superstructure (Reinforced Concrete Haunch Slab Design): AASHTO Specifications, 2007 Edition and latest Interim Specifications. Load and Resistance Factor Design.

Substructure:
AASHTO Specifications, 2020 (9th) Edition and latest Interim Specifications. Load and Resistance Factor Design.

DESIGN LOADING:
HL-93

Design Dead Load includes an allowance of 15 psf for a future wearing surface.

UNIT STRESSES:

Concrete (Grade 4.0)	f'c = 4 ksi
Concrete (Grade 4.0)(AE)	f'c = 4 ksi
Concrete (Grade 4.0)(AE)(SA)	f'c = 4 ksi
Reinforcing Steel (Grade 60)	fy = 60 ksi
Steel Piling (Grade 50)	fy = 50 ksi

LRFD DESIGN PILE LOAD:

Design Loading (Tons/Pile)	Strength	Service	Phi
Abutment 1 & 2	89	64	0.9

LRFD DESIGN DRILLED SHAFT LOAD:

Design Loading (Tons/Shaft)	Strength	Service	Phi	
Pier No. 1 & 3	203	156	End Bearing	0.45
			Side Friction	0.45
Pier No. 2	204	156	End Bearing	0.45
			Side Friction	0.45

NO.	DATE	REVISIONS	BY	APPD
08	10-24-23	Update Notes; add NOT9040 & NOT8221 text	M.L.L.	D.N.S.
07	02-03-22	Made NOT3130 & NOT3140 default	M.L.L.	M.A.H.
06	10-19-15	Added Asbestos NOT8221 option	J.P.J.	C.E.R.

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 70-89-363.90 (324) Sta. 218+29.82

GENERAL NOTES AND QUANTITIES

Proj. 70-89 KA-6808-01 Shawnee Co.

DESIGNED	TRB	DETAILED	ES	QUANTITIES	TRB	CADD	ES
DESIGN CK.	DAS	DETAIL CK.	DAS	QUAN.CK.	DAS	CADD CK.	

Plotted by : BGS01485 16-DEC-2025 15:46
File : 1901_ka680801bss200-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	53	253

GENERAL NOTES

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

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

SLAB ELEVATIONS: The Contractor shall record elevation readings on the "Slab Elevations" sheet in the table at locations designated by a "(2)" and submit the sheet to the Engineer.

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

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

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

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

BRIDGE DECK GROOVING: After the bridge deck has cured, transversely groove the deck in accordance with KDOT Specifications. For phased construction groove each completed phase before opening to traffic. Align the grooves from each adjacent phase across the bridge deck without jogs or discontinuities. For skewed bridges all grooving will be perpendicular to the centerline of the bridge.

BROKEN CONCRETE: Waste the broken concrete from the existing bridge on sites provided by the Contractor and approved by the Engineer.

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

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

DECK FINISHING: Set the finishing machine normal to the centerline of the structure for striking off and screeding the concrete.

DRILLED SHAFTS: Construct the drilled shafts using the cased method. A permanent casing is required. All excavation, concrete, reinforcing steel, pipes for Sonic Testing, casings, labor, and incidentals necessary to complete the shafts as shown on the details and as directed by KDOT Specifications shall be included in the bid item "Drilled Shafts (42")(Cased)". Use Grade 4.0 Concrete in the drilled shaft. In no case shall the bottom of the drilled shaft be placed higher than the elevation shown unless otherwise directed by the KDOT Geologist.

If the location of the top of the shaft is such that the casing cannot be overtopped to remove concrete impurities, provide extra casing length to over-pour the concrete in the shaft and chip back to the plan elevation of the top of the shaft.

If the permanent casing is to be corrugated metal pipe (CMP) then it will be galvanized.

SONIC TESTING: Equip all drilled shafts with piping to allow sonic testing to be done. Install pipes at locations shown on the plans. All wet pours will be tested. Also, the Engineer has the option to require sonic, non-destructive, integrity testing at any location of concern. Sonic testing shall be paid for at the unit price set for "Sonic Test" (Drilled Shaft) (Set Price). If the sonic testing indicates defective concrete in the shaft, the Engineer will measure the first sonic test for payment, and the Contractor is responsible for subsequent sonic testing of that shaft. Report test results directly to KDOT's Chief Geologist. No work will be done above the top of the drilled shaft without the approval of the Chief Geologist.

PERMANENT CASING: See KDOT's Specifications.

DRILLED SHAFT BACKFILL: Backfill the annular space between the temporary casing and the permanent casing with grout/flowable fill as defined in the KDOT Specifications.

COLUMN CONSTRUCTION: Cure the drilled shaft footing as required by the KDOT Specifications before beginning the column construction (placing resteel or formwork). Do not place cast in place shear bolts, coil inserts or other devices used as falsework support in the column without the approval of the Engineer. Do not remove the column formwork without the approval of the Engineer. Curing shall continue after the formwork is removed as required by the KDOT Specifications.

PIER BEAM CONSTRUCTION: Cure the columns as required by the KDOT Specifications before beginning the pier beam construction (placing resteel or formwork). Do not drill and grout bolts or other devices into the columns used for falsework support unless approved by the Engineer. Cure the column as required by the KDOT Specifications before beginning to place the superstructure concrete.

INVESTIGATIVE CORE HOLES: Drill an Investigative Core Hole at the location(s) shown on the plans. See KDOT Specifications.

Please contact the Topeka Regional Geology Office when the schedule for the investigative core holes has been established so that a member of the staff may be on site when the work is being performed.

NO.	DATE	REVISIONS	BY	APPD
08	10-24-23	Update Notes; add NOT9040 & NOT8221 text	M.L.L.	D.N.S.
07	02-03-22	Made NOT3130 & NOT3140 default	M.L.L.	M.A.H.
06	10-19-15	Added Asbestos NOT8221 option	J.P.J.	C.E.R.

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 70-89-363.90 (324) Sta. 218+29.82

GENERAL NOTES AND QUANTITIES

Proj. 70-89 KA-6808-01 Shawnee Co.

DESIGNED	TRB	DETAILED	ES	QUANTITIES	TRB	CADD	ES
DESIGN CK.	DAS	DETAIL CK.	DAS	QUAN.CK.	DAS	CADD CK.	

Plotted by : BGS01485 16-DEC-2025 12:11
File : 1902_ka680801bss200-02.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	54	253

P.I. ℄ SE California Ave. 213+28.09
N 263,659.714 E 2,667,476.869
1. Found 2 ½" Disk in a valve box, not readable, at the E 1/16th Corner, SE ¼ Section 5 T12S R16E
2. Found plus cut on top of curb
3. Found plus cut on curb inlet
4. Found plus cut on top of curb
5. Found plus cut on curb inlet

P.O.T. ℄ SE California Ave. 222+85.00
N 264,616.625 E 2,667,476.407
1. Set ⅝" Rebar and Aluminum Cap stamped Bartlett & West KA 6808-01 ℄ CALI AVE 222+85.00, flush with surface, north end concrete island
2. Set plus cut north end concrete island, 13.56' N
3. Set plus cut on concrete island, 18.31' S
4. Set plus cut on top of curb, 32.60' W
5. Set plus cut on top of curb, 32.36' E

Scale: 1'=50'

JUSTIN LYNN HURD AND NICOLE D. HOLT
LOT 20, CALIFORNIA ACRES
PART OF SE 1/4,
SEC.5, T12S, R16E

AGUSTIN ANTONIO MARTINEZ
LOTS 6, CALIFORNIA ACRES

VF TRUST
LOTS 4 & 5,
CALIFORNIA ACRES

CENTRAL STATES COMMERCIAL RESIDENTIAL INVESTMENT GROUP, LLC.
LOTS 1-3,
CALIFORNIA ACRES

RANDY E. JR. WHEAT
PART OF SE 1/4,
SEC.5, T12S, R16E
BOOK: 3402, PAGE:655

TOPEKA CEMETARY ASSOCIATION,
PART OF EAST 1/2
SEC.5, T12S, R16E

PARKDALE, LLC
PART OF SW 1/4
SEC.4, T12S, R16E

KEMPER TRUST
LOTS 10 - 12,
BANTA SUBDIVSION

JESUS FLORES, ET. AL.
LOT 9,
BANTA SUBDIVSION

CRAIG WOLFE, ET. AL.
LOT 8,
BANTA SUBDIVSION

BRIDAR, LLC
LOT 7,
BANTA SUBDIVSION

RUBEN G. MUNOZ, ET. AL.
LOT 6,
BANTA SUBDIVSION

JAMES JASPER, ET. AL
LOT 5,
BANTA SUBDIVSION

RICHARD COOK

JOHN C. DAVIDSON
ODD LOTS 9 - 45
EAST LAWN SUBDIVISION

KANSAS PARDISE PLAZA, LLC
PART OF SW 1/4
SEC. 4, T12S, R16E

TFMCOMM INC.
LOT 1, 2, AND PART OF LOT 3
RML SUBDIVISION

CENTRAL STATES COMMERCIAL RESIDENTIAL INVESTMENT
BLOCK 1 EVEN LOTS 2 - 18
BELL VIEW ADDITION

JOE KNERNSCHIELD
BLOCK 1, EVEN LOTS 20 - 24
AND ODD LOTS 13 - 23
BLOCK 2, PART OF EVEN LOTS 14 - 24
BELL VIEW ADDITION

Waterline - City of Topeka

℄ Sta. 218+29.82 Remove
Br. No. 70-89-363.90 (039)
49'-59'-59'-44' Reinforced Concrete Voided Slab, Continuous (RVSC)
70'-2" Roadway with 4'-0" Sidewalk Lt. & Rt.
10°41' Skew Rt.

Sta. 218+29.82 Construct
Br. No. 70-89-363.90(324)
48'-64'-64'-48' Reinforced Concrete Slab, Continuous, Haunched (RCSH)
74'-0" Roadway with 6'-0" Sidewalk Rt.
10°41' Skew Rt.

Sta. 214+99.82 Begin Construction

Sta. 220+62.40 End Construction

℄ I-70

EB I-70

WB I-70

℄ SE California Ave.

Ramp A

Ramp B

Ramp C

Ramp D

Exist. R/W & A.C.

Exist. R/W

Const. Limits

Overhead Power

Fiber Optic - Topeka Traffic

2" Φ Conduit - Lighting

4" Φ Conduit - USD 501

SE 13th St.

SE 11th St.

PI 212+49.85

PI 213+28.09

1/16 ℄

UTILITIES

Communications
Cox Communications
931 SW Henderson
Topeka, KS 66615
Glen Cahoon
(785)-215-6707

Gas
Kansas Gas Service Co. (KGS)
200 E 1st Ave.
Topeka, KS 66603
Justin Clements
(913)-599-8980

Power
Evergy Energy (Evergy)
818 S Kansas Ave.
Topeka, KS 66612
Scott Schlageck
(785)-575-6014

Sanitary Sewer
City of Topeka (COT)
620 SE Madison St.
Topeka, KS 66603
(785)-368-3111

Storm Sewer
City of Topeka (COT)
620 SE Madison St.
Topeka, KS 66603
(785)-368-3111

Traffic
City of Topeka (COT Traffic)
1515 SW Saline
Topeka, KS 66618
(785)-251-6101

Water
City of Topeka (COT)
620 SE Madison St.
Topeka, KS 66603
(785)-368-3111

4" Φ Conduit on Bridge
Topeka Public Schools (USD 501)
624 SW 24th St.
Topeka, KS 66611
(785)-295-3000

Lighting

Plotted By: BGS01485 | Plot Location:
File: 1903_ka6808011bbr-324-01.dgn
Plot Date: 16-DEC-2025 12:12

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 70-89-363.90 (324) Sta. 218+29.82

CONTOUR MAP
SE CALIFORNIA AVE. OVER I-70

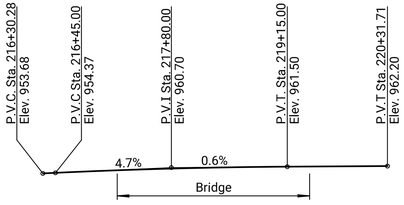
Proj. 70-89 KA-6808-01 Shawnee Co.

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

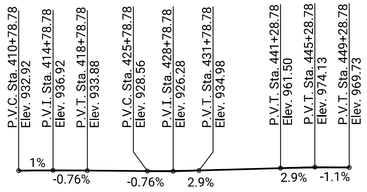
Unless shown otherwise, Elevation are to the NAVD88 Vertical Datum

Sh. No. 54

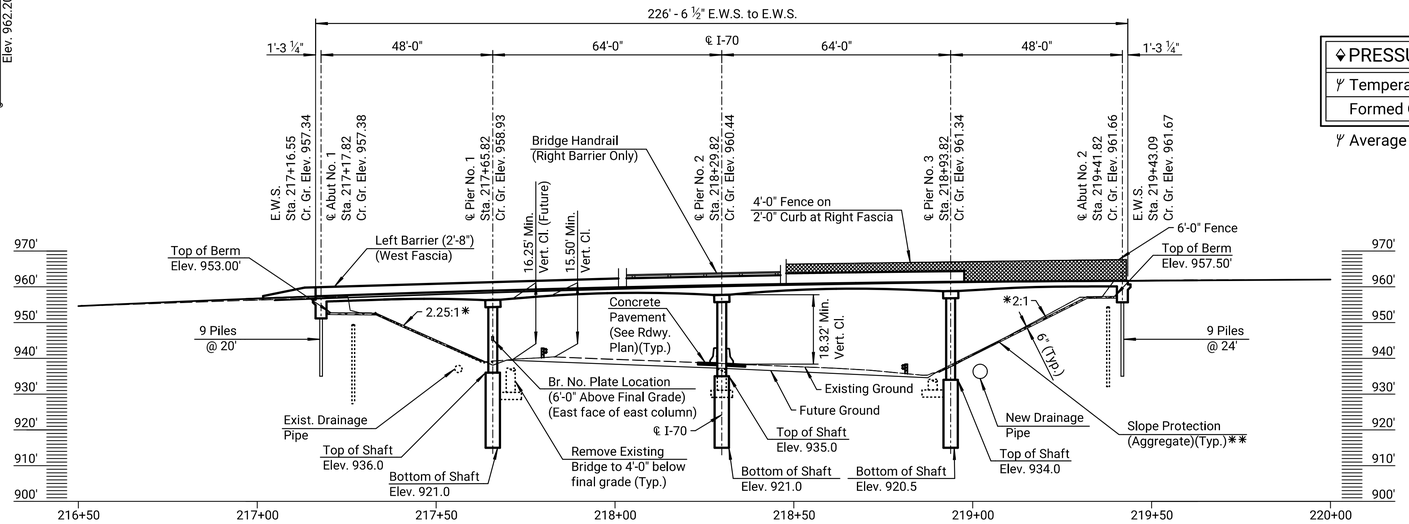
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	55	253



PROFILE GRADE
270' V.C.
SE California Ave.



PROFILE GRADE
℄ I-70 (Existing)



ELEVATION
48'-64'-64'-48' Reinforced Concrete Slab, Continuous, Haunched (RCSH)
Pile Bent Abutments, Column Bent Piers
74'-0" Roadway with 6'-0" Sidewalk Rt.
10°41'00" Skew Rt.

BM #CTBM 229(Datum BM) Brass Disk Stamped City of Topeka Engineering 229, at SE Cor. of Bridge on California Ave.
Sta. 433+75.55 Rt. 110.31' Elev. 956.94'

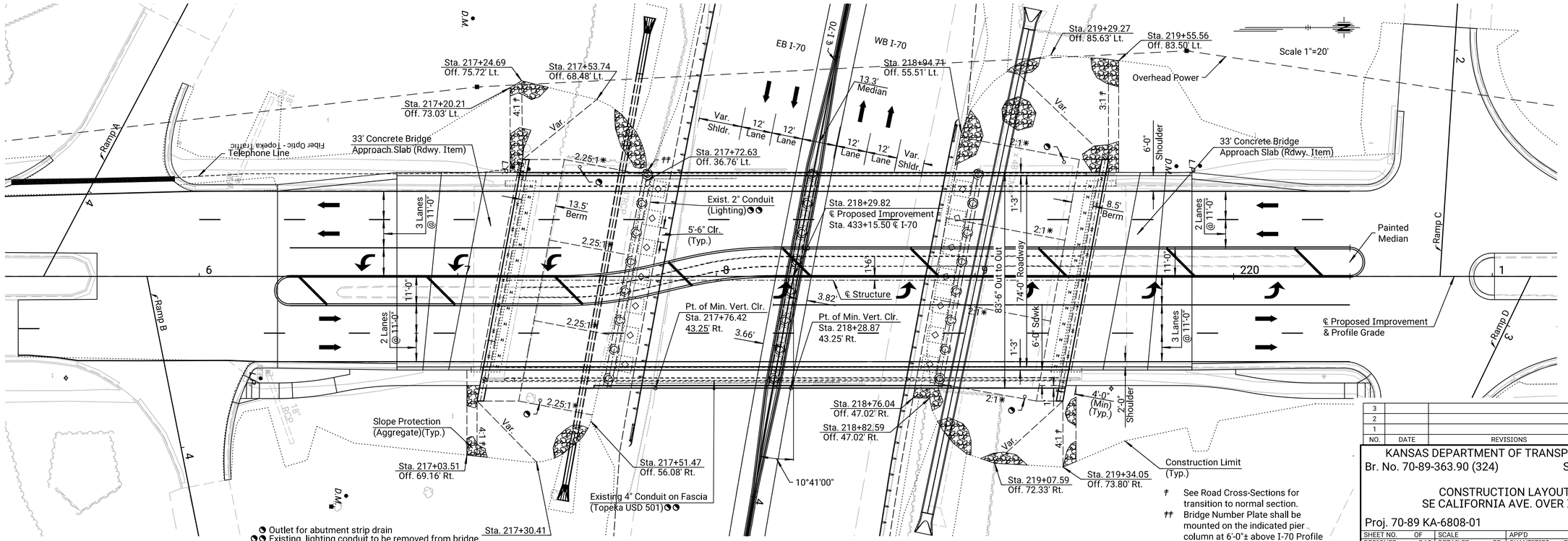
✱ Match Existing (Slope normal to abutment)
✱✱ Remove Exist. Concrete Riprap

BM #124A Square cut at the NW Corner of a curb inlet, W R/W California Ave., N side of ramp to I-70 W.B.
Sta. 432+16.97 Lt. 300.54' Elev. 962.47'

BM #125A 4 Ft. T-Post, Flush with Surface on N. Side of I-70 W.B. off ramp to California Ave.
Sta. 438+24.43 Lt. 162.58' Elev. 953.60'

⟡ PRESSURE RELIEF JOINT WIDTH DETAILS (W_1)						
⍛ Temperature (F°)	40°	50°	60°	70°	80°	90°
Formed Concrete Opening Size	3¼"	3⅛"	3"	2⅞"	2⅞"	2¾"

⍛ Average Ambient Temperature over previous 24 hours.



◔ Outlet for abutment strip drain
◔◔ Existing lighting conduit to be removed from bridge.
Existing Topeka USD conduit to be removed from bridge.

PLAN

ǂ See Road Cross-Sections for transition to normal section.
ǂǂ Bridge Number Plate shall be mounted on the indicated pier column at 6'-0"± above I-70 Profile Grade. See Pier Details

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 70-89-363.90 (324) Sta. 218+29.82

CONSTRUCTION LAYOUT
SE CALIFORNIA AVE. OVER I-70

Proj. 70-89 KA-6808-01 Shawnee Co.

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

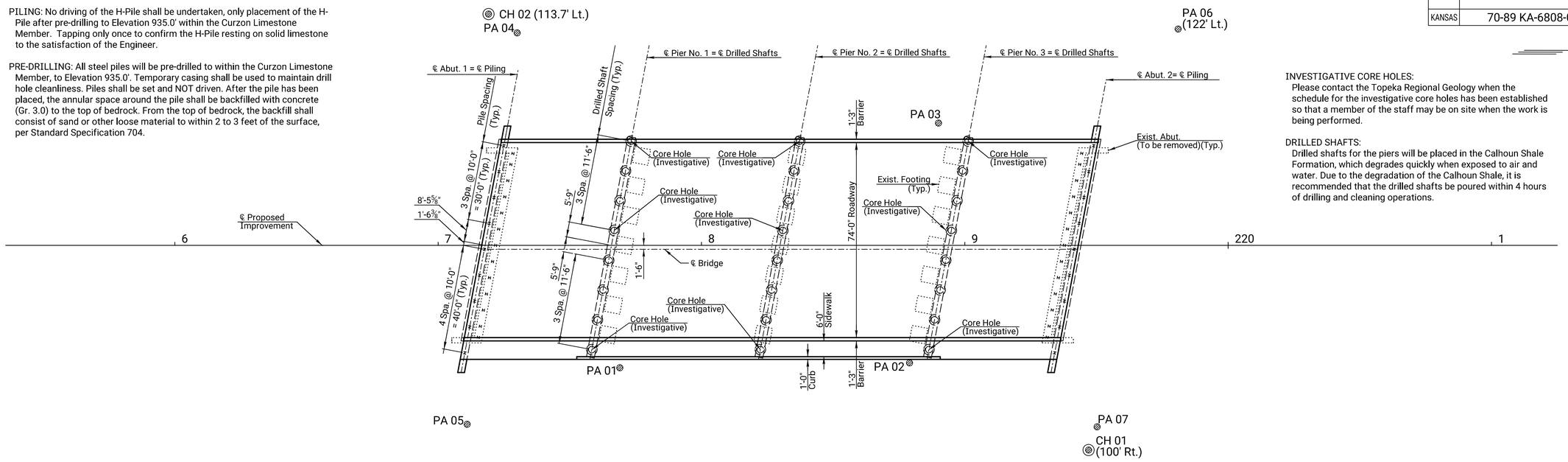
Sh. No. 55

Plotted By: BGS01485 | Plot Location:
File: 1904_ka6808001bbr-324-02.dgn
Plot Date: 16-DEC-2025 12:12

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2027	56	253

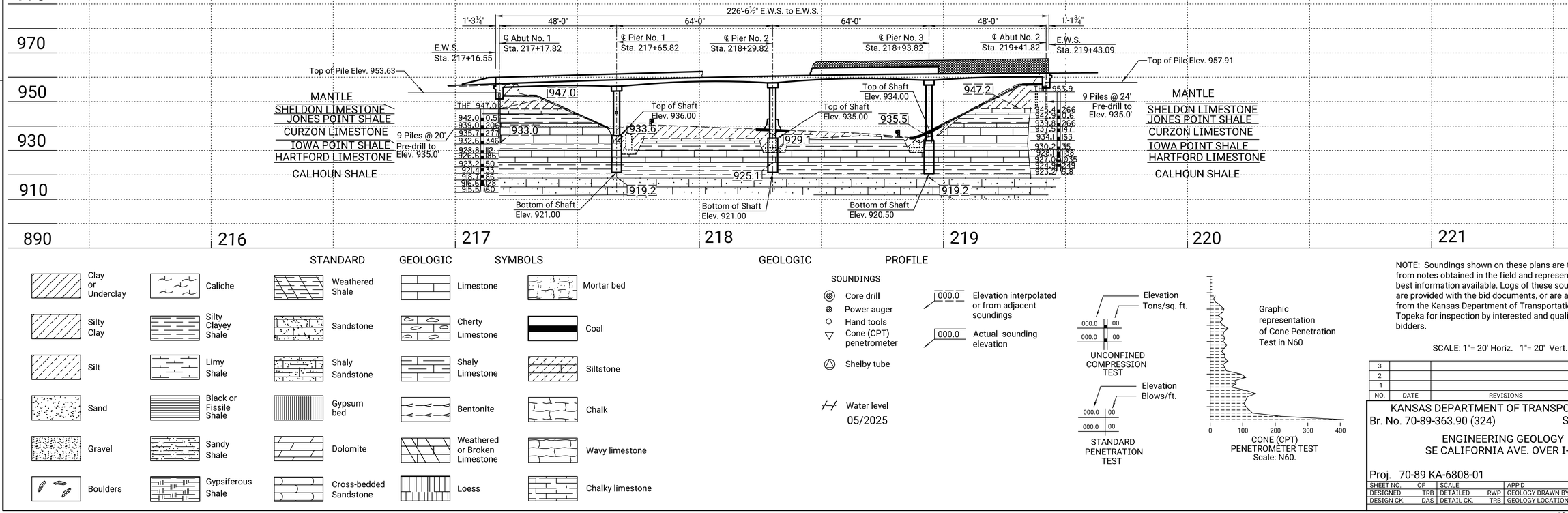
PILING: No driving of the H-Pile shall be undertaken, only placement of the H-Pile after pre-drilling to Elevation 935.0' within the Curzon Limestone Member. Tapping only once to confirm the H-Pile resting on solid limestone to the satisfaction of the Engineer.

PRE-DRILLING: All steel piles will be pre-drilled to within the Curzon Limestone Member, to Elevation 935.0'. Temporary casing shall be used to maintain drill hole cleanliness. Piles shall be set and NOT driven. After the pile has been placed, the annular space around the pile shall be backfilled with concrete (Gr. 3.0) to the top of bedrock. From the top of bedrock, the backfill shall consist of sand or other loose material to within 2 to 3 feet of the surface, per Standard Specification 704.



INVESTIGATIVE CORE HOLES:
Please contact the Topeka Regional Geology when the schedule for the investigative core holes has been established so that a member of the staff may be on site when the work is being performed.

DRILLED SHAFTS:
Drilled shafts for the piers will be placed in the Calhoun Shale Formation, which degrades quickly when exposed to air and water. Due to the degradation of the Calhoun Shale, it is recommended that the drilled shafts be poured within 4 hours of drilling and cleaning operations.



STANDARD GEOLOGIC SYMBOLS

- Clay or Underclay
- Silty Clay
- Silt
- Sand
- Gravel
- Boulders
- Caliche
- Silty Clayey Shale
- Limy Shale
- Black or Fissile Shale
- Sandy Shale
- Gypsiferous Shale
- Weathered Shale
- Sandstone
- Shaly Sandstone
- Gypsum bed
- Dolomite
- Cross-bedded Sandstone
- Limestone
- Cherty Limestone
- Shaly Limestone
- Bentonite
- Weathered or Broken Limestone
- Loess
- Mortar bed
- Coal
- Siltstone
- Chalk
- Wavy limestone
- Chalky limestone

GEOLOGIC PROFILE

SOUNDINGS
- Core drill
- Power auger
- Hand tools
- Cone (CPT) penetrometer
- Shelby tube
- Water level 05/2025

000.0 Elevation interpolated or from adjacent soundings

000.0 Actual sounding elevation

NOTE: Soundings shown on these plans are taken from notes obtained in the field and represent the best information available. Logs of these soundings are provided with the bid documents, or are available from the Kansas Department of Transportation in Topeka for inspection by interested and qualified bidders.

SCALE: 1"= 20' Horiz. 1"= 20' Vert.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 70-89-363.90 (324) Sta. 218+29.82

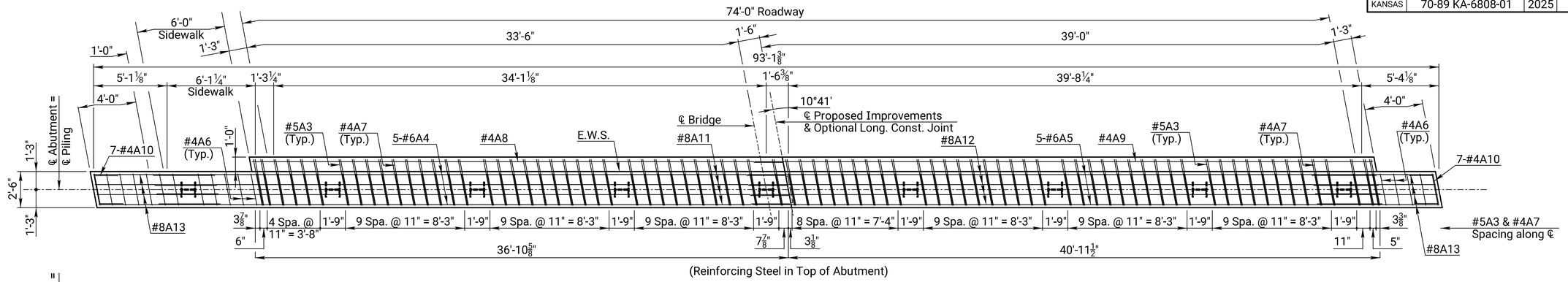
ENGINEERING GEOLOGY
SE CALIFORNIA AVE. OVER I-70

Proj. 70-89 KA-6808-01 Shawnee Co.

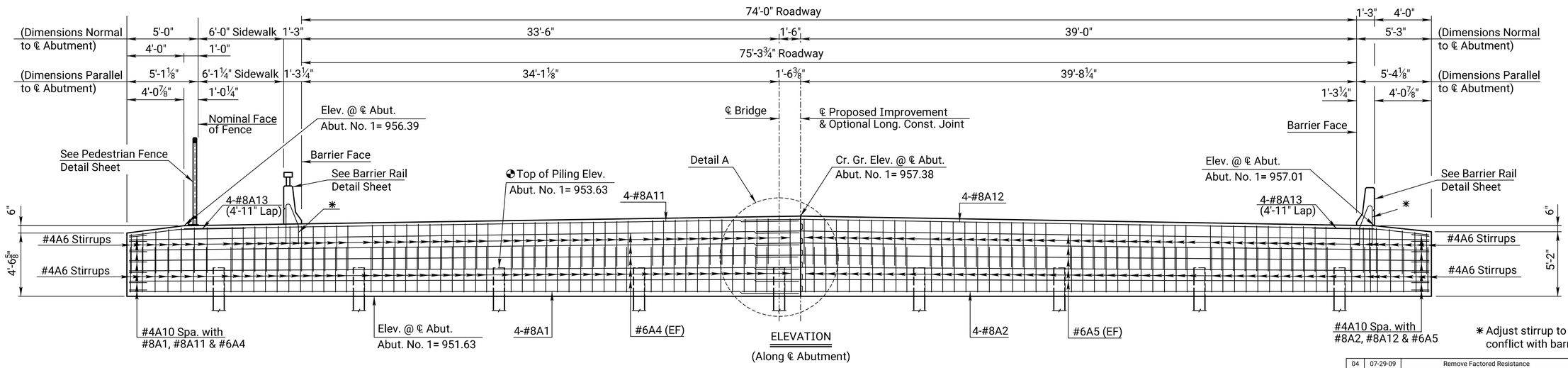
SHEET NO.	OF	SCALE		APP'D	
DESIGNED	TRB	DETAILED	RWP	GEOLOGY DRAWN BY:	Barker
DESIGN CK.	DAS	DETAIL CK.	TRB	GEOLOGY LOCATION:	Topeka

Plotted By: BGS01485
File: 1905_ka6808001.gbr-324-04.dgn
Plot Date: 16-DEC-2025 12:13
Plot Location:

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	57	253



PLAN



ELEVATION
(Along ℄ Abutment)

* Adjust stirrup to avoid conflict with barrier bars.

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

Legend

EF = Each Face

Notes:

For details not shown see "Abutment Details" sheet.

NO.	DATE	REVISIONS	BY	APP'D
04	07-29-09	Remove Factored Resistance	D.R.T.	K.F.H.
03	03-24-09	Add Factored Resistance to Pile Loading	D.R.T.	K.F.H.
02	03-06-07	Correct Abut. Dim. "A" for 54-72-54	D.R.T.	K.F.H.

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 70-89-363.90 (324) Sta. 218+29.82

ABUTMENT NO. 1 DETAILS

Proj. 70-89 KA-6808-01 Shawnee Co.

DESIGNED	TRB	DETAILED	ES	QUANTITIES	TRB	CADD	ES
DESIGN CK.	DAS	DETAIL CK.	DAS	QUAN.CK.	DAS	CADD CK.	

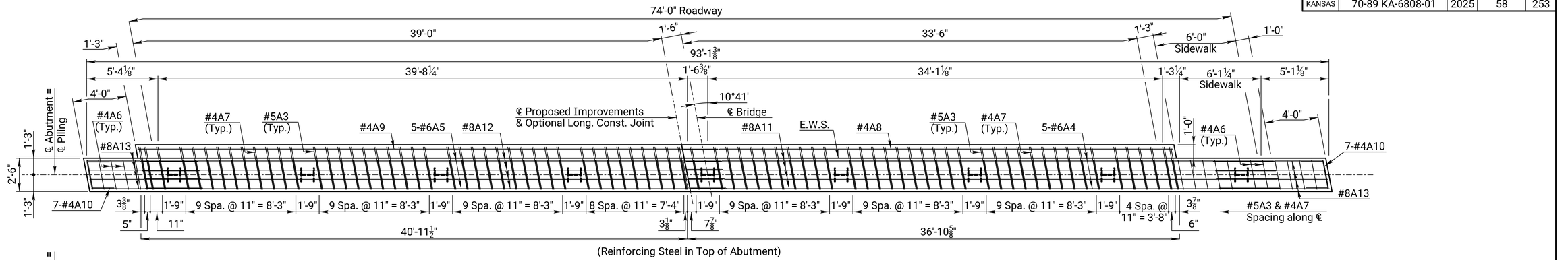
KDOT Graphics Certified 12-15-2025

Sh. No. 57

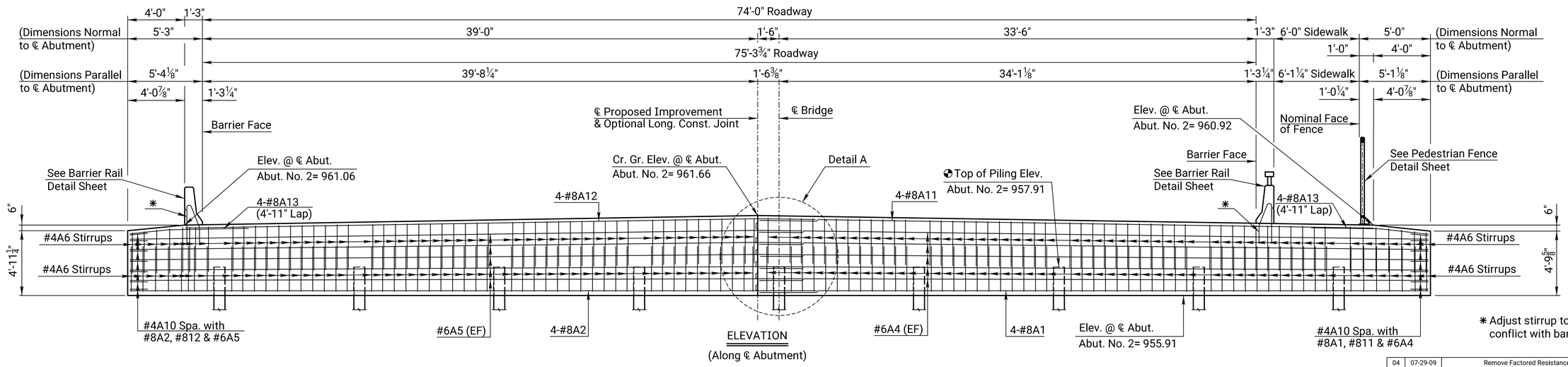
KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 12:13
File : 1906_ka680801bss503-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	58	253



PLAN



ELEVATION
(Along ℄ Abutment)

✳ Adjust stirrup to avoid conflict with barrier bars.

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

Notes:

For details not shown see "Abutment Details" sheet.

NO.	DATE	REVISIONS	BY	APP'D
04	07-29-09	Remove Factored Resistance	D.R.T.	K.F.H.
03	03-24-09	Add Factored Resistance to Pile Loading	D.R.T.	K.F.H.
02	03-06-07	Correct Abut. Dim. "A" for 54-72-54	D.R.T.	K.F.H.

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 70-89-363.90 (324) Sta. 218+29.82

ABUTMENT NO. 2 DETAILS

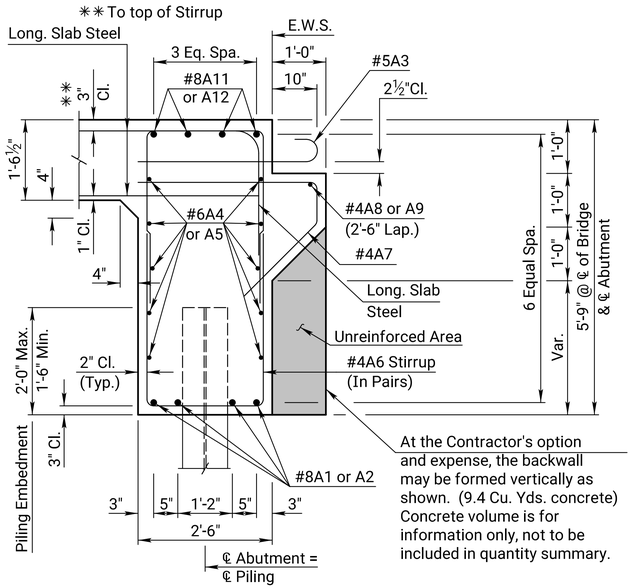
Proj. 70-89 KA-6808-01 Shawnee Co.

DESIGNED	TRB	DETAILED	ES	QUANTITIES	TRB	CADD	ES
DESIGN CK.	DAS	DETAIL CK.	DAS	QUAN.CK.	DAS	CADD CK.	

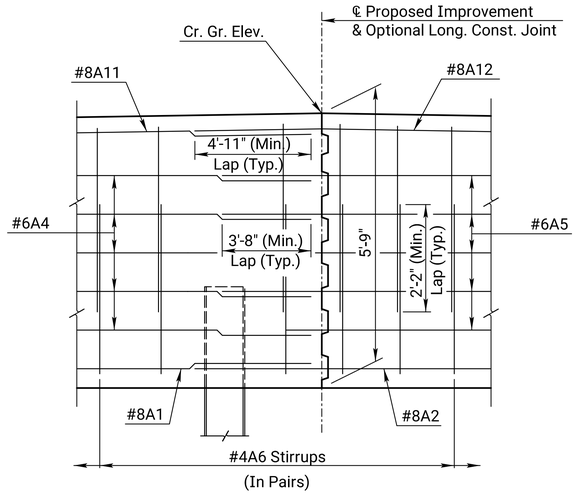
Sh. No. 58

Plotted by : BGS01485 16-DEC-2025 12:13
File : 1907_ka680801bss503-02.dgn

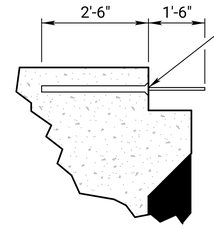
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	59	253



TYPICAL SECTION THRU ABUTMENT



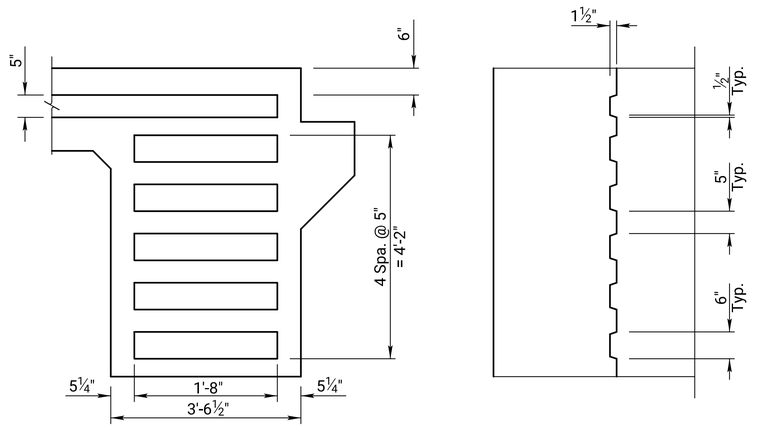
DETAIL A



Reinforcing Steel
Mechanical Splice.
See KDOT Specifications.

APPROACH SLAB TIE BAR OPTION

The Contractor has the option (at no additional cost to the State) of substituting a mechanically spliced reinforcing bar of the same size for any or all of the cast-in-place approach slab tie bars.



LONGITUDINAL CONSTRUCTION JOINT
(Optional Joint)

NO.	DATE	REVISIONS	BY	APP'D
04	07-29-09	Remove Factored Resistance	D.R.T.	K.F.H.
03	03-24-09	Add Factored Resistance to Pile Loading	D.R.T.	K.F.H.
02	03-06-07	Correct Abut. Dim. "A" for 54-72-54	D.R.T.	K.F.H.

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 70-89-363.90 (324) Sta. 218+29.82

ABUTMENT DETAILS

Proj. 70-89 KA-6808-01 Shawnee Co.

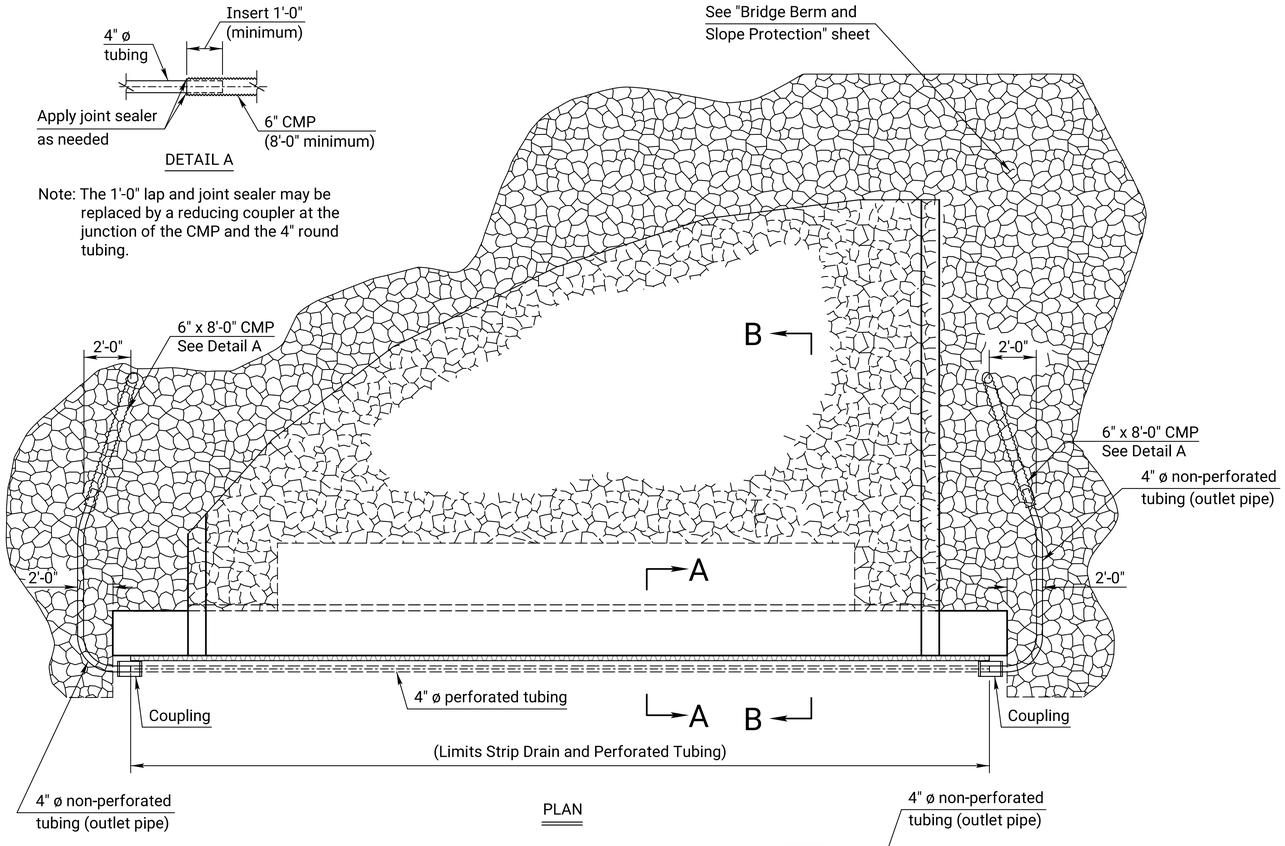
DESIGNED	TRB	DETAILED	ES	QUANTITIES	TRB	CADD	ES
DESIGN CK.	DAS	DETAIL CK.	DAS	QUAN.CK.	DAS	CADD CK.	

Plotted by : BGS01485 16-DEC-2025 12:14
File : 1908_ka680801bss503-03.dgn

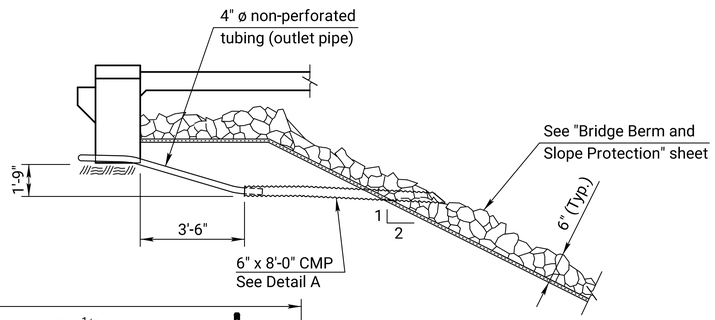
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	60	253

DETAIL A

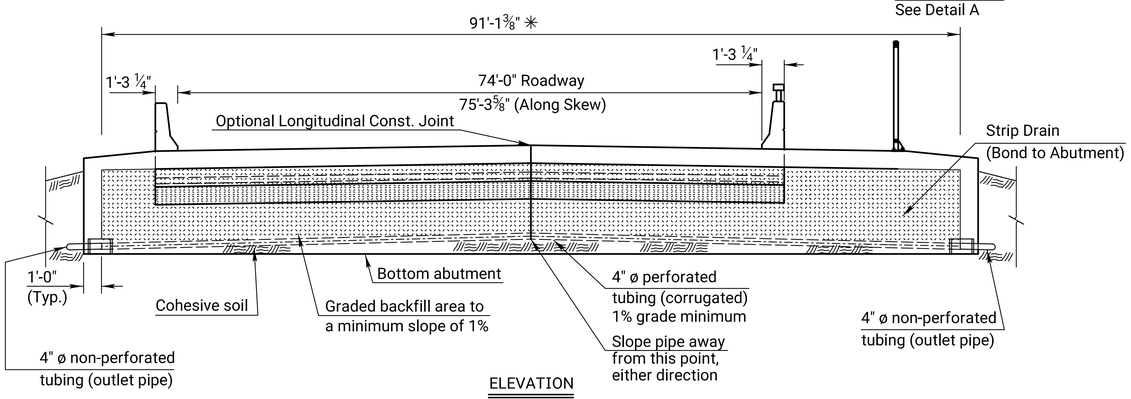
Note: The 1'-0" lap and joint sealer may be replaced by a reducing coupler at the junction of the CMP and the 4" round tubing.



PLAN



SECTION B-B



ELEVATION

GENERAL NOTES

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

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

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

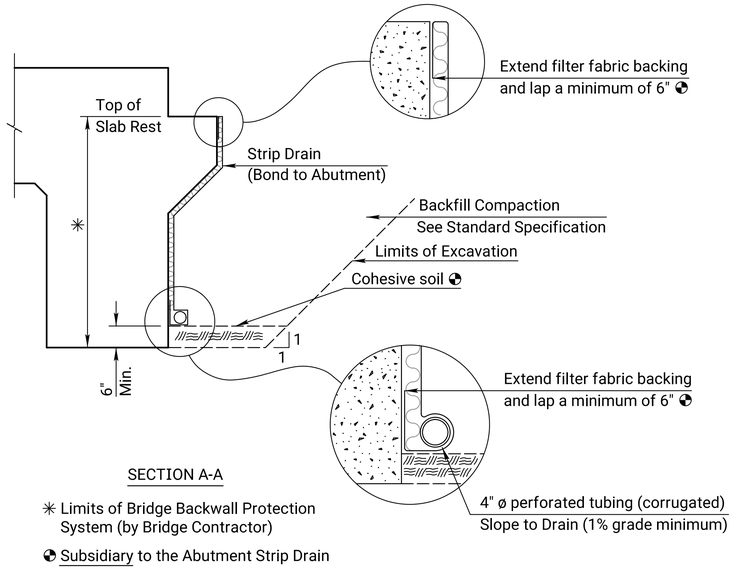
Compact the abutment backfill. See the KDOT Specifications.

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

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

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

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



SECTION A-A

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

◔ Subsidiary to the Abutment Strip Drain

SUMMARY OF QUANTITIES		
	Abut. No. 1	Abut. No. 2
Abutment Strip Drain	37 Sq. Yds.	37 Sq. Yds.
Bridge Backwall Protection System	46 Sq. Yds.	46 Sq. Yds.
Items subsidiary to Strip Drain		
4" ø Perforated Pipe	93 Lin. Ft.	93 Lin. Ft.
4" ø Outlet Pipe	28 Lin. Ft.	35 Lin. Ft.
6" ø CMP	16 Lin. Ft.	16 Lin. Ft.

NO.	DATE	REVISIONS	BY	APP'D
05	09-01-22	Added Cohesive Soils note	M.L.L.	M.A.H.
04	04-07-14	Current Release	J.P.J.	C.E.R.
03	02-12-14	Added Benchmark	J.P.J.	C.E.R.

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 70-89-363.90 (324) Sta. 218+29.82

ABUTMENT STRIP DRAIN
(With Curb)

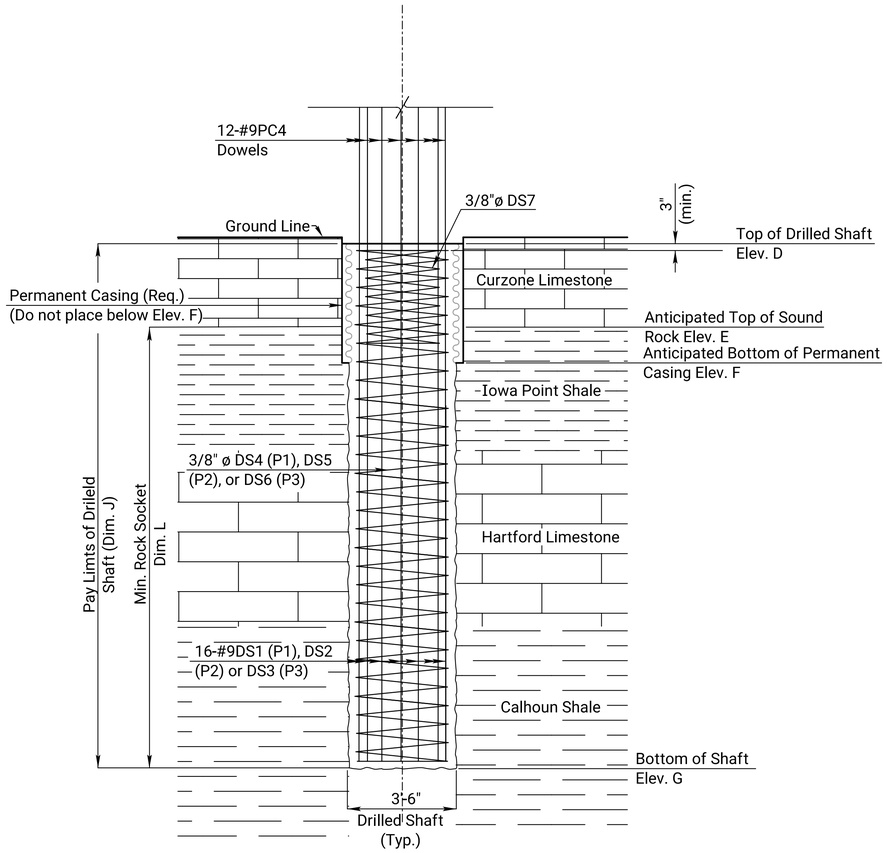
Proj. 70-89 KA-6808-01 Shawnee Co.

DESIGNED	TRB	DETAILED	ES	QUANTITIES	TRB	CADD	ES
DESIGN CK.	DAS	DETAIL CK.	DAS	QUAN.CK.	DAS	CADD CK.	___

Sh. No. 60

Plotted by : BGS01485 16-DEC-2025 12:14
File : 1909_ka680801bss104h.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	61	253



TYPICAL ELEVATION VIEW OF DRILLED SHAFT

GENERAL NOTES

DRILLED SHAFTS: Construct the drilled shafts using the cased method. A permanent casing is required. All excavation, concrete, reinforcing steel, pipes for Sonic Testing, casings, labor, and incidentals necessary to complete the shafts as shown on the details and as directed by KDOT. Specifications shall be included in the bid item "Drilled Shafts (42")(Cased)". Use Grade 4.0 Concrete in the drilled shaft. In no case shall the bottom of the drilled shaft be placed higher than the elevation shown unless otherwise directed by the KDOT Geologist.

If the location of the top of the shaft is such that the casing cannot be overtopped to remove concrete impurities, provide extra casing length to over-pour the concrete in the shaft and chip back to the plan elevation of the top of the shaft.

If the permanent casing is to be corrugated metal pipe (CMP) then it will be galvanized.

Excavations for drilled shafts will need to be cased. Water movement within the mantle could cause caving and collapse of the excavation walls. Casing will be required for drilled shafts. Casing will be required for drilled shafts. Casing will need to be set into bedrock a maximum of 1.0 feet, less, if possible, to reduce the risk that overburden, and groundwater does not enter the rock socket. A wet pour may be anticipated if groundwater is not sufficiently sealed off or if there is water flowing into the excavation.

Note that the shafts have end bearing components and it is important that the bottom socket be clean and relatively flat. Allow no loose material within the footing when the footing is considered ready to pour.

The Calhoun Shale Formation degrades quickly when exposed to air and water. Due to the degradation of the Calhoun Shale, it is recommended that the drilled shafts be poured within 4 hours of drilling and cleaning operations.

INVESTIGATIVE CORE HOLES: Drill an Investigative Core Hole at the location(s) shown on the plans. See KDOT Specifications.

Please contact the Topeka Regional Geology Office when the schedule for the investigative core holes has been established so that a member of the staff may be on site when the work is being performed.

DRILLED SHAFT BACKFILL: Backfill the annular space between the temporary casing and the permanent casing with grout/flowable fill as defined in the KDOT Specifications.

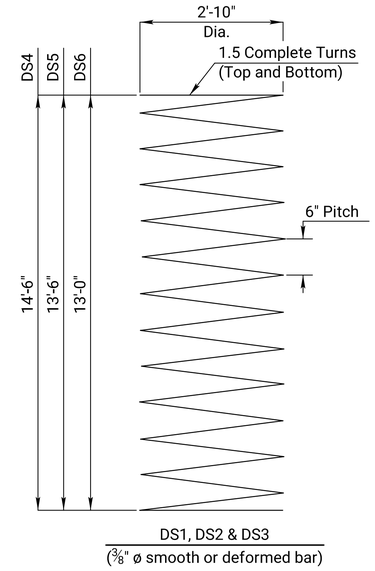
SONIC TESTING: Equip all drilled shafts with piping to allow sonic testing to be done. Install pipes at locations shown on the plans. All wet pours will be tested. Also, the Engineer has the option to require sonic, non-destructive, integrity testing at any location of concern. Sonic testing shall be paid for at the unit price set for "Sonic Test" (Drilled Shaft) (Set Price). If the sonic testing indicates defective concrete in the shaft, the Engineer will measure the first sonic test for payment, and the Contractor is responsible for subsequent sonic testing of that shaft. Report test results directly to KDOT's Chief Geologist. No work will be done above the top of the drilled shaft without the approval of the Chief Geologist.

PERMANENT CASING: See KDOT's Specifications.

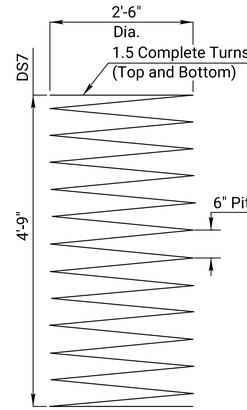
BILL OF REINFORCING STEEL
Total for Pier No. 1, 2, & 3
Subsidiary to Drilled Shafts
Shown for Information Only

Non-Epoxy Coated - Grade 60							
Straight Bars				Bent Bars			
Mark	Size	Number	Length	Mark	Size	Number	Length
DS1	#9	128	14'-6"	DS4	#3	8	ø
DS2	#9	128	13'-6"	DS5	#3	8	ø
DS3	#9	128	13'-0"	DS6	#3	8	ø
				DS7	#3	24	ø
Epoxy Coated - Grade 60							
Straight Bars				Bent Bars			
Mark	Size	Number	Length	Mark	Size	Number	Length
PC4	#9	288	10'-2"				

ø See Bending Diagram



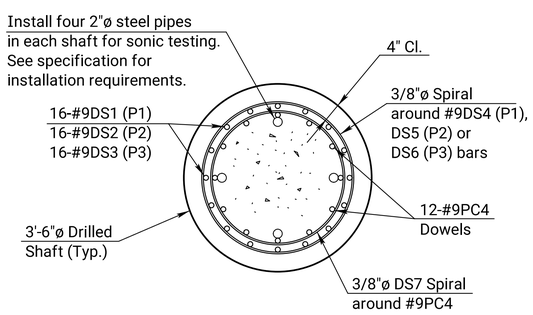
DS1, DS2 & DS3
(⅜" ø smooth or deformed bar)



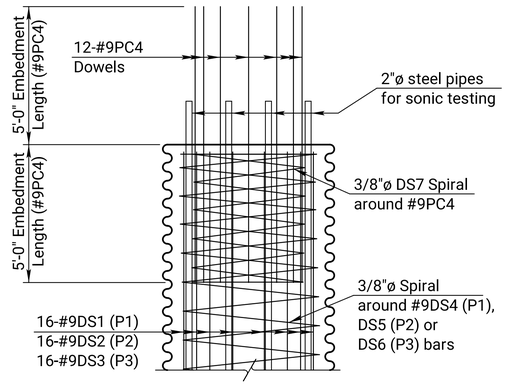
DS4
(⅜" ø smooth or deformed bar)

Spiral reinforcing shall meet the requirements of ASTM A615 Grade (60 or 40) or ASTM A82.

Spiral Spacer Bars:
1) Minimum section modulus = 0.008 in^3
2) 4 required per spiral



TYPICAL SECTION OF DRILLED SHAFT



DETAIL OF DRILLED SHAFT DOWEL BARS

ELEVATION TABLE			
Location	Pier 1	Pier 2	Pier 3
Top of Shaft Elev. D	936.00	935.00	934.00
Anticipated Top of Sound Rock Elev. E	933.60	929.10	935.50
Anticipated Bottom of Permanent Casing Elev. F	931.60	928.00	933.50
Bottom of Shaft Elev. G	921.00	921.00	920.50
Pay Limits of Drilled Shaft, Dim. J	15'-0"	14'-0"	13'-6"
Rock Socket Length Dim. L	10'-7¼"	7'-0"	13'-0"

Notes:

(P1) denotes Pier No. 1
(P2) denotes Pier No. 2
(P3) denotes Pier No. 3

For type of Sonic Testing Tube, see KDOT Specifications and the Special Provisions. Sonic Testing Tubes shall be spaced equally and extend 1'-0" above the top of shaft.

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 70-89-363.90 (324) Sta. 218+29.82

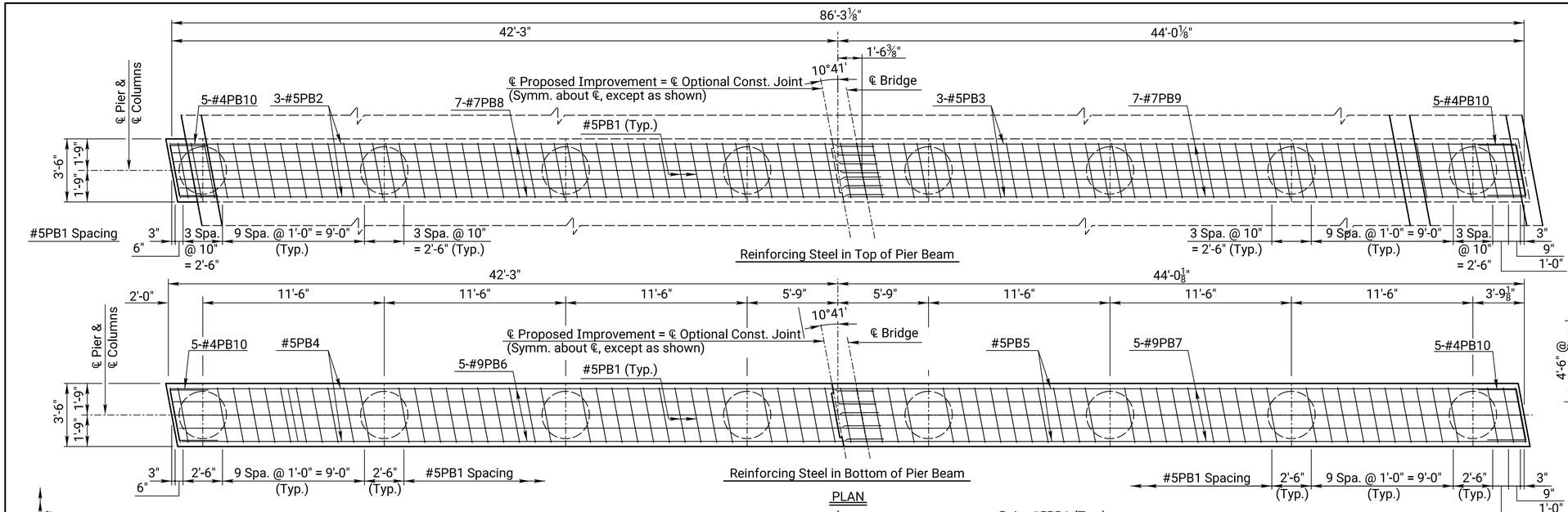
DRILLED SHAFT DETAILS

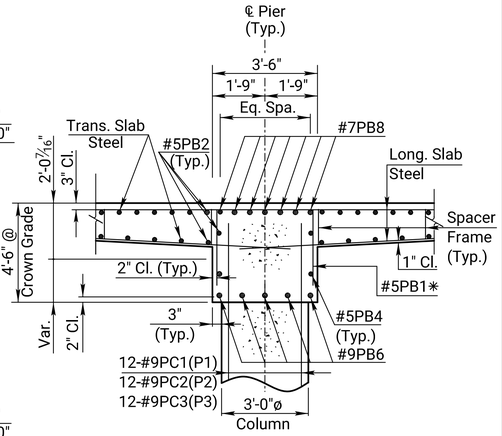
Proj. 70-89 KA-6808-01 Shawnee Co.

DESIGNED	TRB	DETAILED	ES	QUANTITIES	TRB	CADD	ES
DESIGN CK.	DAS	DETAIL CK.	DAS	QUAN.CK.	DAS	CADD CK.	

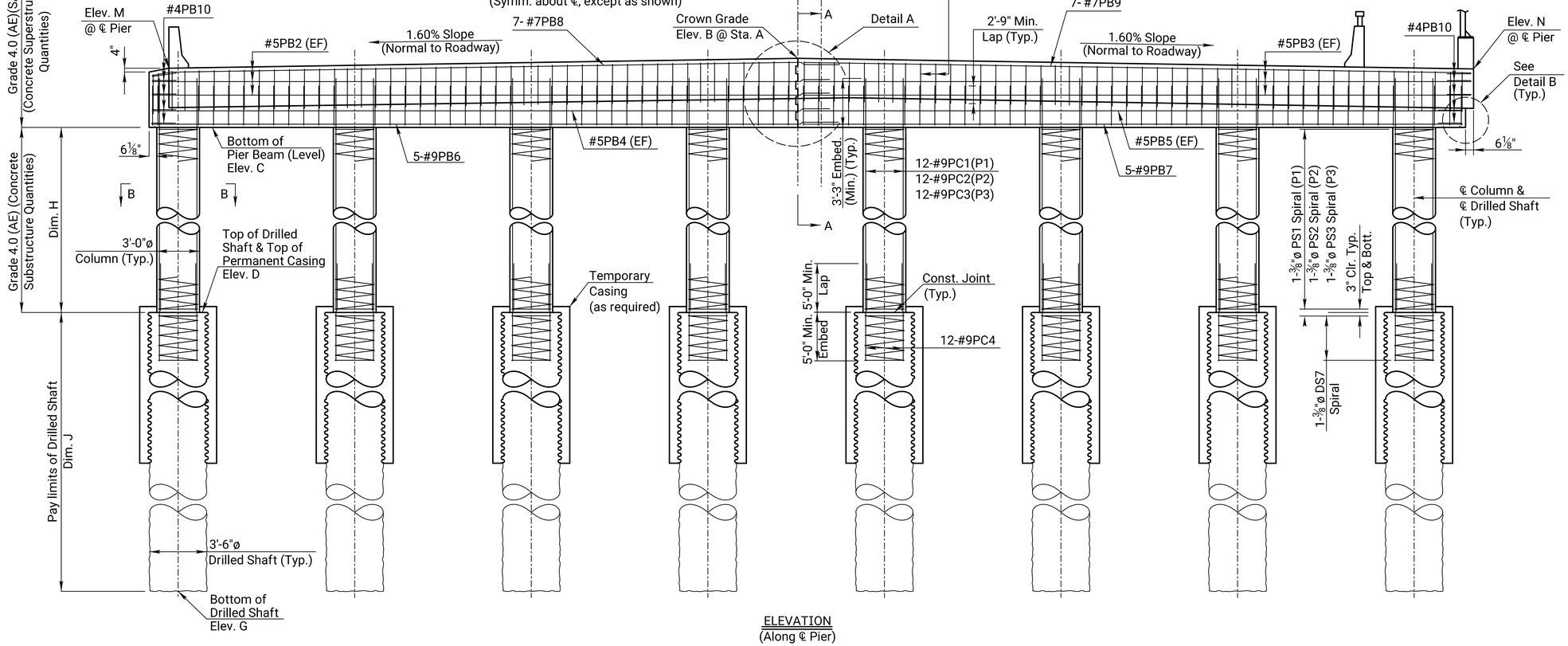
Plotted by : BGS01485 16-DEC-2025 12:14
File : 1909a_ka680801bbr-Drill Shaft Details.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	62	253





SECTION A-A



ELEVATION
(Along ℄ Pier)

∗ In Pairs or Single (Π) bar.
See plan view for locations.

Notes:
(P1) denotes Pier. No. 1
(P2) denotes Pier. No. 2
(P3) denotes Pier. No. 3

(EF) denotes Each Face.

For details of pier not shown, see subsequent "Pier Details" sheet.

TABLE OF VARIABLES			
Variable	Pier 1	Pier 2	Pier 3
Sta. A	217+65.82	218+29.82	218+93.82
Elev. B	958.93	960.44	961.34
Elev. C	954.43	955.94	956.84
Elev. D	936.00	935.00	934.00
Elev. G	921.00	921.00	920.50
Dim. H	18'-5¾16"	20'-11⅝16"	22'-10⅛16"
Dim. J	15'-0"	14'-0"	13'-6"
Elev. M	958.50	959.94	960.76
Elev. N	958.00	959.59	960.57

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 70-89-363.90 (324) Sta. 218+29.82

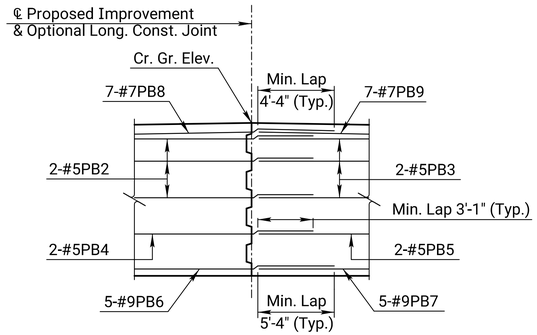
PIER DETAILS

Proj. 70-89 KA-6808-01 Shawnee Co.

DESIGNED	TRB	DETAILED	ES	QUANTITIES	TRB	CADD	ES
DESIGN CK.	DAS	DETAIL CK.	DAS	QUAN.CK.	DAS	CADD CK.	

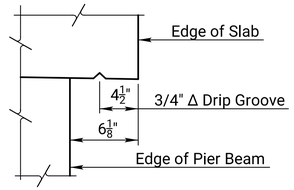
Plotted by : BGS01485 16-DEC-2025 12:15
File : 1910_ka680801bbr-Pier Details.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	63	253

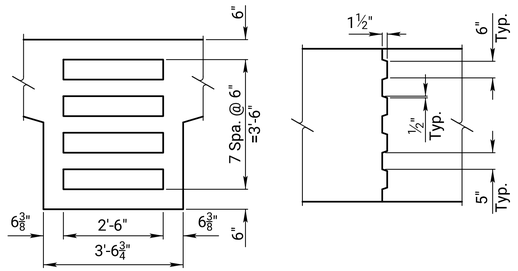


DETAIL A

(#5PB1 Bars not shown for clarity.)

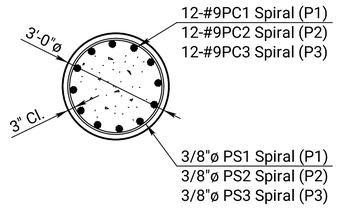


DETAIL B

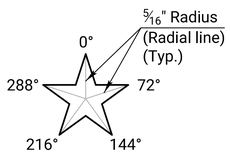


LONGITUDINAL CONSTRUCTION JOINT

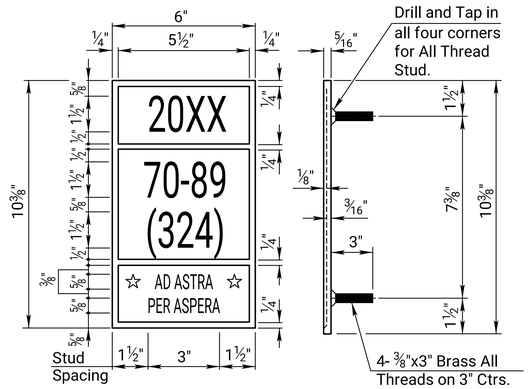
(Optional Joint)



SECTION B-B



STAR GEOMETRY



XX Year Bridge is Completed.

BRIDGE NUMBER PLATE

Notes:

Pier Beam Reinforcement shall be epoxy coated and is included in the Superstructure Quantities.

Column Reinforcement shall be epoxy coated and is included in the Substructure Quantities.

(P1) denotes Pier No. 1
(P2) denotes Pier No. 2
(P3) denotes Pier No. 3

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 70-89-363.90 (324) Sta. 218+29.82

PIER DETAILS

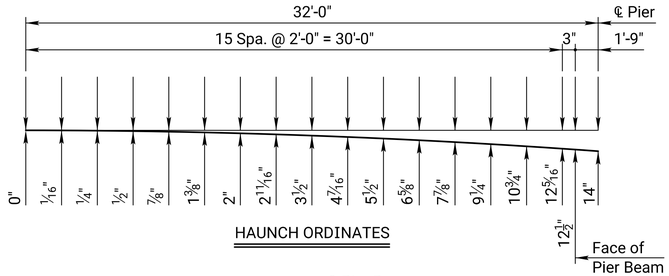
Proj. 70-89 KA-6808-01 Shawnee Co.

DESIGNED	TRB	DETAILED	ES	QUANTITIES	TRB	CADD	ES
DESIGN CK.	DAS	DETAIL CK.	DAS	QUAN.CK.	DAS	CADD CK.	

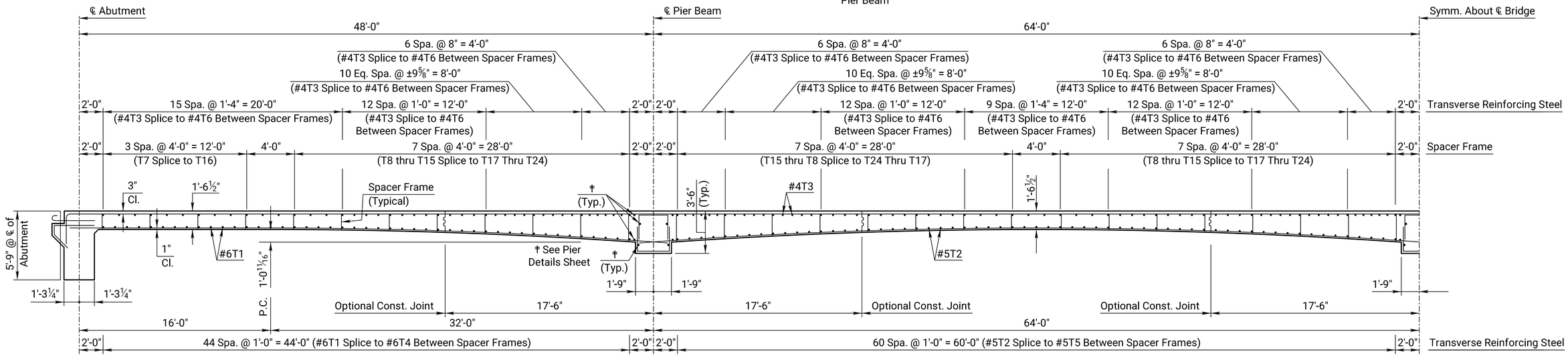
Sh. No. 63

Plotted by : BGS01485 16-DEC-2025 12:15
File : 1911_ka6808001bbr-Pier Details-02.dgn

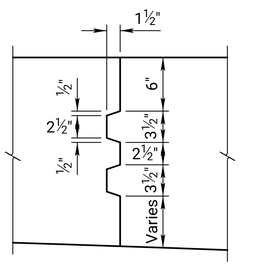
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	64	253



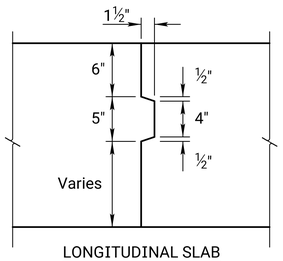
HAUNCH ORDINATES



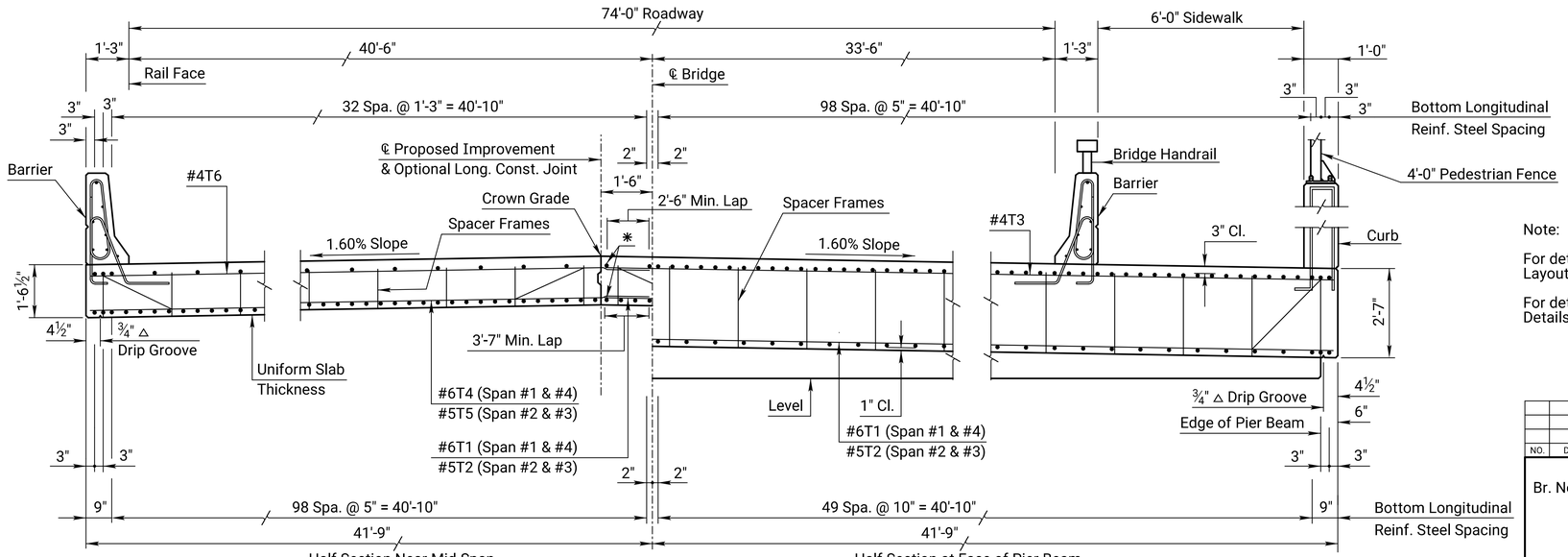
HALF LONGITUDINAL SECTION ALONG ℄ PROPOSED IMPROVEMENT



TRANSVERSE SLAB CONSTRUCTION JOINT (Optional Joint)



LONGITUDINAL SLAB CONSTRUCTION JOINT (Optional Joint)



TYPICAL SECTION OF SLAB

Note:

For details of reinforcement in curb see "Barrier Layout and Curb Details" sheet.

For details of reinforcement in barrier see "Barrier Details" sheet.

✳Shift longitudinal reinforcement to clear longitudinal construction joint by ½"

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 70-89-363.90 (324) Sta. 218+29.82

SUPERSTRUCTURE DETAILS

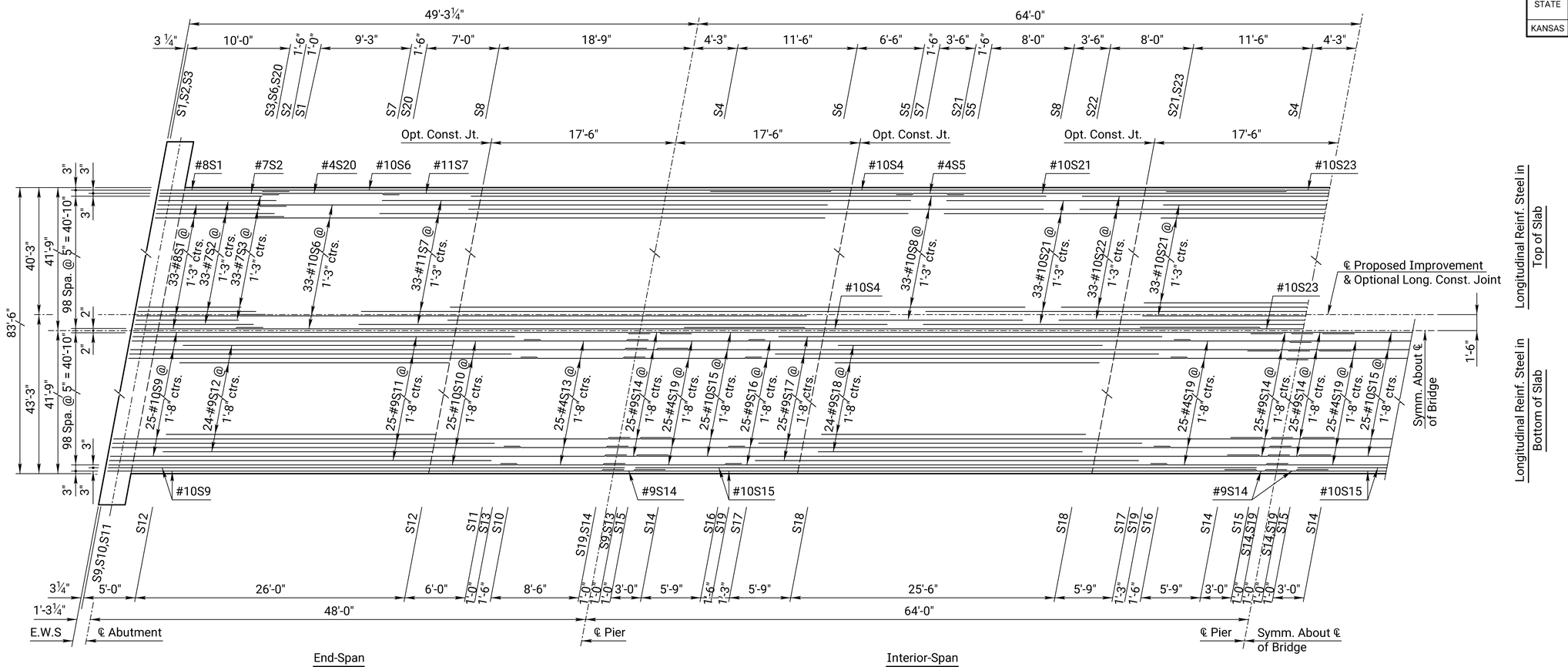
Proj. 70-89 KA-6808-01 Shawnee Co.

DESIGNED	TRB	DETAILED	ES	QUANTITIES	TRB	CADD	ES
DESIGN CK.	DAS	DETAIL CK.	DAS	QUAN.CK.	DAS	CADD CK.	

Plotted by : BGS01485 16-DEC-2025 12:15
File : 1912_ka680801bss529-2_ss.dgn

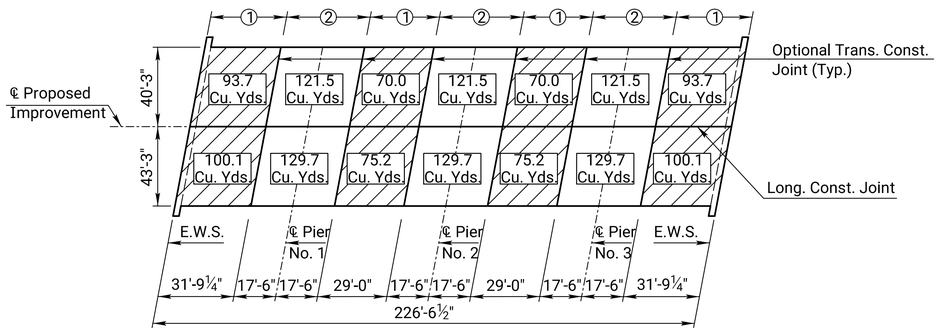
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	65	253

Note to designer: Do not remove this information



End-Span

Interior-Span



CONCRETE PLACING SEQUENCE DIAGRAM

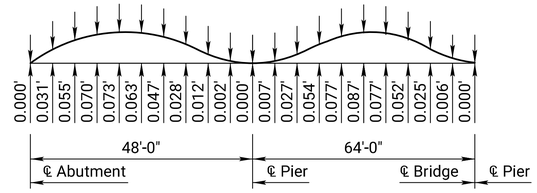
Note: 1.0 & 5.0 pts. are taken at ℄ of abutments
2.0, 3.0, & 4.0 pts. are taken at ℄ of piers

CONCRETE PLACING SEQUENCE

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

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

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



DEAD LOAD CAMBER DIAGRAM AT TENTH POINTS

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

Note: Camber shown is for 79% of that computed for the bridge with no skew.

Top of Form Elevation at 10th Points, (ft.)															
1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5
955.84	956.06	956.25	956.43	956.58	956.67	956.69	956.66	956.57	956.43	956.24	956.85	957.37	957.79	958.12	958.33
2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1
958.42	958.40	958.28	958.06	957.76	958.30	958.76	959.12	959.39	959.54	959.57	959.48	959.30	959.02	958.65	959.02
4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0							
959.34	959.61	959.83	959.99	960.09	960.12	960.14	960.14	960.14							

Note: Elevations are taken at Crown Grade.

Note: The change in elevation from Crown Grade to the Edge of Slab is -0.644' Left and -0.692' Right

NO.	DATE	REVISIONS	BY	APP'D
03				
02	08-22-23	Added Quantities; Placing Sequence	M.L.L.	M.A.H.
01	03-12-12	Added TOF Elevation Table	J.P.J.	T.L.F.

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 70-89-363.90 (324) Sta. 218+29.82

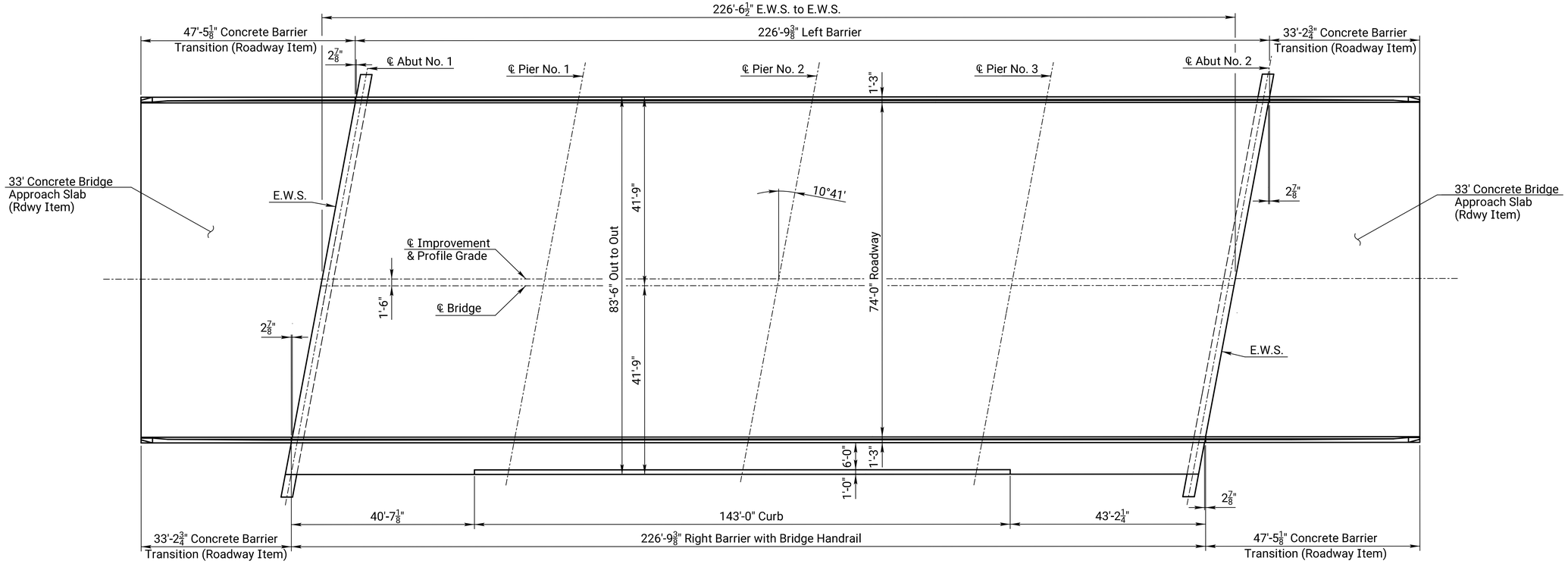
SUPERSTRUCTURE DETAILS

Proj. 70-89 KA-6808-01 Shawnee Co.

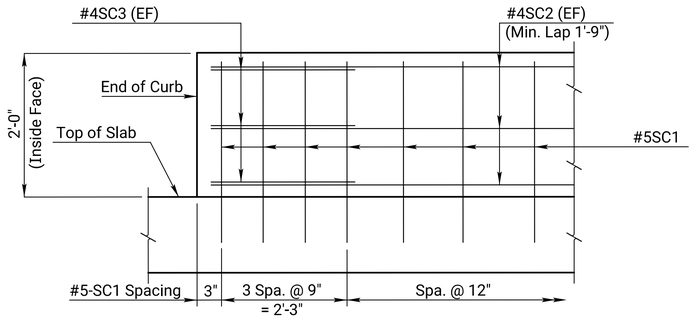
DESIGNED	TRB	DETAILED	ES	QUANTITIES	TRB	CADD	ES
DESIGN CK.	DAS	DETAIL CK.	DAS	QUAN.CK.	DAS	CADD CK.	

Plotted by : BGS01485 16-DEC-2025 12:16
File : 1913_ka680801bss529-2_sp.dgn

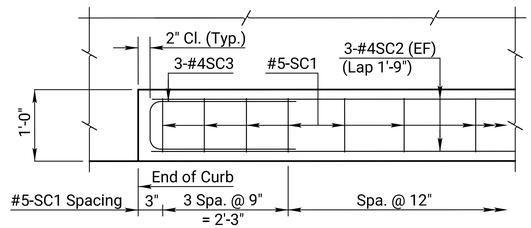
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	66	253



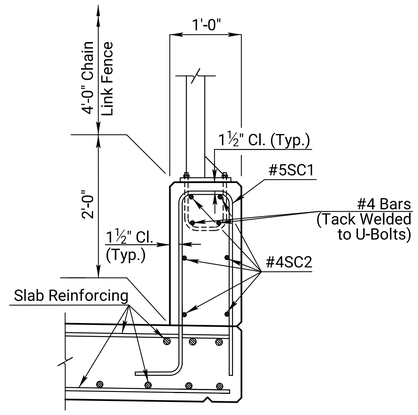
PLAN
(showing barrier and curb layout)



PART ELEVATION OF CURB END



PART PLAN OF CURB END



TYPICAL CURB SECTION

Notes:

For details of Concrete Barrier Transition see Roadway Plans.

Note: This drawing is not to scale. Follow dimensions.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 70-89-363.90 (324) Sta. 218+29.82

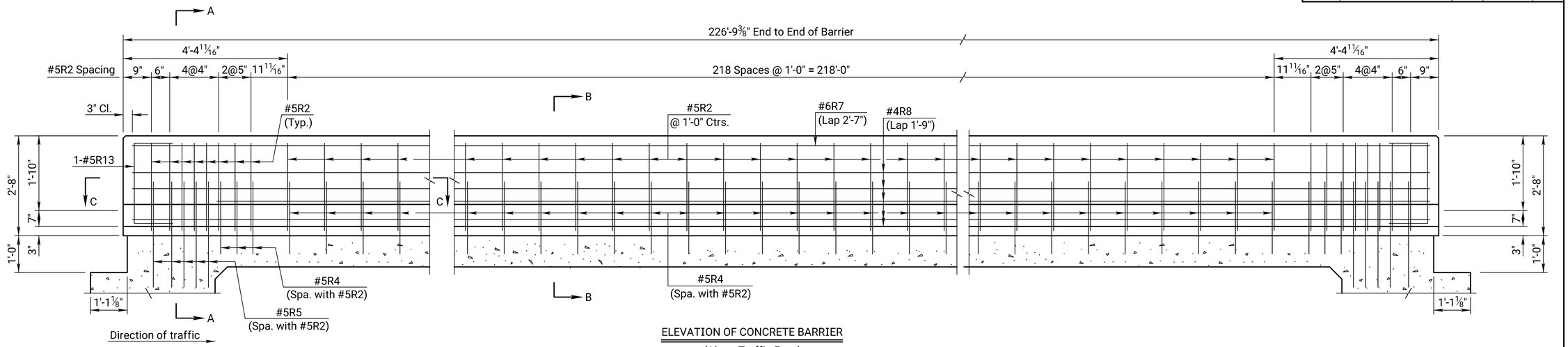
BARRIER LAYOUT & CURB DETAILS

Proj. 70-89 KA-6808-01 Shawnee Co.

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

Plotted By: BGS01485 | Plot Location:
File: 1914_ka6808001bbr-324-05.dgn
Plot Date: 16-DEC-2025 12:16

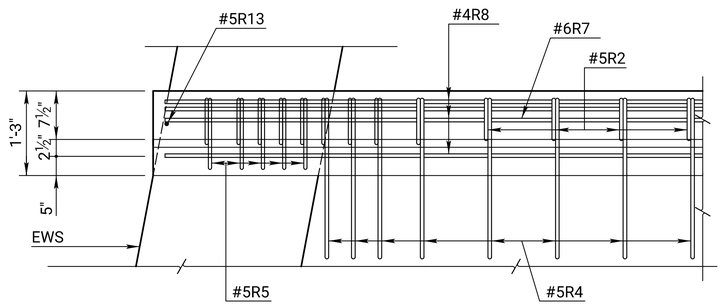
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	67	253



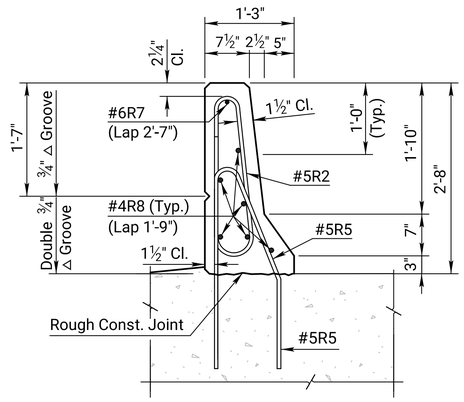
ELEVATION OF CONCRETE BARRIER

(Along Traffic Face)

(Left Barrier Shown. Right Barrier similar by 180° rotation except for Bridge Handrail)

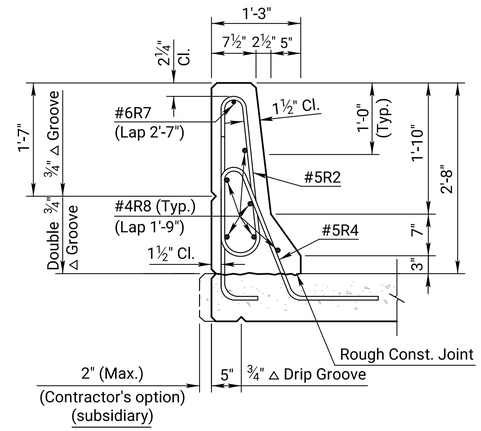


SECTION C-C



SECTION A-A

(At Abutment)



SECTION B-B

(Section thru Barrier)

NO.	DATE	REVISIONS	BY	APP'D
03				
02				
01				

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 70-89-363.90 (324) Sta. 218+29.82

BARRIER DETAILS

Proj. 70-89 KA-6808-01 Shawnee Co.

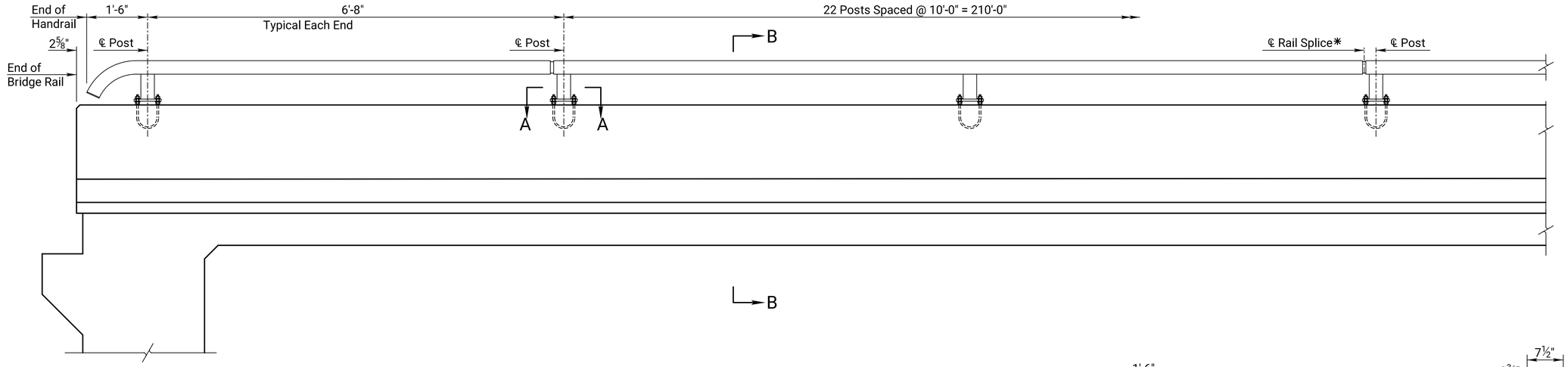
DESIGNED	TRB	DETAILED	ES	QUANTITIES	TRB	CADD	ES
DESIGN CK.	DAS	DETAIL CK.	DAS	QUAN.CK.	DAS	CADD CK.	

Sh. No. 67

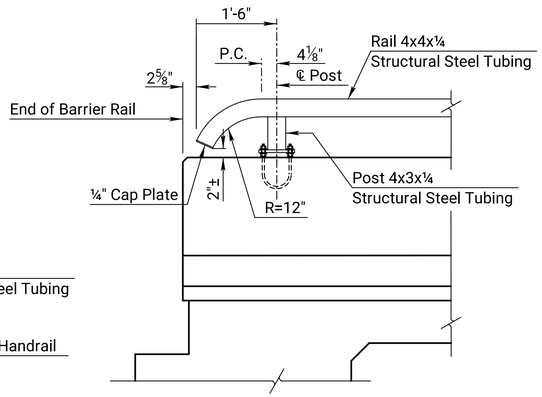
Plotted by : BGS01485 16-DEC-2025 12:16
File : 1915_ka680801bss184cc.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	68	253

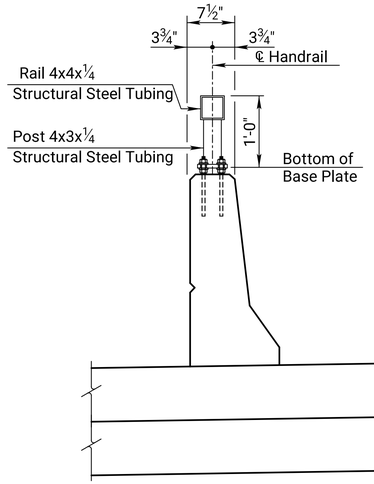
*Provide Rail Splice at every other handrail post.



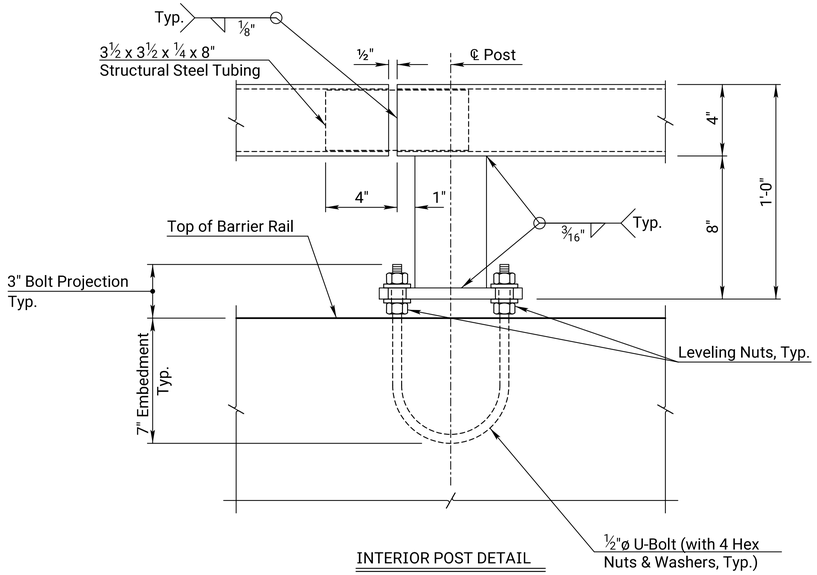
ELEVATION VIEW
(Along Traffic Face of Right Barrier)



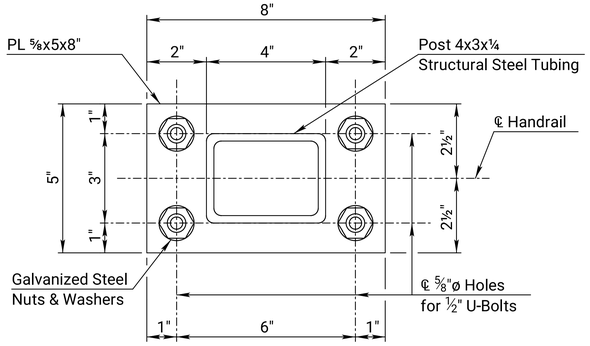
END POST DETAIL



SECTION B-B



INTERIOR POST DETAIL



SECTION A-A

Notes:

The Bridge Handrail shall be bid per linear foot as per bid item "Bridge Handrail (Metal)(1'-0"). This item shall include the furnishing of all material, fabrication of all parts, and all equipment and labor required to erect the handrail in accordance with these plans and specifications.

All U-bolts, hex nuts, and washers shall be galvanized in accordance with ASTM A153 and shall conform to ASTM A307 or A36.

Tube shapes for posts and rails shall conform to ASTM A500, Grade B. Miscellaneous steel plates and bars shall conform to ASTM A36.

Construct the handrail according to Section 721 of the KDOT Standard Specifications. All portions of the Bridge Handrail shall receive a duplex coating after fabrication, and all welds shall be free from slag holes prior to the duplex coating. Duplex coating shall conform to section 1620 in the Standard Specifications. The finished color of the powder coat shall be black.

Set the rail parallel to the top of the corral rail. Set all posts vertical, both in and out of plane of the hand rail. Field welding is not permitted.

For location of Bridge Handrail see "Barrier Layout and Curb Details" sheet.

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 70-89-363.90 (324) Sta. 218+29.82

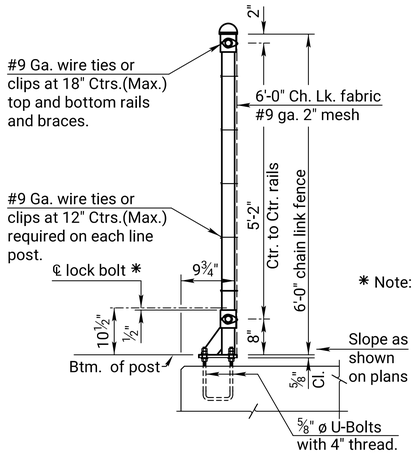
BRIDGE HANDRAIL DETAILS

Proj. 70-89 KA-6808-01 Shawnee Co.

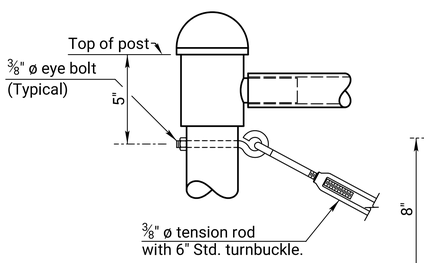
DESIGNED	TRB	DETAILED	ES	QUANTITIES	TRB	CADD	ES
DESIGN CK.	DAS	DETAIL CK.	DAS	QUAN.CK.	DAS	CADD CK.	

Plotted by : BGS01485 16-DEC-2025 12:17
File : 1916_ka680801bbr197.dgn

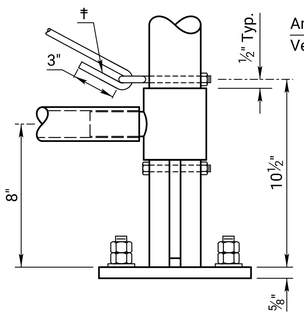
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	69	253



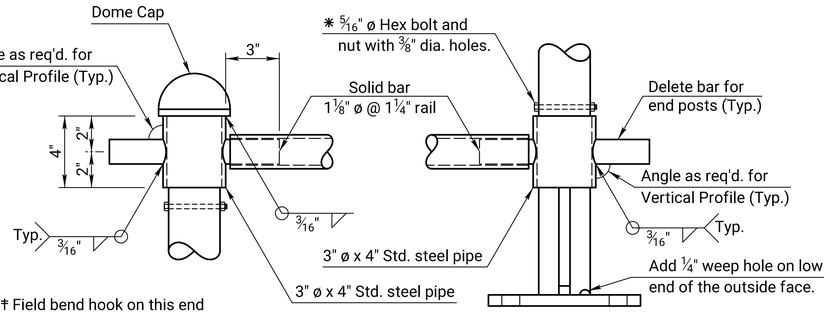
SECTION A-A



✱ Note: Lock bolt shall be ⅝" ø hex head bolt and nut. Bolt holes shall be ⅜" diameter. (Omit at pull post & end post.)

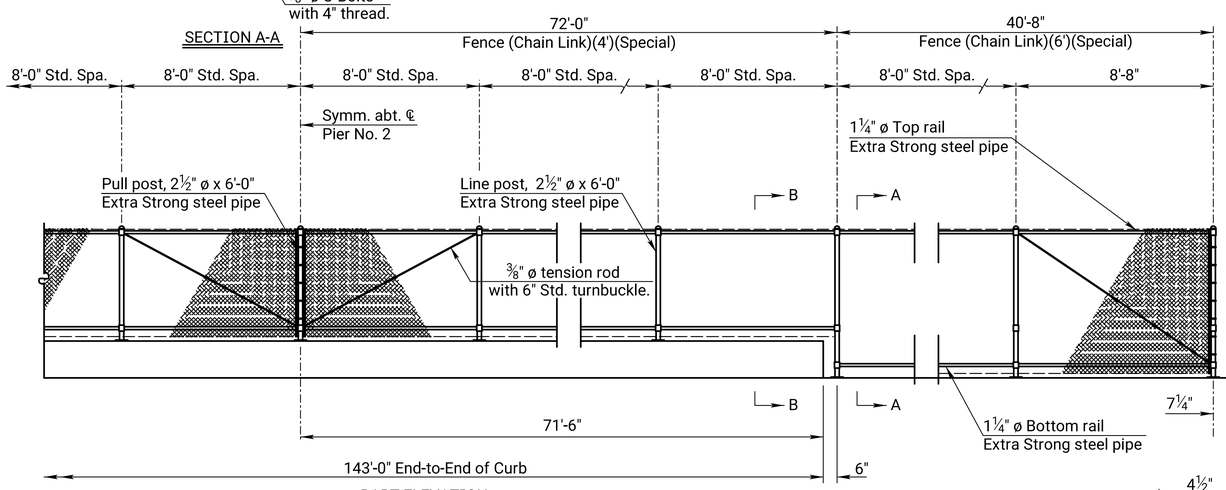


TENSION ROD DETAIL

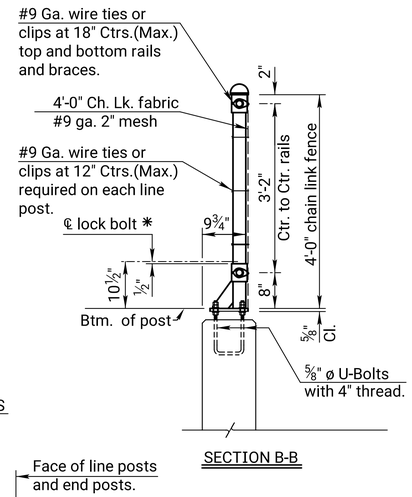


‡ Field bend hook on this end to fit. Shorten as required to achieve 3" tangent.

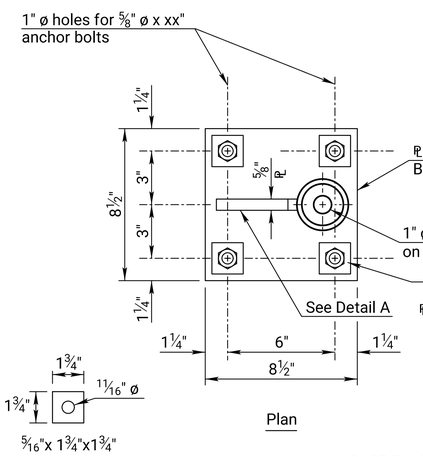
POST - RAIL CONNECTION



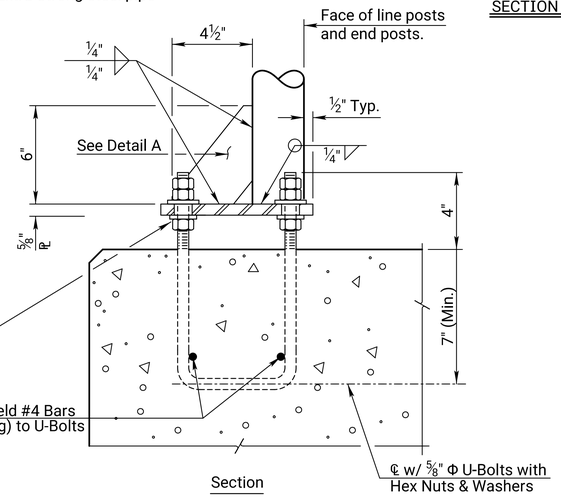
PART ELEVATION



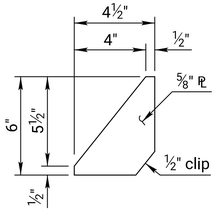
SECTION B-B



Plan



Section



Detail A

BASE PLATE DETAILS FOR END POST AND LINE POSTS

GENERAL NOTES

FENCE (CHAIN LINK)(SPECIAL DUPLEX/PVC): The chain link fence on the sidewalk shall be bid per lineal foot as per bid item, "Fence (Chain Link)(4'-0") (Special Duplex/PVC)" or "Fence (Chain Link) (6'-0") (Special Duplex/PVC)". This item shall include the furnishing of all material, fabrication of all parts, and all of the equipment and labor required to erect the fence in accordance with these plans and specifications. All parts shall be galvanized after fabrication and all welds shall be free of slag holes prior to galvanizing. Galvanization shall conform to KDOT's Standard Specifications. The parts shall have duplex coating according to Section 1620 of the Standard Specifications. The finished color of the powder coat shall be black.

POST AND RAIL: The Contractor shall use extra strong pipe for the posts and for the top and bottom rail. The pipe shall conform to Section 1600 of the Standard Specifications for Road and Bridge Construction. Diameters shown for tubular steel posts and rails are nominal. Weight tolerances shall be as shown in the Specifications.

CHAIN LINK FABRIC: All chain link fabric shall be zinc coated (galvanized). The chain link fabric shall be double knuckled. Intermediate pull posts are required when pedestrian fence exceeds 200 ft. Spacing of pull posts shall be 75 ft. (min.) to 200 ft. (max.) from another pull post or end post.

BOLTS: Bolts, including Anchor bolt, lockbolts, eyebolts and turnbuckle, shall be coated in accordance with the weight of coating requirements of ASTM A 153 and shall conform to ASTM A307 or A36.

STRUCTURAL STEEL: Miscellaneous plates, bars, shapes including tension rod shall conform to ASTM A36.

ERECTION PROCEDURE: The details of the connections require that the post and rail installation be accomplished in a sequential manner. Following the erection of a post, the rails must be installed before an adjacent post can be erected. The installation may begin with an end post or with an interior post and extend both ways.

SHOP DRAWINGS: Approval of shop details and materials is required before installation begins.

SUMMARY OF QUANTITIES	
Fence (Chain Link)(4'-0") (Special Duplex/PVC)	144 Lin. Ft.
Fence (Chain Link)(6'-0") (Special Duplex/PVC)	82 Lin. Ft.

Dead Load = 19 Lbs./Ft.
Loads applied in accordance with 2007 AASHTO Specs.

For location of chain link fence see "Barrier Layout and Curb Details" sheet.

NO.	DATE	REVISIONS	BY	APP'D
09	05-02-15	Added Tension Rod Bolt	J.P.J.	C.E.R.
08	05-13-13	Added Duplex Coating	J.P.J.	T.L.F.
07	08-03-07	Base Plate Detail & Stretcher	J.P.J.	K.F.H.

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 70-89-363.90 (324) Sta. 218+29.82

PEDESTRIAN FENCE DETAILS

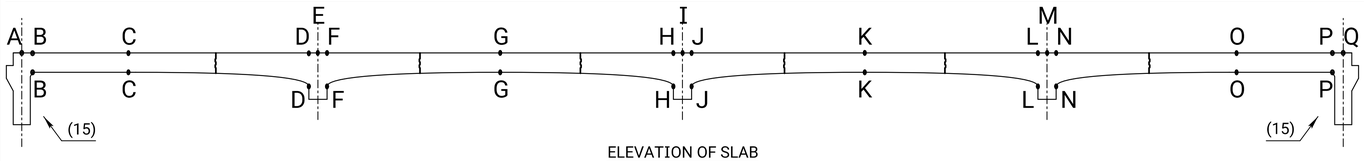
Proj. 70-89 KA-6808-01 Shawnee Co.

DESIGNED	TRB	DETAILED	ES	QUANTITIES	TRB	CADD	ES
DESIGN CK.	DAS	DETAIL CK.	DAS	QUAN.CK.	DAS	CADD CK.	

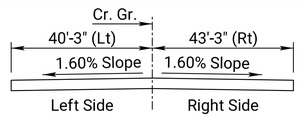
Plotted by : BGS01485 16-DEC-2025 12:17
File : 1917_ka680801bss170.dgn

SLAB ELEVATIONS

				Formwork				Screed			Thickness			Deck Profile	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Survey	Station (1)(16)	Location (13)	Transverse Location (13)	Estimated Falsework Crush (inch) (1)(4)	Target Elevation TOF (1)(6)	Actual Elevation TOF (2)	TOF Variance (QA/QC) (± inch) (2)(5)	Target Screed El. = TOC El. (1)(6)	Actual Bottom of Screed Elevation Prior to Pour (2)	Screed Variance (QA/QC) (± inch) (2)(7)	Plan Deck Thickness (inch) (1)	Measured Deck Thickness (inch) (2)(8)	Deck Thickness Variance (QA/QC) (± inch) (2)(9)	Plan TOC El. (1)	Actual TOC El. Optional Survey Date: (3)
A	217+25.41	℄ Brg. of Abut. #1	Left Fascia					957.01						957.01	
	217+17.82		Crown Gr.					957.38						957.38	
	217+09.66		Right Fascia					956.39						956.39	
B	217+26.69	Interior Face of Abut. #1	Left Fascia		955.51						18.50			957.05	
	217+19.09		Crown Gr.		955.89						18.50			957.43	
	217+10.93		Right Fascia		954.90						18.50			956.44	
C	217+44.61	4/10 Point from Abut. #1	Left Fascia	¼	956.18			957.74			18.64			957.64	
	217+37.02		Crown Gr.	¼	956.58			958.14			18.64			958.04	
	217+28.86		Right Fascia	¼	955.62			957.17			18.64			957.08	
D	217+71.89	Span #1 Face of Pier Beam	Left Fascia	¼	955.89						30.99			958.45	
	217+64.29		Crown Gr.	¼	956.32						30.99			958.88	
	217+56.13		Right Fascia	¼	955.38						30.99			957.95	
E	217+71.41	℄ Brg. of Pier #1	Left Fascia					958.50						958.50	
	217+65.82		Crown Gr.					958.93						958.93	
	217+57.66		Right Fascia					958.00						958.00	
F	217+74.94	Span #2 Face of Pier Beam	Left Fascia	¼	955.98						30.99			958.54	
	217+67.35		Crown Gr.	¼	956.42						30.99			958.97	
	217+59.19		Right Fascia	¼	955.49						30.99			958.04	
G	218+05.41	Midpoint of Span #2	Left Fascia	¼	957.86			959.40			18.50			959.30	
	217+97.82		Crown Gr.	¼	958.33			959.87			18.50			959.76	
	217+89.66		Right Fascia	¼	957.44			958.98			18.50			958.87	
H	218+35.89	Span #2 Face of Pier Beam	Left Fascia	¼	957.35						30.99			959.91	
	218+28.29		Crown Gr.	¼	957.85						30.99			960.42	
	218+20.13		Right Fascia	¼	956.00						30.99			959.56	
I	218+37.41	℄ Brg. of Pier #2	Left Fascia					959.94						959.94	
	218+29.82		Crown Gr.					960.44						960.44	
	218+21.66		Right Fascia					959.59						959.59	
J	218+38.94	Span #3 Face of Pier Beam	Left Fascia	¼	957.41						30.99			959.97	
	218+31.35		Crown Gr.	¼	957.92						30.99			960.47	
	218+23.19		Right Fascia	¼	957.07						30.99			959.62	
K	218+69.41	Midpoint of Span #3	Left Fascia	¼	958.99			960.54			18.50			960.43	
	218+61.82		Crown Gr.	¼	959.54			964.08			18.50			960.97	
	218+53.66		Right Fascia	¼	958.73			960.27			18.50			960.16	
L	218+99.89	Span #3 Face of Pier Beam	Left Fascia	¼	958.19						30.99			960.75	
	219+92.29		Crown Gr.	¼	958.76						30.99			961.33	
	218+84.13		Right Fascia	¼	957.99						30.99			960.55	
M	219+01.41	℄ Brg. of Pier #3	Left Fascia					960.76						960.76	
	218+93.82		Crown Gr.					961.34						961.34	
	218+85.66		Right Fascia					960.57						960.57	
N	219+02.94	Span #4 Face of Pier Beam	Left Fascia	¼	958.21						30.99			960.77	
	218+95.35		Crown Gr.	¼	958.80						30.99			961.35	
	218+87.19		Right Fascia	¼	958.03						30.99			960.58	
O	219+30.21	4/10 Point from Abut. #2	Left Fascia	¼	959.49			961.04			18.64			960.95	
	219+22.62		Crown Gr.	¼	960.09			961.64			18.64			961.55	
	219+14.46		Right Fascia	¼	959.34			960.90			18.64			960.80	
P	219+48.14	Interior Face of Abut. #2	Left Fascia	¼	959.51						18.50			961.05	
	219+40.55		Crown Gr.	¼	960.11						18.50			961.65	
	219+32.39		Right Fascia	¼	959.37						18.50			960.91	
Q	219+49.41	℄ Brg. of Abut. #2	Left Fascia					961.06						961.06	
	219+41.82		Crown Gr.					961.66						961.66	
	219+33.66		Right Fascia					960.92						960.92	



ELEVATION OF SLAB



TYPICAL SECTION
(Looking Up-Station)

LEGEND

TOF = Top of Formwork
TOC = Top of Concrete
QA = Quality Assurance
QC = Quality Control

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	70	253

NOTE: The Contractor will submit a completed copy of this table to the Field Engineer to be inserted into the As-Builts plan set.

Pour Dates (2)	
	Deck
	Left Rail (13)
	Right Rail (13)

Survey Data (1)(11)	
Bench Mk. No.	Elevation
CTBM 229	956.94
124A	962.47
125A	953.60

Crown Grade Profile (1)(12)	
217+80.00	VPI Station
960.70	VPI Elevation
+4.69	G1 %
+0.60	G2 %
2+70	L in Stations

Slab Thickness (1)	
18 ½	Uniform Depth (inch)
12 ½	Haunch Depth @ Face of PB (inch)
⅛	Haunch Depth @ 0.4 Point (inch)

Span Data (1)	
HL-93	Design Loading
48	Span #1 (ft)
64	Span #2 & #3 (ft)
3	Clear Cover (inch)

Roadway Data (1)(10)(13)	
83.50	Deck Width (ft) (14)
-1.60	% Slope Left (±)
-1.60	% Slope Right (±)
10:41:00	Skew (dd:mm:ss)

Camber (1)(17)	
0.073	Span #1 0.4 Point (ft)
0.087	Span #2 Midspan (ft)

(1) By the Design Engineer
(2) By the Contractor
(3) By Request
✱(4) Estimated crush for typical falsework. Revise estimate if/when more accurate information becomes available.
(5) (col 7 - col 6)x12
(6) Crush (Take Up) and camber must be included
(7) (col 10 - col 9)x12
(8) (col 10 - col 7)x12
(9) (col 13 - col 12)
(10) If transition falls on the bridge, then enter "Varies" for the % Slope
(11) From "Construction Layout" sheet
(12) If bridge is not on the vertical curve, enter Abutment #1 ℄ bearing elevation from the "Construction Layout" sheet. Represent a change in grade with G1 only.
(13) Looking Up-Station
(14) Out-to-Out
(15) Ignore Fillet
(16) Non-skewed bridges only require ℄ stations.
(17) Ignore theoretical camber at face of pier beams.

✱ It is assumed that piling have been driven to design bearing and checked by ENR formula (QA/QC). No allowance for pile settlement is included in crush.

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 70-89-363.90 (324) Sta. 218+29.82

SLAB ELEVATIONS

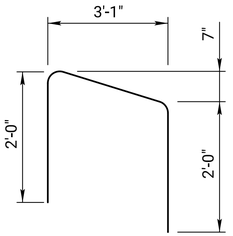
Proj. 70-89 KA-6808-01 Shawnee Co.

DESIGNED	TRB	DETAILED	ES	QUANTITIES	TRB	CADD	ES
DESIGN CK.	DAS	DETAIL CK.	DAS	QUAN.CK.	DAS	CADD CK.	

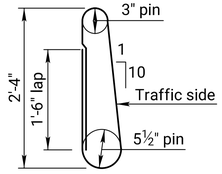
Plotted by : BGS01485 16-DEC-2025 12:17
File : 1918_ka680801bss201ausc.dgn

Irfd\bri529-2_bd.dgn	
Roadway Width = 40'	Longest Span Length = 64'
Skew and Direction = 0	Total No. of Spans = 4
Loading = HL-93	Railing Type = Corral

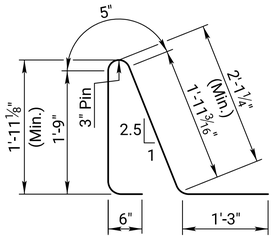
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	71	253



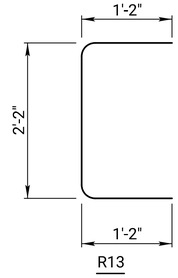
PB10



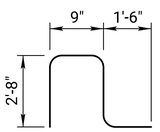
R2



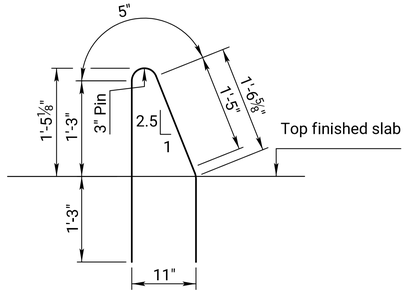
R4



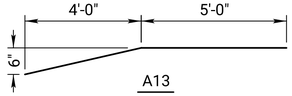
R13



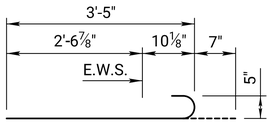
SC1



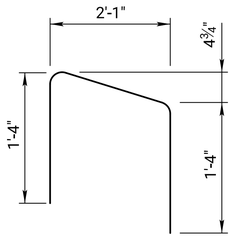
R5



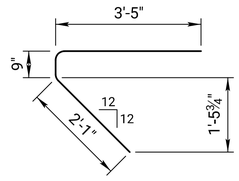
A13



A3

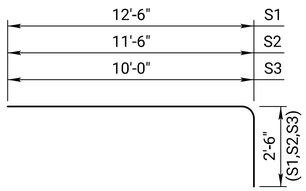


A10

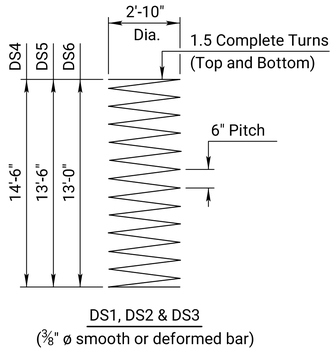


A7

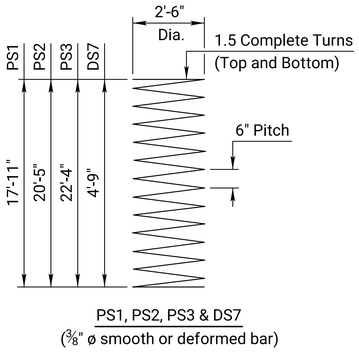
A6, PB1, R1 & SC3



S1, S2 & S3



DS1, DS2 & DS3
(⅜" ø smooth or deformed bar)



PS1, PS2, PS3 & DS7
(⅜" ø smooth or deformed bar)

Spiral reinforcing shall meet the requirements of ASTM A615 Grade (60 or 40) or ASTM A82.
Spiral Spacer Bars:
1) Are included in the weight of reinforcing steel.
2) Minimum section modulus = 0.008 in³
3) 4 required per spiral.

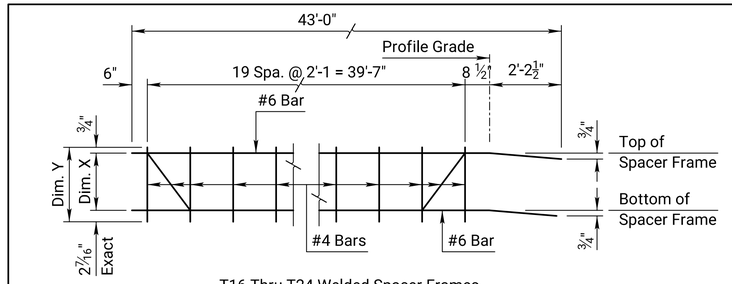
BILL OF REINFORCING STEEL
Non-Epoxy Coated - Grade 60

	Straight Bars				Bent Bars			
	Mark	Size	Number	Length	Mark	Size	Number	Length
Substructure	DS1	#9	128	14'-6"	DS4	#3	8	⊗
	DS2	#9	128	13'-6"	DS5	#3	8	⊗
	DS3	#9	128	13'-0"	DS6	#3	8	⊗
					DS7	#3	24	⊗

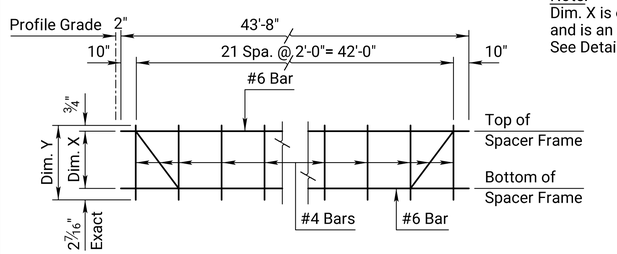
BILL OF REINFORCING STEEL
Epoxy Coated - Grade 60

	Straight Bars				Bent Bars			
	Mark	Size	Number	Length	Mark	Size	Number	Length
Superstructure Pier Beam	PB6	#9	15	47'-8"	PB1	#5	498	9'-7"
	PB7	#9	15	43'-2"	PB10	#4	30	7'-2"
	PB8	#7	21	46'-8"				
	PB9	#7	21	43'-8"				
	PB2	#5	18	45'-4"				
	PB3	#5	18	43'-8"				
	PB4	#5	6	45'-4"				
	PB5	#5	6	43'-2"				
Substructure	PC1	#9	96	21'-7"	PS1	#3	8	⊗
	PC2	#9	96	24'-1"	PS2	#3	8	⊗
	PC3	#9	96	26'-0"	PS3	#3	8	⊗
	PC4	#9	288	10'-2"				

Note: DS1, DS2, DS3, DS4, DS5, DS6, DS7 and PC4 bars are considered part of the drilled shaft.



T16 Thru T24 Welded Spacer Frames



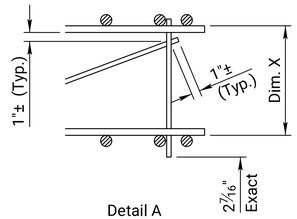
T7 Thru T15 Welded Spacer Frames

⊗ SPACER FRAMES
(Epoxy Coated)

Mark	No. Ea.	Dim. X	Dim. Y
T7, T16	8	11⁷⁄₁₆"	1'-2⅝"
T8, T17	6	11½"	1'-2¹¹⁄₁₆"
T9, T18	6	11¹⁵⁄₁₆"	1'-3⅛"
T10, T19	6	1'-0¹³⁄₁₆"	1'-4"
T11, T20	6	1'-2⅛"	1'-5⁵⁄₁₆"
T12, T21	6	1'-3⅜"	1'-7¹⁄₁₆"
T13, T22	6	1'-6¹⁄₁₆"	1'-9¼"
T14, T23	6	1'-8¹¹⁄₁₆"	1'-11⅜"
T15, T24	6	1'-11¾"	2'-2¹⁵⁄₁₆"

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

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



Detail A

BILL OF REINFORCING STEEL
Epoxy Coated - Grade 60

	Straight Bars				Bent Bars			
	Mark	Size	Number	Length	Mark	Size	Number	Length
Superstructure Abutment - Deck - Rail	S7	#11	136	51'-0"	A13	#8	16	9'-0"
					S1	#8	136	15'-0"
	S4	#10	8	55'-6"				
	S6	#10	136	54'-9"	S2	#7	136	14'-0"
	S8	#10	132	55'-6"	S3	#7	132	12'-6"
	S9	#10	108	50'-0"				
	S10	#10	100	39'-6"	A3	#5	158	4'-0"
	S15	#10	108	60'-0"	R2	#5	470	6'-6"
	S21	#10	134	52'-6"	R4	#5	450	5'-10"
	S22	#10	66	47'-6"	R5	#5	20	5'-10"
	S23	#10	4	31'-6"	R13	#5	4	4'-6"
					SC1	#5	145	7'-6"
	S11	#9	100	37'-0"				
	S12	#9	96	26'-0"	A6	#4	384	9'-6"
	S14	#9	208	6'-0"	A7	#4	158	6'-2"
	S16	#9	100	42'-6"	A10	#4	28	4'-9"
	S17	#9	100	37'-0"	SC3	#4	6	4'-7"
	S18	#9	96	25'-6"				
					T7-T24			⊗
	A1	#8	8	47'-9"				
	A2	#8	8	50'-0"				
	A11	#8	8	43'-9"				
	A12	#8	8	47'-0"				
	A4	#6	20	47'-9"				
	A5	#6	20	48'-9"				
	R7	#6	8	58'-8"				
	T1	#6	66	43'-8"				
	T4	#6	66	44'-8"				
	T2	#5	90	43'-8"				
	T5	#5	90	44'-8"				
	A8	#4	2	36'-6"				
	A9	#4	2	43'-6"				
	R8	#4	48	58'-0"				
	S5	#4	4	6'-6"				
	S13	#4	100	12'-0"				
	S19	#4	200	13'-3"				
	S20	#4	4	13'-3"				
	SC2	#4	18	48'-9"				
	T3	#4	164	43'-8"				
	T6	#4	164	43'-8"				

⊗ See Bending Diagram

BENDING DIAGRAMS
(All dimensions are out to out of bars.)

NO.	DATE	REVISIONS	BY	APP'D
03				
02				
01	08-22-23	C2 bar length & quantity correction	M.L.L.	M.A.H.

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 70-89-363.90 (324) Sta. 218+29.82

BILL OF REINFORCING STEEL
AND
BENDING DIAGRAMS

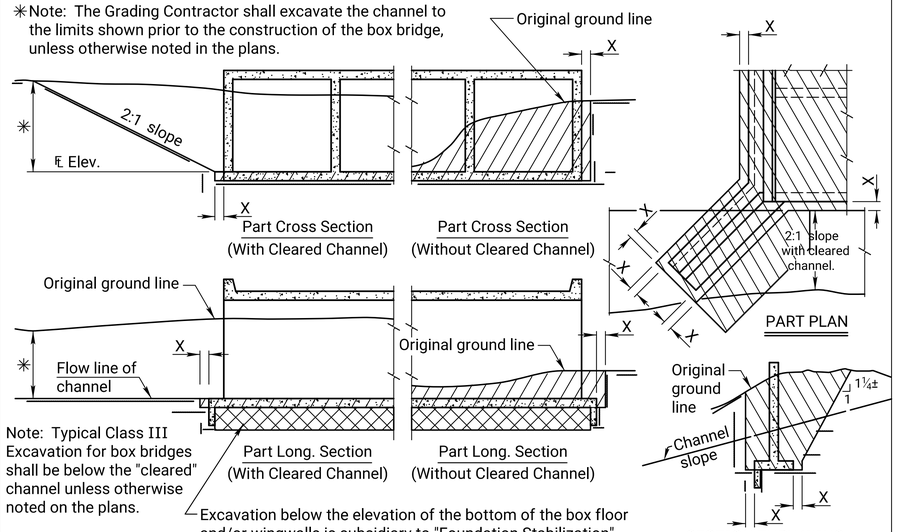
Proj. 70-89 KA-6808-01 Shawnee Co.

DESIGNED	TRB	DETAILED	ES	QUANTITIES	TRB	CADD	ES
DESIGN CK.	DAS	DETAIL CK.	TRB	QUAN.CK.	DAS	CADD CK.	

Plotted by : BGS01485 16-DEC-2025 12:18
File : 1919_ka680801bss529-2_bd.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	72	253

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

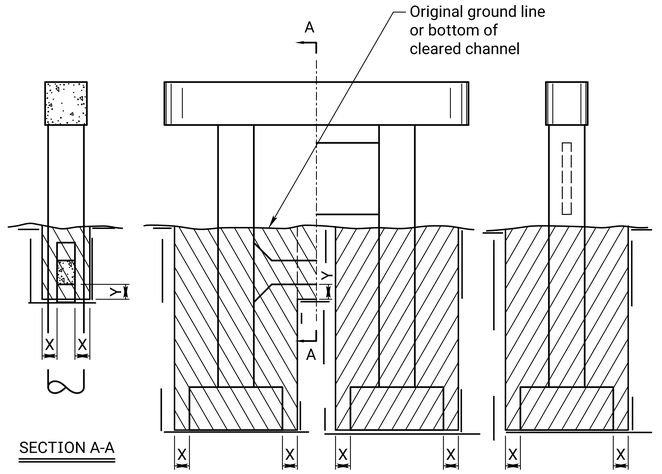


Note: Typical Class III Excavation for box bridges shall be below the "cleared" channel unless otherwise noted on the plans.

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

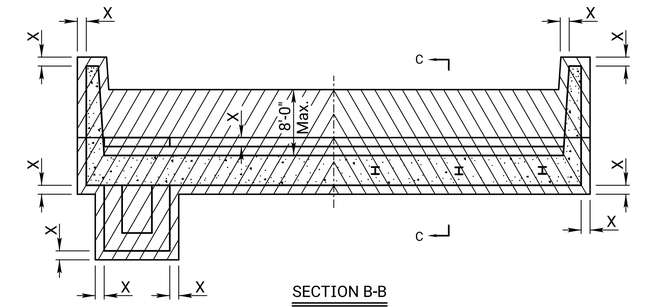
EXCAVATION DETAILS FOR REINFORCED CONCRETE BOX CULVERT

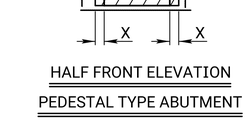
Note: Excavation for culverts less than bridge length and the additional excavation for "Embedded Structures" shall not be paid for as Class III Excavation, but shall be subsidiary to Grade 4.0 Concrete.



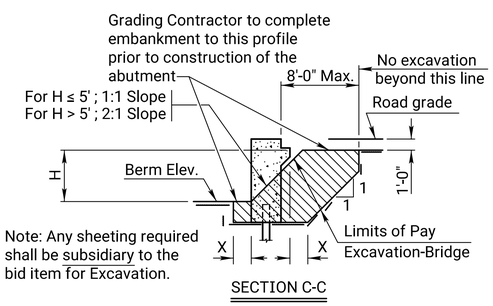
EXCAVATION DETAILS FOR TYPICAL PIERS

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





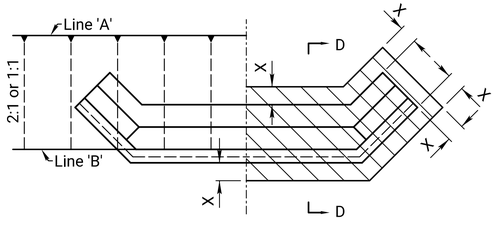
Note: Bridge Contractor shall finish the embankment and berms after the construction of the abutment and dispose of any excess material as approved by the Engineer.

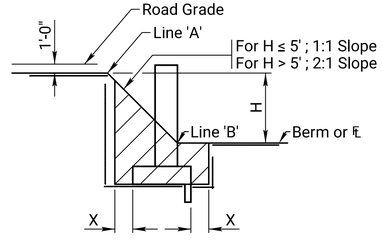


Note: Any sheeting required shall be subsidiary to the bid item for Excavation.

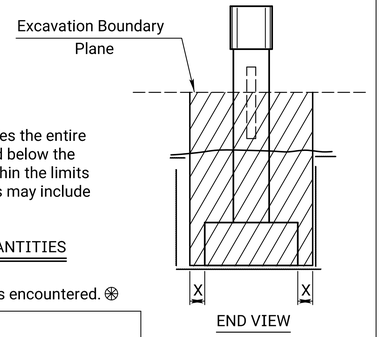
EXCAVATION DETAILS FOR TYPICAL ABUTMENTS

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





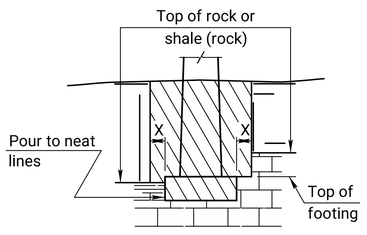
EXCAVATION DETAILS FOR ABUTMENTS WITH FLARED WINGWALLS



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

CLASS II EXCAVATION QUANTITIES

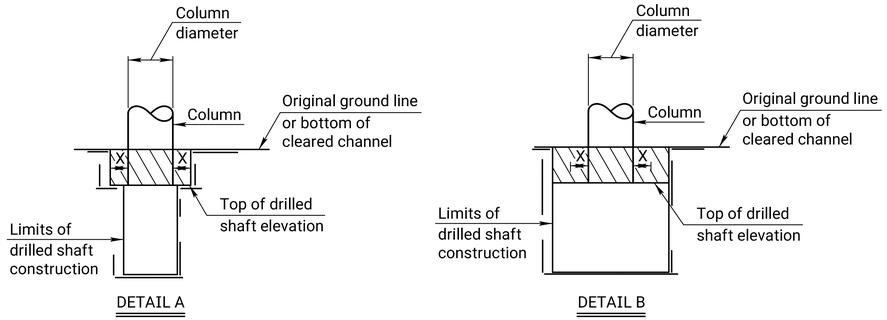
See detail when rock or shale (rock) is encountered. ❀



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

(Piers and Abutments)

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



DRILLED SHAFT DETAILS

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

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

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

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

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

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

KANSAS DEPARTMENT OF TRANSPORTATION

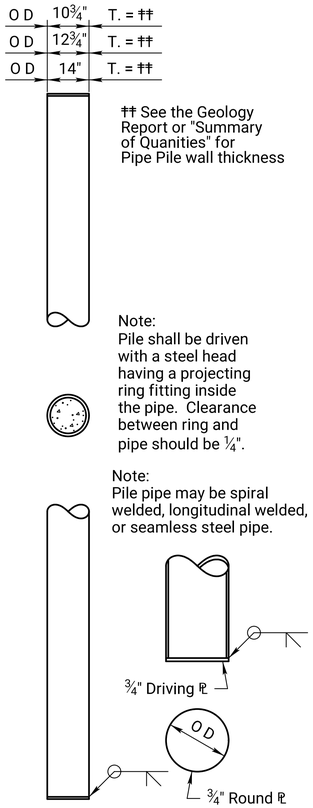
BRIDGE EXCAVATION (LRFD)

BR100B

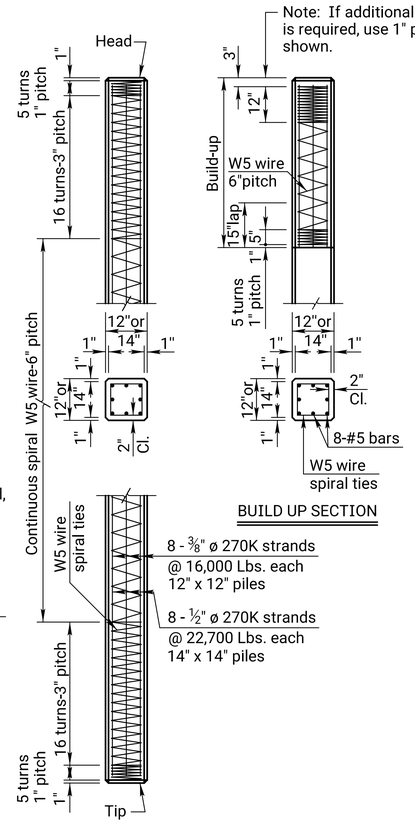
FHWA APPROVAL		04-17-10	APP'D.		Terry L. Fleck
DESIGNED	DETAILED	R.D.R.	QUANTITIES	TRACED	
DESIGN CK.	DETAIL CK.	L.R.R.	QUAN.CK.	TRACE CK.	

Plotted by : BGS01485 16-DEC-2025 12:18
File : 1920_ka680801bss100b.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	73	253

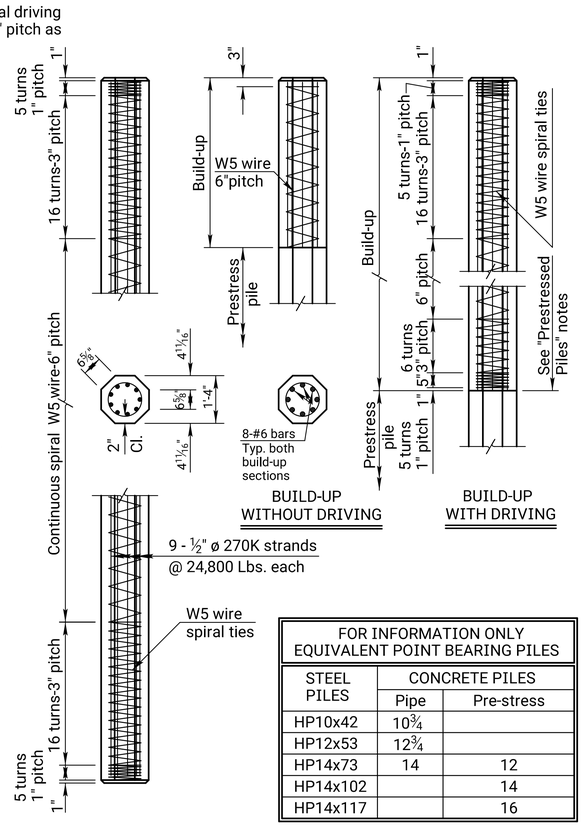


PLAIN ROUND
CAST-IN-PLACE CONCRETE PILES



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

GENERAL NOTES

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

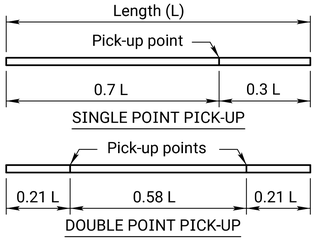
All piles driven without a mandrel shall be of the minimum thicknesses shown. Piles driven with a mandrel shall be of sufficient strength and thickness to withstand driving without injury and to resist harmful distortion and/or buckling due to soil pressure after the mandrel is removed.

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

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

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

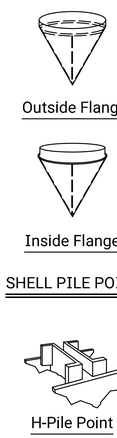
MILL TEST REPORTS: Steel piles test reports and steel shell test reports shall comply with the Standard Specifications.



PICK-UP POINTS FOR PRESTRESSED PILING

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

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



SHELL PILE POINT

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.

CAST STEEL PILE POINT

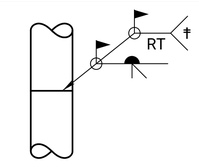
The pile point shall be a one-piece unit of cast steel. Weld pile points in accordance with manufacturer's recommendations to each steel pile before driving.

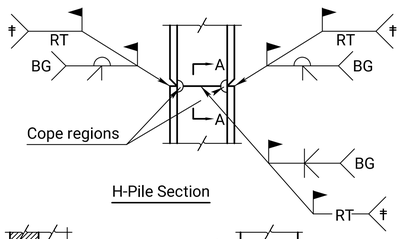
SPLICES: Splices for steel piles and shell piling shall be in accordance with details shown on this sheet and the Standard Specifications.

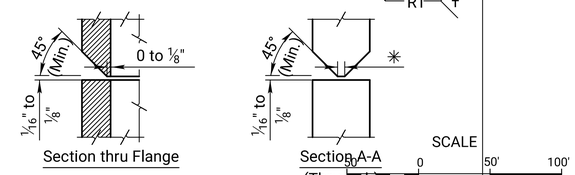
For integral pile bent abutments and piers, if a pile splice is required, do not locate the pile splice within a region extending 2'-0" above and 10'-0" below the bottom of the concrete web wall. For abutments, locate the pile splice at least 10'-0" below top of fill.

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

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







✳ Minimum as required by welding process.

BG = Backgouge

PILE SPLICE DETAILS

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

KANSAS DEPARTMENT OF TRANSPORTATION

STANDARD PILE DETAILS

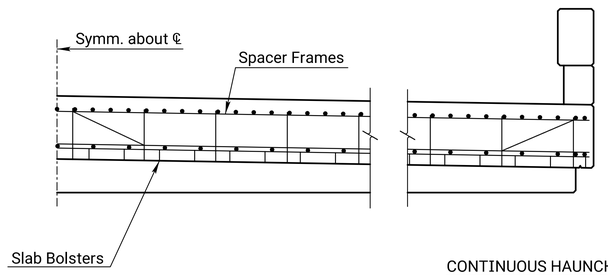
BR110

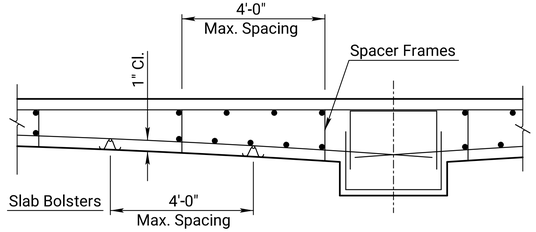
FHWA APPROVAL		10-04-12	APP'D.		Terry L. Fleck
DESIGNED	J.P.J.	DETAILED		QUANTITIES	TRACED R.A.A.
DESIGN CK.		DETAIL CK.		QUAN.CK.	TRACE CK.

Sh. No. 73

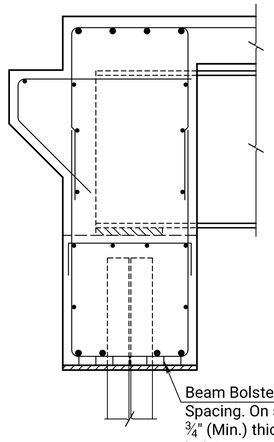
Plotted by : BGS01485 16-DEC-2025 12:19
File : 1921_ka6808001bss110.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	74	253

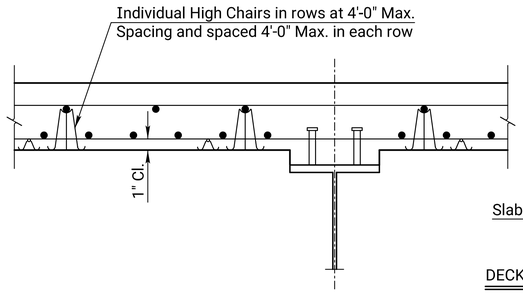


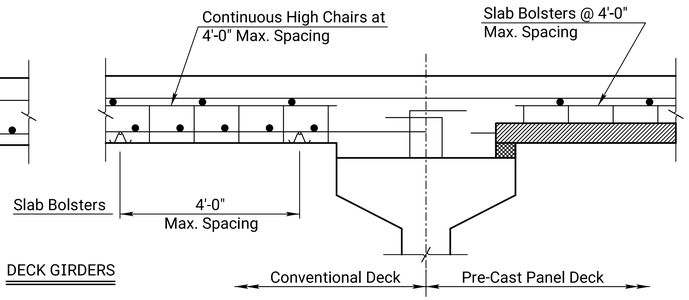


CONTINUOUS HAUNCHED SLAB

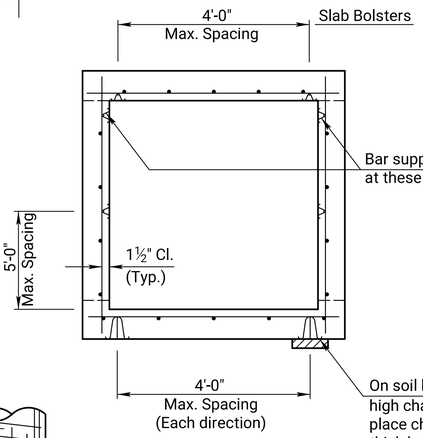


ABUTMENT

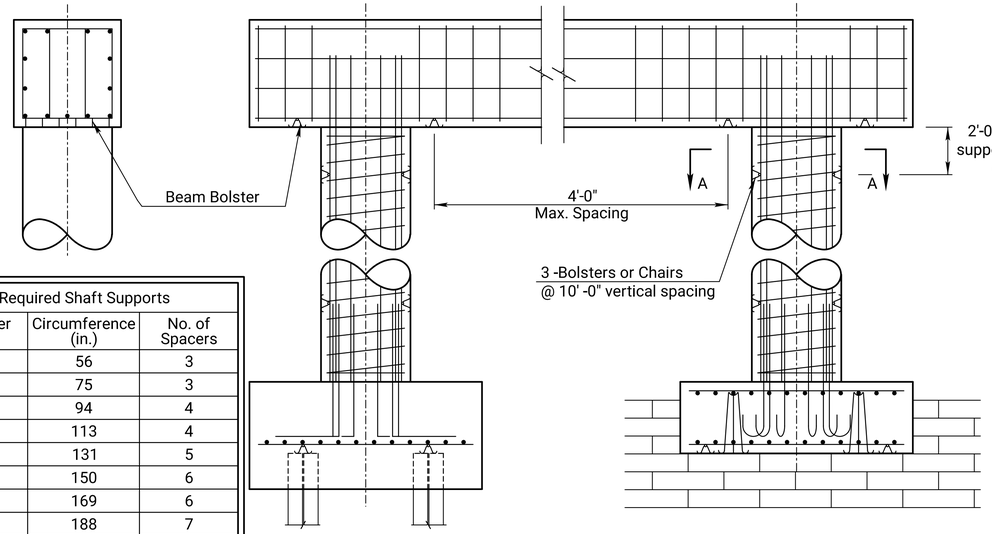




DECK GIRDERS

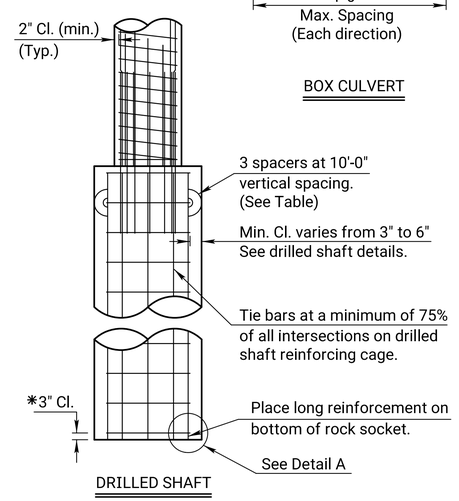


BOX CULVERT

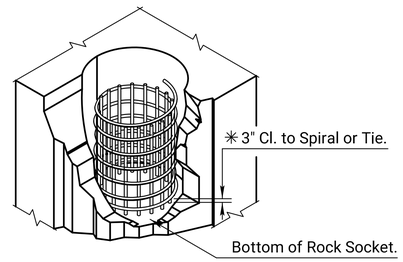


PIER

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

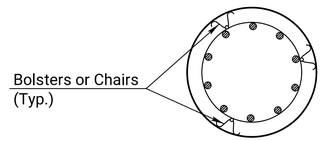


DRILLED SHAFT



DETAIL A

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



SECTION A-A

GENERAL NOTES

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

Use only the following types of bar supports:

1) Wire Bar Supports:

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

2) Plastic Bar Supports

3) Supplementary bars

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

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

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

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

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

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

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

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

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

KANSAS DEPARTMENT OF TRANSPORTATION

SUPPORTS AND SPACERS FOR REINFORCING STEEL

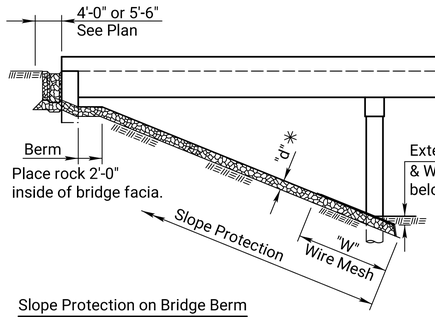
BR120

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

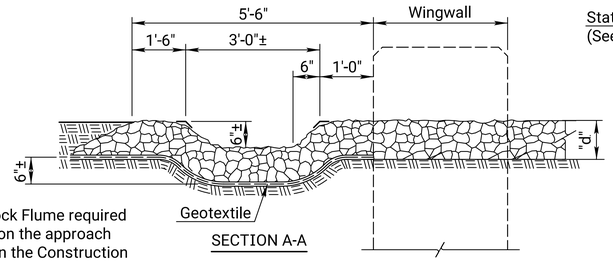
SCALE 50 0 50 100'

Plotted by : BGS01485 16-DEC-2025 12:19
File : 1922_ka680801bss120.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	75	253

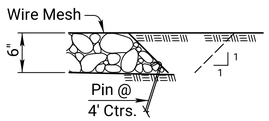


Slope Protection on Bridge Berm

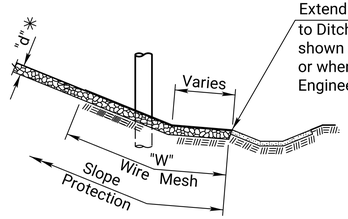


NOTE: Section A-A, Rock Flume required when curb is omitted on the approach slab or when shown on the Construction Layout sheet.

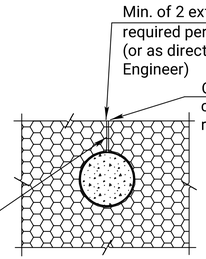
SECTION A-A



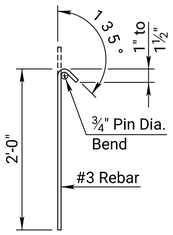
DETAIL AT EDGE OR TOE



Slope Protection at Toe
(with Ditch Lining)

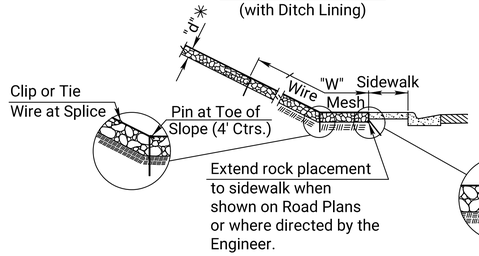


DETAIL AT COLUMNS
(Or Other Obstruction)



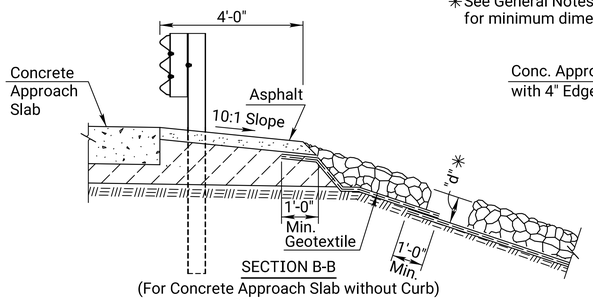
Note:
Pins shall be sharpened or geotextile shall be cut to allow penetration of stake without tearing or ripping the geotextile fabric.

TYPICAL PIN
DETAIL

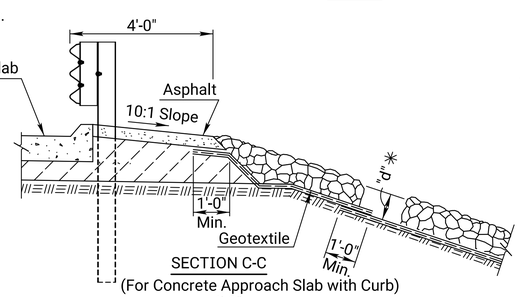


Slope Protection at Toe
(with Sidewalk)

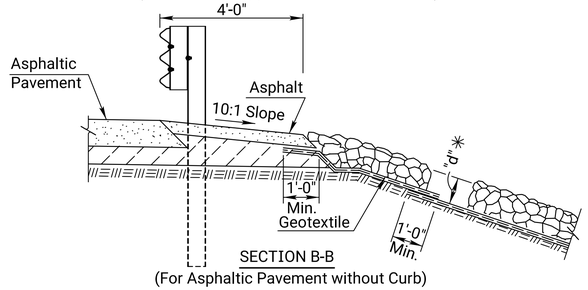
✳See General Notes
for minimum dimensions.



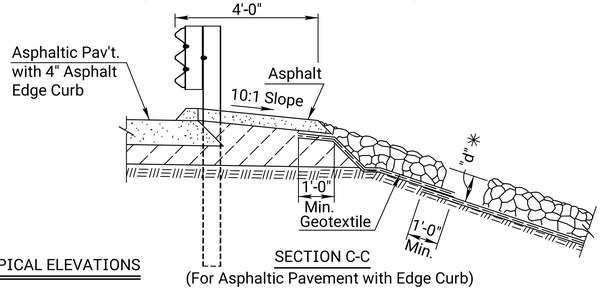
SECTION B-B
(For Concrete Approach Slab without Curb)



SECTION C-C
(For Concrete Approach Slab with Curb)

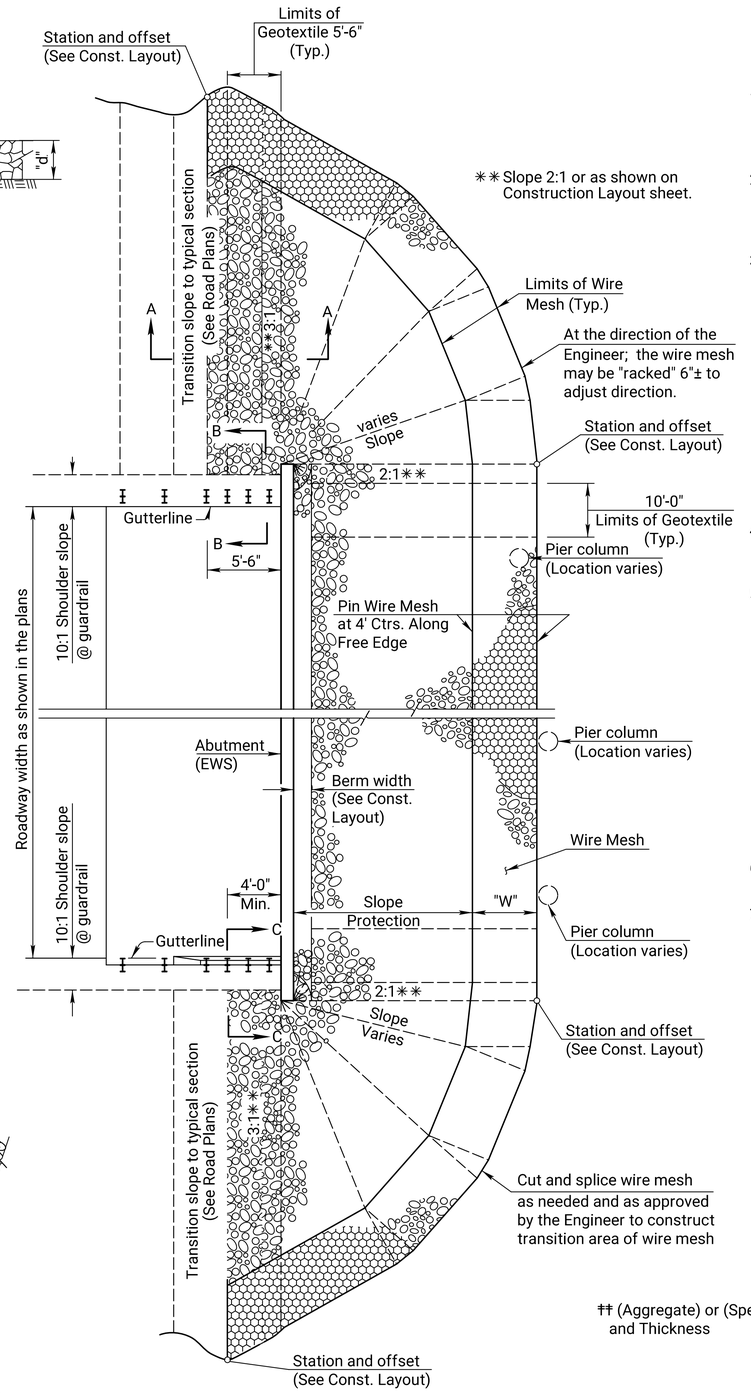


SECTION B-B
(For Asphaltic Pavement without Curb)



SECTION C-C
(For Asphaltic Pavement with Edge Curb)

TYPICAL ELEVATIONS



BERM AND SLOPE PROTECTION PLAN
(Straight Wingwall Abutment)

GENERAL NOTES

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

QUANTITIES
† For Information Only

Bridge Number	Slope Protection (††) Cu. Yds.	†Geotextile Sq. Yds.	†Wire Mesh Sq. Yds.
324	35	163	585

†† (Aggregate) or (Special) and Thickness

NO.	DATE	REVISIONS	BY	APP'D
03	12-10-10	Clarified Geotextile	J.P.J.	T.L.F.
02	07-14-04	Changed to guard "rail"	R.A.M.	K.F.H.
01	05-15-02	Clarified Bid Items	R.A.M.	K.F.H.

KANSAS DEPARTMENT OF TRANSPORTATION

BRIDGE BERM AND SLOPE PROTECTION STRAIGHT WINGWALL ABUTMENT

BR132A

FHWA APPROVAL		06-04-02	APP'D.	Kenneth F. Hurst
DESIGNED R.R.R.	DETAILED P.G.F.	QUANTITIES	TRACED	P.G.F.
DESIGN CK.	DETAIL CK. R.R.R.	QUAN.CK.	TRACE CK.	

Plotted by : BGS01485 16-DEC-2025 12:19
File : 1923_ka680801bss132a.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	76	253

EARTHWORK

STATION to STATION	EXCAVATION COMMON CU.YDS.	EXCAVATION COMMON VMF	EXCAVATION ROCK ▫ CU.YDS.	EXCAVATION ROCK ▫ VMF	CONTR. FURN. CU.YDS.	COMPACTION TYPE AA MR-0-5 CU.YDS.	COMPACTION TYPE A MR-5-5 CU.YDS.		NOT SUBGRADED THROUGH CUTS COMM. CU.YDS.	NOT SUBGRADED THROUGH CUTS TYPE AA (MR-0-5) CU.YDS.		⚹ EMBANKMENT (CU.YDS.) INITIAL CONSOL.	⚹ EMBANKMENT (CU.YDS.) SETTLE-MENT	◭ PLACE SELECT SOIL CU.YDS.
I-70														
429+50.28 to 436+78.80	99	0.74	186	1.0			175		120	120				
California Ave.														
213+56.98 to 221+50.00	✱✱776	0.74	728	1.0		0	344		903	903				
TOTALS	875		914				519		1023	1023				

✱✱ 174 Cu. Yd. to be wasted ▫ Existing Pavt. to be wasted ⚹ Subsidiary (see General Note). ◭ See General note.

SALVAGED TOPSOIL

STATION TO STATION	LOCATION	SIDE	QUANTITY (SQ. YDS.)	REMARKS
429+50.83 to 434+96.08	℄ I-70	Rt.	649.6	
431+05.26 to 436+78.80	℄ I-70	Lt.	498.2	
215+88.57 to 220+61.78	℄ California Ave.	Lt.	907.3	
216+16.85 to 220+54.11	℄ California Ave.	Rt.	846.0	
TOTAL			2901.1	

RECAPITULATION OF BRIDGE QUANTITIES

BRIDGE NUMBER	STATION	SEE SHEET NO.
70-89-363.90 (324)	218+29.82	52

RECAPITULATION OF ROAD QUANTITIES

ITEM	QUANTITY	UNIT
CONTRACTOR CONSTRUCTION STAKING	Lump Sum	LSUM
FIELD OFFICE AND LABORATORY (TYPE A)	1	EACH
MOBILIZATION	Lump Sum	LSUM
REMOVAL OF EXISTING STRUCTURES	Lump Sum	LSUM
CLEANING EXISTING STRUCTURE	Lump Sum	LSUM
CONCRETE FOR SEAL COURSE (SET PRICE)	Lump Sum	LSUM
CLEARING AND GRUBBING	Lump Sum	LSUM
COMMON EXCAVATION (URBAN)	1,898	CUYD
RESETTING END SECTION	2	EACH
RESETTING PIPE CULVERT	32	LNFT
ROCK EXCAVATION	914	CUYD
COMPACTION OF EARTHWORK (TYPE AA)(MR-0-5)	1,023	CUYD
COMPACTION OF EARTHWORK (TYPE A)(MR-5-5)	519	CUYD
WATER (GRADING)(SET PRICE)	1	MGAL
SALVAGED TOPSOIL	2,901	SQYD
CROSS ROAD PIPE (8.5 Sq. Ft.) (RCPHE)	192	LNFT
END SECTION (8.5 Sq. Ft.) (RCHE)	2	EACH
GUARDRAIL, STEEL PLATE (MGS)	569.00	LNFT
GUARDRAIL END TERMINAL (MGS-MSKT) Alt #1	2	EACH
GUARDRAIL END TERMINAL (MGS-SOFTSTOP) Alt #2	2	EACH
ADJUSTMENT OF EXISTING STRUCTURES	Lump Sum	LSUM
INLET (TYPE 22 CURB)	3	EACH
CURB AND GUTTER COMBINED (AE)	654	LNFT
STORM SEWER (15" RCP)	76	LNFT
END SECTION (15" RC)	3	EACH
SIDEWALK CONSTRUCTION (4") (AE)	113	SQYD
SIDEWALK RAMP	34	SQYD
INERTIAL BARRIER SYSTEM (TL-3)	4	EACH
REPLACEMENT MODULES (IBS)	15	EACH
CONCRETE SAFETY BARRIER (TYPE II) (54") (SPECIAL)	327	LNFT
CONCRETE SAFETY BARRIER (TYPE IV) (51")	68	LNFT
CONCRETE SAFETY BARRIER (TYPE IV) (SPECIAL)	10	LNFT
CONCRETE SAFETY BARRIER (TRANSITION)	161	LNFT
CONCRETE SAFETY BARRIER (TYPE F3) (TEMPORARY)	2,100	LNFT
CONCRETE PAVEMENT (8" UNIFORM) (AE) (NRDJ)	1,922	SQYD
CONCRETE PAVEMENT (11" UNIFORM) (AE) (Plain)	360	SQYD
CONCRETE PAVEMENT (10" UNIFORM) (AE) (BR APP)	688	SQYD
BRIDGE APPROACH SLAB FOOTING	91.4	CUYD
GRANULAR BASE (10")	2,790	SQYD
WATER (GRANULAR BASE)(SET PRICE)	1	MGAL
CURING ENVIRONMENT	Lump Sum	LSUM
FOUNDATION STABILIZATION (Set Price)	1	CUYD
TOWING (COURTESY) (SET PRICE)	1	EACH

CURB AND GUTTER, COMBINED (AE)

STATION TO STATION	LOCATION	SIDE	TYPE I (LNFT)	TYPE III (LNFT)	REMARKS
213+56.08 to 213+61.09	℄ California Ave.	Lt.	10.1		
215+23.63 to 215+41.99	℄ California Ave.	Lt.	21.0		
215+95.89 to 216+76.48	℄ California Ave.	Lt.	122.6		
216+12.34 to 216+76.48	℄ California Ave.	Rt.	99.5		
219+83.91 to 220+53.34	℄ California Ave.	Rt.	95.6		
219+83.91 to 220+63.38	℄ California Ave.	Lt.	102.2		
220+82.45 to 221+50.00	℄ California Ave.	Rt.	85.3		
220+92.88 to 221+00.90	℄ California Ave.	℄		24.3	
220+93.99 to 221+50.00	℄ California Ave.	Lt.	93.5		
TOTALS			629.8	24.3	

SIDEWALKS

STATION TO STATION	LOCATION	SIDE	SIDEWALK CONSTRUCTION (4")(AE)(SQ. YDS.)	SIDEWALK RAMP (SQ. YDS.)	REMARKS
216+17.08 to 217+09.14	℄ California Ave.	Rt.	39.4	25.2	
219+35.69 to 220+54.09	℄ California Ave.	Rt.	73.4	8.7	
TOTAL			112.8	33.9	

GUARDRAIL, STEEL PLATE (MGS)

STATION TO STATION	LOCATION	SIDE	STEEL PLATE GUARD RAIL (ft)	END TERM. MGS-MSKT Alt. 1 (each)	END TERM. MGS-SOFTSTOP Alt. 2 (each)	END TERM. MGS-Type II (FOR INFORMATION ONLY)	REMARKS
430+54.53 to 433+88.97	℄ I-70	Rt.	290.63	1	1	1	
432+45.75 to 435+73.63	℄ I-70	Lt.	278.13	1	1	1	
Stations are for Location Only							
TOTALS			568.76	2	2	2	

CONCRETE SAFETY BARRIER

STATION TO STATION	LOCATION	SIDE	TRANSITION	TYPE II (54") (SPEC.)	TYPE IV (51")	TYPE IV (SPEC.)	REMARKS
431+84.84 to 434+26.16	℄ I-70	Lt./Rt.		326.5	68.0	10.0	
216+76.44 to 219+83.96	℄ California Ave.	Rt.	80.6				
216+76.44 to 219+83.96	℄ California Ave.	Lt.	80.6				
TOTAL			161.2	326.5	68.0	10.0	

REMOVAL OF EXISTING STRUCTURES ✱ (FOR INFORMATION ONLY)

STATION	LOCATION	REMARKS
431+84.84 to 434+26.16	℄ I-70	Concrete Barrier (Type IV)
431+71.17	℄ I-70 - Rt.	Remove 241.7' of Exist. Guardrail
432+01.96	℄ I-70 - Lt.	Remove 266.6' of Exist. Guardrail
433+00.15	℄ I-70 - Lt.	Remove Exist. 189.6' 32" x 48" CMP and End Sections
216+14.87	℄ California Ave. - Lt.	Remove Inlet, 35' of 18" RCP and End Sections
216+27.48	℄ California Ave. - Rt.	Remove Inlet, 29' of 18" RCP and End Sections
218+29.82	℄ California Ave.	Remove Br. No. 70-89-363.90 (039)

✱ The listing shown may not be complete. Payment for structures or obstructions not listed but whose removal is required by the construction as determined by the Engineer, shall not be paid for directly but shall be included in the bid item " Removal of Existing Structures."

CONCRETE PAVEMENT

STATION TO STATION	LOCATION	MEDIAN CONC. PVT. 8" (AE) (NRDJ) (SQ. YDS.)	DRIVING LANES CONC. PVT. 8" (AE) (NRDJ) (SQ. YDS.)	DRIVING LANES CONC. PVT. 11" (AE) (Plain) (SQ. YDS.)	SUBGRADE GRANULAR BASE (10") (SQ. YDS.)	BRIDGE APPROACH CONC. PVT. (10") (SQ. YDS.)	REMARKS
431+84.84 to 434+26.16	℄ I-70			359.6	359.6		
216+30.28 to 217+16.55	℄ California Ave.		352.8		760.3	343.8	
219+43.09 to 221+50.00	℄ California Ave.	10.5	1,558.6		2,029.9	343.8	
TOTAL		10.5	1,911.4	359.6	2,790.2	687.6	

CLEANING EXISITING STRUCTURE (FOR INFORMATION ONLY)

STATION	LOCATION	SIDE	REMARKS
433+22.19	I-70	Rt.	146 LF (24" RCP)
216+15.00	℄ California Ave.	Lt.	INLET & 35 LF (18" RCP)
221+41.00	℄ California Ave.	Lt./Rt.	2 INLETS, 47 LF (18" RCP), 68 LF (24" RCP)

ADJUSTMENT OF EXISITING STRUCTURES

STATION	LOCATION	SIDE	REMARKS
221+39.70	℄ California Ave.	Lt.	Adjust Inlet Top
221+42.10	℄ California Ave.	Rt.	Adjust Inlet Top

BRIDGE APPROACH SLAB FOOTINGS

BRIDGE LOCATION	SIDE	CU. YDS.	REMARKS
California Ave. Bridge	South Approach Slab	45.7	
California Ave. Bridge	North Approach Slab	45.7	
TOTAL		91.4	

For Inlets & Drainage Structures See Sh. No. 31
For Summary of Pipe Culverts See Sh. No. 51
For Project Surfacing Quantities, See Sh. No. 77
For Temporary Project Water Pollution Control Quantities, See Sh. No. 78
For Permanent Seeding Quantities, See Sh. No. 89
For Recapitulation of ITS Quantities See Sh. No. 94
For Recapitulation of Lighting Quantities See Sh. No. 133
For Pavement Marking Quantities, See Sh. No. 146
For Permanent Signing Quantities, See Sh. No. 158
For Traffic Control Quantities, See Sh. No. 236
For Temporary Concrete Safety Barrier Quantities, See Sh. No. 238

NO.	DATE	REVISIONS	BY	APP'D
02	01-14-08	Rem. Drainage Structure summary	S.W.K.	J.O.B.
01	01-09-91	Detailed on CADD	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

SUMMARY OF QUANTITIES

RD050

FHWA APPROVAL	05-28-08	APP'D.	James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED	B.N.B.
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.	S.W.K.

KDOT Graphics Certified 12-15-2025

Sh. No. 76

KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 15:46
File : ka680801rss050-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	77	253

GENERAL NOTE:

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

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

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

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

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

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

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

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

Quantities for aggregate for shoulders, AS-1, are calculated on the basis of 150 lbs. per cu. ft. Quantities for stabilized base course, AB-3, are calculated on the basis of 1 56 lbs. per cu. ft. Weight/cu. ft. includes moisture allowed by specification.

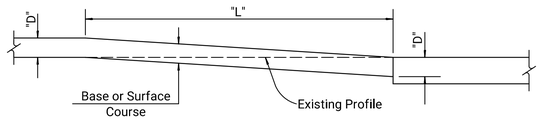
The base course shall be constructed to the plan thickness as shown.

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

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

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

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



TYPICAL PROFILE AT GRADE CONTROL POINTS

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

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

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

SUMMARY OF QUANTITIES					
ITEM	CALIFORNIA AVE.	GUARDRAIL PAD		TOTAL	UNIT
✳HMA Comm. Grade (Class A)	79.8			79.8	TON
✳✳Milling	79.8			733.7	SQYD
Aggregate Shoulder (AB-3) (4")		1031.9		1031.9	SQYD

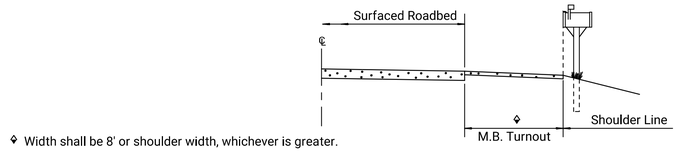
✳HMA Commercial Grade (Class A) Computed at the rate of 145 lbs/ft3 (Mixed Weight Aggregate and Asphalt)

✳✳ Milling to be wasted

RATES OF APPLICATION				
RATE	UNIT	ITEM		

† Computed at the rate of

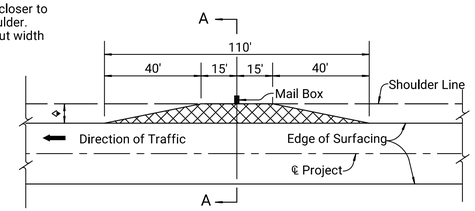
†† Computed at the rate of



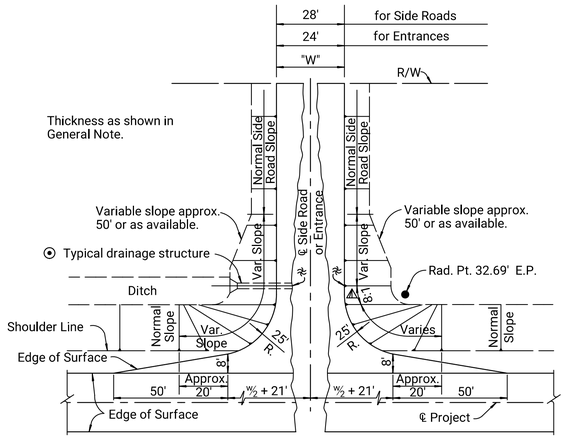
♦ Width shall be 8' or shoulder width, whichever is greater.

SECTION A-A

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



DETAIL FOR SURFACING OF MAIL BOX TURNOUTS



WITH DRAINAGE STRUCTURE MOUND ENTRANCE OR SIDE ROAD

DETAIL FOR SURFACING OF SIDE ROADS & HOUSE ENTRANCES

RECAPITULATION OF QUANTITIES					
ITEM				TOTAL	UNIT
HMA Comm. Grade (Class A)				80	TON
Milling				734	SQYD
Aggregate Shoulder (AB-3) (4")				1,032	SQYD
Water (Aggregate Shoulders) (Set Price)				1	MGAL

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

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

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

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

KANSAS DEPARTMENT OF TRANSPORTATION

SUMMARY OF QUANTITIES (Surfacing)

RD051

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

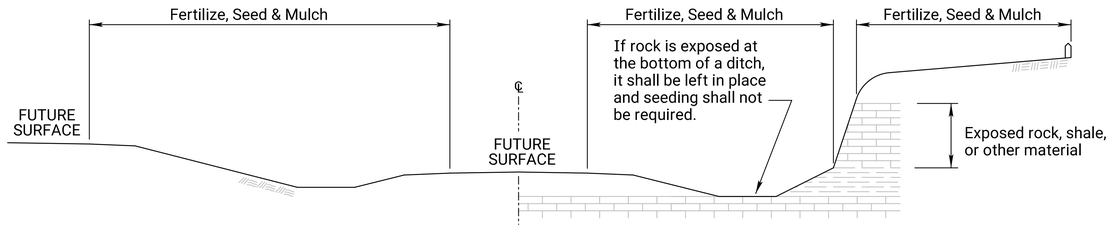
KDOT Graphics Certified 10-02-2025

Sh. No. 77

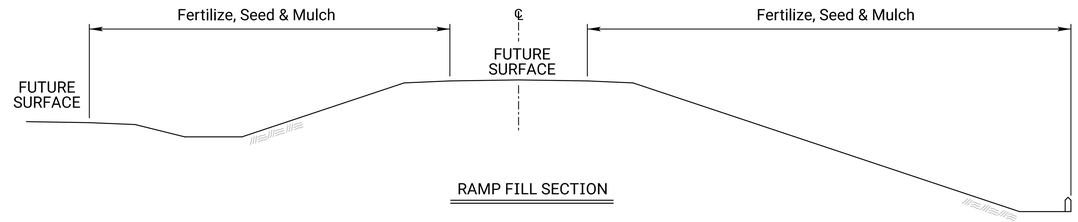
KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 12:20
File : ka6808001rssd051-01.dgn

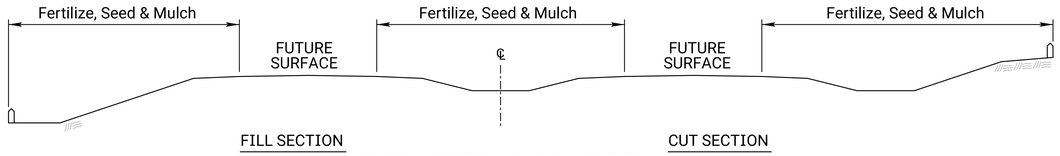
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	78	253



RAMP CUT SECTION



RAMP FILL SECTION



TYPICAL SECTION - DUAL PAVEMENT

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

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

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

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

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

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

GENERAL NOTES

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

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

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

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

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

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

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

SUMMARY OF SEEDING / EROSION CONTROL QUANTITIES

P.L.S. RATE/ ACRE		ACRES		BID ITEM	QUANTITY	UNIT
CLT	SL/CH	CLT	SL/CH			
	150		0.70	Temporary Fertilizer (15 - 30 - 15)	105.0	LB
				Temporary Seed Mix	0.0	LB
				Soil Erosion Mix	126.0	LB
				Erosion Control (Class 1, Type C)	1,955	SQ YD
	180		0.70	Erosion Control (Class 2, Type E)	1,648	SQ YD
				Sediment Removal (Set Price)	1	CU YD
				Synthetic Sediment Barrier		LF
				Temporary Berm (Set Price)	1	LF
				Temporary Ditch Check (Rock)		TON
				Temporary Inlet Sediment Barrier		EACH
				Temporary Sediment Basin		CU YD
				Temporary Slope Drain		LF
				Temporary Stream Crossing		EACH
				Filter Sock (12")	320	LF
				Geotextile (Erosion Control)	1,169	SQ YD
				Silt Fence		LF
				SWPPP Design ǂ	1	LS
				SWPPP Inspection ǂ	57	EACH
				Water Pollution Control Manager ǂ	57	EACH
900 lbs / acre				Mulch Tacking Slurry	0.0	LB
2 tons / acre				Mulching	0.0	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. HECP, Erosion Control (Class I or II) or Hay Mulch may be used at no additional cost to the project.

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

Regreen and Quick Guard are the approved sterile wheatgrass products.

ǂ 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.

The amount of mulch in the bid quantities is estimated. (Acres of Seeding X 1.5 X 2 Tons/Acre).
The amount of mulch tacking slurry in the bid quantities is estimated. (Acres of Seeding X 1.5 X 900 Lbs/Acre).
The estimated quantity includes mulching associated with both temporary and permanent seeding operations. The total mulch and mulch tacking slurry required shall be determined in the field. The bid item for mulching and mulch tacking slurry shall be paid for according to the Standard Specifications.

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

SOIL EROSION MIX

PLS RATE	NAME	QTY (lb)
180	Seed (Turf-type Tall Fescue Seed Blend)	126.0
180	Total (lb)	126.0

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.

TEMPORARY SEED MIX

PLS RATE	NAME	QTY (lb)
	Total (lb)	

NO.	DATE	REVISIONS	BY	APP'D
05	12-02-25	Standard Sheet Update and Simplification	J.D.N.	M.K.L.
04	09-12-24	Added mulch tckng slurry rate & Temp Seed Mix Table	M.R.D.	M.K.L.
03	08-03-20	Added Note	M.R.D.	S.H.S.

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION AND POLLUTION CONTROL

~~LA852A~~

FHWA APPROVAL		12-05-25	APP'D.	Mervin Lare	
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 12-08-2025 Sh. No. 78

KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 15:47
File : 2201_ka680801eec852a-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	79	253

EROSION CONTROL- CLASS 1, TYPE C

STATION TO STATION	ALIGNMENT	SIDE	LENGTH	WIDTH	SQ YARD
213+55.79 to 215+48.19	California Ave.	Lt.	192.40	15	320.7
215+86.18 to 217+53.74	California Ave.	Lt.	167.56	25	465.4
219+14.49 to 220.60.30	California Ave.	Lt.	145.81	33	534.6
216+19.20 to 216.57.16	California Ave.	Rt.	37.96	4	16.9
216+14.68 to 217+30.41	California Ave.	Rt.	115.73	19	244.3
219+07.59 to 220+52.49	California Ave.	Rt.	144.83	22	354.0
220+06.21 to 220+49.22	California Ave.	Rt.	43.01	4	19.1
TOTAL EROSION CONTROL (CLASS 1, TYPE C) =					1,955.0 Sq.Yd.

EROSION CONTROL- CLASS 2, TYPE E

STATION TO STATION	ALIGNMENT	SIDE	LENGTH	WIDTH	SQ YARD
431+25.00 to 432+43.52	I-70	Lt.	118.52	11	144.9
432+88.27 to 437+00.00	I-70	Lt.	411.73	11	503.2
429+25.00 to 435+25.00	I-70	Rt.	600.00	15	1000.0
TOTAL EROSION CONTROL (CLASS 2, TYPE E) =					1,648.1 Sq.Yd.

Plotted by : BGS01485 16-DEC-2025 12:21
File : 2202_ka680801eec852a-ec-01.dgn

NO.	DATE	REVISIONS	BY	APP'D
01	09-12-24	Modified table to add Slope for Cl. 1 Blanket Install.	M.E.C.	M.L.

KANSAS DEPARTMENT OF TRANSPORTATION

EROSION CONTROL SEEDING-SODDING

LA852A-EC

FHWA APPROVAL		03-27-25	APP'D.		Scott H. Shields
DESIGNED	M.R.M.	DETAILED M.R.M.	QUANTITIES	TRACED	M.R.M.
DESIGN CK.	S.H.S.	DETAIL CK. S.H.S.	QUAN.CK.	TRACE CK.	S.H.S.

KDOT Graphics Certified 09-02-2025 Sh. No. 79

KDOT Graphics Certified

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	80	253

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED

Scale 1"=50'

PC 426+59.10

Exist. R/W & A.C.

LEGEND

- Class 1 Erosion Control
- Class 2 Erosion Control
- Geotextile Fabric
- Aggregate Shoulder (AB-3) (4")

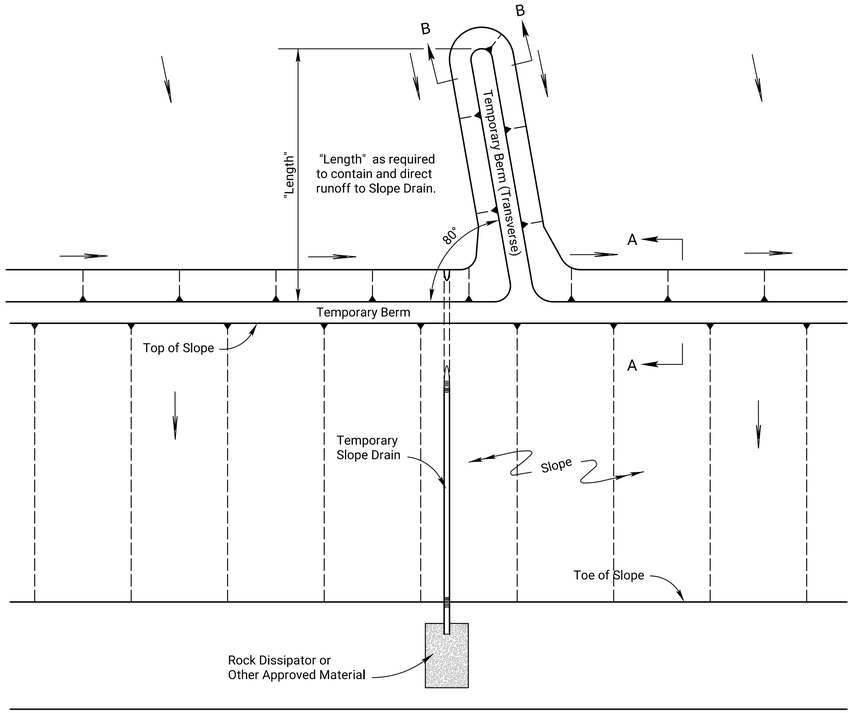
KANSAS DEPARTMENT OF TRANSPORTATION

EROSION CONTROL PLAN

STA. 425+00 TO STA. 441+00

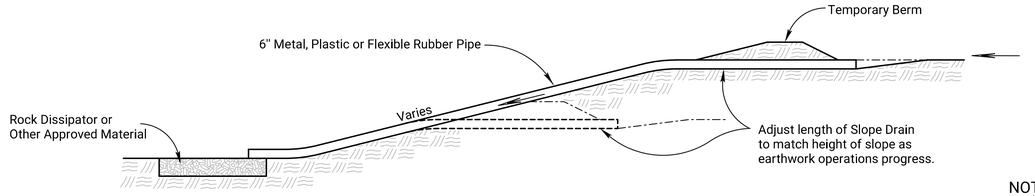
Plotted by : BGS01485 16-DEC-2025 12:22
File : 2203_ka680801ewp-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	81	253



TYPICAL PLAN VIEW OF TEMPORARY BERM AND TEMPORARY SLOPE DRAIN

NO SCALE



TYPICAL PROFILE OF TEMPORARY SLOPE DRAIN

NO SCALE

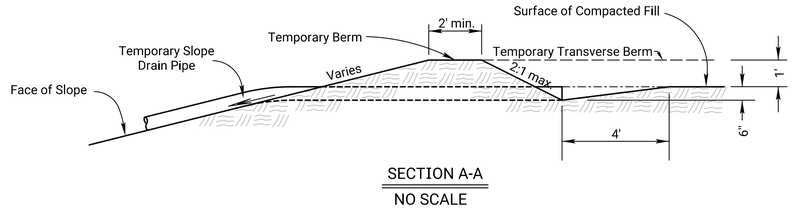
NOTES:

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

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

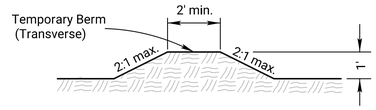
3) Pipe shall be secured in place as approved by Engineer.

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



SECTION A-A

NO SCALE

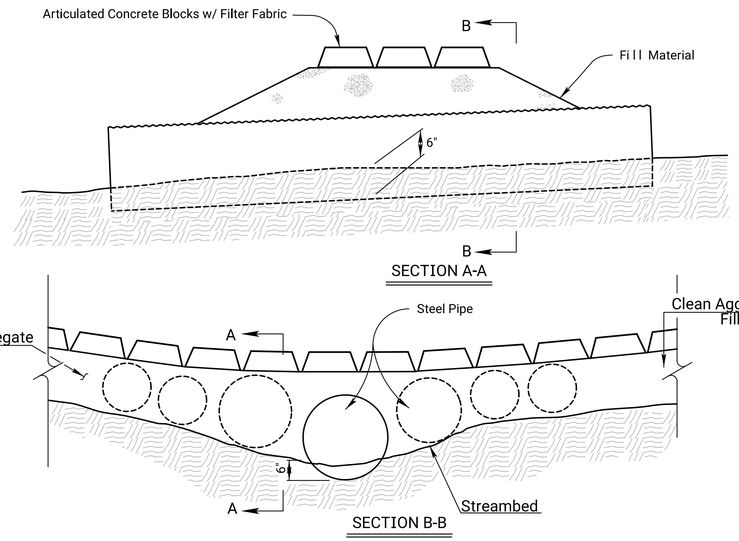


SECTION B-B

NO SCALE

TYPICAL PROFILE OF TEMPORARY BERM

NO SCALE



Pipe size may vary.

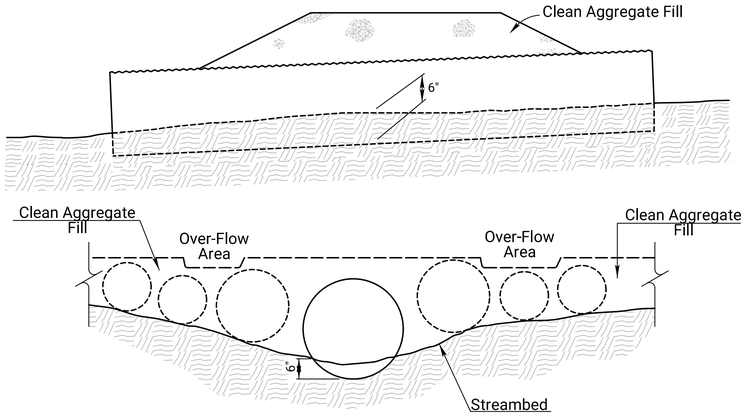
Place 1 pipe buried 6" into stream bottom, in the lowest point of the channel to allow the passage of aquatic organisms, with additional pipes placed along the remainder of the stream channel bottom such that ordinary high water (OHW) flows designated in the Contract Documents shall flow through the 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 (ARTICULATED CONCRETE BLOCKS)

NO SCALE



SECTION B-B

TEMPORARY STREAM CROSSING (AGGREGATE)

NO SCALE

Pipe size may vary.

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

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

See KDOT Specifications for more information.

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

KANSAS DEPARTMENT OF TRANSPORTATION

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

LA852B

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

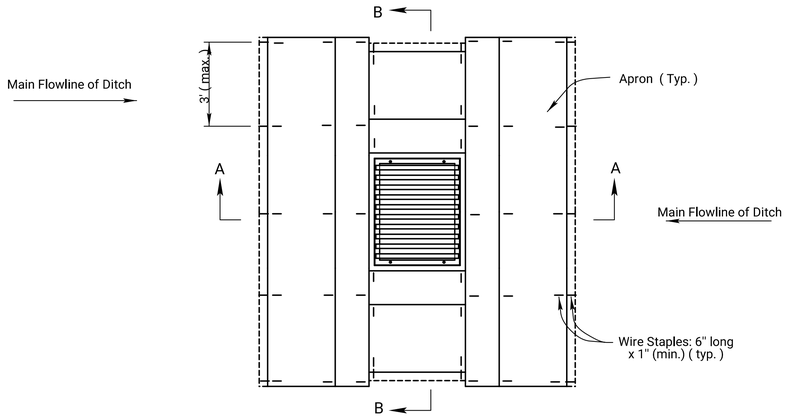
KDOT Graphics Certified 06-17-2022

Sh. No. 81

KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 12:22
File : 2205_ka680801eec852b-01.dgn

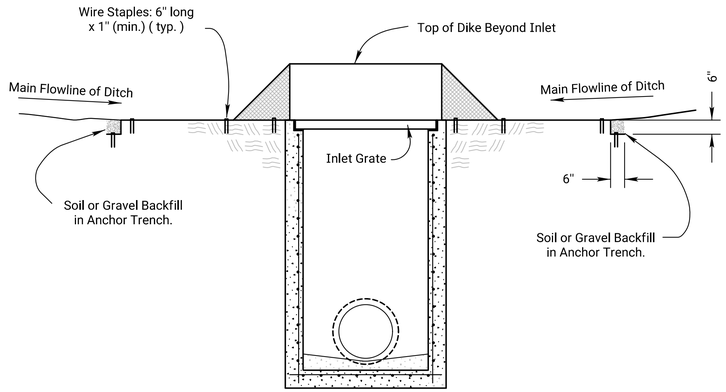
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	82	253



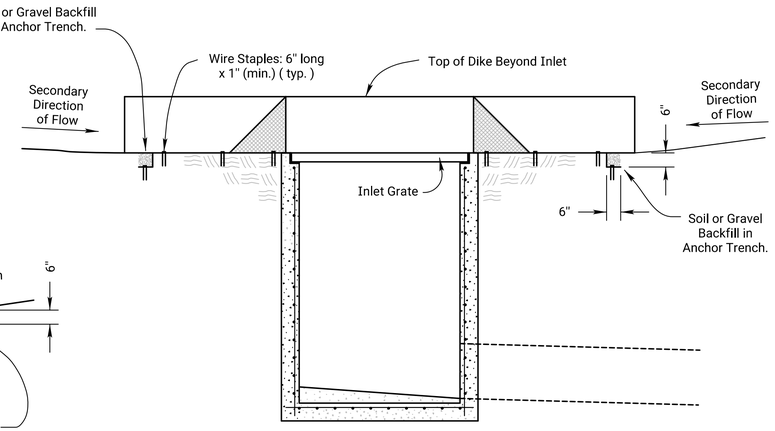
PLAN

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

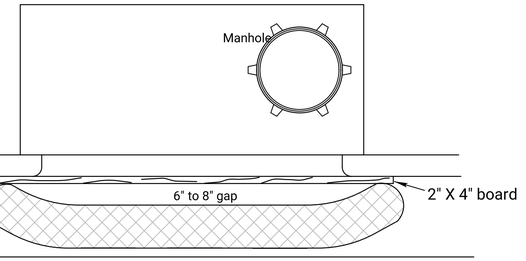
NO SCALE



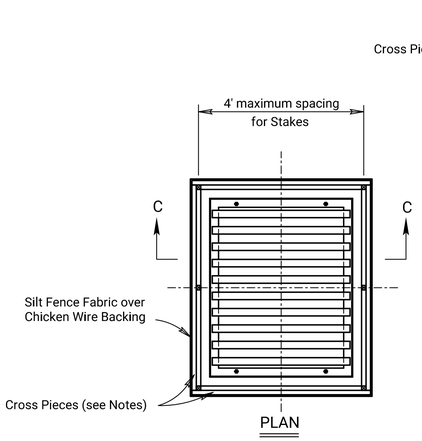
SECTION A - A



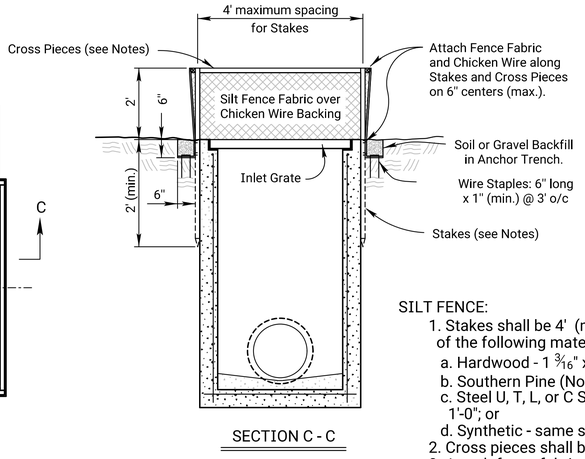
SECTION B - B



CURB INLET PROTECTION



PLAN



SECTION C - C

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

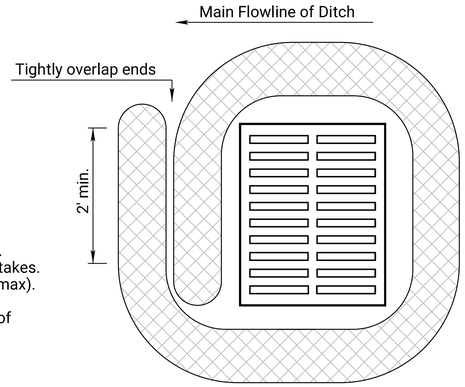
NO SCALE

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

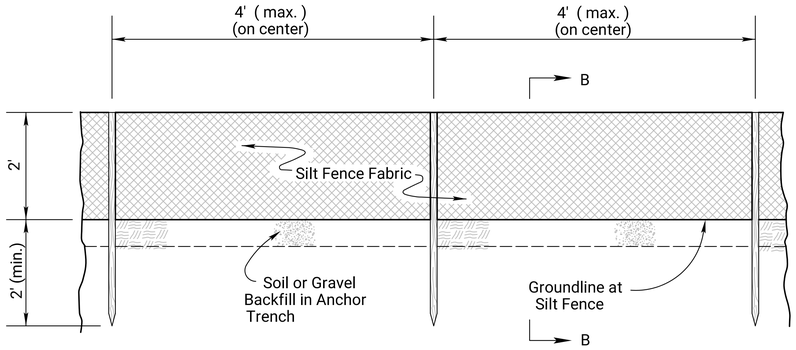
FHWA APPROVAL			03-10-15	APP'D.		Scott H. Shields	
DESIGNED	R.A.	DETAILED	R.A.	QUANTITIES		TRACED	
DESIGN CK.	S.H.S.	DETAIL CK.	S.H.S.	QUAN.CK.		TRACE CK.	

KDOT Graphics Certified 07-14-2022 Sh. No. 82

KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 12:22
File : 2206_ka680801eec852c-01.dgn

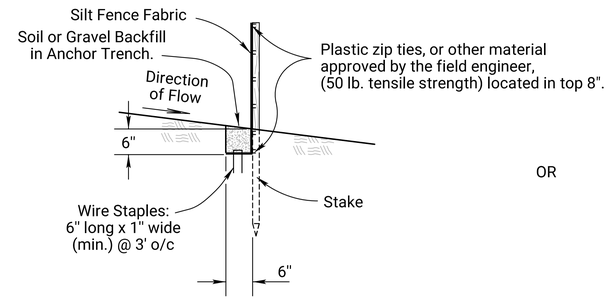
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	83	253



TYPICAL ELEVATION

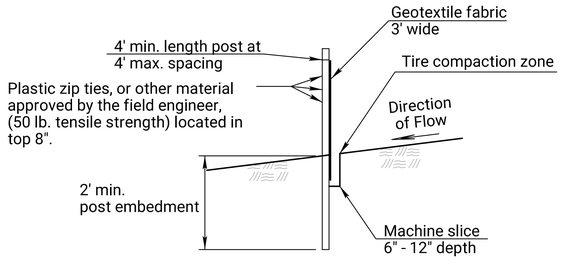
SILT FENCE BARRIER

NO SCALE

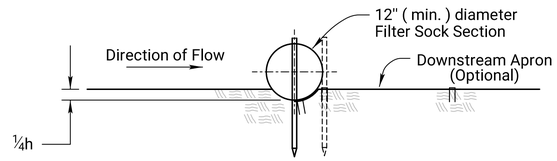


SECTION B-B

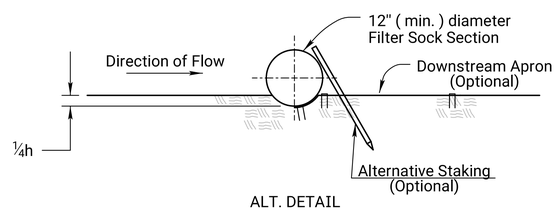
OR



SECTION B-B

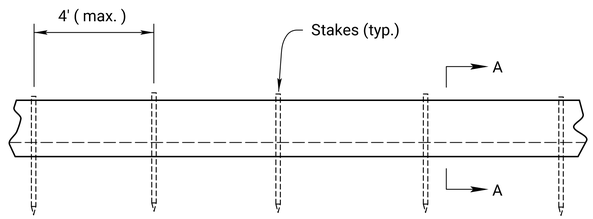


SECTION A - A



ALT. DETAIL

OPTIONAL



TYPICAL ELEVATION

FILTER SOCK SLOPE INTERRUPTIONS

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.

FILTER SOCK

1. Place 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 filter sock required.
4. Each 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 sock at a minimum with minimum ground embedment equal to the height of the sock.

Filter Sock Slope Interruptions

		PRODUCT
		12" Filter Sock (ft)
Slope Gradient	≤4H:1V	60
	3H:1V	45

Deviations should be approved by the Field Engineer.

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
04	12-02-25	Standard Sheet Update and Simplification	J.D.N.	M.K.L.
03	06-28-16	Revised Standard	R.A.	S.H.S.
02	03-01-15	Revised Standard	R.A.	S.H.S.

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION AND POLLUTION CONTROL SLOPE INTERRUPTIONS FILTER SOCKS / SILT FENCE

LA852D

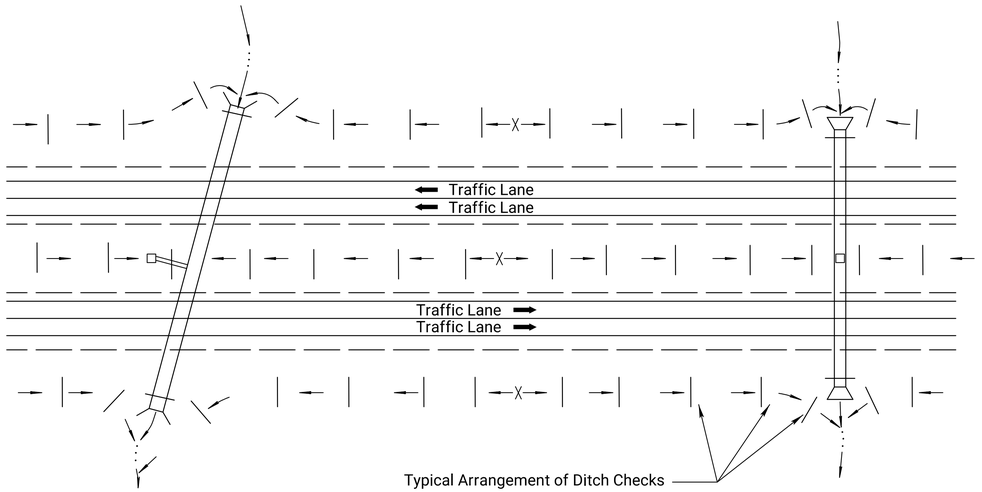
FHWA APPROVAL		12-05-25	APP'D.	Mervin Lare	
DESIGNED	M.R.D.	DETAILED M.R.D.	QUANTITIES	TRACED	
DESIGN CK.	S.H.S.	DETAIL CK. S.H.S.	QUAN.CK.	TRACE CK.	

KDOT Graphics Certified 06-18-2022 Sh. No. 83

KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 12:23
File : 2207_ka680801eec852d-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	84	253



TYPICAL DITCH CHECK LAYOUT PLAN

NO SCALE

12" 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
04	12-02-25	Standard Sheet Update and Simplification	J.D.N.	M.K.L.
03	08-10-16	Revised Standard	R.A.A.	S.H.S.
02	06-28-16	Revised Standard	R.A.A.	S.H.S.

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION AND POLLUTION CONTROL DITCH CHECKS

LA852E

FHWA APPROVAL			12-05-25	APP'D.		Mervin Lare	
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.

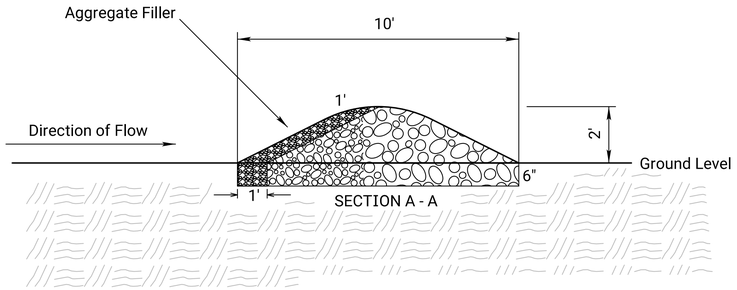
KDOT Graphics Certified 08-08-2025

KDOT Graphics Certified

Sh. No. 84

Plotted by : BGS01485 16-DEC-2025 12:23
File : 2208_ka680801eec852e-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	85	253



TYPICAL ELEVATION

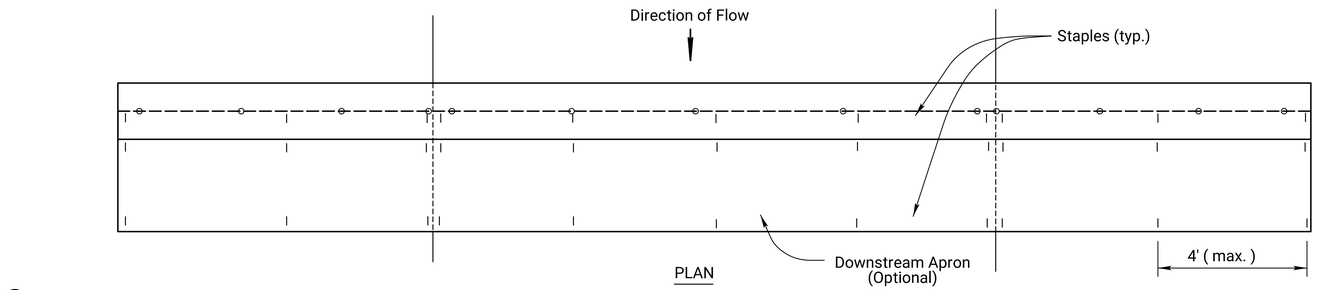
ROCK DITCH CHECK

NO SCALE

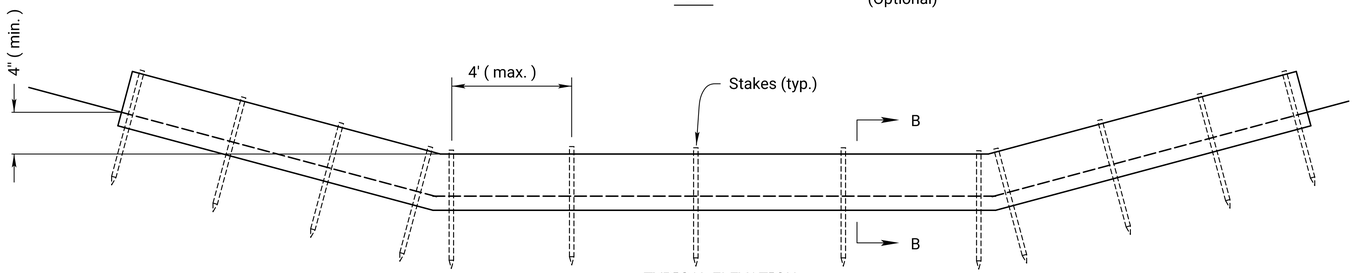
TEMPORARY ROCK DITCH CHECK SPACING	
DITCH ℄ SLOPE (%)	SPACING INTERVAL (FEET)
5.0	60
6.0	50
7.0	43
8.0	36
9.0	33
10.0	29
NOTE: Use this spacing for Rock Ditch Checks only.	

ROCK DITCH CHECK NOTES

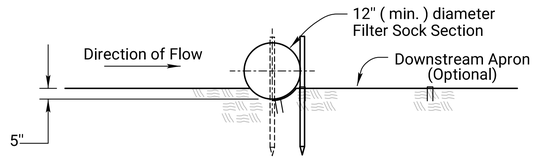
1. Rock shall be clean aggregate, D50-6" and aggregate filler.
2. Place rock in such manner that water will flow over, not around ditch check.
3. Do not use rock ditch checks in clear zone.
4. Excavation: The ditch area shall be reshaped to fill any eroded areas. Prior to placement of the rock, the ditch shall be excavated to the dimensions of the Rock Ditch Check and to a minimum depth of 6" (150mm). After placement of the rock, backfill and compact any over-excavated soil to ditch grade. This work shall be subsidiary to the bid item Temporary Ditch Check (Rock).
5. Aggregate excavated on site may be used as an alternate to the 6" rock, if approved by the Engineer.
6. The Engineer may approve the use of larger aggregates for the downstream portion of the check when conditions warrant their use.
7. When the use of larger rock is approved, D50-6" rock will be placed between the larger aggregate and the aggregate filler.
8. Aggregate filler will be placed on the upstream face of the ditch check. Aggregate filler will comply with Filter Course Type I, Division 1114.



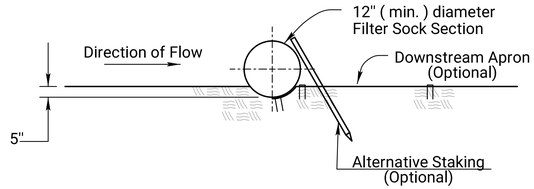
PLAN



TYPICAL ELEVATION



SECTION B - B



ALT. DETAIL
OPTIONAL

FILTER SOCK DITCH CHECK

NO SCALE

FILTER SOCK DITCH CHECK NOTES

1. Use as many filter sock 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 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
04	12-02-25	Removed Biodegradable Log	J.D.N.	M.K.L.
03	11-19-20	Revised Standard	M.R.D.	M.K.L.
02	08-10-16	Revised Standard	R.A.A.	S.H.S.

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION AND POLLUTION CONTROL ROCK DITCH CHECKS FILTER SOCK DITCH CHECKS

LA852G

FHWA APPROVAL		12-05-25	APP'D.	Mervin Lare			
DESIGNED	M.K.L.	DETAILED	D.K.	QUANTITIES		TRACED	R.A.A.
DESIGN CK.	M.K.L.	DETAIL CK.	M.K.L.	QUAN.CK.		TRACE CK.	R.A.A.

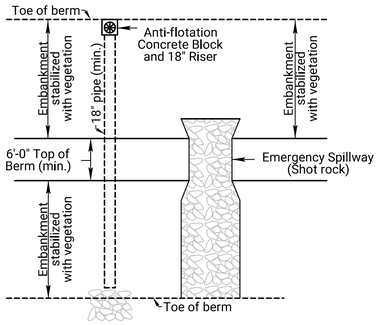
KDOT Graphics Certified 12-08-2025

Sh. No. 85

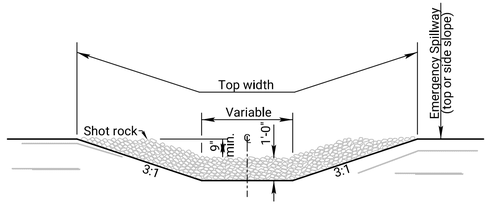
KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 12:24
File : 2209_ka680801eec852g-01.dgn

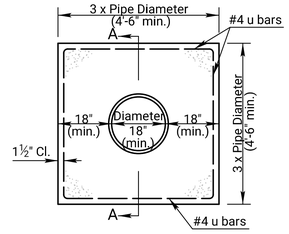
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	86	253



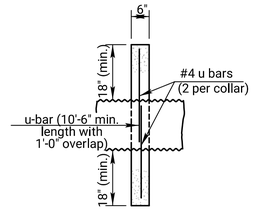
SEDIMENT STORAGE BASIN (PLAN)



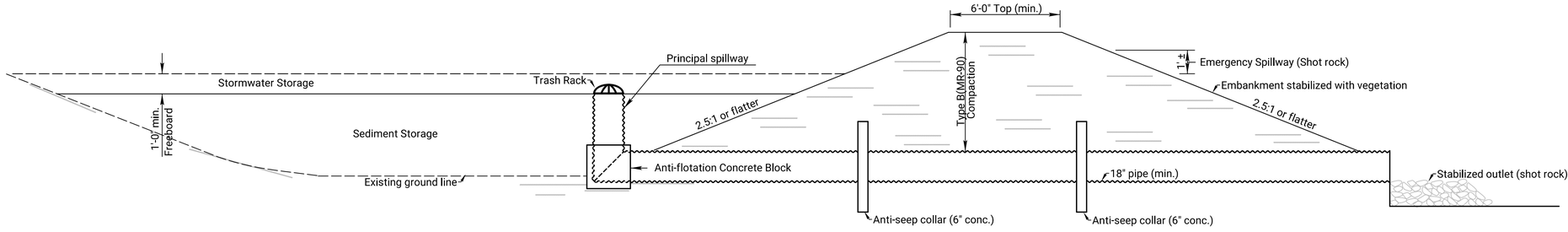
CROSS SECTION (EMERGENCY SPILLWAY)



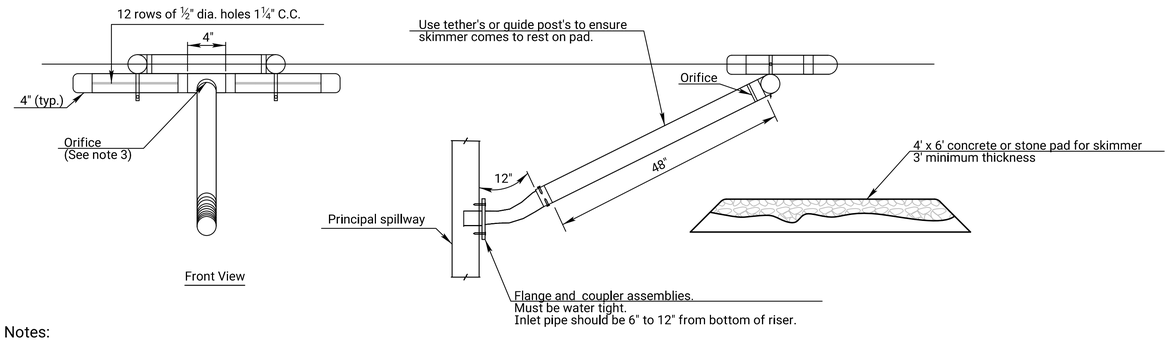
CONCRETE ANTI-SEEP COLLAR



SECTION A-A



SEDIMENT STORAGE BASIN (ELEVATION)



Notes:

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

SKIMMER DEWATERING DEVICE

NOTES:

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

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

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

SEDIMENT STORAGE BASIN LOCATIONS

STATION TO STATION	SIDE	REQUIRED STORAGE CAPACITY

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

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION AND POLLUTION CONTROL SEDIMENT STORAGE BASIN

LA852H

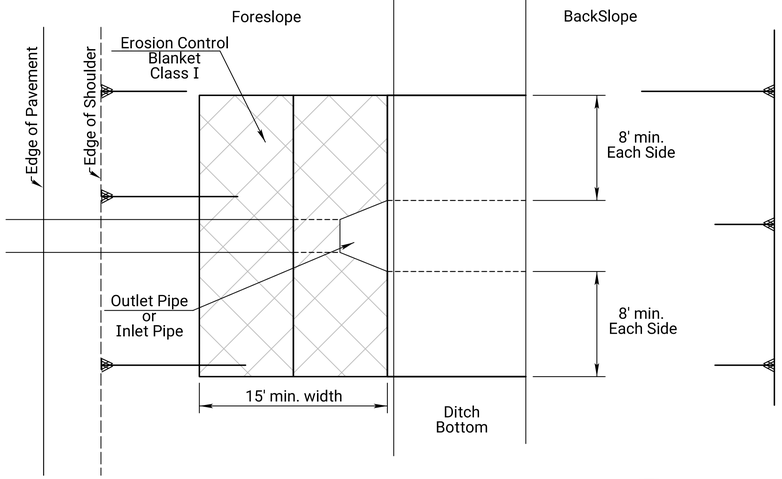
FHWA APPROVAL			09-24-13	APP'D.			
DESIGNED	B.B.	DETAILED	B.B.	QUANTITIES		TRACED	B.B.
DESIGN CK.	S.H.S.	DETAIL CK.	S.H.S.	QUAN.CK.		TRACE CK.	S.H.S.

KDOT Graphics Certified 06-20-2022 Sh. No. 86

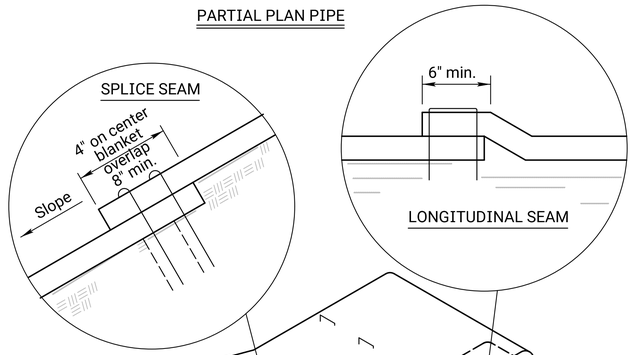
KDOT Graphics Certified

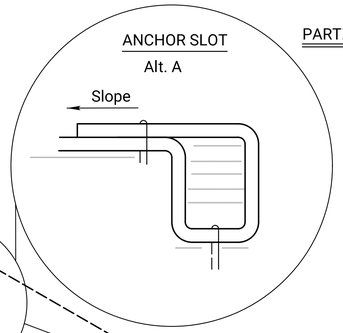
Plotted by : BGS01485 16-DEC-2025 12:24
File : 2210_ka680801eec852h-01.dgn

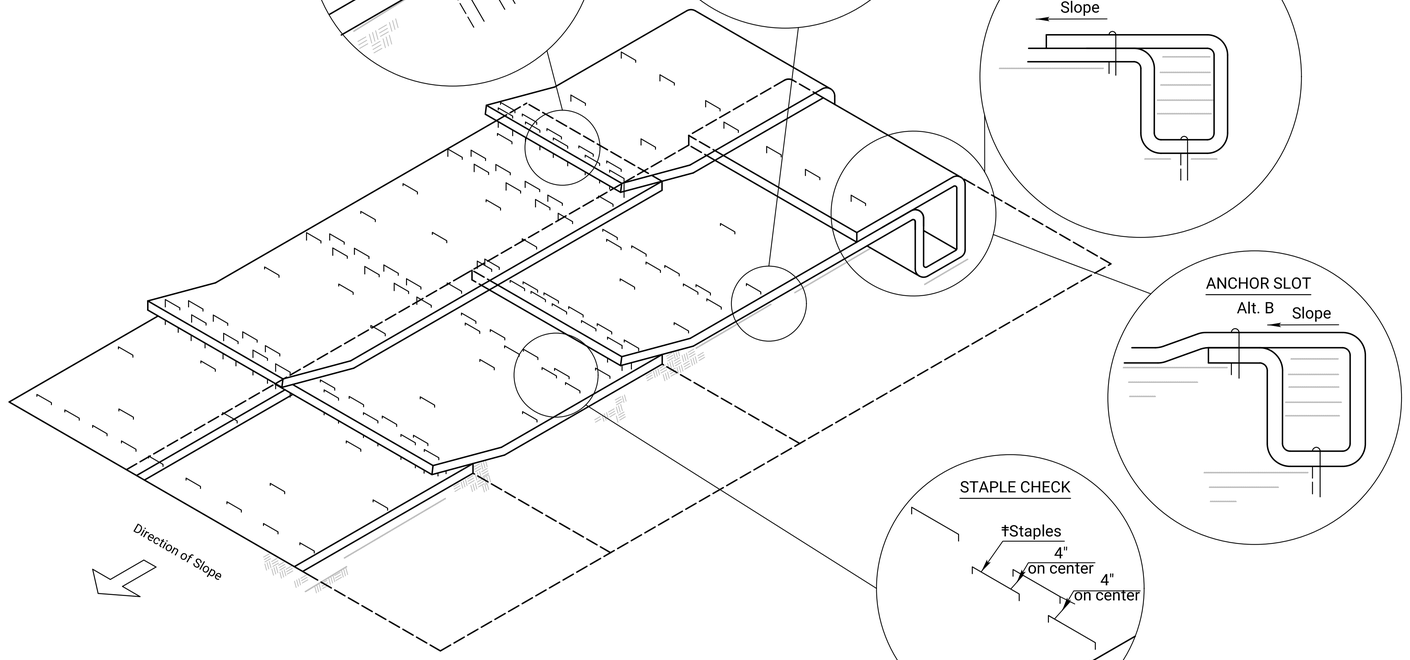
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	87	253



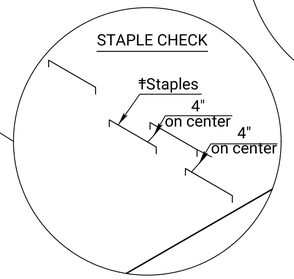
PARTIAL PLAN PIPE





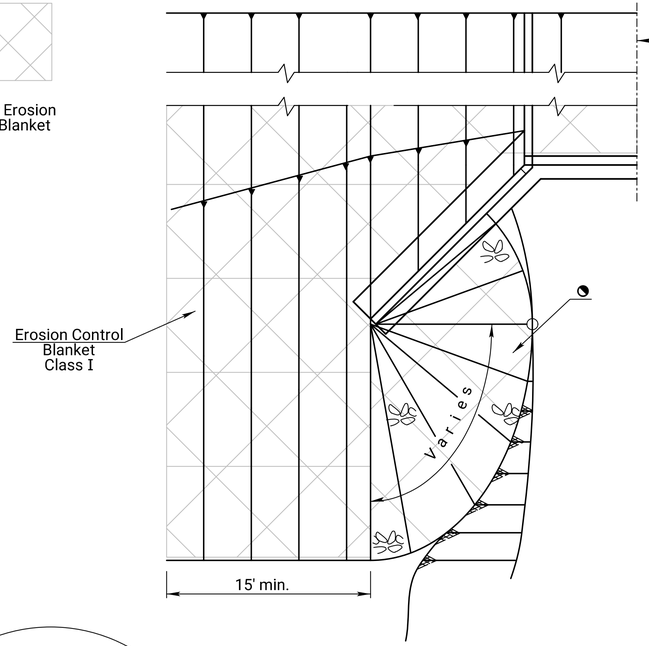


ISOMETRIC VIEW





Limits of Erosion Control Blanket



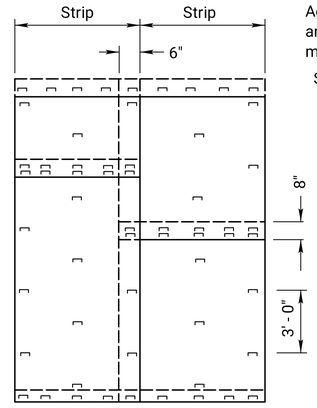
PARTIAL PLAN BOX CULVERT

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

INSTALLATION DETAILS FOR EROSION CONTROL CLASS 1

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

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



PLAN VIEW - ANCHORING DIAGRAM

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

Single post ring and shank staple is acceptable.

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

KANSAS DEPARTMENT OF TRANSPORTATION

INSTALLATION DETAIL EROSION CONTROL CLASS 1 SLOPE PROTECTION

LA855

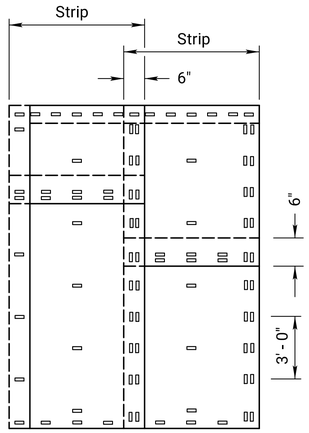
FHWA APPROVAL			03-10-15	APP'D.		Scott H. Shields	
DESIGNED	R.A.A.	DETAILED	R.A.A.	QUANTITIES		TRACED	R.A.A.
DESIGN CK.		DETAIL CK.		QUAN.CK.		TRACE CK.	R.A.A.

KDOT Graphics Certified 06-20-2022 Sh. No. 87

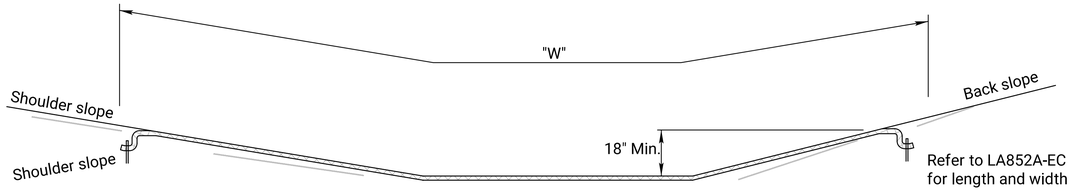
KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 12:24
File : 2211_ka680801eec855-01.dgn

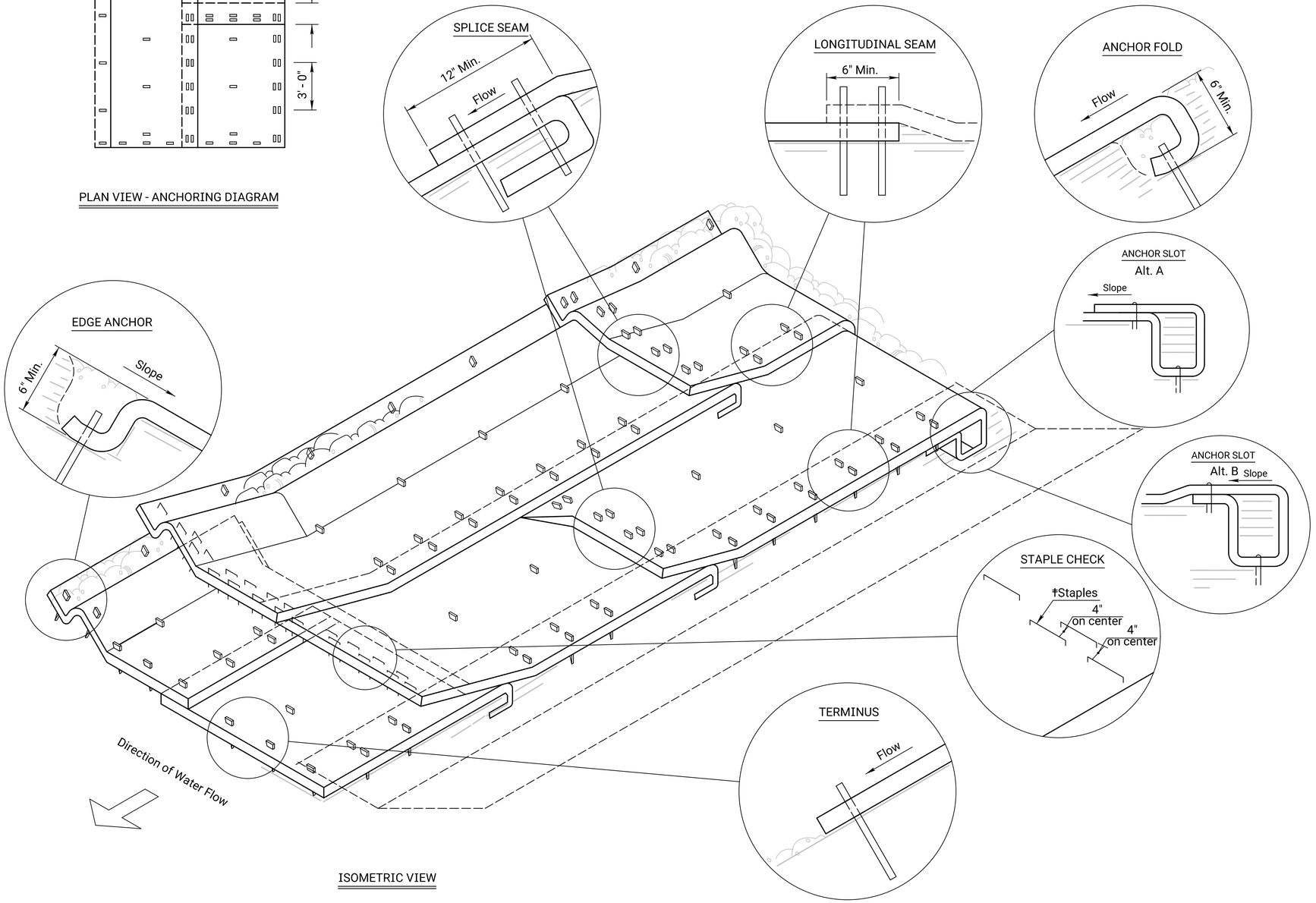
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	88	253



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

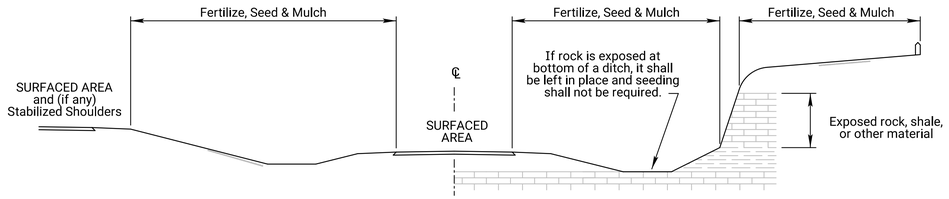
FHWA APPROVAL			11-02-15	APP'D.	Scott H. Shields		
DESIGNED	R.A.A.	DETAILED	R.A.A.	QUANTITIES		TRACED	R.A.A.
DESIGN CK.	S.H.S.	DETAIL CK.	S.H.S.	QUAN.CK.		TRACE CK.	

KDOT Graphics Certified 07-22-2024 Sh. No. 88

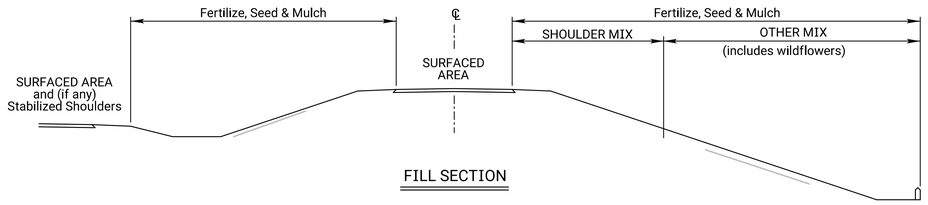
KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 12:25
File : 2212_ka6808001eec856-01.dgn

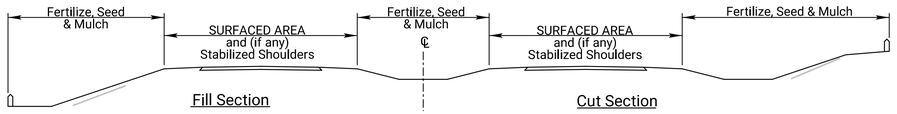
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	89	253



CUT SECTION



FILL SECTION



TYPICAL SECTION - DUAL PAVEMENT

GRASS & WILDFLOWER SEEDING SEASONS

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

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

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

SODDING SEASONS

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

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

GENERAL NOTES

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

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

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

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

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

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

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

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

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

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

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

NATIVE WILDFLOWER MIX 1

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

NATIVE WILDFLOWER MIX 2

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

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

OPTION: Broadcast Tall Drop Seed on the soil surface.

SUMMARY OF SEEDING QUANTITIES

P.L.S. RATE/ACRE				ACRES				BID ITEM	QUANTITY	UNIT
SHLDR	OTHER			SHLDR	OTHER					
								See LA852A Soil Erosion Mix to be used and paid for as Permanent Seeding		
								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

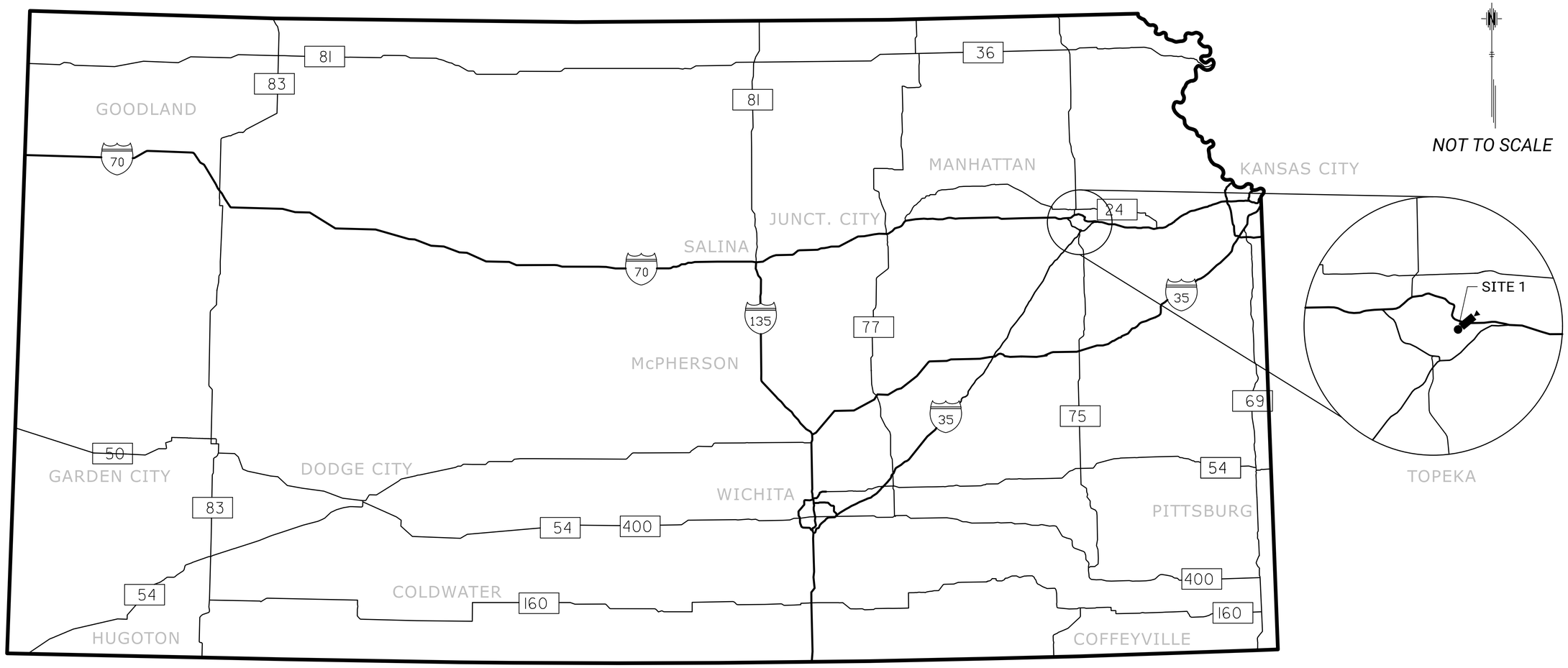
~~LA850~~

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

Sh. No. 89

Plotted by : BGS01485 16-DEC-2025 15:47
File : 2213_ka680801eec850-01.dgn

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	90	253



SITE NO.	KDOT DISTRICT	DEVICE	LOCATION	SHEET
SITE 1	1	WOOD POLE-MOUNTED CCTV	I-70 AT CALIFORNIA AVE	96

KANSAS DEPARTMENT OF TRANSPORTATION

ITS PLAN OVERVIEW

Plotted by : sspatil 16-DEC-2025 14:03
File : ka6808011ipl-02.dgn

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	91	253

NO.	TITLE
90	ITS PLAN OVERVIEW
91	INDEX OF SHEETS
92	ITS-D02: ITS GENERAL NOTES
93	ITS-D01: LEGENDS & ABBREBREVIATIONS
94	SUMMARY OF QUANTITIES
95	ITS-D03A: CABLE, CONDUIT, AND DEVICE LEGEND FOR KDOT INSTALLATIONS
96	I-70 ITS PLAN: STA. 425+00 TO STA. 441+00
97	ITS-D04: TYPICAL 334 AND 336S CABINET LAYOUT
98	ITS-D06A: ITS CABINET FOUNDATION DETAILS
99	ITS-D07: ITS PULL BOX DETAILS
100	ITS-D10: CONDUIT STRUCTURAL ATTACHMENT AND TRENCH DETAILS
101	ITS-D11: FIELD POWER SUPPLY ASSEMBLY DETAILS
102	ITS-D11A: TRANSFORMER ATTACHMENT DETAIL
103	ITS-D11B: GROUND MOUNTED TRANSFORMER CABINET AND FOUNDATION DETAIL
104	ITS-D11C: TRANSFORMER 3KVA & 10KVA DRY TYPE DETAILS AND WIRING DIAGRAMS
105	ITS-D11D: TYPICAL ENCLOSURE DETAILS
106	ITS-D12: ELECTRICAL SERVICE LOCATION SUMMARY
107	WOOD POLE MOUNTED CCTV CAMERA ASSEMBLY DETAILS
108	ITS-D13B: CELLULAR MODEM ANTENNA MOUNTING DETAIL
109	ITS-D14: CCTV ORIENTATION DETAIL
110	ITS-S01: ITS EQUIPMENT SPECIFICATIONS
111	ITS-S02: ITS EQUIPMENT SPECIFICATIONS
112	ITS-S03: ITS EQUIPMENT SPECIFICATIONS
113	ITS-S04: ITS EQUIPMENT SPECIFICATIONS
114	ITS-S05: ITS EQUIPMENT SPECIFICATIONS
115	ITS-S06: ITS EQUIPMENT SPECIFICATIONS
116	ITS-S07: ITS EQUIPMENT SPECIFICATIONS
117	ITS-S08: ITS EQUIPMENT SPECIFICATIONS
118	ITS-S09: ITS EQUIPMENT SPECIFICATIONS
119	ITS-S010: ITS EQUIPMENT SPECIFICATIONS
120	ITS-S011: ITS EQUIPMENT SPECIFICATIONS
121	ITS-S012: ITS EQUIPMENT SPECIFICATIONS
122	ITS-S013: ITS EQUIPMENT SPECIFICATIONS
123	ITS-S015: ITS EQUIPMENT SPECIFICATIONS
124	ITS-S016: ITS EQUIPMENT SPECIFICATIONS
125	ITS-S017: ITS EQUIPMENT SPECIFICATIONS

Plotted by : sspatil 16-DEC-2025 14:03
File : ka680801ipl-00.dgn

KANSAS DEPARTMENT OF TRANSPORTATION

INDEX OF SHEETS

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	92	253

GENERAL NOTES

1. All work will be confined within the existing roadway right-of-way. It is the responsibility of the Contractor to verify and keep installation of all equipment and devices within the existing roadway right-of-way.

2. Contractor shall maintain 2 ft conduit clearance from all landscaped features and irrigation systems existing within the right-of-way. Any landscaping or irrigation systems disturbed during construction activities shall be restored to original condition. No additional payment will be made.

3. Contractor shall be responsible for restoring all disturbed work areas. Restoration includes seeding, fertilizing, mulching, and the removal of all unused material and debris from the work area according to the KDOT standard specifications and as required by the Engineer. All grading work shall slope away from foundations to prevent ponding. Adequate temporary protection against erosion shall be provided according to the KDOT utility accommodation policy. This item of work is incidental to the site bid item.

4. Seeding mix shall be tall fescue (endophyte free) pure live seed (PLS), 220 lbs/acre. Seeding shall be completed in accordance with KDOT standard specifications for cool grass mix design. Seeding shall be considered incidental to the construction per lump sum site. It is anticipated that the total disturbed area will be up to 1 acre but is based on the construction methods of the Contractor and may change at no additional cost to KDOT.

5. Contractor shall determine any conflicts with existing utilities, including KDOT lighting and fiber, in the field prior to initiation of construction per site. The Contractor shall contact the Engineer upon determination of any utility conflicts. The Contractor shall adhere to KDOT's utility accommodation policy unless otherwise noted.

6. Prior to beginning any construction activities, the Contractor shall call dig safe at 811 or 1-800-344-7233 (1-800-DIG-SAFE) to request the utilities be marked in that area. The Contractor shall call the KDOT Field Engineer to request that KDOT lighting and ITS (fiber, other) be marked in that area. The Contractor shall also contact any and all utilities and local government agencies not participating in location services. When in Johnson County, also call Water One locate request services at (913) 895-1806.

7. Survey and stake all ITS device locations including, but not limited to: poles, foundations, cabinets, power services, pull boxes, and splice vaults.

8. Placement of all DMS and CCTV foundations, cabinets, transformers, and pull boxes must be approved by the Engineer prior to construction and before surveyors leave each site. Orientation of all cabinets shall be approved by the Engineer prior to placement. Proposed ITS equipment locations are approximate and may be modified to avoid conflicts with underground utilities or other obstructions. DMS, CCTV camera, detector, and wireless equipment locations are location sensitive. The Contractor and Engineer shall receive approval from the KDOT ITS Engineer prior to revising the plan location or orientation of any ITS equipment. Any restaking necessitated by adjustment is considered incidental to the project and no additional payment will be made.

9. Contractor shall check cellular connection at the specific cabinet location(s) to ensure connectivity to the cellular network. Contractor shall submit signal strength measurements to Engineer prior to installation. The location shall be approved by the Engineer prior to placing the cabinet.

10. Conduit shall be installed in straight lines either parallel or perpendicular to the right-of-way to the extent possible. The Contractor shall determine final routing based on actual field conditions prior to construction at each site, including utility locator service markings, to prevent conflicts with existing utilities. Contractor to route trunkline conduit adjacent to right-of-way line and branch line perpendicular to right-of-way line.

11. The Contractor shall field review conduit on structure for necessary routing, mounting hardware (including bridge hangers, fittings, expansion joints and junction boxes) for all externally mounted conduits prior to submittal of bid to determine the types and extent of incidental items to be included in the unit price of conduit.

12. Bridge attachments require a separate permit from KDOT that shall be obtained by the Contractor per KDOT's utility accommodation policy.

13. All traffic control plans and lane closures shall be pre-approved by the Engineer.

14. KDOT will furnish hardware as described in the plans and specifications. Contractor shall carefully review plans and specifications for details on KDOT furnished items.

15. Contractor shall coordinate with the Engineer a location to store KDOT/KTA furnished DMS signs, cabinets, and incidental items. Contractor shall provide the means to unload and load KDOT/KTA furnished DMS signs, cabinets, and incidental items at the arranged storage location. This item of work is incidental to the site bid item.

16. All ITS equipment called out by plans and specifications as "install" or KDOT furnished, including DMS, CCTV assemblies, detectors, and communications equipment, shall include all loading and transportation from a designated KDOT facility, installation, and testing in accordance with the specifications. Contractor shall coordinate with the Engineer and manufacturer for a storage location at a designated KDOT facility.

17. Installation, testing, and integration of all ITS devices, including KDOT furnished items, shall be in accordance with the specifications.

18. With the Engineer's approval, the off-loading of KDOT provided equipment and surveying operations may begin after the contract is signed, but prior to issuing the Notice to Proceed (NTP). The Contractor will not be charged working days during this period.

19. ITS equipment pole locations as shown have appropriate clear zone protection. Where applicable, and when ITS poles are to be placed near existing guardrail, ITS equipment poles shall be located such that there is a minimum of 7 ft of clearance from back of guard rail to face of equipment pole. Variation from plan location must be approved by the Engineer.

20. Transformer locations as shown have appropriate clear zone protection. Variation from plan location must be approved by the Engineer. Locate transformers and power supply poles at the right-of-way line/fence when possible.

21. Contractor shall notify CenturyLink/Lumen and/or KTA when applicable two weeks and again at 72 hours prior to performing any work within 5 ft of a CenturyLink/Lumen or KTA backbone fiber. A CenturyLink/Lumen, KTA when applicable, and KDOT inspector must be present for work within 5 ft of fiber optic facilities.

22. At no time shall the Contractor access a CenturyLink/Lumen and/or KTA pullbox or splice vault for any reason without a CenturyLink/Lumen and/or KTA inspector present.

23. All work within 10 ft of CenturyLink/Lumen and/or KTA fiber backbone shall be carried out with hand tools only. No mechanized equipment shall be allowed in the access of the KDOT conduit from the CenturyLink/Lumen and / or KTA conduit array. Hydro excavation is allowed.

24. Contractor to maintain at least 20 ft of clearance from all existing gas facilities and 5 ft of clearance from CenturyLink/Lumen and / or KTA fiber. Exception allowed when performing work with CenturyLink/Lumen while KDOT and CenturyLink/Lumen inspector present.

25. When within 5 ft of KDOT lighting facilities, conduit shall be hand dug.

26. High voltage power lines may be within the project limits. All work is to be performed in conformance with all state, local, federal, utility, and contract requirements. KDOT has no control over the means, methods, choice of equipment, sequencing of work, and safety practices used when working in, on, or around high voltage lines or other utility structures as these items are the responsibility of the parties controlling the physical performance of the work.

27. All grounding systems shall be in accordance with the National Electric Code (NEC) and manufacturer specifications. Follow applicable NEC requirements for installation of all project materials. The Contractor shall properly ground all equipment, cabinet, and ground rods per applicable standards or as directed by the Engineer.

28. Contractor shall be responsible for ordering and paying for any electrical service in KDOT's name when in KDOT area or KC Scout's name when in KC Scout area at the locations shown on the plans. Contractor shall make payment of all power company fees until KDOT or KC Scout assumes ownership. KDOT will take possession of electrical bills 60 days after KDOT inspector has signed off on site completion. Utility company, contact name, and phone number for each site are listed on the electrical service location summary sheet.

29. Contractor shall not begin work at any site until power company has confirmed power drop locations for all proposed equipment.

30. Warning tape is required in all trenches containing conduit. Multiple conduits in parallel shall share the same trench.

31. Contractor to inspect and repair existing conduit. See conduit specifications for additional details. Repairs will be paid for under ITS unit cost item "conduit repair".

32. It shall be the Contractor's responsibility to repair any existing conduit and replace any existing conductors or other facilities damaged during construction. All existing improvements removed or damaged by the Contractor shall be replaced in kind by the Contractor, with no additional payment.

33. Prior to installing DMS support structures, the Contractor shall verify final elevations of DMS foundations, pole lengths, and site conditions to ensure that they will provide for the correct height of the overall DMS structure when installed. Any modifications to the design require the approval of the ITS Engineer prior to installation.

34. DMS shall not be attached to the support posts until the supporting systems of conduit, pull boxes, controller assemblies, power supply assemblies, and all other items necessary are in place to provide a fully functioning DMS system.

35. CCTV poles should be oriented so that pole handhole used for camera lowering operations is: not on the downhill side of a slope, not directly beneath the camera, and would not expose workers to traffic. Pole mounted cabinets shall be installed so that they are not directly beneath the camera. The Engineer shall approve placement of camera poles.

36. CCTV cameras and DMS shall be oriented according to the CCTV orientation detail and the DMS orientation detail.

37. The Contractor shall install detectors and antennas so as to not interfere with the CCTV lowering device.

38. The Contractor shall provide KDOT an Excel spreadsheet of GPS readings in latitude and longitude for all installed devices (DMS, CCTV, DET), pull boxes, splice vaults, cabinets, power meters, transformers, and wireless towers. The accuracy of the GPS readings shall be within 3 ft. Obtain GPS (latitude and longitude in decimal degrees) and three tie-point measurements for each buried electrical pull box prior to placing backfill material. Contractor shall complete the KDOT-provided GPS Location Excel Spreadsheet for all installed devices.

39. Controlled demolition: the removal of existing static sign structures, cantilever, and butterfly structures is a controlled demolition. Contractor shall submit demolition plans to the Field Engineer per KDOT specifications and per KDOT controlled demolition special provisions. Controlled demolition, demolition plans, and contingency plans are incidental to the site bid and no additional payment will be made.

40. All materials shall meet the Buy America Act requirements outlined in Section 106 of KDOT's Standard Specifications.

41. The Contractor shall provide a minimum of 7 working days notice for commissioning, requested site visits, etc. A minimum of 3 working days notice is needed for access to KDOT facilities (e.g. POP buildings, TMC, etc.)

42. After final project completion and prior to project acceptance Contractor shall coordinate with KDOT ITS to perform an initial one-call locate to ensure new and existing tracer wire and test station is working properly.

43. Incorporate only tested or approved material into the project. Any work utilizing unaccepted materials will be performed at the Contractor's risk. Such material will be removed from the project or the material accepted at a reduced price at the discretion of KDOT.

44. For 7-way microduct installation, refer to boring method and locator ball requirements on sheet ITS-SMD.

NO.	DATE	REVISIONS	BY	APP'D
00	01-09-25	2024 KDOT Standards Updates	AJS	JAN

KANSAS DEPARTMENT OF TRANSPORTATION

ITS GENERAL NOTES

ITS-D02 06-04-25

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

Sh. No. 92

Plotted by : sspatil 16-DEC-2025 14:04
File : ka680801iss-D02.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	93	253

LEGEND

EXISTING DEVICES ARE SHOWN IN PLANS USING HALFTONE/GRAYSCALE

- Dynamic Message Sign, Ground Mounted (Butterfly)
- Dynamic Message Sign, Ground Mounted (Dual Post)
- Dynamic Message Sign, Ground Mounted (Butterfly, Dual Face)
- Dynamic Message Sign, Truss Mounted
- Dynamic Message Sign, Trailer Mounted
- CCTV Camera
- Radar Vehicle Detector
- Radar Vehicle Detection Area
- ITS Cabinet with Foundation
- Pole Mounted ITS Cabinet
- Fiber Optic Cable Splice Vault without Splice
- Fiber Optic Cable Splice Vault with Splice
- XX Fiber Optic Cable Splice Vault without Splice, by Others (CL, KTA, Etc)
- XX Fiber Optic Cable Splice Vault with Splice, by Others (CL, KTA, Etc)
- Pull Box
- Wireless Communication Tower/Pole
- XXX-XXX New ITS Field Component
- Ramp Meter
- Flashing Beacon
- 6'x6' Loop Detector
- 6'x10' Loop Detector
- 6'x30' Loop Detector

- L.P. Light Pole
- Mile Marker
- Power Pole
- Power Supply Assembly
- T Power Transformer
- OP Power Overhead Source
- UP Power Underground Source
- (R) Removal
- Sign, Existing
- Guy Wire
- Telephone Pole
- Trees, Existing
- Truss Sign
- City Limits
- Conduit, Existing
- Conduit, Bored, Proposed
- Conduit, On Structure, Proposed
- Conduit, Trenched, Proposed
- Construction Limits

- Fiber Optic Cable — Fiber Optic Cable, Existing
- Gas Line — Gas, Existing
- Telephone Cable — Telephone, Existing
- Guard Rail, Existing
- Guard Rail, Proposed
- Hedge, Existing
- Marsh
- Power, Existing
- Property Line
- Railroad, Existing
- Exist R/W — R/W, Existing
- R/W, Existing Access Control
- R/W, Access Control
- Township, Section or Grant Line
- State/County Line
- Culverts, Existing
- Drop Inlet & Storm Sewer, Existing
- Perm Esmt. — Easement, Permanent
- Temp Esmt. — Easement, Temporary
- Fence, Existing

ABBREVIATIONS

AG	Above Ground
Approx.	Approximate
Ave.	Avenue
Blvd.	Boulevard
BOC	Back of Curb
BPU	Board of Public Utilities
BWM	Bandwidth Manager
C	Conductor
CA	ITS Cabinet Assembly
CAT 6	Category 6 Twisted Pair Ethernet Cable
CCR	Camera Control Receiver
CCTV	Closed Circuit Television Camera
CL	CenturyLink/Lumen
Coax.	Coaxial
Comm.	Communications
Conc.	Concrete
Ctr.	Center
DET	Detector
DIO	Digital Input/Output
Dist.	Distribution
DMS	Dynamic Message Sign
Dr.	Drive
Ea.	Each
EB	Eastbound
EOP	Edge of Pavement
EOS	Edge of Shoulder
EOTW	Edge of Travel Way
Exist.	Existing
FDU	Fiber Distribution Unit
F&I	Furnish And Install
Flex.	Flexible
FO	Fiber Optic
FT	Feet
FTC	Field Traffic Controller
HAR	Highway Advisory Radio
HDPE	High Density Polyethylene
HH	Handhole (Splice Vault)
Hwy.	Highway
IN	Inch
I/O	Input/Output
ITS	Intelligent Transportation System
KDOT	Kansas Department of Transportation
KTA	Kansas Turnpike Authority
Ln.	Lane
LS	Lump Sum
LT	Left
Min.	Minimum
MMFO	Multimode Fiber Optic
MM	Mile Marker
MP	Milepost
MPH	Miles per Hour
NB	Northbound
No.	Number
Nom.	Nominal
PB	Pull Box
Pkwy.	Parkway
POP	Point of Presence
PP	Power Pole
PS	Power Supply/Assembly
PVC	Polyvinyl Chloride
Rd.	Road
Req'd.	Required
RMC	Rigid Metal Conduit
RT	Right
Rte.	Route
R/W	Right-of-Way
SB	Southbound
SIG	Traffic Signal
SMFO	Single-mode Fiber Optic
St.	Street
Sta.	Station
SV	Splice Vault
SW	Sidewalk
TB	Transition Box
TMC	Traffic Management Center
Trfwy.	Trafficway
Typ.	Typical
Truck	Truckline
UIP	Use In Place
UP	Underground Power
SOP	Source Of Power
VDS	Vehicle Detection Station
WB	Westbound
XFMR	Transformer

NO.	DATE	REVISIONS	BY	APP'D
00	01-09-25	2024 KDOT Standards Updates	AJS	JAN

KANSAS DEPARTMENT OF TRANSPORTATION

LEGEND AND ABBREVIATIONS

ITS-D01 06-04-25

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

Plotted by : sspatil 16-DEC-2025 14:04
File : ka6808001iss-D01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	94	253

QUANTITY ESTIMATE - CONTRACTOR PROVIDED & INSTALLED

ID NUMBER	ITEM DESCRIPTION	UNITS	ITS SITE		TOTAL QUANTITY
			SITE 1 I-70 AT CALIFORNIA AVE		
1	2" HDPE Conduit - Trenched (Red, Power)	L.F.	68		68
2	2" HDPE Conduit - Bored (Red, Power)	L.F.	113		113
3	2" RMC	L.F.	40		40
4	3-1/C #6 AWG Power Conductor	L.F.	421		421
5	Pull Box (Electrical)	Each	2		2
6	Tracer Test Station - In Cabinet	Each	2		2
7	Tracer Test Station - In Ground	Each	2		2
8	Power Supply Assembly Type 1	Each	1		1
9	Power Transformer	Each	1		1
10	Surge Protection Device - Power Supply Assembly	Each	1		1
11	Cellular Modem (5G Capable)	Each	1		1
12	Cellular Antenna with Mounting Hardware	Each	1		1
13	CCTV Wooden Pole & Foundation, 50'	Each	1		1
14	IP CCTV Assembly with Power Supply (Pole Mounted, PTZ)	Each	1		1
15	Surge Protection Device - Power over Ethernet (POE)	Each	1		1
16	Pole Mounted 336S Cabinet	Each	1		1
17	Category 6 Ethernet Cable (for Communication)	L.F.	75		75
18	Category 6 UTP Patch Cables 1.8 meter	Each	2		2

Note:
Intelligent Transportation System (ITS) site quantities on this sheet are shown for information only.

RECAPITULATION OF QUANTITIES

1	Intelligent Transportation System Site 1	LSUM	1

*Mobilization, Site Staking, Traffic Control Shall be subsidiary to other bid items in the contract.

KANSAS DEPARTMENT OF TRANSPORTATION

SUMMARY OF QUANTITIES

Plotted by : sspatil 16-DEC-2025 14:04
File : ka680801ipl-01A.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	95	253

From Device No. — To Device No. — Device Center to Center Distance — Size, Color, and Number of Conduits in Trench — Size, Color and Number of Conduits in Bore — Size and Number of Conduits on Structure — Power Cable Size — Fiber Optic Cable Fiber Count — Total Length of Category 6 Cable — CCTV/DMS/VDS Device-Specific Cables

CONDUIT AND CABLE ROUTING TABLE

CONDUIT (FT)																	CABLE (FT)															
			TRENCHED									BORED					ON STRUCTURE	POWER					COMM.		DETECTOR		DEVICE			
			1T		2T		3T		XT		ST	2B		3B		SB	2S	1	2	3	4	5	FIBER OPTIC		#		1	2	3	4
			1 IN		2 IN		3 IN		X IN		SPARE 2 IN	2 IN		3 IN		SPARE 2 IN	2 IN RMC						12	XX						
FROM	TO	CTR TO CTR DISTANCE (FT)	RED	GREEN	RED	GREEN	RED	GREEN	RED	GREEN	BLACK	RED	GREEN	RED	GREEN	BLACK		3-#X/0	3-#6	3-#X	2-#X	2-#X	12 SMFO	XX SMFO	CAT 6 CABLE		CCTV	DMS	VDS**	
TOTAL																																

* CONDUIT AND / OR CABLE RUN CARRIES OVER TO ADJACENT SHEETS

** MAX. HEIGHT OF DETECTOR ON POLE ASSUMED AT 25 FT FOR CABLE QUANTITIES

NOTES:

1. Table may be modified to fit project needs. Tables shall be consistent across sites within the same project.
2. All lengths in tables are measured in feet.
3. Trenched conduit shall be HDPE, and conduit on structures shall be rigid metal (RMC), unless otherwise noted.
4. Center to center horizontal distances are rounded up to the nearest whole foot. Grade elevation changes are not accommodated in cable quantities and are incidental.
5. Total lengths of conduit and cable include additional quantities as given on this sheet, and are rounded up to the nearest whole foot.
6. After pulling fiber optic cable through the boxes, the Contractor shall cut off and discard the first 10 ft of the cable. This 10 ft is considered incidental to the project and no additional payment will be made.
7. All conduit sizes are industry standard English size conduit designated by their rounded nominal inch (in) diameter equivalent.
8. Ground wire is required to be installed for conduits wih electrical cables. The number of conductors listed in the table does not include the required ground wire. Ground wire is considered incidental to the project and no additional payment will be made.
9. For all power and communications conduit, install solid tracer wire unless stranded is required for better flexibility. See ITS specifications for details.

ADDITIONAL CONDUIT QUANTITIES INCLUDED IN TABLE

5 FT AT EACH POWER SUPPLY ASSEMBLY (LOAD AND SERVICE SIDE)
5 FT AT EACH ITS CABINET ASSEMBLY
5 FT AT EACH CCTV
5 FT AT EACH DMS
5 FT AT EACH POWER POLE OR POWER PEDESTAL FOR POWER CO. SERVICE

* ADDITIONAL QUANTITIES ADDED TO THE TABLE ARE FOR THE DESIGN ENGINEER'S ESTIMATE ONLY. CONTRACTOR TO FOLLOW SLACK REQUIREMENTS IN SPECIFICATIONS.

CONDUIT SYMBOL LEGEND

- 1T — 1 IN (HDPE)
- 2T — 2 IN (HDPE)
- 3T — 3 IN (HDPE)
- * XT — X IN (HDPE)
- ST — 2 IN SPARE (HDPE)

TRENCHED

- 2B — 2 IN (HDPE)
- 3B — 3 IN (HDPE)
- SB — 2 IN SPARE (HDPE)
- * XB — X IN (HDPE)

BORED

- 2S — 2 IN RMC

ON STRUCTURE

* FOR 7-WAY MULTIDUCT, UTILIZE XT AND XB

ADDITIONAL CABLE QUANTITIES INCLUDED IN TABLE

POWER CABLES

50 FT AT EACH POWER SUPPLY ASSEMBLY
36 FT COIL AT TYPE 1 SERVICE POLE
7 FT COIL AT TYPE 2 LOAD SIDE
7 FT COIL AT TYPE 2 SERVICE SIDE
36 FT COIL AT SERVICE POLE (TYPE 2)
8 FT COIL AT SERVICE PEDESTAL (TYPE 2)
10 FT COIL AT EACH TRANSFORMER
10 FT COIL AT EACH ITS CABINET ASSEMBLY
5 FT COIL AT EACH PULL BOX
25 FT COIL AT EACH ROADSIDE DMS
50 FT COIL AT EACH OVERHEAD DMS

QUANTITIES SHOWN INCLUDE SLACK AND VERTICAL DISTANCE.
CONTRACTOR SHALL LEAVE A MINIMUM OF 2 FT OF SLACK IN THE CABINET AND SHALL PULL ALL EXCESS SLACK BACK TO NEAREST PULL BOX.

FIBER OPTIC TRUNKLINE CABLES (XX SMFO)

50 FT FROM EACH DIRECTION AT EACH SPLICE VAULT WHEN SPLICING
100 FT AT EACH SPLICE VAULT FOR FUTURE USE
25 FT AT EACH PULL BOX (WHEN NOT SPLICING)

FIBER OPTIC BRANCH CABLES (XX SMFO)

50 FT AT EACH ITS CABINET LOCATION
100 FT FROM EACH DIRECTION AT EACH KDOT SPLICE VAULT WHEN SPLICING
25 FT AT EACH PULL BOX OR SPLICE VAULT FOR FUTURE USE

CATEGORY 6 CABLE

10 FT COIL AT EACH ITS CABINET
5 FT COIL EACH AT PULL BOX WHERE SPLICED TO LOOP WIRE
10 FT COIL AT EACH MID-RUN PULL BOX
THESE QUANTITIES MAY BE ADJUSTED AT THE STATE ITS ENGINEER'S DISCRETION TO ENSURE RUNS DO NOT EXCEED 328 FEET IN LENGTH.

CCTV/DMS/VDS CABLES

10 FT COIL AT EACH ITS CABINET
5 FT COIL AT EACH DEVICE
10 FT COIL AT EACH PULL BOX
POLE HEIGHT (VARIES) AT EACH POLE

* ADDITIONAL QUANTITIES ADDED TO THE TABLE ARE FOR THE DESIGN ENGINEER'S ESTIMATE ONLY. CONTRACTOR TO FOLLOW SLACK REQUIREMENTS IN SPECIFICATIONS.

DEVICE ID CODE LEGEND

K075NBC-151.41 — K 075 NB C XXX.XX - X

- Sequential Number or Letter*
- Mile Post or Reference Marker
- Device:
  - AG - Automated Gate
  - BT - Bluetooth
  - C - Camera (CCTV)
  - CA - ITS Cabinet
  - CT - Trailer Camera
  - PB - Pull Box
  - PP - Power Pole
  - PS - Power Supply / Assembly
  - RS - RWIS Sensor
  - S - Sign (DMS)
  - ST - Trailer DMS
  - SV - Splice Vault**
  - T - Transformer
  - V - Vehicle Detection Station
- Direction: NB - Northbound, SB - Southbound; EB - Eastbound, WB - Westbound
- Route: US 75
- Agency:
  - K - Kansas DOT
  - KTA - Kansas Turnpike Authority
  - L - CenturyLink/Lumen
  - IDEA - Ideatek
  - Z - Zayo

* ONLY USE SEQUENTIAL NUMBERS OR LETTERS IF THERE ARE MULTIPLE DEVICES AT THE SAME MILE POST. USE SEQUENTIAL NUMBERS FOR SPLICE VAULTS AND PULL BOXES. USE SEQUENTIAL LETTERS FOR CAMERAS AND DETECTORS.

CL/L-AP1001

** WHEN SPLICE VAULT IS LOCATED ADJACENT TO A THIRD PARTY PROVIDER'S SPLICE POINT, LABEL THE PROVIDER'S SPLICE POINT USING THEIR ID CODE.

NO.	DATE	REVISIONS	BY	APP'D
00	01-09-25	2024 KDOT Standards Updates	AJS	JAN

KANSAS DEPARTMENT OF TRANSPORTATION

CABLE, CONDUIT, AND DEVICE LEGEND FOR KDOT INSTALLATIONS

ITS-D03A — 06-04-25

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

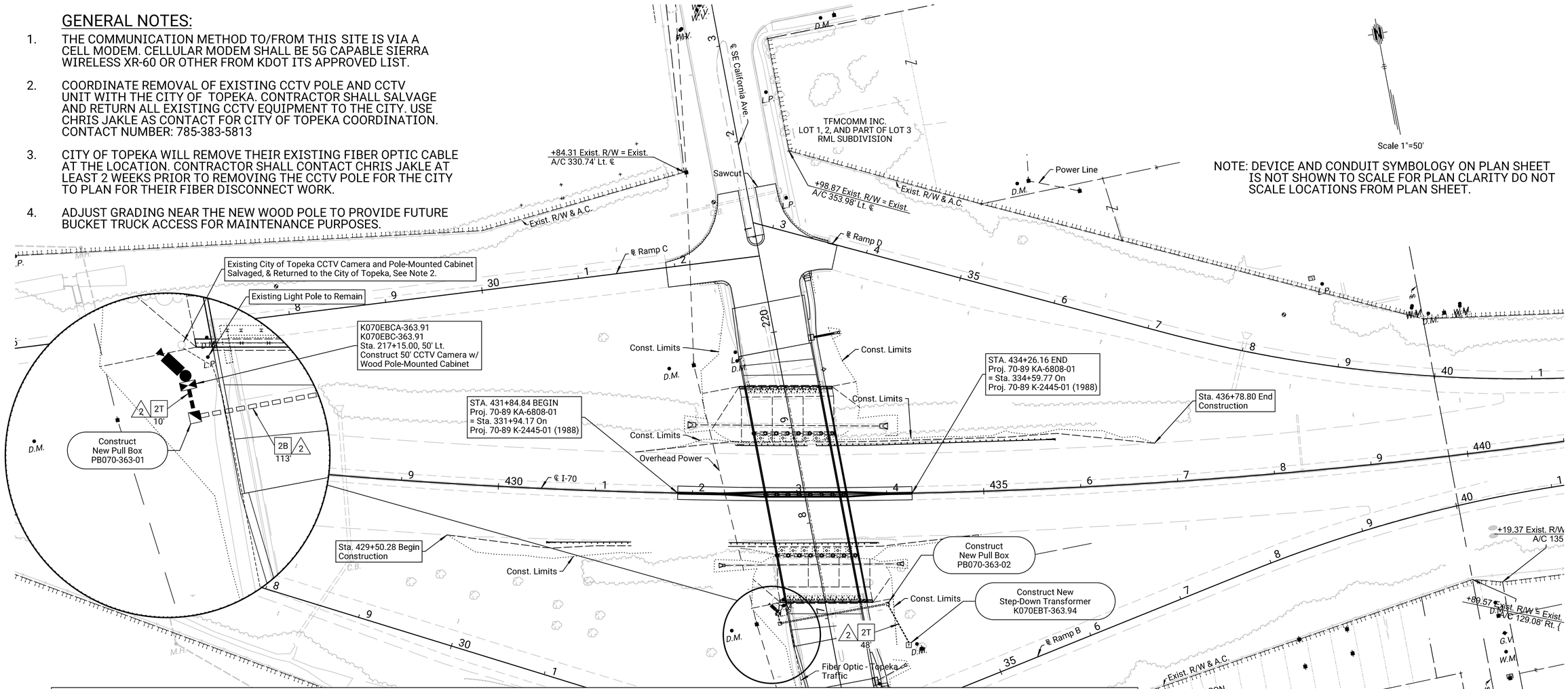
Sh. No. 95

Plotted by : sspatil 16-DEC-2025 14:04
File : ka680801iss-D03A.dgn

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	96	253

GENERAL NOTES:

1. THE COMMUNICATION METHOD TO/FROM THIS SITE IS VIA A CELL MODEM. CELLULAR MODEM SHALL BE 5G CAPABLE SIERRA WIRELESS XR-60 OR OTHER FROM KDOT ITS APPROVED LIST.
2. COORDINATE REMOVAL OF EXISTING CCTV POLE AND CCTV UNIT WITH THE CITY OF TOPEKA. CONTRACTOR SHALL SALVAGE AND RETURN ALL EXISTING CCTV EQUIPMENT TO THE CITY. USE CHRIS JAKLE AS CONTACT FOR CITY OF TOPEKA COORDINATION. CONTACT NUMBER: 785-383-5813
3. CITY OF TOPEKA WILL REMOVE THEIR EXISTING FIBER OPTIC CABLE AT THE LOCATION. CONTRACTOR SHALL CONTACT CHRIS JAKLE AT LEAST 2 WEEKS PRIOR TO REMOVING THE CCTV POLE FOR THE CITY TO PLAN FOR THEIR FIBER DISCONNECT WORK.
4. ADJUST GRADING NEAR THE NEW WOOD POLE TO PROVIDE FUTURE BUCKET TRUCK ACCESS FOR MAINTENANCE PURPOSES.



Scale 1"=50'

NOTE: DEVICE AND CONDUIT SYMBOLOGY ON PLAN SHEET IS NOT SHOWN TO SCALE FOR PLAN CLARITY DO NOT SCALE LOCATIONS FROM PLAN SHEET.

CONDUIT AND CABLE ROUTING TABLE

FROM	TO	CTR TO CTR DISTANCE	CONDUIT (FT) TRENCHED 1T 1 IN RED	1T 1 IN GREEN	2T 2 IN RED	2T 2 IN GREEN	3T 3 IN RED	3T 3 IN GREEN	XT X IN RED	XT X IN GREEN	ST SPARE 2 IN BLACK	BORED 2B 2 IN RED	2B 2 IN GREEN	3B 3 IN RED	3B 3 IN GREEN	SB SPARE 2 IN BLACK	ON STRUCTURE 2S 2 IN RMC	CABLE (FT) POWER 1 3-#X/0	2 3-#6	3 3-#X	4 2-#X	5 2-#X	COMM. FIBER OPTIC 12 12 SMFO	XX XX SMFO	DETECTOR # CAT 6 CABLE		DEVICE 1 CCTV	2 DMS	3 VDS**	4
		(FT)																												
K070EBT-363.94	PB070-363-02	48'			53'														133'											
PB070-363-02	PB070-363-01	113'										113'							193'											
PB070-363-01	K070EBCA-363.91	10'			15'												5'		95'											
K070EBCA-363.91	K070EBC-363.91																35'										75'			
TOTAL					68'							113'					40'		421'								75'			

✱ CONDUIT AND / OR CABLE RUN CARRIES OVER TO ADJACENT SHEETS

✱✱ MAX. HEIGHT OF DETECTOR ON POLE ASSUMED AT 25 FT FOR CABLE QUANTITIES

BID ITEM

ITEM	UNIT	QUANTITY
INTELLIGENT TRANSPORTATION SYSTEM SITE 1	L.S.	1

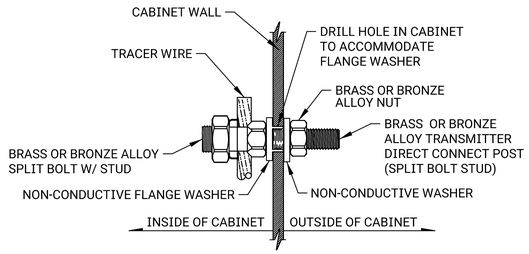
KANSAS DEPARTMENT OF TRANSPORTATION

I-70 ITS PLAN

STA. 425+00 TO STA. 441+00

Plotted by : sspatil 16-DEC-2025 14:04
File : ka680801ipl-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	97	253



NOTES

1. TRACER WIRE TERMINAL SHALL BE SOLID BRASS OR BRONZE ALLOY & ACCESSIBLE FROM THE OUTSIDE OF THE CABINET. IF STRANDED IS NEEDED FOR FLEXIBILITY CONTACT THE ENGINEER FOR APPROVAL.
2. TERMINAL SHALL BE COMPLETELY ISOLATED FROM CABINET & GROUNDING.
3. HOLE IN CABINET SHALL BE MADE WATER TIGHT.
4. MAINTAIN 1.5" MINIMUM CLEARANCE FOR TERMINAL.
5. APPLY THREAD LOCK SEALANT TO REDUCE TAMPERING.
6. TERMINAL LOCATION - TERMINALS SHALL BE MOUNTED IN ORDER TO PREVENT ACCIDENTAL "SNAGGING" . LOCATIONS SHOULD BE A MINIMUM OF 1.5" FROM CABINET EDGES AND SIDE IN WHICH IT IS NOT DIRCTLY MOUNTED TO.
   A. PAD MOUNTED TYPE 334 CABINET - TERMINAL SHALL BE LOCATED NEAR THE BOTTOM OF THE CABINET UNDER THE BACK CABINET DOOR, HINGE SIDE.
   B. POLE MOUNTED TYPE 336 CABINET - TERMINAL SHALL BE MOUNTED ON THE BOTTOM SIDE OF THE CABINET NEAREST THE POLE.

CABINET TRACER WIRE CONNECTION DETAIL

ITS EQUIPMENT/CABINET LABELING EXAMPLE

IN ADDITION TO LABELING EACH DEVICE WITH LABELS AS WRITTEN IN THE ITS SPECIFICATIONS, INCLUDE A CABLE TAG WITH SITE AND DEVICE INFORMATION, SEE ITS EQUIPMENT SPECIFICATIONS FOR ADDITIONAL DETAILS.

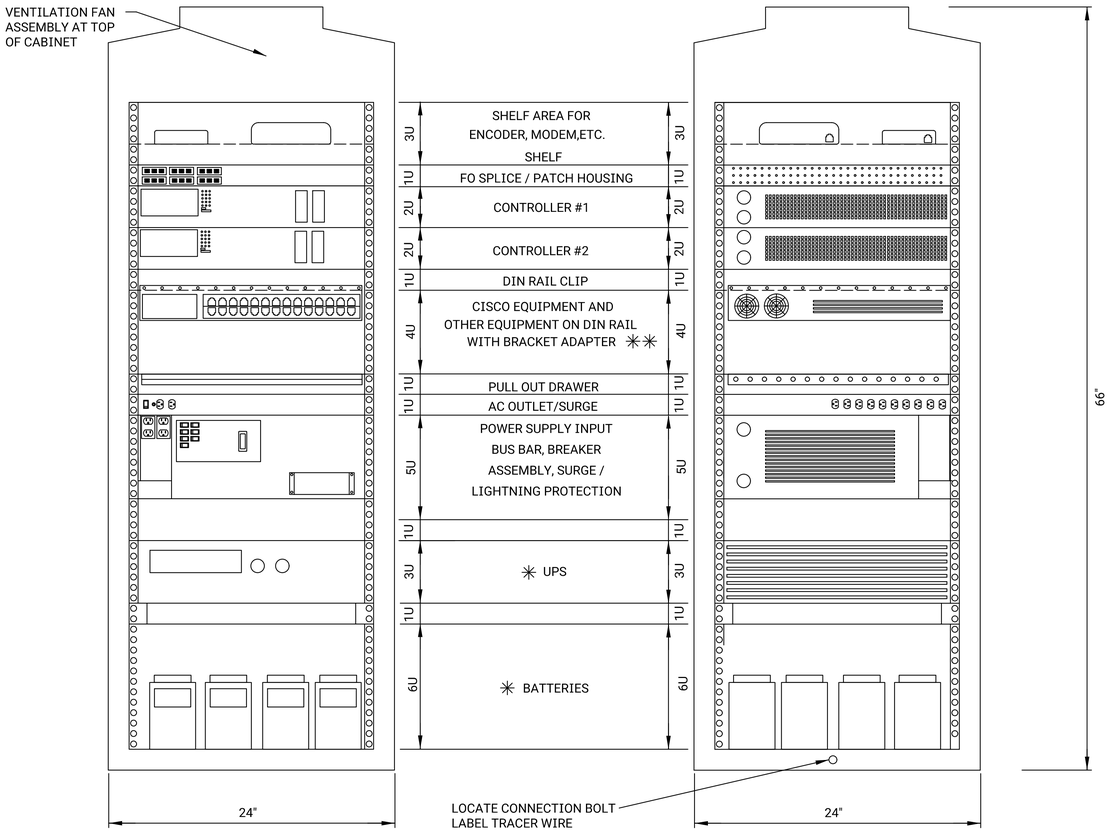
SITE NAME
MILE MARKER
SWITCH IP ADDRESS & VLAN
SWITCH PORT ASSIGNMENTS/CONFIGURATIONS/VLAN

DEVICE IP ADDRESS(ES)
DEVICE IP ADDRESS(ES)
DEVICE IP ADDRESS(ES)

NOTES

GENERAL NOTES:

1. Power supply assemblies and connections shall be mounted a minimum of 12 in above the bottom of ground mounted cabinets.
2. Contractor shall submit actual cabinet elevations to the Engineer for approval prior to installation.
3. See ITS plans and specifications for equipment to be included in cabinets.
4. Door filters shall have full back plates enclosing filter and holding filter in place.
5. Provide a rack elevation drawing for each ITS cabinet within the project showing the front, rear, and side views for proposed equipment placements. Clearly indicate equipment dimensions on elevation drawings.
6. ✳✳ Provide a second DIN rail with bracket adapter for ITS equipment if additional space is required, or as requested by the Engineer. Second DIN rail with bracket adapter shall be incidental to the site bid item.
7. Include louvered back plate on all cabinets.



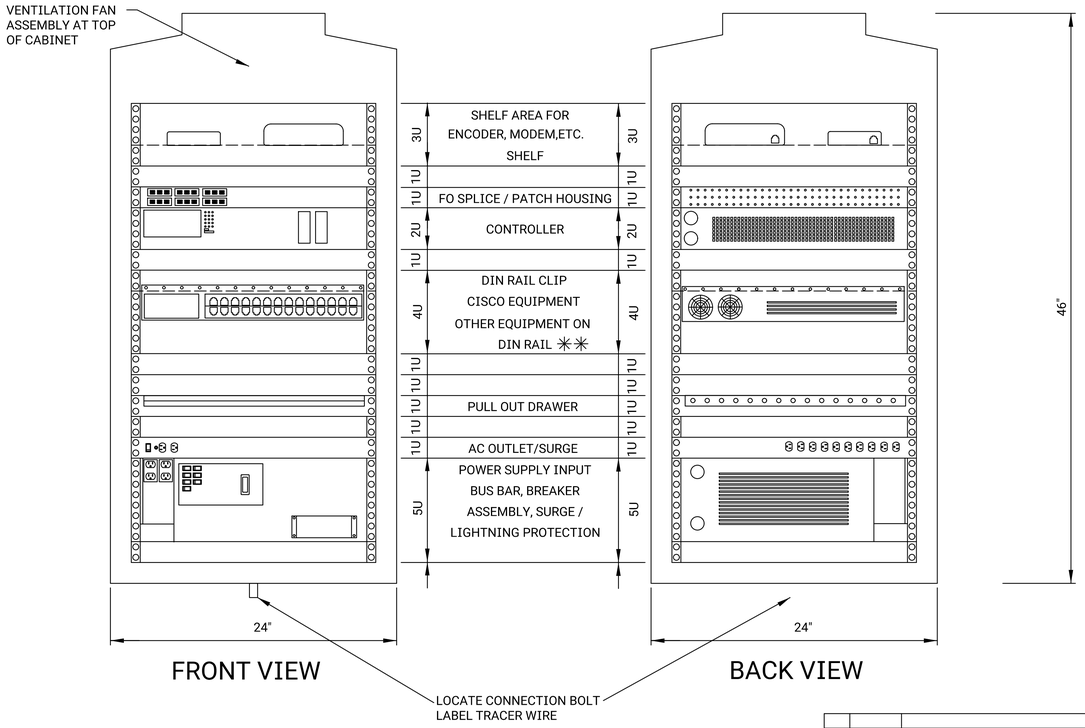
FRONT VIEW

BACK VIEW

TYPICAL TYPE 334 CABINET PAD MOUNT

NOTE: 1U = 1.75 INCHES

✳ UPS + BATTERIES INCLUDED ONLY WHERE NOTED



FRONT VIEW

BACK VIEW

TYPICAL TYPE 336S CABINET POLE MOUNT

NOTE: 1U = 1.75 INCHES

NO.	DATE	REVISIONS	BY	APP'D
00	01-09-25	2024 KDOT Standards Updates	AJS	JAN

KANSAS DEPARTMENT OF TRANSPORTATION

TYPICAL 334 AND 336S CABINET LAYOUT

ITS-D04 06-04-25

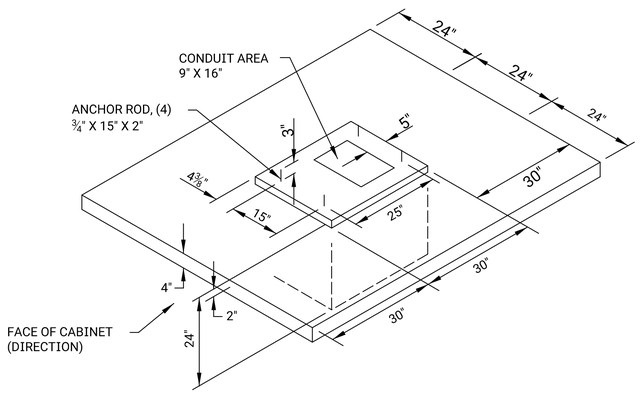
FHWA APPROVAL		APP'D.	
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

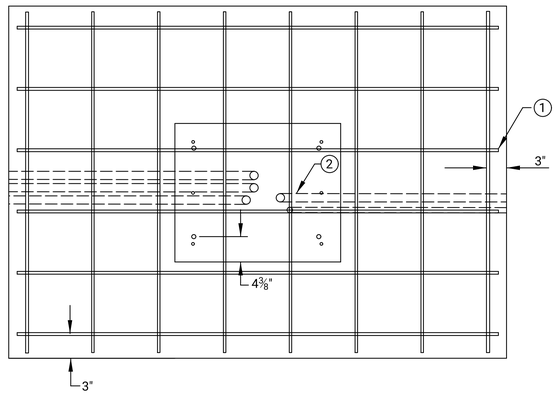
Plotted by : sspatil 16-DEC-2025 14:04
File : ka680801iss-D04.dgn

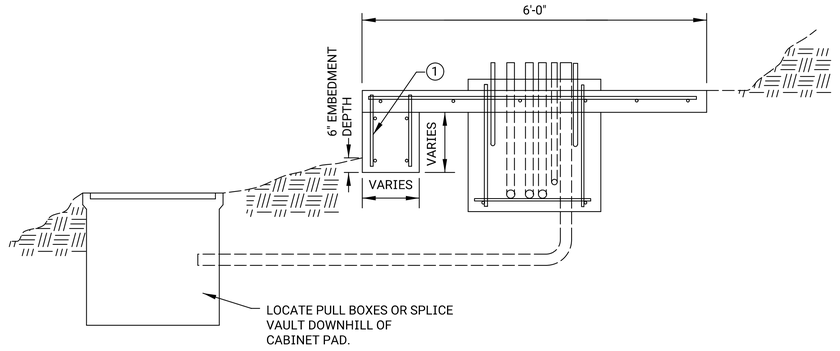
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	98	253

CABINET FOUNDATION NOTES:

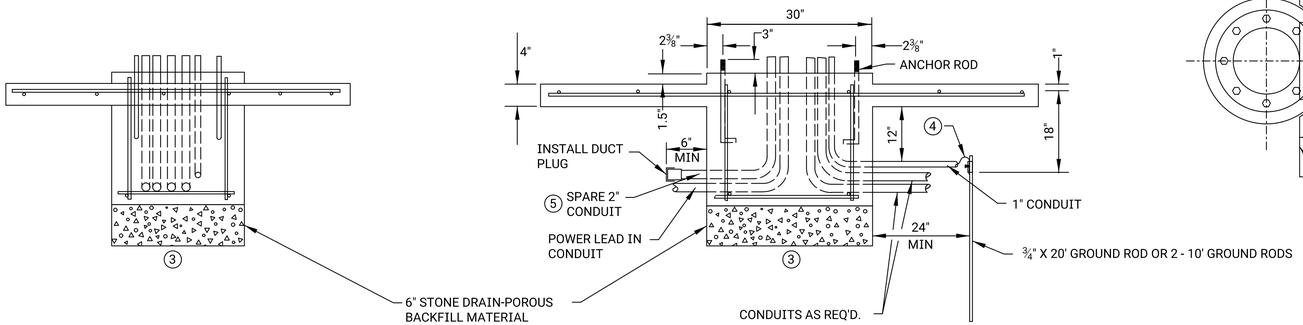
1. All reinforcing bar used in the construction of the cabinet foundation shall be No. 4 bars, evenly spaced at 12 in spacing, +/- 1.5 in.
2. Rebar shall be adjusted to accommodate conduit.
3. Stone drain material shall conform to the standard specification.
4. Minimum No. 4 copper grounding conductor from cabinet equipment ground bus to ground rod.
5. F&I 2 in spare conduit, stub out 6 inches from face of foundation. F&I duct plug.



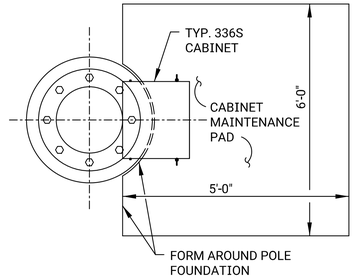


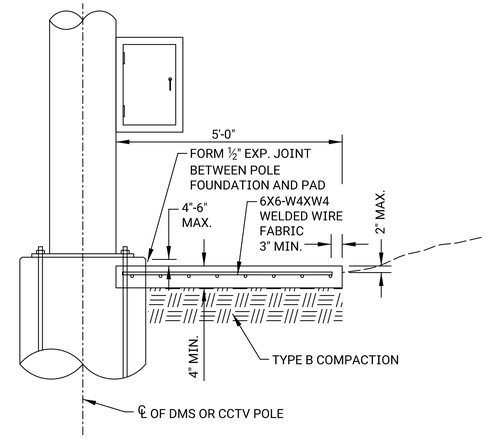


ITS CABINET FOUNDATION ON SLOPE DETAILS



ITS CABINET FOUNDATION DETAILS





POLE MOUNTED ITS CABINET MAINTENANCE PAD

NOTE:

1. Coordinate with the Engineer on anchor bolt spacing for KDOT-provided cabinets (DMS or otherwise).
2. Conduit must enter cabinet foundation on the same side as its approach run.

NO.	DATE	REVISIONS	BY	APP'D
00	07-14-23	2023 KDOT Standards Updates	AJS	JAN

KANSAS DEPARTMENT OF TRANSPORTATION

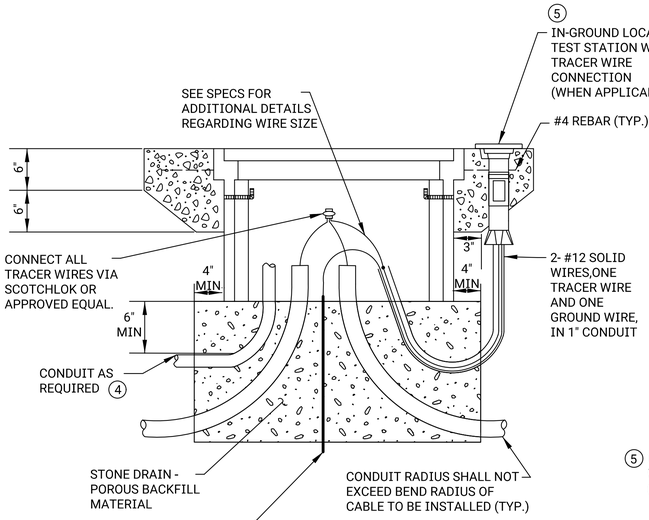
ITS CABINET FOUNDATION DETAILS

ITS-D06A 06-04-25

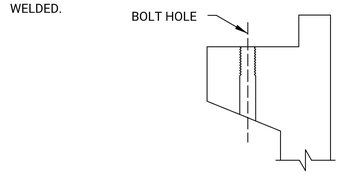
FHWA APPROVAL		APP'D.	
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

Plotted by : sspatil 16-DEC-2025 14:04
File : ka680801iss-D06A.dgn

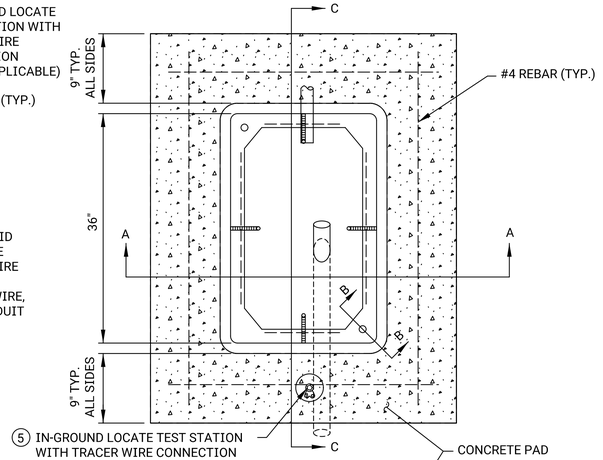
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	99	253



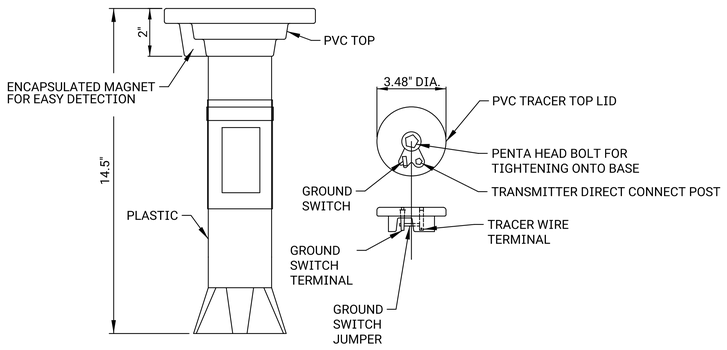
SECTION C-C



SECTION B-B
TYPICAL BOLT CLEANOUT

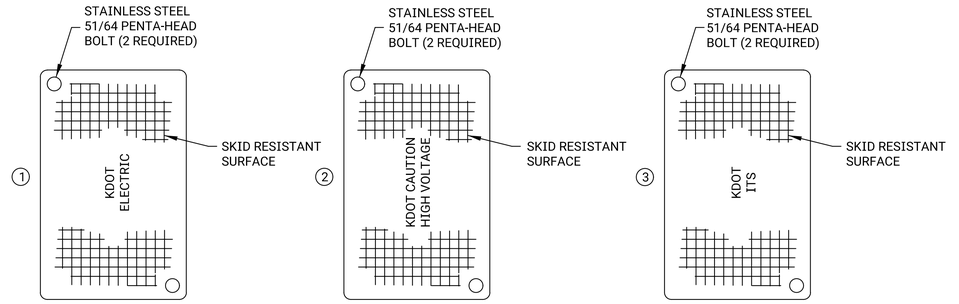


SECTION A-A



IN-GROUND LOCATE TEST STATION DETAIL FOR COMMUNICATION PULL BOXES ONLY

1. USE TWO-TERMINAL SWITCHABLE LID. COPPERHEAD INDUSTRIES SNAKEPIT PART NUMBER SP-SWLID-*2 OR APPROVED EQUAL. TRACER WIRE SHALL BE SOLID BRONZE ALLOY & ACCESSIBLE FROM THE TOP OF LID WITHOUT REQUIRING LID REMOVAL. GROUND WITH A 48-INCH COPPER ROD EXPOSING ONLY 12 INCHES.
2. TRACER LID SHALL BE ORANGE FOR COMMUNICATIONS AND RED FOR POWER AND INCLUDE A CAST-IRON FLANGE FOR LOW TRAFFIC.
3. WHEN CONTRACTOR LEAVES, THEY SHALL LEAVE THE GROUND OFF.



PREFORMED PULL BOX COVER

NOTES:

1. Pull boxes with 120/240V conductors shall have 5" x 11" cast-in, stamped concrete labels with "KDOT/ELECTRIC". Text shall be 2 in high and centered. Maintain adequate letter width and spacing.
2. Pull boxes with 480V conductors shall have 5" x 11" cast-in, stamped concrete labels with "KDOT CAUTION/HIGH VOLTAGE". Text shall be 2 in high and centered. Maintain adequate letter width and spacing.
3. Pull boxes with loop lead-in cables, detector cables, communication cables, or DMS cables shall have 5" x 11" cast-in, stamped concrete labels with "KDOT/ITS". Text shall be 2 in high and centered. Maintain adequate letter width and spacing.
4. All metal conduits shall be electrically bonded by a ground bushing and No. 4 bare copper wire.
5. All KDOT ITS Communication Pull Boxes must include an in-ground locate test station(s). Locate stations are required for each direction of conduit leaving the pull box. Test stations must be located on the same side as conduits is exiting pull box. Match test station color to the color of the related conduit. Test stations are incidental to pull boxes.

GENERAL NOTES:

1. All dimensions shown are in inches unless otherwise noted.
2. Preformed box walls may be either flared or vertical.
3. At the Engineer's discretion, bury electrical pull boxes six inches below grade. Concrete pad is not required when electrical pull box is buried.
4. If an extension is used with a preformed box, the lip of the extension may be interior or exterior. The extension shall be compatible and from the same manufacturer.
5. Conduit shall enter the pull box from the bottom, unless approved by the engineer. If using side entry conduit, ensure bend radius of cable is not exceeded when pulling cable, and the diameter of the hole does not exceed 1.5X the diameter of the conduit.
6. Stub up conduit 6" inside pull box. For multiway microduct, stub up 8" to 12" total, exposing 4" to 6" of individual microducts. See section 6.3.1.
7. Pull box and cover shall be rated for a minimum loading of tier 22 per ANSI/SCTE 77, current edition.
8. Stone drain material shall conform to the standard specifications and shall be clean aggregate.
9. Provide KDOT with one stainless steel penta-head socket and pull box lifting hook for every 20 pull boxes installed. A minimum of one stainless steel penta-head socket and one pull box lifting hook must be provided for each project.
10. Substitute "KC SCOUT" for "KDOT" when installations are in KC Scout area.
11. Conduit must enter pull box on the same side as its approach run.
12. All communications and power pull boxes and splice vaults shall be equipped with locate testing stations. Separate stations shall be provided for power and communications conduit. Separate stations will be required for each power or communications run (E.G. entry and exit straight through would require one test station). Multiple runs will require multiple test stations. Selectable ground (and grounding per manufacturer recommendation) is required at each location where there is a splice vault, both sides of a bored conduit deeper than 4', when a run changes direction greater than forty-five degrees or at the end of a fiber run (or start of a branch run). If an existing mow strip or splice vault that the contractor is connecting to is not equipped with a test station, new test stations will be required to be installed on the existing and new lines.

NO.	DATE	REVISIONS	BY	APP'D
01	06-04-25	Tracer Wire Updates	AJS	JAN
00	01-09-25	2024 KDOT Standards Updates	AJS	JAN

KANSAS DEPARTMENT OF TRANSPORTATION

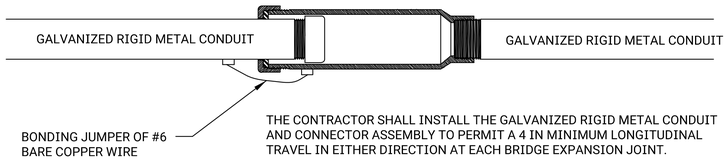
ITS PULL BOX DETAILS

ITS-D07 06-04-25

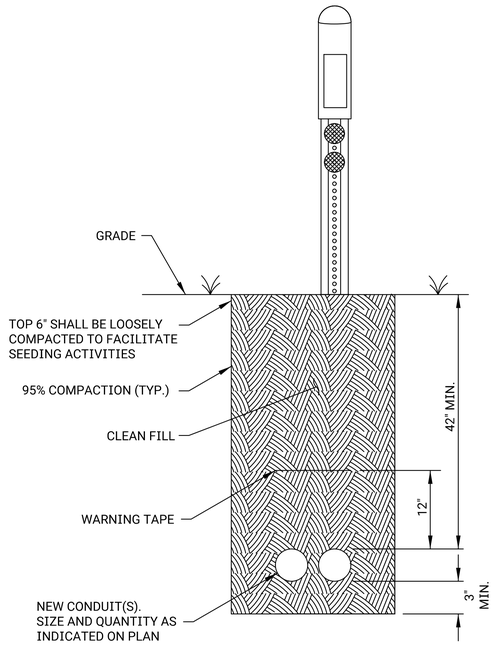
FHWA APPROVAL		APP'D.	
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

Plotted by : sspatil 16-DEC-2025 14:04
File : ka680801iss-D07.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	100	253



EXPANSION FITTING



FIBER OPTIC TRENCH DETAIL

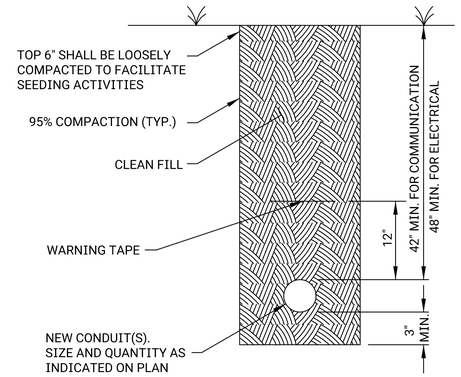
FIBER OPTIC CONDUIT MARKERS TO BE PLACED AT:

1. BEGINNING AND END OF BACKBONE/BRANCH CONDUIT RUNS OVER 100 FT

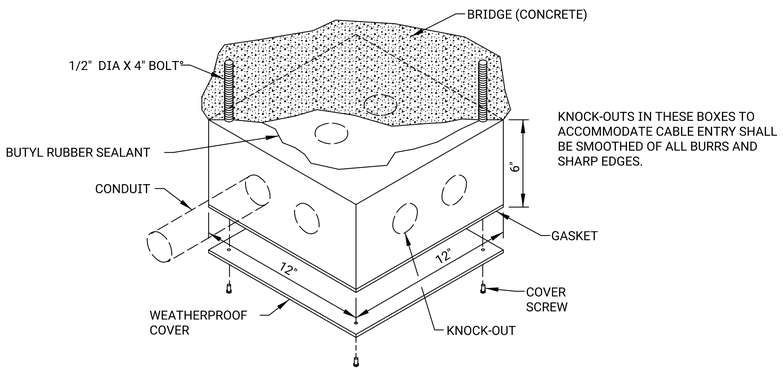
2. EVERY 500 FT FOR BACKBONE/BRANCH CONDUIT RUNS ADJACENT TO R/W

3. BEGINNING AND END OF CONDUIT RUNS ON STRUCTURE

4. AT SPLICE VAULTS AND BURIED CONDUIT SPLICE (IF NOT A TERMINATION POINT ALREADY)
   a. ADD 1 REFLECTIVE DISK TO MARKER IF A SPLICE VAULT WITH SLACK COIL OR BURIED CONDUIT SPLICE.
   b. ADD 2 REFLECTIVE DISKS TO MARKER IF A SPICE VAULT WITH SLACK COIL AND A SPLICE ENCLOSURE.
   c. REFLECTIVE DISK SHALL BE A ROUND, AMBER, 3" DIAMETER REFLECTOR WITH CENTER MOUNT.

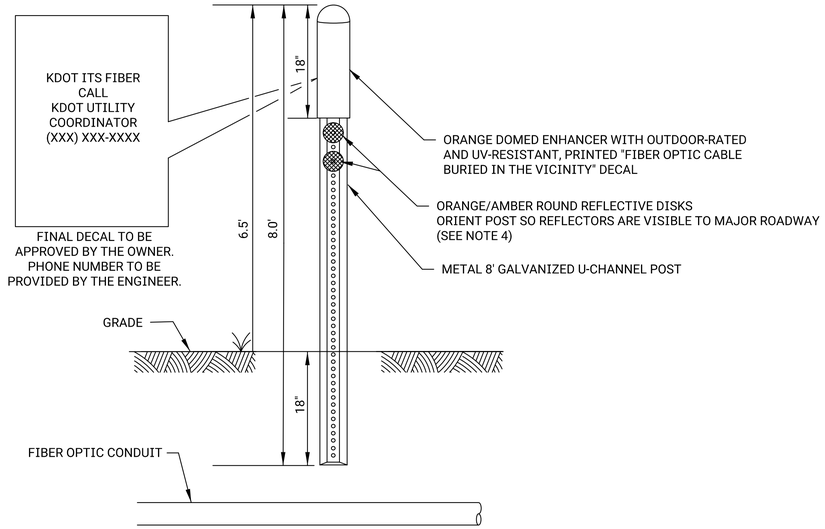


TRENCH DETAIL (NON FIBER)



THE JUNCTION BOX IS TO BE ATTACHED TO THE BRIDGE. THE CONTRACTOR SHALL DRILL TWO HOLES IN THE BOTTOM OF THE BOX AND BOLT THE JUNCTION BOX TO THE BRIDGE AT THE INSERTS PROVIDED. BOLTS SHALL BE 12 IN DIA. BY 4 IN LONG AND SHALL CONFORM TO ASTM F3125. A WASHER SHALL BE INSTALLED BETWEEN THE BOLT HEAD AND BOTTOM OF THE BOX.

ABOVE GROUND JUNCTION BOX



FIBER OPTIC CONDUIT ABOVE GROUND DELINEATOR DETAIL

GENERAL NOTES:

All utility crossings under roadway should have a minimum of 5 ft of cover below crown grade or 3 ft cover below ditch grade.

Refer to the KDOT Utility Accommodation Policy for bridge attachment details.

NO.	DATE	REVISIONS	BY	APP'D
00	03-27-25	2024 KDOT Standards Updates	AJS	JAN

KANSAS DEPARTMENT OF TRANSPORTATION

CONDUIT STRUCTURAL ATTACHMENT AND TRENCH DETAILS

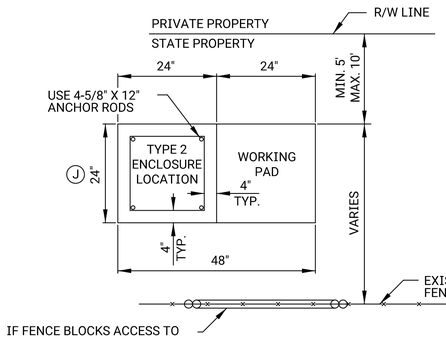
ITS-D10 06-04-25

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

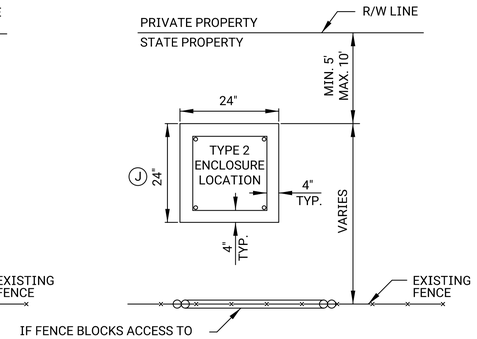
Sh. No. 100

Plotted by : sspatil 16-DEC-2025 14:04
File : ka680801lss-D10.dgn

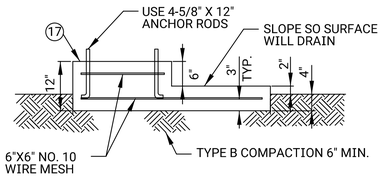
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	101	253



PLAN VIEW

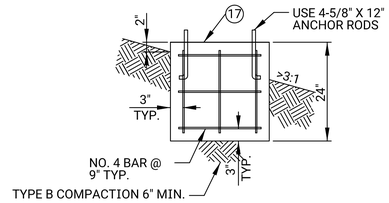


PLAN VIEW



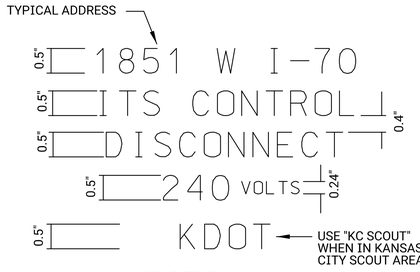
SIDE VIEW

TYPE 2 ENCLOSURE PAD



SIDE VIEW

TYPE 2 ENCLOSURE PAD
WITH SLOPED GRADE



LABEL DETAIL
20

NOTES:

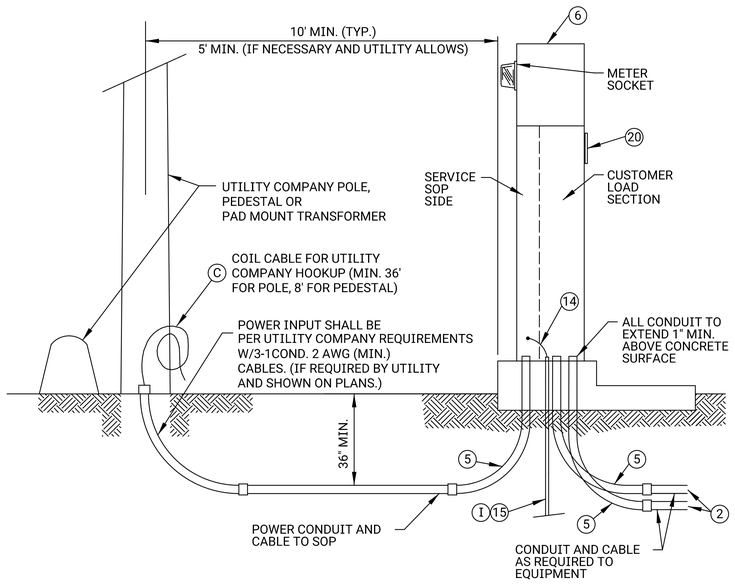
- (A) Service pole shall be guyed when span of overhead service wire exceeds 49 ft.
- (B) Increase 1 ft for each 5 ft above 30 ft.
- (C) Meter socket and other equipment and materials shall be U.L. approved, and conform to the requirements of the utility company or municipality providing power.
- (D) Schematic diagram shall be mounted on inside of cabinet door.
- (E) (not used)
- (F) If multiple circuits are specified, install CB panel on power supply.
- (G) Circuit breakers in the circuit breaker panel shall be plug-in type.
- (H) Service disconnect boxes and meter boxes shall be aluminum or stainless steel. All hardware, hinges, catches, etc. shall be stainless steel.
- (I) If subsurface conditions exist which prohibit the placement of the ground rod in a vertical position, the rod may be driven at an oblique angle not to exceed 45 degrees from vertical or buried in a trench at least 2.5 ft deep. Connection to ground rod shall be exothermically welded.
- (J) Increase foundation width to 33 inches when installing a transformer to the side of enclosure.

LIST OF MATERIALS

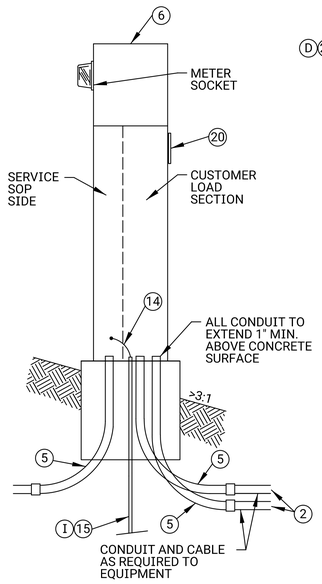
ITEM	DESCRIPTION
1	SERVICE POLE 32.8' MIN., CLASS 4 OR 5 WOOD, CONTRACTOR PROVIDED, STATE OWNED *
2	CABLE, POWER *
3	SERVICE ENTRANCE CAP, FOR CONDUIT
4	GUY CABLE, AS REQUIRED (A)
5	CONDUIT, RIGID, 2" * MIN., WITH PREFORMED ELBOWS
6	TYPE 2 ENCLOSURE, SEE ITS-D11D
7	METER SOCKET, 200 AMP, FOR ITS CONTROLS (C)(H)
8	CONDUIT, RIGID, 2" * MIN.
9	SERVICE DISCONNECT BOX, LOCKABLE, RAINTIGHT, NEMA 4 (D)(H)
10	INSULATED, GROUNDABLE NEUTRAL, 200 AMP MIN.
11	BREAKER, SIZE AND POLE, PER POWER SERVICE TABLE (G)
12	(NOT USED)
13	GALVANIZED METAL CONDUIT, 0.5" *
14	GROUND WIRE, 2 AWG MIN.
15	GROUND ROD, ¾" X 20' MIN.
16	(NOT USED)
17	CONCRETE, KDOT GRADE 4.0 ON-GRADE
18	CONDUIT HUB, THREADED WITH SEALING WASHERS
19	(NOT USED)
20	PHENOLIC PLATE, WHITE WITH BLACK LETTERING
21	(NOT USED)
22	(NOT USED)
23	(NOT USED)
24	NEMA 4, 12 CKT, MAIN LUGS, LOCKABLE, SS ENCLOSURE (F)
25	CABLE, 2 AWG MIN., 600 VOLT (C)
26	STEP-UP TRANSFORMER, IF APPLICABLE
	* - SEE PLANS

GENERAL NOTES:

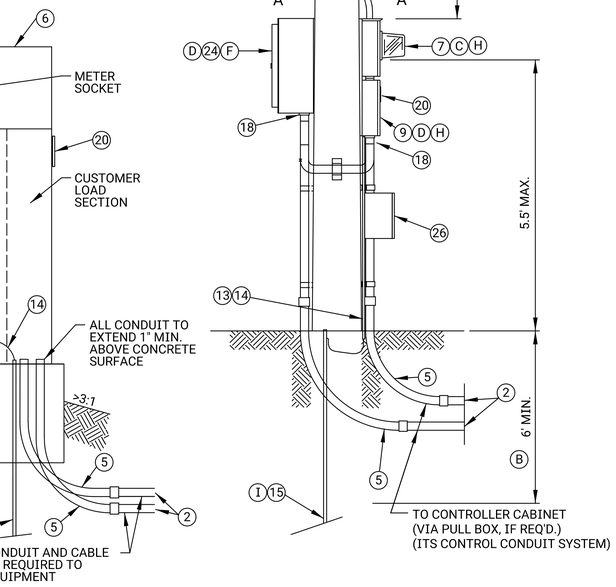
1. For cable types and installation, see standard specifications.
2. The type of power supply assembly is shown on the plans or is designated in the contract.
3. All work and items shall meet National Electrical Code, National Electrical Safety Code and National Electrical Manufacturers Association standards.
4. Where CB panel is not designated, omit items not required.
5. All openings in any service box or meter box shall be covered then sealed with 50 year silicone caulk.
6. All materials required excluding reference items as shown on drawing shall be included in price bid for power supply assembly.
7. Utility company shall decide if lightning arresters are to be connected on the load or line side of the meter. The utility company shall also decide if the lightning arrester is terminated in the meter or disconnect cabinet. If terminated in the disconnect cabinet, it shall be installed on the disconnect cabinet.
8. For single circuit controller assembly feed, route conduit from disconnect box; multiple circuits from feeder breaker panel enclosure.



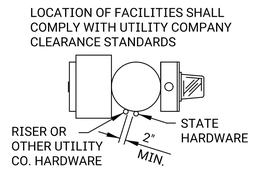
TYPE 2 (PEDESTAL)
USE WITH ITS-D11D TYPICAL ENCLOSURE DETAILS



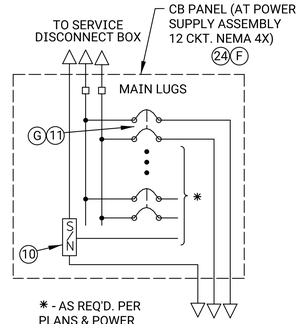
TYPE 2 (PEDESTAL) WITH SLOPED GRADE
USE WITH ITS-D11D TYPICAL ENCLOSURE DETAILS

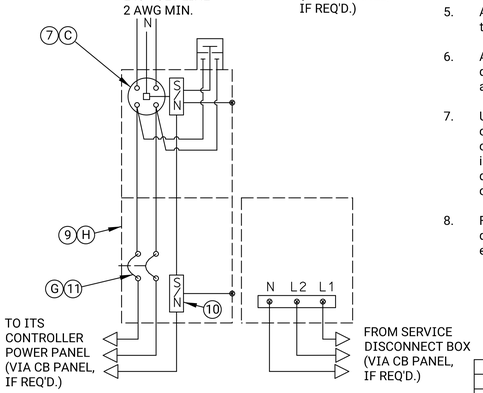


TYPE 1 (POLE) OVERHEAD SERVICE



SECTION A-A





POWER SUPPLY
(-PS)

CONTROLLER ENCLOSURE
POWER PANEL (-CA)

WIRING DIAGRAM - ITS CONTROL

NO.	DATE	REVISIONS	BY	APP'D
00	05-07-20	2020 KDOT Standards Updates	AJS	JAN

KANSAS DEPARTMENT OF TRANSPORTATION

FIELD POWER SUPPLY ASSEMBLY DETAILS

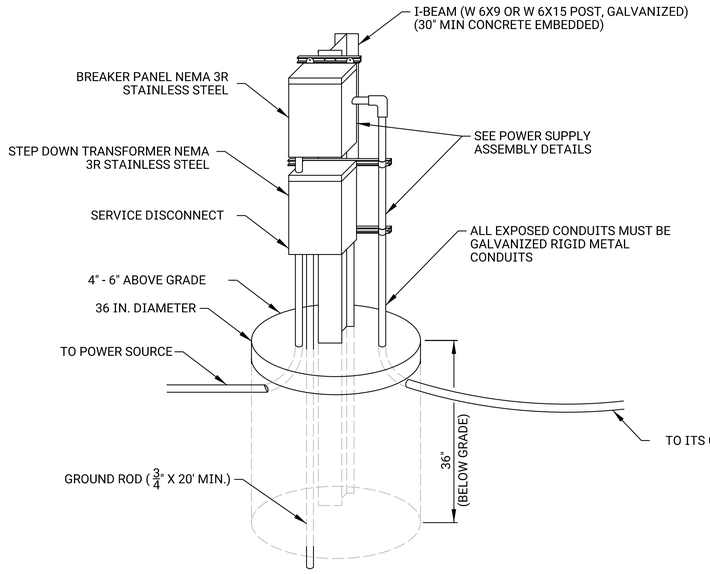
ITS-D11 06-04-25

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

Sh. No. 101

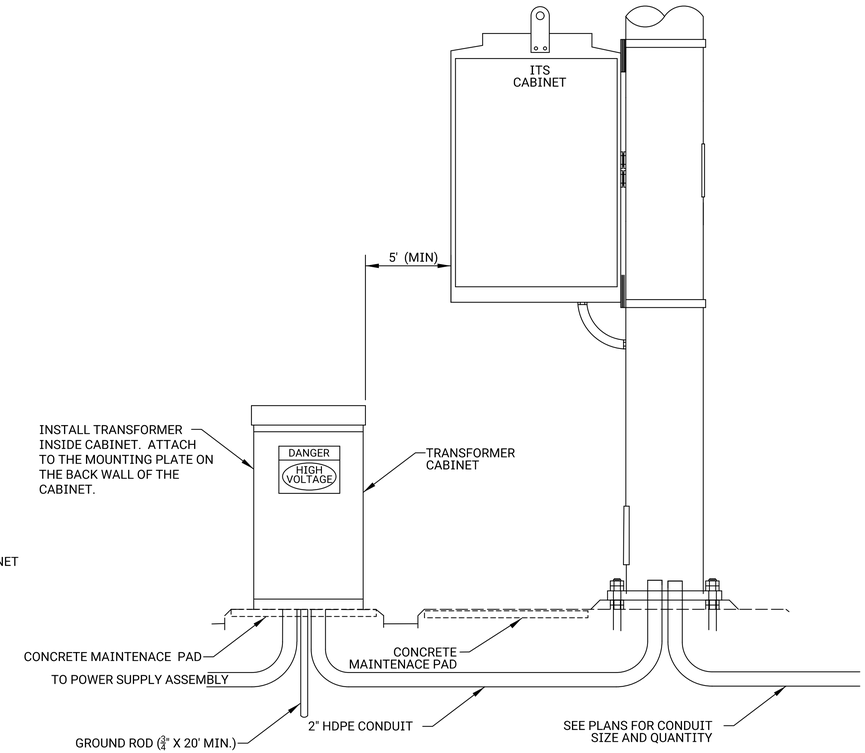
Plotted by : sspatil 16-DEC-2025 14:04
File : ka680801iss-D11.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	102	253



PEDESTAL-MOUNT TRANSFORMER CABINET INSTALLATION

NOT TO SCALE



GROUND-MOUNT TRANSFORMER

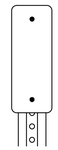
CABINET

GENERAL NOTES:

1. Mount transformer to side away from traffic. Transformer shall be located at the back of the right-of-way where possible and at least 5' from any cabinet.
2. Communications infrastructure not shown for clarity.
3. Install perforated 1.5 in x 1.5 in (min) square tubing on both sides of transformer. Fasten equipment such that all load bearing elements are transferred to the tubing.
4. Seal and waterproof all conduit entrances with 50 year silicone caulk.
5. All metal conduit and equipment shall be galvanized or stainless steel.
6. Service disconnects shall be provided for all step-down transformers. Service disconnects are not required for step-up transformers.
7. Provide mow strip surrounding ground-mount transformer cabinet. Install reflective metal delineators on all corners of concrete pad.

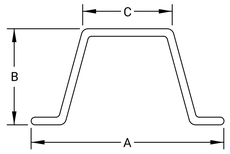
STEEL POST DELINEATOR INSTALLATION

INSTALL DELINEATORS NEXT TO ALL TRANSFORMERS.
FOR GROUND-MOUNT TRANSFORMERS, INSTALL DELINEATORS AT ALL FOUR CORNERS OF CONCRETE PAD.



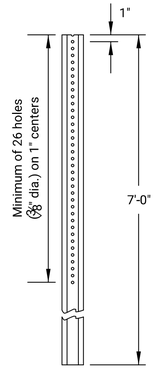
TYPE "A"

TYPICAL DELINEATOR ASSEMBLY

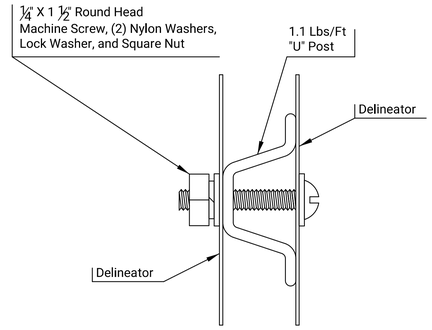


DIMENSIONS	
A	2 1/16
B	7/8
C	13/16

(Dimensions are nominal)



PUNCHING DETAILS



MOUNTING DETAILS
(BACK TO BACK)

NO.	DATE	REVISIONS	BY	APP'D
00	07-14-23	2023 KDOT Standards Updates	AJS	JAN

KANSAS DEPARTMENT OF TRANSPORTATION

TRANSFORMER ATTACHMENT DETAIL

ITS-D11A 06-04-25

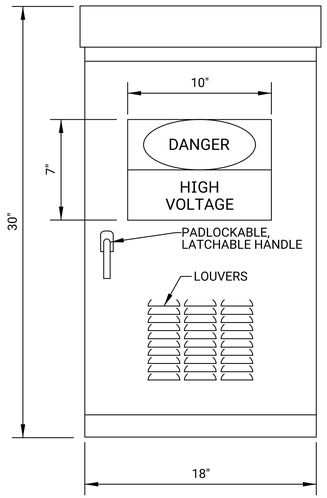
FHWA APPROVAL		APP'D.	
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 06-06-2025 Sh. No. 102

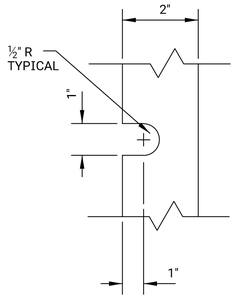
KDOT Graphics Certified

Plotted by : sspatil 16-DEC-2025 14:04
File : ka680801iss-D11A.dgn

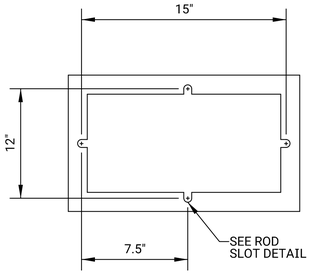
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	103	253



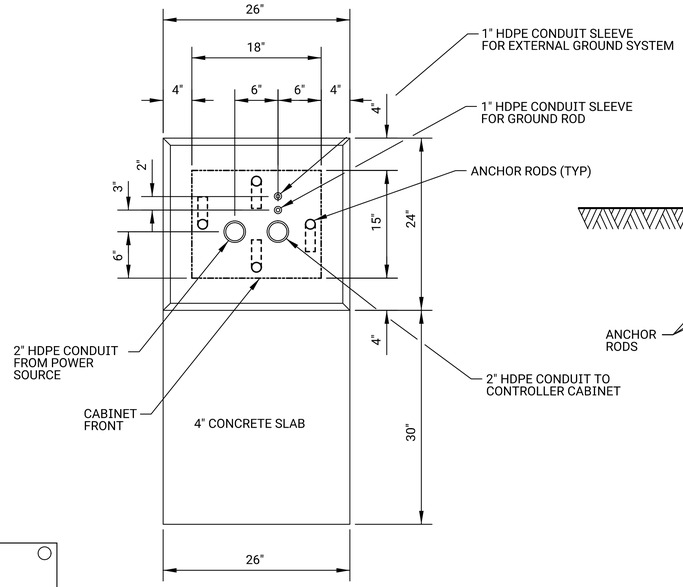
FRONT VIEW



ROD SLOT DETAIL

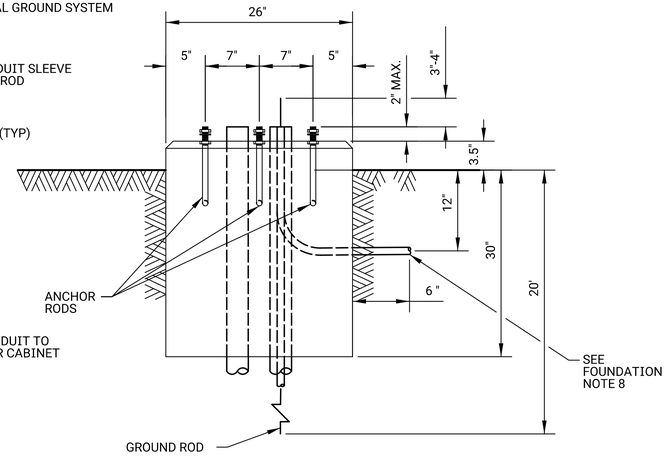


PAD MOUNTING PATTERN



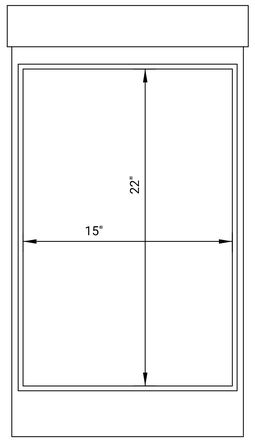
TRANSFORMER CABINET FOUNDATION

TOP VIEW

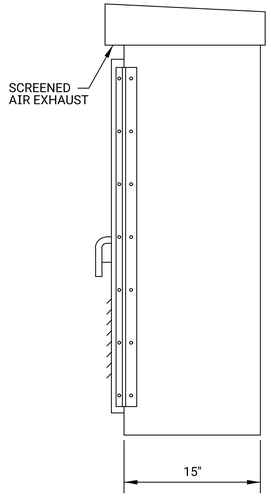


TRANSFORMER CABINET FOUNDATION

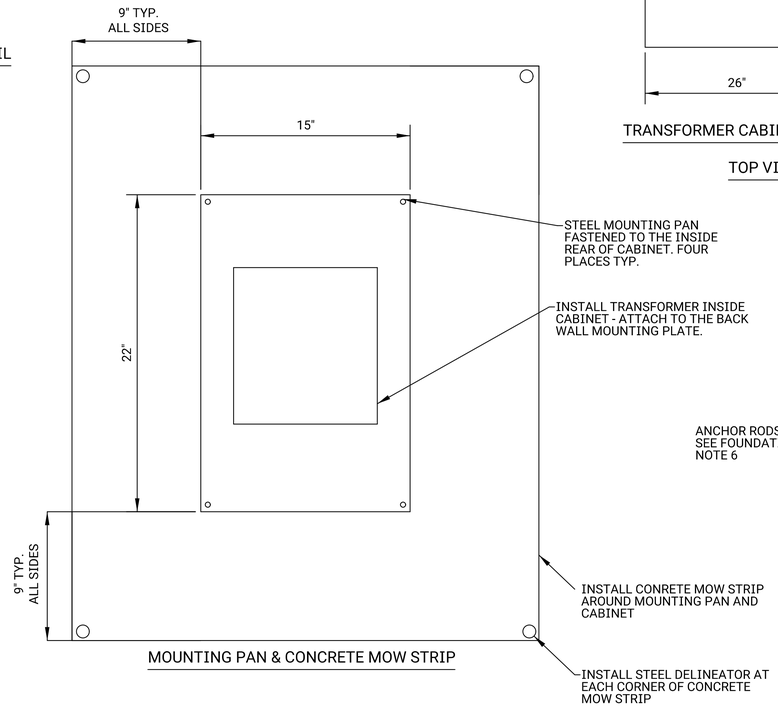
FRONT VIEW



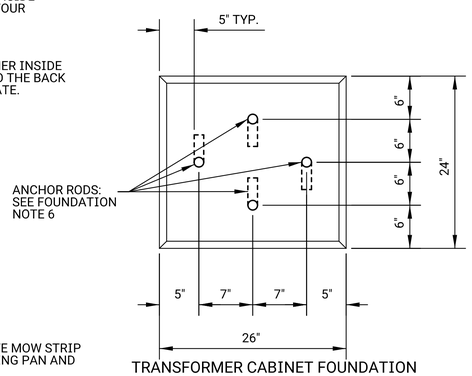
OPENING



SIDE VIEW



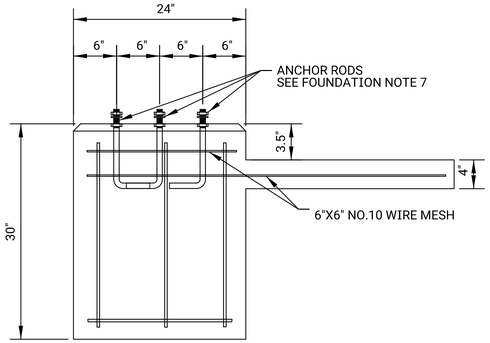
MOUNTING PAN & CONCRETE MOW STRIP



TRANSFORMER CABINET FOUNDATION

& ANCHOR RODS

TOP VIEW



TRANSFORMER CABINET FOUNDATION

& ANCHOR RODS

SIDE VIEW

CABINET NOTES:

1. See the ITS equipment specifications for construction requirements.
2. Use 50 year silicon caulk to seal gap between cabinet and foundation.
3. For number and size of conductors and conduit between transformer cabinet and ITS cabinet see plan sheets.

FOUNDATION NOTES:

1. Foundations shall include a $\frac{3}{4}$ inch x 20 foot ground rod which shall be driven vertically into the earth leaving a projection above the foundation between 2 inches minimum and 4 inches.
2. Foundations shall be level. Level is defined as having a slope of less than $\frac{1}{32}$ inch per foot.
3. Minimum No. 4 copper grounding conductor shall be connected between the ground rod in the transformer cabinet and the ground lug for the CCTV pole.
4. The contractor shall furnish and install two No. 6 AWG conductors from transformer to ITS cabinet main circuit breaker in indicated conduit. Minimum No. 4 copper grounding conductor shall be connected between the transformer cabinet and the ITS cabinet.
5. Anchor rods shall be galvanized steel, 3/4 inch x 11 inches x 5 inches, complete with nuts and washers.
6. Anchor rods shall project a maximum of 2 inches above foundation.
7. 1 inch HDPE sleeve for external ground system-plugged.
8. All reinforcing bar used in the construction of the foundation shall be No. 4 bars, evenly spaced at 9 inch typical and shall be installed to provide 2 inch minimum clearance from edge of foundation.
9. Power cabinets shown on ITS-D11 are also acceptable as a step-down transformer cabinet.

NO.	DATE	REVISIONS	BY	APP'D
00	07-14-23	2023 KDOT Standards Updates	AJS	JAN

KANSAS DEPARTMENT OF TRANSPORTATION

GROUND MOUNTED TRANSFORMER CABINET AND FOUNDATION DETAIL

ITS-D11B 06-04-25

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

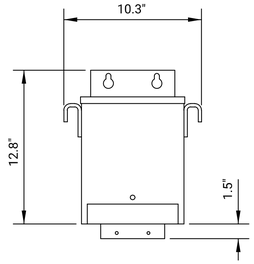
KDOT Graphics Certified 06-06-2025 Sh. No. 103

KDOT Graphics Certified

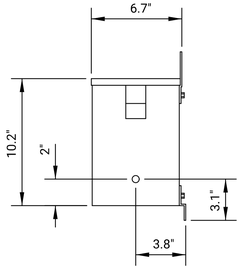
Plotted by : sspatil 16-DEC-2025 14:04
File : ka680801iss-D11B.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	104	253

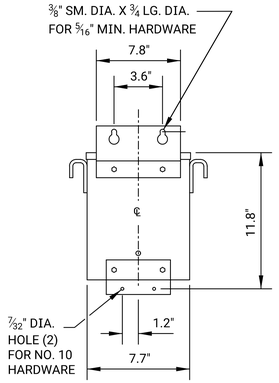
3 KVA DRY TYPE TRANSFORMER



FRONT

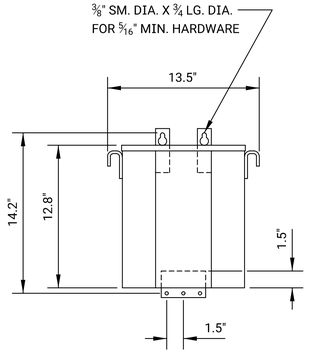


SIDE

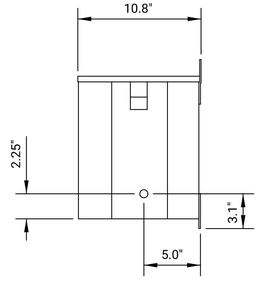


BACK

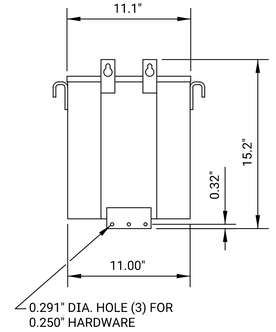
10 KVA DRY TYPE TRANSFORMER



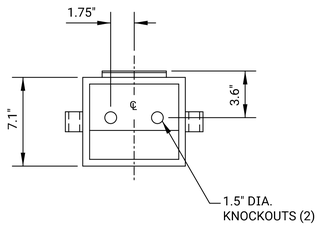
FRONT



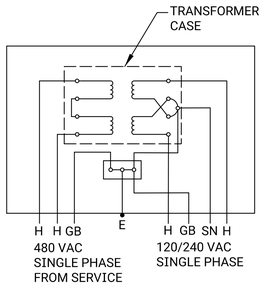
SIDE



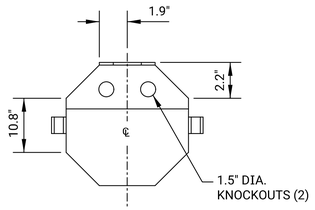
BACK



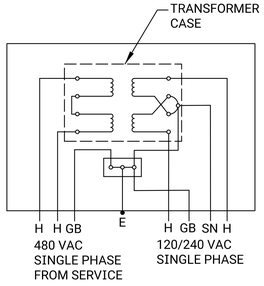
BOTTOM



WIRING DIAGRAM



BOTTOM



WIRING DIAGRAM

LEGEND:

H - Hot Lead
GB - Green Bond Wire
E - Equipment Ground
SN - Service Neutral

NOTES:

1. Install rubber grommets in knockouts.
2. Totally enclosed, encapsulated distribution transformer with front access.
3. Transformer shall be single-phase.
4. The transformer case shall be grounded to equipment through mounting screws.

NO.	DATE	REVISIONS	BY	APP'D
00	05-28-18	2018 KDOT Standards Updates	AJS	JAN

KANSAS DEPARTMENT OF TRANSPORTATION

TRANSFORMER 3KVA & 10KVA DRY TYPE DETAILS AND WIRING DIAGRAMS

ITS-D11C 06-04-25

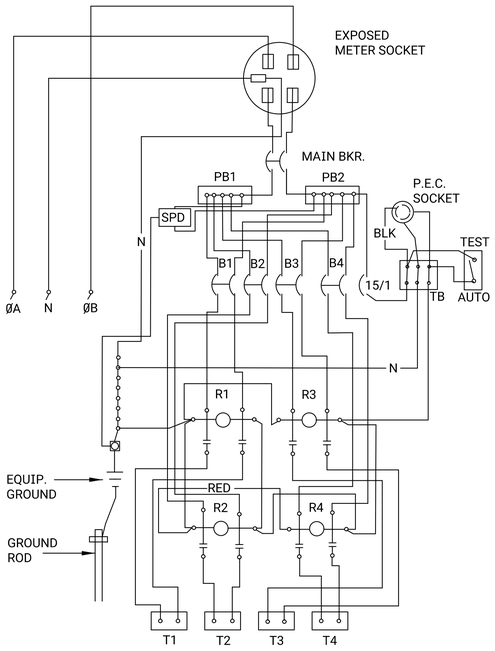
FHWA APPROVAL		APP'D.	
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 06-06-2025 Sh. No. 104

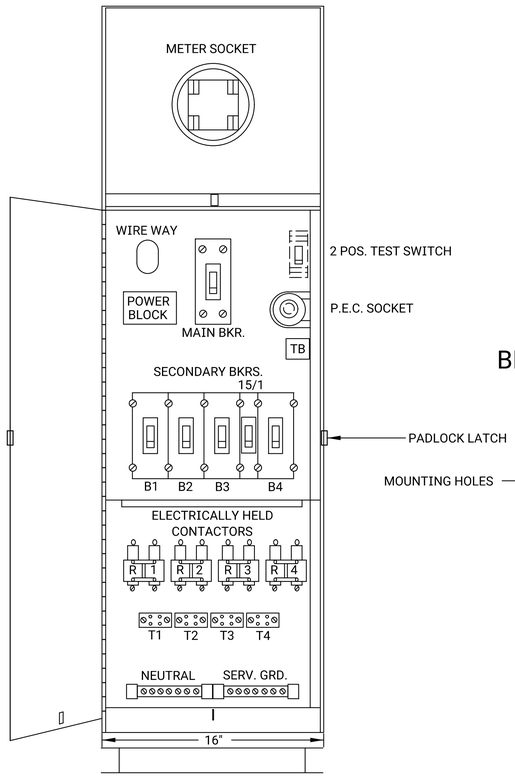
KDOT Graphics Certified

Plotted by : sspatil 16-DEC-2025 14:04
File : ka6808001iss-D11C.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	105	253

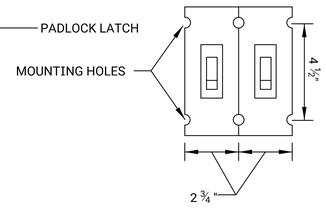


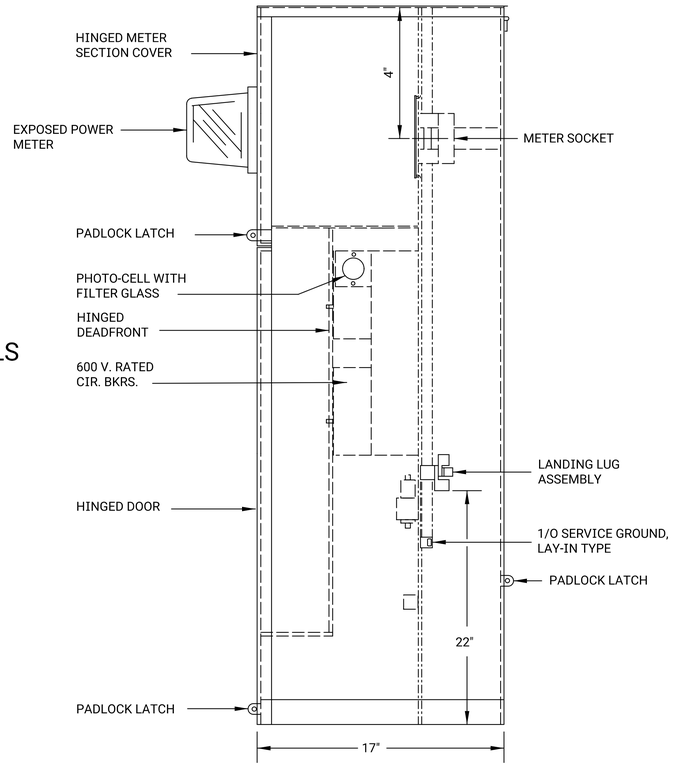
WIRING DIAGRAM

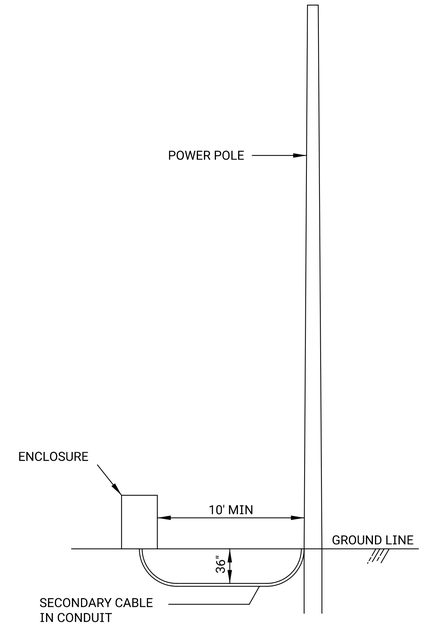


FRONT VIEW

TYPICAL BREAKER DETAILS (2 POLE)

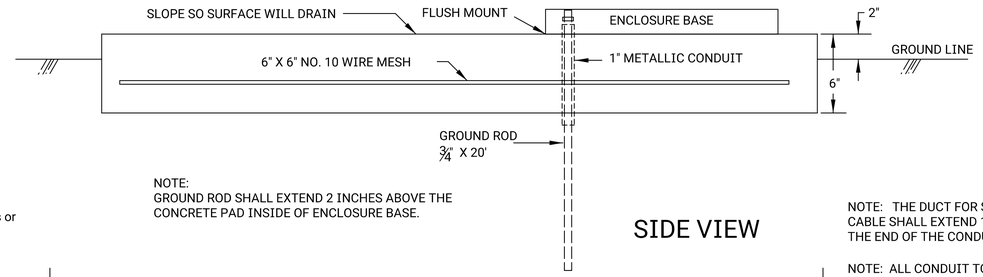






POWER ARRANGEMENT

NOTE: POWER ARRANGEMENT SHALL MEET THE LOCAL UTILITY COMPANY SPECIFICATIONS.



NOTE:
GROUND ROD SHALL EXTEND 2 INCHES ABOVE THE CONCRETE PAD INSIDE OF ENCLOSURE BASE.

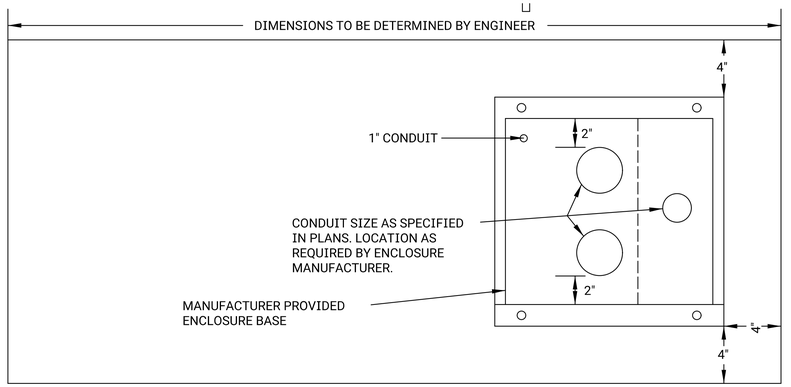
SIDE VIEW

NOTE: THE DUCT FOR SECONDARY CABLE SHALL EXTEND 1" PAST THE END OF THE CONDUIT BEND.

NOTE: ALL CONDUIT TO EXTEND 1" MIN. ABOVE CONCRETE SURFACE.

PAD DIMENSIONS SHALL BE ADJUSTED ACCORDINGLY FOR THE WIDTH OF THE ENCLOSURE TO BE INSTALLED.

MOUNTING BASE SHALL BE USED FOR CONCRETE PAD-MOUNTING AND BE COMPATIBLE WITH MULTIPLE ENCLOSURE SUPPLIERS.



TOP VIEW

NOTES:

1. The enclosure cabinet shall be constructed of bare 5052 alloy aluminum 0.125" thick. The cabinet shall be of clean cut design having no sharp edges, corners or projections and NEMA 3R construction.
2. The enclosure shall increase in size with the number of circuits.
3. The customer door shall be hinged the full length of the door and have suitable means of holding the door in the fully open position. Padlock bracket shall extend through door for security.
4. The dead front door shall be hinged and have 3/4 turn clips or other suitable means of locking.
5. Service entrance in back of enclosure shall have a hinged or a lift off cover with padlock provisions.
6. The secondary breaker for the photo-cell circuit shall be 277 Volt, 15 Amp single pole.
7. The wiring from PB1 and PB2 to T1 through T4 shall be No. 6 AWG THW.
8. The wiring for the load and line side of the main breaker shall be the same size with the wire.
9. The wiring for the photo electric control circuit shall be No. 12 AWG THW.
10. All wiring and wiring methods shall comply with the most current National Electric Code standards. Any changes to these standards shall be approved by the authority having jurisdiction.
11. Provide natural aluminum finish.
12. Power arrangement and enclosures shall meet or exceed the local Power Company specifications and requirements.
13. Unless specified by the Power Company, enclosures shall include:
    - I. Exposed meter
    - II. Ringless Socket with jaw-clamping lever-bypass
    - III. Factory installed 5th terminal at 9 o'clock position.

10-29-2014 ADDED PADLOCK AND NEMA 3R REQUIREMENTS
2-28-2014 SPD ADDED TO PROTECT LOAD SIDE CONDUCTORS

NO.	DATE	REVISIONS	BY	APP'D
03	07-14-23	2023 KDOT Standards Updates	AJS	JAN
02	01-12-12	Add SEE PLAN SHEET, Chg'd TopView/Pwer Argm	C.E.	B.D.G.
01	08-20-08	Chg'd Mech. Held Contractors to Elec. Held	V.H.	C.A.L.

KANSAS DEPARTMENT OF TRANSPORTATION

TYPICAL ENCLOSURE DETAILS

ITS-D11D 06-04-25

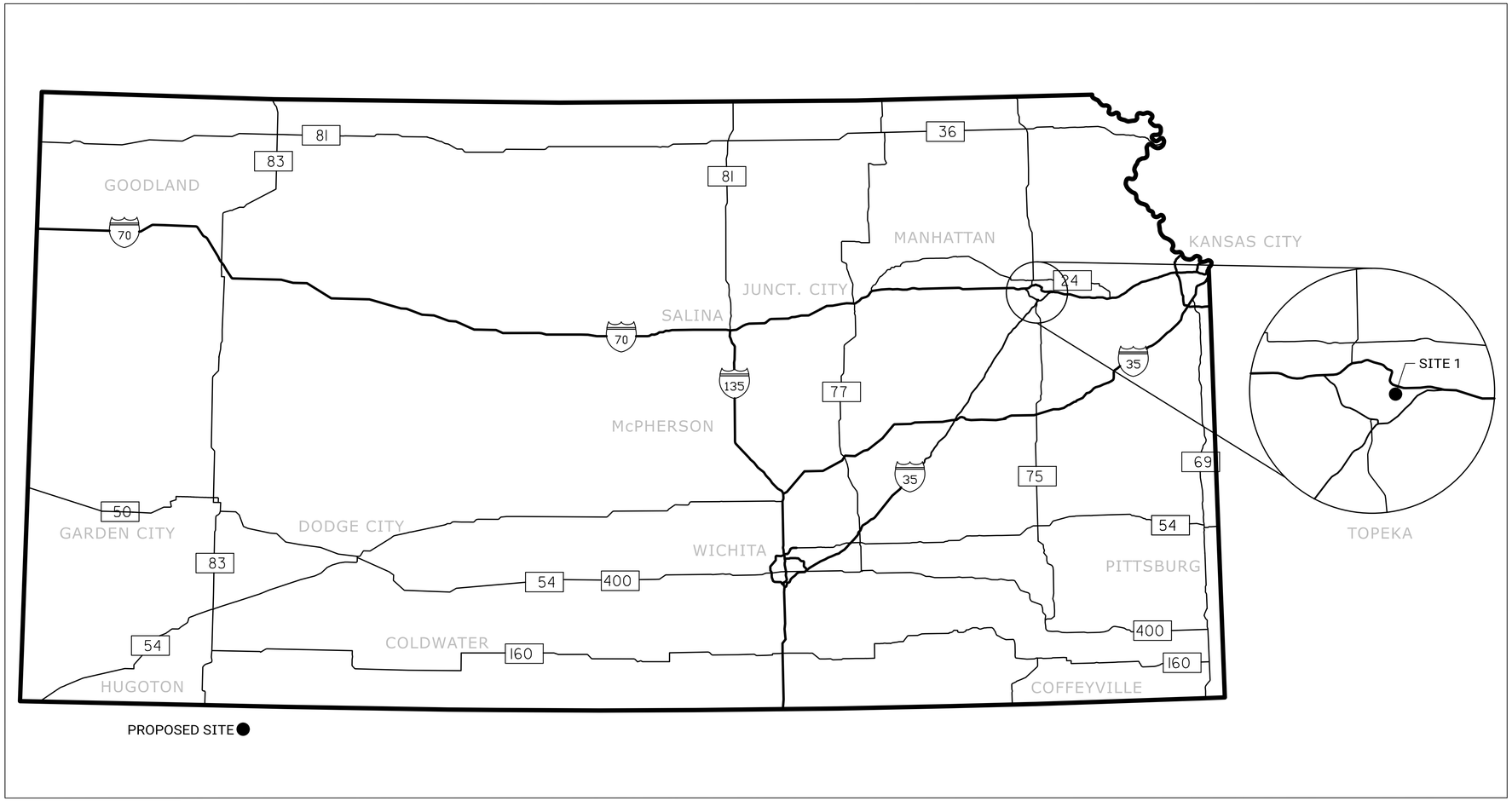
FHWA APPROVAL		APP'D.	
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 06-06-2025 Sh. No. 105

KDOT Graphics Certified

Plotted by : sspatil 16-DEC-2025 14:05
File : ka680801iss-D11D.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	106	253



NOT TO SCALE

UTILITY CONTACTS:

KDOT METRO ENGINEER
STEVE BAALMAN
O - (785) 296-2291
D - (785) 296-1768

EVERGY
MATT SMITH
(785-508-2575)

NOTE:

The Engineer has conducted a field review of all existing power service locations. Contractor shall verify that no damage has occurred since the Engineer's field review. If damage has occurred, the Contractor shall notify the Engineer within five (5) working days of the beginning of the contract.

Contractor shall not begin work at a site until power company has confirmed power drop location for the proposed equipment at that site.

MINIMUM ITS CABINET BREAKER AMPERAGE REQUIREMENTS ARE OUTLINED BY DEVICE BELOW:

DEVICE	MINIMUM BREAKER REQUIREMENTS (AMPS) (ASSUMING 120 VOLT SERVICE)
CCTV	30
DETECTOR	30
ROADSIDE DMS	60
OVERHEAD DMS	100

THIS TABLE OUTLINES ONLY THE MINIMUM REQUIREMENTS.
AMPERAGE FOR EACH DEVICE MUST MEET VOLTAGE DROP AND DEVICE MANUFACTURER REQUIREMENTS.
EACH DMS MUST HAVE ITS OWN DEDICATED BREAKER.
COORDINATE WITH ENGINEER FOR BREAKER REQUIREMENTS FOR ALL DEVICES NOT INCLUDED IN THIS TABLE.

ELECTRICAL SERVICE TABLE

SITE NO.	ADDRESS/CITY/STATE LOCATION DESC.	POWER SERVICE ID	POWER SUPPLY TYPE	SERVICE VOLTAGE	STEP-UP TRANSFORMER VOLTAGE	STEP-DOWN TRANSFORMER VOLTAGE	CABINET NAME	LOAD (WATTS)	LOAD (AMPS)	METER SIZE (AMPS)	METER BASE (AMPS)	NEW BRANCH BREAKERS (POLE-AMPS)	COMMENTS/NOTES	SERVICE UTILITY	CONTACT NAME NUMBER	ESTIMATED COST *
1	EB I-70 AT CALIFORNIA AVENUE MP 363.91 TOPEKA , KS	K070EBPS-363.91	TYPE 1	120/240	–	120/240	K070EBCA-363.91	1000	30	100	100	1P-30	-	EVERGY	Matt Smith (785-508-2575)	$0.00

* POWER SERVICE COST(S) WERE ESTIMATED BY THE SERVICE UTILITY. CONTRACTOR SHALL USE THE ESTIMATED COST IN THEIR BID.
CONTRACTOR SHALL CONTACT AND COORDINATE POWER SERVICE WITH UTILITY.
REGARDLESS OF DIFFERENCE BETWEEN ESTIMATED AND FINAL COST, KDOT WILL PAY FOR FINAL INVOICED COST FROM UTILITY COMPANY USING A CHANGE ORDER.

NO.	DATE	REVISIONS	BY	APP'D
00	07-14-23	2023 KDOT Standards Updates	AJS	JAN

KANSAS DEPARTMENT OF TRANSPORTATION

ELECTRICAL SERVICE LOCATION SUMMARY

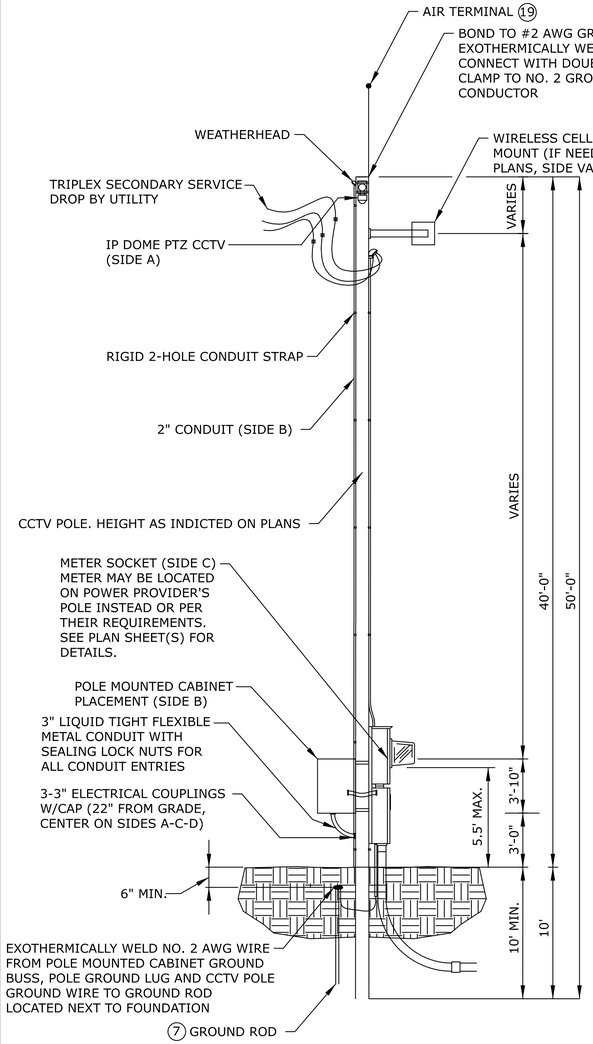
ITS-D12 06-04-25

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

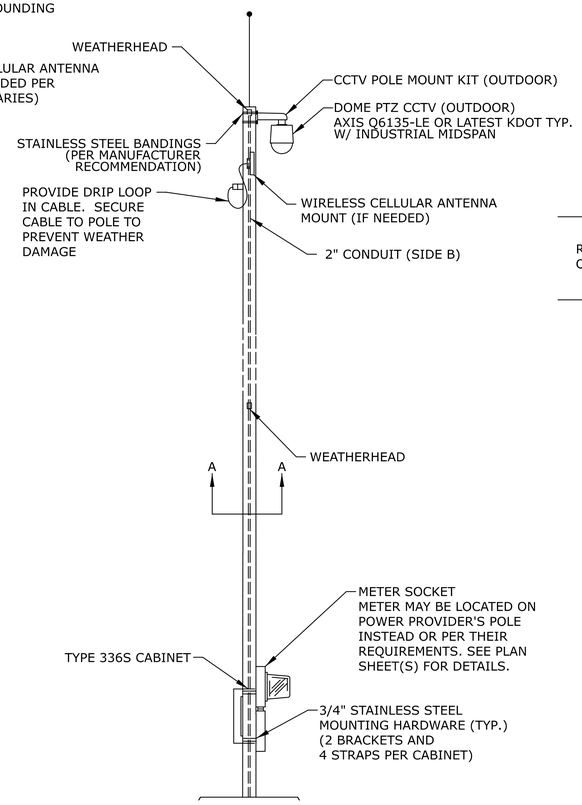
Sh. No. 106

Plotted by : sspatil 16-DEC-2025 14:05
File : ka680801iss-D12.dgn

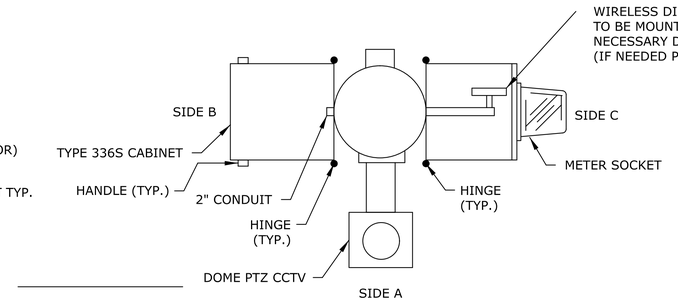
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	107	253



CABINET/CCTV/ANTENNA MOUNTING DETAIL



CABINET/CCTV/ANTENNA DETAIL (SIDE VIEW)



CABINET/CCTV/ANTENNA DETAIL (TOP VIEW)

DESIGN SPECIFICATIONS:

AASHTO LRFD STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINARIES, AND TRAFFIC SIGNALS. FIRST EDITION 2015 THROUGH 2022 INTERIMS.

DESIGN LOADING:

WIND LOADING BASED ON MEAN RECURRENCE INTERVAL OF 300 YEARS FOR A POLE HEIGHT OF 40 FEET ABOVE GROUND

EFFECTIVE PROJECTED AREA FOR CAMERAS AND SENSORS IS 3.58 SQUARE FEET AT A MOUNTING HEIGHT OF 40 FEET.

SOIL DATA FOR EMBEDMENT:

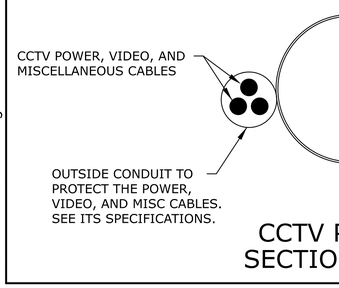
Φ = 20°
c = 0 psf
Y = 45 pcf (submerged)

LIST OF MATERIALS

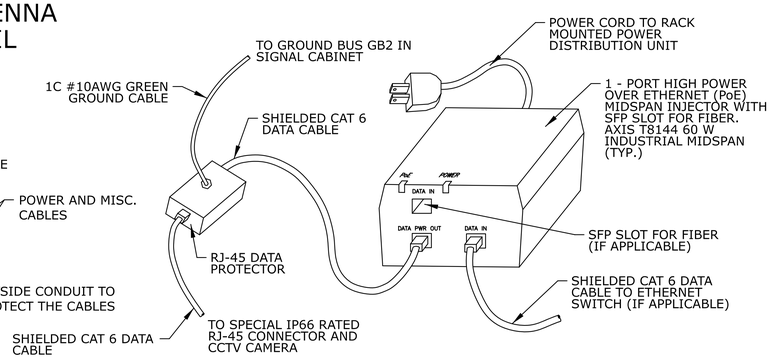
ITEM	DESCRIPTION
1	CLASS 4 WOOD UTILITY POLE (50') CONTRACTOR PROVIDED, STATE OWNED
2	CABLE, POWER #6 AWG MIN.
3	IP DOME PTZ CCTV (AXIS Q6135-LE OR LATEST KDOT)
4	CCTV POLE MOUNT KIT (OUTDOOR)
5	ELECTRICAL CONDUIT, RIGID, 2" MIN.
6	AXIS T8144 60 W INDUSTRIAL MIDSPAN (TYP.)
7	***LIGHTNING PROTECTION (1-3/4" MIN. X 20' OR 2-3/4" MIN. X 10'MIN. GROUND ROD, #2 AWG BARE SOLID COPPER WIRE, & GROUND CLAMP)
8	KDOT KEYED PADLOCKS (KDOT PROVIDED)
9	TYPE 336S CCTV CABINET
~~10~~	~~BATTERY ENCLOSURE~~
11	CELLULAR MODEM (5G)
12	ANTENNA
13	ANTENNA WIRE
14	TERMINAL BLOCK
15	CABINET MOUNTING BRACKETS AND STRAPS
16	CAT6 SURGE SUPRESSER
17	WEATHER HEAD
18	10 AWG WIRE
19	METAL STRAPPING
20	TWO-HOLE CONDUIT STRAP
21	CAT6 CABLE
22	MOUNTING TAPE
23	30 AMP BREAKER (SEE PLANS FOR BREAKER QTY. AT EACH SITE)

GENERAL NOTES:

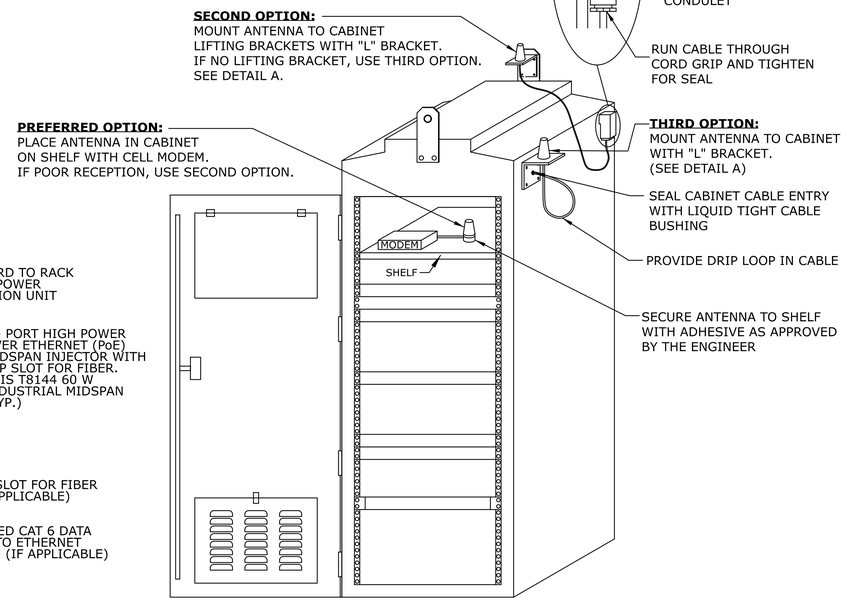
1. FOR CABLE TYPES AND INSTALLATION, SEE STANDARD SPECIFICATIONS.
2. THE TYPE OF POWER SUPPLY ASSEMBLY IS SHOWN ON THE PLANS OR IS DESIGNATED IN THE CONTRACT.
3. ALL WORK AND ITEMS SHALL MEET NATIONAL ELECTRICAL CODE, NATIONAL ELECTRICAL SAFETY CODE AND NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION STANDARDS.
4. MOUNT CCTV CAMERA PER MANUFACTURE'S RECOMMENDATIONS FOR OUTDOOR USE.
5. ALL OPENINGS IN ANY SERVICE BOX OR METER BOX SHALL BE COVERED THEN SEALED WITH 50 YEAR SILICONE CAULK.
6. ALL MATERIALS REQUIRED EXCLUDING REFERENCE ITEMS AS SHOWN ON DRAWING SHALL BE INCLUDED IN PRICE BID FOR POWER SUPPLY ASSEMBLY.
7. UTILITY COMPANY SHALL DECIDE IF LIGHTNING ARRESTERS ARE TO BE CONNECTED ON THE LOAD OR LINE SIDE OF THE METER. THE UTILITY COMPANY SHALL ALSO DECIDE IF THE LIGHTNING ARRESTER IS TERMINATED IN THE METER OR DISCONNECT CABINET. IF TERMINATED IN THE DISCONNECT CABINET, IT SHALL BE INSTALLED ON THE DISCONNECT CABINET.
8. FOR SINGLE CIRCUIT CONTROLLER ASSEMBLY FEED, ROUTE CONDUIT FROM DISCONNECT BOX; MULTIPLE CIRCUITS FROM FEEDER BREAKER PANEL ENCLOSURE.
9. ALL EQUIPMENT, MATERIAL, AND LABOR REQUIRED FOR COMPLETING THE SECONDARY SERVICE CONNECTION WITH ELECTRIC SERVICE PROVIDER SHALL BE SUBSIDIARY TO OTHER BID ITEMS IN THE CONTRACT.



CCTV POLE SECTION A-A



CCTV CAMERA CONNECTION DETAIL (MAYBE DIFFERENT FOR INDUSTRIAL MIDSPAN)



CABINET ANTENA PLACEMENT DETAIL

NO.	DATE	REVISIONS	BY	APP'D

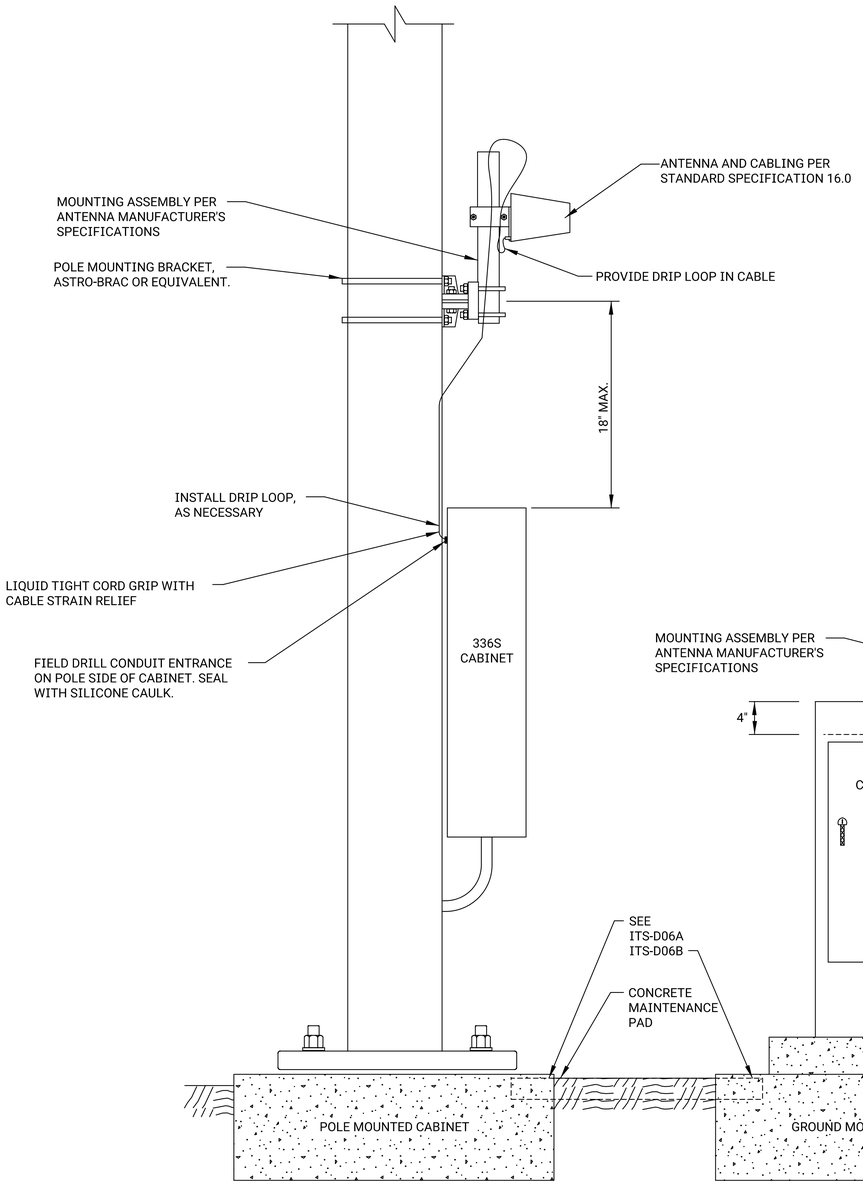
KANSAS DEPARTMENT OF TRANSPORTATION

WOOD POLE MOUNTED CCTV CAMERA ASSEMBLY DETAILS

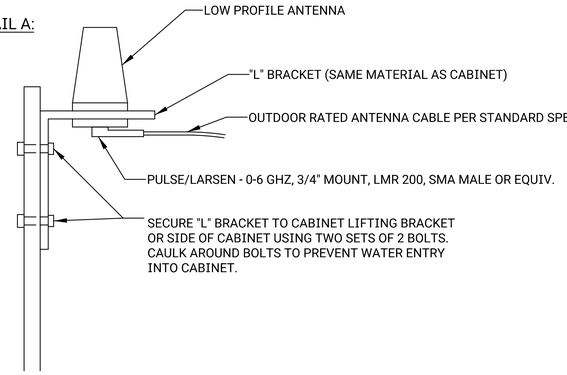
FHWA APPROVAL		APP'D.	
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

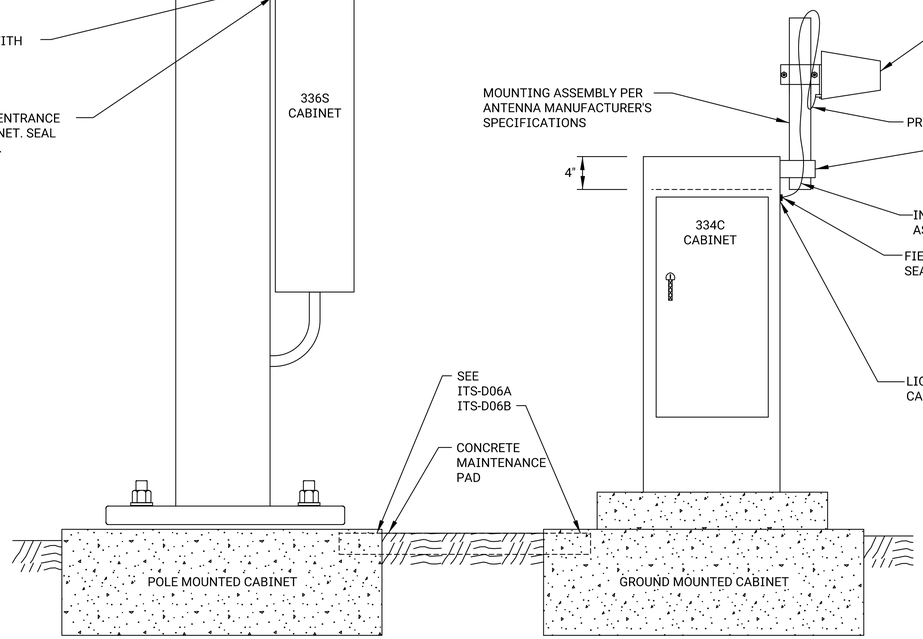
Plotted by : sspatil 16-DEC-2025 14:05
File : ka680801iss-02.dgn

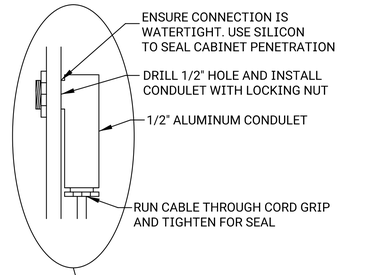
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	108	253

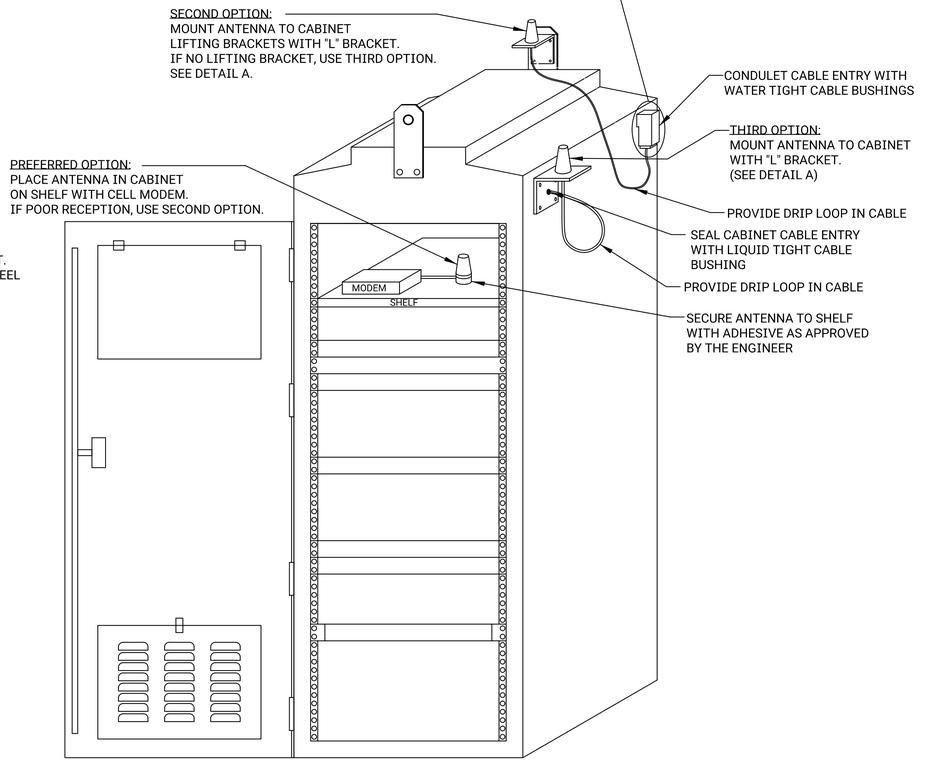


DETAIL A:









YAGI-STYLE ANTENNA NOTES:

1. ALL SEALING CAULK SHALL BE 100% SILICONE.
2. ALL ENTRANCES INTO THE CABINET SHALL BE IN AN EASILY ACCESSIBLE LOCATION FOR ROUTINE MAINTENANCE ACTIVITIES.

LOW-PROFILE ANTENNA NOTES:

1. Antenna shall be placed within cabinet if signal quality is adequate as determined by the Engineer through testing of video streams by the TMC staff. If not, it shall be mounted to the cabinet lifting bracket. If no lifting bracket is present, antenna shall be mounted to the cabinet. See diagram.
2. Antenna type shall be a low profile cellular antenna. Use low profile cellular antenna assemblies where directed by the Engineer.
3. All components shall be rated for outdoor use and be UV resistant.
4. All metal conduit and equipment shall be galvanized or stainless steel.
5. Contractor shall check cellular connection at the specific cabinet location(s) to ensure connectivity to the cellular network. Contractor shall submit the signal strength measurements to engineer prior to installation. The location shall be approved by the Engineer prior to placing the cabinet.

NO.	DATE	REVISIONS	BY	APP'D
00	07-14-23	2023 KDOT Standards Updates	AJS	JAN

KANSAS DEPARTMENT OF TRANSPORTATION

CELLULAR MODEM ANTENNA MOUNTING DETAIL

ITS-D13B 06-04-25

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

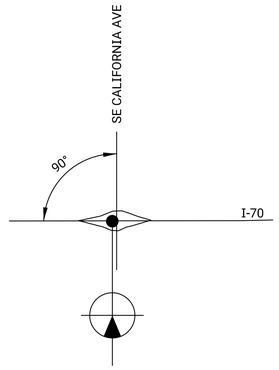
KDOT Graphics Certified 06-06-2025 Sh. No. 108

KDOT Graphics Certified

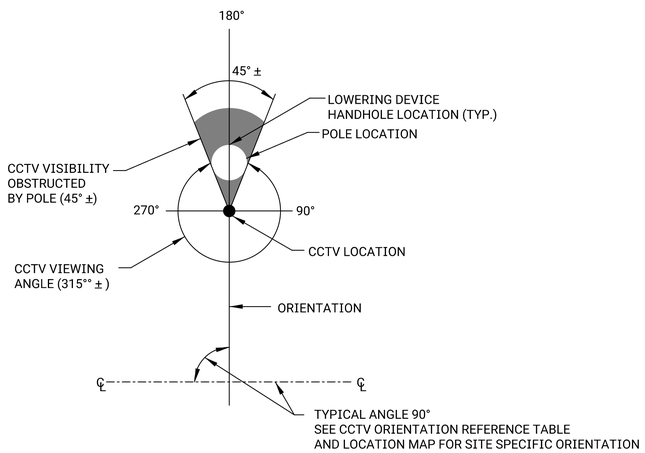
Plotted by : sspatil 16-DEC-2025 14:05
File : ka680801iss-D13B.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	109	253

NOT TO SCALE



K070EBC-363.91
SITE 1



CCTV ORIENTATION REFERENCE TABLE				
SITE	CCTV NUMBER	OFFSET	ORIENTATION ANGLE	ORIENTATION ANGLE REFERENCE CENTERLINE
1	K070EBC-363.91	50'	90°	℄ I-70

HANDHOLE ORIENTATION: CAMERA LOWERING DEVICE ARM TO BE INSTALLED 180 DEGREES FROM THE LOWERING DEVICE HANDHOLE (TYP.). SET POLE IN FIELD TO MAINTAIN THE PROPER CAMERA ORIENTATION ANGLE AND HANDHOLE ORIENTATION.

INSTALL POLE MOUNTED CABINET SO IT IS NOT DIRECTLY UNDER CCTV CAMERAS OR INTERFERING WITH LOWERING DEVICES.

NO.	DATE	REVISIONS	BY	APP'D
00	07-21-23	2023 KDOT Standards Updates	AJS	JAN

KANSAS DEPARTMENT OF TRANSPORTATION

CCTV ORIENTATION DETAIL

ITS-D14 06-04-25

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

Sh. No. 109

Plotted by : sspatil 16-DEC-2025 14:05
File : ka680801iss-D14.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	110	253

CONSTRUCTION AND MATERIAL REQUIREMENTS FOR INTELLIGENT TRANSPORTATION SYSTEM (ITS) INSTALLATIONS

TABLE OF CONTENTS

1.0	DESCRIPTION	SHEET S01
2.0	BID PREPARATION	SHEET S01
3.0	MATERIALS	SHEET S01
4.0	SUBMITTALS	SHEET S01
5.0	CONDUITS	SHEET S02
6.0	PULL BOXES, SPLICE VAULTS, AND JUNCTION BOXES	SHEET S03
7.0	WIRING	SHEET S03
8.0	GROUNDING, POWER SUPPLY ASSEMBLY, AND POWER	SHEET S04
9.0	CONCRETE FOUNDATIONS	SHEET S05
10.0	ITS FIELD ELEMENTS	SHEET S05
11.0	DYNAMIC MESSAGE SIGN SYSTEM (DMS)	SHEET S06
12.0	CLOSED CIRCUIT TELEVISION SYSTEM (CCTV)	SHEET S06
13.0	VEHICLE DETECTION SYSTEM (VDS)	SHEET S08
14.0	ITS CABINET ASSEMBLY	SHEET S08
15.0	FIBER OPTIC CABLE, INSTALLATION, AND HARDWARE	SHEET S09
16.0	CELLULAR MODEMS	SHEET S11
17.0	POINT-TO-POINT (P2P) ETHERNET RADIO (LICENSED BAND)	SHEET S11
18.0	POINT-TO-MULTIPOINT (P2M) ETHERNET RADIO	SHEET S11
19.0	ITS COMMUNICATIONS INTEGRATION	SHEET S12
20.0	ITS COMPONENT TESTING	SHEET S12
21.0	TRAINING	SHEET S13
22.0	BASIS OF ACCEPTANCE FOR ITS SYSTEM	SHEET S13
23.0	MAINTENANCE AND WARRANTY	SHEET S13
24.0	TRM CHECKLIST	SHEET S15

1.0 DESCRIPTION

These specifications describe the equipment, material, and construction requirements to complete the lump sum Intelligent Transportation System (ITS) bid item. Compliance by the Contractor with the Specifications and Plans does not relieve the Contractor of the responsibilities of furnishing equipment and materials of proper design and installation to meet operating warranties for all ITS related components.

2.0 BID PREPARATION

Confirm the existing conditions before preparing the bid. Topography as shown on the plans is derived from existing roadway plans. Visit the site of the work and make a determination of the amount of rock, unclassified, or other materials that might be encountered. No additional pay will be made for differences in material encountered. Review the locations of devices and conduits throughout the project area prior to submittal of bid to determine the types and extent of incidental installation, removal, relocation, and replacement items to include in the price.

3.0 MATERIALS

All materials shall conform to the requirements for individual components of the ITS identified in these Specifications. All materials shall be as specified in the Summary of Quantities on the Plans and shall meet the Buy America Act requirements outlined in Section 106 of KDOT's Standard Specifications.

3.1 BASIS OF ACCPTANCE

Acceptance of material furnished under these specifications will be based on satisfactory submittals that meet the requirements of section 4.0 and on the Engineer's approval of submittals where "no exceptions taken" or "exceptions as noted" is indicated.

3.2 KDOT SUPPLIED MATERIALS

KDOT may provide equipment such as Cisco equipment, VDS, DMS, DMS cabinet, DMS multimode communication cable, and CCTV cameras for installation by the Contractor, as noted in the plans. Refer to the Summary of Quantities in the plans for specific KDOT supplied items. When using KDOT furnished equipment, the KDOT furnished equipment shall become the Contractor's responsibility upon delivery of this equipment to the Contractor.

4.0 SUBMITTALS

Submit one electronic copy of each submittal group to the Engineer for review and approval. At the same time, submit an electronic version to the KDOT ITS unit and others as directed by the KDOT ITS unit. Include in each submittal sufficient information and details to permit full evaluation of each item. Submittals, which in the judgment of the Engineer are insufficient to permit proper evaluation, will not be reviewed. Take care to address all the requirements of the Contract Documents in the submittal data. Leave nothing to assumption. Address the functional and technical interrelationships among the various items in detail.

In each submittal group, state all relevant information regarding materials and equipment in order to procure exact replacements of any or all items on the project. To be acceptable, provide a material list for each submittal group containing all items supplied by the Contractor for the group. The Engineer reserves the right to reject an incomplete or unclear submittal. Identify the materials on the list by the contract project number, item description, catalog part numbers, catalog cuts, shop drawings, trade names, and schedules or other pertinent information. Clearly indicate the materials from any catalog cuts. Note any material designation used in the Contract Documents on the materials list. Submit all manufacturer product sheets for review and approval.

For each item, include in the documents all information necessary to determine product specification compliance. Clearly indicate, on the documentation, the exact model number, accessories, and options that are being proposed for use. If standard manufacturer documentation does not specifically address all the product requirements, then obtain a letter from the manufacturer certifying compliance with each referenced requirement that is not indicated on the standard documentation. If reprinted literature, such as catalog cut sheets, is used to satisfy some or all of the submittal data requirements, do not include any statements on the literature which conflict with the requirements of the Contract Documents. Cross off and initial any such statements. Give an explanation of how specifications shall be met pertaining to items changed from the literature.

4.1 SUBMITTAL SCHEDULE AND REVIEW PERIODS

Submit product data submittals and shop drawings in a timely manner to allow for job completion within the contract working days. All submittals and shop drawings to be approved prior to installion on site.

For each submittal, plan for any given package of submittal information to be in the hands of the Engineer for up to 15 business days. Obtain final approval, in writing from the Engineer, on all items within the submitted documentation. No time extensions will be granted as a result of having to resubmit items for review or having to make any modifications necessary to any submitted documentation. Review of the submittal data by the Engineer will not relieve the Contractor from obligation to furnish and install the work in accordance with Contract Documents.

4.2 SUBMITTAL REQUIREMENTS

Certify, by stamp or letter, that the material has been reviewed and approved and that it conforms to the requirements of the Contract Documents. If this certification is not included, the submittal will be returned without action.

Submit electronic shop drawing submittals for structural items in Group 5 such as CCTV poles and DMS structures as full size created documents or larger. The intent of this requirement is to provide a legible set of shop drawing submittals to allow for a thorough shop drawing review.

At the time of each submittal, define and delineate in writing, separate from the certification, any deviations from the Contract Documents. If the Engineer accepts this deviation, the deviation will be authorized by issuing a change order or if the deviation is minor, by endorsement to the letter.

To aid in control of the submittal data process, transmit each group of submittal data to the Engineer using a transmittal sheet. The Engineer will date-stamp these transmittal sheets with the date received and will return a copy of the stamped transmittal sheet when returning the submittal data. List on the transmittal sheet specifically each item or element included in the transmittal. An element is one part of several parts of information related to the same item. Each drawing shall be listed separately. Furthermore, each drawing shall have a unique drawing number that can be referenced. The same drawing number shall not be used on more than one sheet.

The Engineer review will be only for conformance with the design concept of the work and for compliance with the information contained in the Contract Documents. The review of a specified item, as such, will not indicate review of the assembly in which the item functions. Review by the Engineer will not relieve the Contractor from responsibility for any errors or omissions in the submittals nor from his responsibility for complying with the Contract Documents.

4.3 SUBMITTAL GROUPS

Submit the data for the items in each group together. In general, no items in any group will be accepted until all items in the group are accepted; however, the Engineer may accept some items in a group, at his or her discretion, prior to all items being approved. Submit all additional devices that are not specifically listed below with the appropriate group. Clearly label on each submittal the intended location and purpose for each submitted product. KDOT may provide a list of required submittals to include. For submittal purposes, submit the data for the following items in groups defined as follows:

Group 1 - Conduit, Pull Boxes, Wiring, and Electrical
- HDPE conduit
- Rigid metallic conduit
- Conduit couplings and/or reducers
- Pull boxes
- Splice vaults
- Electrical conductors
- Power service equipment
- PVC Tape
- Grounding equipment
- Air terminal equipment
- Warning tape
- Tracer wire
- Pull rope
- Duct plugs
- Surge Protection Device
- Conduit Caps

Group 2 - Cabinet Assembly
- Cabinet
- Field traffic controller
- Fluorescent or LED cabinet lights and fixture
- Fan and thermostat assembly
- Power supply
- Power strip
- Detector card
- Cabinet rack elevation drawings (See ITS-D04)
- Load center
- Locking system
- Filter
- Door plate label
- Alarm
- Cabinet wiring diagram
- Surge Protection Device
- Label Maker, Label Tape and materials

All other cabinet equipment except CCTV and communications equipment

Group 3 - ITS Device Equipment
- Encoder
- Cat 6 cable
- Communication Switch
- Ethernet/Data transceiver
- PoE Injector
- Pavement sensor
- Vehicle detector
- Sensor mount
- Co-Ax cable
- Cellular equipment
- Communication Surge Protection Device
- Media converter
- CCTV camera and power supply
- CCTV cables
- CCTV mounting equipment
- Detector cable

Automated Gate System
RWIS
Trailer Mounted Devices
Bluetooth detection system
Shop drawings for CCTV camera lowering device, including composite cable for CCTV
Shop drawings and specification for IP CCTV cameras including EPA and weight
Wireless point to multi-point IDU radio, ODU antenna, power supply, mounting equipment, and radio cabling
Wireless point to point IDU radio, ODU antenna, power supply, mounting equipment, and radio cabling
Other communications equipment or accessories

Group 4 - Fiber Optics
Fiber optic cable
Fiber optic patch cable
Fiber optic splice enclosure and trays
Fiber distribution assembly
Fiber optic patch panels
Fiber connectors
Cable labels
Closet connector housing assembly
Any other fiber optic equipment

Group 5 - CCTV, Detector, and DMS Support Structures (send electronic submittal). Structural shop drawings to be reviewed by design Engineer (or consultant of record) with final approval by KDOT.
Shop drawings for DMS structures, foundations, and DMS mounting details
Shop drawings for CCTV pole (including handhole locations) and foundation
Shop drawings for detector pole and foundation
All other structural submittals

Group 6 - Testing
Ground resistance testing procedure and equipment
Example fiber optic test results sheet
Test procedures not provided by KDOT
KDOT provided DMS and CCTV test procedures
OTDR, Power Meter and testing procedures
OTDR equipment calibration certification (recalibrated within 18 months prior to testing unless manufacturer recommends more frequent recalibration)
Power meter calibration certification (recalibrated within 24 months prior to testing unless manufacturer recommends more frequent recalibration)
Device meeting Section 15.3.6.4 (recalibrated within 18 months prior to testing unless manufacturer recommends more frequent recalibration)

Group 7 - Other
Cisco network certifications
Fiber optic splicing certifications
Splicing resume
Fiber optic cable installation procedure
Miscellaneous items that did not fall in any of the previous groups

4.4 STRUCTURAL AND FOUNDATION SHOP DRAWINGS

For all non-catalog or custom made items including the support structures and foundations for VDS, CCTV and DMS, submit shop drawings for approval along with other data necessary to permit full evaluation of the proposed product and/or material. Obtain approved submittals prior to purchase or fabrication of any support structures for use on this project. Roadside DMS leg lengths may be determined in field. Note in shop drawings included in the submittal.

Structural and foundation shop drawings and calculations shall be sealed and signed by a Professional Engineer licensed in the State of Kansas.

No additional payment will be made for Contractor geotechnical work. Historical boring log data may be provided by the Engineer.

NO.	DATE	REVISIONS	BY	APP'D
00	01-09-25	2024 KDOT Standards Updates	AJS	JAN

KANSAS DEPARTMENT OF TRANSPORTATION

ITS EQUIPMENT SPECIFICATIONS

ITS-S01 06-04-25

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

KDOT Graphics Certified 06-06-2025 Sh. No. 110

KDOT Graphics Certified

Plotted by : sspatil 16-DEC-2025 14:05
File : ka680801iss-S01.dgn

4.5 APPROVALS
Any work done prior to the Engineer's review and approval will be at the Contractor's risk and expense. Following review of the submittal data, the Engineer will mark the items in one of five ways:
1. "No Exceptions Taken";
2. "Exceptions Noted - Resubmittal Not Required";
3. "Rejected - Resubmittal Required";
4. "Review Not Required".

Proceed with any items marked "no exceptions taken" since the Engineer has taken no exception to the submittal. Proceed with any items marked "exceptions noted - resubmittal not required", provided that the Contractor concurs with the notations. In such case, proceed immediately to correct said items and resubmit them for review. Items that are marked "rejected - resubmittal required" are judged to be unacceptable. Proceed immediately to identify new items or redesign said items and resubmit them for review.

Substitutions for any of the materials on the list are not acceptable without prior written approval by the Engineer. Submit in writing to the Engineer any changes to the approved materials list.

4.6 ORDER OF WORK
Provide a construction schedule (in MS Project or similar format) outlining the proposed order of work that shows a timely progression of ITS related construction. The Contractor will be allowed to construct footings and place concrete, install conduit and cables, and return at a later date to install the poles, controller assembly, or CCTV. The construction schedule shall provide a detailed plan for connection to the existing KDOT traffic management system.

5.0 CONDUITS

5.1 DESCRIPTION
Construct and install conduits per the KDOT Utility Accommodation Policy as detailed on the Plans, as noted below, or as directed by the Engineer. Provide conduits of the type and size as shown on the Plans. Provide all incidental items necessary to provide a complete and fully functional conduit system. If approved by the Engineer, conduit may be installed by trenching, plowing, or directional bore; however, payment will be made based on the installation method indicated in the Plans for that conduit. No additional payment will be made for installation methods not indicated in the Plans unless approved by the Engineer.

If Micro-Duct is identified in the plan, reference ITS-SMD for all Micro-Duct Pathway details and specifications.

5.2 MATERIALS

5.2.1 RIGID METALLIC CONDUIT
Rigid metallic conduit (RMC) is a threaded metal raceway of circular cross section with a coupling, which can be either a standard straight tapped conduit coupling or the integral type. Cover threads on the uncoupled end by thread protectors prior to installation. Adhere to UL 6 standards and outdoor ratings for all RMC and fittings. All RMC must be galvanized steel in accordance with KDOT Standard Construction Specification 1703.2. Where RMC is installed underground, wrap with an approved PVC tape. For RMC conduits that transition from above ground to underground, the PVC tape shall be extended 6 inches above ground level. Provide a bushing to all metallic conduit ends to protect the electrical conductors or fiber optic cable from abrasion.

5.2.2 NON METALLIC CONDUIT/HDPE CONDUIT
Provide HDPE conduit that is Schedule 80 and UL listed. Provide color-coded conduit as required for installation location. KDOT installation area: Provide red conduit for electrical cables, green conduit for communication and fiber optic cables, and black conduit for spare. KC Scout installation area: Provide yellow conduit for electrical cables, blue conduit for communication and fiber optic cables, and black conduit for spare. Install HDPE conduit according to manufacturer's instruction.

5.2.3 CONDUIT REPAIR SPLICES
When conduit is used to repair a section of existing conduit to provide the required conduit pathway, provide the same grade and size HDPE conduit as the existing conduit. Approval by the Engineer is required for mechanical conduit splices.

5.2.4 TRACER WIRE
Provide orange No. 12 AWG THHN solid copper wire in all underground conduit.
See ITS-D07, D08, and D09 for additional information regarding test stations and tracer wire.

5.2.5 WARNING TAPE
Provide color durable and chemically resistant red reinforced 3 inch minimum wide, 4-mil thickness warning tape imprinted with "CAUTION BURIED CONDUIT BELOW" for conduits. Provide color durable and chemically resistant orange reinforced 3 inch wide warning tape imprinted with "CAUTION - FIBER OPTIC CABLE BURIED BELOW" for fiber optics.

Install warning tape 12" above the top of electrical, fiber optic, and communications conduits, or as directed by the Engineer.

5.2.6 PULL ROPES
Provide polypropylene or polyester pull ropes with a minimum tensile strength of 1,125 lbs.

5.2.7 CONCRETE ANCHORS
The following requirements apply: federal specification FF-S-325, Group II, Type 4, Class I and galvanized in accordance with ASTM A 153, B 695-91 Class 50 or constructed of stainless steel. Furnish a manufacturer's certification that the concrete anchors meet the required material and galvanizing specifications.

5.3 PROOF AND REPAIR OF EXISTING CONDUIT
Proof, and repair as needed, existing conduits to allow fiber optic backbone cable to be pulled or blown through existing conduit as shown on the Plans. In some instances, the existing conduits are collocated with leased fiber conduits. When accessing the KDOT conduits to repair or install a splice vault, care must be taken not to impact the leased fiber conduits.

5.3.1 CONDUIT PROOFING
Provide a single continuous conduit path for pulling or blowing of fiber backbone and fiber branch cables as shown in the Plans. The continuous path must be demonstrated through the conduit between existing pull boxes or newly installed splice vaults by providing a clear path through mandrel or blowing a rubber ball through the conduit.

5.3.2 CONDUIT REPAIR
Repair conduit where needed and as approved by the Engineer by installing a new conduit section connected to the existing conduits using a mechanical conduit splice. Request and receive approval from the Engineer prior to any repair work. Conduit repair is defined based on a section. A section is considered a continuous length of conduit that is removed and replaced in order to provide a continuous conduit path in the excavation area. If multiple conduits are proofed and fixed at one excavated location to allow a continuous path, this will be considered one conduit repair, regardless of how many conduits are tested and touched. Contractor should test conduits to determine if additional blockages exist within 25 feet of the excavation area to evaluate which conduit to repair. Contractor to take care toward repairing the correct conduit within a conduit bundle. If more than one conduit is present, use the first unblocked conduit that can be repaired to provide a continuous path between pullboxes.

The Contractor shall include five (5) sections of conduit repair in their ITS lump sum bid and shall provide a unit price per section in the Unit Cost List shown in the Required Contract Provision Furnishing Individual Components Necessary for the ITS System. KDOT makes no guarantee that this quantity will be utilized in the contract. The unit price quoted in this contract provision will be used to decrease the ITS lump sum bid through a change order for any sections of conduit repair that are not needed or to increase it if more than five sections are needed.

Seek approval from the Engineer prior to use of discretionary splice vaults or pullboxes for conduit repair. Maintain detailed conduit repair records (including, but not limited to the date, time, exact location, quantity in feet, approval/authorization), then submit these records to the Engineer. Conduit damaged by the Contractor during work performed under this contract shall be repaired at the Contractor's expense.

5.4 CONSTRUCTION REQUIREMENTS

5.4.1 LOCATION OF CONDUIT
Prior to construction, contact Kansas One-Call and any private utilities for locates. Field check the existing conditions at each site, including utility locator service markings, to assure no conflicts with existing utilities, including state-owned underground lighting, traffic signals, cathodic protection facilities, and drainage features. Upon written approval by the Engineer, alter the route of the conduit to avoid conflicts. Conduit shall be installed in straight lines either parallel or perpendicular to the right of way line to the best extent possible. Install trunk line conduit adjacent to the edge of the right of way or in the backslope of the ditch. Install conduit branch lines perpendicular to trunk line conduits. Slope conduit to a pull box at a minimum rate of 0.5 percent.

Unless otherwise shown on the Plans, accomplish a change in direction of conduit by bending the conduit uniformly to a radius that will fit the location or by the use of standard bends. The minimum bending radius of all conduits is the greater of the following: twenty (20) times the diameter of the fiber optic cable; six (6) times the internal diameter of a 2-inch conduit or smaller; ten (10) times the internal diameter of a 3-inch conduit or larger.

5.4.2 NOTIFICATION
After utility locates have been completed, and prior to any construction, notify the owner of any leased fiber (when applicable) a minimum of two weeks in advance and again at 72 hours in advance to have an inspector on site prior to any planned work adjacent to their conduits. A leased fiber representative along with a KDOT representative must be present for work that is within five feet of leased fiber conduit. Any adjacent work located within ten feet of any leased fiber conduits, fiber optic pullboxes or vaults will all be done by hand trenching and digging. No mechanical equipment will be allowed.

5.4.3 THREADING
Use nipples to eliminate cutting and threading where short lengths of conduit are required. If it is necessary to cut and thread steel conduit, no exposed threads will be permitted.

5.4.4 CLEANING
Blow air through each conduit to remove debris and water. Clean and swab all conduits before cables are installed. Install expandable type dust plugs after cleaning on each end of individual conduits.

5.4.5 MANDREL TEST
Test conduit path by pulling a mandrel through the conduit. The mandrel shall have a diameter no less than 70% of the inside diameter of the conduit and a length of 2 inches. If the conduit does not allow the mandrel to be pulled through, clean and/or repair conduit to permit passage of the mandrel. When conduit run is an extended distance the Contractor may seek alternative methods as approved by the Engineer for this test.

5.4.6 END TREATMENT
Cut HDPE conduit inside pull boxes and splice vaults at a 90 degree angle with 10 inches to 14 inches exposed inside of the box. Pull from one box to the adjacent box (minimize stretching), not pulling through several boxes at the same time (minimize stretching), and anticipate some conduit pullback by installing a small amount of extra conduit. Conduit installation may be rejected if conduit pullback occurs resulting in less than 8 inches of exposed conduit.

Sand all conduit ends smooth in order to eliminate any burrs on the inside or outside diameter of the HDPE conduit.

5.4.7 SPLICING
Use mechanical splices made in accordance with conduit and splice manufacturer's recommendations. Fusion conduit splices are not allowed. Submit materials to be used for conduit splices to the Engineer for review and approval along with the manufacturer's recommendations and installation procedures.

5.4.8 DEPTH
The following requirements apply: a minimum of 42 inches of cover for all underground conduit containing communication service; a minimum of 48 inches of cover for all underground conduit containing electrical service; a minimum of 5 feet of cover below crown grade or 3 feet below ditch grade for all utilities crossing under roadways. Encase conduit in concrete or other appropriate means as approved by the Engineer if this minimum conduit depth cannot be achieved at site-specific locations. The Engineer will determine if exceptions to meeting the depth requirements are necessary.

5.4.9 TRACER WIRE
Tracer wire shall either run continuous through splice vault, or be grounded per ITS-D07, D08 and D09 as appropriate or as required per this specification. Tracer wire shall be installed in all conduit runs (including power and communications). When multiple conduits share the same trench or bore, only one conduit will be required to contain a tracer wire. Pull tracer wire into all cabinets and device bases. Terminate tracer wire inside cabinets or device bases. Continuously connect tracer wire along the fiber backbone. Use waterproof lug connectors in splice vaults and pull boxes to electrically bond the tracer wires when continuous runs of tracer wire cannot be installed. Label all tracer wires at all access points with "TRACER". All in-ground test stations shall be of the grounded type.

Terminate fiber tracer wires on the installed cabinet test station lugs. Power or fiber should be terminated in the in-ground locator test station terminals, as applicable. Ensure a continuous tracer wire run so that locates can be performed by connection at any single point.

The contractor shall provide an updated GPS location sheet for installed conduit and vaults. Upon TRM Submittal and prior to final acceptance, the Contractor shall coordinate with the Engineer to call an initial locate for the entirety of installed conduit through KDOT's locate contractor. This work shall ensure that KDOT's utility locator is able to mark the new conduits appropriately. Any areas where locates cannot be completed will be identified for remedial action. This process shall be repeated until the entire installed conduit sections can be located appropriately. Any marking locates necessary prior to final acceptance (i.e. during construction) shall be the responsibility of the contractor and follow general located practices. This work shall be subsidiary to the installation of the locate wire and equipment.

After final project completion and prior to project acceptance Contractor shall coordinate with KDOT ITS to perform an initial one-call locate to ensure new and existing tracer wire and test station is working properly. Contractor will provide monthly reports with GPS coordinates of newly installed conduit and vaults to the ITS Engineer.

Contractor is responsible for one-call locates of the newly constructed facilities during construction and until final acceptance. Contractor will provide monthly reports with GPS coordinates of newly installed conduit and vaults to the ITS Engineer.

NO.	DATE	REVISIONS	BY	APP'D
01	06-04-25	Tracer Wire Updates	AJS	JAN
00	01-09-25	2024 KDOT Standards Updates	AJS	JAN

KANSAS DEPARTMENT OF TRANSPORTATION

ITS EQUIPMENT SPECIFICATIONS

ITS-S02 06-04-25

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

KDOT Graphics Certified 06-18-2025 Sh. No. 111

KDOT Graphics Certified

Plotted by : sspatil 16-DEC-2025 14:05
File : ka680801iss-S02.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	112	253

5.4.10 CONDUIT IN TRENCH
Excavate trenches to the width and depth necessary for conduit installation as shown in the Plans. Do not use material which might cause mechanical damage to the conduit for backfilling below an elevation 6 inches above the conduit. Clean the bottom of the trench of such material before the conduit is placed. Obtain approval by the Engineer of the trench prior to conduit placement. Backfill and compact all trenches.

5.4.11 BORED CONDUIT
Install bored conduit without disturbing the existing surface. Place bored conduit by boring or other approved means. Locate all bore pits and spoil piles a minimum of 4 feet from the edge of the paved roadway or shoulder surface and barricade, fence, or protect the pits by some other acceptable method from errant vehicles or pedestrians.

5.4.12 PLOWED CONDUIT
Conduits may be installed by plowing upon approval of the Engineer. Use a vibratory type plow which will place conduits at the minimum depths indicated above when installation is accomplished by plowing. Compact the soil over the installation to the original in-place density. Do not plow conduits in rocky areas.

5.4.13 EXTERNAL CONDUIT ON STRUCTURE
Obtain all permits and approval of all external conduits on structure according to the KDOT Utility Accommodation Policy. All permitting for attachments will go through the KDOT Bridge section for review.

Use Galvanized RMC for all above ground external conduit as noted in Section 5.2.1. When HDPE conduit is installed inside a RMC raceway, install the HPDE conduit such that there are no splices. Use an approved expansion/contraction joint if a splice is necessary.

Use external conduit on structure for existing structures, or if provisions are not made in the Plans for providing a conduit raceway in new structures. Conduit on structure includes conduit on bridges, retaining walls or other structures. Adhere to the requirements in the KDOT Utility Accommodation Policy (latest edition) for all bridge/structure attachments, except as noted herein. Install conduit based on the bridge type. Do not attach conduit to prestressed concrete girders or prestressed-precast concrete deck panels.

Securely fasten conduit within 3 feet of each transition box or other conduit termination. You may increase fastening to a distance of 5 feet where secured to the concrete with clamps or supported by openings through framing members at intervals no greater than 10 feet.

Install concrete anchors in concrete to a minimum embedment of 1.8 inches.

Do not use drilling, grinding or welding if it is necessary to anchor the conduit to steel bridge members. The Engineer shall approve attachment method to steel members. Install junction boxes as shown on the Plans or as directed by the Engineer. Surface mount junction boxes and install such that covers are easily accessible.

Use a conduit expansion fitting when the conduit crosses a bridge expansion joint. Ensure that minimum movement in either direction is provided in the expansion fitting as shown on the Plans or as specified by the Engineer.

5.4.14 GROUNDING AND BONDING
In all conduits for electrical cables, except spare conduit, install a copper wire of a gauge equal to the largest current carrying conductor in the conduit. Use a No. 6 AWG ground wire when the largest current carrying conductor is smaller than a No. 6 AWG. Bond the wire to the ground lugs in poles and cabinets and bond the wires to each other to form electrically continuous conductors over the full length of the conduit system.

5.4.15 SEALING OF CONDUITS
Seal all spare conduit entering pull boxes, splice vaults, cabinets, and foundations with an approved watertight mechanical duct plug. Seal conduits that contain cables with watertight duct seal. Expandable foam seal is not permitted. Do not cap or plug with tape. After cleaning and testing have been completed, place a pull rope in all empty conduits.

<u>6.0 PULL BOXES, SPLICE VAULTS, AND JUNCTION BOXES</u>

6.1 DESCRIPTION
Construct and install all pull boxes and fiber optic splice vaults provided for in this contract as noted below and as detailed in the Plans, or as directed by the Engineer.

Install pull boxes and splice vaults according to the locations, lines, grades, and details shown on the Plans. Locations may be adjusted during installation to clear obstructions and to facilitate wiring as approved by the Engineer. The quantity of pull boxes and splice vaults as shown in the Plans may not be modified without the Engineer's approval. Install additional pull boxes and splice vaults at Contractor's expense and with Engineer's approval to facilitate the ease of construction and pulling of electrical conductors and fiber optic cables.

6.2 MATERIALS

6.2.1 PREFORMED PULL BOX AND SPLICE VAULT
Pull box and splice vault dimensions are shown on the Plans. Preformed pull boxes and splice vaults are composed of mortar consisting of sand, gravel and polyester resin reinforced by a woven glass fiber mat or of resin mortar and fiberglass. Pull box and splice vault shall be rated for a minimum loading of Tier 22 per ANSI/SCTE 77, current edition. Equip each pull box and splice vault with a bolt down cover of the same material and rating per ANSI/SCTE 77, current edition. Electrically bond metal conduits to one another when used in preformed pull boxes.

Rectangular fiber optic splice vault with split lid is for KDOT installations. Round fiber optic splice vault is for KC Scout installations.

6.2.2 PREFORMED PULL BOX AND SPLICE VAULT COVER
Covers on pull boxes shown on the Plans that contain 480 volt or greater circuits shall be labeled with 5" x 11" cast-in, stamped concrete with "KDOT CAUTION-HIGH VOLTAGE". Covers on pull boxes that contain electric cable (120V/240V) shall be labeled with 5" x 11" cast-in, stamped concrete with "KDOT ELECTRIC". Covers on pull boxes that contain communication cable shall be labeled with 5" x 11" cast-in, stamped concrete with "KDOT ITS". Covers on all other pull boxes or splice vaults shall be labeled with 5" x 11" cast-in, stamped concrete with "KDOT ITS" unless otherwise directed by the Engineer. Maintain 2 inch tall block letter widths and spacing. Substitute "KC SCOUT" for "KDOT" on KDOT ITS vaults in the KC Scout area and use 4 inch tall block letter widths and spacing.

Covers on pull boxes and splice vaults shall be rated for a minimum loading of Tier 22 per ANSI/SCTE 77, current edition.

Each pull box and splice vault shall be equipped with a bolt down cover. The threaded hole which receives the cover hold-down bolt shall be open at the bottom to allow cleanout of sand, dirt, and other debris. Lock down bolts shall be stainless steel or brass with a penta-head. For each project, provide KDOT with one penta-head socket and pull box lifting hook. Provide one additional penta-head socket and lifting hook for every twenty pull boxes installed within a project. Sockets and lifting hooks must be submitted to the Engineer prior to the start of the 60-day test period for any device or system.

6.2.3 STONE DRAIN
Comply with Section 1107.2 (e) of the KDOT Standard Construction Specifications, use crushed stone.

6.2.4 IN-GROUND LOCATE TEST STATION
Furnish an in-ground locate test station for each ITS Splice Vault and ITS Communication Pull Box. The tracer wire terminal shall be solid brass or bronze alloy and be accessible from the top of the test station without requiring removal of the lid. The locate test station lid shall be orange and include a flange for low traffic. Submit the proposed test station for approval by the Engineer prior to installation.

6.3 CONSTRUCTION REQUIREMENTS

6.3.1 PREFORMED PULL BOXES AND SPLICE VAULTS
Conduit shall enter the pull box from the bottom, unless approved by the engineer. If using side entry conduit, ensure bend radius of cable is not exceeded when pulling cable. Stub up conduit 6" inside pull box. For multiway microduct, stub up 8" to 12" total, exposing 4" to 6" of individual microducts. If it is necessary to increase the excavation depth and extend the pull box, no direct payment will be made. Excavate the opening outside the pull box wide enough to allow compaction of the backfill material. Do not use cinders, broken concrete, broken rock or other hard or undesirable material for backfilling. Backfill ITS pull boxes and splice vaults.

Drill the holes for the conduit as recommended by the manufacturer. Drill round holes that are no more than 1.5X the diameter of the conduit. Seal all conduit entrances into pull boxes or splice vaults with an expandable foam sealer around the conduits to prevent the entering of foreign material into the pull boxes. Clean all pull boxes and splice vaults so they are free of trash, conduit and wire scraps, etc.

Do not construct pull boxes and splice vaults in or near sidewalk handicap ramps or approaches.

The distance between pull boxes and/or splice vaults shall not exceed 0.5 miles along a route.

When installing ITS communication pull boxes and splice vaults, construct a concrete pad around the perimeter as shown on the Plans. Use KDOT Grade 4.0 on-grade concrete for the pad, or a commercial mixture approved by KDOT and in accordance with Section 401 of the KDOT Standard Specifications. Construct ITS communication pull boxes so the top surface is flush with surfaced areas and approximately 1 inch above earth or sod areas.

Construct all pull boxes and splice vaults with a stone drain that is 2 feet deeper than the bottom of the pull box. Pull boxes or splice vaults located in rock will require a 6 inch concrete floor with a 2 inch rigid conduit drain.

Install separate pull boxes for all power service cables and communications cables. No sharing of the pull boxes will be allowed.

The Contractor shall notify the Engineer if they identify a location where a pull box or splice vault is shown in low-lying area prone to flooding. The Contractor shall work with the Engineer to identify a solution such as moving the pull box or splice vault or installing a French Drain. The Contractor shall include 200 LF of French Drain in their ITS lump sum bid and shall provide a unit price per linear foot in the Unit Cost List shown in the Required Contract Provision Furnishing Individual Components Necessary for the ITS System. KDOT makes no guarantee that this quantity will be utilized in the contract. The unit price quoted in this contract provision will be used to decrease the ITS lump sum bid through a change order for any linear footage of French Drain that is not needed or to increase it if more than 200 LF is needed.

6.3. 2 JUNCTION BOXES
Mount junction boxes to bridges with wedge anchor rods of sufficient size and strength to safely secure the box to the structure. Cover the surface of the junction box which comes in contact with concrete with aluminum colored butyl rubber sealant (caulking compound).

6.3.3 SPLICE VAULT
Install discretionary splice vaults, at Contractor's expense, with approval by the Engineer, along the existing conduit to provide a conduit pathway along the existing conduit or to facilitate pulling or blowing of fiber optic cable. When installing a splice vault, both as shown on the Plans and discretionary, to intercept the KDOT conduits, offset the splice vault from the leased fiber conduit by at least 36 inches. Excavate a new trench adjacent to the leased fiber conduits to allow the KDOT conduits to be re-aligned to intercept the new splice vault offset from the leased fiber conduits. Maintain minimum bending radius for the conduit. Contact the owner of the leased fiber two weeks in advance of excavation adjacent to leased fiber conduits. Do not enter (open, cut into) leased fiber conduit at any time. Only designated representatives from the company which owns the vault has access to the vault.

When rerouting an existing empty KDOT conduit into a new splice vault, propose a method to positively identify the empty KDOT conduit and seek approval by the Engineer. Demonstrate this method of positively identifying the empty KDOT conduit to the Engineer. Perform this demonstration prior to performing field work on the existing conduit.

6.3.4 IN-GROUND LOCATE TEST STATION
Install an in-ground locate test station for each ITS Splice Vault and ITS Communication Pull Box. The in-ground locate test station shall be embedded in the concrete apron surrounding the splice vault or pull box as shown in the splice vault and pull box details. Provide a flexible metallic conduit from the test station to the inside of the vault as shown in the details. Ensure all tracer wires are securely connected to the test station as recommended by the test station manufacturer. The tracer wire shall be connected to the terminal so as to provide a continuous locating system throughout the limits of each device site.

6.3.5 RODENT BAIT
The contractor shall install 2 blocks of rodent bait upon the installation of a vault.

<u>7.0 WIRING</u>

7.1 DESCRIPTION
Comply with the requirements as detailed in the Plans and as described below. Provide wiring of the type and size as shown on the Plans. This section specifically does not include fiber optic cable.

7.2 MATERIALS

7.2.1 ELECTRICAL CONDUCTORS
Use electrical conductors and associated equipment that meet the requirements of ICEA, IMSA, NEMA, RETMA, NEC and the regulations of the national board of fire underwriters, as applicable, and meet the approval of the Engineer. Use soft drawn copper for all conductors except as noted. Solid conductors may be used only for grounding where connected to a ground rod.

Use copper cablings that conform to ASTM B 3 and B 8 with flame-retardant, moisture, and heat resistant cross-linked polyethylene or thermoplastic insulation rated for 90°C in wet locations and listed by UL as Type XHHW-2 or USE-2. Use solid wire for No. 10 AWG and smaller and stranded wire for sizes No. 8 AWG and larger.

For all current carrying electrical conductor runs, use ground wire in run that matches AWG size of the largest conductor in a specified run.

Furnish all low voltage, control, and communications cables on reels. Use reels with continuous cable of sufficient length to permit the associated cable runs to be made without splices in between specified locations shown on the Plans. Utilize the appropriate sheath for the particular application. Comply with the requirements of ANSI/EIA/TIA-568 B or latest approved version of that standard.

7.2.2 CAT 6 CABLE
Use outdoor-rated Cat 6 or higher cable with UV resistant outer jacket. Use a gel-free, paper-based waterstop cable for cabinet and outdoor installations. Furnish plenum rated cable for installations inside of buildings or shelters including POP buildings.

7.2.3 COMMUNICATION (CCTV) CABLE
Comply with manufacturers requirements for Communication CCTV cable. Use communication (CCTV) cable for analog cameras that are 75 ohm co-axial construction with copper center conductors and polyethylene dielectric material. Use co-axial shields that are braided with a 95% minimum coverage. Use outer jackets for cables that are UV resistant and flame retardant. Install CCTV cable connectors that are of the type appropriate for devices specified in the Plans (BNC, F, etc.). For IP based cameras, use communications CCTV cable that is a Cat 6 or higher Ethernet cable with RJ-45 connectors, gold plated, shielded, and allow for power over Ethernet.

NO.	DATE	REVISIONS	BY	APP'D
00	03-27-25	2024 KDOT Standards Updates	AJS	JAN

KANSAS DEPARTMENT OF TRANSPORTATION

ITS EQUIPMENT SPECIFICATIONS

ITS-S03 06-04-25

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

Plotted by : sspatil 16-DEC-2025 14:05
File : ka680801iss-S03.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	113	253

7.2.4 COMMUNICATION (RF) CABLE
Use communication (RF) cables that are 75 ohm co-axial construction with polyethylene dielectric material. Use co-axial shields that have 100% coverage. Use outer jackets for RF cables that are UV resistant and flame retardant. Use RF cables (excluding jumpers with lengths less than three feet) that have an attenuation of less than 6 dB per 100 feet at 1800 MHz. When using RF cables for jumpers of less than three feet, an attenuation of less than 18 dB per 100 feet is required. Install RF cable connectors or provide manufacturer pre-installed RF cable connectors that are appropriate for the type of device as specified in the Plans.

7.3 CONSTRUCTION REQUIREMENTS

7.3.1 PULLING
Use insulating types of pulling compounds containing no mineral oil. Follow the pulling tension limits recommended by the wire and cable manufacturer. Use a dynamometer where mechanical means are used. Cut off section subject to mechanical means.

7.3.2 BENDING RADIUS
Use a minimum bending radius for all cable, except fiber optic cable, that is greater than the manufacturer's minimum bending radius and greater than six times the overall cable diameter.

7.3.3 SPLICES
Use continuous low voltage power conductors from the power supply to the control cabinet and not spliced in pull boxes or junction boxes unless indicated on plan. Install all other cables continuous, without splices, from termination to termination. Where required, splice where shown on the Plans or as approved by the Engineer where required for cable installation. Receive pre-approval by the Engineer for all splices and locations.

If splicing in power supply circuits where the voltage does not exceed 600 Volts AC, utilize splices made with approved spring-type wire connectors. Soldered connections will not be permitted. The insulation for the splice shall consist of two layers of electrical rubber tape, four layers of plastic electrical tape, and two layers of friction tape. Securely apply the tapes over the bare wire splice area and back onto the original insulation a minimum of one inch. Apply a minimum of three coats of approved liquid waterproof compound to the splice. The finished splice's electrical and mechanical characteristics and insulation quality are required to be equal to those of the original cable.

Splice conductors only in pull boxes, terminal compartments, pedestals, or cabinets. Splices are not allowed in conduits. Where possible, install cable continuous, without splices, from termination to termination.

7.3.4 INSTALLATION
Install low voltage control and communications cables in conduit separate from power cables, unless otherwise noted on the Plans. Ground the shield of shielded cables at one end only and as recommended by equipment manufacturer. Install and terminate vendor furnished cable in accordance with vendor equipment requirements.

8.0 GROUNDING, POWER SUPPLY ASSEMBLY, AND POWER

8.1 GROUNDING
Ensure that all equipment, devices, wiring, power supplies, and service antennas are protected from external and internal sources, including power surges, lightning, induced voltages, and static discharges. A minimum of 20' equivalent ground rod is required at any location. An alternative grounding array may be submitted by the Contractor for approval by the Engineer to meet site specific field conditions. Ensure that ground rods are listed according to UL requirements as detailed in the standard UL 467, Grounding and Bonding Equipment, and meet the requirements of NEC 250. Use electrodes that are solid copper or copper-bonded steel. Use grounding rod attachments that are minimum No. 4 tin-plated bare copper wires. All components of the lightning protection system shall conform to the current edition requirements of UL 96A and NFPA 780.

Exothermically weld all underground ground rod attachments at all connection points. When ground rods are above ground and inside cabinets, mechanical connections or exothermic welds are both permitted. Bond all metal components of the ITS device subsystem, such as the cabinets, racks, and steel poles, to the grounding system with a grounding cable that uses a mechanical connection on the equipment side and an exothermically welded connection at the down cable.

8.2 GROUND RESISTANCE TESTING AND CERTIFICATION
Per NEC Article 250, achieve a resistance to ground measurement of 25 ohms or less in dry conditions between the grounding electrode and the soil (using multiple electrodes or extending links, if necessary). Isolate the ground rod from the connected system during testing. Make all connections to the grounding electrode using exothermic welds.

Connect all grounding electrodes related to the ITS device and its subsystems, and any grounded electrical system within a 100 foot radius (but not beyond the right of way) of the ITS cabinet base, to a single point main grounding electrode, sometimes referred to as the ground window, which shall be driven a maximum of 3 feet from the base of the ITS cabinet. Provide for each grounding electrode an interfacing hemisphere, which is an imaginary cylinder with a radius and depth equal to the length of the electrode, so each additional electrode must be spaced two times the electrode length away from other electrodes. Bury the bonding wires a minimum of 2 feet below the grade.

Measure the ground resistance with an instrument designed specifically to measure and document earth/ground resistance, soil resistance, and current flow. Perform testing in the presence of the Engineer or their approved representative. Do not bury the exothermic connections to the ground rod until grounding has been approved by the Engineer. Record the approximate ground rod distance from the foundation for future location identification. Conduct the test by using the fall-of-potential method as described in the IEEE Standard 142-2007. Provide the Engineer with written test results for each testing location prior to backfilling the grounding electrode. Include in the test results the instrument model and date of calibration for the device used in the testing and the local environmental conditions at the time of testing. Certify and sign the test results. The 60-day acceptance test for any device at each site will not start until ground resistance testing reports are submitted to the Engineer for that particular site.

8.3 DESCRIPTION
Provide a complete interface between the project electrical distribution system and the utility company providing power service. New service points will be established as indicated on the Plans. As necessary, provide a service pole or pedestal, meter socket, circuit breakers, weatherproof enclosure for the breakers, risers, grounding materials, fittings, and adapters. Circuit breakers and disconnect switches required as indicated on the Plans. Any work to bring the power from outside of the right-of-way to the right-of-way will be completed by utility company providing power service. Comply with the National Electrical Code (NEC) for all work. Pay particular attention to grounding specifications regarding neutral and ground connections at ITS power supply assemblies and cabinets.

Perform the following: Process an application for electrical service for each location, coordinate with the Utility to ensure the proper location of electrical services provided by the utility, provide the Utility with the construction schedule so that power is available when needed. Coordinate with the Utility for installation of the power meter. Contractor is required to install conduit and conductors as required and as directed by Utility between power source and the ITS power service. Contractor shall work with Utility to meet conduit and conductor requirements. Contractor shall be responsible for ordering and paying for any electrical service in KDOT's name when in KDOT area or KC Scout's name when in KC Scout area at the locations shown on the Plans.

The Contractor shall make payment of all power company fees until KDOT or KC Scout assumes ownership. The Contractor shall follow the steps below for the transfer of power:
1. Once the 60-day testing period is complete for a site or the site is confirmed operational by KDOT ITS, the Contractor may transfer the electric bill to the KDOT Area Office.
2. The Contractor shall submit copies of the most recent electric bills (3 months if possible) to the KDOT construction office. In the Kansas City area, copies of the electric bills shall be provided to KC Scout. These bills should clearly state the date and account numbers on each bill.
3. The KDOT construction office or KC Scout will contact the utility provider (e.g., Evergy) to notify them to transfer the account.
4. The Contractor must also contact the utility provider to formally approve the change of ownership. The Contractor should not request transfer of the account until KDOT contacts the utility.

Utility company, contact name, and phone number for each site are listed on the electrical service location summary sheet.

Power coordination will be reviewed at the pre-construction meeting. All utility hookups are incidental.

For additional detail, see sheet ITS-D12.

8.4 MATERIALS
Comply with the details shown in the Plans. Consult the utility company providing power service regarding their service installation requirements and furnish the service equipment in compliance with codes and regulations, and their requirements.

8.4.1 POWER SUPPLY ASSEMBLY, TYPE 1.
Supply and install new Type 1 power supply assemblies in accordance with the details shown on the Plans. Include meter socket and disconnect on a new Type 1 overhead service pole. Use conductor and disconnect size as indicated on the Plans.

8.4.2 POWER SUPPLY ASSEMBLY, TYPE 2.
Supply and install new Type 2 power supply assemblies in accordance with the details shown on the Plans. Provide power supply assemblies that contain a main circuit breaker frame and trip rating as indicated on the Plans. When breaker lugs are not large enough for the conductor size, provide and install a power distribution block in a NEMA 4 enclosure on the secondary side of the disconnect.

The customer door shall have a latching handle with provision for padlocking in the closed position. Provide a temporary padlock. KDOT will replace the padlock with a KDOT-supplied padlock at final acceptance.

8.4.3 SERVICE POLE
Where service poles are required; either new, modification to existing, or replacement of existing, use a service pole that is 35 feet minimum height made of Class 4 or 5 wood. Ground the pole with a ground rod per the utility company's requirements. Where conduit is attached to the pole include a service entrance cap on the top of the conduit run. Design this cap to prevent ingress of water into conduit. Include guy wires where requested by the utility company.

8.4.4 TRANSFORMERS
Provide and install step-down transformers (480 VAC to 120/240 VAC) and step-up transformers (120/240 VAC to 480 VAC) where indicated on the Plans. Use a transformer assembly in all instances where the control cabinet location requires a transformer to ensure that proper voltage is provided to the control cabinet being serviced by the transformer assembly. Use Jefferson Electric phase encapsulated transformers or approved equal that meet these following minimum requirements.

Step-down transformer: The transformer assembly shall consist of a NEMA 3R rated cabinet/enclosure and an appropriate 480 VAC to 120/240 VAC transformer, service disconnect (480 Volt side), and distribution panel (120/240 volt side). The transformer primary voltage shall be 480 VAC and the secondary voltage shall be 120/240 VAC single phase 0.5Hz, grounded neutral. The volt-ampere rating shall be as shown in the Plans.

Step-up transformer: The transformer assembly shall consist of a NEMA 3R rated cabinet/enclosure and an appropriate 120/240 VAC to 480 VAC transformer, service disconnect (120/240 volt side), and secondary over-current protection, via circuit breaker or fuse (480 volt side). The transformer primary voltage shall be 120/240 VAC and the secondary voltage shall be 480 VAC single phase 0.5Hz, grounded neutral. The volt-ampere rating shall be as shown in the Plans.

Construct the cabinet and door from 5052-H32 sheet aluminum alloy with a thickness of 0.125 inches. Form all welds neatly and free of cracks, blow holes, and other irregularities. Ensure that there are no burrs on all inside and outside edges of the cabinets/enclosures. Provide a sloped top on the cabinets/enclosures to prevent the accumulation of water on its top surface. Construct signs that are riveted to the access doors to the transformer and service disconnect stating "DANGER HIGH VOLTAGE". The latching handle is to have a provision for padlocking in the closed position. Provide temporary padlock. KDOT will replace the padlock with a KDOT supplied padlock at final acceptance. KC Scout will replace with a KC Scout supplied padlock at final acceptance.

Where required by the Plans, mount the step-down transformer to the side of the ITS cabinet facing away from traffic. Ensure all cabling runs from the transformer to the cabinet panel board are tied tightly to the rack to prevent excess slack in the cable.

Provide all transformer assembly equipment and accessories furnished on the project that is new, of prime quality, and has not been used previously on other projects or in other locations. All items of the same type shall be identical and totally interchangeable.

Use transformers that include a fused service disconnect appropriately sized for the intended load and to safely clear a fault. Submit the size of the service disconnect for approval.

Use transformers that are single phase, dry type units with two 5% augmentation taps.

The weight of the transformer shall not exceed 250 pounds. Label the transformer (i.e. step-down or step-up) and identify on the exterior all incoming and outgoing voltages. Use transformers that are the quiet type. Do not use sound levels in excess of 45dB.

8.4.5 FITTINGS AND ADAPTERS
Where large conductor sizes of 1/0 or greater are shown on the Plans, provide shop drawings that show the type of fitting/adapter being proposed and the locations in which these fittings/adapters are being proposed to accommodate proper termination (lugs/splices) within panels, pull boxes, and cabinets for a complete system assembly that can be installed in a tidy, professional manner. Utilize fitting/adapter with a set screw to secure the conductors. Do not use a crimp style fitting/adapter.

8.5 SURGE PROTECTION - LOAD SIDE
Surge protection for all power supply assemblies and cabinets should meet the following minimum specifications:
1. Voltage Protection Rating (VPR) of 700V, L-N, L-G, N-G
2. Surge current 40kA per phase
3. Failure indicator
4. Operating temperature range: -20°F (-28°C) to 165°F (74°C)
5. Operating humidity: 95% RH non-condensing
6. 5 year minimum manufacturer warranty
7. Nominal discharge current (In) rating of 10kA

Terminate all cables on surge protectors. Ensure all surge protection devices are grounded properly to the ground bus via a dedicated ground cable to the cabinet grounding bus bar. Ensure ground wires from all equipment have the shortest lead length possible with direct connection to the cabinet ground bus bar. Avoid cable loops and bends for all ground bonds and wires.

NO.	DATE	REVISIONS	BY	APP'D
00	03-27-25	2024 KDOT Standards Updates	AJS	JAN

KANSAS DEPARTMENT OF TRANSPORTATION

ITS EQUIPMENT SPECIFICATIONS

ITS-S04 06-04-25

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

KDOT Graphics Certified 06-11-2025 Sh. No. 113

KDOT Graphics Certified

Plotted by : sspatil 16-DEC-2025 14:05
File : ka680801iss-S04.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	114	253

8.5.1 POWER SUPPLY ASSEMBLY SURGE PROTECTION
Provide a Citel M50-120T or approved equivalent. Power supply assembly surge protection must meet UL 1449 Type 1 Listed, current edition. Supply each power supply assembly with a 120/240 or 240 /480 Volt AC heavy-duty parallel surge protector on the load side of the main breaker.

8.5.2 CABINET POWER SUPPLY SURGE PROTECTION
Provide a Citel M50-120T or approved equal. Devices must be listed to UL 1449 Type 2, current edition, to protect the control equipment from power surges and over voltages. This includes incoming power lines, the power supply, and outgoing lines when applicable. Supply all cabinets with 120/240 Volt AC heavy-duty parallel surge portector on the AC service input. Provide all cabinets except DMS-only cabinets with surge protection that meets SCCR of 100k AIC or available short circuit current, whichever is greater. Provide DMS-only cabinets with surge protection that meets SCCR of 200k AIC or available short circuit current, whichever is greater.

8.6 SURGE PROTECTION - DEVICE SIDE
Surge protection for all ITS devices should meet the following minimum specifications:
1. Failure indicator
2. Operating temperature range: -20°F (-28°C) to 165°F (74°C)
3. Operating humidity: 95% RH non-condensing
4. 3 year minimum manufacturer warranty

Terminate all cables on surge protectors. Ensure all surge protection devices are grounded properly with a direct connection to the ground bus.

8.6.1 CAMERA SURGE PROTECTION
Furnish and install a surge protection system that ensures all cables between the cabinet and the camera are protected by the surge protectors in the cabinet. Camera surge protection must meet the additional following minimum requirements:
1. UL listed and labeled to curent editions of UL 497B and UL 497C
2. Wall, DIN rail, or 19" rack mountable
3. Three stage protection
4. The minimum requirements listed on the following table:

Circuit	Maximum Continuous Operating Voltage	Frequency/ Bandwidth/ Data Rate	Surge Capacity	Max. Let-Through Voltage	Pre-Approved Model
12 VDC	15-20V	N/A	5kA per mode (8x20 µs)	< 150 Vpk	Citel DS220S-12DC
24 VAC	30-55V	N/A	5kA per mode (8x20 µs)	<175 Vpk	Citel DS220S-24DC
Ethernet Data	7-12V	Up to 1 Gbps	5kA per mode (8x20 µs)	< 30 Vpk (100kHz 0.5µs; 6kV, 500A)	Citel MJ8-Cat6
Power over Ethernet	60-70V	Up to 1 Gbps	5kA per mode (8x20 µs)	< 30 Vpk (100kHz 0.5µs; 6kV, 500A)	Citel MJ8-PoE

8.6.2 VDS SURGE PROTECTION
Provide a Wavetronix Click 200 surge protector or approved equal that meets the following minimum requirements:
1. Three-stage surge protection over DC, RS-232, and RS-485 lines
2. Meets NEMA TS2-1998 environmental testiing and IEC 61000-4-5 electrical surge test
Use these inside the cabinet to in order to protect both the power and the communications lines.

8.6.3 COAX/ANTENNA SURGE PROTECTION
Provide surge protection (Citel P8AX09 or approved equal) on all coax/antenna cables entering a cabinet or data closet. Provide and install bi-direction replaceable gas tube lightning arrestors that are UL 497E listed devices.

8.6.4 POWER STRIP - SURGE PROTECTION
Refer to 14.2.13 for details.

8.7 CONSTRUCTION REQUIREMENTS

8.7.1 POWER SUPPLY
The power service locations, as indicated on the drawings, are initial service points coordinated between KDOT and the utility company providing power service. Coordinate with the utility to verify the final point of service. Consult the utility company providing power service regarding their service installation requirements and furnish the service equipment in compliance with codes and regulations and their requirements.

Notify the utility company providing power service for the need for service and coordinate the schedule for that service from the utility. Any power supply requiring modifications from what is shown on the Plans will require an additional service request form to be submitted by the Contractor.

Measure the resistance between the ground electrode and earth using the testing procedures as outlined in these Specifications.

Verify the power service voltage at the power service locations prior to installation of circuits at all locations indicated on the drawings. Provide lightning arrestors of the rated voltage as shown on the Plans. Provide each constructed service drop with a phenolic nameplate indicating the following:
Project “KDOT ITS” When in KC Scout area use "KC Scout"
Service address: “_____”
Service voltage: “_____”
Coordinate with local City government to determine the appropriate service address for power supply if not otherwise shown on Plans.

8.7.2 IN-CABINET GROUNDING REQUIREMENTS AND TESTING
All equipment within the cabinet must be grounded to the master ground bus in the cabinet via a direct-route ground cable as specified. Do not ground equipment to the rack or frame of the cabinet. The ground resistance between each device and the ground bus must not exceed 3 ohms.

8.7.3 GROUNDING SYSTEM CHECKLIST
KDOT will provide a grounding system checklist for each site. Complete the grounding system checklist in the presence of the Engineer or their approved representative for submittal as part of the Technical Reference Manual (TRM). The Contractor shall provide a minimum of 72 hours' notice in request of the grounding system checklist from KDOT and another 72 hours' notice to schedule the grounding system inspection.

8.7.4 POWER CABLE SLACK
For slack requirements see ITS-DO3A and/or ITS-D03B.

9.0 CONCRETE FOUNDATIONS

9.1 DESCRIPTION
Construct and install all foundations for ITS Field Equipment provided for in this contract per Division 400 and 700 of the KDOT Standard Specifications, as modified below, and as detailed in the Plans.

9.2 MATERIALS

9.2.1 REINFORCING STEEL
Use reinforcing steel that meets the requirements of the KDOT Standard Specifications. Use reinforcing steel that is free of rust and dirt. Provide reinforcing steel of the size, number, shape and dimensions as shown in the Plans.

9.2.2 ANCHOR RODS
Provide anchor rods of the size, number and materials as shown in the Plans and meet the requirements of Division 1600 of the KDOT Standard Specifications, as described below, and as detailed in the Plans.

9.3 CONSTRUCTION REQUIREMENTS

9.3.1 CONCRETE FOUNDATIONS
Before placement of the concrete for the foundation, ensure that the appropriate anchor rods are placed in the proper orientation, in both the horizontal and vertical direction. This will be accomplished by using preformed rod templates as detailed in the Plans. Protect all anchor rod threads from concrete fouling when the foundation is poured.

9.3.2 CONDUIT ENTRY
Extend Conduit 5" into base of pole. Cables shall not be exposed between the foundation and the pole.

9.3.3 ANCHOR ROD INSTALLATION
Install anchor rods per the Plans and according to KDOT standard specification 738.3.e.

10.0 ITS FIELD ELEMENTS

10.1 DESCRIPTION
This work consists of furnishing equipment and material for, and installing ITS field elements in conformity with the locations and details shown on the Plans or established by the Engineer. ITS field elements include the controller assemblies, cabinets, communication equipment, closed circuit television (CCTV) systems, vehicle detection systems (VDS), and dynamic message sign (DMS) systems.

10.2 MATERIALS
Furnish all tools, labor, equipment, materials, supplies, and manufactured articles and perform all operations necessary to construct the ITS field element installations as shown on the Plans and as specified herein. The hardware, construction services, and support services specified are intended to describe the minimum configuration that would be acceptable for these installations.

10.2.1 LABELING EQUIPMENT
Apply permanent external labeling on all communication equipment; including any required cross connects to communications equipment, according to these contract documents. Use self-laminating vinyl or polyester labels at least 3/4-inch wide and long enough that the translucent portion of the label completely covers the white area bearing the legend. Use vinyl or polyester with a layer of pressure sensitive acrylic adhesive. Use labels that resist oil, water, and solvents and are self-extinguishing. Use a machine to print the legend in letters at least 1/8 inch high.

10.2.2 INCIDENTALS
Furnish and install all incidental accessories necessary to make the system complete in all respects and ready for operation, even if not particularly specified; furnish, deliver, and install all incidentals without additional expense. Include in the work and in the bid all minor details not usually shown or specified, but necessary for the proper installation and operation.

10.2.3 CABLES AND CONDUCTORS
Incidental items include all cables and conductors including but not limited to, serial cables, alarm ribbon cables, Cisco equipment power cables, DC power cables, AC power cables, power service conductors, fiber optic jumpers, signal cables, interface cables, and other cables and connectors located at the field element sites. All cables and conductors shall be labeled with the standards identified in these specifications. No separate payment shall be made for incidental items.

10.2.4 MEDIA CONVERTER
Furnish and install a GE Security IFS Ethernet Optical Transceiver DE7200 or approved equal if specified in the Plans with the following minimum requirements:
1. 10/100 Mbps Ethernet, auto-negotiating, full duplex or half duplex data. IEEE 802.3 compliant.
2. Auto network detection.
3. NTCIP Compatible
4. Optical: 1310/1550 nm, Single-mode fiber optic cabling support. LC optical connectors.
5. Minimum optical range of 10 miles.
6. Data: RJ-45 connector
7. Power: 12VDC @ 200mA
8. Power, Transmit, and Received LED indicators.
9. Physical Properties: 4.0 in x 3.0 in x 1.0 in, 2.0 lbs maximum
10. Operating temperature range from -20ºF (-28ºC) to 165ºF (74ºC)

10.3 CONSTRUCTION REQUIREMENTS

10.3.1 LABELING EQUIPMENT AND CABLES
Label all communication equipment and every cable immediately upon installation. Label all communication equipment and all cables at every point of access, including pull boxes, and termination points. Consult with the Engineer concerning the desired method of identifying each cable.

10.3.1.1 FIBER OPTIC CABLES OUTER JACKETS
1. Label each cable with permanent, weatherproof, and UV-resistant cable tags, with two integrated holes on each end for connecting tag to cable with cable ties. Use self-laminating vinyl or polyester labels at least 3/4-inch wide. Use a machine to print the legend in letters at least 1/8" high.
2. Label each cable where it enters a cabinet, pull box, splice vault, splice closure, and termination points. Tape labels are acceptable at splice closures as approved by the Engineer.
3. All cables shall be labeled within 12 inches of the conduit or other entry point. Label both ends as it comes in and out of a pull box or vault.
4. Label FO trunk cables with the following information:
   a. The number of fiber strands in the cable by mode
   b. Cable type (single mode “SM”, Multi-mode “MM” or hybrid “SM/MM”)
   c. Owner
   d. The item to which the cable travels (e.g. “TO PB 18-2”, “To P.O.P.”, etc.)
   e. Example: “96 SM FIBER KDOT” “TO PB 18-2”
5. Label branch cables with same plus what device it is connecting to. Example: “12 SM FIBER KDOT” “TO CCTV10/DET 12”

10.3.1.2 SPLICE ENCLOSURE
1. Label splice closures indicating what fibers inside are spliced.
2. Label splice trays within closures with cable and fiber strand numbers.
3. Example: “KDOT 96 SMFO FIBERS 23-24 TO KDOT 12 SMFO BRANCH FIBERS 3-4" or "CENTURYLINK/LUMEN-KDOT 12 SMFO FIBERS 11-12 TO KDOT 12 SMFO BRANCH FIBERS 3-4”.

NO.	DATE	REVISIONS	BY	APP'D
00	03-27-25	2024 KDOT Standards Updates	AJS	JAN

KANSAS DEPARTMENT OF TRANSPORTATION

ITS EQUIPMENT SPECIFICATIONS

ITS-S05 06-04-25

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

KDOT Graphics Certified 06-06-2025 Sh. No. 114

KDOT Graphics Certified

Plotted by : sspatil 16-DEC-2025 14:05
File : ka680801iss-S05.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	115	253

10.3.1.3 POWER CABLES AND LOAD CENTER
1. Label each cable within 12 inches of where it enters a cabinet, pull box, meter pedestal, transformer or other termination point with a round aluminum identification tag with a minimum thickness of 2.5 micrometers attached to the cables with a copper wire.
2. Label it "POWER XXX VOLTS" with a RED label.
3. Label where it is coming from/going to (e.g. "POWER 120 VOLTS" "TO CA CCTV I-135/Central").
4. Label taps inside meter pedestals or transformers with "ITS POWER" tag.
5. Label each circuit.
6. Use a machine to print the legend in letters at least 1/8" high.

10.3.1.4 ITS CABINETS
1. Inside cabinets, place a patch panel key/diagram of patch panel with port numbers.
2. On each diagram/key include the following:
   a. Cable number for mainline fiber.
   b. What cabinet/shelter and device to which the fiber connects.
   c. The port on the Cisco switch to which a jumper/patch cable connects.
3. Label each port on the fiber optic patch panel with the designated port number.
4. Jumper cables need not be labeled in ITS cabinets as long as they are less than three meters in length.
5. Label each network device (CCTV encoders, DMS controllers, and site numbers, Vehicle Detectors, Media Converters, Power Distribution Devices and Uninterruptable Power Supplies) with IP addresses, ports, and site numbers.
6. Label Cellular Modems with IP addresses and assigned phone numbers.
7. Label Cisco switches with IP address and site number. Label switch ports with Tx1, Rx1, Tx2, Rx2 and what port they connect to on the fiber optic patch panel. Label each port with its corresponding VLAN address.
8. Wireless network devices shall be labeled with the following items:
   a. IP address and ports
   b. Programmed radio frequency/channel
   c. Other wireless devices that link to the unit
   d. e.g.: "AU, 10.8.32.25, 4.97 GHz, TO SU@CCTV 03, TO SU@DET 01, TO SU@DET 02" or "SU, 10.8.34.24, 4.95 GHz, TO AU@SG CO COURTHOUSE"

10.3.1.5 POP BUILDINGS
1. Label patch panels ports to indicate the origin of the fiber optic cable terminated.
2. Label jumper cables at each end with a tag that includes the destination patch panel and port number(s) (e.g. "TO Panel 1 Ports 11-12" and "TO Panel 2 Ports 3-4").
3. Label outer jackets of fiber cables entering patch panels/distribution frames as in Section 10.3.1.1.
4. Label individual fibers entering back of patch panel with the corresponding strand number and origin.

10.3.1.6 TMC COMMUNICATION ROOM (IF UTILIZED)
1. Label patch panels to indicate the origin of the fiber optic cable terminated.
2. Label individual fibers entering back of patch panel with the corresponding strand number and origin.
3. Label jumper cables at each end with a tag that includes the destination patch panel and port number(s) (e.g. "TO: Panel 1 Ports 11-12" and "TO Panel 2 Ports 3-4").
4. Label jumpers from patch panel to Cisco SFPs with the fiber strand numbers, and origin to which they connect (e.g. Fiber #3, P.O.P. Building).
5. Provide Cisco switch port diagram denoting what fiber and ring they are connected to.

10.3.1.7 CONDUITS
1. Label empty conduits noting to where they connect (e.g. "TO PB2-2 TO PB2-3").
2. If a conduit color is not per plans (Red for Power, Green for Communications), label it so it is clear what it is being used for, even if there are cables inside conduit.

11.0 DYNAMIC MESSAGE SIGN SYSTEM

11.1 DESCRIPTION
The purpose of this section is to provide general information for the installation of KDOT furnished dynamic message sign (DMS) systems as shown on the Plans and specified herein.

11.2 MATERIALS

11.2.1 GENERAL
KDOT will supply the dynamic message sign systems. The equipment supplied by KDOT consists of a DMS case including contents, sign controller unit (SCU) and communication unit; communications cables between the DMS case and the sign controller unit, display modules, equipment cabinet; and DMS software and power supplies. Do not attach the DMS to the support posts until the supporting systems of conduits, pull boxes, controller assemblies, power supply assemblies and all other items necessary are in place to provide a fully functioning DMS system. Contractor is responsible for providing and installing power cables as well as installation of any provided communication cables and terminations (including fiber splicing if applicable) between the DMS cabinet and the DMS.

11.2.2 DELIVERY
Contractor is responsible for all loading, unloading, and relocation of DMS prior to installation, including unloading from manufacturer delivery.

Contractor is responsible for any damage to the DMS system upon delivery from the manufacturer. Prior to unloading from the manufacturer, document, in writing and detailed photographs, any visible damage or non-functioning portion of the KDOT-provided DMS system prior to accepting the DMS and leaving the KDOT storage facility. Schedule 72 hours in advanced with KDOT for date and time to pick-up the DMS from the KDOT facility. Do not store the DMS at the field site for more than 24 hours prior to installation.

11.2.3 LIGHTNING PROTECTION
Use system materials that are copper and high copper-content bronze castings. For all fittings, except cable holders, use heavy-duty type made from bronze castings. For all terminal rods, bolts, screws, and related type hardware use copper clad steel, bronze, or brass to prevent galvanic corrosion. The system consists of all necessary equipment as required to provide a complete and coordinated system. Ensure that all cables and all air terminals bear the UL label. Do not mix materials unless using a UL approved transition. All components of the lightning protection system shall conform to the current edition requirements of UL 96A and NFPA 780. Submit 150 foot radius rolling sphere zone of protection drawing with air terminal equipment.

11.3 CONSTRUCTION REQUIREMENTS

11.3.1 GENERAL
Furnish any and all additional tools, equipment, mounting hardware, beam clips, cabling, materials, supplies, manufactured articles and perform all operations necessary to install the DMS as shown on the Plans and as specified herein. The hardware, construction services, and support services specified are intended to describe the minimum configuration that would be acceptable for this DMS system. Furnish and install the DMS support structure as detailed on the Plans.

11.3.2 ERECTION
For category A structures, the Contractor shall submit detailed erection plans to the field engineer per KDOT specifications and per KDOT Field Erection special provisions. The seal of a licensed professional engineer is not required. Field erection and field erection plans are incidental to the site bid and no additional payment will be made.

11.3.3 DMS CONTROLLER CABINET
Install the DMS controller cabinet; this includes providing anchor rods for pad mounted cabinets as shown on the Plans. Coordinate with the Engineer to ensure proper anchor bolt spacing for DMS cabinets provided by KDOT or the manufacturer. Connect the DMS controller to the appropriate communication equipment specified in the plans to access the network as shown on the Plans and as directed by the Engineer. Contractor shall provide and install a raised nameplate with label "KDOT ITS" for all DMS controller cabinet doors. Nameplates shall be of similar material as the controller cabinet.

11.3.4 MOUNTING
Mount the DMS to the support posts or structure as herein specified, shown on the Plans, or as directed by the Engineer.

11.3.5 DMS ORIENTATION
Orient the DMS such that the face of the sign is towards the roadway. Follow the DMS orientation detail located in the construction drawings for the orientation and exact position of the DMS. Receive approval by the Engineer prior to placement of the foundations.

11.3.6 SECURITY
Change manufacturer default password to a unique temporary password upon taking possession of and commissioning the controller. Provide temporary password to KDOT.

11.3.7 LIGHTNING PROTECTION
Furnish and install lightning protection at every DMS to reduce electrical differential potential. Install all equipment in accordance with the requirements of current editions of UL 96A, NFPA 780, and LPI 175.

11.3.8 DMS CABLE
For slack requirements, see ITS-D03A and/or ITS-D03B.

12.0 CLOSED CIRCUIT TELEVISION SYSTEM (CCTV)

12.1 DESCRIPTION
Furnish and install the closed circuit television (CCTV) camera and equipment cabinet as specified in the plans. Orient all equipment as shown on the construction drawings. Pay attention to the specific orientation of the pole and the specific mounting orientation of all equipment on the pole.

Provide and install a pole, pole foundation, anchor rods, equipment cabinet, connection hardware, camera lowering device, composite cable, camera lowering tool, surge protection and grounding, air terminal, CCTV communication equipment and cables as specified in the plans.

Install the new CCTV cameras adjacent to and have their operating and communication equipment located in the pole mounted controller cabinets or in ground mounted cabinet assemblies as indicated on the Plans, or as directed by the Engineer.

12.2 MATERIALS

12.2.1 CCTV CAMERA ASSEMBLY
The CCTV camera assembly consists of a high performance color CCTV camera, zoom lens, pan and tilt drive unit, domed enclosure, mounting brackets, connectors and cabling all assembled together into one operational unit. Ensure that the CCTV camera assembly weighs less than or equal to 130 lbs, has an effective projected area less than or equal to 3.00 SF, and a distance to centroid from center of the pole less than or equal to 2'-6"

Unless shown otherwise on the plans, provide an Axis Q-60 series PTZ POE dome camera such as the Q6135-LE or approved equal. Ensure the encoded video is H.264 compliant using the baseline profile. Provide a 100Base-TX network interface that facilitates the transmission of camera control commands and video over an Ethernet-Based IP network.

The following electrical and environmental requirements are applicable for all CCTV equipment:
1. Power: 120VAC @ 60Hz;
2. Environmental: Operating Temperature: -35° to 50°C; and
3. Operating Humidity: Up to 95% RH non-condensing.
4. Minimum Power Output: 60W

A combination POE and DC power supply may be utilized to power the camera if both the POE injector and DC power supply meet the environmental requirements listed above. Use a Meanwell SDR 120-48 AC to DC Power Supply or approved equal and Axis T8144 60W Industrial Midspan POE or approved equal.

Ensure that the camera operates with a motorized-iris lens and is designed for day and night functionality. Ensure that the shutter speeds are remotely adjustable from 1/60 to 1/10,000 seconds. Ensure that the camera incorporates Digital Signal Processing (DSP) circuitry to provide advanced features such as automatic electronic shutter control, backlight compensation, digital zoom, and image stabilization. Ensure that the camera supports closing of the iris when pointed directly at the sun. Ensure the camera has a minimum horizontal resolution of 470 lines. Ensure the system to noise ratio is no less than 48 dB. Ensure that the camera is equipped with Automatic Gain Control (AGC) so that the camera will be capable of remotely controlling the white balance in response to changes in environmental lighting conditions. If the AGC is switchable, set the AGC to the "on" position. Ensure that the camera supports on-screen title generation that will allow the user to define the camera with character specific information.

Ensure the camera is supplied with optical and digital zoom capabilities. Ensure the optical zoom lens is remotely controlled through the camera unit and has a magnification factor of at least 30x. Ensure the zoom lens has an automatic and manual iris and focus controls. In addition, ensure the camera has at least a 12x digital zoom capability. Ensure the lens aperture range is F1.6 to F2.8 minimum.

Provide a camera housing that contains the CCTV camera, lens, and pan/tilt drive unit. Securely mount and wire the domed enclosure to the camera-lowering device. Supply all hardware required to mount the domed camera enclosure to the camera lowering device. Provide the domed camera enclosure that is water tight and constructed so that the enclosed equipment will not be affected by rainfall, blowing dust, salt, fungus, and other debris. Supply the unit with a heater to keep the camera and lens within the acceptable operating temperature range.

Ensure that the pan and tilt drive unit allows the remote position of the CCTV camera to view freeway traffic conditions. Fit the units to mount to the CCTV camera and domed enclosure and supply with all of the necessary mounting plates, connectors, brackets and wiring for operation. Ensure the unit allows 360° of continuous panning which is variable from 1 to 40°/second. Ensure the unit allows a minimum of 10 preset positions accurate to within 0.5° accuracy.

Demonstrate that the camera assembly functions with the applicable ATMS and video distribution software for KDOT or KC Scout.

Minimum functionality to be demonstrated shall include the ability to decode and display a video stream using the codes, resolution and frame rate specified and all pan-tilt-zoom, iris, focus and present functions.

Video Stream Settings for an Axis IP CCTV

Communication	Resolution	Frame Rate (frames per sec)	Compression	Zipstream	Bitrate (kbit/s)
Fiber	4CIF (704x480)	*30	30	Off	**Variable
Radio	4CIF (704x480)	25 or lower	50	Off	**Variable
Cell	CIF (352x240)	10 or lower	50	Off	**Variable

*may be set to higher rates if no issues are observed
**may be set to a constant 100kbit/s if needed

Camera functionality must also include the ability to add a text overlay with the camera name and image stabilization.

Change manufacturer default passwords of the cameras to a unique temporary password prior to their connection to the network. Provide temporary password to KDOT.

12.2.2 CCTV CAMERA LOWERING SYSTEM
Ensure that the camera lowering system is designed to support and lower the CCTV camera assembly without damage or causing degradation of camera operations. The camera lowering system device and the pole are interdependent and thus, must be considered a single unit or system. Provide a lowering system that consists of a suspension contact unit, divided channel support arm, pole top adjustable tenon, pole top junction box, conduit mount adapter, and camera connection box. Provide a cable strain relief device/wire mesh grip if not provided by the lowering device supplier. Provide a MG Squared system or approved equal.

NO.	DATE	REVISIONS	BY	APP'D
01	03-27-25	2024 KDOT Standards Updates	AJS	JAN
00	07-21-23	2023 KDOT Standards Updates	AJS	JAN

KANSAS DEPARTMENT OF TRANSPORTATION

ITS EQUIPMENT SPECIFICATIONS

ITS-S06 06-04-25

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

Plotted by : sspatil 16-DEC-2025 14:05
File : ka680801iss-S06.dgn

Ensure that the divided support arm and receiver brackets are designed to self-align the contact unit with the pole center line during installation and ensure the contact unit cannot twist under high wind conditions. Provide a camera-lowering device that withstands sustained 100 mile per hour winds with a 30 percent gust factor using a 1.65 safety factor. Deliver to the Engineer the lowering device manufacturer independent laboratory testing documents certifying adherence to the stated wind force criteria utilizing, as a minimum effective projected area (EPA), the actual EPA or an EPA greater than that of the camera system to be attached.

Provide a camera-lowering device product from a manufacturer with a minimum of 2 years of experience in the successful manufacturing of such systems. Provide documentation by the lowering device provider identifying a minimum of 3 previous projects where the proposed system has been installed successfully.

As part of this contract, the lowering device manufacturer is required to furnish a factory representative to assist with the assembly and testing of the first installation of the lowering system onto the pole assembly. Receive approval by the Engineer for this installation to lowering device manufacturer is required to be available to assist in a second installation or possibly a third installation until the manufacturer and KDOT are satisfied with proper installation. Furnish from the manufacturer the applicable documentation certifying instruction on the installation, operation, and safety features of the lowering device. Provide operational instructions to the Engineer.

Provide the suspension contact unit with a load capacity of 600 pounds with a 4 to 1 safety factor. Use a locking mechanism between the fixed and moveable components of the lowering device. Use a movable assembly with a minimum of 2 latches. Use a latching mechanism that securely holds the device and its mounted equipment. Use a latching mechanism that operates by alternately raising and lowering the assembly using the winch and lowering cable. When latched, ensure that all weight is removed from the lowering cable. Use a fixed unit that has a heavy duty cast tracking guide and means to allow latching in the same position each time. Use a contact unit housing that is weatherproof with a replaceable neoprene gasket provided to seal the interior from dust and moisture. Ensure that the entire unit has a minimum temperature rating of -35 degrees Celsius to 50 degrees Celsius.

Ensure that the prefabricated components of the lift unit support system are designed to preclude the lifting cable from contacting the power or video cabling. Supply an internal 1.25 inch PVC conduit in the pole for the lifting/lowering cable. Ensure that a conduit mount adapter for housing the lowering cable with an interface to allow the connection of a 1.25 inch PVC conduit is located just below the cable stop block at the back of the lowering device. Ensure that the only cable permitted to move within the pole or lowering device during lowering or raising is the stainless steel lowering cable. Ensure that all other cables remain stable and secure during lowering and raising operations.

Provide one lowering tool for up to 10 lowering devices, and one additional tool for each 10 additional devices. Lowering tools must be submitted to the Engineer prior to the start of the 60-day test period for any device or system. Ensure that the camera lowering device is operated by use of a portable lowering tool. Ensure that the tool consists of a lightweight aluminum metal frame and winch assembly with a quick release cable connector and an adjustable safety clutch (socket). Ensure that this tool is compatible with accessing the support cable through the handhole of the pole. When attached to the handhole, the tool will support itself and the load assuring lowering operations and provide a means to prevent freewheeling when loaded. Ensure that the lowering tool has a reduction gear to reduce the manual effort required to operate the lifting handle to raise and lower a capacity load. Provide the lowering tool with an adapter (socket) for operating the lowering device by a portable drill using a clutch mechanism.

Ensure that the lowering tool is equipped with a positive locking mechanism to secure the cable reel during raising and lowering operations and prevent freewheeling. Ensure that the lowering tool is made of durable and corrosion-resistant materials, powder coated, galvanized, or otherwise protected from the environment by industry accepted coatings to withstand exposure to a corrosive environment. The lowering tools are incidental to other items of work.

Provide a camera junction box that is of two piece clamshell design with one hinge side and one latch side to facilitate easy opening. Ensure that the general shape of the box is cylindrical to minimize the EPA. Ensure that the Camera Junction Box is cast aluminum with stabilizing weights on the outside of the box to increase room on the interior. Ensure that the box is capable of having up to 40 pounds of stabilizing weights. Ensure that the bottom of the Camera Junction Box is drilled and tapped with a 1-1/2" NPT thread to accept industry standard dome housings and be able to be modified to accept a wide variety of other camera mountings. Install gaskets with the junction box to prevent water intrusion. Ensure that the bottom of the box has a screened and vented hole to allow airflow and reduce internal condensation.

Ensure that all pulleys for the camera lowering device and portable lowering tool have sealed, self lubricated bearings, oil tight bronze bearings, or sintered-oil impregnated bronze bushings. Ensure that the lowering cable is a minimum 1/8 inch diameter stainless steel aircraft cable with a minimum breaking strength of 1740 pounds with (7) strands of 19 AWG wire each.

Ensure that all electrical and communications connections between the fixed and movable lowering device components are protected from exposure to the weather by a waterproof seal to prevent degradation of the electrical contacts. Ensure that the electrical connections between the fixed and movable lowering device components are designed and tested to conduct video signals as well as the power for operation of dome environmental controls.

Provide a camera lowering system for IP cameras that is equipped with a contact block specifically designed for use with IP cameras in an outdoor environment and includes an outdoor rated Cat 6 cable for the operations of video, power, data, and control molded directly to the contact block.

Ensure that the current carrying male contacts are gold plated, beryllium, and 0.09 inch in diameter at the contact area. Ensure that all current carrying female barrel contacts are also gold-plated, beryllium copper, and at least 0.09 inches I.D. at the contact area. Ensure that each individual female barrel contact has a stainless steel sleeve which prevents foreign matter from entering the contact area as well as preclude the possibility of the leaves of the female contact from opening beyond allowable limits and ensure a snug fit around the respective male pins. Ensure that there is at least one female contact that is positioned closer to the face of the female connector body than all the others, which will allow it to make first contact and break last contact to provide optimum grounding performance.

Ensure that each IP male/female connector includes (8) contacts mechanically crimped to Cat 6 wire and (5) contacts mechanically crimped to #18/1 UL lead wire, which may be used for additional camera requirements including, but not limited to: power, alarms, or grounds. Connect these wire ends to the contractor-provided power/signal cable in the pole and CCTV accordingly in a manner acceptable to Engineer. Ensure that each male pin is self wiping. During production, the contacts must be successfully tested and verified for Ethernet data speeds up to a minimum of 1000 Base T requirements.

Ensure that each male contact and female barrel contact is individually encased in their respective male and female molded rubber blocks to provide protection from moisture.

Ensure that the contacts are self-wiping with a shoulder at the base of each male contact so that it will recess into the female block, thereby giving a rain-tight seal when mated. Ensure that the facility manufacturing the electrical contact connector complies with Mil Spec Q-9858 and Mil Spec I-45208.

Ensure that the interface and locking components are made of stainless steel or aluminum. Ensure that all external components of the lowering device are made of corrosion resistant materials, powder coated, galvanized, or otherwise protected from the environment by industry accepted coatings to withstand exposure to a corrosive environment.

The lowering unit shall have sufficient weight to disengage the camera and its control components in order that it can be lowered properly. Provide counterweights as necessary to assure that the alignment of pins and connectors are proper for camera support to be raised into position without binding. Ensure that the pole top and/or camera junction boxes have the connectors for attachment to the bare leads in the pole top and/or junction boxes.

Install a drip shield above the lowering device connection to prevent moisture from infiltrating the camera assembly.

12.2.3 CCTV POLE
Provide poles in accordance with the latest edition of AASHTO **LRFD** Specifications for Structural Supports for Highway Signs, Luminaries, and Traffic Signals**, First Edition** including all interims. Other design requirements, such as MRI, wind speed, fatigue, and foundation are listed on the pole detail or foundation detail sheets. Furnish and install camera poles as shown on the Plans and details.

Submit camera pole shop drawings and detailed calculations, signed and sealed by a Professional Engineer, to the Engineer for approval prior to pole and lowering device fabrication.
The Contractor is responsible for the design and construction of all poles. All steel poles must meet the requirements outlined in these specifications.

Provide steel poles that are designed with the following considerations:
1. Pole dimensions shall be determined by the manufacturer's design.
2. Only round or hexadecagonal (16 sided) shapes will be allowed.

Ensure that the pole is designed such that the deflection does not exceed one inch (1") at the top of the pole in a sustained 30 mile per hour wind condition. Use a service limit load factor of 1.0 for deflection. Provide a pole shaft that is one-piece construction up to 50 feet in length and poles with a maximum of one splice for greater lengths and conforms to ASTM A595 Grade A with minimum yield strength of 55 ksi or ASTM A572 with minimum yield strength of 55 ksi. Provide a pole with a constant linear taper of greater than or equal to 0.14 in/ft and contain only one longitudinal seam weld. Ensure that hexadecagonal poles have a 4 in. corner radius. Circumferential welded tube butt splices and laminated tubes are not permitted.

Ensure that longitudinal seam welds within 6 in. of complete penetration pole to base plate welds are complete penetration welds. Ensure that tube longitudinal seam welds are free of cracks and excessive undercut, performed with automatic processes, and be visually inspected. Ensure that longitudinal welds suspected to contain defects are magnetic particle inspected. Ensure that all circumferential butt-welded pole and arm splices are ultrasonically or radiographically inspected.

Provide a single, large, bottom handhole opening that is reinforced with a minimum 2-inch-wide hot rolled steel rim. Ensure that the nominal outside dimension is approximately 6 inches x 27 inches. Ensure that the handhole has a tapped hole for mounting the portable winch thereto. Ensure that a tenon is welded or bolted to the pole top with mounting holes and slot as required for the mounting of the camera-lowering system. Ensure that the tenon is of dimensions necessary to facilitate camera lowering device component installation. Ensure that each slot is parallel to the pole centerline for mounting the lowering device.

Provide a pole with a custom plate-mounted tenon that allows the field modification of the arm/camera orientation up to 360 degrees. Ensure that the tenon has mounting holes and slot as required for the mounting of the camera-lowering system. Ensure that the tenon is of dimensions necessary to facilitate camera lowering device component installation. Ensure that each slot shall be parallel to the pole centerline for mounting the lowering device.

Ensure that top and bottom electrical cable guides are located within the pole aligned with each other. Position one cable guide 2 inches below the handhole and position the other 1 inch directly below the top of tenon. Position a parking stand 1.5 inches below the top of the handhole on the inner portion of the handhole frame and located at 90, 180, and 270 degrees.

Construct CCTV pole foundations as indicated on the Plans.

Direct Tension Indicators:
DTIs are to comply with the requirements of the latest edition of ASTM F959 for the ASTM F3125 bolts. The DTIs on the anchor rods are to comply with the requirements of the latest edition of ASTM F2437. Installation will adhere to the Plans and the KDOT Standard Specifications.

Demonstrate compliance with the requirements shown on the Plans and herein. Submit calculations for poles that include analysis of the pole, base plate, and anchor rods. Submit pole calculations that are analyzed at six-inch (6") intervals from the base plate to the pole top. At each of these locations, give the following information:
1. The pole diameter, thickness, section modulus, moment of inertia, and cross-sectional area.
2. The centroid, weight, projected area, drag coefficient, velocity pressure, and wind force of each trapezoidal pole segment.
3. The factored axial force, shear force, primary moment, total moment, axial stress, bending stress, axial resistance, bending resistance, and demand over capacity ratio at each elevation.
4. The pole angular and linear deflection at each elevation.
5. The factored axial force, shear force, primary moment, and total moment at the top of the foundation for foundation design.

Submit weld details with pole shop drawings, referencing approved weld procedures in KDOT Specification 744. Weld procedures will be approved by KDOT prior to use. All welding shall be in accordance with AWS D1.1 (latest revision). All handholes and weld backing rings shall have CJP at splices unless made from a solid.

12.2.5 ASSOCIATED CONTROL EQUIPMENT
Furnish and install equipment in the cabinet as specified in the construction Plans including associated patch cables and incidental items.

12.2.8 AIR TERMINAL
Furnish and install a solid or tubular aluminum, copper, or stainless steel at least 5/8 inch in diameter air terminal. Use air terminals that are UL listed.

12.2.9 POLE GROUNDING
Provide pole grounding that meets the requirements of the Power Supply Assembly, Power, and Grounding sections of these specifications.

12.2.10 TRANSPORTATION
Obtain the correct transportation guidelines from the manufacturer and implement these guidelines. Take precautions to ensure no damage to the lowering system.

12.3 CONSTRUCTION REQUIREMENTS

12.3.1 CAMERA ASSEMBLIES
Install the dome so that the pole does not block the camera's view of traffic. Refer to the Plans for guidance on where the allowable blind spot is located.

12.3.2 POLE AND FOUNDATION
Contact the Engineer a minimum of two weeks prior to final placement of the CCTV foundation to schedule the final location review.

12.3.3 NETWORK SWITCH CONNECTIONS
Request port assignments from the Engineer/owner at least 4 weeks prior to making the physical connections to the network switch. Supply technicians with at least one year of experience installing and configuring Cisco network switches. Submit experience resume to the Engineer for approval prior to performing any work.

Plotted by : sspatil 16-DEC-2025 14:05
File : ka680801iss-S07.dgn

NO.	DATE	REVISIONS	BY	APP'D
00	01-09-25	2024 KDOT Standards Updates	AJS	JAN

KANSAS DEPARTMENT OF TRANSPORTATION

ITS EQUIPMENT SPECIFICATIONS

ITS-S07 06-04-25

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

KDOT Graphics Certified 06-06-2025

KDOT Graphics Certified

12.3.4 AIR TERMINAL
Install the air terminal on the opposite side of the pole from the dome. Position the rod to project a minimum of 5 feet in length above the top of pole (not including the lowering device cap) with an equal length to be mounted to the pole. Provide and install an air terminal mounting bracket. Locate and size the air terminal to adhere to the 150 foot radius rolling sphere model as described in NFPA 780 and as shown on the Plans. Seek approval from Engineer for adjustment of 5 foot height requirement.

Apply a copper-based conductive sealant between the rod and the pole before tightening the bolts. Perform all work related to the installation of the air terminal in accordance with NFPA 780.

12.3.5 POLE GROUNDING
Connect the bottom of the pole to one or more ground rods using a minimum #2 stranded copper grounding conductor from pole to grounding rod. Construct the ground conductor to travel through the foundation in a schedule 40, non-metallic, U.L. listed conduit as shown in the plans. If the steel pole thickness is 3/16 inch or less, use a copper down grounding conductor. Clean galvanized ground lug at bottom connection point prior to exothermic welding. Use exothermic welding for all ground wire connections, except the connection to the pole, which shall use the pole's grounding lug.

12.3.6 CCTV CAMERA LOWERING SYSTEM
Ensure that the lowering device manufacturer furnishes a factory representative to assist with the assembly and testing of the first installation of the lowering system onto the pole assembly. Ensure that this installation is working properly and is approved by the Engineer prior to a second installation. Ensure that the lowering device manufacturer is available to assist in a second installation or possibly a third installation until the manufacturer and KDOT are satisfied with proper installation. Provide from the manufacturer the applicable documentation certifying that the Contractor has been instructed on the installation, operation and safety features of the lowering device. Provide the Engineer with operational instructions.

13.0 VEHICLE DETECTION SYSTEM

13.1 DESCRIPTION
Furnish and install a Vehicle Detection System (VDS) including lightning surge protection, AC/DC power converter and a media converter for Ethernet communications for the purposes of detecting vehicular speed, volume counts, and lane occupancies. Install in the locations shown on the Plans.

13.2 MATERIALS

13.2.1 RADAR VEHICLE DETECTORS (DETECTORS)
Include all the cables, connectors, and mounting hardware recommended by the manufacturer for proper operation of the system. If required, provide a Wavetronix Smartsensor HD (model SS126) unit or approved equal including lightning surge protection, AC/DC power converter and a media converter for Ethernet communications that meets the following minimum requirements. Provide a SS126-001 Retrofitted SmartSensor HD if noted in the plans or if directed by the Engineer.

13.2.1.1 PERFORMANCE
The following requirements apply:
1. Able to measure volume, occupancy (including slow moving or stationary vehicles), classification counts, and speed, when in a sidefire configuration and mounted as shown on the Plans.
2. Suitable for polled operation using multipoint RS-232 communication at 9600 bits per second.
3. Detection range: 6.0 to 250.0 feet.
4. Detection Zone: Up to 22 traffic lanes simultaneously
5. Operating Frequency: 24.0-24.25 GHz
6. Transmit bandwidth: 245 MHz.
7. Transmitter power: up to 10 W.
8. Operating temperature range: -35ºC to 50ºC
9. Operating humidity range from 5 to 95% RH.
10. Meets FCC rules Part 15 for interference.
11. Occupies no more than 0.6 cubic feet.
12. Weighs no more than 15 lbs.
13. Housing sealed to withstand rain (or snow) up to a rate of 2 inches per hour or wind loads up to 90mph.
14. Includes a mounting assembly for each radar detector with the following requirements: stainless steel or all aluminum construction, capable of supporting a load of 20 lb., capable of being mounted on the side of the pole approved by the manufacturer of the microwave detector.
15. Includes a twisted-pair cable between the cabinet and each microwave detector with the following requirements: provides both power and serial communication, UV-resistant and rated for 300 volts, terminate on a single MS connector.

13.2.2 LAPTOP SOFTWARE
Provide vendor software that enables a technician to test all features and functions of the detector, and perform all set-up procedures with a web based interface. Provide this software to the Engineer so that it can be installed on other computers. Ensure that the Engineer has the right to make and use an unlimited number of copies of this software.

13.2.3 COMMUNICATION PROTOCOL
Demonstrate that the radar vehicle detector can communicate with KDOT ATMS software and is compliant with the National Transportation Communications for ITS Protocol (NTCIP). To be NTCIP compliant, ensure that the detector adheres to the version of the following standards that is current at the time of bidding:
1. Information level: NTCIP Standard 1209, including implementation of the TSS Data Collection conformance group.
2. Application level: NTCIP Standard 1101, Compliance Level 2.
3. Transport level: Null protocol
4. Subnetwork level: NTCIP Standard 2101

13.2.4 DEVICE SERVER
Provide a Wavetronix Click 301 device server or approved equal (if specified in the plans) which will allow the detector to communicate over the Ethernet IP network when the detector is connected to an Ethernet network device. Provide a device server that meets the following minimum requirements:
1. Able to convert half-duplex serial communication to Ethernet and vice versa
2. Include multiple communication ports: Ethernet, RS-485, RS-232 DTE
3. Use either Ethernet or serial interfaces to configure baud rates
4. Operating temperature range: -20ºF (-28ºC) to 165ºF (74ºC)
5. Operating humidity range from 5 to 95% RH
6. Input voltage range between 10 to 30 VDC

If multiple vehicle detectors are present at one location, ensure physical separation between the click components for each vehicle detector. Ensure no T-bus connections occur between different detector components.

Provide a Mean Well 20-24 power converter or approved equal that meets the following minimum requirements:
1. Provide 24 VDC at currents of 1-Amp
2. Provide a mains buffering greater than 20ms under full load

13.2.6 DETECTOR POLE
For standalone detector locations, conform and construct in accordance with details shown on the Plans. For locations where detectors are mounted to another ITS device pole or structure, mount as shown in the plans. Design the poles for the standalone detectors to comply with the latest edition of the AASHTO publication "Standard Specifications for Structural Supports for Highway Signs, Luminaires, Traffic Signals and Interims". Also, see the KDOT Standard Specifications.

Provide all hardware (bolts, nuts, and washers, but not including anchor rod assemblies) not otherwise specifically designed in the specifications that is aluminum or stainless steel. Furnish all materials in natural aluminum color. Finish pole shafts with a polished surface.

Conform to the standard KDOT specifications, latest edition, Division 1600 for miscellaneous hardware that requires galvanizing or electroplating.

Use ground wire that is a #6 AWG bare copper wire, unless otherwise shown on the Plans. Use ground rods that are solid copper or copper-bonded steel.

Conform to the KDOT Standard Specifications, latest edition, Division 1600 for anchor rods.

Provide break-away cable connectors that provide a fused waterproof wiring connection that when subjected to strain consistent with a knockdown, will separate without damage to the wiring. When separation occurs, ensure the connectors shall have no contacts exposed to present a shock hazard. Meet requirements as listed in the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals (Latest Edition), Article 12.5.3 (C). Install the connectors as directed by the manufacturer.

If wedge-type stud rod anchors are used, install 3/8 inch by 3 inch wedge-type anchors for conduit clamps. Use wedge-type anchors made from carbon steel meeting AISI 12L14 Steel. Provide a minimum embedded depth of 1-3/4 inches.

If conduit clamps with clamp backs are used, install 2 inch conduit clamps with a compatible clamp back. Use heavy duty steel clamps to secure the rigid conduit to the structure. Space conduit clamps at 6 foot intervals.

Install one cable support grip in each detector pole. Provide a cable support grip made of high grade, non-magnetic tin coated bronze strand. Provide a cable support grip that is capable of securing two #10 AWG type USE-2 cables in a vertical position holding the weight of the cables and cable connectors off the detector assembly.

Comply with the requirements of the ASTM 607 with the exceptions and/or additions as listed in the KDOT standards.

Submit weld details with pole shop drawings, referencing approved weld procedures. Weld procedures will be approved by KDOT prior to use. All welding shall be in accordance with AWS D1.1 (latest revision), and AASHTO standard specifications for structural supports for highway signs, luminaires, and traffic signals and current interims. All handholes and weld backing rings shall have CJP at splices unless made from a solid.

13.3 FOUNDATION
Construct as indicated on the Plans and Specifications.

13.4 CONSTRUCTION REQUIREMENTS

13.4.1 RADAR VEHICLE DETECTORS
Install in accordance with the manufacturer's recommended procedure for side-fired installation. Determine proper mounting height of the detector being supplied based on offset, height, and lanes to be detected. Note that the recommended mounting height is relative to the road surface, not the base of the pole. Install mounting hardware to prevent conflict with CCTV camera when lowered. Aim the detector to detect vehicles in the lanes indicated at the particular location.

Specify the length of control cable/harness required to the detector supplier. Include the vehicle detector control cable/harness in the detector ITS unit cost.

Provide a separate entry point for each VDS.

Installation may be done by the Contractor's forces, but each installation must be checked by the manufacturer or manufacturer's representative, and adjusted as recommended by the manufacturer. Installation includes connecting the detector to the device server and power supply in the associated ITS cabinet, as shown on the Plans. Coordinate with the manufacturer to resolve any calibration or environmental concerns.

The set up includes speed calibration using measured (not estimated) reference speeds with a LIDAR gun. When the setup is complete and the detector is ready for operation, deliver the values of all parameters that were set during the process to the Engineer in printed or computer-readable form. Provide all equipment, such as a LIDAR gun, software, laptop computer, tools and cables, needed for the set up work.

13.4.2 VDS CABLE
For slack requirements see ITS-D03A and/or ITS-D03B

14.0 ITS CABINET ASSEMBLY

14.1 DESCRIPTION
ITS cabinet assemblies are defined as the complete assembly of all required equipment and components for the control of ITS field elements at each location as detailed in the Plans and the collection and communication to the Traffic Management Center of data gathered from the ITS Field Elements. Install Type 334 and Type 336 in the quantities and numbers at the locations as detailed in the Plans or as directed by the Engineer. Provide all necessary incidental items for a complete fully functioning cabinet installation including DIN rails, wiring, and all equipment mounting hardware.

14.2 MATERIALS

14.2.1 GENERAL
Include necessary back panels, interface for CCTV, VDS, or DMS as shown on the Plans, all required communication equipment, all required wiring, switches and connectors, and all other equipment as required by these specifications and as shown on the Plans, or as directed by the Engineer, to provide a fully functioning and operational ITS system.

14.2.2 ITS CABINETS
Use either model 334 for pad mounted cabinets or 336 for pole mounted cabinets as shown and indicated in the Plans and exhibit a bare aluminum finish. Provide cabinets with two full size doors for front and rear entry. Ensure that all cabinets are designed to NEMA 3R specification. Provide handles for each main door that open outwards. Supply all cabinets with a removable self-standing rack assembly, an AC bus, and a ground bus. Do not provide any power distribution assemblies unless specified.

Provide all KDOT main cabinet doors with a BEST 3L Series Deadbolt Cabinet Lock with construction core that will allow KDOT to install their own lock core. KDOT will replace the construction core with a KDOT keyed core upon cabinet acceptance. Dispose of the construction core after cabinets are accepted. Provide all KDOT main cabinet doors with a raised designation 'KDOT ITS' as indicated in the Plans. Name plates shall match cabinet material type.

Provide all KC Scout main cabinet doors with a Corbin Number 2 Lock. Provide all KC Scout main cabinet doors with a raised designation 'KC SCOUT ITS' as indicated in the Plans.

14.2.3 CABINET SIZE
Standard 336 cabinet dimensions are approximately 46" x 24" x 22". Standard 334 cabinet dimensions are approximately 66" x 24" x 30". Size each controller cabinet based on the equipment as identified on the Plans and described herein.

NO.	DATE	REVISIONS	BY	APP'D
00	01-09-25	2024 KDOT Standards Updates	AJS	JAN

KANSAS DEPARTMENT OF TRANSPORTATION

ITS EQUIPMENT SPECIFICATIONS

ITS-S08 06-04-25

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

KDOT Graphics Certified 06-06-2025 Sh. No. 117

KDOT Graphics Certified

Plotted by : sspatil 16-DEC-2025 14:05
File : ka680801iss-S08.dgn

14.2.4 LIGHTS
Include 2 fluorescent or LED lighting fixtures mounted inside the front and back portion of the cabinet. Install a door-activated switch to turn on the cabinet lights when the door is open. Install each switch to work each individual light.

14.2.5 ALARM
Install an additional door actuated switch for each main door. If shown in the plans, wire this switch such that an alarm can be sent to the TMC when both or either door is opened.

14.2.6 POWER AND LOAD CENTER
The cabinet will be capable of accepting/landing a 120V/240V power circuit. Land all incoming power in a 60 Amp, 120/240 VAC, UL listed Load Center provided with the cabinet, including circuit breakers. Furnish and install a GFCI convenience outlet two position on its own circuit. Provide GFCI outlet that meets the following requirements: 15 Amp - 125 Volt NEMA 5-15R, tamper and weather resistant receptacle, aluminum, steel, or HDPE rectangular box, no cover, mountable to DIN rack adapter for load center. Power will be distributed to the cabinet through the Load Center that will be installed in the cabinet. Ground bars and distribution bars are to be installed adjacent to the Load Center for internal cabinet power distribution. Provide the main power to have its own 2-pole circuit breaker (amperage as defined in the plans) in the load center that will shut off power to the entire cabinet. The load center will be provided with a minimum of three single pole 120V-15A circuit breakers. Distribute cabinet loads across circuits to balance loads. The GFCI outlet and camera should each be on their own individual circuit (three total including one spare). Mount all power terminals and the Load Center a minimum of 12" above the bottom of ground mounted cabinets. If a PDA input file is required for loop detection, one may be installed as approved by the Engineer.

14.2.7 FILTER
Install and house a removable and replaceable furnace type fiberglass or aluminum filter behind door vents. Ensure the filtration area covers the vent openings. Ensure the filter is held firmly in place with a vented back plate shell that fits over the entire filter providing full support. Ensure the shell is louvered to direct the incoming air downward. Where air-conditioning is required, do not use door vents on the main doors and block the top vents of the cabinet with aluminum panels welded in place.

14.2.8 DIN RACK ADAPTER
Provide each ITS cabinet with a 19 inch recessed DIN rail adapter with DIN rail for placement of Cisco equipment and other equipment. Where necessary for space, provide a second adapter for vehicle detector and/or CCTV equipment. The following minimum requirements apply: rail adapter is a 4U or 5U adapter with a minimum depth of 7.5 inches, 19 inch rack mountable with four mounting holes, aluminum or steel, supports a minimum of 20 lbs of equipment.

Provide each ITS cabinet with an additional 19 inch recessed DIN rail adapter for placement of load center and GFCI outlet. The following minimum requirements apply: adapter is 8U or 9U with a minimum depth of 7.5 inches, 19 inch rack mountable with four mounting holes, aluminum or steel.

14.2.9 FAN
Attach a fan and thermostat assembly to the top of the cabinet.

14.2.10 DRAWER
Supply a pull out drawer for all 334 and 336 type cabinets for placement of laptops or tools.

14.2.11 SHELF
Supply a vented equipment shelf for all 334 and 336 type cabinets for placement of laptops or tools.

14.2.13 POWER STRIP
Provide a rack mounted power strip receptacle in cabinets. Include a minimum of 8 receptacles on this unit with a minimum of 2 receptacles on front and 6 receptacles on rear. Use UL 1449 rated for 330V surge suppression. Provide power strip to protect from over voltages up to 40,000 amps per phase. The power strip must be plugged into one of the quadplex outlets. Do not plug the power strip into the GFCI receptacles.

Unless otherwise specified in plans, provide a remote controlled IP addressable power strip. Use a rack-mounted power strip that meets the following minimum requirements:
1. Web controlled 8 outlet power strip
2. Multi-outlet, multi-user remote reboot
3. Outlet grouping for simultaneous switching
4. AutoPing for automatic failure detect and reboot

14.3 CONSTRUCTION REQUIREMENTS

14.3.1 GENERAL
Stake the proposed location of all Type 334 ground mounted cabinets, indicating the direction that the doors will open for approval by the Engineer prior to excavating and pouring of the cabinet foundation. Place pole mounted cabinets so that the top of cabinet shall not exceed 6 feet above ground and cabinet orientation shall not expose workers to traffic. Receive approval by the Engineer for orientation of all cabinets prior to placement. Install all equipment in all ITS cabinets as shown in the Plans and allowing sufficient space between equipment for ease of maintenance and trouble-shooting. Do not locate any devices in the bottom 10 inches of the cabinet. Submit to the Engineer for approval all ITS cabinet layouts including wiring diagram, dimensional plans and cabinet population drawings. Size and space the ITS equipment racks to accommodate any future communications equipment shown on the Communication Routing Schematics shown on the Project Plans.

14.3.2 WIRING
Use insulated, stranded copper wire. Neatly bundle and secure wiring with plastic cable ties. Route incoming field circuits horizontally from the conduit to the back of the cabinet, then vertically to the terminal block. Label all terminals and ensure they are not visibly obstructed. Identify all field leads by means of round aluminum identification tags with a minimum thickness of 0.1 mils attached to the cables with a copper wire to correspond with the Plans. Use outgoing circuits of the same polarity as the line side of the power supply, and the common return of the circuits of the same polarity as the ground side of the power supply. Provide the power supply through three single conductor cables. Carry the ground side of the power supply throughout the cabinet in a continuous circuit, and secured to a ground bus bar in an approved manner. Terminate all field conductors in the ITS cabinet. Ensure ground wires from all equipment have the shortest lead length possible with direct connection to the cabinet ground bus bar. Avoid cable loops and bends for all ground bonds and wires.

14.3.3 CABINET PANEL WIRING
Neatly bundle and secure all wiring on the cabinet panel with plastic cable ties. Use an expandable braided sleeve for any multi-conductor cable between the controller or auxiliary equipment and the back panel. Use discrete insulated wires and solder directly to lugs on the back of terminal blocks and sockets. Do not use printed circuit boards.

14.3.4 CABLES
Locate and secure all cables such that they do not interfere with the removal of the rack mounted equipment or opening access panels on the equipment.

14.3.5 CABINET LOCATE TEST STATION
For each cabinet installed (all ITS and KDOT-furnished DMS cabinets), furnish and install a cabinet locate test station as shown in the plan details. The tracer wire terminal for the cabinet locate test station shall be solid brass or bronze alloy and must be accessible from the outside of the cabinet. Puncture a hole no larger than necessary in the cabinet at the locations shown in the details to install the locate test station terminal, then be sure to seal and make the hole water tight. For Type 334 cabinets, the terminal shall be located near the bottom of the cabinet under the hinge side of the back cabinet door. For Type 336 cabinets, the terminal shall be located on the bottom side of the cabinet near the pole. Apply thread lock sealant to reduce tampering and maintain a 1.5-inch minimum clearance in all directions of the terminal. The terminal shall be completely isolated from the cabinet and the grounding system. The tracer wire shall be mechanically bonded to the tracer terminal so as to provide a continuous locating system throughout the limits of the project. Contractor shall submit construction details for the cabinet locate test station wire connection for approval.

14.3.5 CONDUIT ARRANGEMENT
Install the conduits placed in the controller base such that the appropriate conduit is placed at the location where wire running through it will be attached in the cabinet. Each cabinet may require different conduit placement. Carefully design conduit placement to prevent crossing of cables within the cabinet.

14.3.6 DOCUMENT POCKET
Install a document pocket on the inside of the front door of the cabinet for storage of wiring diagrams, maintenance logs, cabinet elevation drawings, communication schematic drawings, and test results.

14.3.7 CABINET RACK ELEVATIONS
Submit rack elevation drawings for each ITS cabinet and all racks modified in the KDOT designated facility. Provide rack elevation drawings that are drawn to scale; include front, back, and side elevations. Label each rack elevation with a summary title stating the location, type of cabinet, cabinet outside dimensions, and rack dimensions (19" rack with XXU slots). Indicate the placement of each rack-mounted or shelf-mounted piece of equipment, including vehicle detector equipment, CISCO switches, DIN Rail Adapters, blank panels, and blank spaces. Show vertical dimensions in both inches and rack units (multiples of 1.75 inches). Conform to Documentation section of these specifications.

14.3.8 RODENT BAIT
The contractor shall install 2 blocks of rodent bait upon the installation of a Cabinet.

15.0 FIBER OPTIC CABLE, INSTALLATION, AND HARDWARE

15.1 DESCRIPTION
Provide, install, terminate, and test fiber optic cable.

15.2 MATERIALS
Provide fiber optic components that are compatible, designed for the purpose intended, and manufactured by a company regularly engaged in the production of material for the fiber optic industry. Provide all cable, components, or assemblies that are best quality, non-corroding, with a design life of at least 20 years. Provide all components or assemblies of the same from the same manufacturer. Provide all components that are the size and type required for the specified fiber.

15.2.1 FIBER OPTIC CABLE
Provide fiber optic cables in compliance with Corning ALTOS All-Dielectric gel free cables for fiber counts of 2-288 fibers or approved equal and that comply with the following minimum requirements. Provide all fiber optic cable required for this project that are all dielectric, duct type, with loose buffer tubes and conform to these Specifications. Ensure that the Single Mode Fiber Optic (SMFO) cables contain single mode (SM) dual-window (1310 nm and 1550 nm) fibers. Ensure the multi-mode fiber optic (MMFO) cables contain graded index fiber at 850 nm and 1300mm with 62.5 micron core diameters.

Ensure the optical fibers are contained within loose buffer tubes. Ensure the loose buffer tubes are stranded around an all dielectric central member. Ensure that Aramid yarn and/or fiberglass is used as a primary strength member, and a polyethylene outside jacket is provided for overall protection. Provide and install fiber optic cables as shown in the Plans and specifications. Provide single mode fibers within the finished cable that comply with the requirements in the following table:

Parameters	Value
Mode	Single
Type	Step Index
Core diameter	8.3µm (nominal)
Cladding diameter	125µm±1.0µm
Core to Cladding Offset	= 0.6 µm
Coating Diameter	245 µ m±10µm
Cladding Non-circularity defined as: [1-(min. cladding dia ÷max. cladding dia.)]x100	≤ 1.0%
Proof/Tensile Test	690 Mpa, min.
Attenuation @ 1,310nm	≤ 0.40 dB/km
Attenuation @ 1,550 nm	≤ 0.35 dB/km
Attenuation at the Water Peak	≤ 2.1 dB/km @ 1383±3nm
Chromatic Dispersion:	
Zero Dispersion Wavelength	1301.5 to 1321.5 nm
Zero Dispersion Slope at zero dispersion wavelength	=0.092 ps/(nm2✳km)
Maximum Dispersion:	3.3 ps/(nm✳km) for 1285 - 1330nm <18 ps/(nm✳km) for 1550 nm
Cut-Off Wavelength	<1260 nm
Mode Field Diameter (Petermann II)	9.3±0.5µm at 1310 nm 10.5±1.0µm at 1550 nm

15.2.2 COLOR CODING
Comply with EIA/TIA-598a "color coding of fiber optic cables."

15.2.3 GENERAL CABLE PERFORMANCE SPECIFICATIONS
As part of the material submittal for the cable, include evidence that the cable meets the ANSI/ICEA S-87-640 design and test criteria.

15.2.4 PACKAGING AND SHIPPING REQUIREMENTS
Provide documentation of compliance to the required specifications to the Engineer prior to ordering the material. Attention is directed to "fiber optic testing" elsewhere in these Specifications. Ensure the completed cable is packaged for shipment on reels. Ensure the cable is wrapped in weather and temperature resistant covering. Ensure both ends of the cable are sealed to prevent the ingress of moisture.

Securely fasten each end of the cable to the reel to prevent the cable from coming loose during transit. Provide six feet of accessible cable length on each end of the cable for testing. Ensure that the complete outer jacket marking is visible on these six feet of cable length.

Provide each cable reel with a durable weatherproof label or tag showing the Manufacturer's name, the cable type, the actual length of cable on the reel, the Contractor's name, the contract number, and the reel number. Include a shipping record in a weatherproof envelope showing the above information and also include the date of manufacture, cable characteristics (size, attenuation, bandwidth, etc.), factory test results, cable identification number and any other pertinent information. Ensure that the minimum hub diameter of the reel is at least 30 times the diameter of the cable. Provide the cable in one continuous length per reel with no factory splices in the fiber. Ensure that each reel is marked to indicate the direction the reel should be rolled to prevent loosening of the cable. Include all installation procedures and technical support information in the Technical Reference Manual.

15.2.5 FIBER OPTIC SPLICE ENCLOSURE
Provide all fiber optic splice closures that are CommScope FOSC or Corning SCF Splice Closures, or approved equal that meets the following minimum requirements.

Type	Canister Style
Min. # of Cable Ports	4
Min. # of Express Ports	2
Cable Seal	Reusable Gel

Provide fiber optic splice closures with splice trays from the same manufacturer as the splice closure. Provide a splice closure with enough trays to account for all proposed splices required on the plans plus at least two additional trays for future capacity.

NO.	DATE	REVISIONS	BY	APP'D
00	03-27-25	2024 KDOT Standards Updates	AJS	JAN

KANSAS DEPARTMENT OF TRANSPORTATION

ITS EQUIPMENT SPECIFICATIONS

ITS-S09 06-04-25

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

KDOT Graphics Certified 06-06-2025 Sh. No. 118

KDOT Graphics Certified

Plotted by : sspatil 16-DEC-2025 14:05
File : ka680801iss-S09.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	119	253

15.2.6 FIBER OPTIC CABLE ASSEMBLIES
Provide cable assemblies (jumpers and pigtails) that are Corning Lanscape Solution cable assemblies or approved equal that meets the following minimum requirements. Provide the cable used for cable assemblies that is made of fiber meeting the performance requirements of these Specifications for the fiber optic cable being connected. Provide Manufacturer's attenuation test results for all cable assemblies. Provide breakout cables that comply with the specifications for pigtails.

15.2.7 PIGTAILS
Provide pigtails that are of simplex or duplex construction, in 900 micrometer tight buffer form, surrounded by aramid yarn for strength, with a connector on one end. Provide an outer jacket that is yellow PVC with a nominal diameter of 3 mm, marked with the Manufacturer's identification information. Provide all pigtails a minimum of one meter in length. Provide pigtail connectors that are factory terminated. Field terminations are not permitted. Follow the installation procedures outlined for fiber optic cables for pigtails installed in conduit, except that the pulling tension shall not exceed 200 pounds.

15.2.8 JUMPERS
Jumpers should be duplex unless specified by Engineer. Provide all jumpers to be at least six feet in length, sufficient to avoid stress and allow orderly routing. Provide jumpers that have connectors on both ends. Ensure that the outer jacket of duplex jumpers is yellow for all single mode; orange for 62.5µm multimode; aqua for 50µm multimode jumpers. Ensure that the two inner simplex jackets have contrasting colors to provide easy visual identification for polarity. Ensure that all jumper connectors are factory terminated. Do not use field terminations.

15.2.9 CONNECTORS
In the KC Scout area use SC Connectors. For all other areas, use LC connectors for all new connectors. Many existing connectors are SC. Use SC to LC jumpers to mate with equipment when required to assure all new connectors are type LC. Do not apply index-matching fluids, gels, or anti-reflection coating to the end of the fiber. Ensure that the connector operating temperature range is -20ºF (-28ºC) to 165ºF (74ºC). Ensure that typical insertion loss is 0.2 dB (or better) and the return reflection loss is 50 dB (or better). Ensure that connection durability is less than a 0.2 dB change per 500 mating cycles per EIA-455-21A (FOTP-21). Provide connectors with a blue color body or boot.

15.2.10 FACTORY TESTING
Provide all pigtail and jumper connectors that are factory-installed and tested. Do not install connectors in the field.

15.2.11 FIBER DISTRIBUTION UNIT (FDU)
Use the FDU, also referred to as patch panels, to terminate fibers in all cabinets containing fiber terminations. Provide units that are capable of terminating the required number of fibers, as is indicated on the Plans. Use terminations that are SC, LC or LC UPC (as indicated on the Plans), bulkhead connectors which match the fiber optic jumper cables used for connection to the optical termination equipment in the controller assembly. Do not allow fiber optic splicing to occur outside of splice trays housed within the FDUs. Provide all units located in POP buildings to be rack mountable in an EIA 23-inch rack. Provide all units located in roadside devices to be rack mountable in an EIA 19-inch rack. Use units that are of the minimum necessary dimensions to terminate the quantity of fibers indicated on the Plans as to maximize the total amount of available rack space. Provide units which terminate 6 or 12 fibers that occupy no more than one rack unit of space within the cabinet. Comply with the requirements of ANSI/TIA/EIA-568-A and ANSI/TIA/EIA-606.

15.2.12 FIBER OPTIC CABLE MARKERS
Provide fiber optic cable markers as shown in the standard details. Fiber optic cable markers shall have information machine printed on the marker. No stickers will be accepted. All fiber optic marker materials shall be outdoor rated and UV resistant. Decals shall be factory printed with a minimum letter height of 1-inch.

15.3 CONSTRUCTION REQUIREMENTS
Install all equipment per the manufacturer's instructions and industry standards. Do not exceed equipment and material ratings. When cable is delivered to the site, conduct optical time domain reflectometer (OTDR) tests on-the-spool. See testing section 20.8 Fiber Optic Tests of these specifications.

15.3.1 INSTALLATION AND SPLICING QUALIFICATIONS
Submit resumes and references detailing fiber splicing and installation experience for on-site personnel to the Engineer for approval. The subcontractors used on this project are considered part of the contractor's team and are also required to submit resumes and references. Submit to the Engineer references including client project manager, phone number and project experience. Failure to comply may result in a declaration of noncompliance. Provide necessary documentation of subcontractor qualifications to the Engineer upon request.

In addition, ensure that a member of the contractor's team, that has two years experience in the installation, testing, use and maintenance of fiber optic cable and fiber optic splicing equipment and has been approved by the Engineer, is on site at all times during the fiber optic cable installation and fiber optic splicing work until successful completion of the work. Receive approval from the Engineer for any substitution of this individual. The Engineer may stop activity on this project as a result of the absence of this on-site personnel from the project and may continue to charge time to the contractor and will not grant a time extension. Demonstrate successful completion of fiber optic installation and splice training courses. Provide any certificates demonstrating the on-site personnel has completed fiber optic splicing training courses provided by third-party trainers such as Light Brigade or Corning, or approved equal. Training courses shall cover at a minimum the following material:

1. Cable preparation
   a. Cable preparation tools
   b. Cable and jacket types
   c. Cable/buffer tube preparation for splicing
   d. Fanout kits
2. Fiber termination
   a. Mechanical and fusion connectors preparation and cleaning
   b. Loss measurement with power meter
   c. Bend and break identification
3. Fiber splicing
   a. Stripping and cleaving fiber
   b. Splicer settings modification
   c. Arc calibration
   d. Fusion splicing
4. Fiber testing and troubleshooting
   a. Port and connector cleaning
   b. OTDR machine settings
   c. End-to-end OTDR testing
   d. Reading OTDR outputs (identifying loss or failure points)
   e. Launch cables
   f. Reading power meter outputs
   g. Developing loss budgets
   h. Identifying active fibers
5. Cable protection after splicing
   a. Placement in splice closure
   b. Placement of splice closure in splice vault or cabinet
   c. Securing cable in cabinet

Ensure that installations provide ease of maintenance, with all component parts being readily accessible for inspection and maintenance.

15.3.2 CABLE INSTALLATION
Submit fiber optic cable installation procedures to the Engineer for review and approval at least 2 weeks prior to installing cables. The Contractor's submittal shall include:
1. The manufacturer's recommended procedures for pulling and for blowing fiber optic cable.
2. The name of the person on the Contractor's team who will be onsite at all times during the fiber optic cable installation and fiber optic splicing work. This should include their name, number, and experience.
3. Locations of end of reel splices.
4. Dates of fiber installation.
5. Installation start and end points and general pulling schedule.

Contractor is required to have the equipment and experience to install cable by either method: pulling or blowing. KDOT reserves the right to choose the method of installation. Use mechanical aids to assist cable installation. Use a breakaway swivel to ensure that the tension does not exceed 80 percent of the manufacturer's recommended tension. Ensure that the cable grips for installing fiber optic cable have a ball bearing swivel to prevent the cable from twisting during installation. Ensure pulling of cable is with even tension. Properly seal cable ends during installation.

Use cable pulling lubricant recommended by the cable manufacturer and a non-abrasive pull tape conforming to the provisions described under "Conduit" elsewhere in these Specifications. When blowing cable, use cable blowing lubricant specifically designed for installation of cable by blowing. Ensure that the lubricant will cover the fiber optic cable for the entire pull. Provide cable slack as indicated on the Plans. Record sequential markings (the number of feet printed on the cable) at all splice vaults; organize and submit this information to the Engineer.

During cable installation, keep the bend radius at a minimum of twenty times the outside diameter of the cable. Install cable with no splices except those indicated on the Plans. After installation, cut off and discard the first 10 feet of the cable. These 10 feet have not been included in the conduit and cable table and are considered incidental to other items of work. Ensure that no residual tension remains on the cable after installation, except the weight of the cable.

For all cable used as a trunkline cable, use full, uncut, virgin reels or spools. No unauthorized cuts or cable splicing will be allowed, e.g. convenience cuts.

15.3.2.1 TRUNKLINE FIBER OPTIC CABLE SLACK
For slack requirements see ITS-D03A and/or ITS-D03B.

15.3.2.2 BRANCH FIBER OPTIC CABLE SLACK
For slack requirements see ITS-D03A and/or ITS-D03B.

15.3.3 CABLE DAMAGE DURING INSTALLATION
If the cable becomes damaged during installation, stop operations and notify the Engineer immediately. There will be no extra payment or revisions to contract completion time for the replacement of the damaged cable.

15.3.4 SPLICING
When a buffer tube is required to be opened in order to perform fusion splicing, cut only the fibers to be terminated/spliced at a location according to the Plans. Unused fibers or fibers that are continuous through a splice location (expressed fibers) are to be coiled, and neatly routed around the inside edges of the splice tray. Splice optical fibers using the fusion splice method. Ensure alignment is via fiber cores and splicing equipment has fully automated X, Y, and Z axis (3-axis) alignment using a light injection/detection system. Use splicing equipment that has an auto fusion time control to monitor the power level through the splice to complete the fusing process when splice loss is a minimum. Complete all cabinet terminations and branch splicing prior to mainline or trunkline splices to ensure network connectivity for testing and communications. All splices and terminations must meet the requirements outlined in section 20.7: Fiber Optic Tests.

At splice locations where branch cables intersect with trunkline cables, do not open the buffer tubes of the trunkline cable unless a splice is required within that particular buffer tube. Ensure that these "straight through" buffer tubes remain unopened and simply be "expressed" through the splice enclosure; stowed in the bottom of the splice closure beneath the splice tray/s.

Protect all splices with a thermal shrink sleeve, 60 millimeters long. Place the completed splices in a splice tray. Place the splice tray in the splice closure or housing. Refer to the "Fiber Optic Cable Segment Diagram" in the Plan Set concerning the required labeling text for each cable segment.

An "end of reel/spool" trunkline splice is allowed every 10,000 cable feet minimum. Contain full cable splice in a single splice enclosure of adequate size. Redline the location of the trunkline splice enclosure/s onto the plan set and formally submit along with the fiber optic cable system test report. End of reel/spool splicing is considered incidental to the lump sum ITS site bid item for which no additional payment will be made.

15.3.5 SPLICE ENCLOSURES
Use a fiber optic splice enclosure contained inside a splice vault for underground splicing. Contain all fibers that require splicing within one enclosure. Upon completion of the splices, secure the splice trays to the inner enclosure. Seal the enclosure using a procedure recommended by the manufacturer that will provide a waterproof environment for the splices.

Sealing tape shall be used outside canister at all used ports. Port plugs shall be in place and prevent water intrusion on unused ports (as appropriate).

All installations shall be completed to manufacturer instructions.

Any entry into a closure shall include a pressure check of the enclosure on resealing using a hand pump to a minimum of 5 psi (or as shown in the manufacturer instructions), and soapy water on any ports or ring to ensure proper seal. If properly sealed, release pressure after testing; if not, find subsequent issues reseal and retest until leaks have been fixed. Any entry shall also require resealing rings with fresh lubricant per manufacturer recommendations. Ensure no debris (grass, leaves, dirt, etc.) are on or in sealing gasket or sealing mechanism.

All armored cables shall be grounded per manufacturer instructions.

Suspend all splice closures off the floor of the vault.

For end of reel splicing, use an appropriate splice enclosure to accommodate full cable splice in one enclosure.

Fasten the enclosure securely to the wall of the pull box in a manner that allows the cables to enter at the end of the closure without violating the minimum bending radius for the cables, while maximizing the clearance from the bottom of the pull box.

A splice closure is required at the end of all fiber runs for both terminated and un-terminated fibers. No fibers shall be left exposed.

15.3.6 FIBER DISTRIBUTION UNIT (FDU)
Secure the main cable into the FDU in a workman like manner. No bends to exceed a 2.0 inch minimum bend radius. Sparingly and carefully use wire pulls as to not pinch the fiber. Organize and secure fiber optic cables within the cabinet using hook and loop wire ties. Zip ties are not permitted.

15.3.6.1 SLACK CABLE
Leave sufficient amount of fiber optic cable in the FDU to facilitate removal of splice casettes to allow splicing to occur on a splice table.

15.3.6.2 LAST LINE
All terminations and splices within the cabinet are incidental to the site bid item and will not be paid on an individual splice price basis - this includes any splicing from a pre-terminated pigtail or FDU to a branch fiber when the splicing occurs within the cabinet.

15.3.6.3 TERMINATION SPLICES
Termination splices are splices in an equipment cabinet that join fibers in a cable to pigtails or connector modules. Place the termination splices in a splice cassette and place the splice cassettes in the FDU. Loop the individual fibers at least one full turn within the splice cassette to avoid micro bending. Maintain a 2.0 inch minimum bend radius during installation and after placing fibers in the cassette. Individually restrain each fiber in a splice cassette. Place the optical fibers in the splice cassette to provide no discernible tensile force on the optical fiber. Label every Closet Connector Housing Module by placing appropriate labels with pin/port numbers 1 through 12 on the Module; Label the fiber optic SFP Ports on every Ethernet Switch with the text (TX1, RX1, TX2, RX2). Terminate all fibers required for system operation as shown in the Plans. All termination splices are incidental to the site bid item and will not be paid on an individual splice price basis. This includes any splicing from a pre-terminated pigtail or FDU to a branch fiber when the splicing occurs within the cabinet. See section 20.8 Fiber Optic Tests for testing unterminated fibers. See section 15.2.5 Fiber Optic Splice Closure for unterminated fibers.

15.3.6.4 INSPECTION AND CLEANING
All FDUs and patch panels must be cleaned to meet IEC 61300-3-35 standards, and equipment paperwork (including yearly calibration) shall be made available to the engineer upon request.

NO.	DATE	REVISIONS	BY	APP'D
00	03-27-25	2024 KDOT Standards Updates	AJS	JAN

KANSAS DEPARTMENT OF TRANSPORTATION

ITS EQUIPMENT SPECIFICATIONS

ITS-S10 06-04-25

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

KDOT Graphics Certified 06-06-2025 Sh. No. 119

KDOT Graphics Certified

Plotted by : sspatil 16-DEC-2025 14:06
File : ka680801iss-S10.dgn

Before mating two optical surfaces together, both surfaces must be visually inspected with an approved fiber inspection camera. If debris is detected by the camera, the surfaces shall be cleaned using an approved cleaning pen or lint-free wipes. Use at least 98% isopropyl alcohol. After cleaning, inspect the surfaces again before mating to verify they are clean. Only clean surfaces if debris is detected to prevent smearing on the surface. While surfaces are not being inspected, they should be protected with dust caps or patch cords.

Immediately after installation and testing, all optic panels shall be wrapped in protective wrap such as cellophane to prevent ingress of debris. The protective wrapping will be removed upon handover to KDOT.

15.3.7 CONNECTIONS
Clean all connections to meet IEC61300-3-35 standards. Cleaning shall only be completed if camera detects debris, and connectors shall be cleaned in a similar process to 15.3.6.4.

15.3.8 FIBER OPTIC CABLE TESTING
Perform Fiber Optic Cable Testing in accordance with the requirements set forth in the testing section of these Specifications.

16.0 CELLULAR MODEMS

16.1 GENERAL
Furnish all tools, equipment, materials, supplies and manufactured articles and perform all operations necessary to install cellular modems as shown on the Plans and as specified herein.

16.2 MATERIALS

16.2.1 CELLULAR MODEM
Provide a modem that is a Sierra Wireless MP70 (ethernet model with four ports) or approved equal, as indicated on the Plans. The following minimum requirements apply: Support automatic scheduled over the air Preferred Roaming List (PRL) updates and be supported on Verizon network, ALEOS embedded intelligence or equivalent functionality, high speed processor, embedded machine protocols, class 1 division 2 certified, serial and Ethernet interface. Provide associated antennas, antenna cables, and power supplies with the modem at no additional charge. KDOT will activate all cellular modems.

16.2.2 DIRECTIONAL ANTENNA
Provide an antenna that is a Wilson 314411 or approved equal to meet the following minimum requirements. Use antenna assemblies with cellular modems that are of the dual-band (698~960/1710~2700 MHz) Yagi style and have a working temperature of -35°C to 50°C. Provide a vandal-resistant type antenna base. Mount antenna to the top of the ITS device pole or structure as shown in the details with mounting hardware that is approved by the Engineer.

16.2.3 ANTENNA CABLE - DIRECTIONAL ANTENNA
Provide riser cables that are of a low-loss co-axial design. Ensure loss per 100 feet does not exceed 5 dB at 1800 MHz. Jumper cables may be used inside cabinets between cellular modems and lightning protection devices. Jumper cables may not exceed three feet in length and may not have losses greater than 18 dB per 100 feet. Provide outdoor rated RF cables with UV resistant outer jacket. Provide plenum rated cable for installations inside of buildings or shelters.

16.2.4 OMNIDIRECTIONAL ANTENNA - LOW PROFILE
Provide an antenna that is a PCTEL BMLPVMBLTENGP, BMLPVMBLTENGP-VP or approved equal to meet the following minimum requirements. Where specified, use antenna assemblies with cellular modems that are of low-profile, omnidirectional design. Antenna shall not exceed 4 1/2" in height (excluding mounting base, if used) and 1 1/2" in diameter. Provide antenna assemblies that are dual band (700-960/1710-2700 MHz), have a temperature rating of -35°C to +50°C. If mounting directly through a cabinet shelf or other surface, provide an antenna with an integrated Type-N female connector and appropriate Type-N to SMA adapter cable. If mounting to an exterior bracket, provide bracket and suitable antenna base with an integrated lead that includes an SMA connector.

16.2.5 SURGE PROTECTION
Provide lightning protection Wilson 859902 or approved equal.

16.3 CONSTRUCTION REQUIREMENTS

16.3.1 GENERAL
Incidental items include all connectors, adaptors, and cables; including but not limited to RF co-axial cables, DC power cables, AC power cables, Ethernet cables, or any other interface cables. There will be no separate payment for incidental items. KDOT will provide IP addressing. Construct and make all necessary network configurations. Coordinate with KDOT and receive approval for any downtime necessary to connect the cellular modems.

16.3.2 ANTENNA INSTALLATION
Install antennas as per manufacturer's instruction and in accordance with any applicable electrical or construction codes. Align antennas to optimize signal quality (received signal strength indication (RSSI) and signal to noise ratio (S/N)). Determine the appropriate antenna azimuth and align the antenna toward the appropriate cellular communication tower. Supply the necessary test equipment for antenna alignment to achieve the maximum signal transfer.

17.0 POINT-TO-POINT (P2P) ETHERNET RADIO (LICENSED BAND)

17.1 DESCRIPTION
Furnish, install, configure, and test an Ethernet radio. If required to supply a radio, provide an Ethernet radio that meets these specifications. Ensure that the radio provides an acceptable wireless Ethernet communication link when combined with another radio.

17.2 SPECIFICATIONS AND REQUIREMENTS
Provide wireless equipment that meets the following specifications and requirements:
1. Point-to-Point (P2P).
2. Operate in 11 GHz FCC licensed frequency band.
3. Use Time Division Multiplexing (TDM) wireless modulation.
4. Allow Quality of Service (QoS) management.
5. Support 802.1Q headers to carry VLAN tags and priority markings shall support VLAN tagging per port.
6. Use a native Ethernet technology for Payload Interface. Mapping of Ethernet over TDM will not be accepted. Equipment will support FE and GE autosensing interfaces.
7. Frame Length Support: Support for "Baby Jumbo" frames up to 1632 Bytes.
8. Buffer Size: overall buffer size (used to manage traffic queues) of at least 1 Mb. Usable by a single service, if required by traffic profile.
9. RF Bandwidth: 10 MHz, 30 MHz capable.
10. Receive sensitivity (BER 10-6): With 10MHz channel spacing, range between -90.5 dBm at QPSK to -73.0 dBm at 256 QAM.
11. Support forward error correction.
12. Fade and Intermodulation Countermeasures: Support for adaptive equalization, adaptive modulation and space diversity.
13. Minimum supplied bandwidth 100Mbps. Software expandable to 200Mbps without hardware changes. During testing, actual bandwidth to be verified with RFC2544 throughput and latency tests.
14. FCC Part 15 compliant and certified for EMC.
15. Type of emission: Licensed only (compliant with FCC Part 101).
16. Provide 10/100 BaseT RJ-45 Ethernet port
17. Minimum operating temperature range for P2P radio Outdoor Unit (ODU): -35°C to 50°C. Minimum operating temperature range for P2P radio Indoor Unit (IDU): -20°F (-28°C) to 165°F (74°C).
18. Security: Provide user-controlled levels and privileges and user access control.
19. Management: Ethernet SNMP remotely, ASCII RS-232 locally or equivalent. Fully managed remotely, allowing downloading of system configuration, equipment software or system operation firmware changes.
20. Rack mounted
21. Warranty: In-warranty product repairs are covered up to 5 years.
22. Advance replacement: Replacement product is shipped express overnight (in most cases) in case of a verified product issue.

17.3 CONSTRUCTION
Provide all radio channel planning, communication path analysis, power level settings, antenna positioning (X, Y and Z axis including tilt), and Radio Frequency Interference (RFI) and Electro-Magnetic Interference (EMI) resolution so that fully functional, operational, and secure communication links are provided. A preliminary design plan has been provided in the plan set, but it is understood that the design may need to change based on field conditions encountered. Take into consideration existing licensed radio networks operated by others. Install, orient, and align the P2P radios in order to optimize performance. Reference and follow installation guidelines provided by the radio manufacturer. Provide all antennas, pipes, mounts, cabling, lightning protection, grounding, configuration, testing, and other subsidiary items and include in this individual bid item.

Furnish all tools, equipment, materials, supplies, and manufactured articles and all operations necessary to install wireless equipment and construct, configure, and test the wireless communications facilities as shown on the plans and as specified herein. Use stainless steel for all hardware and fasteners.

Lightning Protection: For protection of the P2P radio equipment, provide and install bi-directional replaceable gas tube lightning arrestors (Polyphaser Model RGT or equivalent).

Mount the ground level network interface, power supply, and grounding block in the cabinet or data closet at the site. Contact the Engineer to coordinate FCC required prior coordination notice and FCC License Application. Contact the Engineer to obtain network configuration information including: IP addresses, VLAN tags and security key info for equipment installed.

Connect the P2P Ethernet radio to the Ethernet switch or other Ethernet-enabled device at the site.

17.4 TESTING/SUBMITTALS
Develop a test plan to demonstrate that each P2P Ethernet Radio is providing a wireless link capable of a continuous data rate of 100 Mbps. Complete a minimum 15-day test period before final acceptance. Submit test plan to the Engineer for approval. Incorporate any changes requested by the Engineer into the test plan and test each link. Document all test results and submit these to the Engineer for approval. Provide an Excel spreadsheet (electronically) that details all equipment received and installed as well as all configuration settings, including VLAN's.

18.0 POINT TO MULTIPOINT (P2M) ETHERNET RADIO

18.1 DESCRIPTION
Furnish, install, configure, and test a P2M Ethernet Radio. Ensure that the P2M radio provides an acceptable wireless Ethernet communication link when combined with another P2M radio.

18.2 SPECIFICATIONS AND REQUIREMENTS
Provide wireless equipment that meets the following specifications and requirements:

1. Operates in unlicensed frequency band, 5.15-5.35 GHz, 5.47-5.725 GHz, 5.725-5.850 GHz or in the 4.94-4.99 GHz band
2. Radio Access Method: Time Division Duplex (TDD)
3. Channel: 10 MHz, 20 MHz
4. Central Frequency Resolution: 5 MHz, 10 MHz
5. Typical Sensitivity (dBm at antenna port):

Modulation	1	2	3	4	5	6	7	8
Level* 20 MHz	-89	-88	-86	-84	-81	-77	-73	-71
Level* 10 MHz	-92	-91	-89	-87	-84	-80	-76	-74

*Modulation Level combines modulation scheme and coding gain.

6. Modulation Scheme (Adaptive): OFDM: BPSK, QPSK, QAM16, QAM64
7. VLAN Support: Based on IEEE 802.1q, QinQ 802.3ad
8. Layer-2 Traffic Prioritization: Based on IEEE 802.1p
9. Layer-3 Traffic Prioritization: IP ToS according to RFC791 and DSCP according to RFC2474
10. Layer-4 Traffic Prioritization: UDP/TCP port range
11. Security: WEP 128-bit authentication, AES128, WEP 128, and certified FIPS-197 mode built-in encryption
12. Remote Management Access: From wired LAN or wireless link
13. Management Access Protection: Multilevel password; configuration of remote direction (from Ethernet only, wireless only, or both sides); configuration of IP addresses of authorized stations
14. Software Upgrade: via TFTP and FTP
15. SNMP Agents: SNMP v1 client, MIB II, Bridge MIB
16. Allows Quality of Service (QoS) management
17. Ethernet Interface: 10/100 BaseT RJ-45 port
18. Operating Temperature, SU/AU Outdoor Units: -35° C to 50° C
19. Power over Ethernet (POE)
20. Point-to-Multipoint (P2M)
21. Minimum rated/actual bandwidth of 54/24 Mbps
22. EMC and Radio: FCC Part 15 compliant

18.3 CONSTRUCTION
Install P2M Ethernet Radios at locations as shown on the plans.

Provide for all radio channel planning, communication path work, power level settings, antenna positioning (X, Y and Z axis including tilt), Radio Frequency Interference (RFI) and Electro-Magnetic Interference (EMI) resolution so that fully functional, operational, and secure communication links are provided. A design plan has been provided in the plan set but it is understood that that design may need to change based on field conditions encountered. Take into consideration existing unlicensed radio networks operated by others. Install the radios and orient to maximize the Signal-to-Noise Ratio (SNR) levels. Reference and follow installation guidelines provided by the radio manufacturer. Provide all antennas, pipes, mounts, cabling, lightning protection, grounding, configuration, and testing to provide a fully functional system.

Furnish all tools, equipment, materials, supplies, and manufactured articles and all operations necessary to install wireless equipment and construct, configure, and test the wireless communications facilities as shown on the plans and as specified herein. Use stainless steel for all hardware and fasteners.

Mount the P2M Radio Outdoor Unit/Antenna as high on the supporting structure as practical, while remaining within the 30 degree protected radius beneath the air terminal (if installed). Do not allow the mounting of the radio to interfere with the camera lowering device or with the lightning air terminal.

Use outdoor-plant rated industrial Cat 6 cable (Commscope 2003 Black or approved equivalent) with shielded RJ-45 end connectors (Digi-Key A9115-ND or approved equivalent) between the radio outdoor unit and the cabinet or data closet surge protector.

Mount the network interface, power supply, surge suppression, and grounding block neatly in the cabinet or data closet at the site.

Contact the Engineer to obtain network configuration information including; IP addresses, VLAN tags, and security key info for equipment installed.

Connect the P2M Ethernet radio to the Ethernet switch or other Ethernet-enabled device at the site.

Apply permanent external labeling on radio equipment in the cabinet according to information to be provided by the Engineer.

NO.	DATE	REVISIONS	BY	APP'D
00	03-27-25	2024 KDOT Standards Updates	AJS	JAN

KANSAS DEPARTMENT OF TRANSPORTATION

ITS EQUIPMENT SPECIFICATIONS

ITS-S11 06-04-25

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

KDOT Graphics Certified 06-06-2025 Sh. No. 120

KDOT Graphics Certified

Plotted by : sspatil 16-DEC-2025 14:06
File : ka680801iss-S11.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	121	253

19.0 ITS COMMUNICATIONS INTEGRATION

19.1 DESCRIPTION
This work consists of the installation of communication equipment and configuration of hardware settings and software parameters (both wireless and fiber optic), such as IP addressing and serial port definitions, VLAN definitions and network management parameters of KDOT furnished and Contractor furnished communications equipment as defined herein, in KDOT designated facilities, or ITS cabinets as shown on the Plans, or as directed by the Engineer.

Configure all communication equipment based on a template provided by the Engineer for each type of ITS component such as Ethernet switches, modems, CCTV cameras, and DMS.

Provide a complete, functional, wireless, fiber optic, and electronic communications system, including all necessary cables, connections, surge suppressors, antenna alignments and configurations in accordance with the KDOT and equipment manufacturers' specifications and as specified on the Plans and Specifications. Provide equipment as specified on the Plans and Specifications, integrate, test, demonstrate, and receive KDOT's approval of the complete system.

Provide troubleshooting, reinstallation, and reconfiguration of all KDOT furnished and Contractor furnished communication equipment in the event of communication equipment failure. Receive approval by the Engineer for any reconfiguration.

There will be no separate payment for troubleshooting, reinstallation, or reconfiguration of devices. If an issue outside of contractor control causes delay of more than 8 hours in completing integration, additional payment may be requested from KDOT.

19.1.1 CERTICIATION OF CONTRACTOR PERSONNEL
Use a CISCO certified technician, or in the presence of and under the responsible charge of an employee or subcontractor who is a CISCO certified technician, for all configuration of Cisco switches. Before starting work, provide the Engineer with the names of the personnel assigned to perform switch configuration and a copy of their certification card.

19.2 MATERIALS

19.2.1 GENERAL
Supply all tools, equipment, materials, supplies, and manufactured articles and perform all operations necessary to install KDOT furnished equipment and construct the communications facilities as shown on the Plans and as specified herein, or as directed by the Engineer.

19.2.2 CONNECTORS, CABLES AND ADAPTERS
Incidental items include all connectors, adaptors, and cables, including but not limited to serial cables, alarm cables, all power cables for Cisco equipment, DC power cables, AC power cables, fiber optic jumpers, DS-1 cables, Ethernet cables, interface cables, located within and between all ITS cabinets and KDOT designated facilities. There will be no separate payment for incidental items. Use outdoor-rated for cables exposed to weather conditions or installed in field cabinets.

19.3 CONSTRUCTION REQUIREMENTS

19.3.1 GENERAL
Furnish all tools, equipment, materials, supplies, and manufactured articles and perform all operations necessary to install KDOT-furnished equipment and Contractor-furnished equipment and construct the communications facilities as shown on the Plans and as specified herein.

19.3.2 KDOT FURNISHED EQUIPMENT
Receive and review the installation wiring diagrams from the KDOT-furnished communication equipment suppliers. Use these drawings to make necessary terminations to all KDOT-furnished and Contractor-furnished communication equipment.

19.3.3 COMMUNICATION SCHEMATIC DRAWINGS
Submit as-built communication schematic drawings to the Engineer based on the actual connections made in the field and in the KDOT designated facility. Include in the as-built communication schematic drawings all equipment, both KDOT furnished and Contractor furnished. Leave a copy of these approved drawings in each respective ITS cabinet or KDOT designated facility. Use documentation format as specified in these specifications.

19.3.4 NETWORK CONFIGURATIONS
KDOT will provide IP addressing and configuration files for each KDOT furnished communication equipment type. Make all necessary network configurations. Coordinate with KDOT and receive approval for any downtime necessary to connect the new network components.

19.3.5 COORDINATION
Provide a skilled staff member to attend a coordination meeting prior to installation of communication equipment.

19.4 INTEGRATION WITH CENTRAL SOFTWARE
Ensure proper integration and functionality with systems as identified by KDOT or KC Scout. Ensure continuity of functions currently in place, and prevent disruption of service for any sites not included in the plans. Coordinate with KDOT or KC Scout to identify affected systems and devise methods to prevent service interruptions.

Perform software integration testing in coordination with KDOT or KC Scout on ATMS and video distribution systems. Configure both KDOT furnished and Contractor furnished equipment as needed in order to achieve functionality prescribed by KDOT. Travel to site locations as many times as required to test and configure equipment to provide a working communication system with KDOT or KC Scout central software. Complete integration prior to final acceptance.

20.0 ITS COMPONENT TESTING

20.1 DESCRIPTION
Test all ITS devices and communication links installed in this project. Demonstrate functionality of each device using a test plan provided by KDOT. Test plans will include a list of items to be tested, a test method (observation, calculation, or demonstration), an expected result, and an obtained result. Seek KDOT approval for input or specific procedures or for modifications to the test plan.

First, test each unit with its vendor software, then coordinate with KDOT to test with KDOT ATMS software, finally check transmission at site and at the KDOT designated facility. Demonstrate through testing that the equipment associated with each cabinet works as required. The tests described below are in addition to any other tests required herein.

20.2 MATERIALS
Provide all testing equipment, labor, materials and incidentals required to carry out the KDOT-provided test plan and all tests described in this section.

20.3 CABINET LEVEL FUNCTIONAL TESTS
Perform testing on each of the field components installed. Ensure that this testing verifies the proper functioning of the field components after installation. Perform the tests identified under this type of testing on each installed component and ensure the results are signed off by the Engineer or designated KDOT representative.

Provide copies of the test results for each component to KDOT and if requested, the test hardware and software.

20.3.1 CCTV PAN-TILT-ZOOM (PTZ) CAMERA CONTROL TEST
Ensure that the PTZ camera control test verifies the functionality of the installed camera controller as well as the serial communication to the camera controller. This test will use vendor test software to the CCTV camera to be commanded to turn on; turn off; send a message to the controller to pan right and left; send a message to the controller to tilt up and down; and send a message to the camera controller to zoom-in and zoom-out.

20.3.2 CCTV STAND-ALONE TEST
Following the installation, conduct an approved stand-alone test for each CCTV to verify that the units operate as specified. Ensure that this test demonstrates that video data from the CCTV camera can be manually selected on the IP network switch and be displayed on a workstation monitor at a KDOT-designated facility. Use vendor's software to test the CCTV camera for the follow commands: to turn on, turn off, pan right and left, tilt up and down, and zoom-in and zoom-out. If a unit fails to pass the stand-alone test, correct or replace the unit, and repeat the test until proven successful.

For each unit of equipment, conduct approved stand-alone tests that exercise all stand-alone functional operations of the equipment including the following: control of focus, iris, and power on/off; range of pan, tilt, zoom and digital zoom; presence and quality of video signal; camera ID and preset text generation; and pan and tilt limit stops are set to the Engineer's specification.

Stand-alone test the CCTV camera assembly for no-less-than 24 hours as a complete unit to include the CCTV camera, all cabling, all surge suppression, video encoder and/or IP network switch (if applicable) as required per project plans and specifications. This testing will require that each CCTV location be connected to a laptop to exercise the CCTV camera functionality.

Verify the video transmission quality; response to all central software commands identified under functional requirements; horizontal and vertical resolution; and verify the video transmission quality to the designated KDOT or KC Scout facility. Conduct the test in the following order: test with vendor software at site, test with the ATMS software, verify video transmission at site, and verify video transmission at the designated KDOT or KC Scout facility. Test video for smooth frame transmission, good color, and overall image quality. Ensure no video locking.

Prior to testing, the contractor shall program CCTV cameras according to the documented requirements. Coordinate with the Engineer to obtain written programming procedures. After programming is complete, the Engineer will verify that cameras are correctly programmed, and network communication is functional. Once programming and communication is verified, the CCTV subsystem test may begin.

20.4 DYNAMIC MESSAGE SIGN TEST
Perform the DMS test to evaluate the functionality of the installed DMS signs as well as the communication links between the controller and the KDOT central software. Use vendor software and KDOT's current NTCIP-compliant central software for this test. This testing will require that each DMS location be connected to a laptop to exercise DMS functionality. Contact and coordinate with the DMS manufacturer to power up the unit and perform sign commissioning. Provide all equipment required to complete testing.

20.4.1 DMS STAND-ALONE TEST
Following the installation, including power connectivity, conduct an approved stand-alone test for each DMS assembly to verify that the unit operates as specified. Complete the stand-alone test for each DMS within two weeks following the installation of the DMS case, cabinet, power, and communication links. If a unit fails to pass the stand-alone test, correct or replace, and repeat the test until proven successful. The Contractor shall ensure that the installed DMS is powered up within two weeks from the installation date. If the Contractor is unable to power the sign within the stipulated two-week period, the Contractor shall be responsible for removing and reinstalling the sign at a later date at their own cost. The Contractor must notify the ITS Engineer immediately if there are any issues preventing the sign from being powered within the specified timeframe.

If DMS parts are defective, coordinate with the DMS vendor to obtain warranty replacement of defective parts for DMS or other KDOT-provided equipment and reinstall at no charge to KDOT.

Perform the stand-alone test for the DMS system using both the controller front display panel and a laptop. Provide the laptop. The DMS manufacturer shall provide the vendor software for the test.

20.4.2 DMS COMMISSIONING
Manufacturer shall perform on-site DMS commissioning including communication testing with KDOT central software. DMS commissioning includes the following items: DMS system is installed correctly, DMS system is functioning correctly, DMS is ready for normal operations without the need for an additional site visit, record of all tests and setup tests performed. Manufacturer shall provide procedures. DMS commissioning shall include the following tests in this order: test with vendor software at site, test with KDOT central software, verify transmission at site, verify transmission at KDOT facility. Provide DMS ground test report to the Engineer with commissioning report.

20.5 VEHICLE DETECTOR TEST
Test each radar vehicle detector to confirm the accuracy of the data reported to the KDOT designated facility staff.

20.5.1 VOLUME
Use human observers to count the vehicles in each lane during a 15 minute interval. The total for each lane shall be compared with the lane total for the same period reported by the central computer. The totals from the computer and from the observers must not differ by more than 10 percent for every lane.

20.5.2 SPEED
Conduct this test one lane at a time. Use a trained, experienced operator with a speed measuring device such as a a LIDAR or Radar to measure the speeds of individual vehicles, excluding large trucks, in the lane. Measure as many vehicles as possible in a 10 minute period and the results averaged. Calculate a weighted average speed for the same period based on data from the central computer. Weight the speed for each reporting period by the number of vehicles in that reporting period. The speeds from the computer must be within fifteen percent of the observed speed for every lane. If vehicles in the closest lane interfere with speed measurements in other lanes, provide a means of elevating the observer enough to provide a clear line of sight to the vehicles being observed.

20.6 60 DAY ACCEPTANCE TESTING
The test period for each device (including all CCTV, DMS, and VDS) will be 60 days, to commence when all work has been completed, materials have been furnished and completely installed, and copies of the test results have been received and accepted by the Engineer. Final system acceptance for each device will be defined as when the device has operated continuously and successfully for 60 calendar days with no more than 2 calendar days downtime due to mechanical, electrical, and/or other malfunctions.

20.7 WIRELESS DATA COMMUNICATIONS LINK TEST
Prior to testing an installed link, calculate expected signal strengths for each link and expected throughput. Include the following in the test plans installation documentation for each site: Transmit power setting, antenna type and gain, antenna azimuth, transmit frequencies (or channel/band for broadband equipment), antenna height, and minimum receive power for the applicable modulation scheme/throughput as provided by the manufacturer. Include in the test reports: signal quality, modulation scheme selected (or selected by device if automatic), link throughput for TCP and UDP protocols using a tool such as Iperf over a period of no less than 60 seconds and packet loss over a period of no less than 60 seconds. Include in the test report comparisons of observed and expected throughput for each link. Provide test results to the Engineer.

20.8 FIBER OPTIC TESTS
Provide sample test results and test procedures to the Engineer for approval before testing begins.

Contractor shall schedule a joint meeting with KDOT ITS to review testing procedures for live fiber at least two weeks prior to testing.

After all splices and terminations have been completed, test each fiber, including spares and unterminated fibers, with a power meter/stable laser source and OTDR between termination points (for unterminated fiber a temporary pigtail termination to a temporary FDU is required; there is no extra payment for temporary terminations, this work is subsidiary to other iterms of the contract). Test fiber optic cables bi-directionally. Both ends of the tested fiber require a launch cable to accurately measure connector losses. Test with a launch cable that is at least ten times the pulse width used for the test and a receive cable of similar length.

Conduct power meter tests for each fiber to demonstrate connectivity and attenuation from origin to destination. Model this test after FOTP-171 insertion loss. Demonstrate that the attenuation for each fiber path including connectors, and splices as a whole, comply with the loss budgets required by these documents. Submit a test result summary sheet showing calculated attenuation, splice and connector losses, and tested loss for each fiber to the Engineer for review and approval. The Contractor may request a sample test result summary sheet. Test between termination and ITS Cabinets as designated by the Engineer.

Conduct bi-directional OTDR and power meter tests end to end for each fiber. End to end is defined as KDOT designated facility to field device or temporary termination point for testing purposes on unterminated fiber. This includes tests for each fiber from the designated KDOT facility to the field device. If using two OTDR or power meter testers, verify that they are providing similar results using the same pulse width on a single fiber prior to testing. Provide these results to the Engineer upon request.

Conduct the tests at test wavelengths of 1310 nm and 1550 nm. Prior to testing, provide the Engineer with an example test sheet for approval that includes OTDR and power meter test data as well as physical characteristics of the fiber optic cable and the cable run. Provide OTDR trace results in a graphical form acceptable to the Engineer. Identify direction using an A/B identifier for each fiber tested. Identify the pulse width used on all trace results.

The actual link loss must be less than the calculated maximum for each fiber and no unexplained events shall exist. If any fiber fails to satisfy the specified performance requirements in the 1310 nm or 1550 nm wavelength tests, determine the cause and correct the failure to the satisfaction of the Engineer. Provide electronic copies of all test results to the Engineer. Provide test results with a summary table indicating fiber data, calculated losses, 1310 nm results, 1550 nm results, and fiber identification. Additionally power meter tests and OTDR tests should provide similar end to end results.

NO.	DATE	REVISIONS	BY	APP'D
00	01-09-25	2024 KDOT Standards Updates	AJS	JAN

KANSAS DEPARTMENT OF TRANSPORTATION

ITS EQUIPMENT SPECIFICATIONS

ITS-S12 06-04-25

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

KDOT Graphics Certified 06-06-2025 Sh. No. 121

KDOT Graphics Certified

Plotted by : sspatil 16-DEC-2025 14:06
File : ka680801iss-S12.dgn

Testing results must meet the loss budget as shown below:

	Test Wavelength:	
Allowed Loss Per:	1310 nm	1550 nm
Kilometer	0.40 dB	0.35 dB
Splice (Average)*	0.05 dB	0.05 dB
Connector (Average)**	0.20 dB	0.20 dB

*A maximum loss of 0.30 dB is allowed for any single splice. If fewer than four splices exist in the fiber being tested, an average loss of 0.15 dB is allowed for each splice.

**A maximum loss of 0.40 dB is allowed for any single connector. If the distance between a field splice and FDU is less than 50 feet, a maximum combined loss of 0.50 dB is allowed.

The OTDR measured back reflection (reflectance) loss shall be less than -40dB. Averaging time for OTDR traces shall be at least 30 seconds. OTDR pulse width shall be appropriate for the length of trace that is being tested; auto-test values by OTDR should be reviewed by contractor and a series of pulse widths used to determine best trace for each run. Acquire approval from the Engineer for any exceptions and document them at the time of testing.

If the maximum loss is exceeded for any splice, cut and re-splice the fiber. A minimum of two attempts at cutting and re-splicing fiber should be made to correct the loss. If the loss still exceeds the maximum listed, verify with the Engineer that the loss will be acceptable. Provide documentation of each attempted test.

Provide documentation that all testing equipment has been calibrated within the last year. KDOT reserves the right to require a new calibration certificate for OTDRs, Power Meters, or Fusion Splicers if it is felt that equipment has been mishandled or damaged.

Coordinate with the owner of leased fiber (e.g., KTA, CenturyLink/Lumen, etc.) as necessary for access to test locations to verify testing and confirm results. If problems are identified on leased fiber, the Contractor shall document issues and work with KDOT to notify providers and remedy the identified issues. Additional expenses from extra site visits to establish and test connectivity as a result of coordination with the owner of leased fiber or backbone splicing shall be approved by KDOT in advance. Losses within leased fiber are not the responsibility of the Contractor. If leased fiber power meter results fail, results may still be accepted. Instances will be evaluated on a case-by-case basis.

20.9 STRUCTURAL INSPECTION REQUIREMENTS
Coordinate with the Engineer to schedule initial structural inspections and any necessary follow-up inspections once the project's structural elements are constructed and complete in place. KDOT will perform the initial inspection, will generate the initial inspection form, and will provide the contractor with a list of deficiencies that will be included in the project punch list. The contractor shall provide access to KDOT such that the inspector can safely perform the inspection. The contractor is responsible for obtaining the initial inspection form and including it in the Technical Reference Manual (TRM).

20.10 TECHNICAL REFERENCE MANUAL (TRM)
Coordinate with the Engineer to locate and compile all project, device, and component information required by these specifications into a Technical Reference Manual (TRM). Organize and submit all information electronically via a USB flash drive or online drop box system in the formats noted on Table S.15.2 on sheet ITS-S15.

A complete draft of the TRM, including all fiber test results, must be submitted prior to commencement of the 60-day test period for any device or system. KDOT's ITS Unit will provide written approval and confirmation that all materials were received and that equipment is ready for testing prior to commencing any test periods.

The Engineer will review the draft TRM during the 60-day test period and will provide comments to the Contractor for any corrections to be made prior to the termination of the 60-day test period. Final acceptance of any system or project will not be granted until a final, updated version of the TRM has been submitted to and accepted by KDOT's ITS Unit.

The following sections must be included in the TRM:
1. Table of Contents
2. Project Information, Documents, and As-Built Plans
3. Device Documentation & Warranties
4. Test Results
5. Splice Vault / Pull Box Documentation
6. GPS Documentation
7. Cabinet Documentation Records

See Table S.15.1 and S.15.2 on ITS-S15 for a checklist of all items to be submitted as part of the project.

20.10.1 TABLE OF CONTENTS
Following the cover page of the TRM, include a linked or bookmarked table of contents for the entire TRM. Each section and subsection as noted in Table S.15.2 must be included and linked.

20.10.2 PROJECT INFORMATION, DOCUMENTS, AND AS-BUILT PLANS
In this section, include any relevant information or documents obtained or developed for the project.

Provide all approved permits obtained for the project, including railroad, waterway, bridge, city, or county permits.

Additionally, include a table listing all new power service locations with corresponding addresses, service types, and utility contact information.

After all cable and conduit has been installed, contact Kansas OneCall to perform locates for all cable included in project. Include email(s) from Kansas OneCall showning status of all locates as complete. The project will not be accepted if utilities cannot be located correctly. The Contractor will be responsible for correcting utilities so they can be located.

Include an As-Built version of the plans in this section with any field alterations or changes noted in red. Legibly mark plans in a contrasting, reproducible color to depict any changes or deviations made during construction, including buried or concealed construction or utility features. Record locations of all buried utilities that differ from the location indicated or that were not included on the contract plans. As-Builts must include marked-up communication schematic drawings. Supplement as-built documents with detailed sketches as necessary.

20.10.3 DEVICE DOCUMENTATION & WARRANTIES
Provide a list of all components and parts used in the project. Include a brief description, part or model number, and listing of recommended suppliers including e-mail addresses, phone numbers, or website links. For each item, include the warranty start date and effective warranty period. Also include component serial numbers for cameras, detectors, and DMS.

Include electronic copies of any warranty submittals.

Include all final and approved submittals and shop drawings as an electronic PDF file with bookmarks of each component or cable. Be sure to include any structural weld drawings and general wiring/block schematics.

Additionally, provide a copy of each user manual for all vendor-supplied software and equipment. Tab or highlight any fault diagnostic or repair procedures and any preventative maintenance procedures to facilitate field maintenance or repairs.

Include all lowering device installation certifications from the manufacturer indicating that the lowering devices were installed correctly. Include the installation and operation specifications and manuals for the lowering device in this section if they were not already included in the approved submittals.

20.10.4 TEST RESULTS
Include copies of all results for each test conducted for the contract. Test results should be labeled clearly with locations on the header of each page. This includes, but is not limited to:
1. Ground Resistance Test Results
2. ITS Component Test Results
   - a. CCTV Camera
     - i. Standalone
     - ii. 60-day/Final Acceptance
   - b. CCTV Lowering Device Test Results
   - c. DMS Test Results
     - i. Standalone
     - ii. Commissioning
     - iii. 60-day/Final Acceptance
   - d. VDS Test Results
     - i. Standalone Test
     - ii. 60-day/Final Acceptance
   - e. Ethernet Radio Systems
     - i. Wireless data communications link
     - ii. Throughput
3. Fiber Optic Test Results
   - a. Power Meter
   - b. OTDR
   - c. Total Fiber Loss Budget

20.10.5 SPLICE VAULT / PULL BOX DOCUMENTATION
For each fiber optic splice vault and communications pull box, include the following documentation: a photo of the inside of each vault or box, a brief location description, the vault or box identifier as labeled on the plans, a description of the cables within the vault or box, sequential fiber markings taken within three feet of conduit entry, and any other pertinent information that would be useful for future maintenance activities. Upon completion of splicing, take a picture of each splice tray, labeling each fiber and each tray with clear identifiers.

For at least one electrical pull box per project, include a photo of the outside of the box after installation.

The data for each vault may be presented in a PDF format or included as attached data in a shape or KMZ file. All data must be embedded in the GPS points provided and should not reference external storage locations.

20.10.6 GPS DOCUMENTATION
Provide electronic GPS documentation of all items installed or used in the project. Include plan identifiers/labels for each item. GPS documentation shall be submitted as an electronic spreadsheet using the template provided by the Engineer, a shapefile, or a KMZ file. If Providing an electronic spreadsheet, provide the spreadsheet as a PDF within the TRM and as an electronic Excel file.

GPS points shall be included for all the following installed devices: DMS foundations, CCTV camera poles, detector poles, cabinets (pad- and pole-mounted), pull boxes, splice vaults, wireless towers, power supply assemblies (Type 1 and Type 2), service poles, transformers, junction boxes, and all conduit and cable runs. GPS coordnates shall be collected for existing devices or features utilized or modified during the project. GPS coordinates for conduit runs shall be taken every 100 feet for trenched or plowed conduit and every 20 feet for bored conduit. Collect both depth (distance from ground level) and elevation (distance from datum) data for bored conduit.

GPS points shall be collected with high accuracy GPS receivers capable of submeter accuracy. GPS points shall be in decimal degree format reported to a minimum of six decimal places for both latitude and longitude.

Include a photo of both the front and back of the inside (doors open) of each cabinet in the GPS documentation section of the TRM. Include pictures of all fiber distribution units in POP Buildings, Hub Cabinets, or Communications Shelters that were modified with the project.

20.10.7 CABINET DOCUMENTATION RECORDS
For each cabinet in the project (installed, modified, or existing), provide an electronic copy of the cabinet documentation to be included in the document pouch/folder. The following documents must be included for each cabinet: Patch Panel Diagrams, Cabinet and Device Wiring Diagrams, Cabinet Elevation Drawings with detailed labels, Site Communication Schematics, and a copy of any maintenance logs.

Print an 8 ½" by 11" hard copy of all documentation for each cabinet and place within the cabinet's document pouch/folder. Final acceptance will not be granted until both the hard copies are placed in each cabinet and electronic copies are included in the TRM.

21.0 TRAINING

21.1 DESCRIPTION
Conduct training courses for KDOT operations and maintenance staff on operating components of the ITS system if requested by KDOT. Design training courses to ensure that KDOT staff achieves a full knowledge and appreciation of the design, operation and maintenance of equipment. Training may consist of field device operations and maintenance training, field communications operations and maintenance training, and system (outside plant) operations and maintenance training.

21.2 MATERIALS
Provide all training documentation, and coordination with vendors to provide teaching staff. Provide the training to consist of lectures and demonstrations that shall provide practical (hands-on) training and experience.

Provide 5 hard copies of the training manuals and 1 electronic copy of the training manuals.

Provide a detailed training plan and a syllabus for each course for the approval of the Engineer. Include in the information: tentative dates for courses, locations, and an outline of topics and names of instructors. Provide this information to the Engineer at least 30 days in advance of the training course.

21.3 CONSTRUCTION REQUIREMENTS
Provide up to a 2-day training class to train operations and field maintenance personnel at KDOT's request. Include in-field demonstrations.

22.0 BASIS OF ACCEPTANCE FOR ITS SYSTEM

The ITS system will be accepted when all test results, documentation including but not limited to the TRM and as-built plans are received and approved by the Engineer, all test periods are successfully completed, and all training is completed.

Prior to acceptance, KDOT will contact Kansas One-Call to confirm new utilities can be located and are in the correct position. The project will not be accepted if utilities cannot be located correctly. The Contractor will be responsible for correcting utilities so they can be located.

KDOT reserves the right to retain 10% of final payment until the TRM is approved.

23.0 MAINTENANCE AND WARRANTY

23.1 MAINTENANCE
Maintain all equipment and cables installed in this project until the ITS system has passed all testing requirements specified herein and has been accepted by KDOT. Once the operational test period has successfully been completed, turn over the maintenance of the ITS system to KDOT.

23.2 WARRANTY
Equipment Warranty: Obtain, assign, and furnish to the Engineer written manufacturer's warranties for all Contractor-provided products and electronic equipment consistent with those provided as customary trade practice.

Contractor Warranty: Provide a Contractor's warranty providing for satisfactory in-service operation of the ITS during the 60 day test period for each ITS component. Comply with the following for Contractor provided equipment: if defects develop during this period, replace or repair the provided equipment, at the expense of the Contractor, including all labor, material and associated costs, as necessary to restore required performance. Comply with the following for KDOT provided equipment: if defects develop in KDOT provided equipment, KDOT will provide a replacement and Contractor shall replace equipment, at the expense of the Contractor, including all labor, material and associated costs, as necessary to restore required performance. KDOT labor costs resulting from equipment replacement will not be charged to the manufacturer or the Contractor.

NO.	DATE	REVISIONS	BY	APP'D
00	01-09-25	2024 KDOT Standards Updates	AJS	JAN

KANSAS DEPARTMENT OF TRANSPORTATION

ITS EQUIPMENT SPECIFICATIONS

ITS-S13 06-04-25

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

KDOT Graphics Certified 06-06-2025 Sh. No. 122

KDOT Graphics Certified

Plotted by : sspatil 16-DEC-2025 14:06
File : ka680801iss-S13.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	123	253

TABLE S.15.1

THE FOLLOWING ITEMS MUST BE GIVEN TO THE ENGINEER PRIOR TO THE SUBMITTAL OF THE TRM

Spec	Item Description	Format	Deadline	Complete
4.0	Submittals Including Shop Drawings, Product Data, Resumes and Certifications of Fiber Splicing Subcontractors, Recommended Procedure for Fiber Optic Installation, and Certifications for CISCO Technician	PDF	Prior to Construction	
4.6	Construction Schedule	MS Project or Similar	Prior to Construction	
14.3.1	Device Placement Approval/Staking	Stake in Field	Prior to Device Placement	
5.4.1	Conduit Trench Alteration Approval, If Applicable	Flag in Field	Prior to Conduit Placement	
5.3.2	Conduit Repair Approval, If Applicable	PDF	Prior to Repair	
11.3.2	DMS Erection and Corresponding Traffic Control Plans	PDF	Prior to DMS Installation	
8.2	Ground Resistance Test Results and Grounding Checklist	Table	Prior to Backfilling Electrodes	
20.8	Sample Fiber Optic Test Results	PDF	30 Days Prior to Testing	
6.2.2	Pull Box Hooks & Pentahead Sockets	Physical Tools	Prior to 60-Day Testing	
12.2.2	CCTV Lowering Device Equipment	Physical Tools	Prior to 60-Day Testing	
11.3.6	Passwords for DMS Controllers and CCTV Cameras	Word Document	Prior to 60-Day Testing	

TABLE S.15.3

THE FOLLOWING ITEMS MAY BE PROVIDED BY KDOT, IF APPLICABLE

Spec	Item Description	Received
4.3	List of Required Submittals	
4.4	Historical Boring Log Data, If Applicable	
11.1	DMS and System Components	
19.3.4	Cisco Switches and Configuration	
20.2	CCTV and VDS Test Reports	
20.8	Fiber Test Summary Sheet	
16.3.1	IP Address Schedules	

TABLE S.15.4

THE FOLLOWING ITEMS SHALL BE EXAMINED BY THE DEVICE MANUFACTURER

Spec	Item Description	Examined
11.1	DMS and System Components	
12.2.2	CCTV Lowering Device	
13.4.1	Vehicle Detection System (If Applicable)	

TABLE S.15.2

ITEMS TO INCLUDE IN THE TRM

TRM Subsection	Spec	Item Description	Format	Complete
1) Table of Contents for TRM			Linked PDF w/ Bookmarks	
2) Project Information, Documents, and As-Built Plans - Any Documents Pertinent to the Project				
	20.10.2	As-Built Plan Set	PDF	
	20.10.2	As-Built Communication Schematic Drawings	PDF	
	20.10.2	Approved Permits - RR, Waterway, Bridge, City, County	PDF	
	20.10.2	List of New Power Services - Addresses, Service Type, Utility Contact Info	Table	
	20.10.2	Kansas OneCall Utility Locate Documentation	Email	
3) Device Documentation & Warranties- Related Documents & Warranties of All ITS Components and Equipment				
	20.10.3	List of All Equipment/Parts	Table	
		Description		
		Part/Model Number		
		Serial Number (If Applicable)		
		Warranty Start Date		
		Effective Warranty Period (Start and End Date)		
	20.10.3	Warranty Document(s) for Each Device	PDF	
	20.10.3	Final, Approved Submittals/Drawings	PDF w/ Bookmarks	
		Structural Weld Drawings		
		System Wiring/Block Diagrams		
		Rack Elevation Drawings		
	20.10.3	User Manuals - Tab Repair & Maintenance Procedures	PDF	
		DMS		
		CCTV Cameras		
		VDS		
		Controllers (e.g., Signal Controllers, Loop Cards, etc.)		
		FO Patch Panels		
		Surge Protection Devices		
		Network Switches		
	20.10.3	Lowering Device Certification from Manufacturer	PDF	
	20.10.3	Lowering Device Installation Instructions & Operational Specs	PDF	
4) Test Results - Results for All Tests Conducted for the Contract				
	8.2	Ground Resistance Test Results & Checklist	Table	
	20.1	ITS Component Test Results	Table	
	20.3	CCTV Test Report	Table	
	20.1	CCTV Lowering Device Test Documents from Vendor	Table	
	20.4	DMS	Table	
	20.5	VDS Test Report	Table	
	17.4	Ethernet Radio Systems (P2P & P2MP)	Table	
	20.7	Wireless Data Communications Link Test	Table	
	20.7	Throughput Test	Table	
	20.1	Test Results for ITS Components Specific to the Project	Table	
	20.8	Fiber Optic Test Results	Table	
	20.8	Total Fiber Loss Test Summary	Table	
	20.8	OTDR Test Results	PDF / OLTS Files	
	20.8	Power Meter Test Results	PDF / Trace Files	
	20.9	Structural Inspection Requirements	PDF	

TRM Subsection	Spec	Item Description	Format	Complete
5) Splice Vault/Pull Box Documentation - Splice Vault/Pull Box Documents				
	20.10.5	For Each Vault/Box, Include on a Single Page:	PDF	
		Vault or Box Identifier as Labeled in Plans	PDF	
		Geo-Tagged Photo of Splice Vault / Pull Box	PDF	
		Photo of Splice Trays / Enclosures	PDF	
		Brief Location Description	PDF	
		Identification of Each Cable in Box/Vault	PDF	
	20.10.5	Sequential Fiber Markings taken from within 3' of Conduit Entry	Spreadsheet	
6) GPS Documentation - Coordinates and Plan Identifiers for All Installed Equipment				
	20.10.6	DMS Structures	Spreadsheet	
	20.10.6	CCTV Poles	Spreadsheet	
	20.10.6	VDS Poles	Spreadsheet	
	20.10.6	Cabinets - Pole & Pad Mounted Include Pictures of Front and Back of Cabinet	Spreadsheet	
	20.10.6	Pull boxes	Spreadsheet	
	20.10.6	Splice Vaults	Spreadsheet	
	20.10.6	Wireless Towers	Spreadsheet	
	20.10.6	Power Supplies	Spreadsheet	
	20.10.6	Service Poles	Spreadsheet	
	20.10.6	Transformers	Spreadsheet	
	20.10.6	Junction Boxes	Spreadsheet	
	20.10.6	Conduit Runs - Points at the beginning and end of trenched conduit and provide bore logs with points every 20' for bored conduit.	Spreadsheet	
7) Cabinet Documentation Records - Include a Copy of Each Cabinet's Documentation, Labeled by Cabinet ID				
	10.3.1.4	Patch Panel Diagram	Paper in Cabinet PDF in TRM	
	20.10.6	Photo of FDUs / Patch Panels (Including those in POP Buildings, Hub Cabinets, and Communication Shelters)	Paper in Cabinet PDF in TRM	
	14.3.6	Wiring Diagrams	Paper in Cabinet PDF in TRM	
	14.3.6	Maintenance Logs	Paper in Cabinet PDF in TRM	
	14.3.6	Communication Schematics	Paper in Cabinet PDF in TRM	

GENERAL NOTES

1. Items included in the TRM differ for each project. The Contractor is responsible for including all necessary items in the correct format in the TRM.
2. TRM should be submitted to the KDOT Construction Office and ITS unit on a Flashdrive or be made available online.
3. A complete draft of the TRM must be submitted prior to the start of the 60-day testing period for any device.
4. Include a copy of this completed checklist with the final TRM submittal.
5. The Contractor shall provide a minimum of 7 working days notice for commissioning, requested site visits, etc.
6. The Contractor shall provide a minimum of 3 working days notice for access to KDOT facilities (e.g. POP buildings, TMC, etc.).

NO.	DATE	REVISIONS	BY	APP'D
00	01-09-25	2024 KDOT Standards Updates	AJS	JAN

KANSAS DEPARTMENT OF TRANSPORTATION

ITS EQUIPMENT SPECIFICATIONS CONSTRUCTION/TRM CHECKLIST

ITS-S15 06-04-25

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

KDOT Graphics Certified 06-06-2025 Sh. No. 123

KDOT Graphics Certified

Plotted by : sspatil 16-DEC-2025 14:06
File : ka680801iss-S15.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	124	253

GENERAL NOTES:

The following checklist is provided as a guide to the ITS/Project Inspector for critical points of inspection during the ITS construction process. This checklist does not include all requirements outlined in the plans and specifications and should not be used as a standalone reference to the requirements of this contract. Review all specifications and plan documents thoroughly and use this inspection checklist to verify correct and accurate construction and installation of critical ITS infrastructure. Work with the project Engineer to resolve any potential conflicts prior to final approval of any items on this checklist.

GENERAL: PRE-CONSTRUCTION				
Spec. No.	Item	Pass	Fail	N/A
4.0	Shop drawings have been submitted and approved.			
4.6	A construction schedule (in MS Project or similar format) outlining the proposed order of work has been submitted and approved by the engineer.			
GN 7, GN 8	All field locations for devices have been staked and approved by the engineer. Any proposed plan modifications have been approved by the engineer.			
KDOT Spec	All construction permits including KDOT Access Permit have been obtained.			

GENERAL: DURING CONSTRUCTION				
Spec. No.	Item	Pass	Fail	N/A
GN 2	Disturbed areas at sites are restored and reseeded.			
GN 2	Disturbed landscaping is restored and irrigation lines repaired.			
Best Practices	Extra concrete at site is cleaned up and removed.			
Best Practices	Materials and trash at sites are cleaned up and removed			
Best Practices	Brush has been trimmed around power sources and devices as needed			
Per Plans	Temporary detectors and their associated equipment noted as salvaged have been delivered to KDOT.			
Per Plans	All temporary cameras, poles, cabinets, and associated equipment have been salvaged and delievered to KDOT.			
Best Practices	A minimum clear zone for devices of 38' is maintained for slopes 4:1 or 5:1. For rural DMS, this is a 32' to edge of DMS face.			
Best Practices	A minimum clear zone for devices of 32' is maintained for slopes 6:1 or flatter. For rural DMS, this is 32' to edge of DMS face.			
Best Practices	Ground rods shall not be buried until connections are visually verified by the Engineer and test results are accepted.			

GENERAL: DURING CONSTRUCTION				
Spec. No.	Item	Pass	Fair	N/A
14.2.2	All cabinets have been accepted and construction cores are replaced with KDOT or KC Scout lock cores. In the KC Scout area construction cores are replaced with Corbin Number 2 locks.			
GN 38, 20.9.6	Contractor has taken a GPS reading accurate to within 3 feet at all splice vaults and pull boxes and recorded them electronic spreadsheet and provided to KDOT. Contractor has recorded three tie-point measurements for buried electrical pull boxes.			
20.9	All structures have been inspected by KDOT and documentation is provided in the TRM.			
20.10	Technical Reference Manuals have been delivered to KDOT at the end of job. TRM includes items as referenced in specifications.			
20.10.2	As-built plans have been provided to KDOT.			
GN 43, 5.4.9, 20.10.2	Kansas OneCall utility locates have been confirmed by KDOT ITS by performing initial one-call locate to ensure new and existing tracer wire and test station is working properly.			
20.10.3, 20.10.4	Equipment warranties have been assigned to KDOT and documentation provided to KDOT. Contractor warranty of products and installation for 60 days test period, including on-site repair and/or replacement at no cost to KDOT provided.			
20.10.4	Equipment testing at each site has been performed, recorded in forms, signed by the Contractor, and a copy provided to KDOT.			
Best Practices	Inspector has provided contractor with final punch list.			
22.0	Engineer has accepted all work.			
22.0	All utilities have been located by Kansas One-Call and verified by KDOT.			

CONDUITS & PULL BOXES				
Spec. No.	Item	Pass	Fail	N/A
5.3	Existing conduits have been proofed and cleaned before installation of cables.			
5.2.2	Non-metallic conduits are Schedule 80.			
GN 10	If site allows, conduit is routed parallel to ROW line and/or KDOT's fiber backbone and then perpendicular to ROW to device.			
GN 21, GN 23, GN24	When within 5 feet of KDOT lighting conduit or 10 feet of KDOT fiber or CenturyLink/Lumen fiber, conduit was hand dug or hydro-excavated			
Best Practices	Conduits and pull boxes are located at least 25' from edge of roadway and ramps where possible.			
5.2.2	Colors of conduit used are correct: KDOT area: green for communication, red for power, and black for spare. KC Scout area: blue for communication, yellow for power, and black for spare.			
5.4.16	Minimum bend radius of conduit is the greater of the following: 20 times the OD of fiber optic cable, 6 times the ID of the conduit for 2 inch or smaller, or 10 times the ID of the conduit for 3 inch or larger.			
5.4.8	Empty conduits have mechanical duct plugs installed, no duct tape or expandable foam seal			
5.4.16, 15.3.2	Conduits with cable have watertight duct seal at each end, no duct tape or expandable foam seal.			
5.4.6, 6.3.1	Conduit edges are square and smooth, free of burrs. 10 to 12 inches of conduit is exposed inside the box.			
5.4.4, 5.4.5	Conduits are cleaned, swabbed, and mandrel tested			
5.4.8, ITS-D10	Communication conduit has a minimum of 42 inches of cover. Electrical conduit has a minimum of 48 inches of cover. Utilities crossing under roadways have a minimum of 5 feet of over below crown grade or 3 feet below ditch grade.			
ITS-D10, 5.2.5, 5.4.11, GN 25	Trenches for conduit have 3 inch minimum reincorced warning tape installed 12 inches above the top of conduit. Tape is orange for conduit carrying communication and red for other conduits.			
ITS-D10, 5.4.11	Trenches for conduit are free of rock or items that may damage conduit when compacted.			
ITS-D10, 5.4.11	Trenches for conduit are filled and compacted.			
5.4.14	HDPE conduit on bridges has expansion devices installed.			
5.4.14	Rigid metal conduit attached to structures is anchored within 3 feet of each termination and every 5 feet with galvanized or stainless steel hardware.			
5.4.14	Rigid metal conduit attached to steel bridge members is clamped. No drilling, grinding, or welding is allowed.			
ITS-D10, 5.4.14	Rigid metal conduit that passes across an expansion joint has a conduit expansion device installed.			
ITS-D10	Metal conduits have bushings on ends to protect cable from sharp edges.			
ITS-D10	Metal conduits are grounded and bonded to one another.			
5.4.15	Conduit carrying electrical wire is grounded. Ground wire is the size of the largest current-carrying conductor, #6 minimum.			
5.2.4, 5.4.9	Tracer wire is orange, No. 12 solid THHN copper wire and is installed in conduits with fiber optics and spare conduits intended for future fiber optics (one tracer wire per conduit group).			
5.4.9	Tracer wire is isolated at terminals and labeled "Tracer" and not grounded.			
Best Practices	Do not allow truck traffic over pull boxes.			
Best Practices	Use a double pull box configuration when power and communications are present in same location.			
ITS-D06A	Pull boxes are installed downhill of cabinets on slope so they do not rain into cabinet.			
6.2.2	Lids on pull boxes are labeled correctly for power, communications, and high voltage.			
6.3.1	Pull boxes and splice vaults have 24" of gravel underneath.			
6.3.1, ITS-D07, ITS-D08	Concrete around pull boxes and splice vaults is formed square with clean and neat edges.			
5.4.9, 6.2.4 ITS-D07, ITS-D08	Tracer wire test station is installed for communication pull boxes with tracer wire hooked up and proper grounding.			
6.2.2, ITS-D07, ITS-D08	Stainless steel bolts with pentaheads are installed in pull box lids after final punch list is approved.			
6.2.2	Lid bolt holes and lift anchors are free of concrete and debris.			
Best Practices	Extra concrete at pull boxes cleaned up.			
6.3.1	Pull boxes should be cleaned out of mud/debris before final acceptance.			

POWER/WIRING				
Spec. No.	Item	Pass	Fail	N/A
6.3.1	Power and communication cables are in separate conduits and pull boxes per plan requirements.			
8.7.1	Power meter assemblies have phenolic nameplate with "KDOT ITS" or "KC Scout", service address, and service voltage			
GN 19, GN 20	Transformers are mounted adjacent to cabinet or near ROW line, always outside clear zone, on lightweight structure in weather-tight enclosure			
8.4.4	Transformers and service disconnect doors have metal plates with "DANGER HIGH VOLTAGE".			
8.4.4	Transformer are labeled as step-up or step-down and with all incoming and outgoing voltages.			
8.4.4	Transformers have padlocks and key is provided to KDOT.			
8.5.2	Surge protectors installed in cabinets.			
10.3.1.3	Power cables labeled correctly entering cabinets, pull boxes, transformers, or power meter assemblies.			
8.7.1	All circuits are labeled in power supply.			
8.3	Power at sites has been ordered in KDOT's or KC Scout's name. Contractor assumes all fees until KDOT or KC Scout assumes ownership.			
7.3.2	The minimum bend radius of power cable is 6 times the OD of the cable.			
ITS-D03A, ITS-D03B	36 feet of power cable stored at Type 1 power supply assembly			
ITS-D03A, ITS-D03B	7 feet of power cable stored at each Type 2 power supply assembly, load side			
ITS-D03A, ITS-D03B	7 feet of power cable stored at each Type 2 power supply assembly, service side			
ITS-D03A, ITS-D03B	36 feet of power cable stored at service pole and 8 feet at service pedestal			
ITS-D03A, ITS-D03B	10 feet of power cable stored at transformers			
ITS-D03A, ITS-D03B	Minimum of 2 feet of power cable stored at ITS cabinets			
ITS-D03A, ITS-D03B	5 feet of power cable stored at pull boxes			
ITS-D03A, ITS-D03B	50 feet of power cable at each overhead DMS			
ITS-D03A, ITS-D03B	25 feet of power cable at each roadside DMS			
7.3.3	Power cable splice is in pull box or enclosure only and only if indicated on the plans. No splices allowed in conduit.			
7.3.3	Splices have connectors, 2 layers of electrical rubber tape, 4 layers of plastic electrical tape, 2 layers of friction tape, and 3 coats of waterproof compound. No soldered connections allowed.			
8.1	Ground rod attachments are exothermically welded. No clamps. Mechanical connections are permitted if ground rods are above ground and inside cabinet.			
8.2	Ground resistance testing is performed in the presence of the engineer or their approved representative and results provided to the Engineer.			
Best Practices	Ground rods shall not be buried until connections are visually verified by the Engineer and test results are accepted.			

NO.	DATE	REVISIONS	BY	APP'D
01	06-04-25	Tracer Wire Updates	AJS	JAN
00	01-09-25	2024 KDOT Standards Updates	AJS	JAN

KANSAS DEPARTMENT OF TRANSPORTATION

ITS INSPECTION CHECKLIST PAGE 1 OF 2

ITS-S16 06-04-25

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

KDOT Graphics Certified 06-18-2025 Sh. No. 124

KDOT Graphics Certified

Plotted by : sspatil 16-DEC-2025 14:06
File : ka680801iss-S16.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	125	253

GENERAL NOTES:

The following checklist is provided as a guide to the ITS/Project Inspector for critical points of inspection during the ITS construction process. This checklist does not include all requirements outlined in the plans and specifications and should not be used as a standalone reference to the requirements of this contract. Review all specifications and plan documents thoroughly and use this inspection checklist to verify correct and accurate construction and installation of critical ITS infrastructure. Work with the project Engineer to resolve any potential conflicts prior to final approval of any items on this checklist.

CCTV SITES				
Spec. No.	Item	Pass	Fail	N/A
12.3.5	CCTV pole grounded using a minimum #2 stranded copper grounding conductor.			
12.3.5	Galvanization at grounding lug cleaned away.			
12.3.5	Grounding wire welded to grounding rod.			
ITS-D13D	Grounding rod is 20' x¾ copper clad.			
Best Practices	Grounding rod drive below ground surface min. 6".			
12.3.4, ITS-D13	Air terminal is minimum 5 ft length above top of pole and 5ft length attached to pole (total length of 10ft).			
Per Plans	Extra conduit stubbed from CCTV pole to adjacent pull box.			
Per Plans	Pull boxes for power and communications located within 25' of CCTV, where site allows			
10.3.1	Wiring is labeled and labeled correctly.			
ITS-D13D	A maintenance pad is installed beneath pole mounted cabinet.			
GN 19	CCTV pole face is minimum 7' from back of guardrail			
Per Plans	Radios and detectors mounted on CCTV pole oriented correctly.			
ITS-D13	Wire mesh installed at base of poles to prevent rodent intrusion			
Per Plans	CCTV orientation correct as per plans			
ITS-D13	CCTV not directly over cabinet or lowering device access point			
ITS-D13, ITS-D14	CCTV lowering will not interfere with radio or detectors			
Best Practices	Camera cable connected and tight to CCTV dome			
8.5.2	Surge protection devices installed in cabinet			
ITS-D20	Folding poles have two winch operation placards in place as per standards			
ITS-D21	Cables installed through folding pole hinge properly			
ITS-D22	For folding poles, 2" Schedule 80 conduit used for FO pigtail in exposed portion. Conduit does not block access door.			
20.3.1, 20.3.2	CCTV acceptance testing has been conducted and acceptance checklist is completed. CCTV has been operated successfully for 60 days.			

CCTV LOWERING DEVICE				
Spec. No.	Item	Pass	Fail	N/A
12.2.2	Verify lowering device is attached properly to pole using supplied hardware.			
12.2.2	Verify lowering device cable and wiring harness are routed through pole on separate paths so as not to interfere with each other.			
Best Practices	Verify that wiring harness is securely fastened to tie down loops inside pole.			
12.2.2	Very that lowering tool attaches properly to pole handhole using the provided tapped hole and bolt through lowering device.			
12.2.2	Verify operation of lowering drill forward and reverse.			
12.2.2	Verify clutch operation on clutch/socket assembly.			
12.2.2	Attach lowering tool to pole, connect lowering tool cable to lowering device cable using supplied screw links.			
12.2.2	Unlock camera using hand crank attached to lowering tool.			
12.2.2	Attach lowering drill to lowering tool and lower camera to full extent			
12.2.2	Verify camera stops lowering before contact with ground or other objects.			
12.2.2	Raise camera using drill to within 12" of camera mount. Use hand crank to raise camera final 12" and to lock in position. Verify camera is locked in place by releasing tension on lowering cable.			
GN 35	Lowering device handhole is not on downhill side of pole nor underneath CCTV.			
12.2.2	Lowering device engages and disengages easily.			
Best Practices	Lowering device safety loop properly installed.			

DETECTOR SITES				
Spec. No.	Item	Pass	Fail	N/A
ITS-D19	Detector pole bases are complete with covers.			
13.2.6	Detector pole base wires have breakaway cable connectors.			
13.2.6	Ground wire is a #4 bare copper wire or as shown on plans.			
ITS-D19	Drip loop in detector cable before it enters pole.			
13.2.6	Cable grips installed inside pole to support cable weight.			
13.4.1	Detector is mounted at height specified by manufacturer for offset.			
ITS-D13, ITS-D19	Detector is mounted securely to bracket and bracket securely strapped to pole.			
ITS-D19	Attachment hardware is stainless steel or aluminum.			
8.6.2	Click! 200 surge protection device or equivalent is installed in cabinet.			
13.2.4	Click! 301 media converter device installed in cabinet.			
8.6.2	Click! 201 power converter installed in cabinet.			
13.4.1	Detector has been tested and verified in the field to provide coverage for all lanes and accuracy tested.			
20.5	Test report on detector provided to KDOT.			

CABINETS				
Spec. No.	Item	Pass	Fail	N/A
14.3.1	Cabinet heights are such that the top of the cabinet does not exceed 6 feet above ground.			
Best Practices	Cabinet attachement does not interfere with pole pull boxes.			
VARIOUS	Cabinet conduit to pole connections are watertight.			
14.3.5	Cabinet locate test station is installed. Tracer wire is connected, accessible from the exterior of the cabinet, and is isolated from cabinet and ground.			
5.4.6	Conduits edges are square and smooth and free of burrs.			
ITS-D05	Cabinets are sealed between pad and cabinet bottom.			
14.2.2	Cabinet locks are Best 3L (KDOT) or Corbin Number 2 (KC Scout), keys given to KDOT or KC Scout.			
14.2.2	Cabinet has metal or phenolic name plate labeled KDOT ITS or KC SCOUT ITS and a phenolic name plate with device number.			
ITS-D16	Ground mounted cabinets are installed minimum of 5 feet from ROW line (5'-10' preferred) or behind device pole (if in median or site dictates).			
ITS-D25	DMS cabinets attached to pole with 4 stainless steel straps.			
14.2.4	Lights are installed in cabinet.			
8.5.2	Surge proection installed in cabinet.			
ITS-D04	Power terminals and breakers are installed a minimum of 12" from bottom of cabinet for ground mounted cabinets.			
5.4.9	Tracer wire entering cabinet is labeled and NOT grounded.			
5.4.16	Conduits with wire are sealed with watertight duct seal. Conduits without wire are sealed with a mechanical duct plug. Expandable foam seal is not permitted.			
14.2.13	Rack mounted power strip is installed in cabinet.			
14.3.2, 14.3.3	Wires in cabinet are routed and bundled in a neat manner and wire tired so no loose cables are dangling in cabinet.			
14.3.7	Rack elevation drawing of finished cabinet provided to KDOT.			
Per Supplier	If UPS equipment is present, test the individual battery voltage to ensure they are fully charged/charging. Voltage should be at or near 12 volts.			
14.2.7	Filters installed in cabinet and fit tightly to door.			
14.2.11	Verify a single slide-out shelf is installed.			
14.2.13	Verify the presence of surge suppression devices.			
7.3.2	Fiber optic jumpers and cable do not exceed recommended bending radius.			
Best Practices	Cabinet is vacuumed and free of any dust or loose debris.			
10.3.1.4	Cabinet devices have IP addresses and subnet labeled, including sign controller, IE 3000 with switch, modem, encoder, and boot bar.			
14.3.6	Cabinet documentation is in cabinet.			
14.3.2	Cabinet wiring is labeled.			
14.3.7	Verify cabinet documentation, including maintenance log, wiring schematic, rack elevation drawing, splice diagrams and test results.			
14.2.2	All cabinets have been accepted and construction cores are replaced with KDOT lock cores.			

DYNAMIC MESSAGE SIGNS				
Spec. No.	Item	Pass	Fail	N/A
11.2.3	All lighting protection fittings except cable holders are heavy-duty and made from bronze castings.			
11.2.3	All terminal rods, bolts, screws, and hardward use coper clad steel, bronze, or brass.			
11.2.3	All cables and terminals bear UL Label.			
11.2.3	150-foot radius rolling sphere zone of protection drawing with air terminal has been submitted to the engineer.			
11.3.2	Detailed erection plans have been sent to the field engineer.			
11.3.5	DMS face is oriented towards roadway and according to plans.			
11.3.6	DMS temporary password is unique and provided to KDOT.			
ITS-D24, ITS-D26	Exposed anchor rods are cleaned of debris and lubricated with an approved wax.			
ITS-D25	All connections are liquid-tight.			
ITS-D25	All exposed conduits are HDPE.			

FOUNDATIONS				
Spec. No.	Item	Pass	Fail	N/A
Best Practices	Depth of foundation excavation meets minimum depth on all sides, even on slope side.			
KDOT Spec	Welding of reinforcement and anchor bolt threads is prohibited in concrete foundations.			
9.3.1	Anchor bolts are protected from concrete fouling during foundation pour.			
9.3.2	Anchor bolts are placed in proper alignment with bolt pattern of pole.			
9.3.2	Steel pole leveling nuts are torqued as specified.			
9.3.2	Steel pole top nuts are torqued as specified.			
9.3.2	Rodent screens are installed between steel pole base and foundation and in a manner such that wiring and fiber are not exposed.			
ITS-D21, ITS-D22	Folding pole foundations are 6" to 8" above existing ground grade.			
ITS-D24	Foundation has cured for at least 14 days.			
Best Practices	Concrete foundations and concrete pads are formed and neat in appearance.			
Best Practices	Excavation sites are protected with fencing or caution tape and covered.			
ITS-D24	DMS foundation does not extend more than 6" above existing ground line.			
ITS-D13D, ITS-D21	Wire mesh installed at base of poles to prevent rodent intrusion.			

COMMUNICATIONS				
Spec. No.	Item	Pass	Fail	N/A
5.4.9	Tracer wire is installed in conduits with fiber optics and spare conduits intended for future fiber optics (one tracer wire per conduit group).			
ITS-D10	Fiber optic marker posts are installed at pull box, splice vaults, at sharp turns, and every 500' over conduit with fiber.			
ITS-D10	Marker posts at pull box or splice vault with coiled fiber only shall have one orange band mark.			
ITS-D10	Marker posts at pull box or splice vault with splice enclosure shall have two orange band marks.			
15.3	Fiber optic cable is single mode XX strand per plans and meets requirement of specifications.			
15.3.2	No end-of-day cable cuts done. Full reel, contiguous installations of cable utilized as situation permitted.			
15.2.4	New fiber cable on reel has ends that are sealed to prevent moisture instrusion.			
15.2.4	Each fiber reel has tag with specification information as required.			
15.3.1	At least one member of on-site fiber personnel have two years of experience in industry as required.			
15.2.7 15.2.8	Pigtails and jumpers are all factory terminated. No field terminations allowed.			
14.3.2 14.3.3	Fiber optic cables are not folded and are not wire tied tightly in any enclosure or cabinet.			
15.3.2	Bend radius of fiber optic cable is no less than 20 times the OD of the fiber optic cable in cabinets, pull boxes, and splice vaults.			
15.3.2	Lubricant is used when placing cabling in conduit.			
15.3.2	When fiber optic cable is pulled, a break-away swivel is used to prevent cable tension from exceeding 80% of recommended tension and swivel has ball bearings to prevent cable twisting.			
15.3.2	When fiber optic cable is pulled, cable ends are sealed to prevent ingress of dirt and moisture.			
15.3.2	No tension remains on fiber optic cable after installation.			
15.3.2	The first 10 feet of fiber optic cable pulled is discarded.			
ITS-D03A, ITS-D03B	50' of slack trunkline fiber optic cable from each direction stored in splice vault with splices.			
ITS-D03A, ITS-D03B	100' of slack trunkline fiber optic cable stored in splice vault without splices.			
ITS-D03A, ITS-D03B	25' of slack trunkline fiber optic cable stored in pull boxes.			
ITS-D03A, ITS-D03B	100' of slack branch fiber optic cable from each direction stored in pull boxes or splice vaults with splices.			
ITS-D03A, ITS-D03B	25' of slack branch fiber optic cable stored in pull box or splice vaults without splices			
ITS-D03A, ITS-D03B	50' of slack branch fiber optic cable stored at each ITS cabinet location. 40' stored at nearest pull box or splice vault. 10' store at ITS cabinet.			
15.2.5	Splice closures are mounted to side of splice enclosure box, not laying on bottom.			
15.3.5	Splice closure is waterproof and has been sealed.			
15.3.4	Fiber splicing is by fusion method only. No mechanical splices allowed.			
15.3.4	All splices have thermal shrink sleeve protection.			
15.3.6.4 15.3.7	Clean all connections to meet IEC61300-3-35			
10.3.1.1	All fibers at splice locations and pull box locations are labeled.			
15.3.6.3	Individual fibers in a splice tray are looped at least one full turn.			
10.3.1.4 15.3.6.3	Each closet connector housing with pin/port numbers is labeled and each patch panel with pin/port numbers is labeled.			
Best Practices	Patch panels are protected with plastic wrapping during construction. Post-construction, all unpatched terminals shall have dust covers intact.			
10.3.1.4.7	Each SFP port on Cisco switches is labeled with proper TX and RX port numbers.			
15.3.7	Unmated connectors have protective caps installed.			
20.8	Power meter tests and OTDR test have been performed per specs. Test results are provided to the Engineer.			
ITS-D13	Cable connections on back of radio antennas are sealed and waterproofed.			
Best Practices	Radio antenna is mounted securely to brakcet and bracket securely strapped to pole.			
17.3, 18.3	Radio antenna attachment hardware is stainless steel or aluminum.			
ITS-D13, 17.3, 18.3	Radios are oriented correctly to provide maximum signal strength.			

NO.	DATE	REVISIONS	BY	APP'D
01	06-04-25	Tracer Wire Updates	AJS	JAN
00	01-09-25	2024 KDOT Standards Updates	AJS	JAN

KANSAS DEPARTMENT OF TRANSPORTATION

ITS INSPECTION CHECKLIST PAGE 2 OF 2

ITS-S17 06-04-25

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

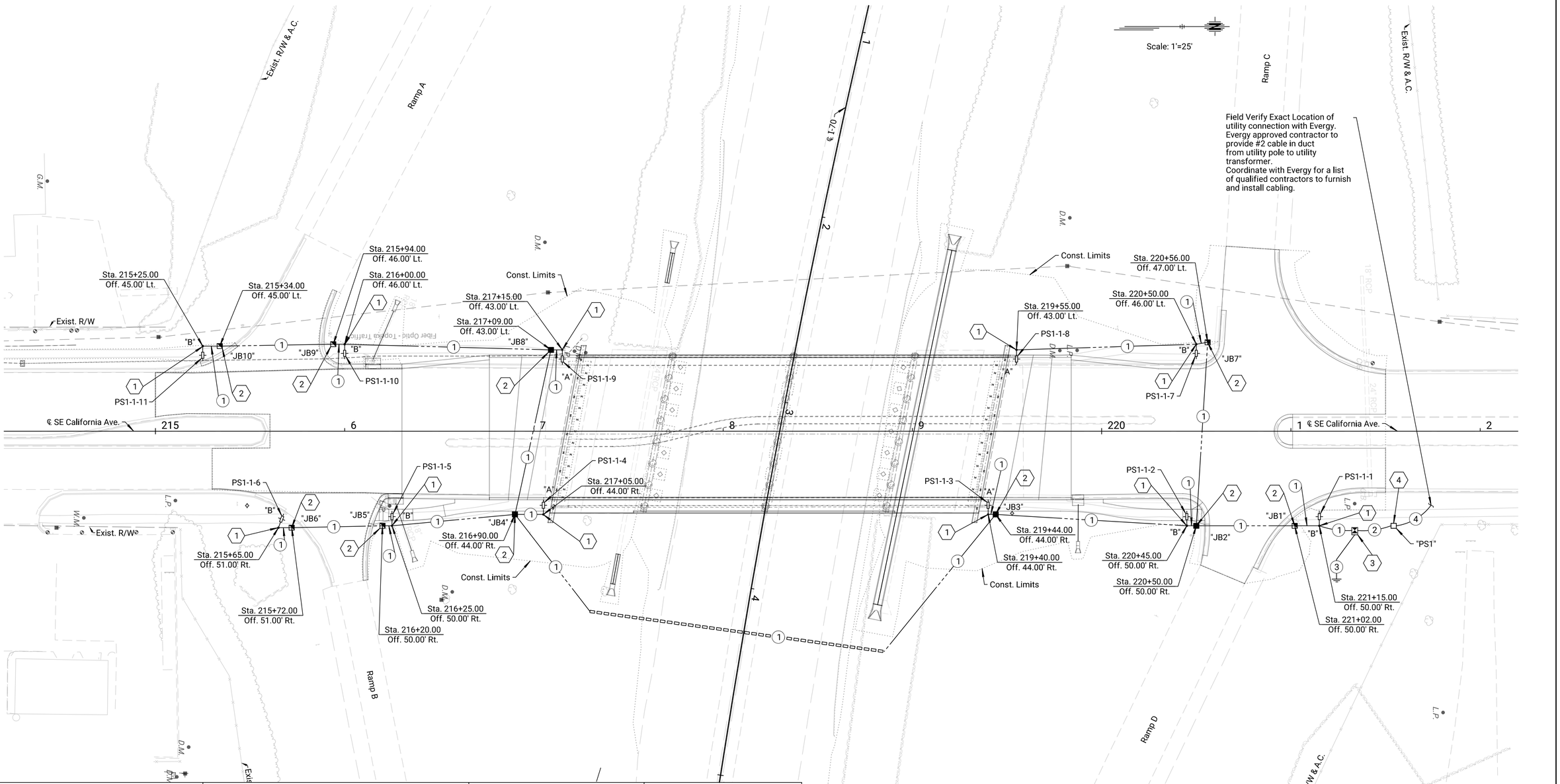
KDOT Graphics Certified 06-18-2025 Sh. No. 125

KDOT Graphics Certified

Plotted by : sspatil 16-DEC-2025 14:06
File : ka680801iss-S17.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	126	253

DATE	BY	REFERENCES NOTED / REFERENCES CHECKED



REFERENCE NOTES:	GENERAL NOTES:	FEEDER SCHEDULE:	LEGEND:
1 Refer to Lighting Pole Base Details	1. Wiring up 30' Pole Shall be as Follows: 2-10 & 1-10G	1 2 - 8 & 1-8G in 2"C	Single Luminaire (30' Pole)
2 Refer to Junction Box Details	2. Refer to Lighting Fixture Schedule, On Lighting Schedule Sheet	2 3 - 1 in 2"C	Lighting Controller
3 Refer to Lighting Controller Details	3. Controller to be Located within City Right of Way, Closest to Controller Location Currently Indicated, Refer to Lighting Controller Details Sheet.	3 1-6G in 1"C	Power Supply
4 Refer to Secondary Service Connection Details	4. A Journeyman Electrician Licensed by the City of Topeka Shall Make a Final Inspection of the Street Light Circuits Prior to Street Lights Being Energized. A Journeyman Electrician Shall Make the Power Service Connection from the Power Source to the Street Light Controller.	4 Utility Service Feeders. Coordinate with Utility. Provide 1 - 3"C with Pull Strings	Type 1 Junction Box Type 2 Junction Box Conduit SCH 80 PVC Conduit (Bored)

KANSAS DEPARTMENT OF TRANSPORTATION

SE CALIFORNIA AVE. LIGHTING

STA. 215+00 TO 222+00

Plotted by : BGS01485 16-DEC-2025 15:48
File : ka6808001lpl_01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	127	253

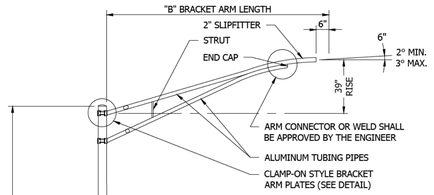
STREET LIGHT POLE, BRACKET ARM, AND BREAK-AWAY BASE

POLE TYPE	MOUNTING HEIGHT (A)	BRACKET ARMS		POLE SHAFT				SHOE BASE	ANCHOR BOLTS		
		LENGTH		BASE O.D.	TOP O.D.	MIN. WALL THICKNESS	SHAFT LENGTH (C)	BOLT CIRCLE (BC)	DIAMETER	LENGTH	HOOK
		ARM 1	ARM 2								
P14	14'	-	-	6"	3"	0.156"	14'-0"	9.5"	0.75" 10NC	25"	3"
P30S	30'	6' OR 10'	-	8"	6"	0.188"	26'-6" ±2"	11.0"	1.00" 8NC	36"	4"
P30D	30'	6' OR 10'	6' OR 10'	8"	6"	0.219"	26'-6" ±2"	11.0"	1.00" 8NC	36"	4"
P40S	40'	6', 10' OR 15'	-	8"	6"	0.219"	36'-6" ±2"	11.5"	1.00" 8NC	36"	4"
P40D	40'	6', 10' OR 15'	6', 10' OR 15'	10"	6"	0.219"	36'-6" ±2"	14.5"	1.00" 8NC	48"	4"

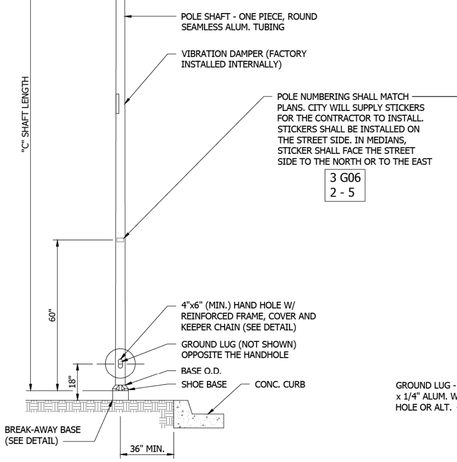
NOTES:
1. ALL POLES, ARMS, AND MISCELLANEOUS EQUIPMENT SHALL CONFORM TO THESE DETAILS AND AS SPECIFIED BY THE LATEST CITY STANDARD SPECIFICATIONS.
2. POLE SHAFT SHALL HAVE A SATIN GROUND FINISH.
3. ALL HARDWARE (BOLTS, NUTS, WASHERS BUT NOT INCLUDING ANCHOR BOLTS) NOT OTHERWISE SPECIFICALLY DESIGNATED IN THE SPECIFICATIONS OR DETAILS SHALL BE 300-SERIES STAINLESS STEEL CONFORMING TO ASTM A193 OR A194.
4. ANCHOR BOLTS SHALL BE USED WITH CONCRETE BASES. ANCHOR BOLTS SHALL BE STEEL WITH 50,000 PSI MINIMUM YIELD; TOP 10" MIN. GALVANIZED; INCLUDING 8 NUTS AND 8 FLAT WASHERS GALVANIZED TO ASTM A153 STANDARDS. GALVANIZED HEX HEAD BOLTS (SEE POLE FOUNDATION SHEET) SHALL BE USED WITH SCREW-IN ANCHOR BASES. 4 BOLTS, 4NUTS AND 8 FLAT WASHERS TO BE PROVIDED WITH EACH ANCHOR.
5. ALL WELDING IS TO BE DONE WITH 4043 WELD WIRE. ALL ARMS AND SHAFTS ARE TO BE HEAT-TREATED TO T6 TEMPER AFTER WELDING.
6. ANCHOR BOLTS SHALL PROJECT ABOVE THE CONCRETE BASE AS PER MANUFACTURER'S RECOMMENDED PRACTICES, 2-1/2" TO 3".
7. THE ALUMINUM STREET LIGHT POLE ASSEMBLY, INCLUDING ANCHORAGE AND LUMINAIRE, SHALL COMPLY WITH THE LATEST CITY STANDARD SPECIFICATIONS AND THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) LOAD WIND LOADING.
8. ALL POLES AND ARMS SHALL BE CLEARLY IDENTIFIED BY THE MANUFACTURER'S NAME, ABBREVIATION, OR SYMBOL ENGRAVED ON THE SHAFT, SHOE BASE, HAND HOLE, OR OTHER MEANS SUCH AS TO BE READILY VISIBLE AFTER INSTALLATION.

MATERIAL DATA

COMPONENT	ALUMINUM ALLOY DESIGNATION	SPECIFICATION
SHOE BASE	356-T6, CAST	ASTM B26 OR B108
BREAK	356-T6, CAST	ASTM B108
BOLT COVERS	356 OR 360, CAST	ASTM B26 OR B108
POLE SHAFT	6063-T6, EXTRUDED	ASTM B221 OR B241
GROUND LUG	6061-T5 OR 6063-T6, PLATE	ASTM B221
REINFORCED HANDHOLE FRAME	356-T6 OR 6061-T6	ASTM B26, B108 OR B221
HANDHOLE COVER	6063-T6	ASTM B209, B221 OR B241
BRACKET ARM & TUBING PIPES	6063-T6	ASTM 221, B241 OR B249
BRACKET ARM MOUNTING PLATES	6061-T6 OR 6063-T6 EXTRUDED	ASTM B221
BRACKET ARM STRUT & ARM CONNECTOR	6061-T6 OR 6063-T6 EXTRUDED	ASTM B221, B241 OR B249
POLE CAP	356, CAST	ASTM B26 OR B108
ANCHOR BOLTS	N/A	GALVANIZED PER ASTM A153

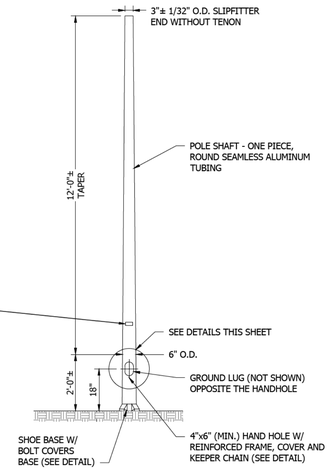


BRACKET ARM



POLE ELEVATION

(SEE TABLES FOR DIMENSIONS AND MATERIALS



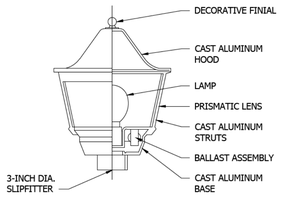
PEDESTAL POLE ELEVATION

(SEE TABLES FOR DIMENSIONS AND MATERIALS



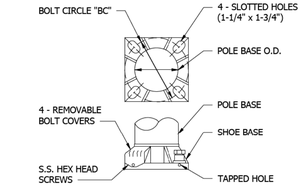
COBRA HEAD STYLE LUMINAIRE

150, 250 OR 400 WATT HPS

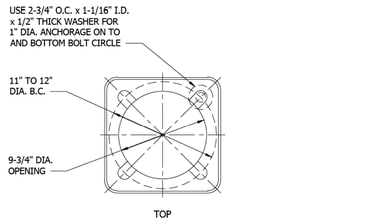


POST TOP LUMINAIRE

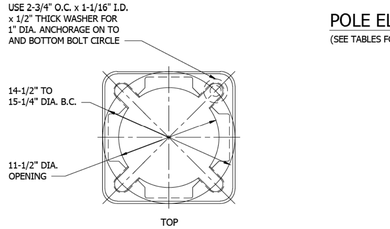
150 WATT HPS



SHOE BASE

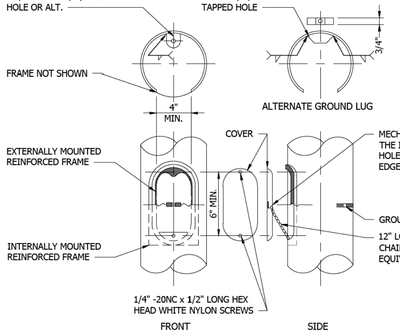


11" BREAK-AWAY BASE

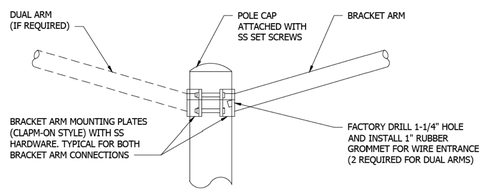


15" BREAK-AWAY BASE

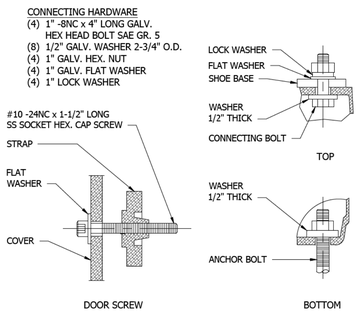
NOTES:
1. DOOR SHALL BE ON THE SAME SIDE OF THE POLE AS THE HAND HOLE.
2. BASE CONFORMS TO BREAK-AWAY CRITERIA OF AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS (1994.)



HAND HOLE



BRACKET ARM MOUNTING



BREAK-AWAY BASE ANCHORAGE

KANSAS DEPARTMENT OF TRANSPORTATION

LIGHTING POLE DETAILS

KDOT Graphics Certified 11-14-2025

Sh. No. 127

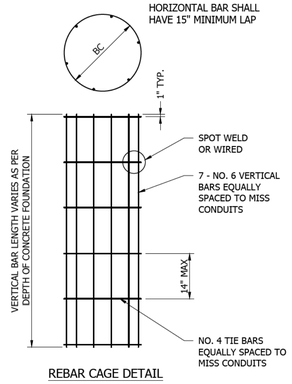
DATE	BY	
	REFERENCES NOTED	
	REFERENCES CHECKED	

Plotted by : BGS01485 16-DEC-2025 12:26
File : ka6808001pl_02.dgn

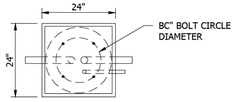
KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	128	253

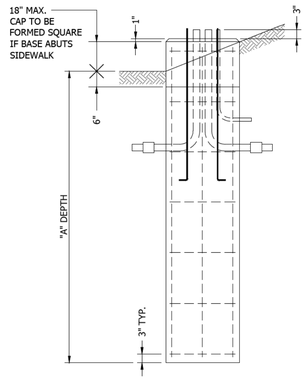
POLE TYPE	BRACKET ARM	DEPTH (A)	BOLT CIRCLE (BC)
P14	---	48"	9.5"
P30S OR P30D	SINGLE OR DUAL	72"	11.0"
P40S	SINGLE	94"	11.5"
P40D	DUAL	94"	14.5"



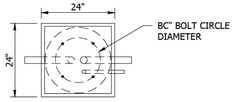
REBAR CAGE DETAIL



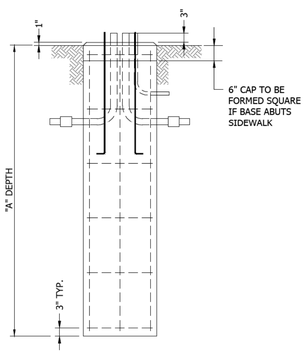
PLAN VIEW



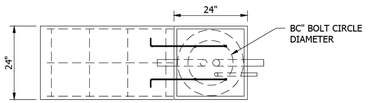
RAISED POLE BASE ELEVATION



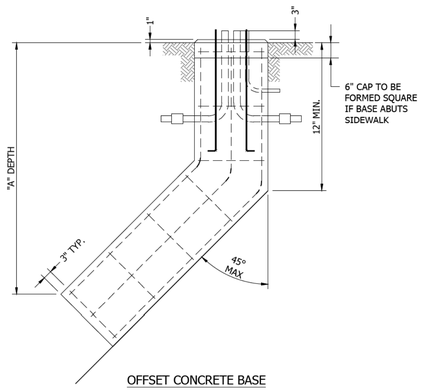
PLAN VIEW



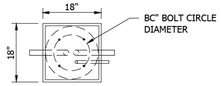
AT-GRADE POLE BASE ELEVATION



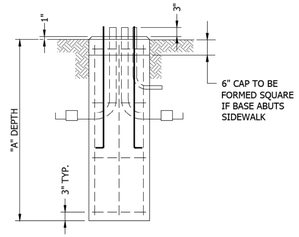
PLAN VIEW



OFFSET CONCRETE BASE



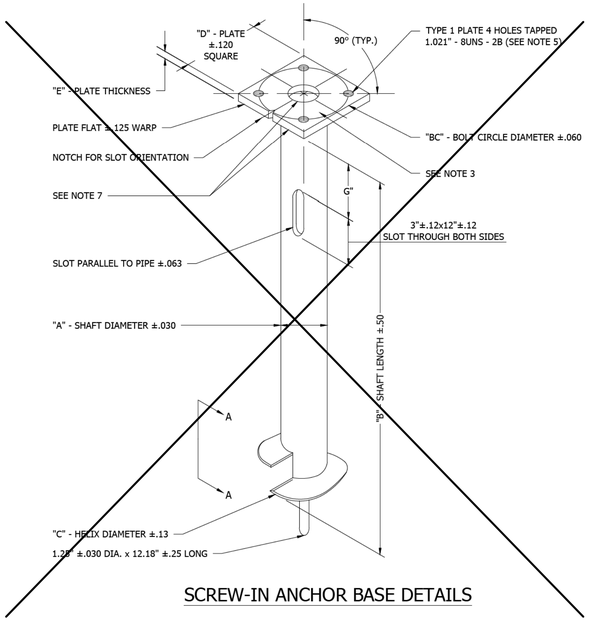
PLAN VIEW



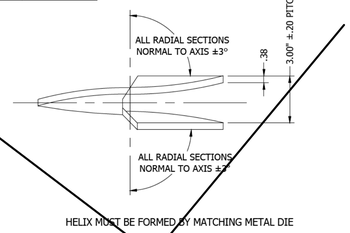
PEDESTAL POLE BASE

CONCRETE BASE DETAILS

BASE TYPE	POLE TYPE	MINIMUM TORQUE RATING (LBS. FT.)	MAXIMUM TORQUE RATING (LBS. FT.)	SHAFT DIA. (A)	SHAFT LENGTH (B)	HELIX DIA. (C)	PLATE SIZE (D)	PLATE THICKNESS (E)	BOLT CIRCLE (BC)	SLOT LOCATION (G)
B14	P14	2,000	15,000	6"	48"	12"	10"	0.75"	9.5"	12"
B30	P30S OR P30D	2,000	15,000	6"	60"	12"	12"	1.0"	11.0"	18"
B40S	P40S	2,000	20,000	6"	60"	14"	12"	1.0"	11.5"	18"
B40D	P40D	2,000	20,000	6"	60"	14"	15"	1.25"	14.5"	18"



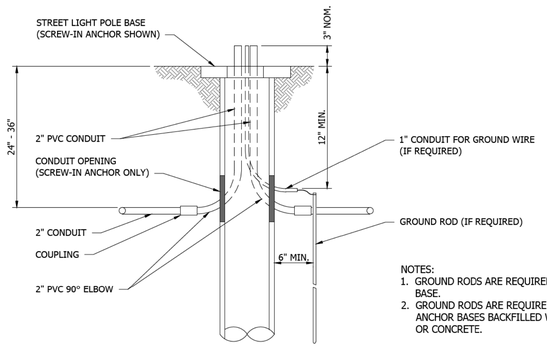
SCREW-IN ANCHOR BASE DETAILS



HELIX MUST BE FORMED BY MATCHING METAL DIE

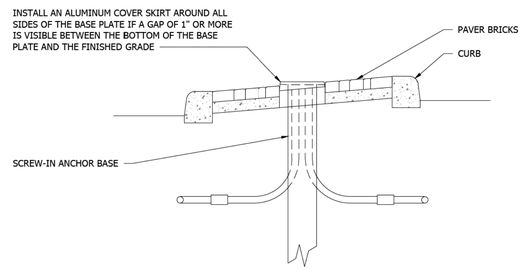
SECTION A-A

NOTES:
1. FINISH: HOT DIP GALVANIZE PER ASTM-1153 (LATEST REVISION).
2. BASEPLATE TO BE PERPENDICULAR TO SHAFT AXIS (±1°) AND HOLE AND CONCENTRIC (±.188 I.D. FIM) TO SHAFT AXIS.
3. ALL BASES SHALL BE IDENTIFIED BY THE MANUFACTURER'S INITIALS AND THE ANCHOR TYPE (1 OR 2) PERMANENTLY STAMPED INTO THE TOP PLATE WITH 1/2" LETTERS., THE JULIAN DATE OF MANUFACTURE SHALL BE PERMANENTLY STAMPED IN 1/4" NUMERALS.
4. PILOT POINT AND SHAFT AXIS TO BE CONCENTRIC (±.125 FIM) AND IN LINE (±2°).
5. TAP 1" HOLES ON THE SPECIFIED BOLT CIRCLE PERPENDICULAR TO THE BASEPLATE. CLEAN AND CHASE THE THREADS AFTER HOT-DIP GALVANIZING SO THAT A BOLT MAY BE INSTALLED.
6. PREHEAT (ROOM TEMPERATURE 70°F), TUMBLEBLAST, HANDGRIND, AND CLEAN BASEPLATE, HELIX, AND CORE ON ALL WELD AREAS.
7. FLAME CUT IRREGULARITIES PERMISSIBLE:
   (1) VALLEYS NOT TO EXCEED 3/32" IN. BELOW NOMINAL SURFACE LEVEL.
   (2) PEAKS OR POSITIVE IRREGULARITIES NOT TO EXCEED 1/32 IN. ABOVE NOMINAL SURFACE LEVEL OR INTERSECTIONS OF NOMINAL SURFACES.
8. MANUFACTURER TO HAVE IN EFFECT INDUSTRY RECOGNIZED WRITTEN QUALITY CONTROL FOR ALL MATERIALS AND MANUFACTURING PROCESSES.
9. ALL MATERIAL IS TO BE NEW, UNUSED AND MILL TRACEABLE MEETING THE FOLLOWING SPECIFICATIONS:
   BASEPLATE: ASTM A36-(LATEST REVISION) HOT ROLLED STEEL PLATE (CONFORM TO AASHTO TECHNICAL BUL. #270).
   SHAFT:A: STEEL PIPE PILES, SEAMLESS OR STRAIGHT WELDED, GRADE 2 PER ASTM A252. ALTERNATE MATERIAL: PIPE TYPE E OR S, GRADE B PER ASTM A53.
   HELIX:B: ASTM A635-(LATEST REVISION) HOT ROLLED STEEL PLATE
   PILOT POINT: ASTM A575-(LATEST REVISION) HOT ROLLED STEEL
   BOLT:C: ASTM A326 OR GRADE 5 SAE J429 - 1" DIAMETER HOT DIP GALVANIZED HEX HEAD BOLT. BOLT SHALL INCLUDE ONE EACH LOCK AND FLAT WASHER.
10. THE DESIGN AND PERFORMANCE INTEGRITY OF THE FOUNDATION SHALL BE VERIFIED BY FULL-SCALE TESTS BY QUALIFIED ENGINEERS INDEPENDENT OF THE MANUFACTURER. CERTIFIED TEST REPORTS SHALL BE PROVIDED UPON REQUEST.
11. FLAME CUT NOTCH OR PROJECTION WILL BE ON THE BASE PLATE TO INDICATE SLOT ORIENTATION.



NOTES:
1. GROUND RODS ARE REQUIRED FOR ALL CONCRETE BASE.
2. GROUND RODS ARE REQUIRED FOR SCREW-IN ANCHOR BASES BACKFILLED WITH FLOWABLE FILL OR CONCRETE.

CONDUIT ENTRANCE AND GROUNDING



COVERSKIRT REQUIREMENTS

KANSAS DEPARTMENT OF TRANSPORTATION

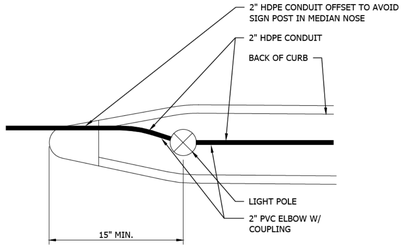
LIGHTING BASE DETAILS

DATE	BY	REFERENCES NOTED	REFERENCES CHECKED

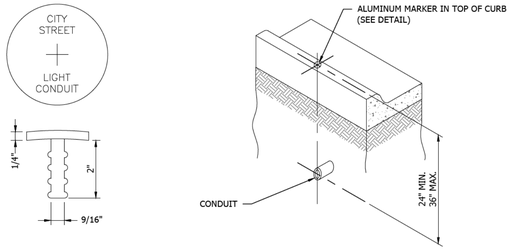
Plotted by : BGS01485 16-DEC-2025 12:27
File : ka6808011pl_03.dgn

KDOT Graphics Certified

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	129	253

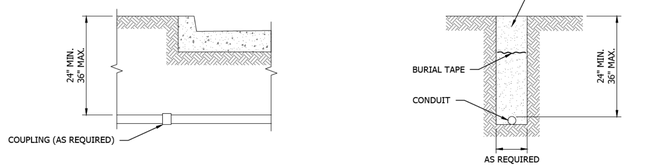


STREET LIGHT POLE IN MEDIAN



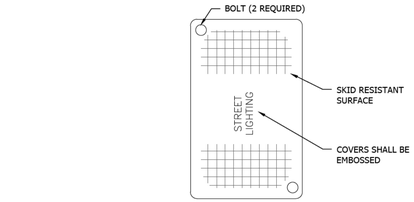
CONDUIT MARKING DETAIL

NOTES:
1. AN ALUMINUM MARKER SHALL BE PLACED IN THE TOP OF THE CURB DIRECTLY OVER THE CONDUIT.
2. MARKERS SHALL BE INSTALLED BY DRILLING THE CURB AND EPOXY THE MARKER IN PLACE. IF INSTALLED IN A SIDEWALK OR CURB RAMP, THE TOP OF THE MARKER SHALL BE FLUSH WITH THE CONCRETE SURFACE.
3. NO DIRECT PAYMENT SHALL BE MADE FOR CONDUIT MARKERS; THEY ARE SUBSIDIARY TO THE INSTALLATION OF CONDUIT.

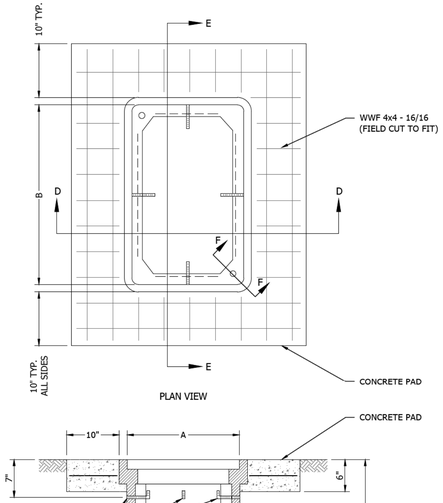


CONDUIT LOCATIONS

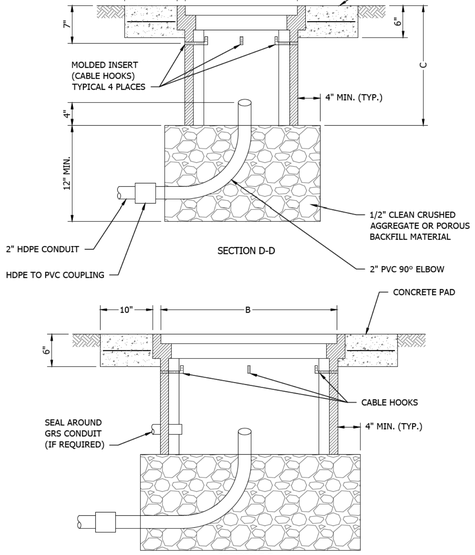
NOTES:
1. BACKFILL UNDER PAVED SURFACES SHALL BE FLOWABLE FILL.
2. THE CONDUIT SHALL NOT BE COVERED UNLESS INSPECTED AND APPROVED BY THE CITY ENGINEER, SO AS TO ENSURE PROPER DEPTH, CORRECT CONDUIT MATERIALS, AND PROPER CONDUIT END TREATMENT.



BOX COVER



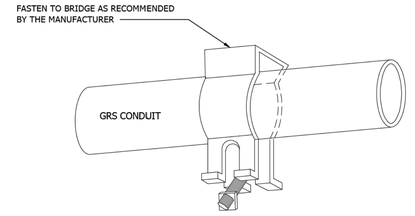
PLAN VIEW



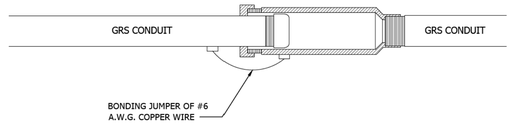
SECTION D-D

SECTION E-E

PULL OR JUNCTION BOX DETAILS



CONDUIT HANGER



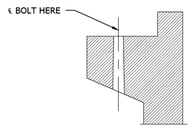
EXPANSION FITTING

GRS CONDUIT DETAILS

NOTES:
1. ALL CONDUITS INSTALLED ABOVE GROUND SHALL BE GRS.
2. CONDUIT ATTACHED TO BRIDGES SHALL HAVE EXPANSION FITTINGS INSTALLED AT EACH END OF THE BRIDGE AND AT EACH EXPANSION JOINT ON THE BRIDGE.
3. ALL GRS CONDUITS SHALL BE ELECTRICALLY BONDED BY A GROUNDING BUSHING AND GROUND WIRE AS DETAILED.
4. INSTALL THE CONDUIT AND CONNECTOR ASSEMBLY TO PERMIT A 1/2" MINIMUM LONGITUDINAL TRAVEL IN EITHER DIRECTION.

NUMBER OF ENTERING/EXITING CONDUITS	BOX TYPE	MINIMUM BOX DIMENSIONS		
		A	B	C
1 - 2	TYPE 1 JUNCTION BOX	12"	12"	12"
3 - 4	TYPE 2 JUNCTION BOX	12"	18"	12"
>4	CLASS 1 PULL BOX	17"	30"	22"

ALL DIMENSIONS SHOWN ARE NOMINAL



SECTION F-F

NOTES:
1. LIFT OPENING REQUIRED ON ALL COVERS.
2. PREFORMED BOX WALLS MAY BE EITHER FLARED OR VERTICAL. THE BOTTOM OF BOXES SHALL BE OPEN TO BELOW.
3. IF AN EXTENSION IS USED WITH A PREFORMED BOX, THE LIP OF THE EXTENSION MAY BE INTERIOR OR EXTERIOR . THE EXTENSION SHALL BE COMPATIBLE AND FROM THE SAME MANUFACTURER.
4. CABLE HOOKS ARE TO BE INCLUDED WITH CLASS 1 PULL BOXES ONLY.
5. A CLASS 1 PULL BOX SHALL BE INSTALLED ADJACENT TO EACH 4-CIRCUIT POWER SUPPLY.
6. ENCLOSURES, BOXES, AND COVERS ARE REQUIRED TO CONFORM TO ALL TEST PROVISIONS OF THE MOST CURRENT ANSI/SCTE 77 "SPECIFICATIONS FOR UNDERGROUND ENCLOSURES INTEGRITY" FOR TIER 15 APPLICATIONS. WHEN MULTIPLE "TIERS' ARE SPECIFIED THE BOXES MUST PHYSICALLY ACCOMMODATE AND STRUCTURALLY SUPPORT COMPATIBLE COVERS WHILE POSSESSING THE HIGHEST TIER RATING. ALL COVERS ARE REQUIRED TO HAVE THE TIER LEVEL RATING EMBOSSED ON THE SURFACE. IN NO ASSEMBLY CAN THE COVER DESIGN LOAD EXCEED THE DESIGN LOAD OF THE BOX. INDEPENDENT THIRD PARTY VERIFICATION OR TEST REPORTS STAMPED BY A REGISTERED PROFESSIONAL BEGINNER CERTIFYING THAT ALL TEST PROVISIONS OF THIS SPECIFICATIONS HAVE BEEN MET ARE REQUIRED WITH EACH SUBMITTAL.

DATE	BY	REFERENCES NOTED	REFERENCES CHECKED

Plotted by : BGS01485 16-DEC-2025 12:27
File : ka680801lpl_04.dgn

KANSAS DEPARTMENT OF TRANSPORTATION

LIGHTING JUNCTION BOX DETAILS

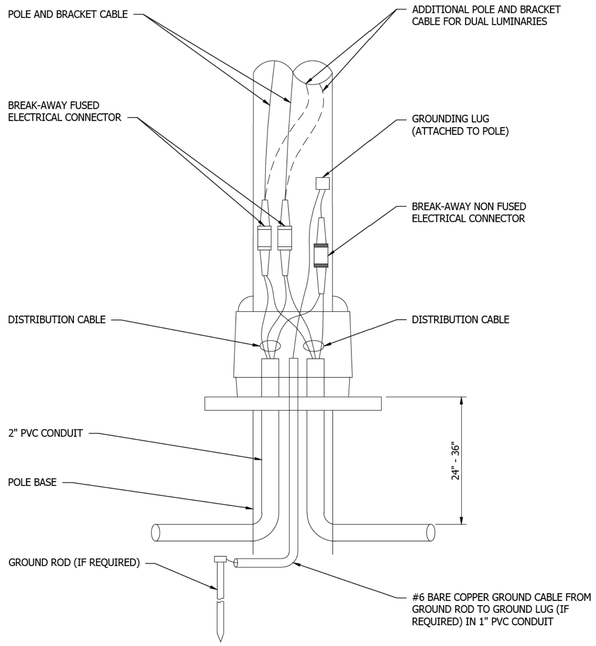
KDOT Graphics Certified 11-14-2025

Sh. No. 129

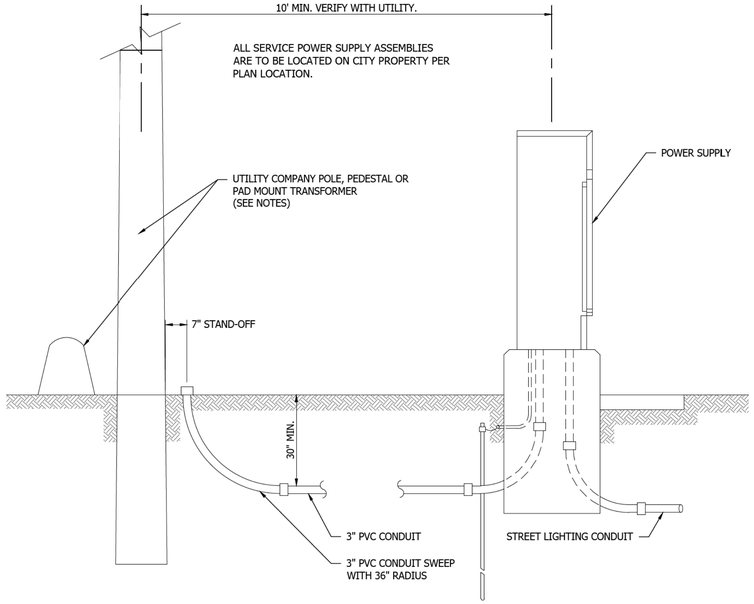
KDOT Graphics Certified

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	130	253

DATE	BY	REFERENCES NOTED	REFERENCES CHECKED

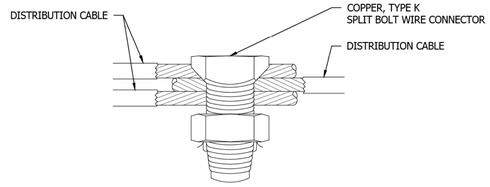


POLE WIRING DETAILS



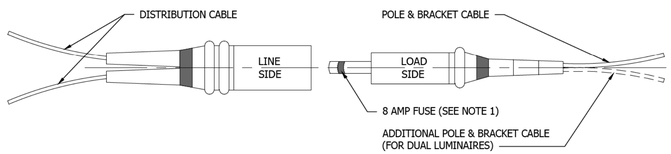
SECONDARY SERVICE CONNECTION DETAILS

NOTES:
1. CONTRACTOR SHALL INSTALL A CONDUIT STUB 24" TO 6" ABOVE GROUND AT UTILITY POLES. CONDUIT SHALL BE STUBBED TO THE SIDE OF THE POLE THAT WILL ALLOW A DIRECT RUN UP THE POLE TO THE TRANSFORMER WITHOUT CROSSING OTHER UTILITY LINES OR CABLES. THE END OF THE CONDUIT SHALL BE CAPPED.
2. CONTRACTOR SHALL INSTALL CONDUIT IN A TRENCH TO WITHIN 24" OF PEDESTALS OR PAD MOUNT TRANSFORMER AND LEAVE A 36"x36"x36" ACCESS HOLE IN THE GROUND. CONTRACTOR SHALL KEEP OPEN TRENCH COVERED AND PROMPTLY BACKFILL ACCESS HOLE WHEN SERVICE IS COMPLETED.

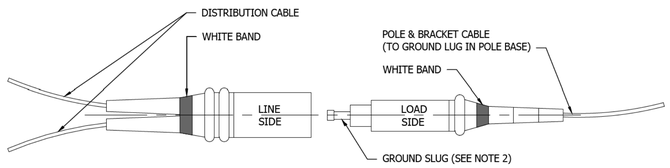


SPLICE KIT DETAILS

NOTES:
1. TO BE USED ONLY IN JUNCTION OR PULL BOXES WHERE CIRCUITS BRANCH OR "TEE".
2. ALL SPLICES SHALL BE PROTECTED WITH A RESIN SPLICE KIT (NOT SHOWN) INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

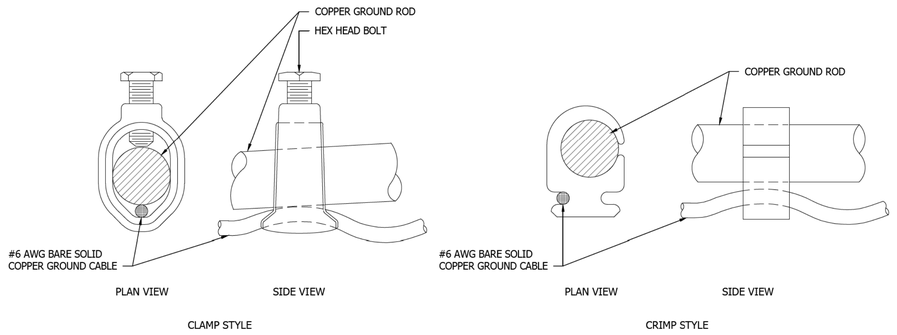


BREAK-AWAY FUSED ELECTRICAL CONNECTORS



BREAK-AWAY NON FUSED ELECTRICAL CONNECTOR

NOTES:
1. FUSE REMAINS IN "LOAD SIDE" AFTER BREAK-AWAY.
2. GROUND "SLUG" REMAINS IN "LOAD SIDE" AFTER BREAK-WAY.
3. CONNECTORS SHALL HAVE SET SCREW TYPE TERMINALS TO ATTACH CABLES.



GROUND ROD CONNECTION DETAILS

KANSAS DEPARTMENT OF TRANSPORTATION

LIGHTING CONNECTION DETAILS

KDOT Graphics Certified 11-14-2025

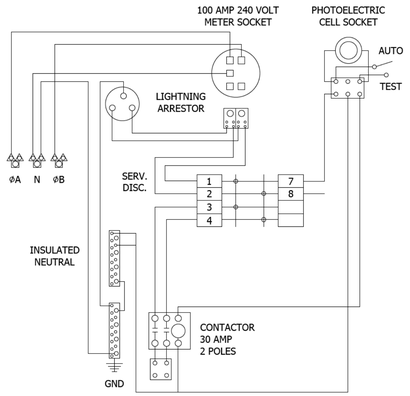
Sh. No. 130

Plotted by : BGS01485 16-DEC-2025 12:28
File : ka680801lpl_05.dgn

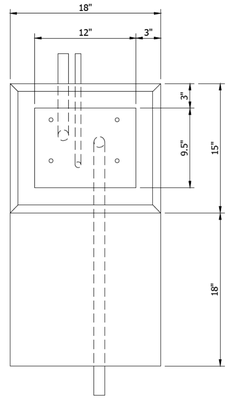
KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	131	253

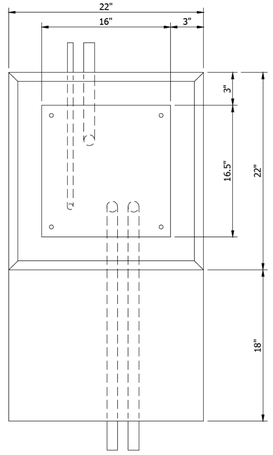
DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED



WIRING SCHEMATIC

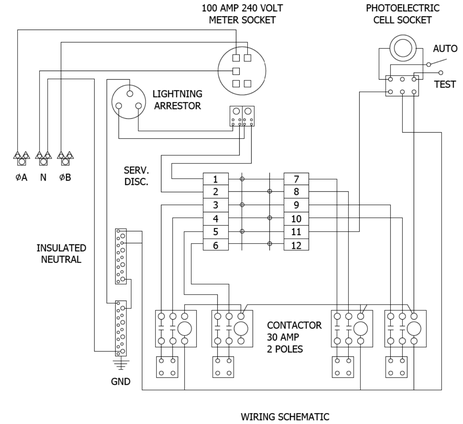


PLAN VIEW

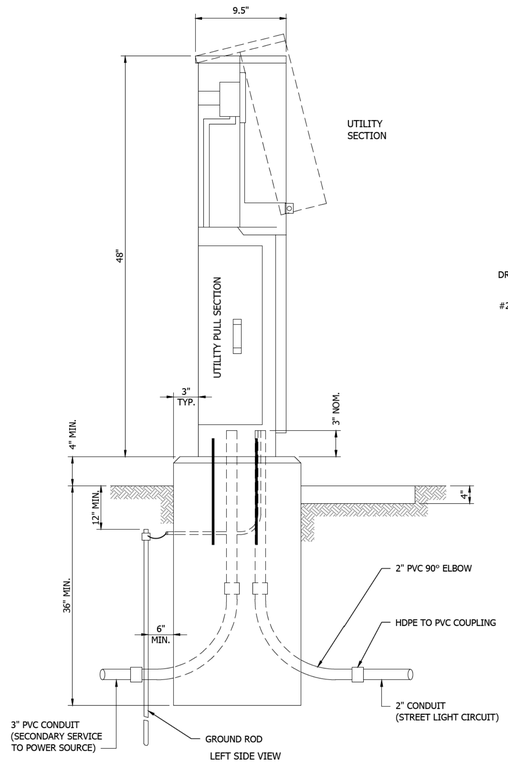


PLAN VIEW

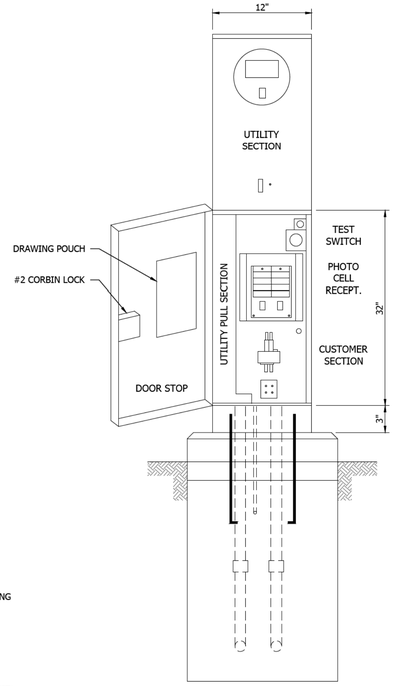
FUSED CONTACTORS ARE NOT PERMITTED



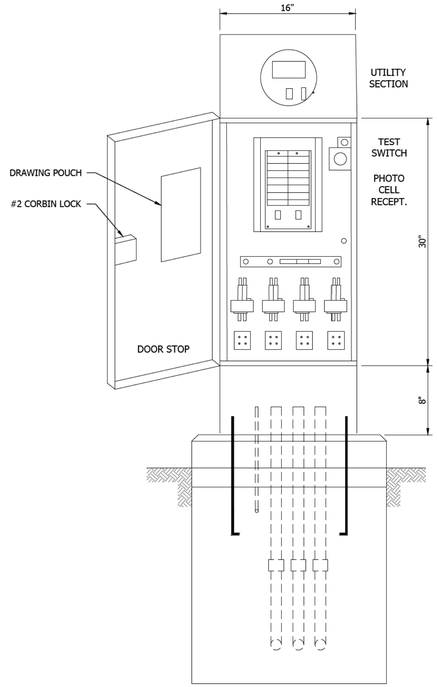
WIRING SCHEMATIC



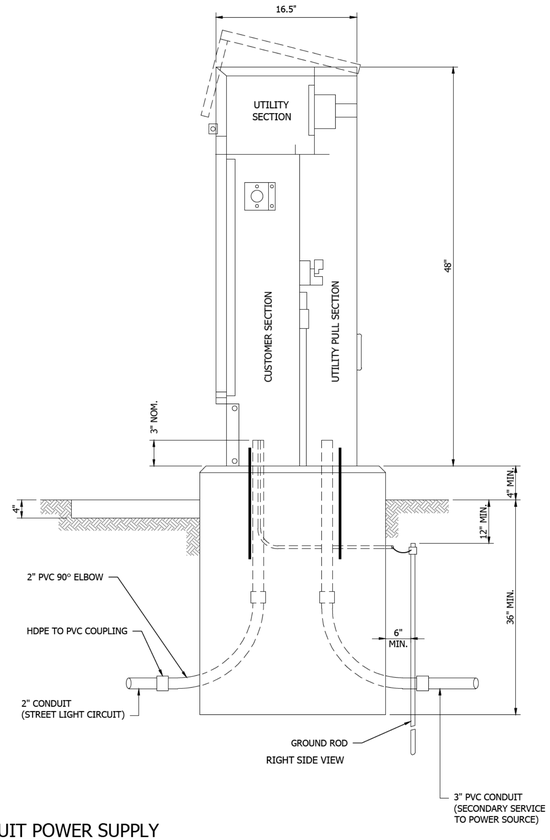
LEFT SIDE VIEW



FRONT VIEW



FRONT VIEW



RIGHT SIDE VIEW

NOTE:
1. PHOTOELECTRIC CELLS SHOULD BE ORIENTED TO THE NORTH OR EAST.
2. SEAL AROUND JOINT BETWEEN CABINETS AND BASE WITH LIFETIME SILICONE CAULK.
3. ALL EXPOSED EDGES OF THE BASE SHOULD HAVE A 1" CHAMFER.
4. IF BASE IS ADJACENT TO A TRAFFIC SIGNAL CONTROLLER, RAISED PORTION OF BASE (ABOVE FINISHED GRADE) SHOULD BE CONSTRUCTED TO THE SAME HEIGHT AS THE SIGNAL CONTROLLER BASE.
5. THE STREET ADDRESS WITH THE POWER SUPPLY NUMBER BELOW IT SHOULD BE LABELED ON THE UPPER PORTION OF THE CABINET FACING THE STREET. THE CITY WILL SUPPLY STICKERS FOR THE CONTRACTOR TO INSTALL.

1 - CIRCUIT POWER SUPPLY

4 - CIRCUIT POWER SUPPLY

KANSAS DEPARTMENT OF TRANSPORTATION

LIGHTING CONTROLLER

DETAILS

KDOT Graphics Certified 11-14-2025

Sh. No. 131

KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 12:28
File : ka6808001lpl_06.dgn

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	132	253

GROUND MOUNTED LIGHTING CONTROL CENTER												
LIGHTING PLAN SHEET	APPROACH	CONTROL STATION	MAIN BREAKER	FINISH	CIRCUIT BREAKER TRIP RATING							
		240 VOLT EA			CIRCUIT 1		SPARE		SPARE		SPARE	
STA. 215+00 TO STA. 222+00	SE CALIFORNIA	PS1	100A	BLACK	SIZE	20A2P	SIZE	20A2P	SIZE	20A2P	SIZE	20A2P
					VOLTAGE	240V	VOLTAGE	240V	VOLTAGE	240V	VOLTAGE	240V
					ON PHOTOCELL	YES	ON PHOTOCELL	YES	ON PHOTOCELL	YES	ON PHOTOCELL	YES

NOTES:
1.ALL EXPOSED SURFACES OF THE STREETS LIGHTING SYSTEM, INCLUDING POLES, ARMS, CABINETS AND FIXTURES SHALL HAVE BLACK, SEMI-GLOSS, FEDERAL STANDARD 595 COLOR #27038 POWDER COAT FINISH, OR APPROVED EQUIVALENT.
2. PROVIDE 20A2P CIRCUIT BREAKERS AS INDICATED ON SCHEDULE.

LIGHTING FIXTURE SCHEDULE							
MARK	MANUFACTURER	CATALOG NUMBER	MOUNTING	FINISH	LAMP		NOTES
			POLE		TYPE	WATTS	
A	AMERICAN ELECTRIC	ATB0-P302-MVOLT-R2-BK-UMR XX	RTS-30-6-6B-SMAC19-TP-DBLXD	BLACK	LED	83	1,2,3,4,5
B	AMERICAN ELECTRIC	ATB0-P302-MVOLT-R2-BK-UMR XX	RTS-30-6-6B-SMAC19-TP-DBLXD	BLACK	LED	83	1,2,3,4,5

NOTES:
1. PROVIDE 8'-0" BRACKET ARM AND ACCESSORIES.
2. ALL EXPOSED SURFACES OF THE STREET LIGHTING SYSTEM, INCLUDING POLES, ARMS, CABINETS, AND FIXTURES SHALL HAVE BLACK, SEMI-GLOSS FEDERAL STANDARD 595 COLOR #27038 POWDER COAT FINISH OR APPROVED EQUIVALENT.
3. POLE SHALL HAVE BREAK-AWAY STYLE BASE.
4. PROVIDE 2" SLIPFITTER.
5. BASIS OF DESIGN LIGHTING FIXTURES

LIGHT POLES AND APPURTENANCES									
LIGHT PLAN SHEET	SHEET NUMBER	POLE NUMBER	CIRCUIT NUMBER	APPROACH	STATION	OFFSET	LIGHT POLE 30 FT.	LED FIXTURE "A"	LED FIXTURE "B"
STA. 215+00 TO 222+00	126	PS1-1-1	1	SE CALIFORNIA AVE.	221+15.00	50.0 RT	1		1
STA. 215+00 TO 222+00	126	PS1-1-2	1	SE CALIFORNIA AVE.	220+45.00	50.0 RT	1		1
STA. 215+00 TO 222+00	126	PS1-1-3	1	SE CALIFORNIA AVE.	219+40.00	44.0 RT	1	1	
STA. 215+00 TO 222+00	126	PS1-1-4	1	SE CALIFORNIA AVE.	217+05.00	44.0 RT	1	1	
STA. 215+00 TO 222+00	126	PS1-1-5	1	SE CALIFORNIA AVE.	216+25.00	50.0 RT	1		1
STA. 215+00 TO 222+00	126	PS1-1-6	1	SE CALIFORNIA AVE.	215+65.00	51.0 RT	1		1
STA. 215+00 TO 222+00	126	PS1-1-7	1	SE CALIFORNIA AVE.	220+50.00	46.0 LT	1		1
STA. 215+00 TO 222+00	126	PS1-1-8	1	SE CALIFORNIA AVE.	219+55.00	43.0 LT	1	1	
STA. 215+00 TO 222+00	126	PS1-1-9	1	SE CALIFORNIA AVE.	217+15.00	43.0 LT	1	1	
STA. 215+00 TO 222+00	126	PS1-1-10	1	SE CALIFORNIA AVE.	216+00.00	46.0 LT	1		1
STA. 215+00 TO 222+00	126	PS1-1-11	1	SE CALIFORNIA AVE.	215+25.00	45.0 LT	1		1
						TOTALS:	11	4	7

JUNCTION BOX SCHEDULE						
PLAN SHEET	PULL BOX NUMBER	APPROACH	STATION	OFFSET	TYPE 1 JUNCTION BOX EACH	TYPE 2 JUNCTION BOX EACH
STA. 215+00 TO 222+00	JB1	SE CALIFORNIA AVE.	221+02.00	50.0 RT	1	
STA. 215+00 TO 222+00	JB2	SE CALIFORNIA AVE.	220+50.00	50.0 RT		1
STA. 215+00 TO 222+00	JB3	SE CALIFORNIA AVE.	219+44.00	44.0 RT		1
STA. 215+00 TO 222+00	JB4	SE CALIFORNIA AVE.	216+90.00	44.0 RT		1
STA. 215+00 TO 222+00	JB5	SE CALIFORNIA AVE.	216+20.00	50.0 RT	1	
STA. 215+00 TO 222+00	JB6	SE CALIFORNIA AVE.	215+72.00	51.0 RT	1	
STA. 215+00 TO 222+00	JB7	SE CALIFORNIA AVE.	220+56.00	47.0 LT	1	
STA. 215+00 TO 222+00	JB8	SE CALIFORNIA AVE.	217+09.00	43.0 LT		1
STA. 215+00 TO 222+00	JB9	SE CALIFORNIA AVE.	215+94.00	46.0 LT	1	
STA. 215+00 TO 222+00	JB10	SE CALIFORNIA AVE.	215+34.00	45.0 LT	1	
				TOTAL	6	4

PS1 LIGHTING AND ELECTRICAL QUANTITIES SCHEDULE																	
FROM	TO	CENTER TO CENTER (LF)	CENTER TO CENTER AND ADDITIONAL LENGTH FOR SLACK (LF)	3" RIGID CONDUIT TRENCHED (LF)	2" RIGID CONDUIT TRENCHED (LF)	2" RIGID CONDUIT BORED (LF)	CABLE 8 AWG 1 CONDUCTOR POWER (LF)	CABLE 2 AWG 1 CONDUCTOR POWER (LF)	CABLE 1 AWG 1 CONDUCTOR POWER (LF)	POLE CABLE 10 AWG 1 CONDUCTOR (LF)	LIGHTING POLE 30 FT. (EA.)	10FT GROUND ROD (EA.)	30 FT POLE FOUNDATION (EA.)	TYPE II POWER SUPPLY ASSEMBLY 240V (EA.)	POLE LED LUMINAIRE "A" (EA.)	POLE LED LUMINAIRE "B" (EA.)	NOTES
UTILITY	PS1	100.0	107	107				428				1		1			1
PS1	CONTROLLER	80.0	87		87				346								
CONTROLLER	PS1-1-1	30.0	36		36		107			120	1	1	1			1	
PS1-1-1	JB1	10.0	15		15		46										
JB1	JB2	50.0	56		56		168										
JB2	PS1-1-2	10.0	15		15		46			120	1	1	1			1	
PS1-1-2	JB3	100.0	107		107		321										
JB3	PS1-1-3	10.0	15		15		46			120	1	1	1		1		
JB3	JB4	225.0	235		235		704										
JB3	JB4	205.0	214			214	642										
JB4	PS1-1-4	10.0	15		15		46			120	1	1	1		1		
JB4	PS1-1-5	75.0	82		82		245			120	1	1	1			1	
PS1-1-5	JB5	10.0	15		15		46										
JB5	JB6	45.0	51		51		153										
JB6	PS1-1-6	10.0	15		15		46			120	1	1	1			1	
JB4	JB8	90.0	97		97		290										
JB8	PS1-1-9	10.0	15		15		46			120	1	1	1			1	
JB8	PS1-1-10	115.0	122		122		367			120	1	1	1			1	
PS1-1-10	JB9	10.0	15		15		46										
JB9	JB10	55.0	61		61		183										
JB10	PS1-1-11	10.0	15		15		46			120	1	1	1			1	
JB2	JB7	105.0	112		112		336										
JB7	PS1-1-7	10.0	15		15		46			120	1	1	1			1	
PS1-1-7	PS1-1-8	100.0	107		107		321			120	1	1	1		1		
TOTALS				107	1303	214	4293	428	346	1320	11	12	11	1	3	8	

NOTES: 1. COORDINATE WITH UTILITY FOR EXACT LOCATION AND LENGTH OF FEEDERS AND CONDUIT.

KANSAS DEPARTMENT OF TRANSPORTATION

LIGHTING SCHEDULES

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED

Plotted by : PDD00855 16-DEC-2025 16:46
File : ka680801lpl_07.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	133	253

SUMMARY OF ELECTRIC LIGHTING SYSTEM QUANTITIES (HARDWARE)

ID NO	Item	Unit	Quantity
1	Solid State Photo Cell	Each	1
2	Controller	Each	1
3	Junction Box	Each	10
	Cable Support Grip	Each	
	Expansion Joint	Each	
4	Breakaway Connectors	Each	33
5	600 Volt 3/C Primary Cable In Duct #2 AWG	Lin Ft	428
	600 Volt 2/C Secondary Cable with Ground Wire (CIC) #6 AWG	Lin Ft	
6	600 Volt 1/C Secondary Cable #8 AWG	Lin Ft	4,293
	600 Volt 2/C Secondary Cable with Ground Wire (CIC) #10 AWG	Lin Ft	
7	600 Volt 1/C Secondary Cable with Ground Wire #1 AWG	Lin Ft	346
8	600 Volt 1/C Secondary Cable #10 AWG	Lin Ft	1,320
9	Groundwire, #6 AWG Solid Bare Copper	Lin Ft	132
	1" Metallic Conduit	Lin Ft	
	2" Metallic Conduit	Lin Ft	
	3" Metallic Conduit	Lin Ft	
10	2" Schedule 40 Conduit	Lin Ft	1,305
11	2" Schedule 80 Conduit	Lin Ft	214
12	3" Schedule 80 Conduit	Lin Ft	110
13	3" 90 Degree Sch 40 PVC Conduit Bends 24" Radius	Each	2
14	2" 90 Degree Sch 40 PVC Conduit Bends 24" Radius	Each	45
	⅜" X 3" Wedge Type Anchor Bolts	Each	
	2" Conduit Clamps w/ Clamp Backs	Each	
15	Ground Rods with Clamps ¾" X 20'	Each	12

SUMMARY OF ELECTRIC LIGHTING SYSTEM QUANTITIES (LIGHT POLES)

ID NO	Item	Unit	Quantity
16	30' Mounting Height Light Pole with 6' Luminaire Arm and Frangible Base	Each	11
17	30' LED Luminaire (See Basis of Design)	Each	11
	55' Mounting Height Light Pole with XX' Luminaire Arm and Frangible Base	Each	
	55' LED Luminaire (See Basis of Design)	Each	
18	30" Concrete Base (30' Pole)	Each	11
	36" Concrete Base (55' Pole)	Each	

SUMMARY OF ELECTRIC LIGHTING SYSTEM QUANTITIES (MISCELLANEOUS ITEMS)

ID NO	Item	Unit	Quantity
19	Boring	Lin Ft	214
20	Trench and Backfill	Lin Ft	1,500
	Removal of Concrete Base	Each	

NOTES:

1. Linear quantities are approximate and included for information only. The contractor shall conduct all work, furnish and install all lighting equipment necessary, including towers, concrete bases for towers, anchor bolts, luminaires, lamps, wiring, conduit, conduit fittings, supports, interconnections, ground rods, and all incidentals necessary for the complete installation within the limits shown on the plans. To insure complete and satisfactory operation of the Electric Lighting System whether specifically mentioned or not.
2. Items not specifically called out are subsidiary to other bid items.
3. Refer to Lighting Fixture Schedule for Basis of Design

SUMMARY OF ELECTRIC LIGHTING SYSTEM QUANTITIES (TOWER)

ID NO	Item	Unit	Quantity
	LED Luminaire (See Basis of Design)	Each	
	Lowering Device	Each	
	½" Heavy Duty Reversible Drill	Each	
	Step Down Transformer	Each	

BID ITEM

	Item	Unit	Quantity
#	Electric Lighting System	L.S.	Lump Sum
	High Mast Light Tower (100')(48" Concrete Base)	Each	
	High Mast Light Tower (110')(48" Concrete Base)	Each	
	High Mast Light Tower (120')(48" Concrete Base)	Each	
	High Mast Light Tower (100')	Each	
	High Mast Light Tower (110')	Each	
	High Mast Light Tower (120')	Each	

Federally Non-Participating

BASIS OF DESIGN (ADDITIONAL CRITERIA)

	Designed Lumens	10,000 Per Fixture
	Maximum Wattage	83
	Distribution Type	Type 2
	Other	
	Designed Lumens	10,000 Per Fixture
	Maximum Wattage	83
	Distribution Type	Type 4
	Other	

NO.	DATE	REVISIONS	BY	APP'D
03	05-25-23	Added boring	J.A.P.	S.M.P.
02	03-17-21	High mast footing to 48"/ground rod	J.A.P.	C.P.A.
01	04-28-20	Add 55' pole/change footing size	J.A.P.	C.P.A.

KANSAS DEPARTMENT OF TRANSPORTATION

CONSTRUCTION QUANTITIES
ELECTRIC LIGHTING SYSTEMS

~~TE209~~

FHWA APPROVAL		07-07-23	APP'D.	Sara M. Peters	
DESIGNED	J.A.P.	DETAILED	J.A.P.	QUANTITIES	TRACED
DESIGN CK.	S.M.P.	DETAIL CK.	S.M.P.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 12-16-2025

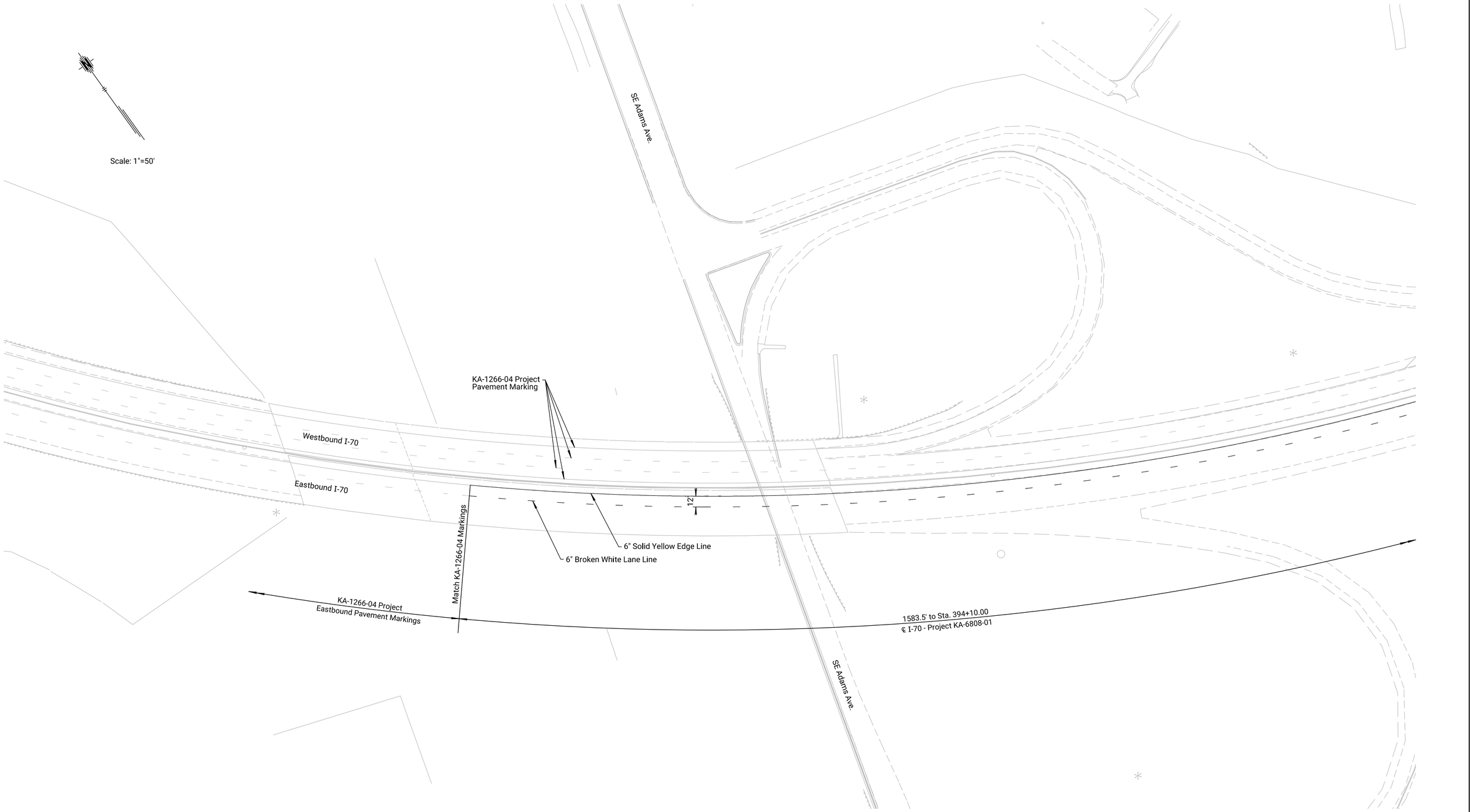
Sh. No. 133

KDOT Graphics Certified

Plotted by : BGS01485 17-DEC-2025 12:45
File : ka680801lss209.dgn

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	134	253

Scale: 1"=50'



DATE	BY
REFERENCES NOTED	
REFERENCES CHECKED	

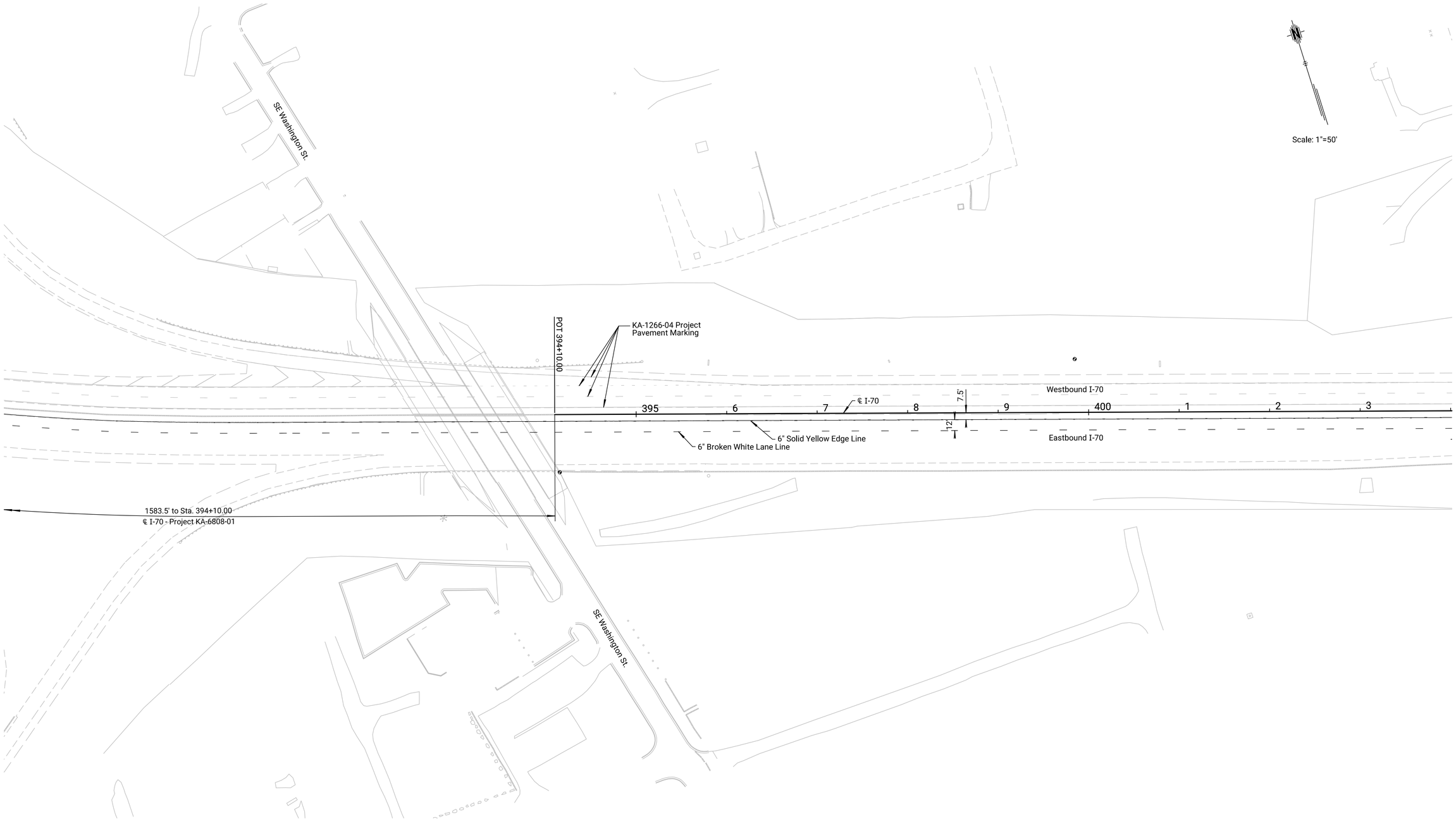
KANSAS DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING
MAINLINE I-70

Plotted by : BGS01485 16-DEC-2025 12:30
File : ka680801mpl-01.dgn

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	135	253

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED



KANSAS DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING

MAINLINE I-70

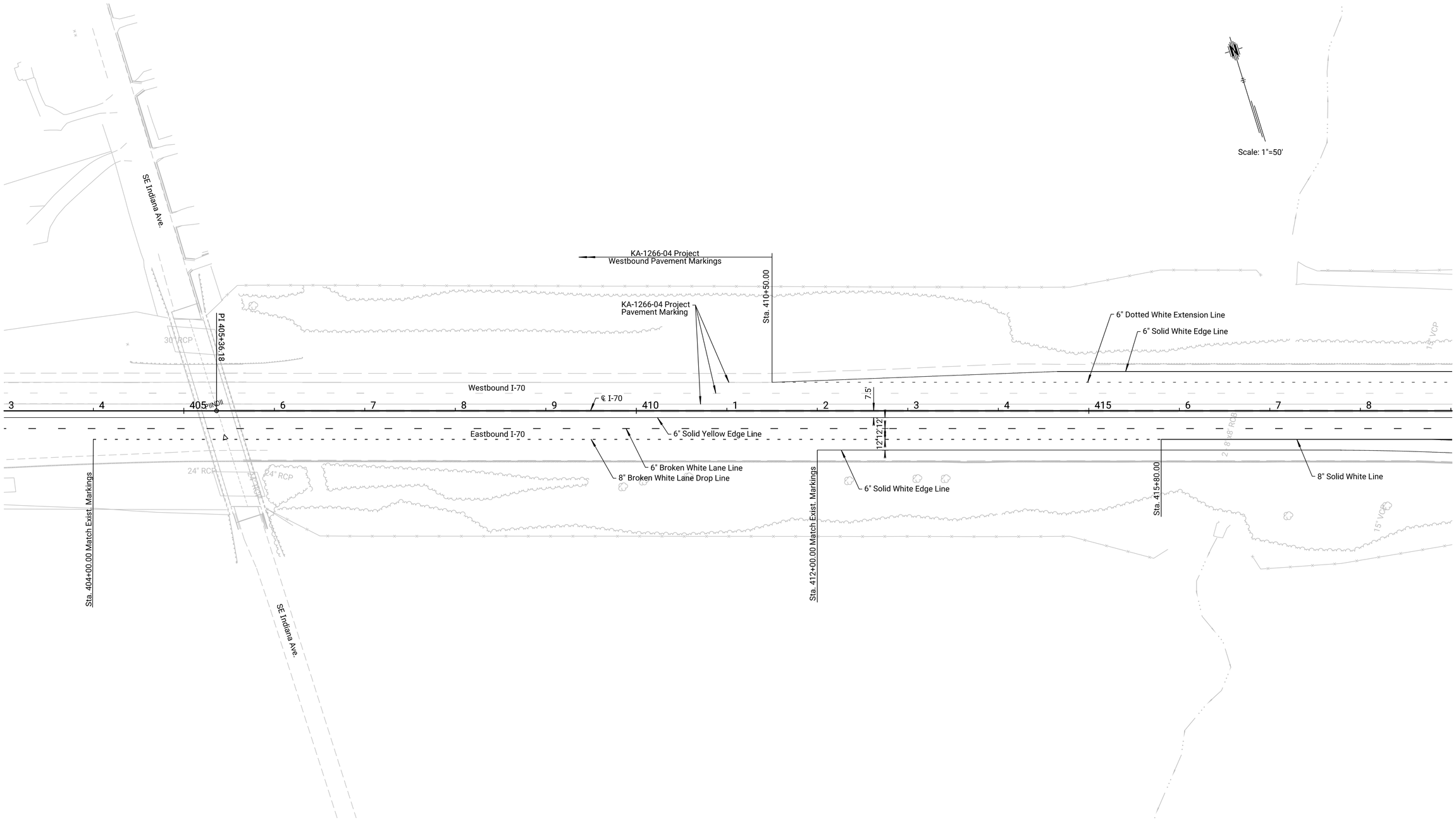
STA. 394+10 TO 403+00

Sh. No. 135

Plotted by : BGS01485 16-DEC-2025 12:32
File : ka680801mpl-02.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	136	253

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED



KANSAS DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING

MAINLINE I-70

403+00 TO 418+00

Plotted by : BGS01485 16-DEC-2025 12:33
File : ka680801mpl-03.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	137	253

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED

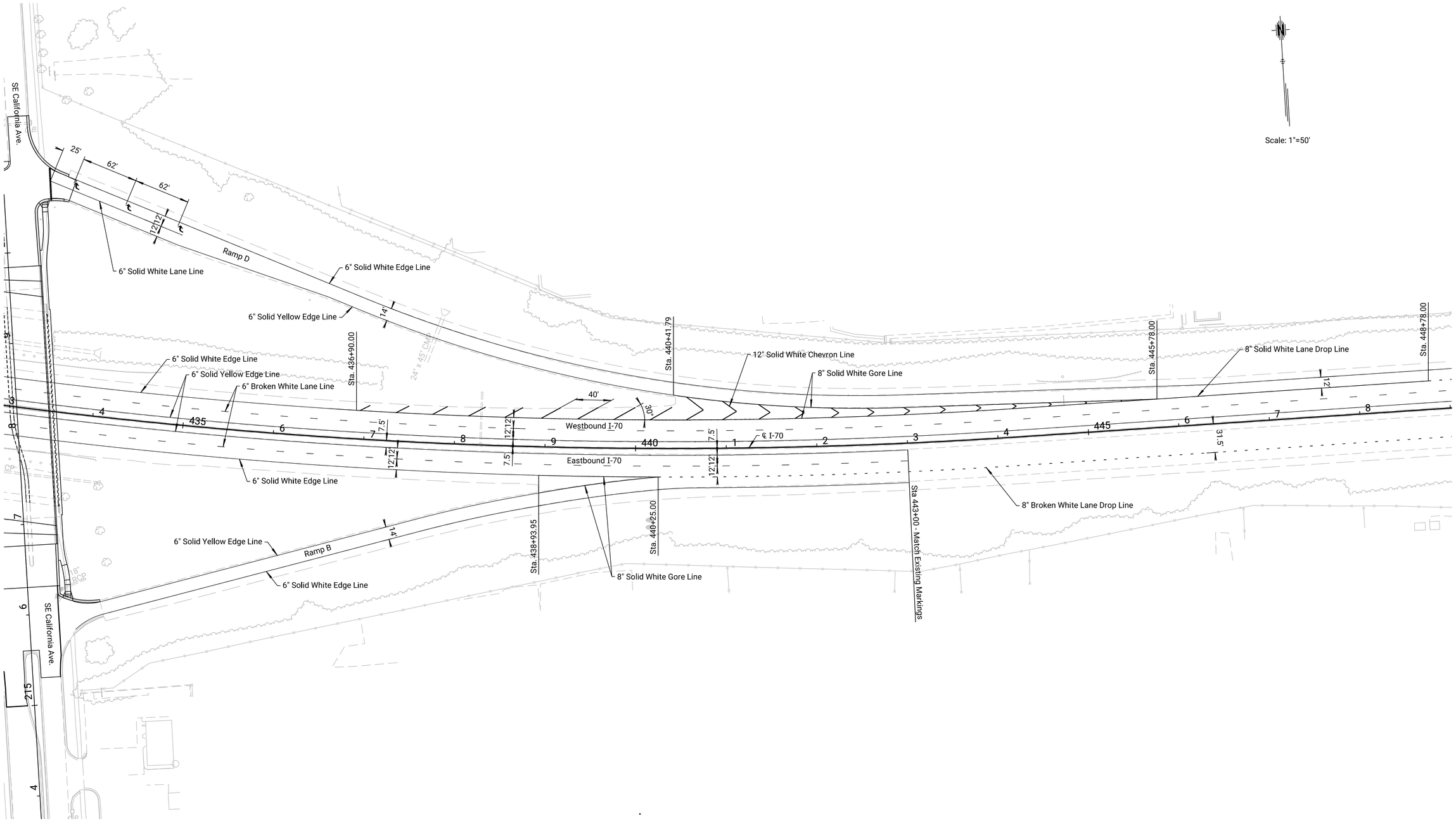
Scale: 1"=50'

KA-1266-04 Project Pavement Marking
6" Dotted White Extension Line
6" Solid White Edge Line
Sta. 420+94.43 Solid Yellow and Broken White Match KA-1266-04 Markings
Sta. 421+96.00
6" White Edge Line
8" Solid White Gore Line
6" Solid Yellow Edge Line
6" Broken White Lane Line
8" Solid White Gore Line
6" White Edge Line
Sta. 418+80.00
Sta. 425+84.37
PC 426+59.10
℄ I-70
Westbound I-70
Eastbound I-70
12" Solid White Chevron Line
Sta. 431+25.00
6" White Edge Line
W14-2R
Existing Sign shown for Reference
187.5'
62.5'
Ramp C
6" Broken White Lane Line
6" Broken White Lane Drop Line
6" Yellow Edge Line
6" White Edge Line
6" Yellow Edge Line
Ramp A
6" Solid White Lane Line
80'
80'
80'
80'
25'
SE California Ave.
Fiber Optic - Topeka Traffic
12'
14'
7.5'
40'
30°
32° 48' 0"
10" VCP
15" VCP
8" RCP
18" RCP
24" RCP
36" RCP
48" RCP
8" VCP
M.H.
C.B.

KANSAS DEPARTMENT OF TRANSPORTATION
PAVEMENT MARKING
MAINLINE I-70
418+00 TO 433+00

Plotted by : BGS01485 16-DEC-2025 12:33
File : ka680801mpl-04.dgn

STATE	PROJECT N0.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	138	253



Scale: 1"=50'

	DATE
	BY
REFERENCES NOTED	
REFERENCES CHECKED	

KANSAS DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING

MAINLINE I-70

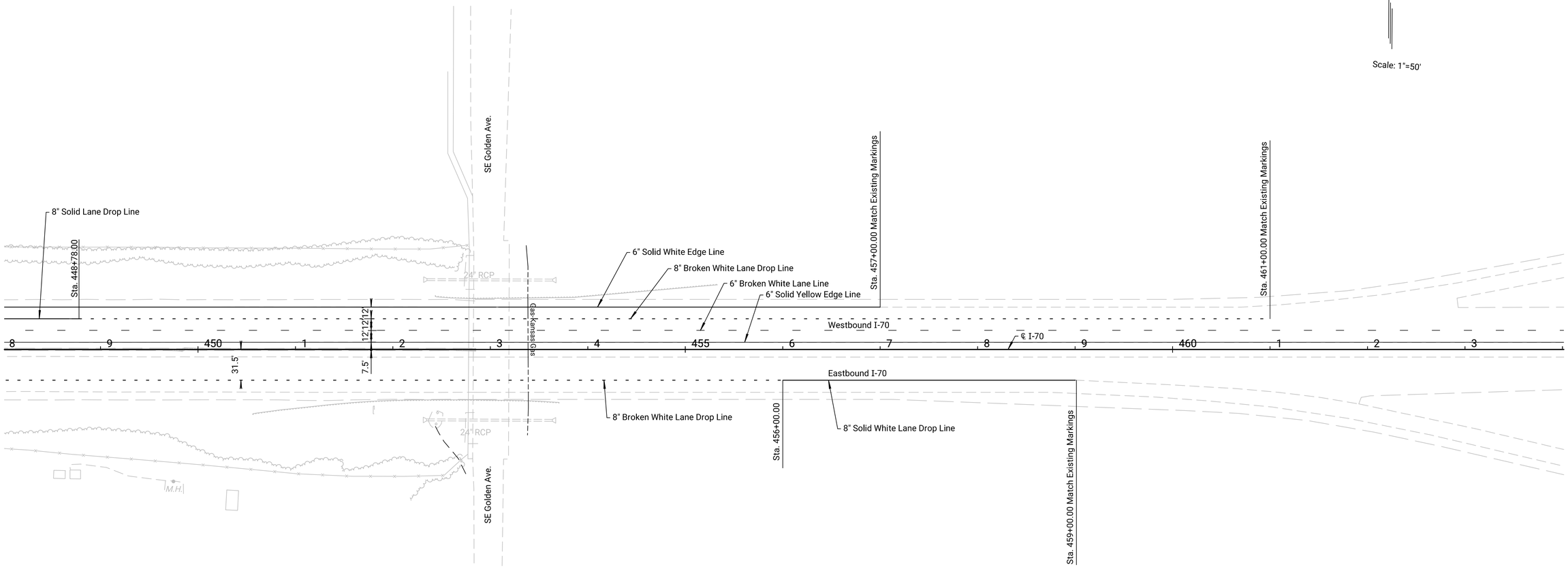
433+00 TO 448+00

Sh. No. 138

Plotted by : BGS01485 16-DEC-2025 12:33
File : ka680801mpl-05.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	139	253

Scale: 1"=50'

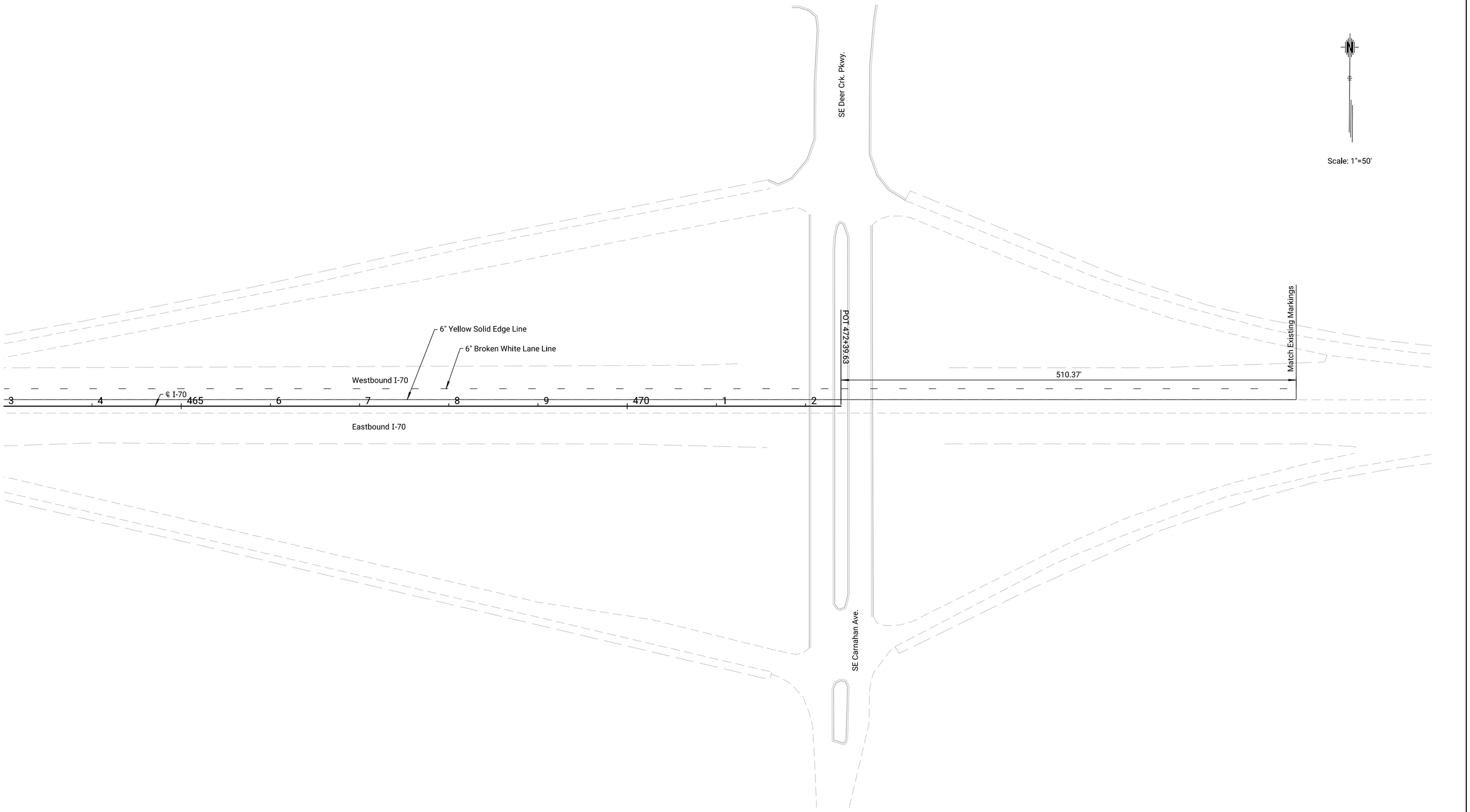


DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED

Plotted by : BGS01485 16-DEC-2025 12:34
File : ka6808801mpl-06.dgn

KANSAS DEPARTMENT OF TRANSPORTATION
PAVEMENT MARKING
MAINLINE I-70
448+00 TO 463+00

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	140	253



BY	DATE
REFERENCES NOTED	
REFERENCES CHECKED	

KANSAS DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING

MAINLINE I-70

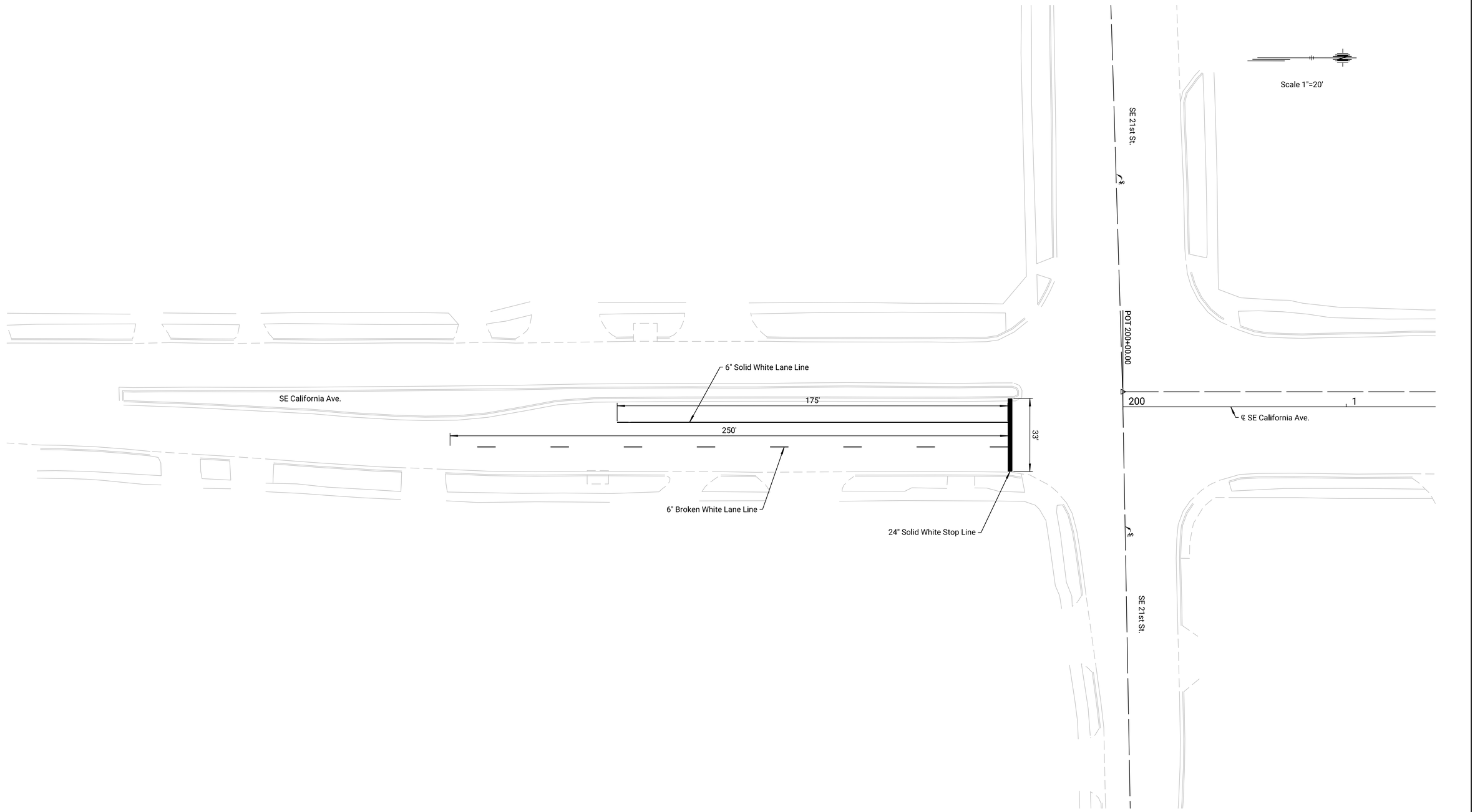
463+00 TO 472+39

Sh. No. 140

Plotted by : BGS01485 16-DEC-2025 12:34
File : ka680801mpl-07.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	141	253

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED



Plotted by : BGS01485 16-DEC-2025 12:35
File : ka680801mpl-08a.dgn

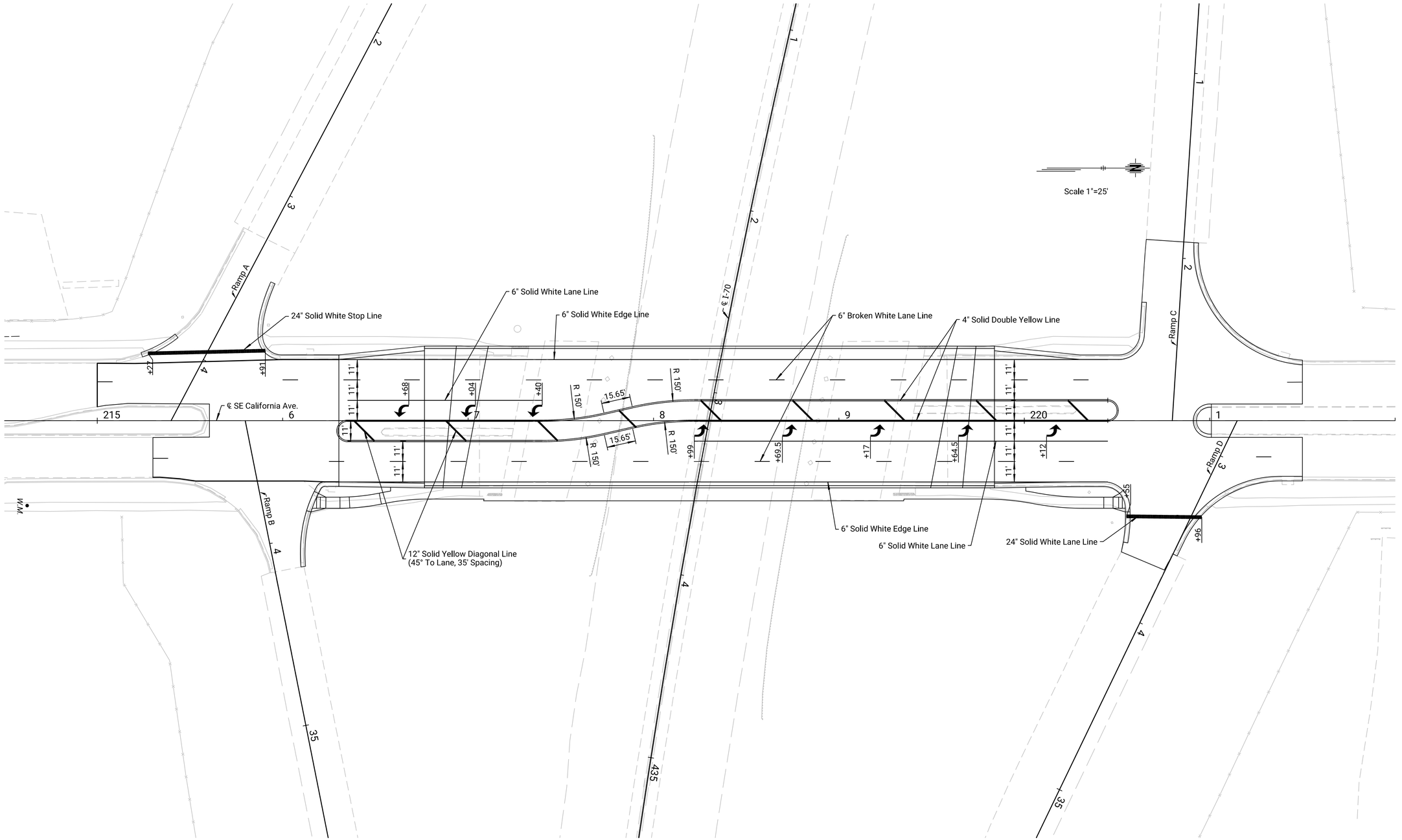
KANSAS DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING

SE CALIFORNIA AVE. & 21ST ST.

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	142	253

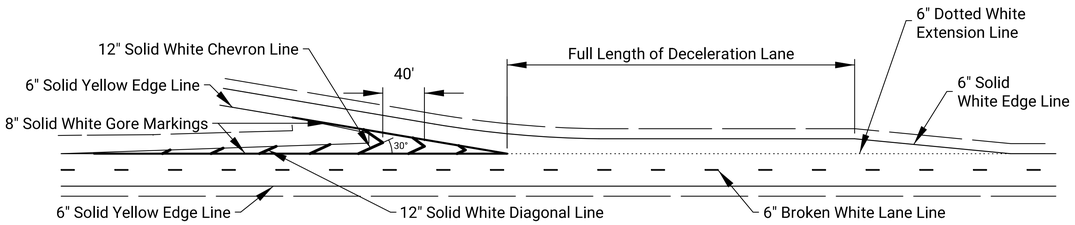
DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED



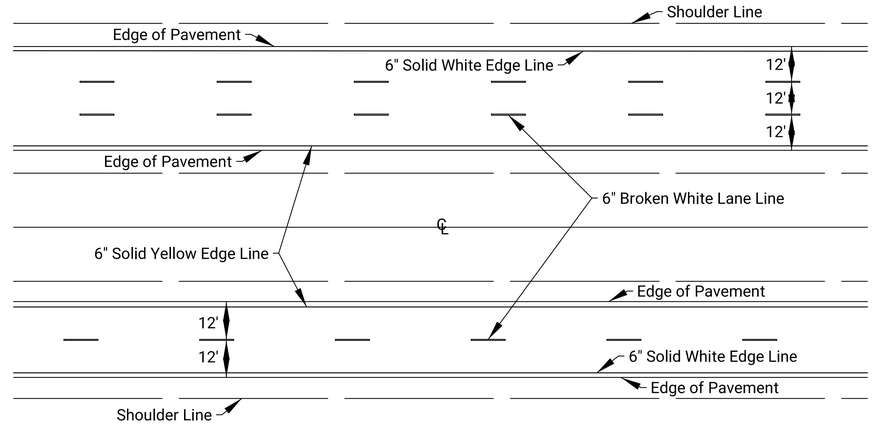
Plotted by : BGS01485 16-DEC-2025 12:35
File : ka680801mpl-08.dgn

KANSAS DEPARTMENT OF TRANSPORTATION
PAVEMENT MARKING
SE CALIFORNIA AVE.
STA. 215+00 TO STA. 220+00

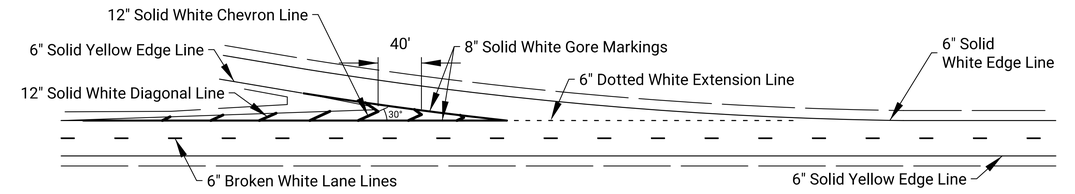
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	143	253



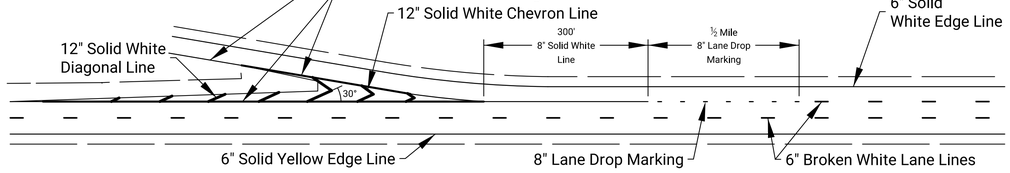
TYPICAL DECELERATION EXIT RAMP



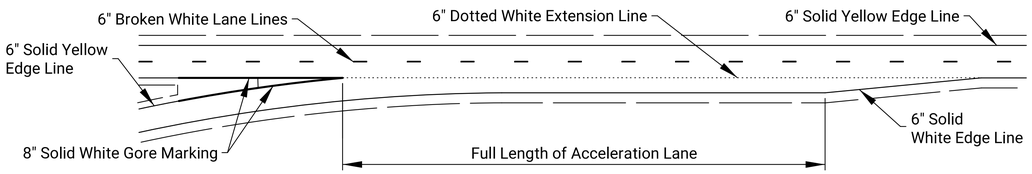
TYPICAL LANE LINE AND EDGE LINE MARKINGS FOR FOUR LANE AND SIX LANE DIVIDED HIGHWAYS



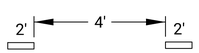
TYPICAL TAPERED EXIT RAMP



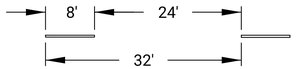
TYPICAL LANE DROP



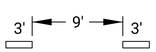
TYPICAL ACCELERATION RAMP



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



TYPICAL SPACING FOR BROKEN LINES, UNLESS OTHERWISE NOTED ON PLANS.



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

NOTE:
Longitudinal pavement marking lines shall be offset a minimum of 2" from longitudinal pavement joints.

At ramp terminals with cross-roads, wrap 6" edge lines around radii.

On non I, US, and K routes, 4" edge lines may be installed. 6" edge lines are not required on non I, US, and K routes.

NO.	DATE	REVISIONS	BY	APP'D
02	05-25-12	Dotted Extension Lines and Lane Drop Lines	B.A.H.	B.D.G.
01	07-26-05	New FHWA Approval Date	J.F.F.	B.D.G.

KANSAS DEPARTMENT OF TRANSPORTATION

TYPICAL PAVEMENT MARKING DETAILS FOR MULTI-LANE DIVIDED ROADWAYS

TE307

FHWA APPROVAL		05-25-12	APP'D.	Brian D. Gower	
DESIGNED	J.F.F.	DETAILED	J.F.F.	QUANTITIES	TRACED
DESIGN CK.	B.D.G.	DETAIL CK.	B.D.G.	QUAN.CK.	TRACE CK.

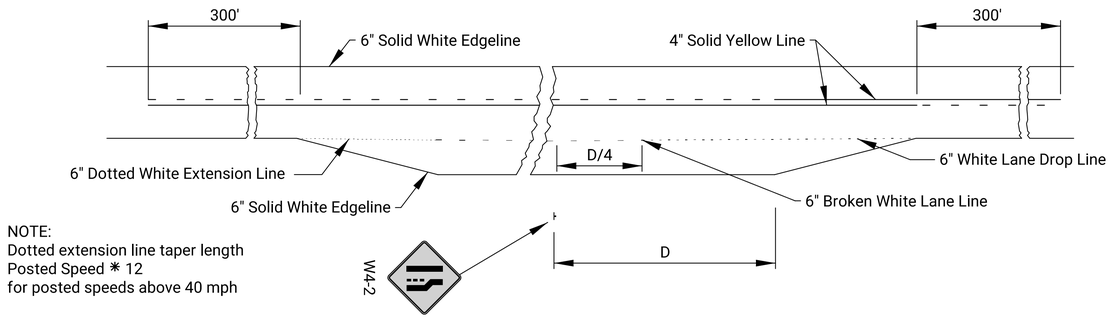
KDOT Graphics Certified 05-23-2025

Sh. No. 143

KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 12:35
File : ka680801mss307.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	144	253

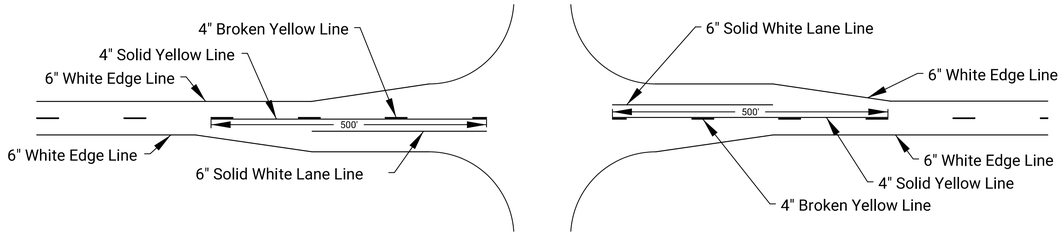


NOTE:
Dotted extension line taper length
Posted Speed ✳ 12
for posted speeds above 40 mph

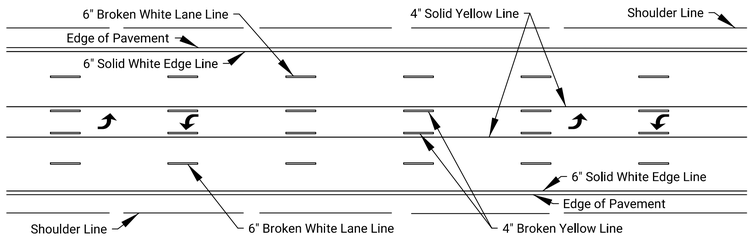
TYPICAL MARKING FOR AUXILIARY PASSING LANE

NOTE:
All pavement markings shall be broken at cross roads.

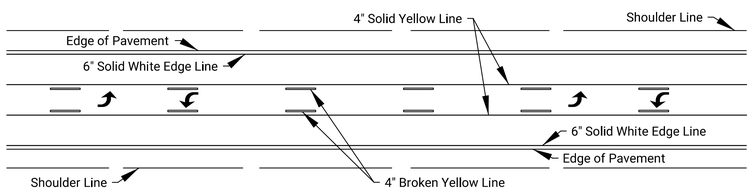
For highway junctions the no passing zone will extend 1000' from intersection.



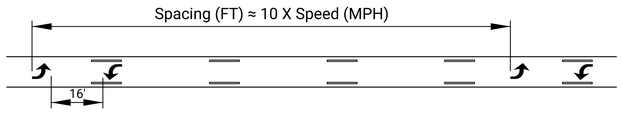
TYPICAL ROAD JUNCTION MARKINGS WITH BYPASS LANES



TWO-WAY LEFT TURN DETAIL FOR FIVE LANE ROADWAY

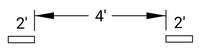


TWO-WAY LEFT TURN DETAIL FOR THREE LANE ROADWAY

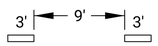


TWO-WAY LEFT TURN ARROW SPACING DETAIL

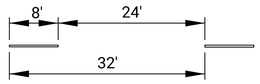
NOTE:
If arrows are used space the arrows as shown in the spacing detail.



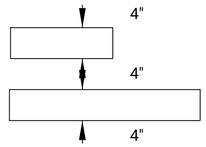
TYPICAL SPACING FOR DOTTED EXTENSION LINES, UNLESS OTHERWISE NOTED ON PLANS.



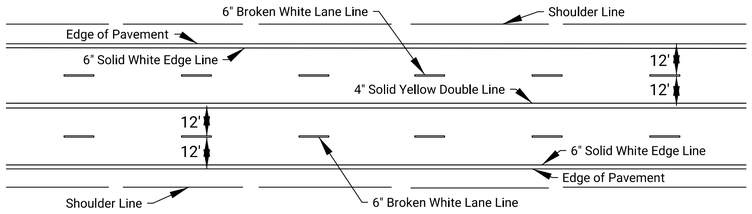
TYPICAL SPACING FOR LANE DROP, UNLESS OTHERWISE NOTED ON PLANS.



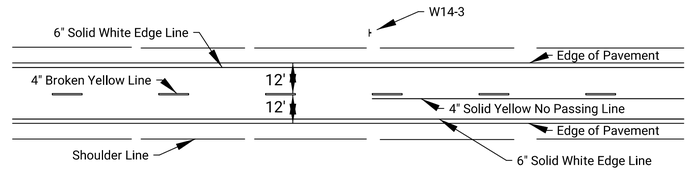
TYPICAL SPACING FOR BROKEN LINES, UNLESS OTHERWISE NOTED ON PLANS



TYPICAL SPACING FOR NO PASSING LINES, UNLESS OTHERWISE NOTED ON PLANS



TYPICAL MARKINGS FOR FOUR LANE ROADWAY



TYPICAL TWO LANE MARKINGS

NOTE:
Longitudinal pavement marking lines shall be offset a minimum of 2" from longitudinal pavement joints.

On non I, US, and K routes, 4" edge lines may be installed.
6" edge lines are not required on non I, US, and K routes.

NO.	DATE	REVISIONS	BY	APP'D
03	05-25-12	Added Dotted Extension and Lane Drop Lines	B.A.H.	B.D.G.
02	09-20-05	Removed Aux. Passing Lane Dotted Ext. Line	J.F.F.	B.D.G.
01	07-26-05	New FHWA Approval Date	J.F.F.	B.D.G.

KANSAS DEPARTMENT OF TRANSPORTATION

TYPICAL PAVEMENT MARKING DETAILS FOR UNDIVIDED ROADWAYS

TE308

FHWA APPROVAL		05-25-12	APP'D.	Brian D. Gower	
DESIGNED	J.F.F.	DETAILED	J.F.F.	QUANTITIES	TRACED
DESIGN CK.	B.D.G.	DETAIL CK.	B.D.G.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 05-23-2025

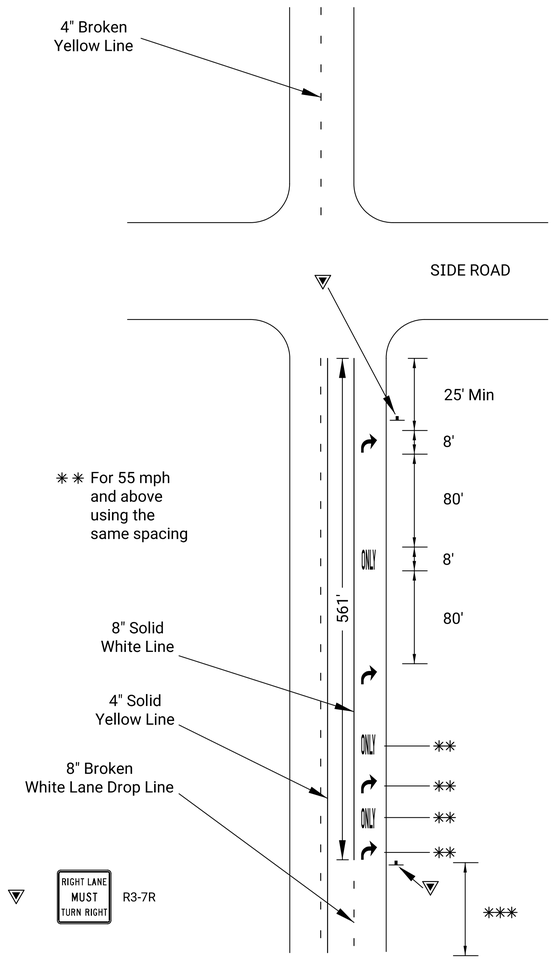
Sh. No. 144

KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 12:36
File : ka680801mss308.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	145	253

TYPICAL SIGNING AND MARKING FOR RIGHT LANE MUST TURN RIGHT



✳✳✳ The lane drop markings length is a minimum of 100' and a maximum of 250' prior to the 8"solid white line

RAILROAD CROSSING MARKING

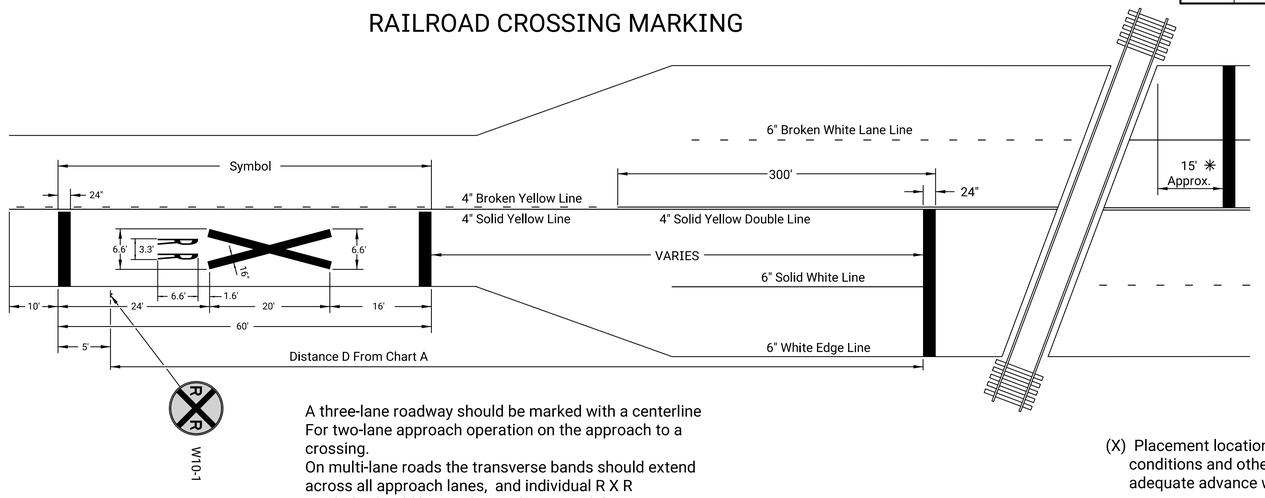


CHART "A"

SPEED MPH	DISTANCE D (feet)
75	850
70	750
65	650
60	550
55	450
50	375
45	300
40	225
35	150
30	(X)
25	(X)
20	(X)

All distances are minimum.

A three-lane roadway should be marked with a centerline For two-lane approach operation on the approach to a crossing.
On multi-lane roads the transverse bands should extend across all approach lanes, and individual R X R symbols should be used in each approach lane.
Refer to standard alphabet for highway signs and markings for R X R symbols details.

✳Stop line 8' from near edge of gate or cantilever, if present.

NOTE:
On non I, US, and K routes, 4" edge lines may be installed.
6" edge lines are not required on non I, US, and K routes.

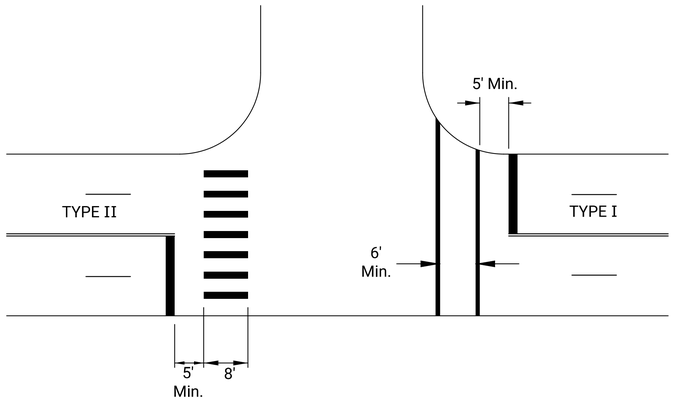
(X) Placement location is dependent on site conditions and other signing to provide adequate advance warning to the driver

TYPICAL CROSSWALKS

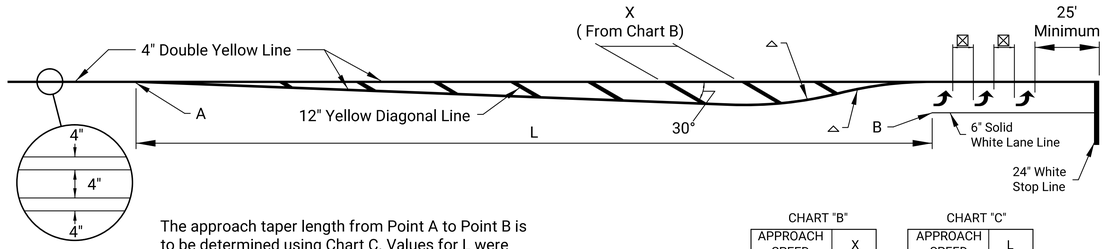
TYPE I: Crosswalk lines shall be 12" solid white lines. They shall be spaced a minimum of 6' apart from inside edge to inside edge.

TYPE II: These lines should be solid white 24" wide placed parallel to the direction of traffic flow. The line placement is determined by lane line, center line, and wheel path in such a manner as to minimize traffic wear. The crosswalk width should be not less than 8'. The transverse crosswalk lines may be added.

When required, stop lines shall be installed a minimum of 5' from crosswalks.



TYPICAL APPROACH TAPER DETAIL



The approach taper length from Point A to Point B is to be determined using Chart C. Values for L were calculated using the equations below and increased to the next higher 5 mph increment.

- SPEEDS < 45 MPH $L = \frac{W \times S^2}{60}$
- SPEEDS = 45 MPH $L = W \times S$

If arrows are used and unless otherwise specified the space between lines should be at least four times the height of the characters for low speed roads but not more than ten times the height of the characters, under any conditions.

For speeds less than or equal to 40 mph, R=150'.
for speeds greater than or equal to 45 mph, R=300'.

CHART "B"

APPROACH SPEED	X
20 MPH	20'
25 MPH	25'
30 MPH	30'
35 MPH	35'
40 MPH	40'
45 MPH	45'
50 MPH	50'
55 MPH	55'
60 MPH	60'
65 MPH	65'
70 MPH	70'

CHART "C"

APPROACH SPEED	L
20 MPH	80'
25 MPH	125'
30 MPH	180'
35 MPH	245'
40 MPH	320'
45 MPH	540'
50 MPH	600'
55 MPH	660'
60 MPH	720'
65 MPH	780'
70 MPH	840'

NO.	DATE	REVISIONS	BY	APP'D
03	05-25-12	Updated Chart B and Lane Drop Lines	B.A.H.	B.D.G.
02	10-20-06	RR Xing Symbol Changed from 18" to 16'	T.L.H.	B.D.G.
01	09-20-05	Added 4" Solid Yellow Double Line to RRxing	J.F.F.	B.D.G.

KANSAS DEPARTMENT OF TRANSPORTATION

TYPICAL MISCELLANEOUS PAVEMENT MARKING DETAIL SHEET

TE309

FHWA APPROVAL		07-26-05	APP'D.	Brian D. Gower	
DESIGNED	J.F.F.	DETAILED	J.F.F.	QUANTITIES	TRACED
DESIGN CK.	B.D.G.	DETAIL CK.	B.D.G.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 05-20-2025

Sh. No. 145

KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 12:36
File : ka680801mss309.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	146	253

SUMMARY OF PAVEMENT MARKINGS

LOCATION	4" Solid WHITE Edge Line	6" Solid WHITE Edge Line	6" Broken WHITE Lane Line	6" Broken WHITE Lane Line (PCP)	6" Dotted WHITE Extension Line	6" Broken WHITE Lane Drop Line	6" Solid WHITE Lane Line	8" Broken WHITE Lane Drop Line	8" Solid WHITE Gore Line	8" Dotted WHITE Extension Line	12" Solid WHITE Diagonal Line	12" Solid WHITE Chevron Line	12" Solid WHITE Type I Crosswalk Line	24" Solid WHITE Type II Crosswalk Line	24" Solid WHITE Stop Line	4" Solid YELLOW Edge Line	4" Solid YELLOW Double Line	4" Solid YELLOW Line	4" Broken YELLOW Line	6" Solid YELLOW Edge Line	12" Solid YELLOW Diagonal Line
MAINLINE I-70																					
BEGIN - STA. 394+10.00			1,584																	1,579	
STA. 394+10.00 - STA. 403+00.00			890																	890	
STA. 403+00.00 - STA. 418+00.00		1,250	1,500		650			1,180	220											1,500	
STA. 418+00.00 - STA. 433+00.00		2,450	2,706		396				2,378			733								2,706	
STA. 433+00.00 - STA. 448+00.00		2,117	2,450						1,935			441								2,500	
STA. 448+00.00 - STA. 463+00.00		900	1,500					2,022	378											1,500	
STA. 463+00.00 - STA. 472+39.63			940																	940	
STA. 472+39.63 - END			510																	510	
Ramp A		793					348													779	
Ramp B		532																		528	
Ramp C		806	264			403														856	
Ramp D		732					157													722	
SE CALIFORNIA AVE.																					
SE CALIFORNIA AVE. & SE 21ST ST.			250				175								33						
STA. 215+00.00 - STA. 220+00.00		829	917				328								104		856.5				137
TOTALS		10,409	3,378		349	202	1,008	801	4,911			1,174			137		1,713			15,010	137

SUMMARY OF WORD & SYMBOL MARKINGS

LOCATION							STOP	ONLY	X-ING	SCHOOL											
Ramp A				5																	
Ramp D				3																	
SE California Ave.					8																
TOTALS				8	8																

RECAPITULATION OF QUANTITIES

ITEMS	TOTAL	UNITS
PAVEMENT MARKING (MULTI-COMPONENT)(WHITE)(4")		FT
PAVEMENT MARKING (MULTI-COMPONENT)(WHITE)(6")	15,346	FT
PAVEMENT MARKING (MULTI-COMPONENT)(WHITE)(8")	5,712	FT
PAVEMENT MARKING (MULTI-COMPONENT)(WHITE)(12")	1,174	FT
PAVEMENT MARKING (MULTI-COMPONENT)(YELLOW)(4")	1,713	FT
PAVEMENT MARKING (MULTI-COMPONENT)(YELLOW)(6")	15,010	FT
PAVEMENT MARKING (MULTI-COMPONENT)(YELLOW)(12")	137	FT
PAVEMENT MARKING (THERMOPLASTIC)(WHITE)(4")		FT
PAVEMENT MARKING (THERMOPLASTIC)(WHITE)(6")		FT
PAVEMENT MARKING (THERMOPLASTIC)(WHITE)(8")		FT
PAVEMENT MARKING (THERMOPLASTIC)(WHITE)(12")		FT
PAVEMENT MARKING (THERMOPLASTIC)(YELLOW)(4")		FT
PAVEMENT MARKING (THERMOPLASTIC)(YELLOW)(6")		FT
PAVEMENT MARKING (THERMOPLASTIC)(YELLOW)(12")		FT
PAVEMENT MARKING (EPOXY)(WHITE)(4")		FT
PAVEMENT MARKING (EPOXY)(WHITE)(6")		FT
PAVEMENT MARKING (EPOXY)(WHITE)(8")		FT
PAVEMENT MARKING (EPOXY)(WHITE)(12')		FT
PAVEMENT MARKING (EPOXY)(YELLOW)(4")		FT
PAVEMENT MARKING (EPOXY)(YELLOW)(6')		FT
PAVEMENT MARKING (EPOXY)(YELLOW)(12")		FT
PAVEMENT MARKING (INTERSECTION GRADE)(WHITE)(12')		FT
PAVEMENT MARKING (INTERSECTION GRADE)(WHITE)(24')	137	FT
PAVEMENT MARKING (INTERSECTION GRADE)(YELLOW)(12")		FT
PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(WHITE)(RIGHT ARROW)	8	EACH
PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(WHITE)(LEFT ARROW)	8	EACH
PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(WHITE)(ONLY)		EACH
PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(WHITE)( )		EACH
PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(WHITE)( )		EACH
PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(US-SHIELD)( )		EACH
PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(K-SHIELD)( )		EACH
PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(I-SHIELD)( )		EACH
PAVEMENT MARKING (PATTERNED COLD PLASTIC)(WHITE)(6")		FT
PAVEMENT MARKING (PATTERNED COLD PLASTIC)(WHITE)(8")		FT
PAVEMENT MARKING (PATTERNED COLD PLASTIC)(WHITE)(12")		FT
PAVEMENT MARKING REMOVAL		FT

NOTE:
For specific pavement marking details and dimensions see plan sheets.

All totals reflect actual quantity of pavement marking materials required.

Prior to commencement of pavement marking work the Engineer will establish the limits for "no passing" zones. These limits shall be used for the location of "no passing" lines and for the computation of actual marking quantities for this line type.

Words & symbols shall conform to the latest edition of "Standard Alphabets for Highway Signs and Pavement Markings" printed by the U.S. Department of Transportation, Federal Highway Administration.

NO.	DATE	REVISIONS	BY	APP'D
02	05-25-12	Added Line Types, Symbols, and Shields	B.A.H.	B.D.G.
01	07-26-05	New FHWA Approval Date	J.F.F.	B.D.G.

KANSAS DEPARTMENT OF TRANSPORTATION

SUMMARY AND RECAPITULATION OF PAVEMENT MARKING QUANTITIES

TE311

FHWA APPROVAL		05-25-12	APP'D.	Brian D. Gower	
DESIGNED	J.F.F.	DETAILED	J.F.F.	QUANTITIES	TRACED
DESIGN CK.	B.D.G.	DETAIL CK.	B.D.G.	QUAN.CK.	TRACE CK.

Plotted by : BGS01485 16-DEC-2025 12:36
File : ka680801css311.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	147	253

SYMBOL KEY

- REMOVE SIGN
- REMOVE POST
- REMOVE FOOTING
- REMOVE SIGN & POST
- REMOVE POST & FOOTING
- REMOVE SIGN, POST, & FOOTING
- MOUNT ON WOOD POST IN CONCRETE FOOTING
- MOUNT ON WOOD POST IN SOIL
- MOUNT ON STEEL BEAM BREAKAWAY POST
- MOUNT ON STEEL U-POST
- MOUNT ON PSST POST
- MOUNT ON EXISTING POST
- MOUNT ON VERTICAL SUPPORT
- SHOULDER MOUNTED INSTALLATION
- OFFSET MOUNTED INSTALLATION
- EXISTING SIGN
- EXISTING SIGN TO BE OVERLAID
- SIGN IS NOT PART OF PROJECT
- TYPE 'A' DELINEATOR (RIGID)
- TYPE 'A' DELINEATOR (RIGID) (BK-BK)
- TYPE 'B' DELINEATOR (RIGID)
- TYPE 'A' DELINEATOR (FLEXIBLE)
- TYPE 'A' DELINEATOR (FLEXIBLE) (BK-BK)
- TYPE 'B' DELINEATOR (FLEXIBLE)
- TYPE 2 OBJECT MARKER
- TYPE 3 OBJECT MARKER
- TYPE 3 OBJECT MARKER (BK-BK)

GENERAL NOTES

In order to expedite the completion of the project for traffic service, the signing and delineator work shall be sequenced with any other contract work such that the phases of construction may proceed and be completed at the same time.

New signs erected on the project which are in conflict with existing signing are to be completely covered until the existing signs are removed or the new signing is applicable. The existing signs that are being replaced, removed, or do not follow the current MUTCD signing standards are to be removed when the project is completed or as determined by the Engineer.

The Contractor shall exercise caution at all times when installing sign supports in and around areas where utilities exist, either underground or overhead, and will be held responsible for any damage incurred to the system. The installation of sign supports shall include the excavation, drilling, or driving the support footing and the erection of the sign support. The contractor shall exercise caution when working around any existing signs that are to remain and will be held responsible for any damage to the signs, supports, or footings. The Contractor shall exercise care when working around shrubbery while removing or installing signs or sign supports.

An existing sign post installation shall be plumb and the compaction of the backfill soil shall comply with the specifications after the removal and resetting of a sign, the removal and replacement of a sign, or the installation of a new sign.

The Contractor shall provide mounting bolts that are of a length that does not extend more than a nominal 1 inch beyond the sign post. The Contractor shall not make any field modifications to the mounting bolt prior to or after the sign is installed.

Specific service (LOGO) signs that are to be removed shall have the business logo plaques removed and transported to location determined by KDOT, at which time the plaques become the property of KDOT. The Contractor will be assessed a replacement cost for any damage to a business logo plaque prior to the plaque becoming the property of KDOT.

The materials and fabrication for signing and delineation work shall conform to the Standard Specifications for State Road and Bridge Construction (2015 edition) and Special Provisions.

INDEX OF SHEETS

147	SIGNING INDEX, SYMBOLS, & GENERAL NOTES
148	POST SPACING & SIGN ANGLE DETAILS
149-150	HEIGHT & LATERAL DISTANCE FOR ERECTION
	POSITIONING, DESIGN, & MOUNTING OF DELINEATORS
	POSITIONING, DESIGN, & MOUNTING FOR OBJECT MARKERS (TYPE 2 & 3)
	POSITIONING FOR CHEVRON (W1-8) SIGNS
151-152	PLAN SHEETS (INSTALLATIONS)
153-154	PLAN SHEETS (REMOVALS)
155	QUANTITIES SHEETS (INSTALLATIONS)
	QUANTITIES SHEET (DELINEATORS & OBJECT MARKERS)
156	SUMMARY SHEET (INSTALLATIONS & REMOVALS)
157	SUMMARY SHEET (REMOVAL & RESET)
158	RECAPITULATION SHEET
159-162	STANDARD STRUCTURAL SIGN SUPPORTS (WOOD & STEEL POSTS)
163	MOUNTING OF SIGNS ON WOOD POSTS
	MOUNTING OF FLAT SHEET SIGNS ON STEEL I-BEAM POSTS
164	MOUNTING OF REINFORCED PANEL SIGNS ON I-BEAM POSTS
te503-te509	DETAILS FOR FLAT SHEET SIGN BLANKS
te512-te515	DETAILS FOR PROCESSED SIGNS
165-167	DETAILS FOR REINFORCED PANELS
	DETAILS FOR GUIDE SIGN LEGEND
	DETAILS FOR GUIDE SIGNS
168-169	DETAILED SIGN SPECIFICATIONS

NO.	DATE	REVISIONS	BY	APP'D
02	10-01-19	Changed symbol, notes, & index	D.D.G.	E.W.N.
01	07-23-10	Changed General Notes and Spec Book Date	D.D.G.	D.B.

KANSAS DEPARTMENT OF TRANSPORTATION

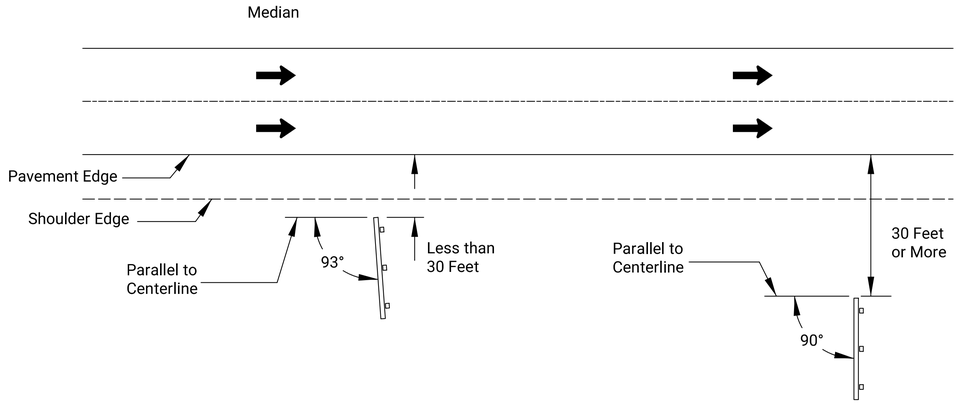
SIGNING SYMBOL KEY GENERAL NOTES AND INDEX

TE402 07-01-03

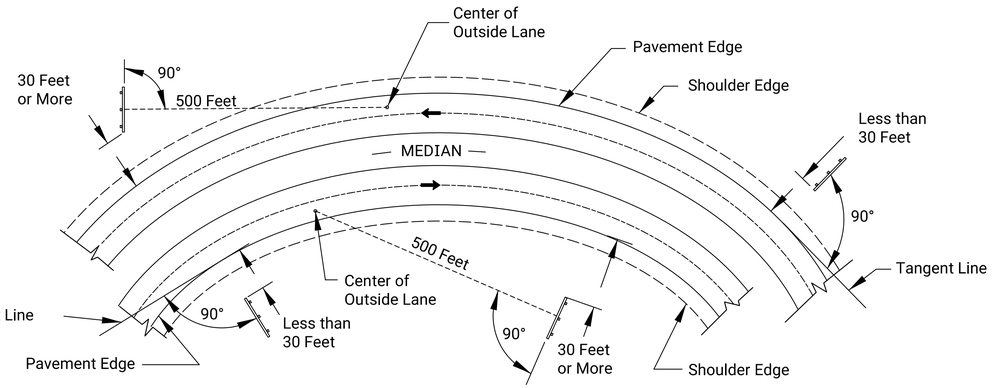
FHWA APPROVAL		10-01-19	APP'D.	Steven A. Buckley	
DESIGNED	D.D.G.	DETAILED	W.S.B.	QUANTITIES	TRACED
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN.CK.	TRACE CK.

Plotted by : BGS01485 16-DEC-2025 12:37
File : 2501_ka680801pss402-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	148	253

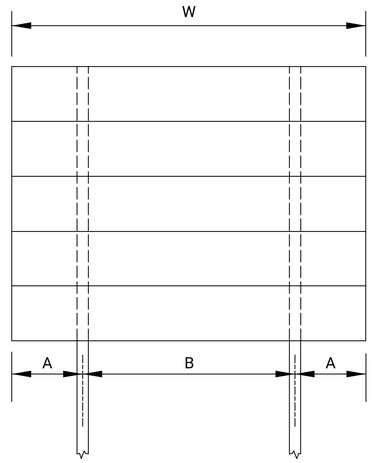


ANGLE OF SIGNS ERECTED ON STRAIGHT ROADWAY



ANGLE OF SIGNS ERECTED ON CURVED ROADWAY

GENERAL NOTE:
Gore and median signs shall normally be erected such that the sign face is truly vertical and rotated 93 degrees away from the center of the lane which the sign serves. All angles are measured to the face of the sign.



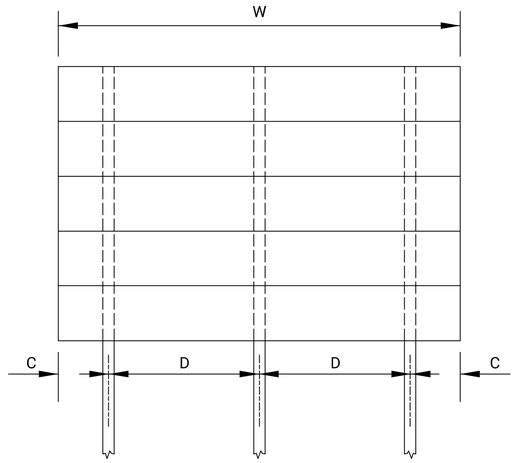
TWO POST SPACING

Wood Post		
A	B	W
6" (Min.)	3/5 W (Min.)	NA

Steel Beam Post (Width less than or equal to 13'-0")		
A	B	W
12" (Min.)	8'	10'-0" (Min.)

Steel Beam Post (Width greater than 13'-0")		
A	B	W
32" (Min.)	8' (Min.)	13'-6" (Min.)

Spacing Pattern: A+B+A
W= Sign Width
A= 1/5 W
B= 3/5 W



THREE POST SPACING

Wood Post		
C	D	W
6" (Min.)	4' (Min.)	9'-0" (Min.)

Steel Beam Post (Width less than or equal to 21'-0")		
C	D	W
12" (Min.)	8'	18'-0" (Min.)

Steel Beam Post (Width greater than 21'-0")		
C	D	W
32" (Min.)	8' (Min.)	21'-6" (Min.)

Spacing Pattern: C+D+D+C
W= Sign Width
C= 1/8 W
D= 3/8 W

NOTE: All spacing dimensions are measured to the centerline of the posts.

POST SPACING FOR REINFORCED PANEL SIGNS

NO.	DATE	REVISIONS	BY	APP'D
01	10-01-19	Changed the post spacing tables and notes	D.D.G.	E.W.N.

KANSAS DEPARTMENT OF TRANSPORTATION

POST SPACING FOR REINFORCED PANEL SIGNS AND ANGLE OF SIGNS

TE404 07-01-03

FHWA APPROVAL		10-01-19	APP'D.	Steven A. Buckley	
DESIGNED	D.D.G.	DETAILED	W.S.B.	QUANTITIES	TRACED
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN.CK.	TRACE CK.

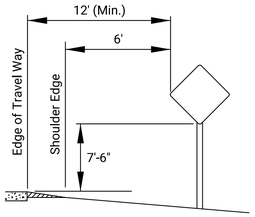
KDOT Graphics Certified 05-16-2025

Sh. No. 148

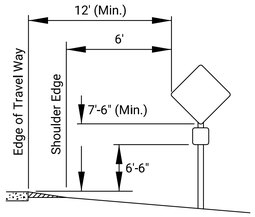
KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 12:37
File : 2502_ka680801pss404-01.dgn

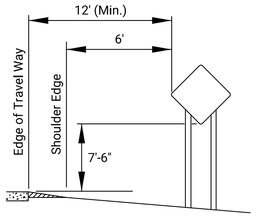
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	149	253



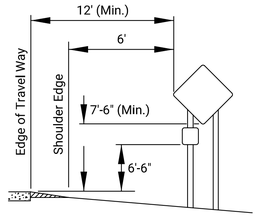
ONE POST



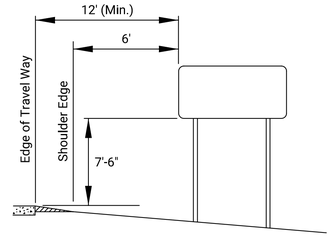
ONE POST WITH SUPPLEMENTAL SIGN



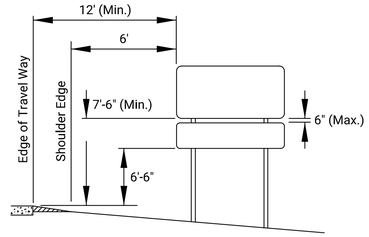
TWO POSTS



TWO POSTS WITH SUPPLEMENTAL SIGN

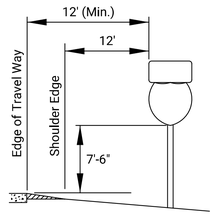


MULTIPLE POSTS

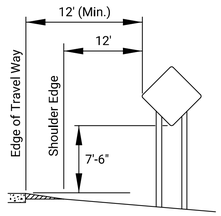


MULTIPLE POSTS WITH SUPPLEMENTAL SIGN

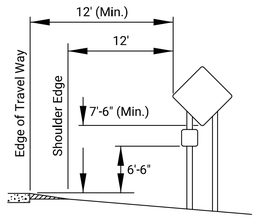
RAMPS AND EXPRESSWAY INTERSECTIONS



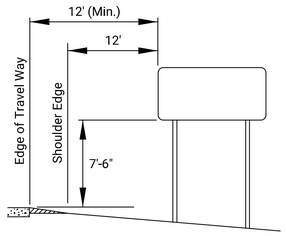
ONE POST



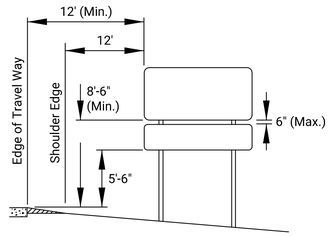
TWO POSTS



TWO POSTS WITH SUPPLEMENTAL SIGN

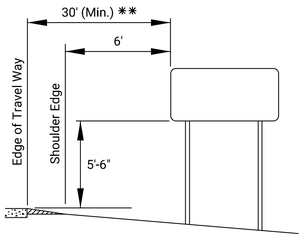


MULTIPLE POSTS

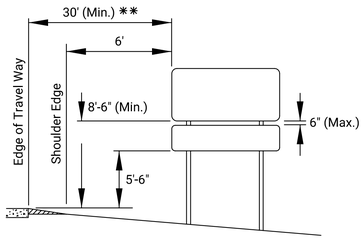


MULTIPLE POSTS WITH SUPPLEMENTAL SIGN

MAINLINE - SHOULDER MOUNT



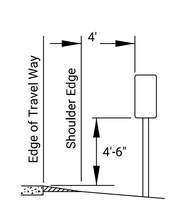
MULTIPLE POSTS



MULTIPLE POSTS WITH SUPPLEMENTAL SIGN

** 60' Max.

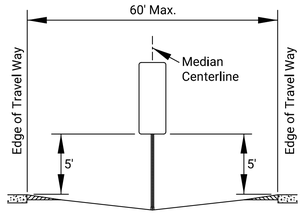
MAINLINE - OFFSET MOUNT



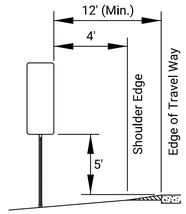
SHOULDER

Post Sizes:
D10-1: 2 Lb/Ft "U" Post
D10-2: 2 Lb/Ft "U" Post
D10-3: 3 Lb/Ft "U" Post

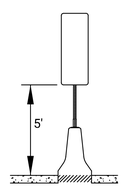
MILE POSTS



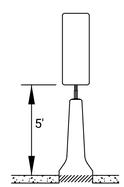
MEDIAN WIDTH
60' OR LESS
(SOIL)



MEDIAN WIDTH
GREATER THAN 60'
(SOIL)



32" BARRIER

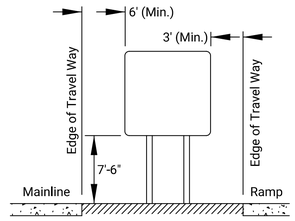


51" BARRIER

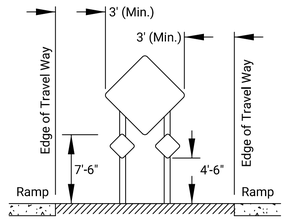
Post Size (Soil): 2" PSST Post with Footing

Post Size (Barrier): 1 3/4" PSST Post

INTERMEDIATE REFERENCE MARKERS

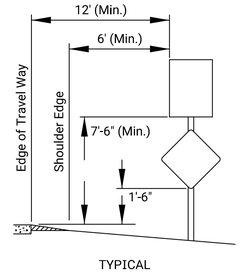


MAINLINE/RAMP



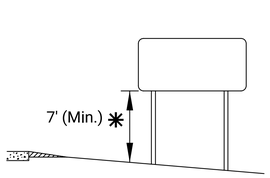
RAMP/RAMP

HIGHWAY GORES

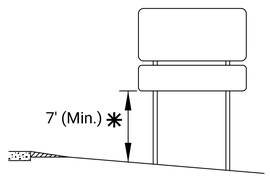


TYPICAL

ADOPT A HIGHWAY



PRIMARY SIGN



PRIMARY SIGN WITH SUPPLEMENTAL SIGN

* NOTE: Measured from the nearest point between the sign and the groundline.

GROUND CLEARANCE FOR STEEL BEAM POSTS

The "Edge of Travel Way" is the edge line or the edge of driving lane.

The outer edge of the mainline sign shall be a minimum of 10' from the right of way line. The outer edge of the ramp sign shall not extend beyond the right of way line.

A minimum lateral clearance of 6' from pavement edge where lateral offsets are limited may be used.

When signs are behind guardrail, the near edge of the sign shall not extend beyond the back side of the guardrail and the nearest sign post shall be a minimum of 5' from the face of the guardrail. Shoulder mounted signs shall not be located between 100' in advance of and 50' beyond the nose of the guardrail.

The gore sign shall be installed in the paved gore area. The edges of the gore sign shall not extend beyond the shoulder edge. The minimum distance from the centerline of the posts to the back of the paved gore area is 2'.

Both the mounting height and ground clearance minimum dimensions are to be met for steel beam post installations.

NOTES

Signs may be moved laterally or longitudinally if it will improve visibility of the sign or other signs or if it will protect the sign more.

The maximum allowable longitudinal adjustments are:
- Advance guide: 1320'
- Supplemental guide: 1320'
- Motorist service: 1320'
- Exit direction: 100'
- Mileage: 2640'
- Merge: 50'
- Mainline signs within an interchange: 50'
- Milepost or intermediate reference marker: 50'
- Ramp: 50'

If any sign with a distance or mileage is longitudinally adjusted, the distance or mileage shall be checked and modified as needed.

The minimum spacing between signs are:
- Mainline guide sign to mainline guide sign: 800'.
- Mainline guide sign to regulatory, warning, route marker sign: 400'.
- Ramp sign to ramp sign: 100'.

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

MOUNTING HEIGHT & LATERAL OFFSET FOR FREEWAYS AND EXPRESSWAYS

TE406 10-01-19

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

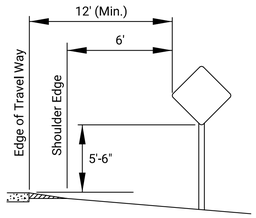
KDOT Graphics Certified 05-16-2025

Sh. No. 149

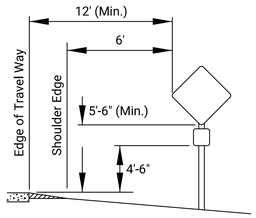
KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 12:37
File : 2503_ka6808001pss406-01.dgn

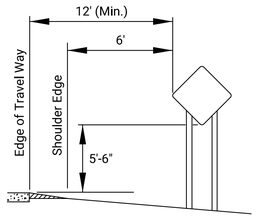
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	150	253



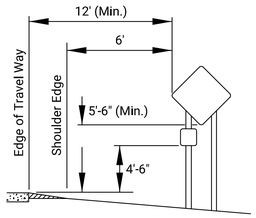
ONE POST



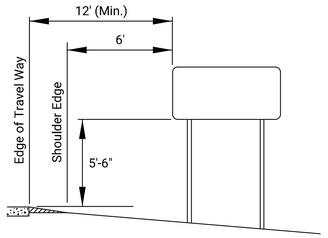
ONE POST WITH SUPPLEMENTAL SIGN



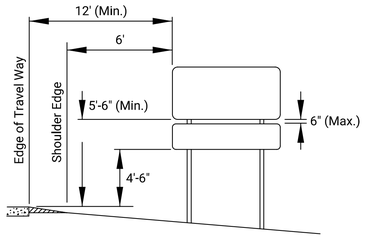
TWO POSTS



TWO POSTS WITH SUPPLEMENTAL SIGN

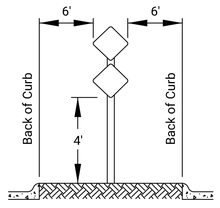


MULTIPLE POSTS

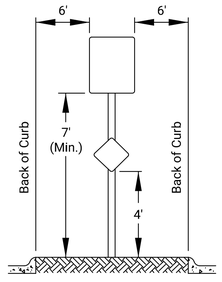


MULTIPLE POSTS WITH SUPPLEMENTAL SIGN

CONVENTIONAL HIGHWAY AND SIDE ROADS

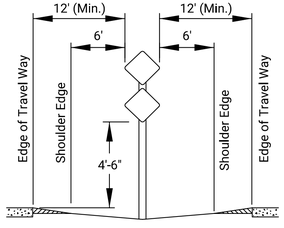


ONE OR TWO OM1-3

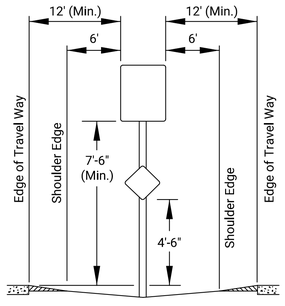


PRIMARY SIGN WITH OM1-3

RAISED



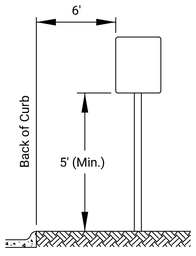
ONE OR TWO OM1-3



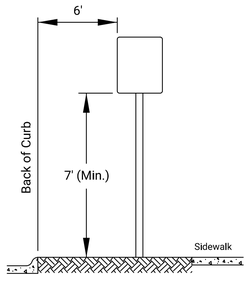
PRIMARY SIGN WITH OM1-3

DEPRESSED

MEDIANS AND ISLANDS

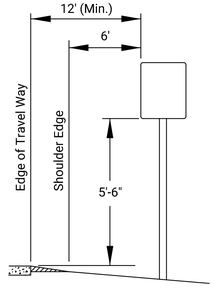


NO PARKING OR SIDEWALK



PARKING OR SIDEWALK

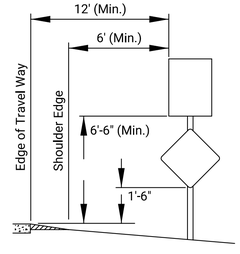
CURB



TYPICAL

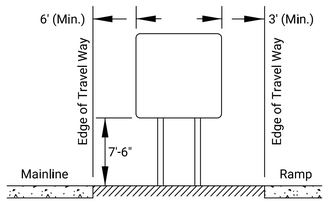
NO CURB

URBAN ROADWAYS

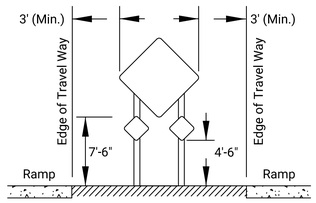


TYPICAL

ADOPT A HIGHWAY

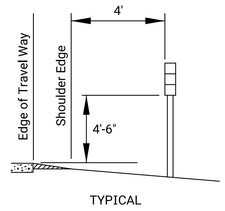


MAINLINE/RAMP



RAMP/RAMP

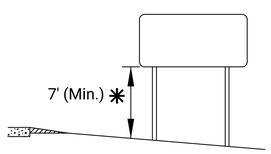
HIGHWAY GORES



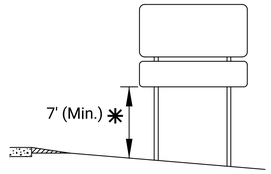
TYPICAL

Reference Marker Post: 2 Lb/Ft "U" Post

REFERENCE MARKERS



PRIMARY SIGN



PRIMARY SIGN WITH SUPPLEMENTAL SIGN

✱NOTE: Measured from the nearest point between the sign and the groundline.

GROUND CLEARANCE FOR STEEL BEAM POSTS

NOTES

The "Edge of Travel Way" is the edge line or the edge of the driving lane.

The outer edge of the sign shall not extend beyond the right of way line.

A minimum lateral clearance of 6' from pavement edge may be used where lateral offsets are limited.

In business, commercial, or residential districts where with limited lateral offsets, a minimum lateral clearance of 2' with a 7'-6" minimum mounting height may be used.

When signs are behind guardrail, the near edge of the sign shall not extend beyond the back side of the guardrail and the nearest sign post shall be a minimum of 5' from the face of the guardrail. Shoulder mounted signs shall not be located between 100' in advance of and 50' beyond the nose of the guardrail.

When the median or island is too narrow for the typical lateral placement, the sign may be placed a minimum of 2' from the back of the curb. In no case shall the sign edge extend beyond the back edge of the curb.

The gore sign shall be installed in the paved gore area. The edges of the gore sign shall not extend beyond the shoulder edge. The minimum distance from the centerline of the posts to the back of the paved gore area is 2'.

Signs may be moved laterally or longitudinally if it will improve visibility of the sign or other signs or if it will protect the sign more. The maximum allowable longitudinal adjustment is 100', with the exception of the reference marker which is 50'.

The minimum spacing between signs, excluding reference markers is 100'.

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

MOUNTING HEIGHT & LATERAL OFFSET FOR CONVENTIONAL HIGHWAYS, SIDE ROADS, MEDIANS, ISLANDS, GORES, AND URBAN ROADWAYS

TE407 10-01-19

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

KDOT Graphics Certified 05-16-2025

Sh. No. 150

KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 12:37
File : 2504_ka680801pss407-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	151	253

DATE	BY	
REFERENCES NOTED		
REFERENCES CHECKED		

Scale 1"=50'

SE 11th St.

℄ California Ave.

Ramp C

Ramp D

Ramp A

Ramp B

Westbound I-70

Eastbound I-70

℄ I-70

EXIT 364A

EXIT 363 GAS

Carnahan Ave Deer Creek Trfwy ½ MILE EXIT 364B (New Cantilever)

Adams St Branner Trfwy EXIT ONLY (New Cantilever)

California Ave

DO NOT ENTER

STOP

ONE WAY

WRONG WAY

ONLY

LITTER CREW WORKING

Note: SE California Ave. Signs not shown for clarity

KANSAS DEPARTMENT OF TRANSPORTATION

PROPOSED SIGNING

I-70

KDOT Graphics Certified 11-14-2025

Sh. No. 151

KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 12:38
File : 2507_ka680801ppl_03-I70Proposed.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	152	253

REFERENCES NOTED	BY	DATE
REFERENCES CHECKED		

Scale 1"=50'

Ramp A

Eastbound I-70

Westbound I-70

Ramp C

Ramp B

Ramp D

℄ I-70

430

435

E4-1a
11'-0" x 7'-6"

EAST
70
Kansas City

220+09

R6-1L

M(1)3-2 M1-1 M1-4 M1-5 M6-1L

M(1)3-4 M1-1 M1-4 M1-5 M6-1R

M(1)3-2 M1-1 M1-4 M1-5 M6-3

DO NOT ENTER R5-1

PI 212+49.85

PI 213+28.09

1 2 3 4 215 OM1-3 6 7 8 9 220

1 2 OM1-3 3 4 225 6

℄ California Ave.

220+97

SE 13th St.

SE 11th St.

STOP R1-1

OM1-3

216+98

220+35

221+17

R5-1

R6-1L R6-1R

AVE. BID ONE WAY

ONE WAY

R6-1R

STOP R1-1

M6-3 M1-5 M1-4 M1-1 M(1)3-4

M6-1R M1-5 M1-4 M1-1 M(1)3-2

WEST
70
Salina

E4-1a
10'-0" x 7'-6"

M6-1L M1-5 M1-4 M1-1 M(1)3-4 R5-1

Note: I-70 Signing not shown for clarity

KANSAS DEPARTMENT OF TRANSPORTATION

PROPOSED SIGNING

SE CALIFORNIA AVE.

Sh. No. 152

Plotted by : BGS01485 16-DEC-2025 12:38
File : 2508_ka680801ppl_04-CaliforniaProposed.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	153	253

DATE	BY	
REFERENCES NOTED		
REFERENCES CHECKED		

Scale 1"=50'

SE 11th St.

℄ California Ave.

Ramp C

Ramp D

Ramp A

Ramp B

Westbound I-70

Eastbound I-70

℄ I-70

PC 429+69.10

425 6 7 8 9 430 1 2 3 4 435 6 7 8 9 440

220 9 8 7 9 215 4

218+55

218+01

W4-2R

KR5-10

W4-1R

R5-1 DO NOT ENTER

R6-1R ONE WAY

R1-1 STOP

KR3-8L ONLY

KR3-8h ONLY

R5-1a WRONG WAY

W12-2

15'-4"

R5-1a 7'-6" x 3'-6"

California Ave

R5-1a 9'-0" x 5'-0"

EXIT 364A

R4 7'-6" x 6'-6"

EXIT 363 GAS

R6 10'-0" x 6'-6"

W12-2

15'-4"

R2 7'-6" x 3'-6"

KR3-8L ONLY

R5-1a WRONG WAY

KR3-8aR ONLY

R5-1a WRONG WAY

E1-3 Caranhan Ave Deer Creek Trfwy ½ MILE EXIT 364B (Sign on California Ave Bridge)

E1-5p

R6-1L ONE WAY

R6-1R ONE WAY

R1-1 STOP

R5-1 DO NOT ENTER

KR5-10 PROHIBITED

E1-5 EXIT 363 Adams St Branner Trfwy EXIT ONLY (Sign on California Ave Bridge)

E6-3

KR3-8h ONLY

R5-1a WRONG WAY

R5-1a 7'-6" x 3'-6"

KR3-8h ONLY

R6 10'-0" x 6'-6"

W12-2

15'-4"

D10-3 MILE 3 6 4

D10-3 MILE 3 6 4

W4-1R

E5-1a 9'-0" x 5'-0"

EXIT 364A

UTTER CREW WORKING

NEXT 1 MILES

Note: SE California Ave. Signs not shown for clarity

KANSAS DEPARTMENT OF TRANSPORTATION

REMOVAL OF SIGNS

I-70

KDOT Graphics Certified 11-14-2025

Sh. No. 153

KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 12:39
File : 2509_ka680801ppl_01-I70Removal.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	154	253

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED

Scale 1"=50'

Ramp A

Ramp C

Ramp D

Ramp B

℄ I-70

I 430

I 435

E4-1a 10'-0" x 8'-0"

E4-1a 10'-0" x 7'-6"

M(1)3-2 M1-1 M1-4 M1-5 M6-1L

M(1)3-4 M1-1 M1-4 M1-5 M6-1R

M(1)3-2 M1-1 M1-4 M1-5 M6-3

M(1)3-4 M1-1 M1-4 M1-5 M6-3

M6-1L M1-5 M1-4 M1-1 M(1)3-4 R5-1

M6-1R M1-5 M1-4 M1-1 M(1)3-2

R5-1 R6-1L R6-1R

R6-1L R6-1R

R1-1

OM1-3 OM3-R

PI 212+49.85

PI 213+28.09

219+51

220+09

220+25

220+35

220+97

221+07

216+55

216+98

217+12

℄ California Ave.

SE 13th St.

SE 11th St.

Note: I-70 Signing not shown for clarity

KANSAS DEPARTMENT OF TRANSPORTATION

REMOVAL OF SIGNS

SE CALIFORNIA AVE.

Sh. No. 154

Plotted by : BGS01485 16-DEC-2025 12:39
File : 2510_ka680801ppl_02-CaliforniaRemoval.dgn

QUANTITIES SHEET

SIGNS, POSTS, & FOOTINGS TO BE INSTALLED ON PROJECT

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	155	253

PLAN SHEET NUMBER	PLAN STATION NUMBER	CENTERLINE LOCATION / INSTALL POSITION	SIGN DESIGNATION	SIGN SIZE	SIGN LAYOUT SHEET NUMBER	TYPE OF SIGN FABRICATION			4" X 6" POSTS			3I2.25 ALUMINUM BEAM	U-POSTS		GALVANIZED STEEL BEAM POSTS						PERFORATED SQUARE STEEL TUBE (PSST) POSTS										CONCRETE FOOTINGS					SIGN STRUCTURE TYPE						VERTICAL SUPPORT MOUNT	MOUNT ABOVE GUIDE SIGN DESIGNATION
									WOOD		STEEL				W6x9		W10x12		W10x22		1 3/4"			2"			2 1/4"		2 1/2"		WOOD POST	STEEL BEAM POST										
															A36	A572 (ALT)	A36	A572 (ALT)	A36	A572 (ALT)	POST	FOOTING	BRACKET	POST	FOOTING	BRACKET	POST	FOOTING	POST	FOOTING		A36		A572 (ALT)		OVERHEAD							
						FLAT SHEET	REINFORCED PANEL	OVERLAY	FLAT SHEET SIGN	REINFORCED PANEL SIGN	STRUCTURAL TUBING		2 LB PER FT	3 LB PER FT																	18" DIA.	24" DIA.	30" DIA.	24" DIA.	30" DIA.		CANTILEVER	BUTTERFLY	BRIDGE MOUNT ATTACHMENT	MAST ARM	SINGLE TAPERED TUBE		
151	431+85	R/OH	E1-3	21'-6" x 8'-6"	168		X																													X						
			E1-5p	10'-6" x 2'-6"	168		X																																				E 1-3
			E1-5p	9'-0" x 2'-6"	168		X																																				E 6-3
151	433+85	L/OH	E6-3	18'-0" x 8'-6"	168		X																															X						
151	215+42	L/S	R5-1	30" x 30"	Existing	X			1																																		
151	215+97	L/S	R5-1	30" x 30"	Existing	X			1																																		
152	216+98	R/S	E4-1a	10'-0" x 7'-6"	Existing		X								2	2																2		2									
152	220+09	L/S	E4-1a	11'-0" x 7'-6"	Existing		X								2	2																2		2									
152	220+35	R/S	M(I)3-4	24" x 12"	Existing	X			1																						1												
152	220+35	R/S	M1-1	24" x 24"	Existing	X																																					
152	220+35	R/S	M1-4	24" x 24"	Existing	X																																					
152	220+35	R/S	M1-5	24" x 24"	Existing	X																																					
152	220+35	R/S	M6-1L	21" x 15"	Existing	X																																					
152	220+35	R/S	R5-1	30" x 30"	Existing	X																																					
152	220+42	R/S	R5-1	30" x 30"	Existing	X			1																																		
152	220+97	C/M	OM1-3	18" x 18"	Existing	X																		1	1																		
152	221+07	R/S	R1-1	36" x 36"	Existing	X			1																						1												
152	221+07	R/S	R6-1R	36" x 12"	Existing	X																																					
152	221+07	R/S	R6-1R	36" x 12"	Existing	X																																					
152	221+07	R/S	R6-1L	36" x 12"	Existing	X																																					
152	221+11	R/S	R5-1	30" x 30"	Existing	X			1																																		

CENTERLINE LOCATION
L or LL - Left of Centerline
R or RR - Right of Centerline
C - On the Centerline

INSTALL POSITION
S - Shoulder Mount
O - Offset Mount
G - Gore Mount
M - Median Mount
OH - Overhead Mount

NOTE: See standard plan sheet TE590 for detailed specifications.

NO.	DATE	REVISIONS	BY	APP'D
02	10-01-19	Added Tapered Tube. Removed Couplers.	D.D.G.	E.W.N.
01	07-23-10	Added Coupler and Coupler/Footing Quantity	D.D.G.	D.B.

FHWA APPROVAL		10-01-19	APP'D.	Steven A. Buckley	
DESIGNED	D.D.G.	DETAILED	K.S.	QUANTITIES	TRACED D.B.
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN.CK.	TRACE CK.

TE430

07-01-03

Sh. No. 155

Plotted by : BGS01485 16-DEC-2025 12:39
File : 2511_ka680801pss430-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	156	253

SUMMARY OF QUANTITIES

SIGNS

TYPE	NUMBER	SQUARE FEET
FLAT SHEET		
REINFORCED PANEL	4	429.5
OVERLAY		

DELINEATORS

TYPE	FLEXIBLE DELINEATOR		RIGID DELINEATOR	
	TYPE I ANCHOR	TYPE III ANCHOR	"U" POST	BRACKET MOUNT
TYPE 'A' WHITE				
TYPE 'A' YELLOW				
TYPE 'B' WHITE				
TYPE 'B' YELLOW				
TYPE 'A' WHITE (BACK TO BACK)				
TYPE 'A' YELLOW (BACK TO BACK)				

OBJECT MARKERS

TYPE		NUMBER
TYPE 2 ("U" POST)		
TYPE 3 ("U" POST)		
INFORMATION ONLY	OM3-L	
	OM3-R	
	OM3-C	
TYPE 3 ("U" POST) (BACK TO BACK)		

POSTS AND ALUMINUM BEAMS

	4" x 6" POST			3I2.25 ALUMINUM BEAM	"U" POST		GALVANIZED STEEL BEAM POST						PERFORATED SQUARE STEEL TUBE (PSST)			
	WOOD		STEEL				W6x9		W10x12		W10x22					
	FLAT SHEET SIGN	REINFORCED PANEL SIGN	STRUCTURAL TUBING		2 LBS/FT	3 LBS/FT	A36 STEEL	A572 STEEL (ALT)	A36 STEEL	A572 STEEL (ALT)	A36 STEEL	A572 STEEL (ALT)	1-3/4"	2"	2-1/4"	2-1/2"
NUMBER	6						4	4						1		
FEET	100						68	68						8		

POST FOOTINGS AND BRACKETS

	CONCRETE FOOTING (DIA.)					PERFORATED SQUARE STEEL					
						TUBE FOOTING				BRACKET	
	WOOD	A36 STEEL		A572 STEEL (ALT)							
	18"	24"	30"	24"	30"	1-3/4"	2"	2-1/4"	2-1/2"	1-3/4"	2"
NUMBER	1	4		4			1				
FEET	3	24.0		24.0							

BASE PLATES AND STUB POSTS

	W6x9		W10x12		W10x22	
BREAKAWAY BASES	A36 STEEL	A572 STEEL (ALT)	A36 STEEL	A572 STEEL (ALT)	A36 STEEL	A572 STEEL (ALT)
BASE PLATE (TOP)	4	4				
STUB POST WITH BASE PLATE	4	4				
NON-BREAKAWAY BASES						
BASE PLATE						

REMOVALS

TYPE	NUMBER
SIGNS	17
POSTS	10
FOOTINGS	5
SIGN STRUCTURES	2

NUMBER & LENGTHS OF POSTS & ALUMINUM BEAMS (INFORMATION ONLY)

LENGTH OF POST OR BEAM	4" x 6" POST			3I2.25 ALUMINUM BEAM	"U" POST		GALVANIZED STEEL BEAM POST						PERFORATED SQUARE STEEL TUBE (PSST)			
	WOOD		STEEL				W6x9		W10x12		W10x22					
	FLAT SHEET SIGN	REINFORCED PANEL SIGN	STRUCTURAL TUBING		2 LBS/FT	3 LBS/FT	A36 STEEL	A572 STEEL (ALT)	A36 STEEL	A572 STEEL (ALT)	A36 STEEL	A572 STEEL (ALT)	1-3/4"	2"	2-1/4"	2-1/2"
2.1' - 4'																
4.1' - 6'																
6.1' - 8'														1		
8.1' - 10'																
10.1' - 12'																
12.1' - 14'																
14.1' - 16'	5						2	2								
16.1' - 18'							2	2								
18.1' - 20'	1															
20.1' - 22'																
22.1' - 24'																
24.1' - 26'																
26.1' - 28'																
28.1' - 30'																
30.1' - 32'																

SIGN STRUCTURES

TYPE	NEW	MODIFIED	REMOVE AND RESET	RESET
OVERHEAD STRUCTURE				
CANTILEVER STRUCTURE	2			
BUTTERFLY STRUCTURE				
BRIDGE MOUNT ATTACHMENT				
MAST ARM SIGN SUPPORT				
SINGLE TAPERED TUBE SIGN SUPPORT				

NO.	DATE	REVISIONS	BY	APP'D
02	10-01-19	Revised Tables	D.D.G.	E.W.N.
01	07-23-10	Revised Tables	D.D.G.	D.B.

KANSAS DEPARTMENT OF TRANSPORTATION

SUMMARY OF QUANTITIES FOR INSTALLATIONS AND REMOVALS

TE439 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.

Plotted by : BGS01485 16-DEC-2025 12:40
File : 2514_ka680801pss439-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	157	253

SUMMARY OF QUANTITIES

REMOVAL AND RESETTING OF SIGNS ON PROJECT

EXISTING PLAN STATION NUMBER	NEW PLAN STATION NUMBER	SIGN TYPE	SIGN SIZE
215+45	215+42	R5-1	30" x 30"
215+94	215+97	R5-1	30" x 30"
216+98	216+98	E4-1a	10'-0" x 7'-6"
220+09	220+09	E4-1a	11'-0" x 7'-6"
220+35	220+35	M(I)3-4	24" x 12"
220+35	220+35	M1-1	24" x 24"
220+35	220+35	M1-4	24" x 24"
220+35	220+35	M1-5	24" x 24"
220+35	220+35	M6-1L	21" x 15"
220+35	220+35	R5-1	30" x 30"
220+46	220+43	R5-1	30" x 30"
220+97	220+97	OM-1	18" x 18"
221+07	221+07	R1-1	36" x 36"
221+07	221+07	R6-1R	36" x 12"
221+07	221+07	R6-1R	36" x 12"
221+07	221+07	R6-1L	36" x 12"
221+07	221+11	R5-1	30" x 30"

EXISTING PLAN STATION NUMBER	NEW PLAN STATION NUMBER	SIGN TYPE	SIGN SIZE

EXISTING PLAN STATION NUMBER	NEW PLAN STATION NUMBER	SIGN TYPE	SIGN SIZE

EXISTING PLAN STATION NUMBER	NEW PLAN STATION NUMBER	SIGN TYPE	SIGN SIZE

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

SUMMARY OF QUANTITIES FOR REMOVAL AND RESETTING OF SIGNS

TE445 07-01-03

FHWA APPROVAL			07-22-03	APP'D.		Steven A. Buckley	
DESIGNED	D.D.G.	DETAILED	K.D.S.	QUANTITIES		TRACED	
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN.CK.		TRACE CK.	

KDOT Graphics Certified 12-11-2025

Sh. No. 157

KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 12:40
File : 2515_ka680801pss445-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	158	253

RECAPITULATION OF SIGNING & DELINEATION BID ITEMS

BID ITEMS	APPROXIMATE QUANTITIES		UNITS
SIGN (FLAT SHEET) (HIGH PERFORMANCE)			SQUARE FOOT
SIGN (REINFORCED PANEL) (HIGH PERFORMANCE)	429.50		SQUARE FOOT
SIGN (OVERLAY) (HIGH PERFORMANCE)			SQUARE FOOT
SIGN POST (4" x 6" WOOD) (FLAT SHEET SIGN)	100		LINEAR FOOT
SIGN POST (4" x 6" WOOD) (REINFORCED PANEL SIGN)			LINEAR FOOT
SIGN POST (2 LB/FT "U" STEEL)			LINEAR FOOT
SIGN POST (3 LB/FT "U" STEEL)			LINEAR FOOT
SIGN POST (1-3/4" PERFORATED SQUARE STEEL TUBE)			LINEAR FOOT
SIGN POST (2" PERFORATED SQUARE STEEL TUBE)	8		LINEAR FOOT
SIGN POST (2-1/4" PERFORATED SQUARE STEEL TUBE)			LINEAR FOOT
SIGN POST (2-1/2" PERFORATED SQUARE STEEL TUBE)			LINEAR FOOT
SIGN POST (4" X 6" STRUCTURAL STEEL)			LINEAR FOOT
SIGN POST (3 I 2.25 ALUMINUM)			LINEAR FOOT
	A36	A572(ALT)	
SIGN POST (W6X9 STEEL BEAM)	68	68	LINEAR FOOT
SIGN POST (W10X12 STEEL BEAM)			LINEAR FOOT
SIGN POST (W10X22 STEEL BEAM)			LINEAR FOOT
SIGN POST STUB WITH BREAKAWAY BASE PLATE (W6X9)	4	4	EACH
SIGN POST STUB WITH BREAKAWAY BASE PLATE (W10X12)			EACH
SIGN POST STUB WITH BREAKAWAY BASE PLATE (W10X22)			EACH
SIGN POST BREAKAWAY BASE PLATE (W6X9)	4	4	EACH
SIGN POST BREAKAWAY BASE PLATE (W10X12)			EACH
SIGN POST BREAKAWAY BASE PLATE (W10X22)			EACH
SIGN POST FOOTING (24" Dia. CONCRETE)(STEEL BEAM POST)	24.0	24.0	LINEAR FOOT
SIGN POST FOOTING (30" Dia. CONCRETE)(STEEL BEAM POST)			LINEAR FOOT
SIGN POST FOOTING (18" Dia. CONCRETE)(WOOD POST)	3.0		LINEAR FOOT
SIGN POST FOOTING (1-3/4" PERFORATED SQUARE STEEL TUBE)			EACH
SIGN POST FOOTING (2" PERFORATED SQUARE STEEL TUBE)	1		EACH
SIGN POST FOOTING (2-1/4" PERFORATED SQUARE STEEL TUBE)			EACH
SIGN POST FOOTING (2-1/2" PERFORATED SQUARE STEEL TUBE)			EACH
SIGNING OBJECT MARKER (TYPE 2)			EACH
SIGNING OBJECT MARKER (TYPE 3)			EACH
SIGNING DELINEATOR (TYPE A)(WHITE RIGID, "U" POST)			EACH
SIGNING DELINEATOR (TYPE A)(YELLOW RIGID, "U" POST)			EACH
SIGNING DELINEATOR (TYPE B)(WHITE RIGID, "U" POST)			EACH
SIGNING DELINEATOR (TYPE B)(YELLOW RIGID, "U" POST)			EACH
SIGNING DELINEATOR (TYPE A)(WHITE FLEXIBLE)(TYPE I ANCHOR)			EACH
SIGNING DELINEATOR (TYPE A)(YELLOW FLEXIBLE)(TYPE I ANCHOR)			EACH
SIGNING DELINEATOR (TYPE B)(WHITE FLEXIBLE)(TYPE I ANCHOR)			EACH
SIGNING DELINEATOR (TYPE B)(YELLOW FLEXIBLE)(TYPE I ANCHOR)			EACH
SIGNING DELINEATOR (TYPE A)(WHITE FLEXIBLE)(TYPE 3 ANCHOR)			EACH
SIGNING DELINEATOR (TYPE A)(YELLOW FLEXIBLE)(TYPE 3 ANCHOR)			EACH
SIGNING DELINEATOR (TYPE B)(WHITE FLEXIBLE)(TYPE 3 ANCHOR)			EACH
SIGNING DELINEATOR (TYPE B)(YELLOW FLEXIBLE)(TYPE 3 ANCHOR)			EACH

BID ITEMS	APPROXIMATE QUANTITIES	UNITS
CANTILEVER SIGN STRUCTURE (35.1' - 40.0') (STEEL)	2	EACH
SIGN (REMOVE AND RESET)	LUMP SUM	LSUM

Note:
The contract bid for steel beam posts, stub posts, base plates, and footings will be based on A36 Grade steel quantities. When furnishing the A572 Grade alternate steel, the payment will be based on the equivalent A36 steel unit prices in the contract.

NO.	DATE	REVISIONS	BY	APP'D
02	10-01-19	Removed PSST coupler and changed the tables	D.D.G.	E.W.N.
01	07-23-10	Changed Bid Items as per Spec Book (2007)	D.D.G.	D.B.

KANSAS DEPARTMENT OF TRANSPORTATION

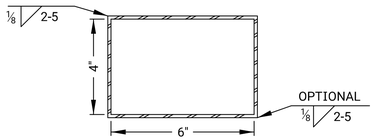
RECAPITULATION OF SIGNING & DELINEATION BID ITEMS

TE450 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.

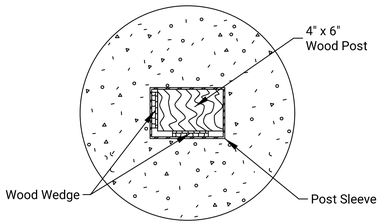
Plotted by : BGS01485 16-DEC-2025 12:40
File : 2516_ka680801pss450-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	159	253

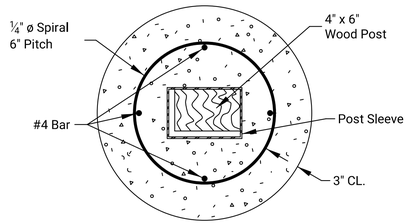


NOTE: Dimensions are to inside of post sleeve.

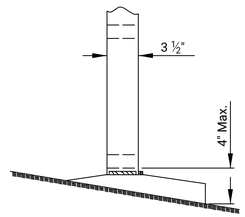
POST SLEEVE



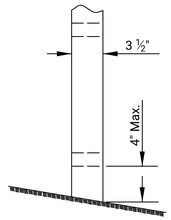
SECTION A-A



SECTION B-B



FRONT ELEVATION
CONCRETE FOOTING



FRONT ELEVATION
SOIL

NOTE TO THE ENGINEER:
The intent of the "AASHTO Roadside Design Guide" and these plans is to have a 4" or less projection above the finished ground line after impact.

BREAKAWAY CLEARANCE

GENERAL NOTES

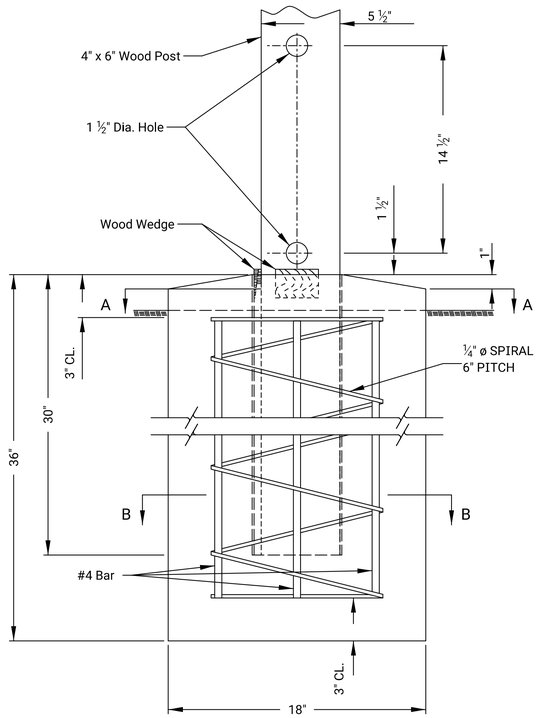
The post sleeve shall be formed from 10 gauge sheet steel to meet the requirements of ASTM A653 and zinc coated to meet the requirements of coating designation A123. If galvanized sheet steel is used, no other galvanization is required. It is permissible to close the bottom of the sleeve with a metal plate. Basis of acceptance shall be visual inspection of the finished sleeve and determination of zinc thickness by magnetic gage.

All sign mounting holes in the wood posts shall be drilled prior to treating.

Breakaway holes, field drilled sign mounting holes, and field cuts shall be treated in accordance with the preservative treatment specifications.

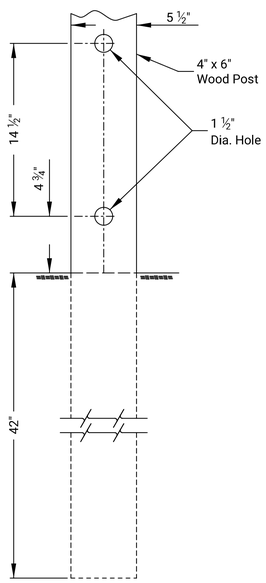
Prior to sealing the opening between the wood post and the top of the concrete footing, secure the post by placing 3" wide by 2" long wood wedges into the opening on two adjacent sides of the post. The wedges are be flush with up to a maximum of ⅜" sticking up above the top of the footing.

Commercial grade concrete may be substituted for sign support footings.



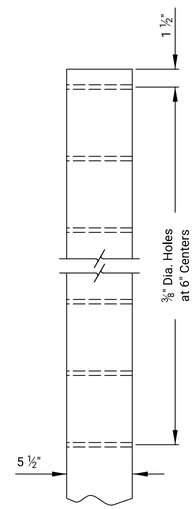
SIDE ELEVATION

WOOD POST IN CONCRETE FOOTING



SIDE ELEVATION

WOOD POST IN SOIL



SIGN POST

SIGN MOUNTING HOLES

All dimensions in inches unless otherwise noted.

NO.	DATE	REVISIONS	BY	APP'D
01	10-01-19	Change details and note	D.D.G.	E.W.N.

KANSAS DEPARTMENT OF TRANSPORTATION

DETAILS FOR WOOD POSTS

TE460 07-01-03

FHWA APPROVAL			10-01-19	APP'D.		Steven A. Buckley	
DESIGNED	D.D.G.	DETAILED	A.A.D.	QUANTITIES		TRACED	
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN.CK.		TRACE CK.	

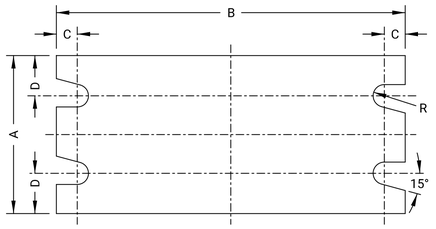
KDOT Graphics Certified 05-16-2025

Sh. No. 159

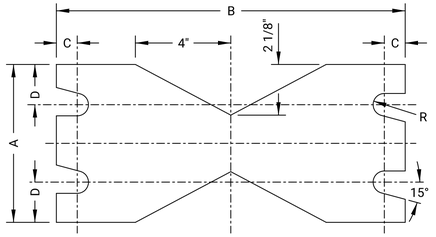
KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 12:41
File : 2517_ka680801pss460-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	160	253

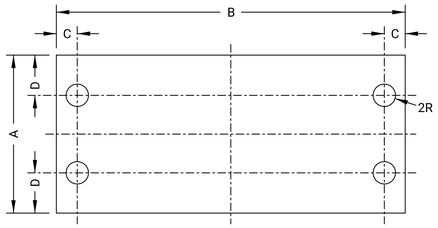


W6 X 9 and W10 X 12 POSTS

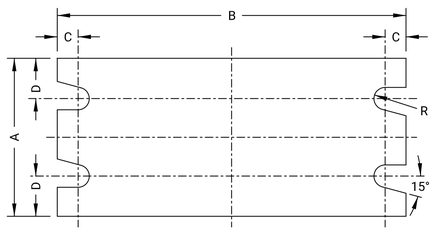


W10 X 22 POSTS

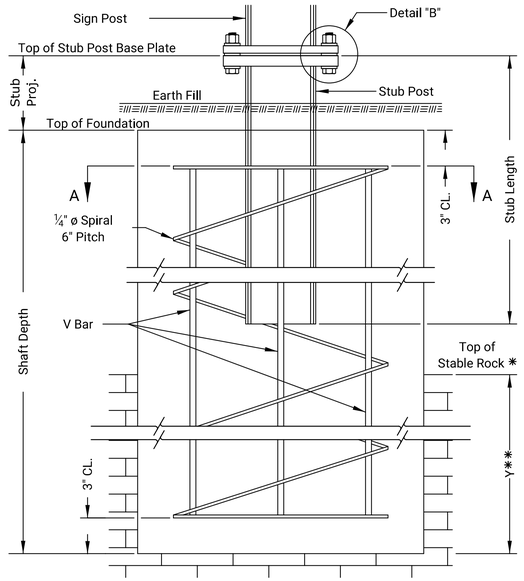
SIGN POST BASE PLATE



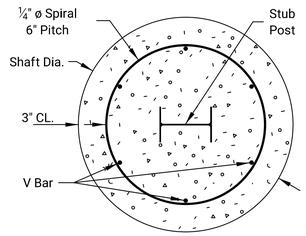
BOLT RETAINER PLATE



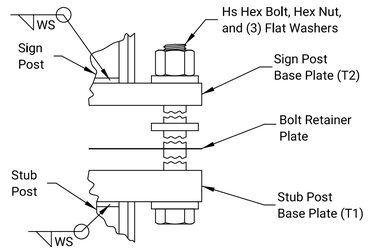
STUB POST BASE PLATE



SIDE ELEVATION



SECTION A-A



DETAIL "B"

GENERAL NOTES

All structural steel shall conform to ASTM A36 or A572 Grade 50. Alternates using ASTM A588 or A242 Grade 50 or other approved steels may be substituted for ASTM A572 steel. All structural steel shall be galvanized in accordance with ASTM A123 after fabrication.

All high strength bolts, nuts, and washers shall conform to ASTM A325 and shall be coated in accordance with the coating specifications.

The bolt retainer plate is to be 30 gauge sheet steel and galvanized in accordance with ASTM 123 after fabrication. If galvanized sheet steel is used, no other galvanization is required.

Commercial grade concrete may be substituted for sign support footings.

PROCEDURE FOR ASSEMBLY OF BASE CONNECTION

1. Assemble sign post base plate to stub post base plate with bolts, nuts, washers, and bolt retainer plate. Washers are to be installed on top of the sign post base plate, bottom of the stub post base plate, and between the sign post base plate and bolt retainer plate for each bolt.
2. Plumb post by varying thickness of washers between sign post base plate and bolt retainer plate.
   NOTE: no washers or shims are to be placed between the bolt retainer plate and stub post base plate.
3. Tighten all bolts the maximum possible with a 12 to 15 inch wrench to bed washers and shims and to clean bolt threads. Loosen each bolt in turn and retighten in a systematic order to the prescribed torque (see table). Do not over tighten.
4. Burr threads at junction with nut using a center punch to prevent nut loosening.

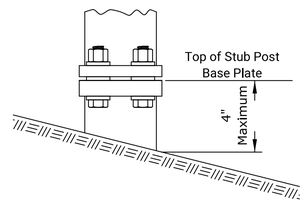
NOTE:
The plates shown are for right shoulder or gore installations. The plate slot bevels are to be reversed for left shoulder installations.
The sign post and stub post are to be centered on base plates.

BASE CONNECTION DATA TABLE										
POST SIZE	BOLT SIZE	TORQUE (IN. LBS.)	WS	T1	T2	A	B	C	D	R
W6 X 9	⅝" X 3"	345	¼"	⅞"	⅝"	4 ⅝"	9 ⅝"	¾"	1 ¹⁄₁₆"	¹¹⁄₃₂"
W10 X 12	⅝" X 3 ¼"	345	¼"	1"	¾"	4 ⅝"	13 ⅝"	¾"	1 ¹⁄₁₆"	¹¹⁄₃₂"
W10 X 22	⅞" X 4"	640	⅜"	1 ⅜"	1"	6 ⅝"	14 ⅝"	⅞"	1 ¹¹⁄₁₆"	¹⁵⁄₃₂"

T1: Stub Post Base Plate Thickness
T2: Sign Post Base Plate Thickness

FOUNDATION DATA TABLE								
POST SIZE	STUB LENGTH	STUB PROJ.	SHAFT DIA.	SHAFT DEPTH			V BAR	
				A36	A572 ALT	Y**	NO.	SIZE
W6 X 9	2'-6"	6 ¼"	2'-0"	6'-0"	6'-0"	3'-6"	6	#4
W10 X 12	2'-9"	6 ¼"	2'-0"	8'-0"	8'-0"	4'-0"	5	#6
W10 X 22	3'-3"	7"	2'-6"	11'-0"	12'-0"	5'-6"	13	#6

* As determined by Engineer.
** When stable rock is encountered, while drilling the shaft for the concrete foundation, extend the shaft into the stable rock the distance "Y". The total shaft depth shall not exceed that given for the corresponding post size and steel type.



FRONT ELEVATION

NOTE TO THE ENGINEER:
The intent of the "AASHTO Roadside Design Guide" and these plans is to have a 4" or less projection above the finished ground line after impact.

All dimensions are in inches, unless otherwise noted.

NO.	DATE	REVISIONS	BY	APP'D
01	10-01-19	Removed S3x5.7 post and revised notes	D.D.G.	E.W.N.

KANSAS DEPARTMENT OF TRANSPORTATION

DETAILS FOR STEEL BEAM BREAKAWAY POSTS SHEET 1 OF 2

TE463 07-01-03

FHWA APPROVAL		10-01-19	APP'D.	Steven A. Buckley	
DESIGNED	D.D.G.	DETAILED	A.A.N.	QUANTITIES	TRACED
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN.CK.	TRACE CK.

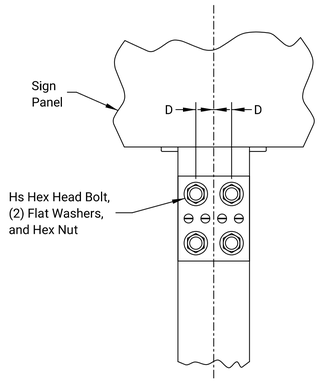
KDOT Graphics Certified 05-16-2025

Sh. No. 160

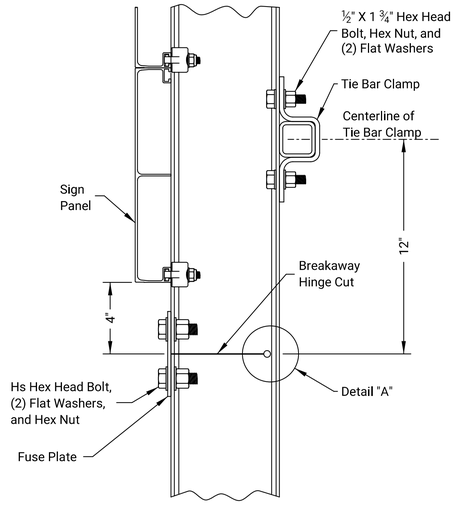
KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 12:41
File : 2518_ka6808001pss463-01.dgn

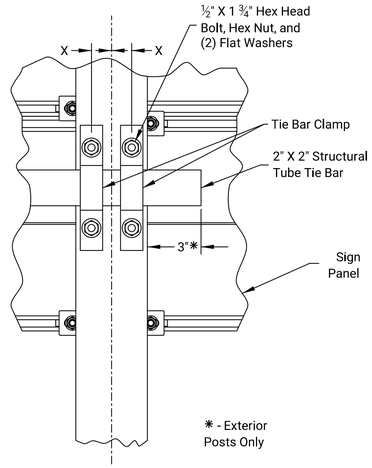
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	161	253



FRONT ELEVATION

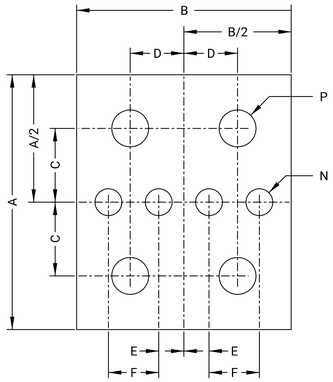


SIDE ELEVATION

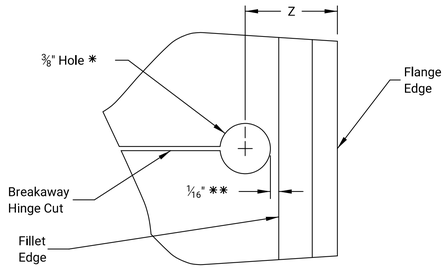


REAR ELEVATION

BREAKAWAY HINGE AND STRUCTURAL TUBE TIE BAR INSTALLATION



FUSE PLATE



* - Hole To Be Drilled Prior To Cutting Web
** - Edge Of Hole To Fillet

DETAIL "A"

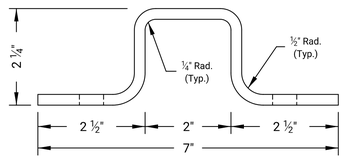
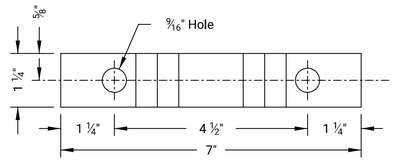


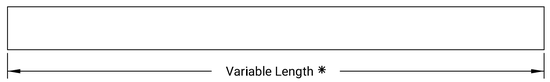
Plate Thickness: ¼"



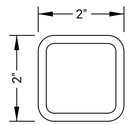
TIE BAR CLAMP

FUSE DATA TABLE												
POST SIZE	BOLT SIZE	A	B	C	D	E	F	N	P	T3	X	Z
W 6 X 9	⅝" X 1 ¾"	4 ¾"	4"	1 ⅜"	1"	15/32"	15/16"	½"	11/16"	⅜"	1 ⅛"	13/16"
W 10 X 12	¾" X 2"	4 ¾"	4"	1 ⅜"	1"	15/32"	15/16"	15/32"	13/16"	¼"	1 ⅛"	⅞"
W 10 X 22	1" X 2 ½"	6"	5 ¾"	1 ½"	1 ⅜"	11/16"	1 ⅜"	21/32"	1 1/16"	5/16"	1 ⅜"	1"

Dimensions "N" And "P" are Hole Diameters.
Dimension "T3" is the Fuse Plate Thickness.
Dimension "Z" is to the Center of the Hole.



* - Minimum Length:
W6x9: 8'-10"
W10x12: 8'-10"
W10x22: 8'-11 ¾"



Wall Thickness: 3/16"

STRUCTURAL TUBE TIE BAR

GENERAL NOTES

Fuse plate steel shall conform to ASTM A36 (no substitutes will be allowed). All other structural steel shall conform to ASTM A36 or A572 Grade 345. Alternates using ASTM A588 or A242 Grade 345 or other approved steels may be substituted for ASTM 572 steel. All structural steel shall be galvanized in accordance with ASTM A123 after fabrication.

All high strength bolts, nuts, and washers shall conform to ASTM A325 and shall be coated in accordnce with the coating specifications.

The fuse plate shall be centered on the saw cut and the steel post.

It is permissible to close the ends of the structural tubing tie bar with a steel plate.

All dimensions are in inches, unless otherwise noted.

NO.	DATE	REVISIONS	BY	APP'D
01	10-01-19	Removed S3x5.7 posts and revised notes.	D.D.G.	E.W.N.

KANSAS DEPARTMENT OF TRANSPORTATION

DETAILS FOR STEEL BEAM BREAKAWAY POSTS SHEET 2 OF 2

TE464 07-01-03

FHWA APPROVAL		10-01-19	APP'D.	Steven A. Buckley	
DESIGNED	D.D.G.	DETAILED	A.A.D.	QUANTITIES	TRACED
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN.CK.	TRACE CK.

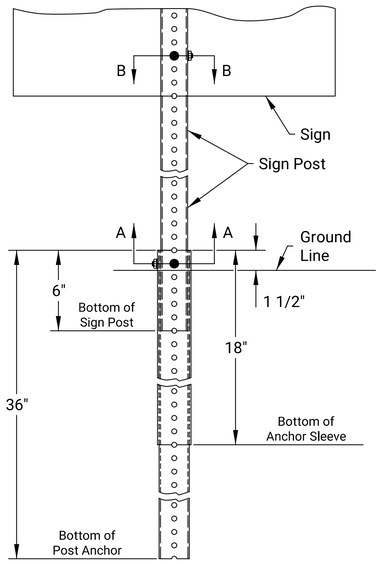
KDOT Graphics Certified 05-16-2025

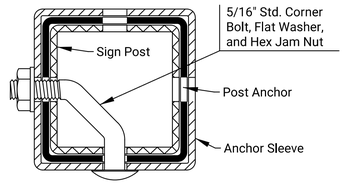
Sh. No. 161

KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 12:41
File : 2519_ka680801pss464-01.dgn

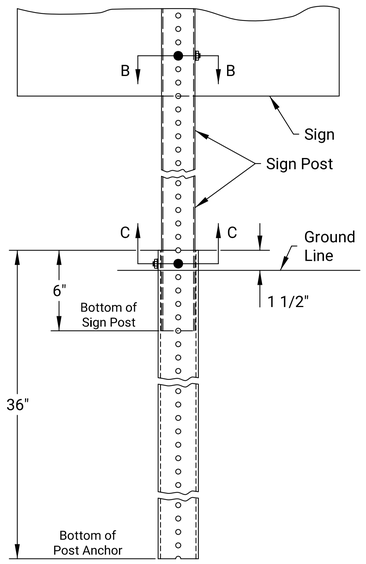
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	162	253

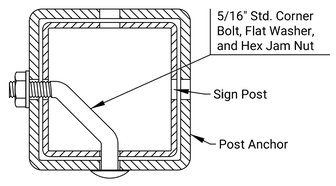




SECTION A-A

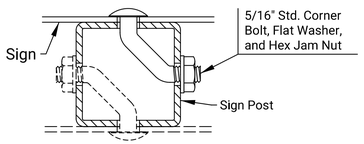
1 ¾", 2", OR 2 ¼" PSST SIGN POST





SECTION C-C

2 ½" PSST SIGN POST



SECTION B-B

MATERIALS TABLE FOR SIGN POST AND FOOTING		
SIGN POST 12 GA. OR 14 GA.	FOOTING	
	POST ANCHOR	ANCHOR SLEEVE
1 ¾" X 1 ¾"	2" X 2" X 12 GA.	2 ¼" X 2 ¼" X 12 GA.
2" X 2"	2 ¼" X 2 ¼" X 12 GA.	2 ½" X 2 ½" X 12 GA.
2 ¼" X 2 ¼"	2 ½" X 2 ½" X 12 GA.	3" X 3" X 7 GA.
2 ½" X 2 ½"	3" X 3" X 7 GA.	Not Required

NOTE: 14 ga. posts must meet a certified minimum yield strength of 60,000 p.s.i.

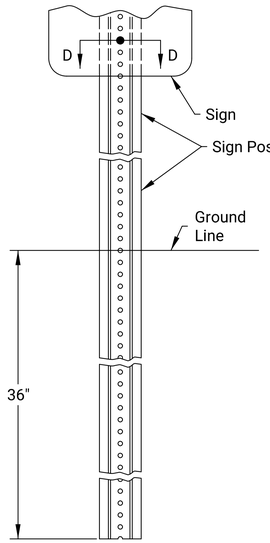
INSTALLATION PROCEDURES

1. Plumb and drive post anchor into the ground 18", if anchor sleeve is required, or to the specified height above the ground line.

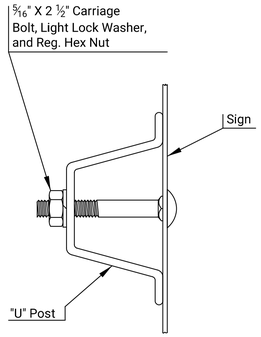
2. Install anchor sleeve (if required) on the post anchor and align the first holes above the ground line. Plumb and drive post anchor with anchor sleeve into the ground to the specified height above the ground line.

3. Install sign post into the post anchor.

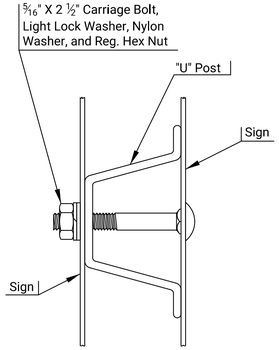
PERFORATED SQUARE STEEL TUBE POST (PSST)



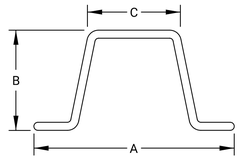
TYPICAL



SECTION D-D
(TYPICAL)



SECTION D-D
(BACK TO BACK)



DIM.	2 LBS/FT	3 LBS/FT
A	3 1/8 "	3 1/2 "
B	1 17/32 "	1 3/4 "
C	1 1/4 "	1 5/8 "

(Dimensions are nominal)

"U" POST

STEEL "U" POST

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

DETAILS FOR PERFORATED SQUARE STEEL TUBE POSTS (PSST) AND STEEL "U" POSTS

TE466 10-01-19

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

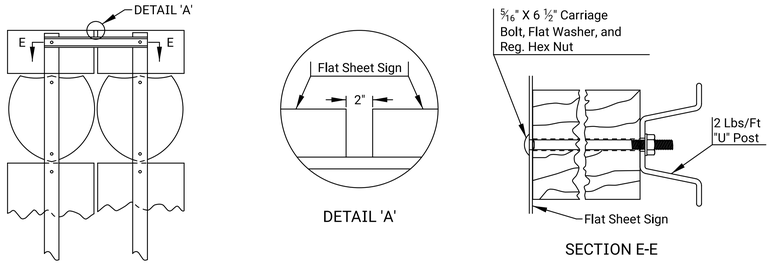
KDOT Graphics Certified 05-29-2025

Sh. No. 162

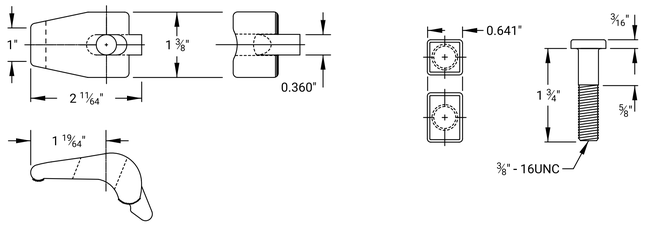
KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 12:42
File : 2520_ka680801pss466.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	163	253



ROUTE MARKER ASSEMBLIES ATTACHMENT



ALUMINUM POST CLIP AND POST CLIP BOLT

NOTES:

The top of the post shall not extend above the top of the sign.

When signs are mounted back to back, the signs shall be mounted at their prescribed height. In general installations, the bottom holes of the signs should be aligned. In order to prevent having to drill holes in the signs or posts, the sign on the back should be raised and positioned such that the holes are aligned.

The primary sign and supplemental sign are to be mounted at their prescribed height, but under no circumstances shall the signs overlap each other. If the primary sign cannot be mounted without overlapping, then it shall be raised above the supplemental sign.

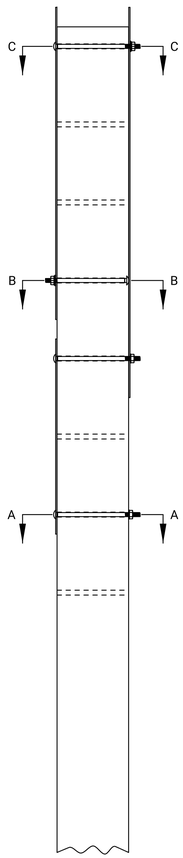
Any additional mounting holes, either through the sign or post, shall be drilled by the contractor. All holes drilled in the post shall be treated with a perservative. All holes drilled in the sign shall be free of any defects and the sheeting around the hole shall not be damaged.

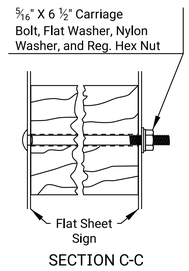
A nylon washer shall be placed against the sheeting when a nut is to be tightened against the sign face.

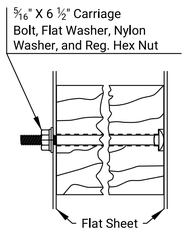
The 3 lb/ft steel "U" post used for reinforced panel sign installations is to be included in the bid item 'SIGN POST (4" x 6" WOOD) (REINFORCED PANEL SIGN)'.

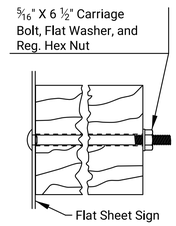
When the 2 lb/ft steel "U" post is used for the route marker assemblies attachment, it shall be subsidiary to the bid item 'SIGN POST (4" x 6" WOOD) (FLAT SHEET SIGN)'.

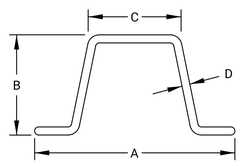
The aluminum post clip bolt may have a rectangular head if the smaller dimension is equal to the square head dimension.









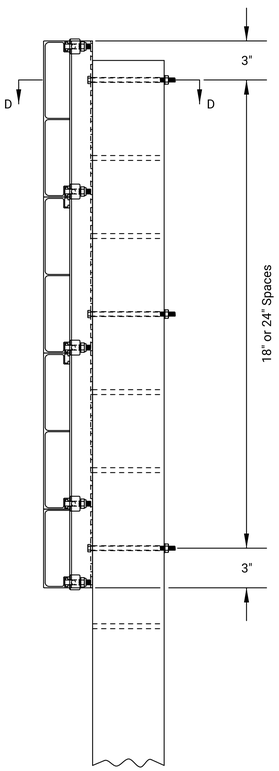


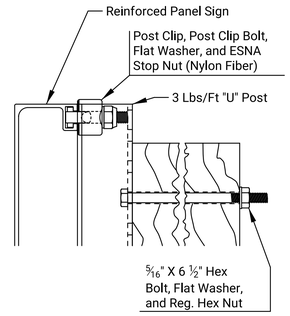
DIM.	2 LBS/FT	3 LBS/FT
A	3 1/8 "	3 1/2 "
B	1 17/32 "	1 3/4 "
C	1 1/4 "	1 5/8 "
D	1/8 "	9/64 "

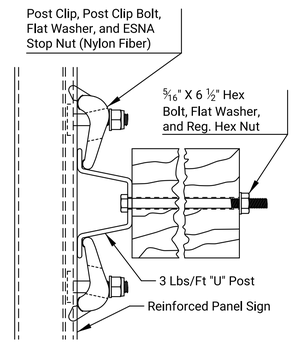
(DIMENSIONS ARE NOMINAL)

"U" POST

TYPICAL MOUNTING OF FLAT SHEET SIGNS







TYPICAL MOUNTING OF REINFORCED PANEL SIGNS

All dimensions are in inches

NO.	DATE	REVISIONS	BY	APP'D
02	09-16-25	Removed note - mounting back to back signs	D.D.G.	N.T.J.
01	10-01-19	Revised drawings and notes	D.D.G.	E.W.N.

KANSAS DEPARTMENT OF TRANSPORTATION

DETAILS FOR MOUNTING SIGNS ON WOOD POST FLAT SHEET AND REINFORCED PANEL

~~TE481~~ 07-01-03

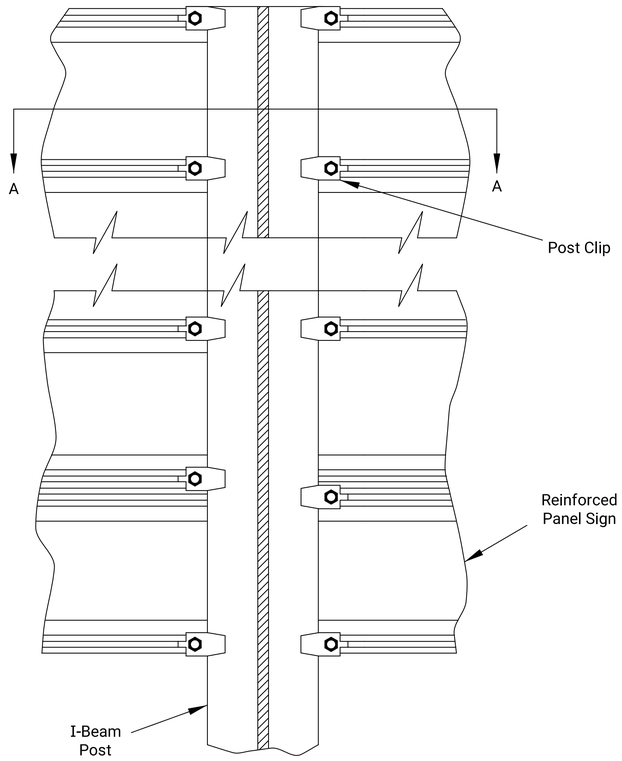
FHWA APPROVAL			10-01-19	APP'D.	Steven A. Buckley
DESIGNED	D.D.G.	DETAILED	A.A.D.	QUANTITIES	TRACED
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 09-16-2025 Sh. No. 163

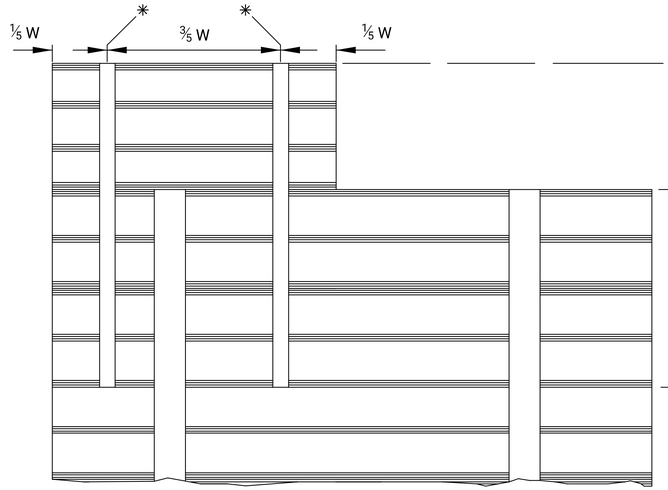
KDOT Graphics Certified

Plotted by : jpoitevint@gbateam.com 16-SEP-2025 19:17
File : te481.dgn

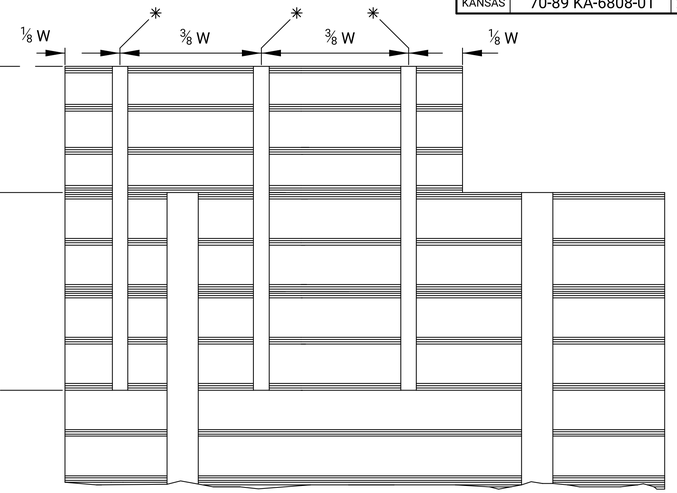
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	164	253



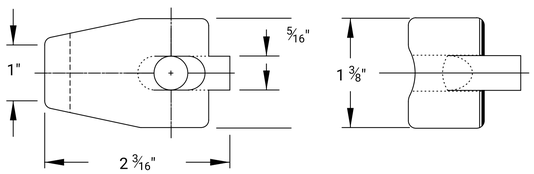
MOUNTING OF REINFORCED
PANELS TO I-BEAM POST

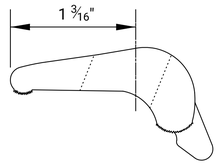


E1-5 MOUNTING FROM RIGHT EXIT
(2 I-BEAMS)

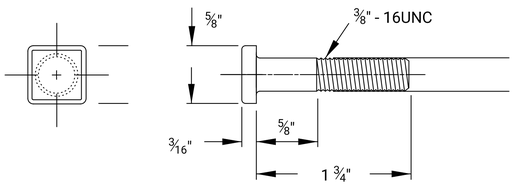


E1-5 MOUNTING FROM RIGHT EXIT
(3 I-BEAMS)

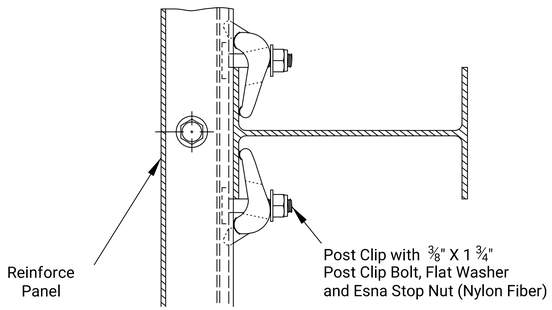




POST CLIP
ALUMINUM



POST CLIP BOLT
ALUMINUM



SECTION A-A

NOTES:
* - Centerline of aluminum I-beam
H1 - height of added sign (E1-5)
H2 - H1 + 12" or to the bottom of the next stiffener
The E1-5 sign shall be positioned above the guide sign according to the direction of the exit:
Right exit - right edge of sign
Left exit - left edge of sign
Two exits (one left and one right) - center of sign
The aluminum I-beams are to be mounted at the spacings shown. If the I-beam spacing conflicts with the sign posts, then the I-beam is to be moved to the side of the sign post that more closely fits the spacings and as determined by the engineer.
The post clip bolt may have a rectangular head, if the smaller dimension is equal to the square head dimension.

All dimensions are in inches.

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

DETAILS FOR MOUNTING REINFORCED PANEL SIGN ON I-BEAM POST

TE490 07-01-03

FHWA APPROVAL			07-22-03	APP'D.	Steven A. Buckley		
DESIGNED	D.D.G.	DETAILED	B.A.H.	QUANTITIES	TRACED		
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN.CK.	TRACE CK.		

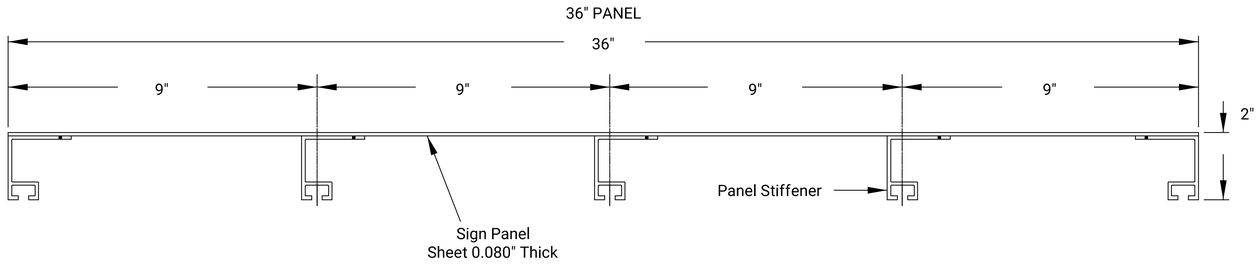
KDOT Graphics Certified 05-19-2025

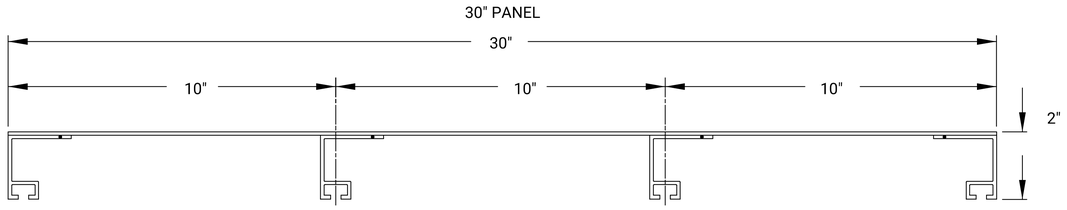
Sh. No. 164

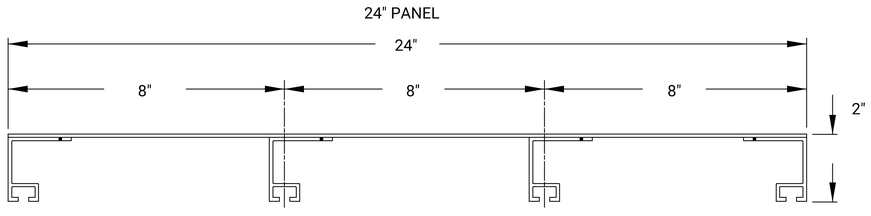
KDOT Graphics Certified

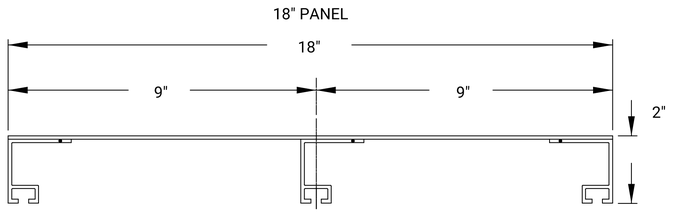
Plotted by : BGS01485 16-DEC-2025 12:42
File : 2522_ka6808001pss490-01.dgn

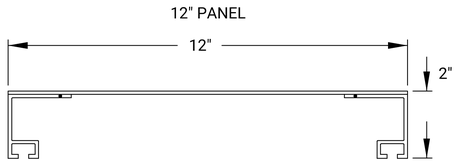
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	165	253



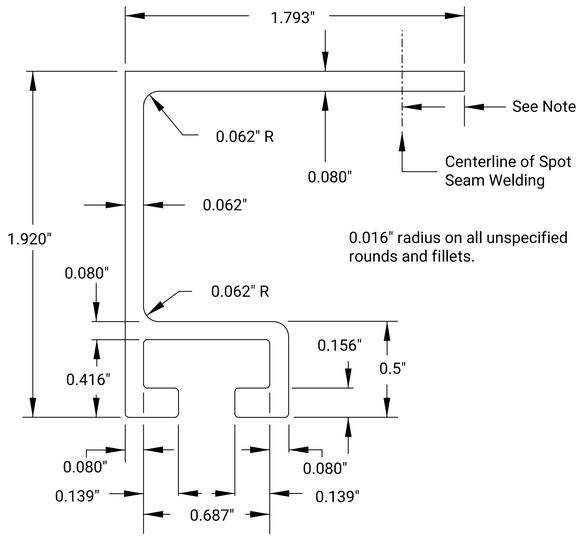




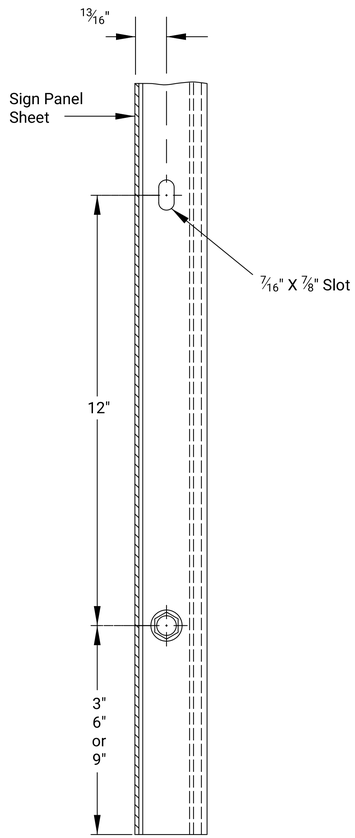




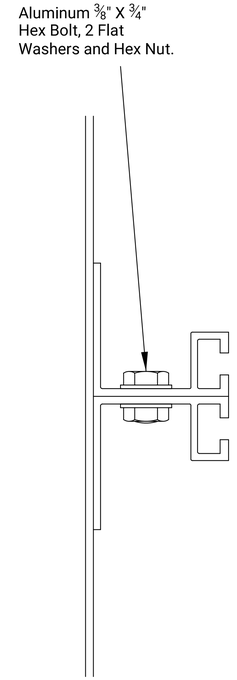
STRUCTURAL SIGN PANEL WIDTHS



PANEL STIFFENER



PANEL CONNECTOR SLOTS



PANEL CONNECTIONS

NOTE:
Sign panel stiffeners shall be attached to sign panel using intermittent seam welding with spot on 8" centers the length of the stiffener and a minimum of ½" from the edge of the stiffener.

All dimensions are in inches.

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

REINFORCED PANEL DETAILS
EXTRUSHEET FABRICATION

TE551 07-01-03

FHWA APPROVAL		07-22-03	APP'D.	Steven A. Buckley	
DESIGNED	D.D.G.	DETAILED	B.A.H.	QUANTITIES	TRACED
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 05-19-2025

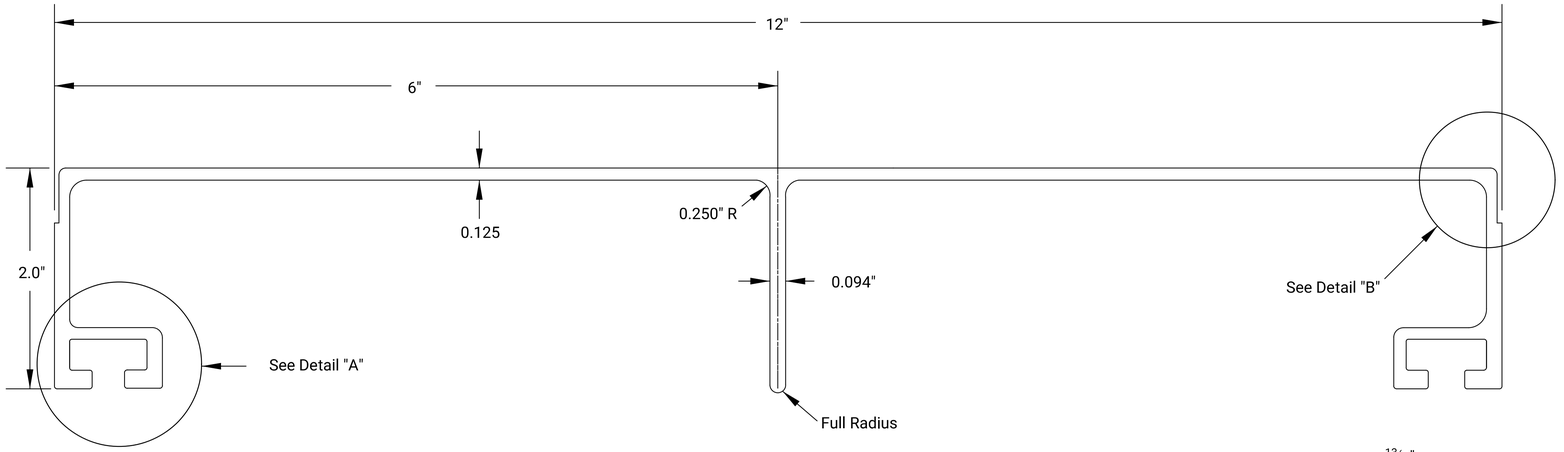
Sh. No. 165

KDOT Graphics Certified

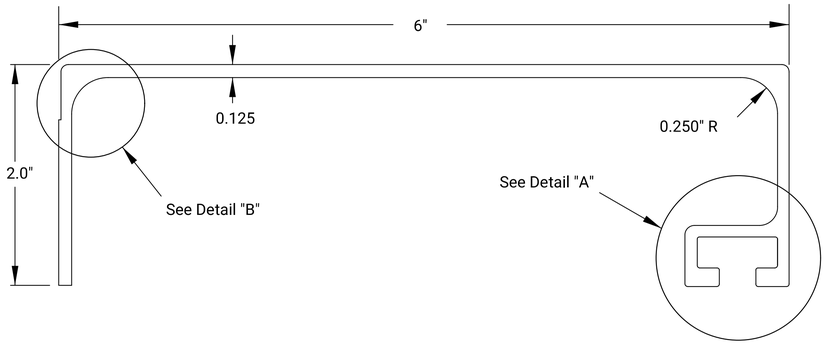
Plotted by : BGS01485 16-DEC-2025 12:42
File : 2528_ka680801pss551-01.dgn

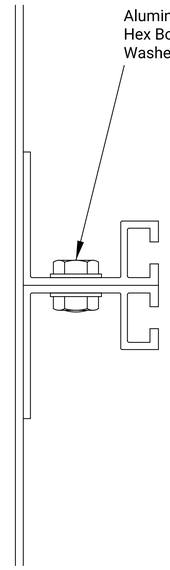
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	166	253

12" PANEL

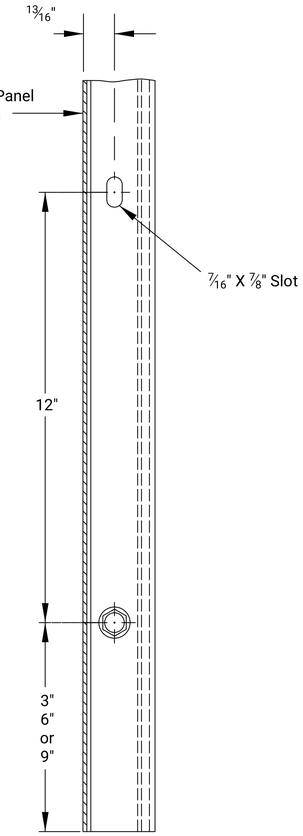


6" PANEL

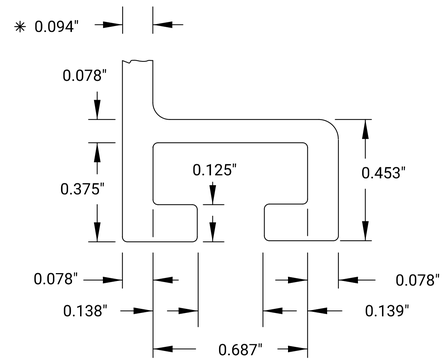




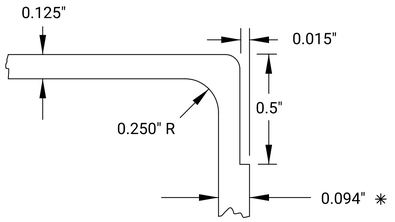
PANEL CONNECTIONS



PANEL CONNECTOR SLOTS



DETAIL "A"



DETAIL "B"

0.031" radius on all unspecified rounds and fillets.

✳ 0.078" for 6" panel

NOTE:
For extruded panel signs with an overall height in intervals of 6", use the 6" panel at the top or bottom of the sign. All other panels are to be the 12" panel.

All dimensions are in inches.

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

REINFORCED PANEL DETAILS EXTRUDED FABRICATION 0.125" 1 OF 2

TE554 07-01-03

FHWA APPROVAL			07-22-03	APP'D.	
DESIGNED	D.D.G.	DETAILED	B.A.H.	QUANTITIES	TRACED
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 05-19-2025

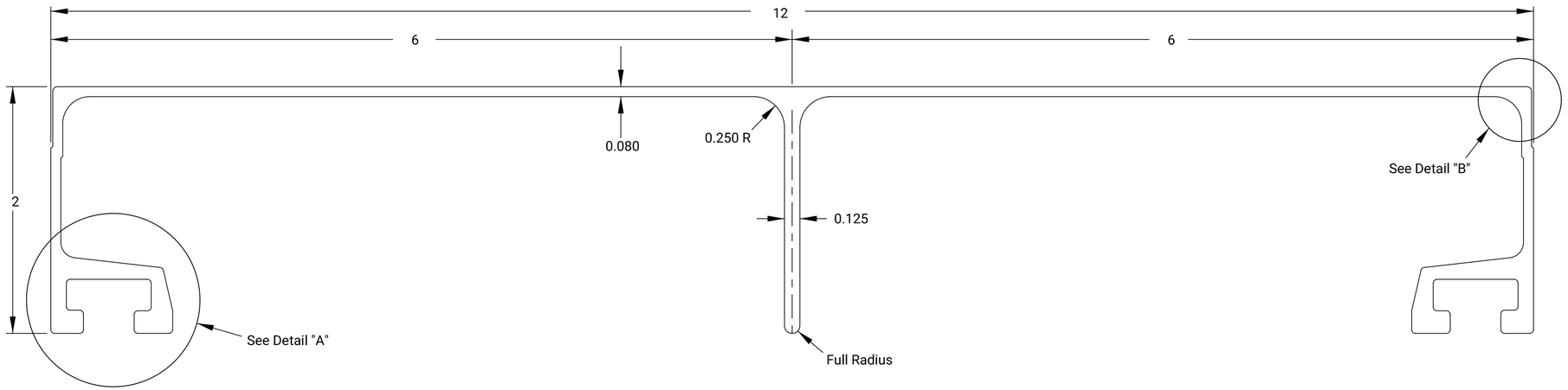
Sh. No. 166

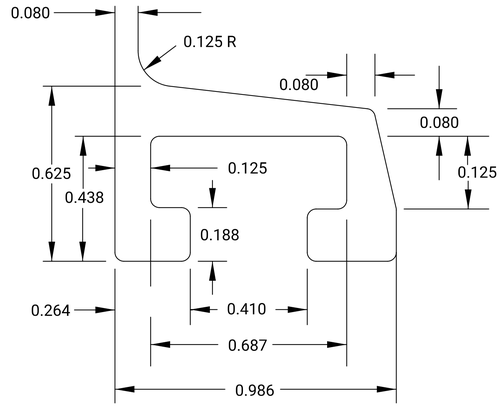
KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 12:43
File : 2529_ka680801pss554-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	167	253

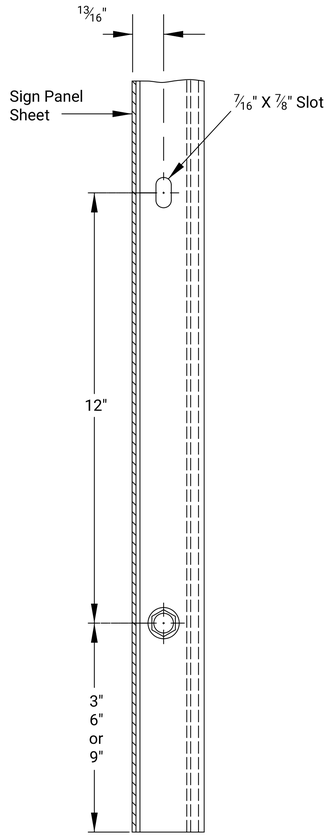
12" PANEL



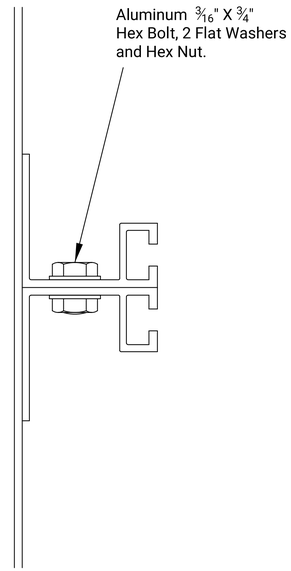


NOTE:
.016" radius on all unspecified rounds and fillets.

DETAIL "A"

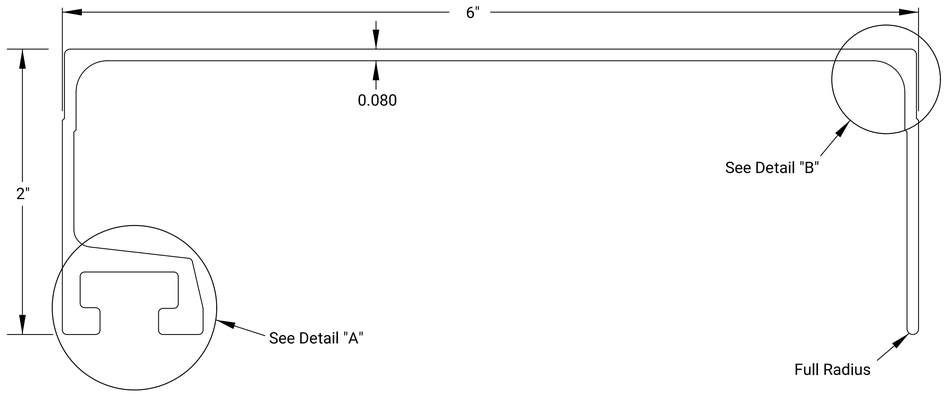


PANEL CONNECTOR SLOTS

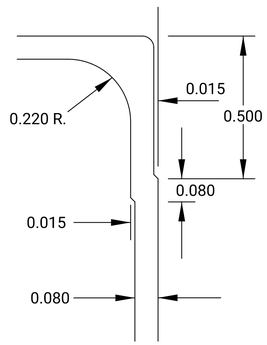


PANEL CONNECTIONS

6" PANEL



For extruded panel signs with an overall height in intervals of 6", use the 6" panel at the top or bottom of the sign. All other panels are to be the 12" panel.



DETAIL "B"

All dimensions in inches

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

REINFORCED PANEL DETAILS EXTRUDED FABRICATION .080" 2 OF 2

TE555 07-01-03

FHWA APPROVAL			07-22-03	APP'D.		Steven A. Buckley	
DESIGNED	D.D.G.	DETAILED	B.A.H.	QUANTITIES		TRACED	
DESIGN CK.	S.A.B.	DETAIL CK.	D.D.G.	QUAN.CK.		TRACE CK.	

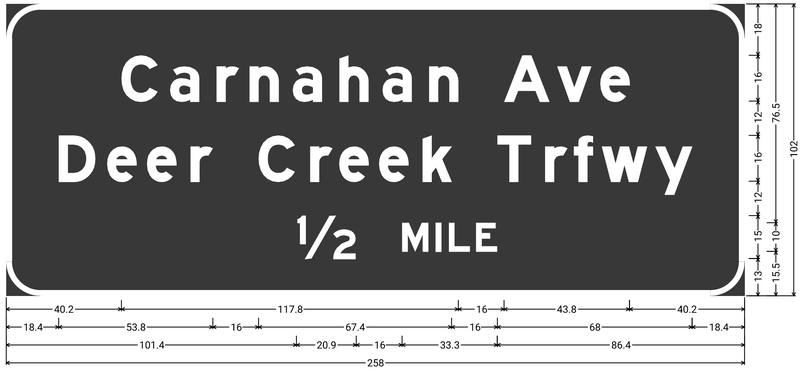
KDOT Graphics Certified 05-19-2025

Sh. No. 167

KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 12:43
File : 2530_ka6808801pss555-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	168	253



E1-3 Carnahan;
12.0" Radius, 2.0" Border, White on Green;
"Carnahan Ave", E Mod; "Deer Creek Trfwy", E Mod; " ½ MILE", E Mod;
Table of distances between letter and object lefts

| | | |

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	169	253

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 (Current version or any 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
03	09-16-25	Changed 2004 to current version	D.D.G.	N.T.J.
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

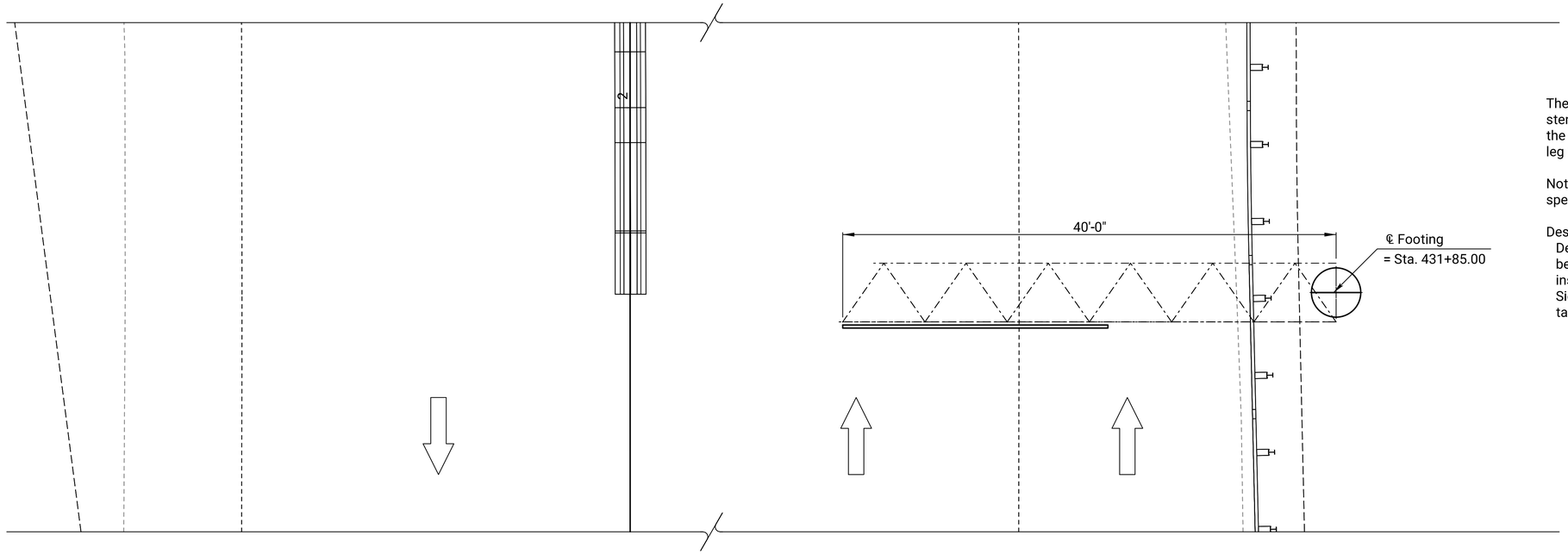
FHWA APPROVAL		10-01-19	APP'D.	Steven A. Buckley	
DESIGNED	D.D.G.	DETAILED K.D.S.	QUANTITIES	TRACED	
DESIGN CK.	S.A.B.	DETAIL CK. D.D.G.	QUAN.CK.	TRACE CK.	

KDOT Graphics Certified 09-16-2025 Sh. No. 169

KDOT Graphics Certified

Plotted by : jpoitevint@gbateam.com 16-SEP-2025 19:17
File : te590.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	170	253



PLAN

ELEVATION
Sta. 431+85.00
I-70 Eastbound

*Note: Use this point as a control point for all elevations.

Serial Number = 089S0195

The serial number shall be painted in black paint using three - inch stencils. The serial number will be painted so it is readable from the structure's assigned route at approximate eye level on the right leg (looking up station.)

Note: See "Cantilever Sign Structure Detail" sheets for sign specifications

Design Sign: This structure was designed using a Design Sign. The Design Sign is a relative maximum area of sign that is allowed to be installed. The Design Sign is horizontally centered on the installed sign and vertically centered on the Truss. The Design Sign area shall not be exceeded. See "Design Sign Specifications" table for Design Sign information.

Design Sign Specifications		
Length	Height	Area
21'-6"	11'-0"	237 sqft

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

I-70 EB — Sta. 431+85.00

Cantilever Type
Construction Layout

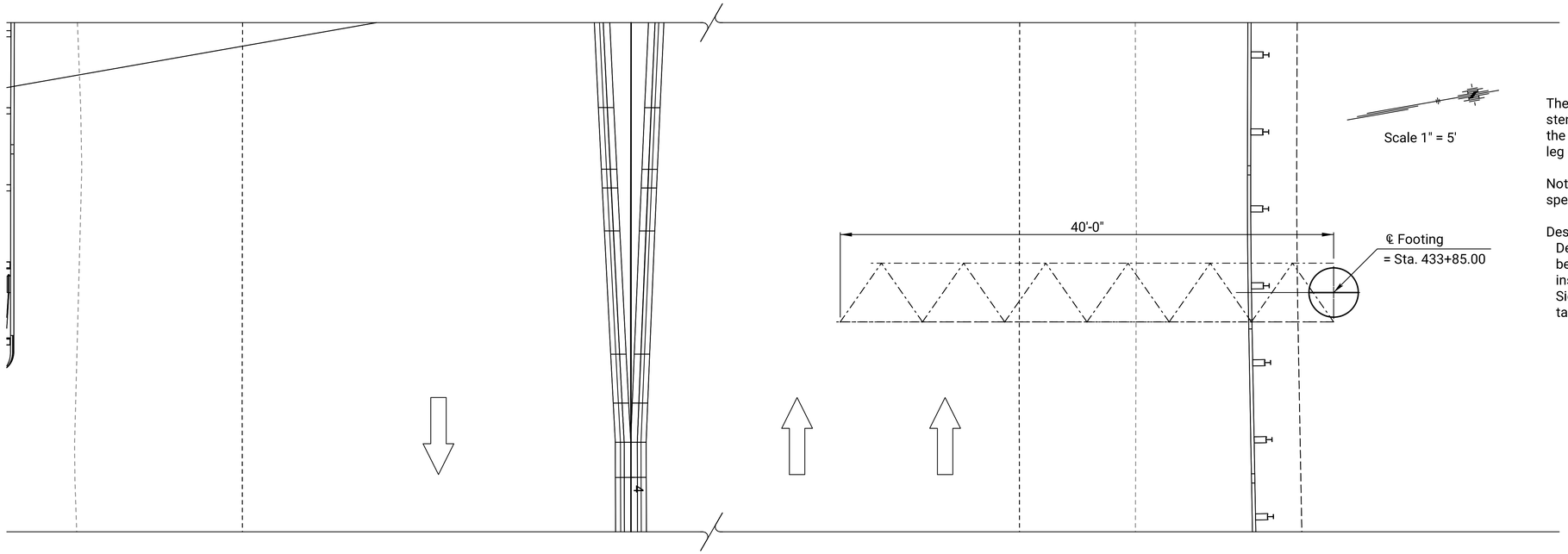
Proj. No. 70-89 KA-6808-01 — Shawnee Co.

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

Sheet No. 170

Plotted by : Andrew.Nickols@ks.gov 12-SEP-2025 15:56
File : 70-89 ka680801pos01-001.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	171	253



Scale 1" = 5'

Serial Number = 089S0194

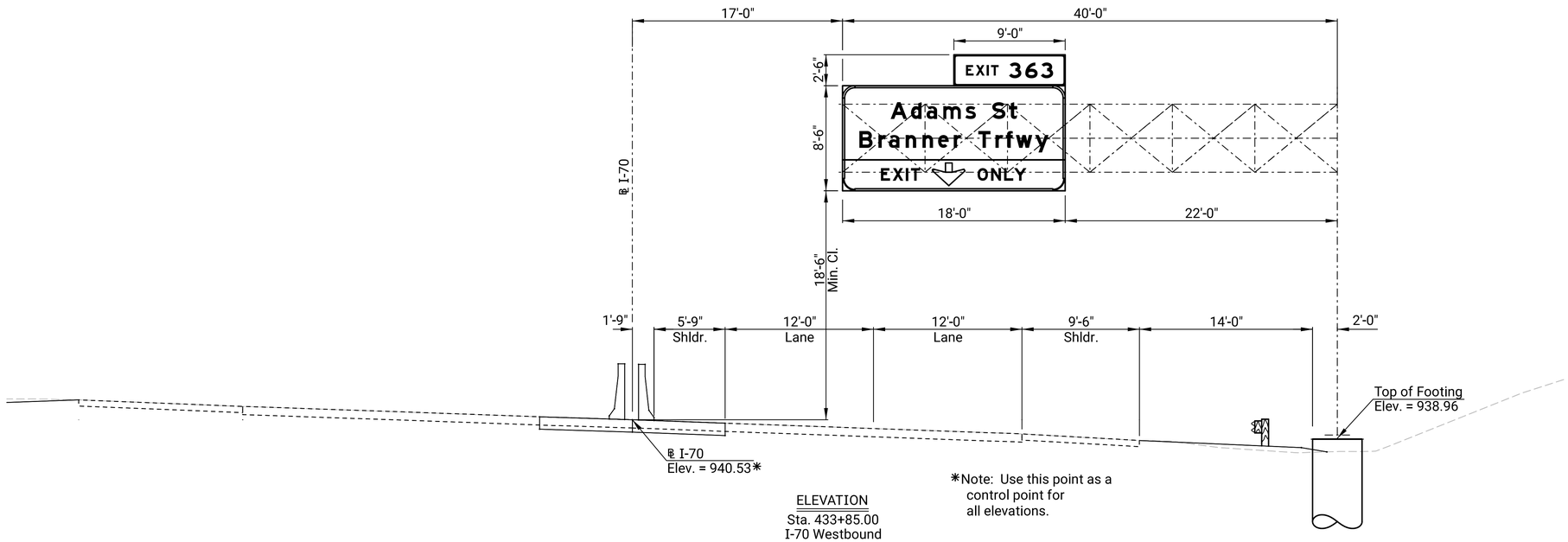
The serial number shall be painted in black paint using three - inch stencils. The serial number will be painted so it is readable from the structure's assigned route at approximate eye level on the right leg (looking up station.)

Note: See "Cantilever Sign Structure Detail" sheets for sign specifications

Design Sign: This structure was designed using a Design Sign. The Design Sign is a relative maximum area of sign that is allowed to be installed. The Design Sign is horizontally centered on the installed sign and vertically centered on the Truss. The Design Sign area shall not be exceeded. See "Design Sign Specifications" table for Design Sign information.

Design Sign Specifications		
Length	Height	Area
18'-0"	11'-0"	198 sqft

PLAN



ELEVATION
Sta. 433+85.00
I-70 Westbound

*Note: Use this point as a control point for all elevations.

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

I-70 WB — Sta. Sta. 433+85.00

Cantilever Type
Construction Layout

Proj. No. 70-89 KA-6808-01 — Shawnee Co.

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

Plotted by : Andrew.Nickols@ks.gov 12-SEP-2025 15:56
File : 70-89 ka6808001post03-001.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	172	253

NOTES:

1. Design according to AASHTO LRFD Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals' 1st edition with current interims. Alternate Designs are not allowed.

2. Submit shop drawings for all work. Include:
   a. Field verification of all upright heights.
   b. Foundation elevations necessary to ensure minimum vertical clearances as per traffic plans.
   c. Anchor bolt orientation with respect to centerline of truss and the direction of traffic.
   d. Chord Splices are not allowed.
   e. Upright Splices are not allowed.

3. Shop Fabrication, Assembly, Handling and Shipping:
   a. Do not begin fabrication before receiving shop drawing approval.
   b. Welding: Conform to American Welding Society Structural Welding Code (Steel) ANSI/AWS D1.1 (current edition).
   c. Shop assemble the entire structure after galvanizing and prior to shipment.
   d. If necessary, disassemble and secure components for shipment.

4. Sign Structure Materials:
   a. Upright and Chords (Steel Pipe): API-5L-X42, 42 ksi yield or ASTM A500, Grade B/C (min.).
   b. Steel Angles: ASTM A709, Grade 36.
   c. Steel Plates: ASTM A709, Grade36.
   d. DTI
      i. Anchor Bolt: ASTM F2437
      ii. Bolt: F959
   e. Weld Metal: E70XX.
   f. Bolts: ASTM A325 Type I, (install per Specification Section 712) (Turn of the Nut Method) with DTI washers and standard nuts.
   g. Anchor Bolts: ASTM F1554, Grade 55 with ASTM A563 Grade A heavy-hex double nuts and DTI washers.
   h. Install all nuts per manufacturer's instructions.
   i. Bolt hole diameters: equal to the bolt diameter plus $\frac{1}{16}$".
   j. Anchor bolt hole diameters: equal to the bolt diameter plus $\frac{1}{2}$".
   k. Use of split lock washers is not permitted.

5. Magnetic Particle Testing shall be performed prior to galvanization in accordance with KDOT Special Provision 15-07004-R02 and current AASHTO LRFD Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals.

   After galvanization, perform Magnetic Particle Testing of 100% of upright fillet welds.

6. Galvanization: Nuts, bolts and washers: ASTM F2329, Other steel items: ASTM A123

7. Sign Panels: Standard KDOT Panel Material. See Cantilever Truss Type Construction Layout Sheets and Roadway Plans for sizes and locations.

8. Foundation Materials:
   a. Reinforcing Steel: ASTM A615, Grade 60.
   b. Concrete: Grade 4.0 (AE) minimum 4.0 ksi compressive strength at 28-days.

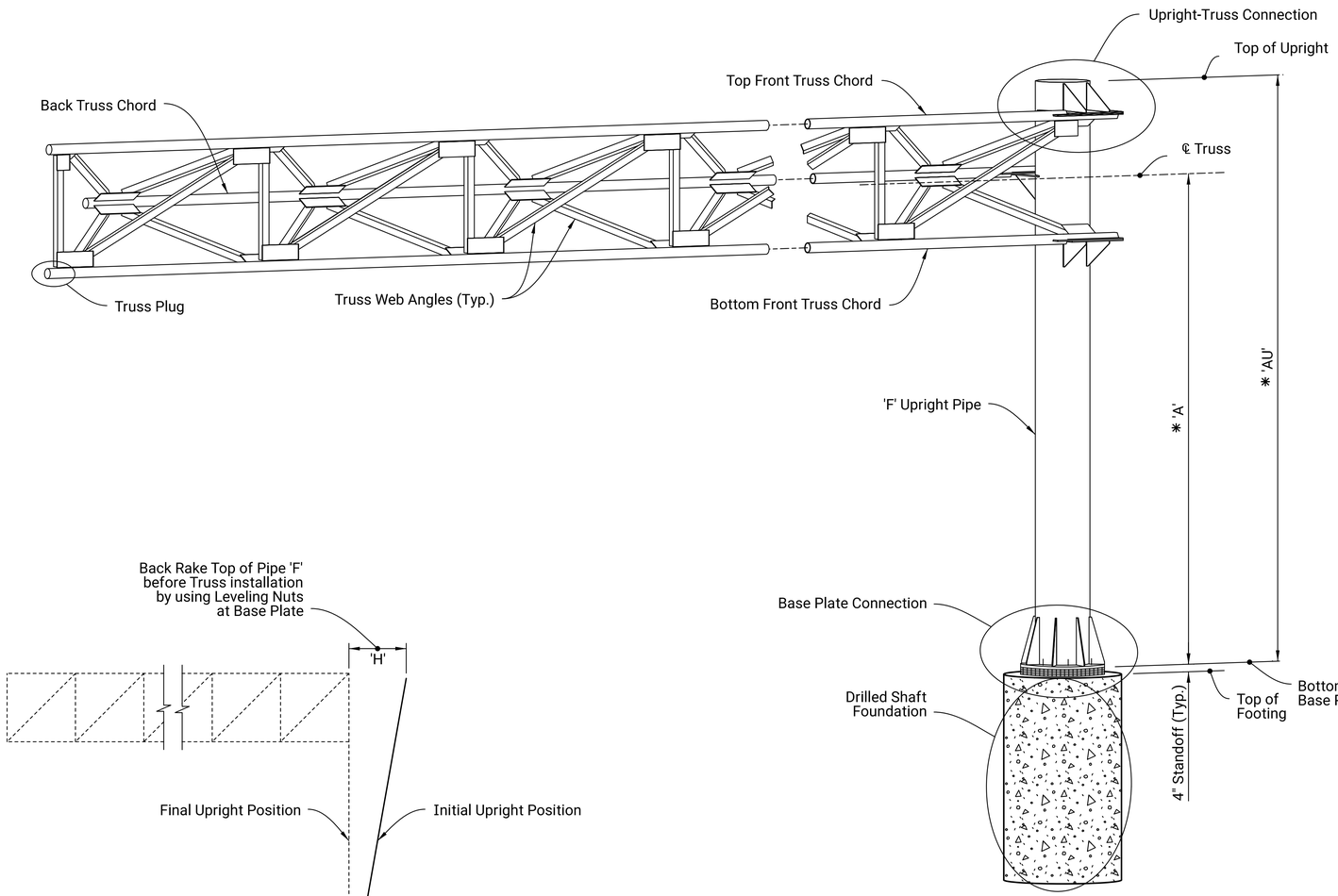
9. Construct the Sign Structure foundation in accordance with Specification Section 744.

10. Prior to erection, record the as-built anchor locations and provide to the Engineer.

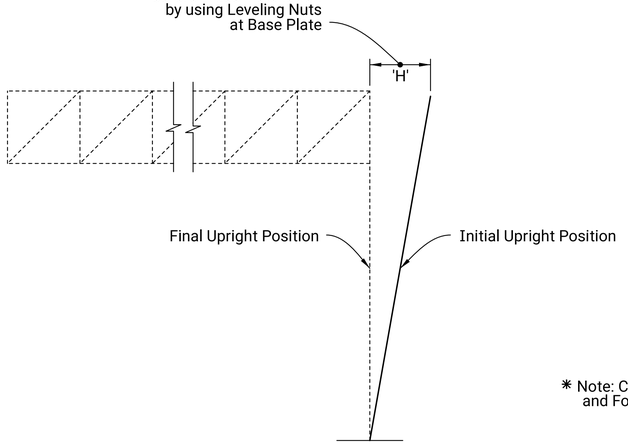
11. After placement of the upright and prior to installation of the truss, adjust the leveling nuts beneath the base plate to achieve the back rake shown on the Camber Diagram.

12. Place backfill to 1' below top of footing elevation and grade to drain away prior to installation of the sign panels and structure. Do not remove or reduce in height without prior approval of the Engineer.

13. Install sign panels as shown on the Cantilever Truss Type Construction Layout Sheets.



ISOMETRIC VIEW



CAMBER DIAGRAM

* Note: Contractor shall verify these Dimensions and Footing Elevations prior to Fabrication of Upright.

CANTILEVER SIGN ASSEMBLY

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

CANTILEVER SIGN STRUCTURE DETAILS

Proj. No. 70-89 KA-6808-01 Shawnee Co.

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

Plotted: Andrew.Nickols@ks.gov | Plot Location: SigningLighting
File: br1000.dgn
Plot Date: 12-SEP-2025 15:56

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	173	253

CANTILEVER SIGN STRUCTURES DATA TABLE

SIGN #	STATION	DIMENSIONS								PNLS	MEMBER SIZES			BACKRAKE
		A		AU		B		C	CA	N	D (CHORD)	E (WEB)	F (UPRIGHT)	H
		ft	in	ft	in	ft	in	in	in	#	O.D. X Wall Thk. (in)	Angle (in)	O.D. X Wall Thk. (in)	in
089S0195	431+85.00	22	3 1/4	26	4 7/8	6	8	54	23 7/16	6	5.563 x 0.375	2 1/2" x 2 1/2" x 1/4"	20.00 x 0.500	7 3/4
089S0194	433+85.00	24	0	28	1 5/8	6	8	54	23 7/16	6	5.563 x 0.375	2 1/2" x 2 1/2" x 1/4"	20.00 x 0.500	8 1/2

CANTILEVER SIGN STRUCTURES DATA TABLE (CONT.)

SIGN #	GUSSET PLATES																
	GA	GB	GC		GD		GE		GF		GG		GH		GJ		GK
	in	in	ft	in	ft	in	ft	in	ft	in	ft	in	ft	in	ft	in	in
089S0195	1/2	7/8	1	4 1/4	0	7	1	1 3/4	0	6 1/2	0	9	0	6 3/4	0	11 1/4	3/16
089S0194	1/2	7/8	1	4 1/4	0	7	1	1 3/4	0	6 1/2	0	9	0	6 3/4	0	11 1/4	3/16

CANTILEVER SIGN STRUCTURES DATA TABLE (CONT.)

SIGN #	TRUSS CONNECTION									
	TA	TB	TC	TD	TE	TF	TG	TH	TJ	TK
	in	#	#	in	in	in	in	in	in	ft
089S0195	7/8	10	10	1/2	1/2	1/4	3/16	3/16	3/16	20 1/2
089S0194	7/8	10	10	1/2	1/2	1/4	3/16	3/16	3/16	20 1/2

CANTILEVER SIGN STRUCTURES DATA TABLE (CONT.)

SIGN #	BASE CONNECTION									
	BA	BB	BC	BD	BE		BF	BG	BH	BJ
	in	#	in	in	ft	in	in	in	in	in
089S0195	1 3/4	10	2	3/8	1	11 1/2	5/16	5/16	5/16	3/16
089S0194	1 3/4	10	2	3/8	1	11 1/2	5/16	5/16	5/16	3/16

Plotted: Andrew.Nickols@ks.gov | Plot Location: *SigningLighting*
File: *br100l.dgn*
Plot Date: 12-SEP-2025 15:56

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

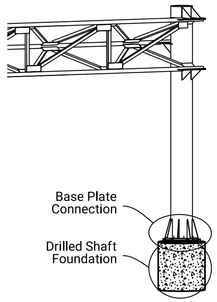
KANSAS DEPARTMENT OF TRANSPORTATION

CANTILEVER SIGN STRUCTURE
DATA TABLES

Proj. No. 70-89 KA-6808-01 Shawnee Co.

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

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	174	253



CANTILEVER ASSEMBLY

GENERAL NOTES

DESIGN: Footing is designed per Chapter 13 of the LRFD Specifications of Structural Supports for Highway Signs Luminaires and Traffic Signals, and Interim Revisions

CONCRETE: Use Grade 4.0 Concrete throughout. Form top 2 feet of footing. Refer to Drilled Shaft (Special) Specification.

REINFORCING: Bar bend dimensions are measured out to out. All other dimensions relative to reinforcing steel are to center line of bar unless otherwise noted. Use 60 Grade Reinforcing Steel.

ANCHOR RODS: Anchor rods will adhere to KDOT Standard Specification Section 1600 (Grade 55) with the following exception: cut threads are not permitted.

EXCAVATION: Footing holes shall be carefully drilled to the required size at the proper location. All excavation shall be disposed of within the right-of-way in such a manner as to blend uniformly with the existing surface and as approved by the Engineer. Immediately before placing any concrete the Contractor shall remove all loose and uncompacted material from the bottom of the hole.

BACKFILL: All soil used for the backfilling of footing excavation shall be thoroughly compacted as it is placed. The backfill shall be brought up to the finished ground line adjacent to footings.

STRENGTH: The curing time shall be a minimum of 15 days or until a test cylinder achieves a compressive strength of 4.0 ksi or greater.

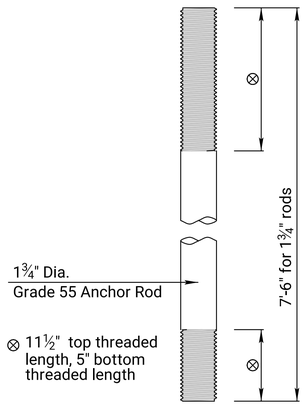
PAYMENT: The cost of all material and labor needed to construct its footing shall be subsidiary to "Cantilever Sign Structure(✳)(✳✳)".

✳ See Construction Layout Sheets for elevations and station.
◔ The depth of shaft includes the 1'-0" Min, exposed footing above the ground.

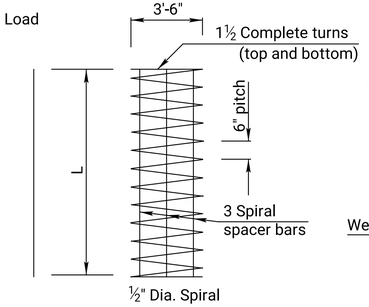
✳ Location	Serial Number	Depth◔	L	Offset
Sta. 431+85, EB I-70	089S0195	13'-0"	12'-6"	1'-0"
Sta. 433+85, WB I-70	089S0194	12'-0"	11'-6"	1'-0"

△ DTI Acceptable Range of Compression Load

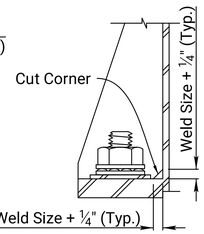
△ DTI (Kips)	Anchor Bolt Size
59.6 to 65.9	1¾"



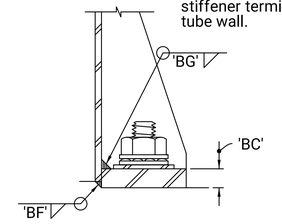
ANCHOR ROD DETAILS



BENDING DIAGRAMS



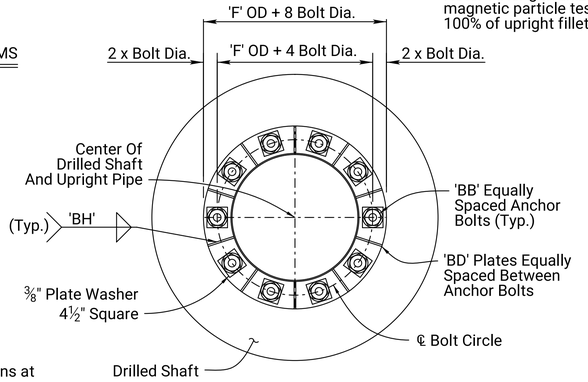
DETAIL "A"



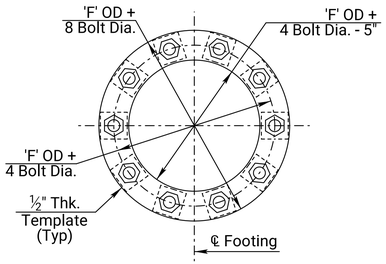
DETAIL "B"

Note: Wrap fillet weld around the stiffener termination on the tube wall.

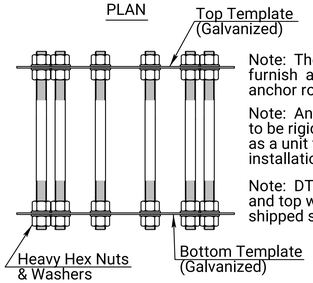
Note: After galvanizing, provide magnetic particle testing on 100% of upright fillet welds.



PLAN



PLAN



(Not all anchor rods shown)

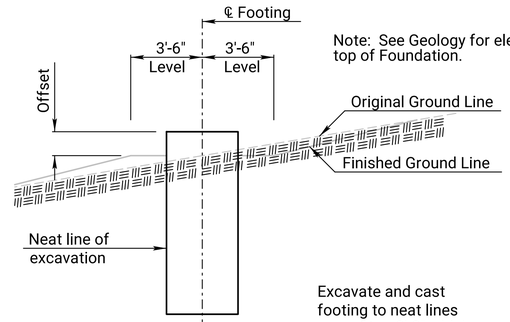
TOP AND BOTTOM TEMPLATE DETAIL

Note: The fabricator shall furnish a top and bottom anchor rod template.

Note: Anchor Rod assembly to be rigidly tightened in place as a unit for shipping and installation.

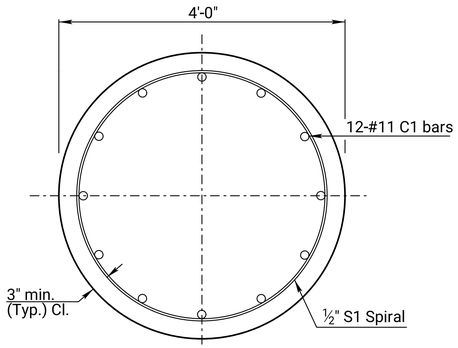
Note: DTIs, plate washer, and top washer will be shipped seperately.

Note: See Geology for elevations at top of Foundation.

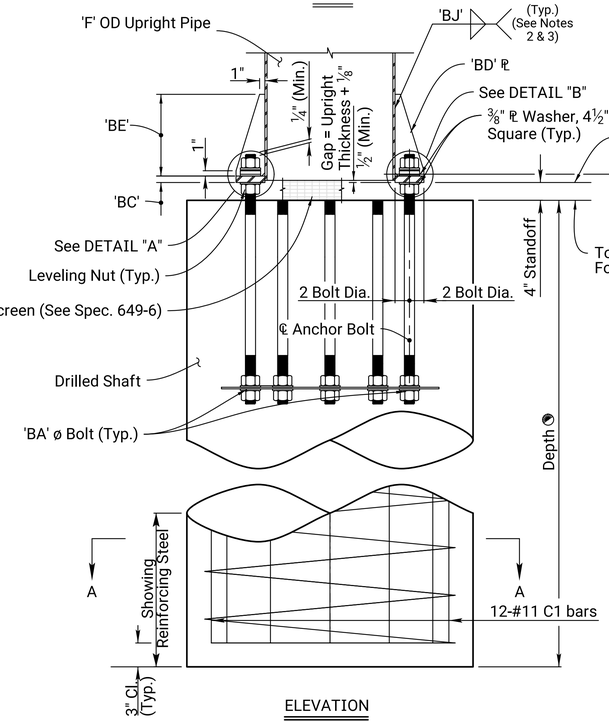


SECTION IN PLACE

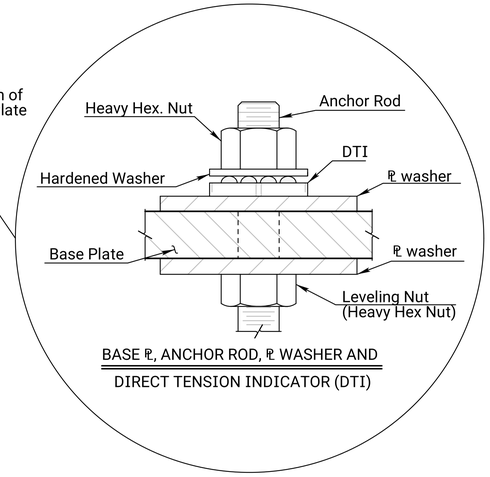
Excavate and cast footing to neat lines except top 2'-0" which is to be formed.



SECTION A-A



ELEVATION



BASE ℄, ANCHOR ROD, ℄ WASHER AND DIRECT TENSION INDICATOR (DTI)

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

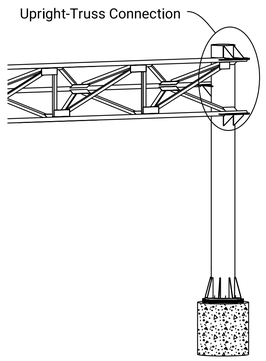
CANTILEVER SIGN STRUCTURE DETAILS

Proj. No. 70-89 KA-6808-01 Shawnee Co.

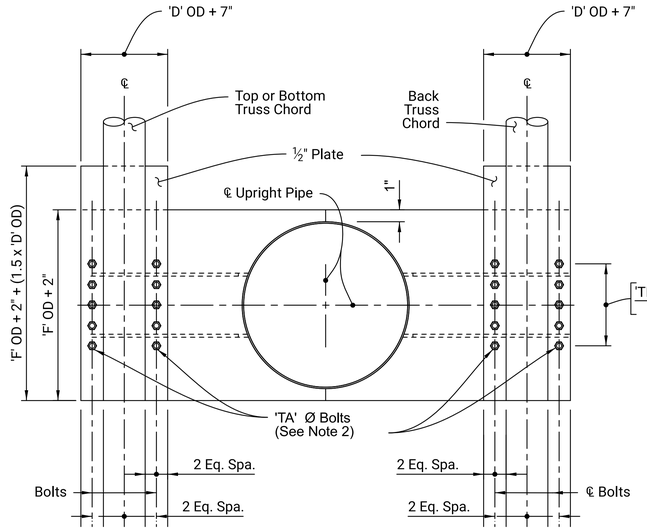
SHEET NO. OF	SCALE	APP'D	
DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN. CK.	CADD CK.

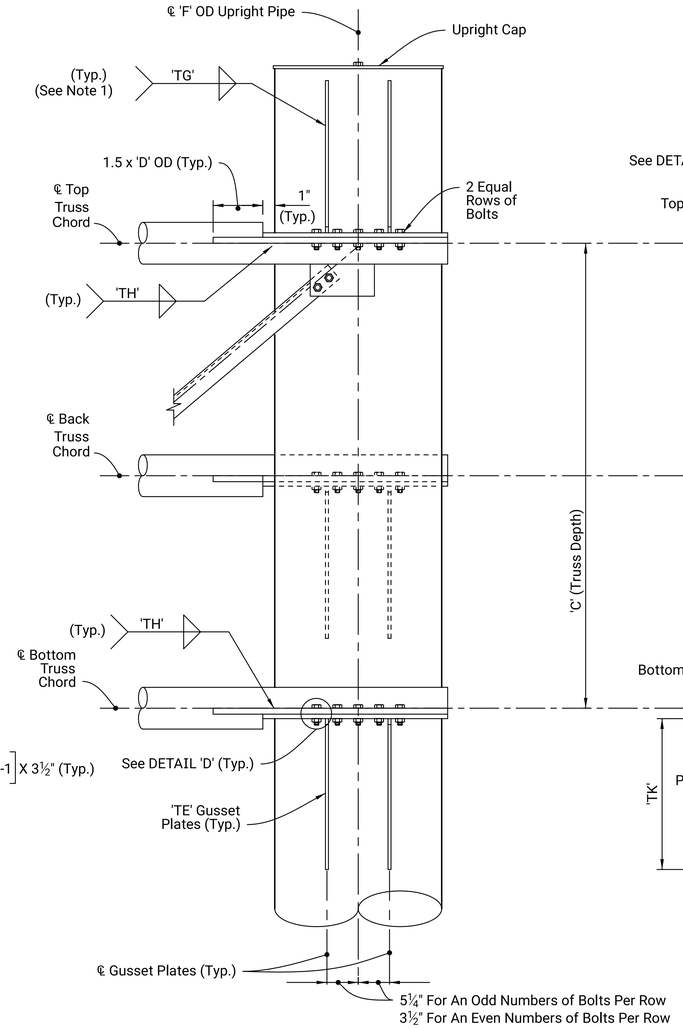
Plotted: Andrew.Nickolseks.gov | Plot Location: SigningLighting
File: br1002.dgn
Plot Date: 12-SEP-2025 15:56

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	175	253

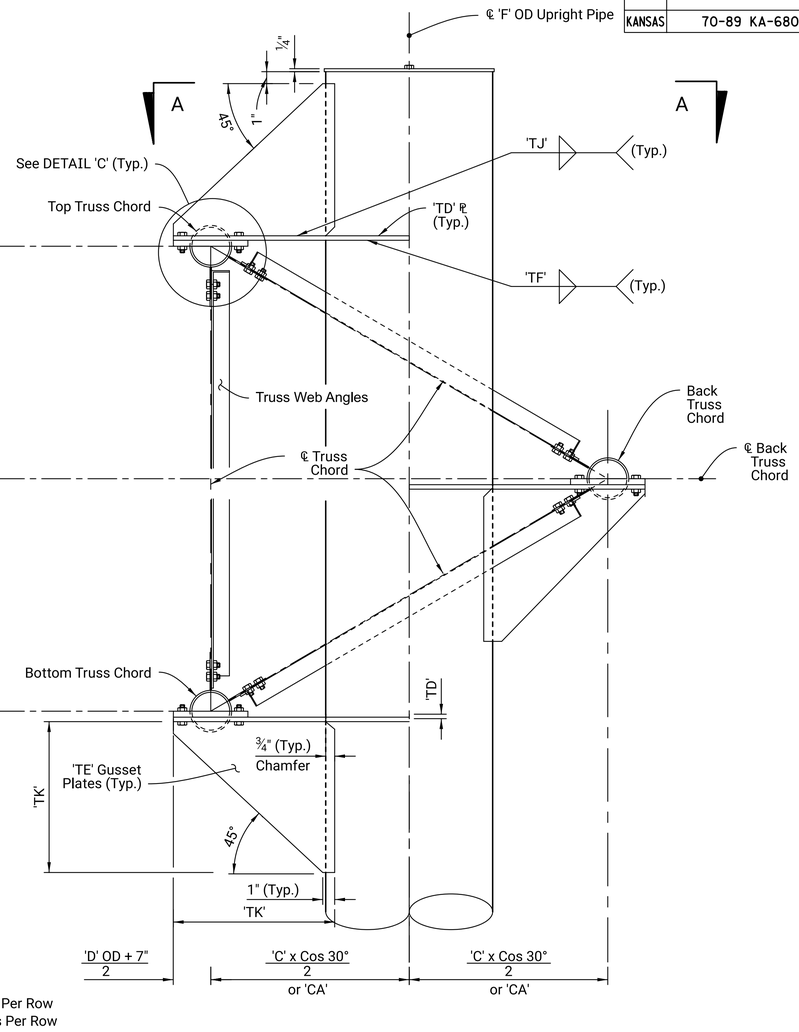


CANTILEVER ASSEMBLY





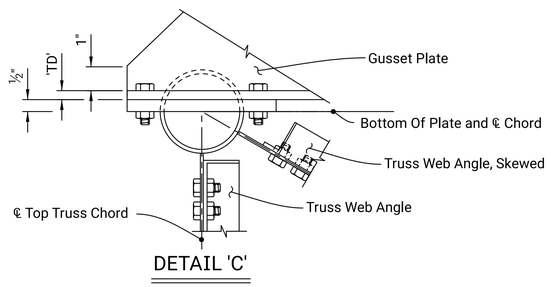
FRONT ELEVATION



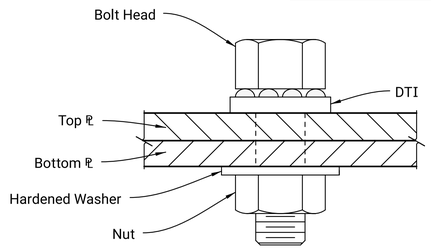
SIDE ELEVATION

SECTION A-A

(With Gusset Plates And Web Angles Omitted For Clarity)



DETAIL 'C'



DTI INSTALLATION

DETAIL 'D'

UPRIGHT-TRUSS CONNECTION DETAIL

(Web Members From Back Truss Chord Omitted For Clarity)

NOTE:

1. Wrap fillet weld around the stiffener termination on the tube wall.
2. Truss Chord Bolts:
   A. Top and Bottom: Install 'TC' hex head bolts.
   B. Back: Install 'TB' hex head bolts.
3. For the Chord and ½" Plate connection: slot the Chord for the ½" Plate to be inserted. Do not slot the ½" Plate.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

CANTILEVER SIGN STRUCTURE DETAILS

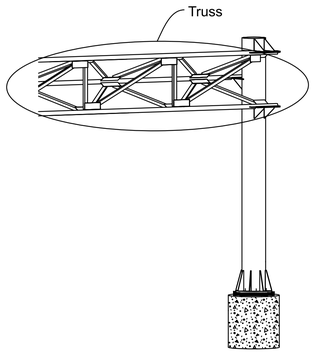
Proj. No. 70-89 KA-6808-01 Shawnee Co.

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

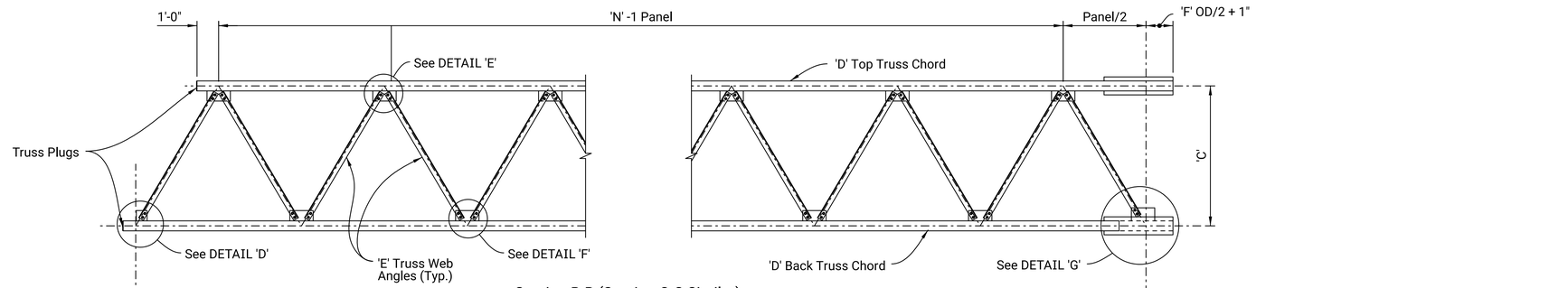
Sheet No. 175

Plotted: Andrew.Nickols@ks.gov | Plot Location: SigningLighting
File: br003.dgn
Plot Date: 12-SEP-2025 15:56

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	176	253



CANTILEVER ASSEMBLY



Section B-B (Section C-C Similar)
(See Note 1 & 3)

FRONT ELEVATION
(See Note 1 & 3)

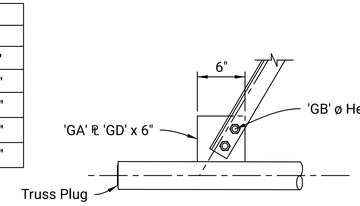
SIDE ELEVATION

TRUSS NOTES:

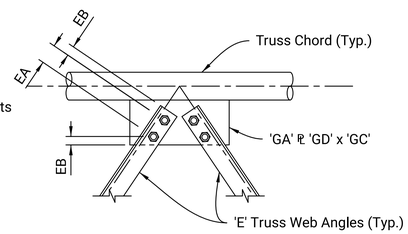
1. Out-of-plane members are not shown for clarity.
2. Wrap fillet weld around plate termination on the tube wall.
3. Chord Splices are not allowed.

Bolt Size	Distance	
	EA	EB
1¼" Ø	4⅜"	2¼"
1" Ø	3½"	1¾"
⅞" Ø	3"	1½"
¾" Ø	2½"	1¼"
⅝" Ø	2¼"	1⅛"

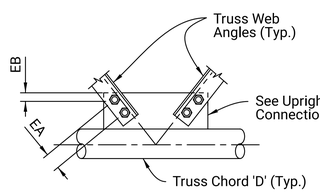
TRUSS



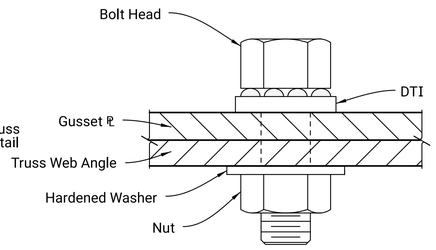
DETAIL 'D'



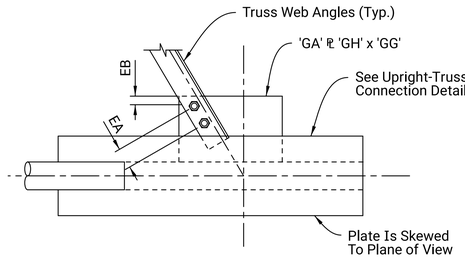
DETAIL 'E'



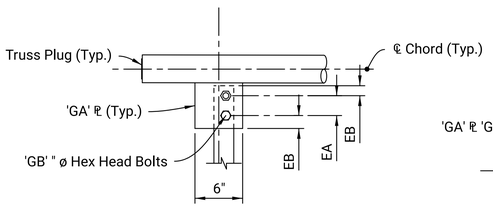
DETAIL 'F'



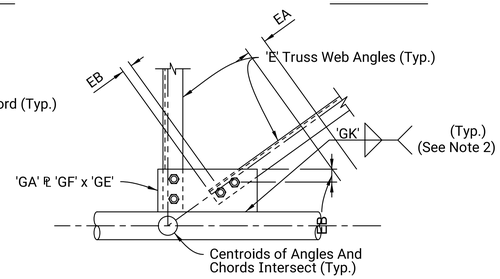
DTI INSTALLATION



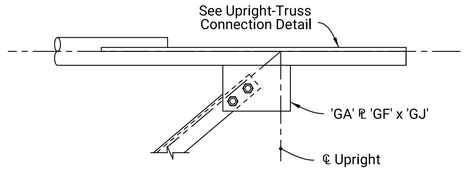
DETAIL 'G'



DETAIL 'H'



DETAIL 'I'



DETAIL 'J'

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

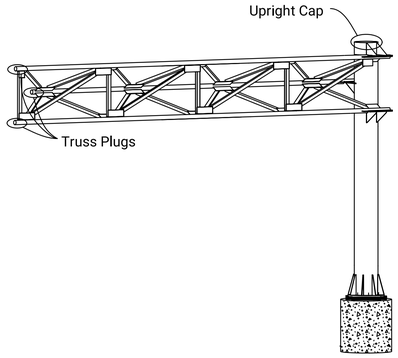
CANTILEVER SIGN STRUCTURE DETAILS

Proj. No. 70-89 KA-6808-01 Shawnee Co.

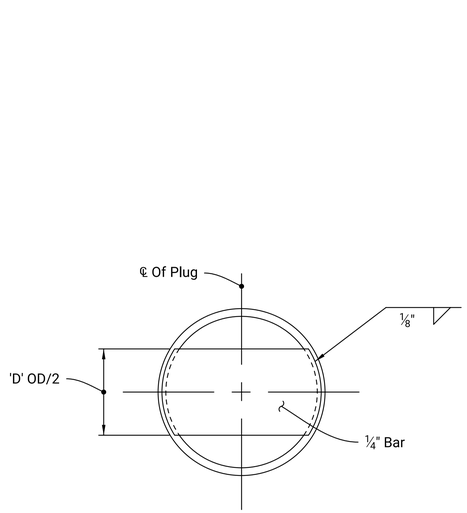
SHEET NO. OF	SCALE	APP'D	
DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN. CK.	CADD CK.

Plotted: Andrew.Nickols@ks.gov | Plot Location: SigningLighting
File: br1004.dgn
Plot Date: 12-SEP-2025 15:56

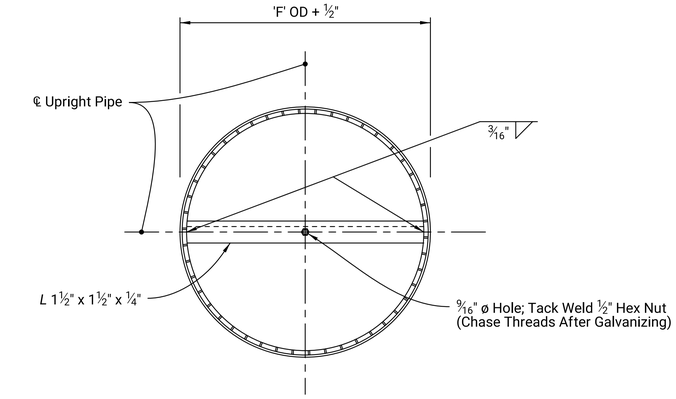
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	177	253



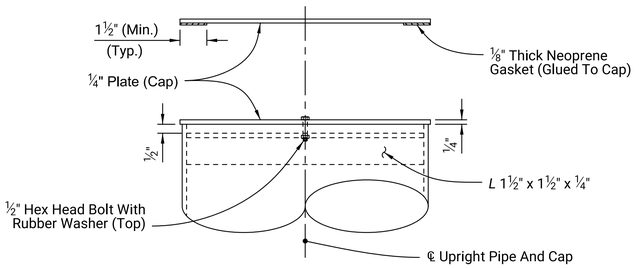
CANTILEVER ASSEMBLY



TRUSS PLUG DETAIL



PLAN



ELEVATION

UPRIGHT CAP DETAIL

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

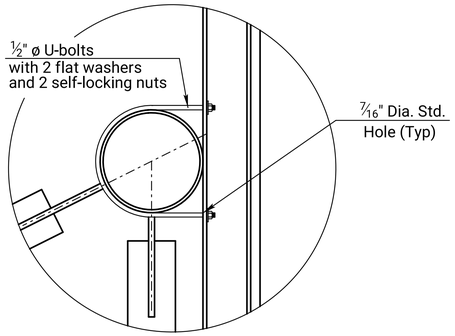
CANTILEVER SIGN STRUCTURE DETAILS

Proj. No. 70-89 KA-6808-01 Shawnee Co.

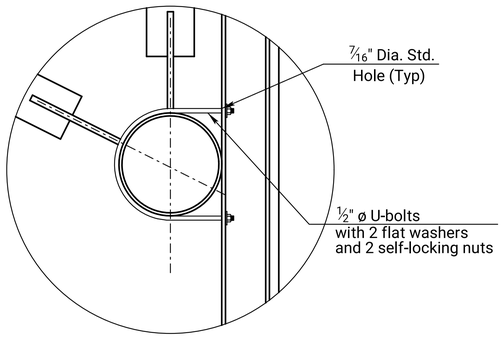
SHEET NO. OF	SCALE	APP'D	
DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN. CK.	CADD CK.

Plotted: Andrew.Nickols@ks.gov | Plot Location: SigningLighting
File: br1005.dgn
Plot Date: 12-SEP-2025 15:56

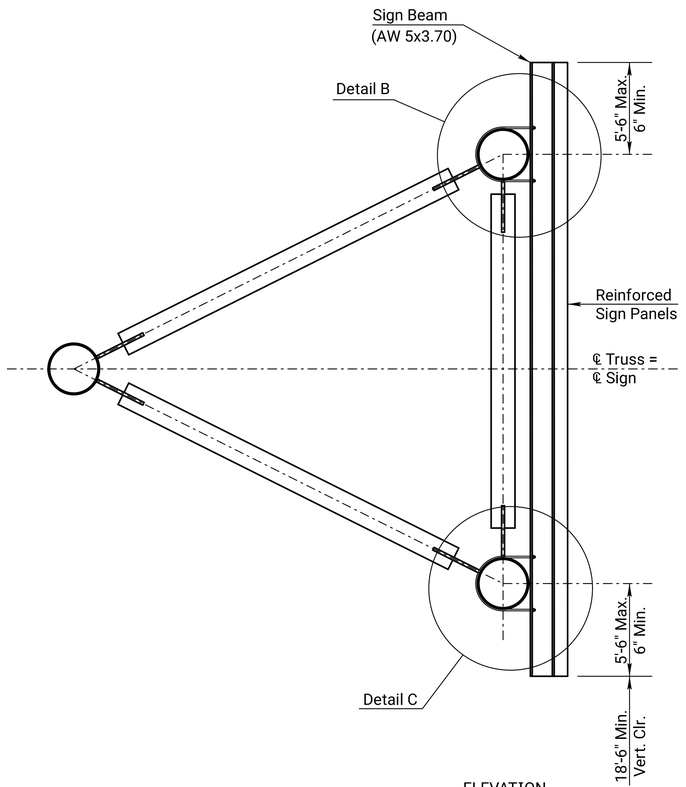
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	178	253



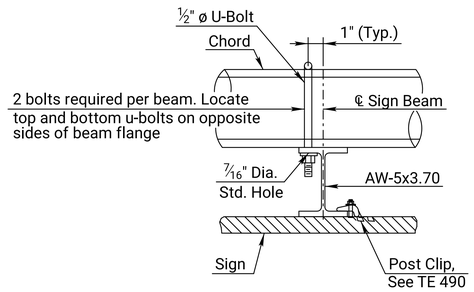
Detail B



Detail C



ELEVATION



Typical Static Sign Connection Plan

NOTE: Beam spacing for structures will be placed 1'-0" from ends of sign with a 5'-0" Max. spacing. Exit signs (signs on top of signs) must have 2 beams minimum within its length.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

SIGN CONNECTION DETAILS

Proj. No. 70-89 KA-6808-01 Shawnee Co.

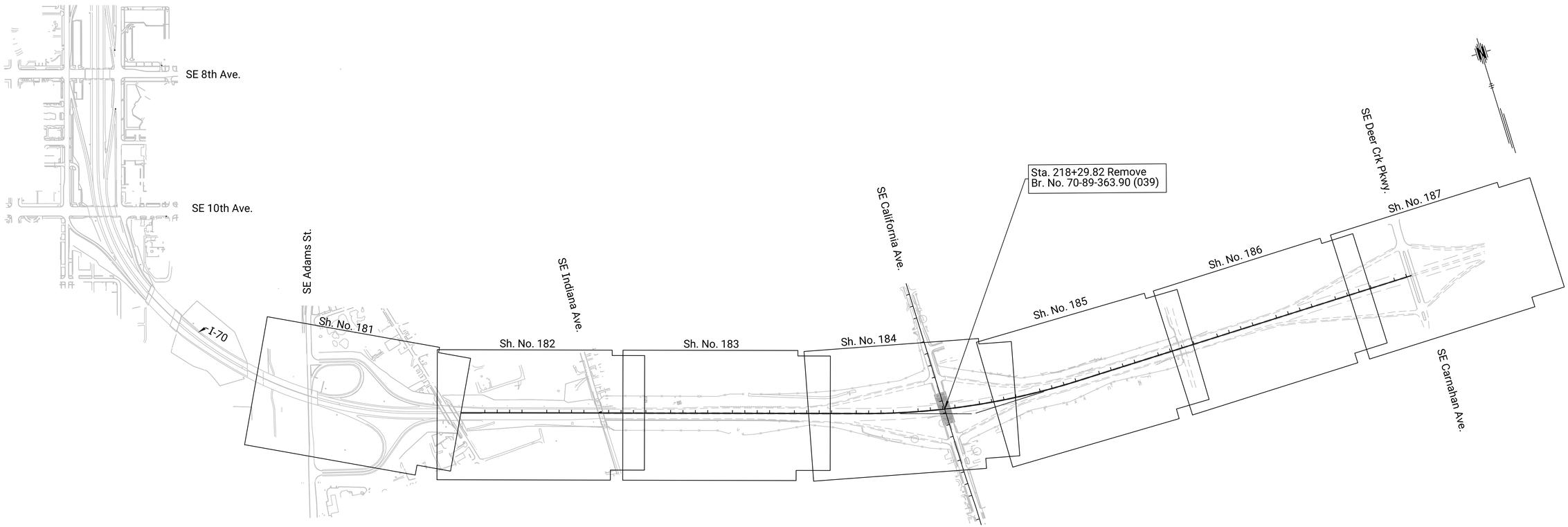
SHEET NO. OF	SCALE	APP'D	
DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN. CK.	CADD CK.

Plotted: Andrew.Nickolsek.gov | Plot Location: SigningLighting
File: br1012.dgn
Plot Date: 12-SEP-2025 15:57

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	179	253

CONSTRUCTION SEQUENCE		
PHASE	CONSTRUCTION	TRAFFIC
1	Demolition of California Avenue Bridge over I-70	I-70 Closed (Weekend Closure) California Avenue Closed North of WB Ramp Terminals at SE 11th St. California Avenue Closed South of EB Ramp Terminals near SE 13th St. Close Entrance North of SE 13th St. on East Side of California Ave. EB Off-Ramp and On-Ramp to be used as Detour for EB I-70 (Single Lane) WB Off-Ramp and On-Ramp to be used as Detour for WB I-70 (Single Lane) No turns allowed in any direction onto California Ave. from Ramps

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED



KANSAS DEPARTMENT OF TRANSPORTATION

PHASE 1

CONSTRUCTION PHASING

NARRATIVE & KEY MAP

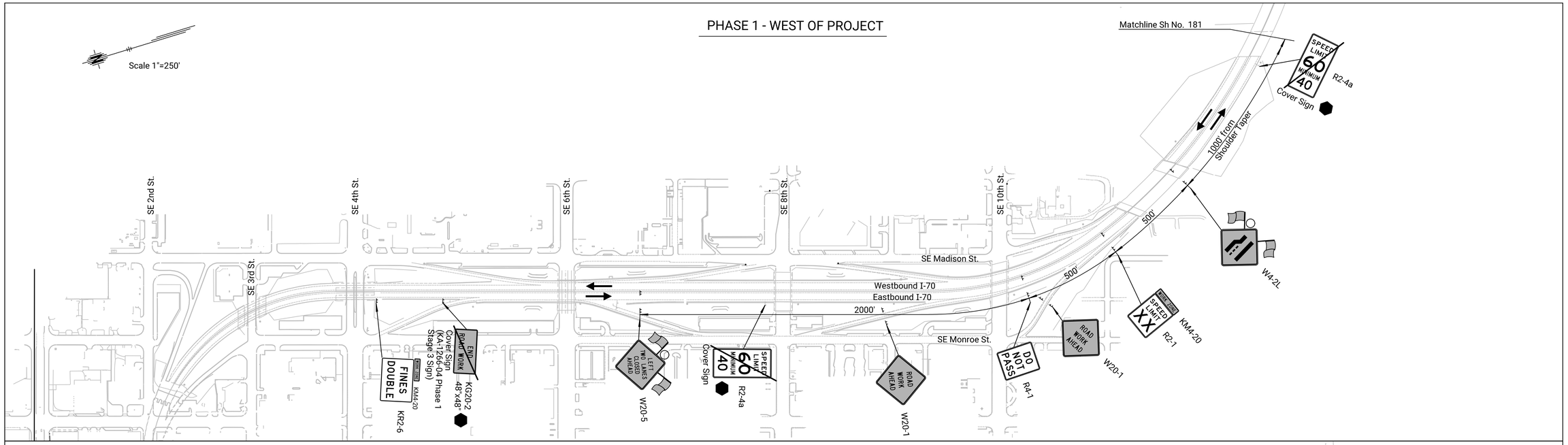
Sh. No. 179

Plotted by : BGS01485 16-DEC-2025 12:44
File : ka680801-cpl-100.dgn

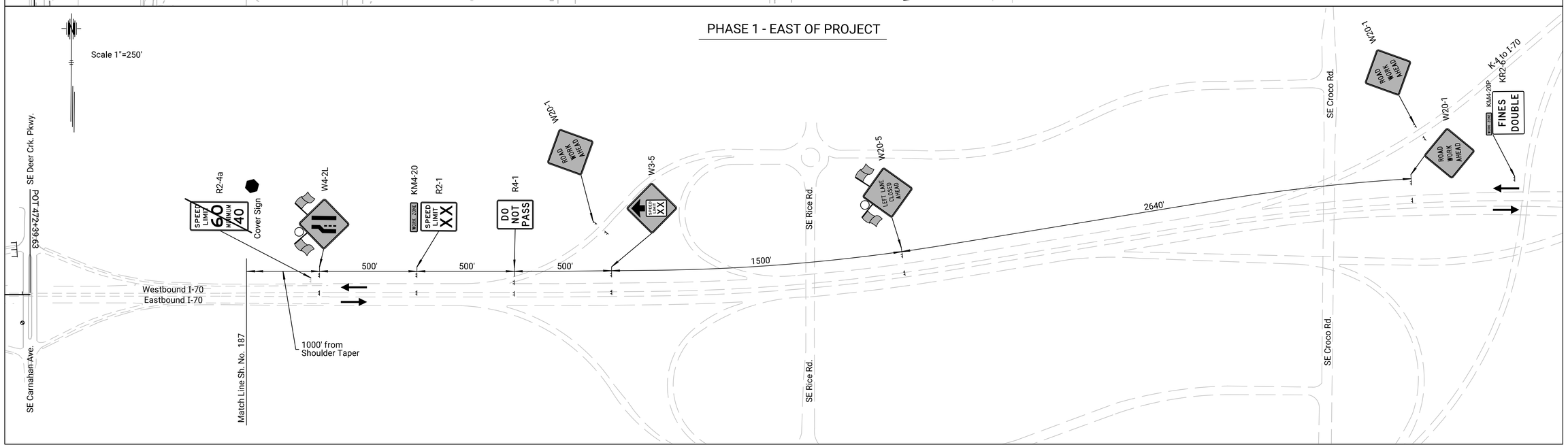
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	180	253

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED

PHASE 1 - WEST OF PROJECT



PHASE 1 - EAST OF PROJECT



LEGEND

- Existing Sign Not Part of Project
- Traffic Flow

KANSAS DEPARTMENT OF TRANSPORTATION

I-70 PHASE 1

ADVANCED WARNING SIGN LAYOUT

Sh. No. 180

Plotted by : BGS01485 16-DEC-2025 15:49
File : ka680801-cpl-100a.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	181	253

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED

Scale 1"=50'

SE Adams St.

E9
9'-0" x 7'-0"
Central Business District
NEXT 3 EXITS

E5-1a
7'-6" x 5'-0"
EXIT 363

Matchline Sheet No. 180

12'
12'
12'

Arrow Display

Type III Barricade

Westbound I-70

Eastbound I-70

260' Shoulder Taper
16.25' Ch. Device Spacing

780' Merging Taper
16.25' Ch. Device Spacing

1560' Buffer Space
50' Ch. Device Spacing

D10-3
3 MILE

W4-3R

E1-3
18'-6" x 9'-0"
EXIT ONLY

E1-5
10'-0" x 2'-6"
California Ave
3/4 MILE
EXIT 364A

E6-1
21'-6" x 8'-6"
Adams St
Branner Trfwy
20 MPH

E1-5
9'-0" x 2'-6"
EXIT 363

E5-1a
7'-6" x 5'-0"
EXIT 363

W7-3aP
1/4 MILE

W12-2
14-11"

W4-1R

R9-6

ROAD WORK AHEAD
W20-1

LEGEND

- Arrow Display
- Channelizing Device
- Traffic Flow
- Inertial Barrier System
- Temporary Barrier
- Existing Sign Not Part of Project

KANSAS DEPARTMENT OF TRANSPORTATION

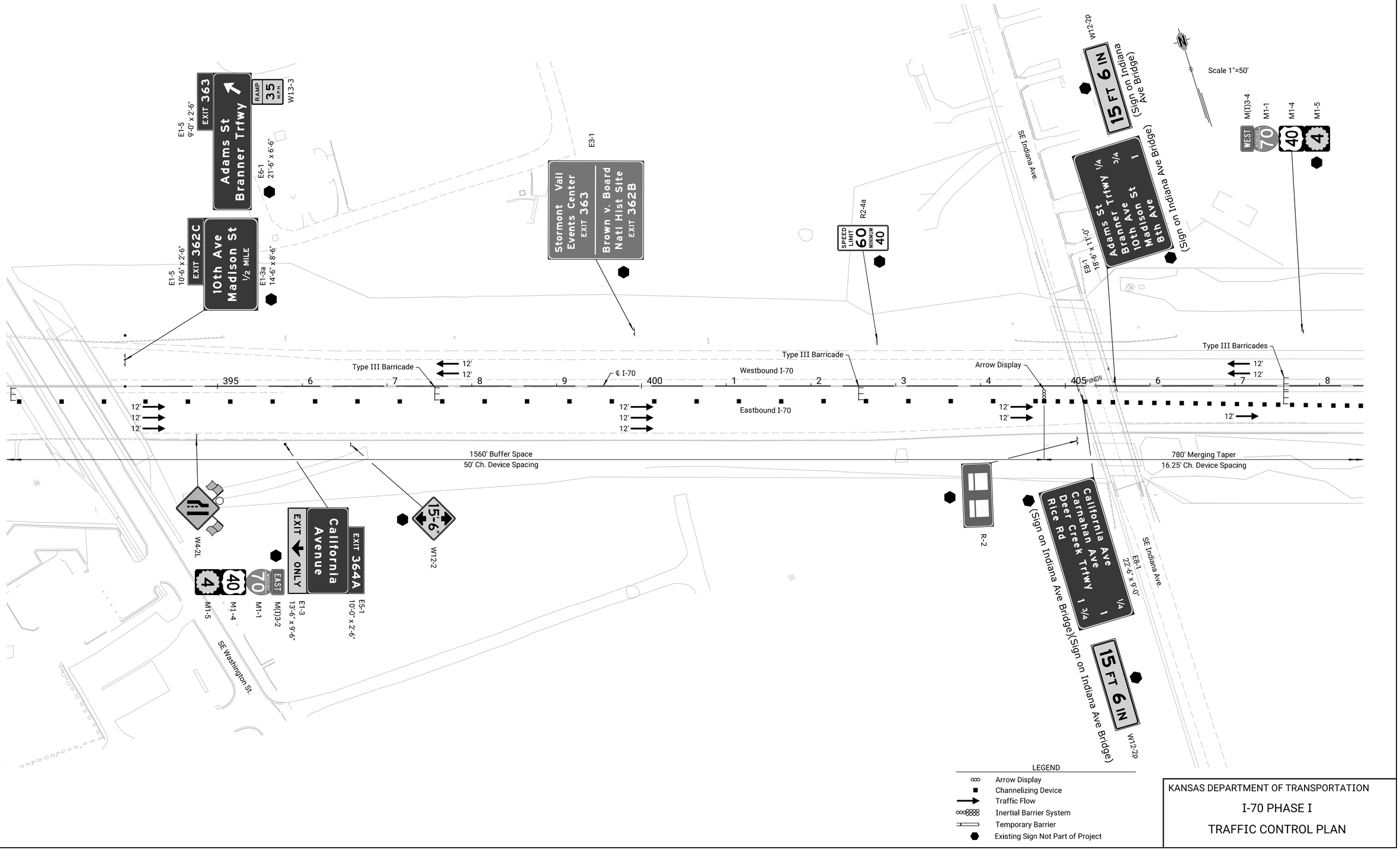
I-70 PHASE I

TRAFFIC CONTROL PLAN

Plotted by : BGS01485 16-DEC-2025 12:45
File : ka680801-cpl-101.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	182	253

DATE	BY	
REFERENCES NOTED		
REFERENCES CHECKED		



LEGEND

- Arrow Display
- Channelizing Device
- Traffic Flow
- Inertial Barrier System
- Temporary Barrier
- Existing Sign Not Part of Project

KANSAS DEPARTMENT OF TRANSPORTATION

I-70 PHASE I

TRAFFIC CONTROL PLAN

Sh. No. 182

Plotted by : BGS01485 16-DEC-2025 12:45
File : ka680801-cpl-102.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	183	253

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED

Scale 1"=50'

KG20-2 END ROAD WORK
KR2-11 DOUBLE FINES END

R3-33 RIGHT LANE MUST EXIT

W12-2 15-6

Type III Barricades

12'
12'

℄ I-70

Type III Barricades

Type III Barricades

Westbound I-70

Type III Barricades

12'
12'
12'

16.25' Ch. Device Spacing

Ramp C

12'

16.25' Ch. Device Spacing

8 9 410 1 2 3 4 415 6 7 8 9 420 1 2 3

200' Downstream Taper
16.25 Ch. Device Spacing

Eastbound I-70

12'

12'

Ramp A

780' Merging Taper
16.25' Ch. Device Spacing

645' Buffer Space
50' Ch. Device Spacing

Follow Exit 364A Marking
16.25' Ch. Device Spacing

SPEED LIMIT MAXIMUM 65 40
Cover Sign
R2-4a

ALL TRAFFIC MUST EXIT
W19-5

ROAD CLOSED
R11-2

W1-6R

California Avenue
EXIT 364 A
EXIT ONLY
E6-1
E1-5

LEGEND

- Arrow Display
- Channelizing Device
- Traffic Flow
- Inertial Barrier System
- Temporary Barrier
- Existing Sign Not Part of Project

KANSAS DEPARTMENT OF TRANSPORTATION

I-70 PHASE I

TRAFFIC CONTROL PLAN

Sh. No. 183

Plotted by : BGS01485 16-DEC-2025 15:53
File : ka680801-cpl-103.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	184	253

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED

Scale 1"=50'

SE California Ave.

Westbound I-70

℄ I-70

Eastbound I-70

Ramp A

Ramp B

Ramp C

Ramp D

12'

16.25' Ch. Device Spacing

10' Ch. Device Spacing

Type III Barricades

Cover Signs

Sta. 218+29.82 Remove Br. No. 70-89-363.90 (039)

W4-1R

W4-2R

KR5-10

R11-2 ROAD CLOSED

W1-8L

KR3-8cL

R6-1R

R6-1L

R5-1

R1-1 STOP

KR3-8h

R5-1a ← California Ave

W1-6R

W13-1

W12-2

15-1

15-4

D10-3

R-4 7'-6" x 6'-6"

R-2 7'-6" x 3'-6"

EXIT 363 GAS

EXIT 364A

E5-1a

W12-1

W4-1R

W1-

W13-1

XX MPH

215'

LEGEND

- Arrow Display
- Channelizing Device
- Traffic Flow
- Inertial Barrier System
- Temporary Barrier
- Existing Sign Not Part of Project

KANSAS DEPARTMENT OF TRANSPORTATION

I-70 PHASE I

TRAFFIC CONTROL PLAN

Plotted by : BGS01485 16-DEC-2025 12:46
File : ka680801-cpl-104.dgn

Sh. No. 184

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	185	253

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED

Scale 1"=50'

KR3-8h
EXIT ONLY
Cover Signs
R-6
10'-0" x 6'-6"
Cover Signs
W1-2L
W13-1
D10-3
MILE 3 6 4
Ramp D
EXIT 364A
E5-1a
9'-0" x 5'-0"
E1-5
E6-1
EXIT 364A
California Avenue
EXIT ONLY
W1-6R
R11-2
ROAD CLOSED
R2-4a
SPEED LIMIT 65 MINIMUM 40
Cover Signs
W19-5
ALL TRAFFIC MUST EXIT
E8-1
18'-6" x 11'-0"
California Ave 1/4
Adams St 1 1/4
Branner Trfwy 1 3/4
10th Ave
Madison St
(Sign on Golden Ave Bridge)
R2
7'-6" x 5'-6"

Follow Exit 364A Marking
16.25' Ch. Device Spacing
1080'
50' Ch. Device Spacing

12'
Type III Barricades
Type III Barricades
8 9 440 1 2 3 4 445 6 7 ℄ I-70 8 9 450 1 2 3
Westbound I-70
Eastbound I-70
12'
12'
12'
12'
Type III Barricades
12'
12'
12'
Type III Barricades

Ramp B
Follow Ramp Marking
16.25' Ch. Device Spacing
200' Downstream Taper
16.25' Ch. Device Spacing

14'-11"
W12-2
D9-3a
RIGHT LANE MUST EXIT
W9-7
DOUBLE FINES END
KR2-11
END ROAD WORK
KG20-2
(Sign on Golden Ave Bridge)
14 FT 11 IN
W12-2p

LEGEND

- Arrow Display
- Channelizing Device
- Traffic Flow
- Inertial Barrier System
- Temporary Barrier
- Existing Sign Not Part of Project

KANSAS DEPARTMENT OF TRANSPORTATION

I-70 PHASE I

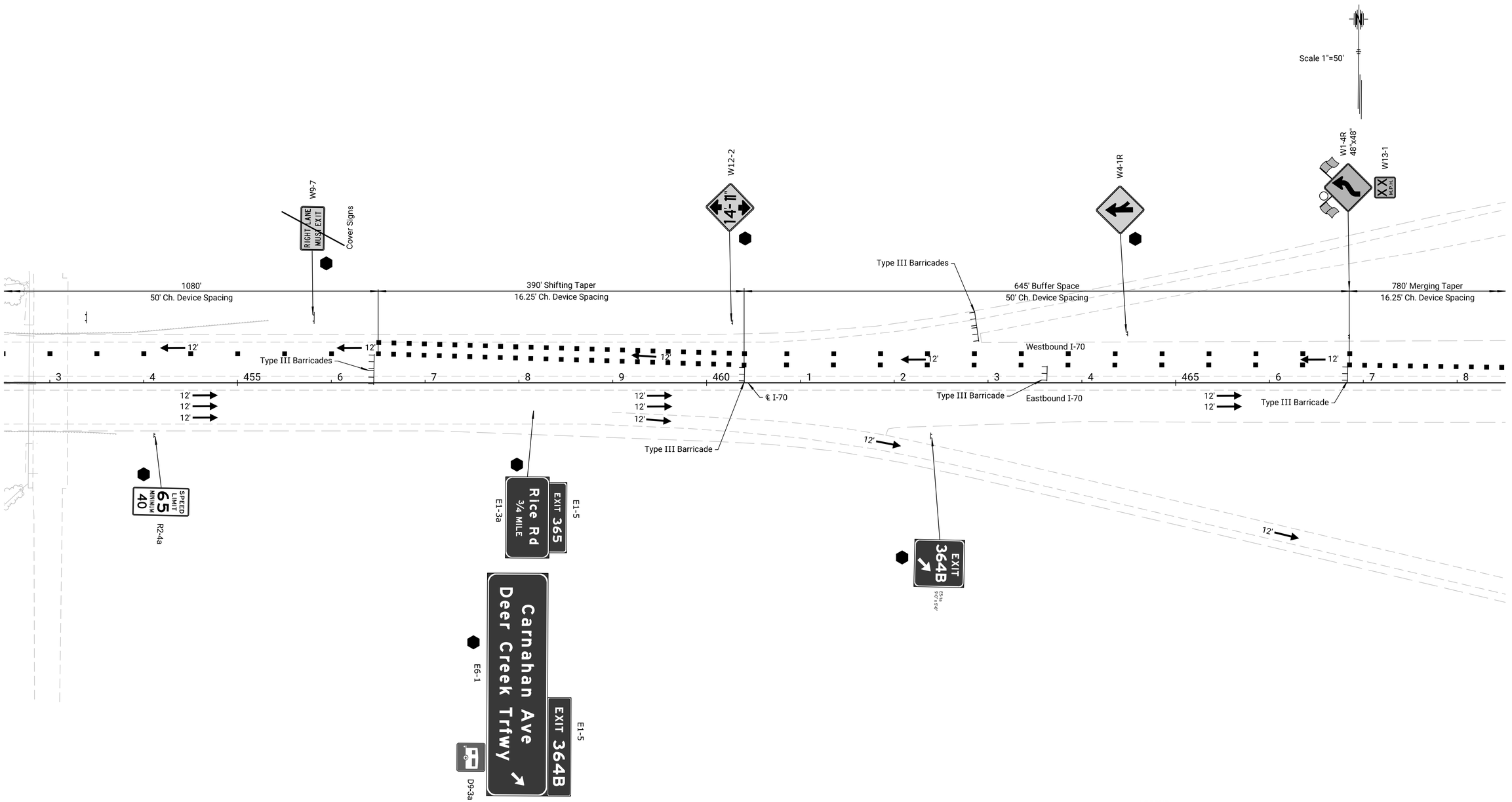
TRAFFIC CONTROL PLAN

Sh. No. 185

Plotted by : BGS01485 16-DEC-2025 15:53
File : ka680801-cpl-105.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	186	253

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED



LEGEND

- Arrow Display
- Channelizing Device
- Traffic Flow
- Inertial Barrier System
- Temporary Barrier
- Existing Sign Not Part of Project

KANSAS DEPARTMENT OF TRANSPORTATION

I-70 PHASE I

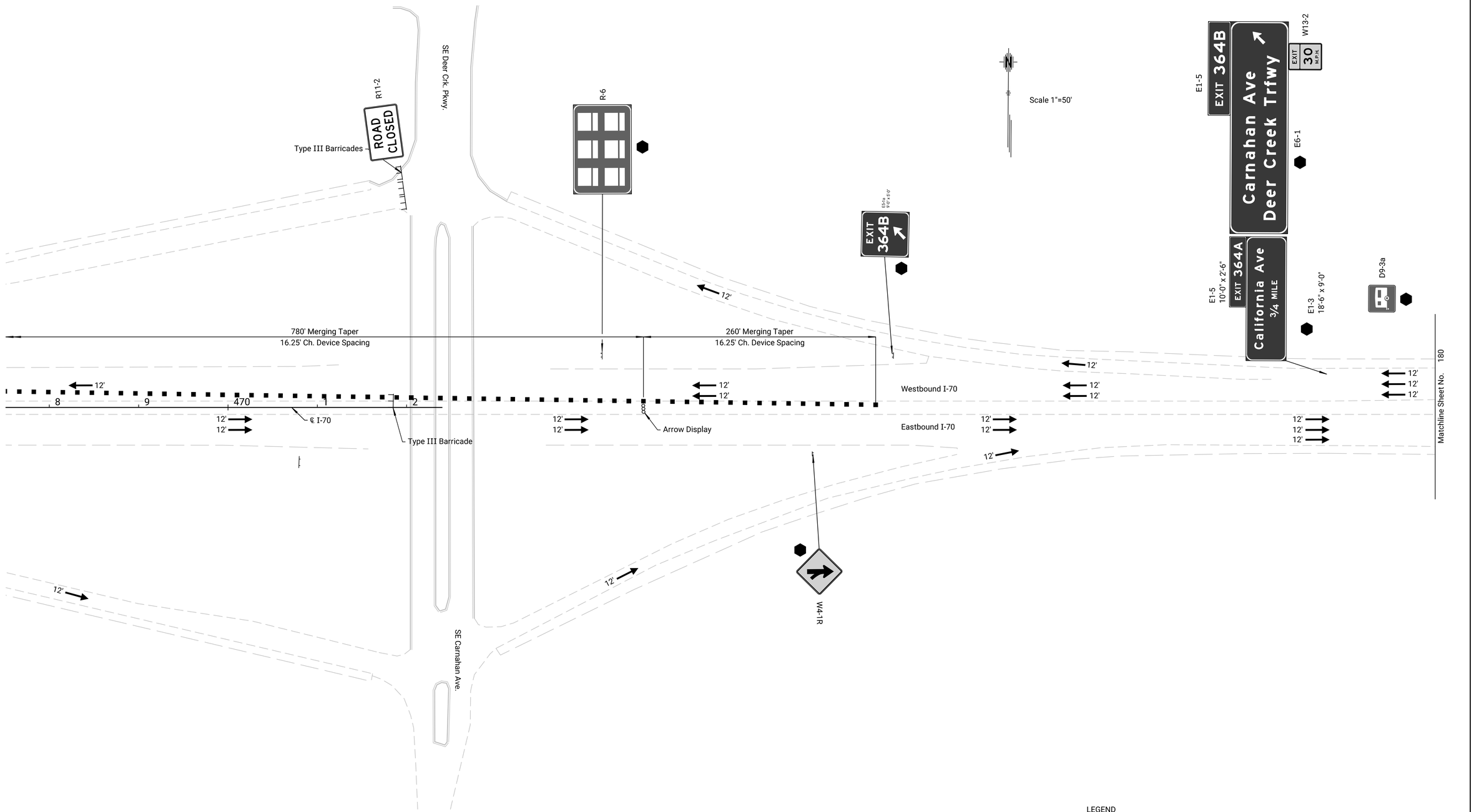
TRAFFIC CONTROL PLAN

Sh. No. 186

Plotted by : BGS01485 16-DEC-2025 12:46
File : ka680801-cpl-106.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	187	253

BY	DATE
REFERENCES NOTED	
REFERENCES CHECKED	



LEGEND

- Arrow Display
- Channelizing Device
- Traffic Flow
- Inertial Barrier System
- Temporary Barrier
- Existing Sign Not Part of Project

KANSAS DEPARTMENT OF TRANSPORTATION

I-70 PHASE I

TRAFFIC CONTROL PLAN

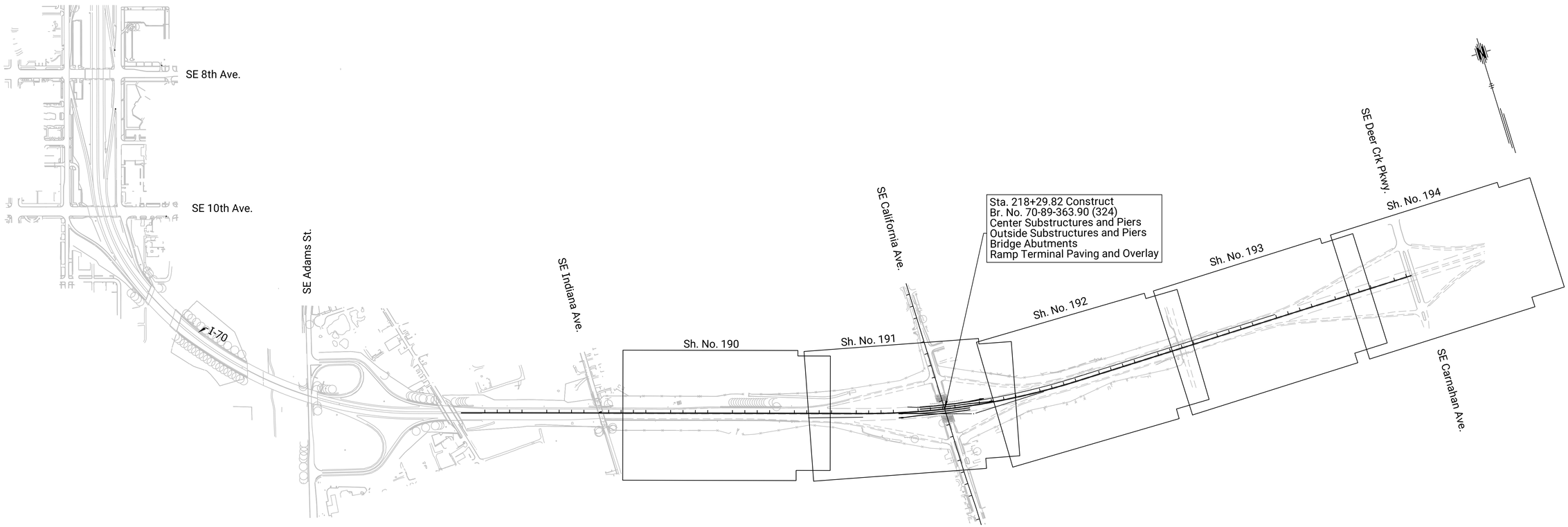
Sh. No. 187

Plotted by : BGS01485 16-DEC-2025 12:47
File : ka680801-cpl-107.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	188	253

CONSTRUCTION SEQUENCE		
PHASE	CONSTRUCTION	TRAFFIC
2A	Construct Center Substructure & Piers Construct Outside Substructures & Piers Construct Bridge Abutments Construct Intersection Pavement of WB Ramp Terminal and California Ave. Construction Mill and Overlay at EB Ramp Terminal and California Ave.∗	I-70 One-Lane of Traffic in each direction in the outside drive lane (16' Lane with CSB each side) California Avenue Closed North of WB Ramp Terminals at SE 11th St. California Avenue Open South of EB Ramp Terminals No Left Turn or Straight movement allowed onto California Ave. from EB Ramp Terminals

∗ Note: Mill and Overlay to occur overnight to minimize traffic impacts. Traffic to be handled by flagger during construction as shown on sheet number



DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED

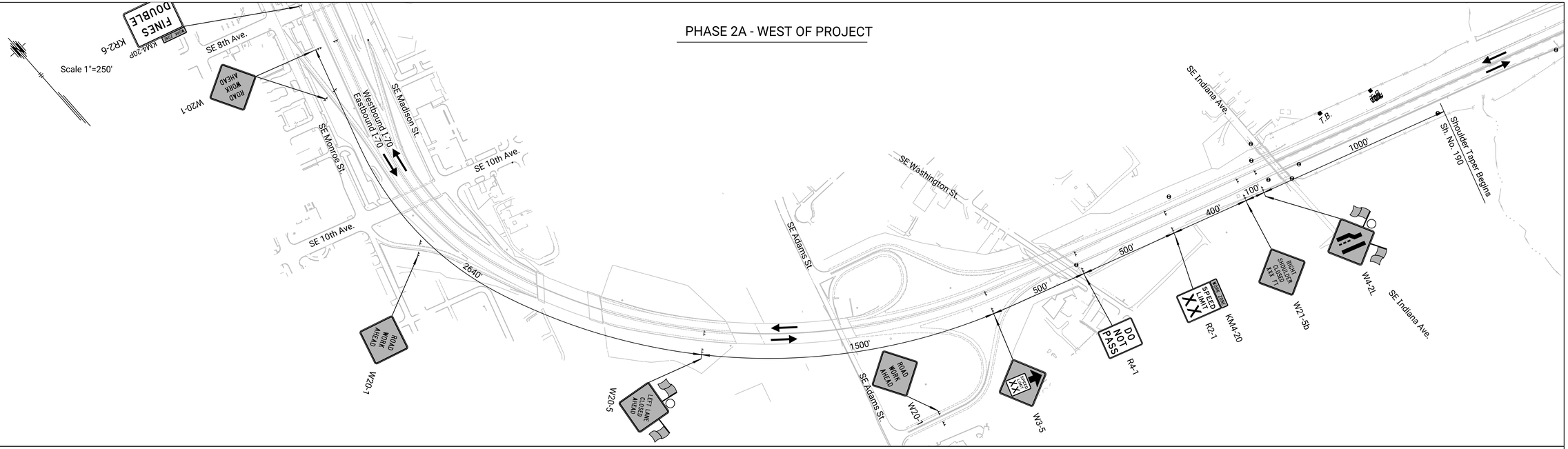
Plotted by : BGS01485 16-DEC-2025 12:47
File : ka680801-cpl-190.dgn

KANSAS DEPARTMENT OF TRANSPORTATION
PHASE 2A
CONSTRUCTION PHASING
NARRATIVE & KEY MAP

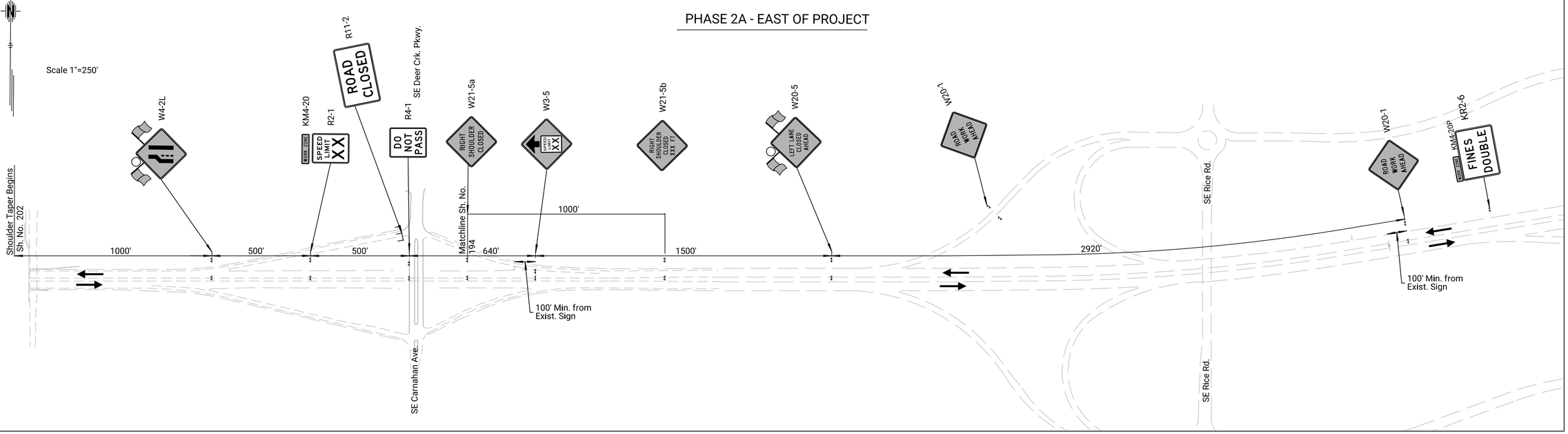
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	189	253

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED

PHASE 2A - WEST OF PROJECT



PHASE 2A - EAST OF PROJECT



LEGEND

Traffic Flow

KANSAS DEPARTMENT OF TRANSPORTATION

I-70 PHASE 2A

ADVANCED WARNING SIGN LAYOUT

Sh. No. 189

Plotted by : BGS01485 16-DEC-2025 15:54
File : ka680801-cpl-190a.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	190	253

DATE	BY	REFERENCES NOTED	REFERENCES CHECKED

Scale 1"=50'

KG20-2 END ROAD WORK
KR2-11 DOUBLE FINES END
R3-33 RIGHT LANE MUST EXIT
W12-2 15-6

8 9 410 1 2 3 4 415 6 7 8 9 420 1 2 3

℄ I-70
℄ I-70

Matchline Sheet No. 189

12' 12' 12' 12' 12' 12' 12' 12' 12' 12' 12' 12' 12' 12' 12' 12' 12' 12'

WESTBOUND I-70
EASTBOUND I-70

Pavement Marking (Solid) (Temporary)(Yellow)(4")

260' Shoulder Taper
32.5' Ch. Device Spacing

260' Shoulder Taper
32.5' Ch. Device Spacing

780' Merging Taper
32.5' Ch. Device Spacing

SPEED LIMIT MAXIMUM 65 40
R2-4a
Cover Sign

NEXT XX MILES
W7-3a

RIGHT SHOULDER CLOSED
W21-5a

EXIT ONLY
California Avenue
EXIT 364 A
E6-1
E1-5

LEGEND

- Arrow Display
- Channelizing Device
- Traffic Flow
- Inertial Barrier System
- Temporary Barrier
- Existing Sign Not Part of Project

KANSAS DEPARTMENT OF TRANSPORTATION

I-70 PHASE IIA

TRAFFIC CONTROL PLAN

Plotted by : BGS01485 16-DEC-2025 15:28
File : ka680801-cpl-191.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	191	253

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED

Scale 1"=50'

Ramp C

Ramp D

Ramp A

Ramp B

SE California Ave.

WESTBOUND I-70

EASTBOUND I-70

Type III Barricades

Type III Barricade

Pavement Marking (Solid) (Temporary)(Yellow)(4")

Pavement Marking (Solid) (Temporary)(White)(4")

780' Merging Taper
32.5' Ch. Device Spacing

260' Shoulder Taper
32.5' Ch. Device Spacing

645' Buffer Space
130' Ch. Device Spacing

100' Downstream Taper
32.5' Ch. Device Spacing

130'
130' Ch. Device Spacing

32.5' Ch.
Device Spacing

Sta. 218+29.82 Construct
Br. No. 70-89-363.90 (324)
Center Substructures and Piers
Outside Substructures and Piers
Bridge Abutments

ROAD CLOSED

R11-2

W4-1R

W4-2R

KR5-10

R11-2

W12-2

15:-1"

D10-3

MILE 3 6 4

EXIT 363 GAS

R-4 7'-6" x 6'-6"

EXIT 364A

E5-1a

R-6

R-2

R-2 7'-6" x 3'-6"

California Ave

R5-1a

WRONG WAY

KR3-8h

KR3-8cL

KR3-8cR

ONLY

Cover Sign

Cover Signs

R1-1

STOP

R6-1R

R6-1L

R5-1

DO NOT ENTER

ONE WAY

LEGEND

- Arrow Display
- Channelizing Device
- Traffic Flow
- Inertial Barrier System
- Temporary Barrier
- Existing Sign Not Part of Project

KANSAS DEPARTMENT OF TRANSPORTATION

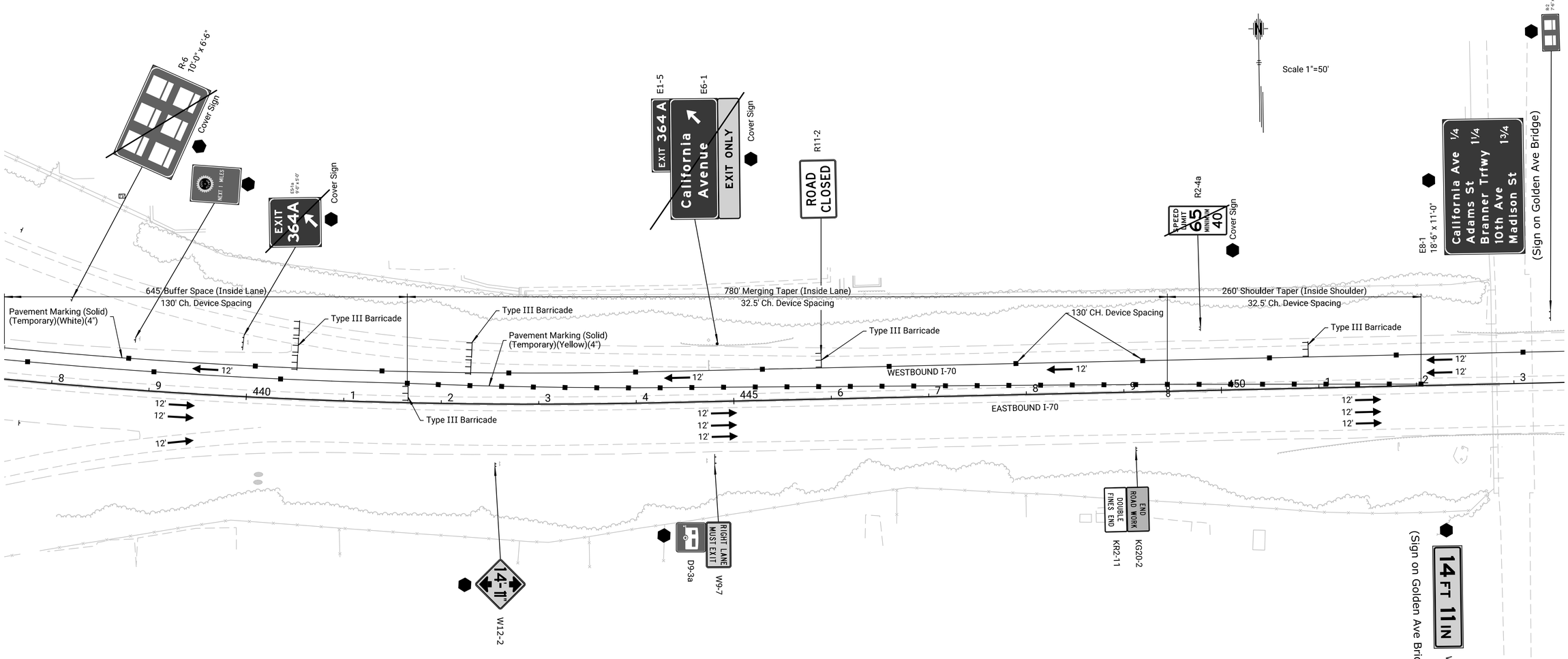
I-70 PHASE IIA

TRAFFIC CONTROL PLAN

Plotted by : BGS01485 16-DEC-2025 12:49
File : ka680801-cpl-192.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	192	253

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED



LEGEND

- Arrow Display
- Channelizing Device
- Traffic Flow
- Inertial Barrier System
- Temporary Barrier
- Existing Sign Not Part of Project

KANSAS DEPARTMENT OF TRANSPORTATION

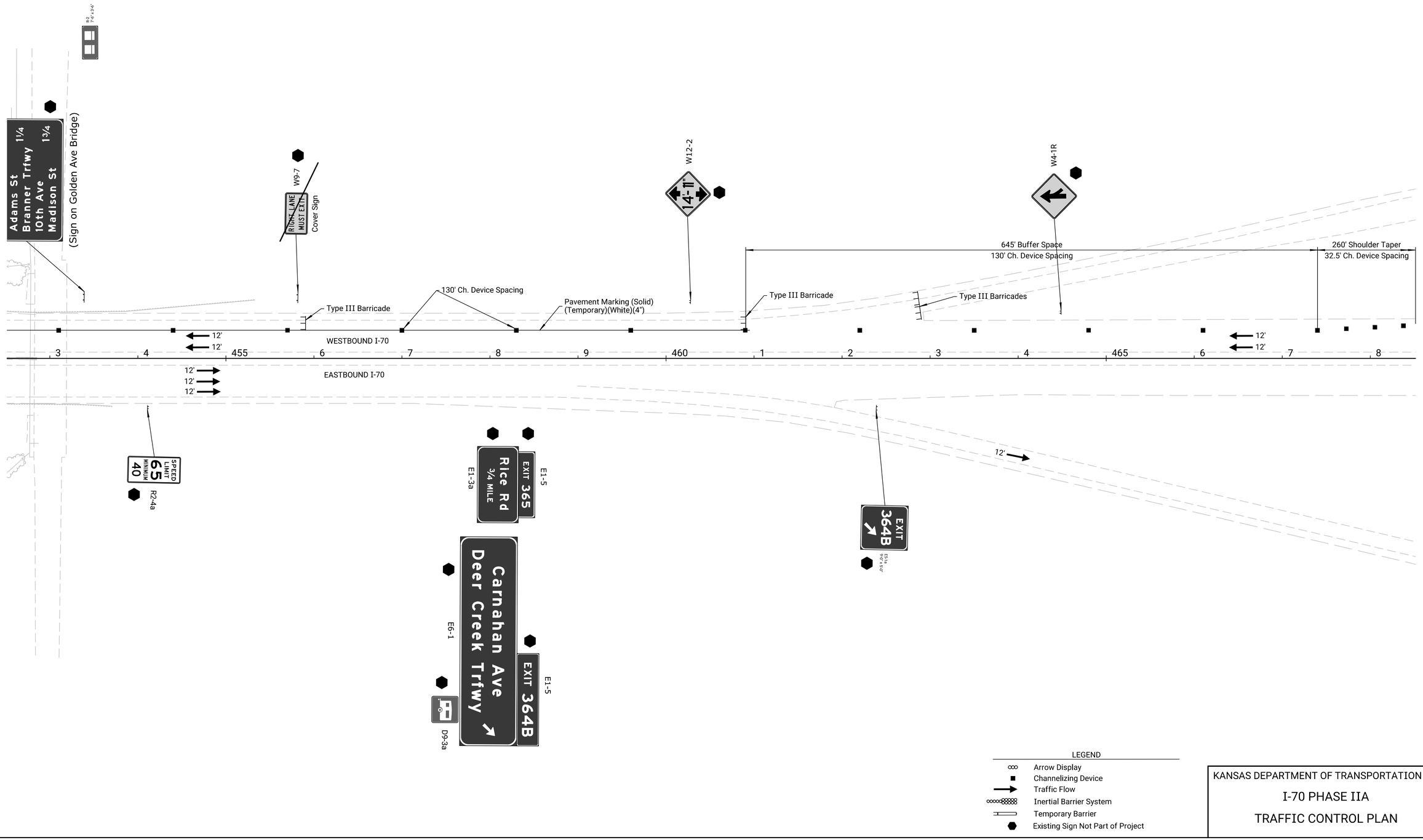
I-70 PHASE IIA

TRAFFIC CONTROL PLAN

Plotted by : BGS01485 16-DEC-2025 15:25
File : ka680801-cpl-193.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	193	253

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED



LEGEND

- Arrow Display
- Channelizing Device
- Traffic Flow
- Inertial Barrier System
- Temporary Barrier
- Existing Sign Not Part of Project

KANSAS DEPARTMENT OF TRANSPORTATION

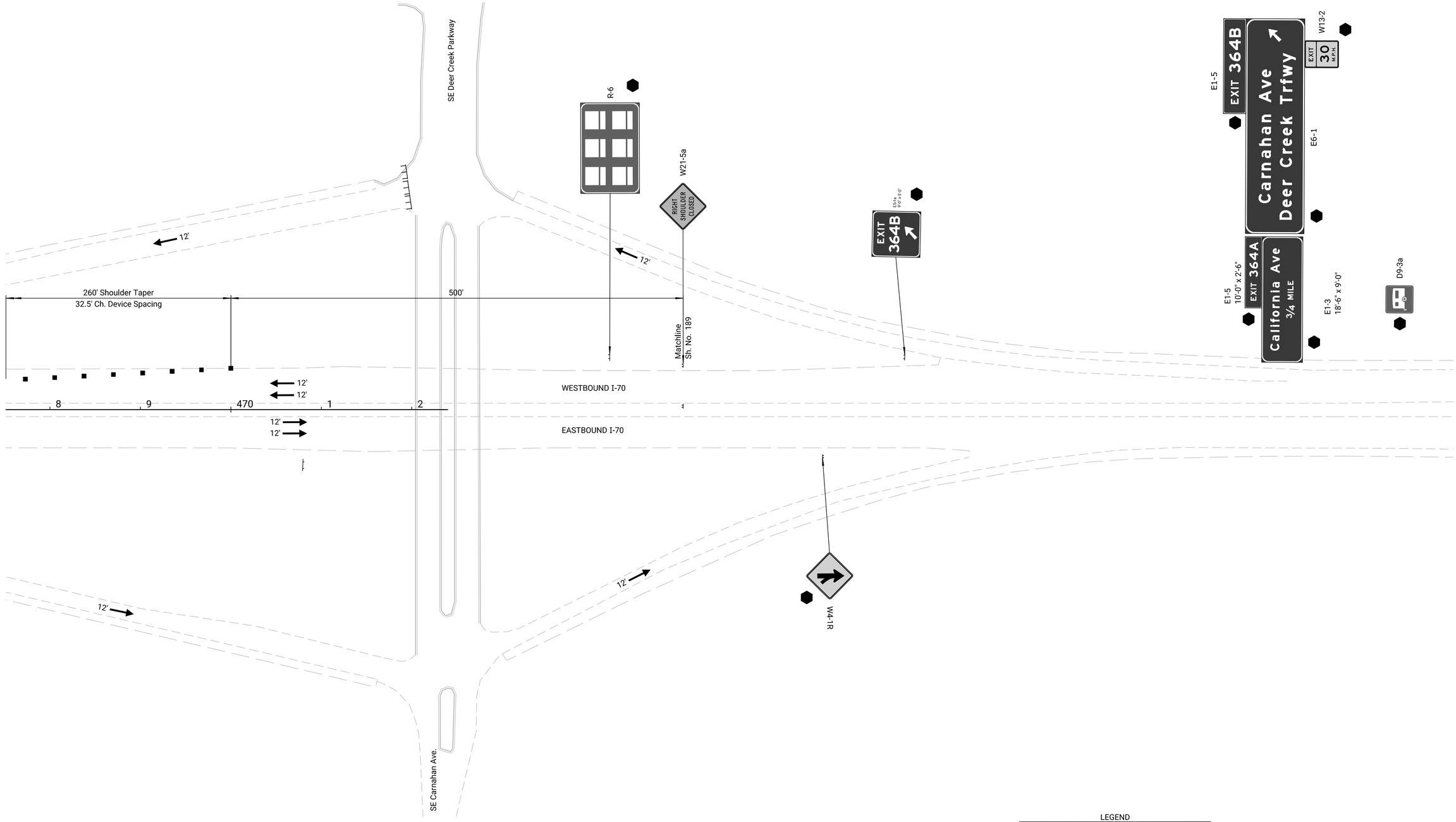
I-70 PHASE IIA

TRAFFIC CONTROL PLAN

Plotted by : BGS01485 16-DEC-2025 12:50
File : ka680801-cpl-194.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	194	253

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED



LEGEND

- Arrow Display
- Channelizing Device
- Traffic Flow
- Inertial Barrier System
- Temporary Barrier
- Existing Sign Not Part of Project

KANSAS DEPARTMENT OF TRANSPORTATION

I-70 PHASE IIA

TRAFFIC CONTROL PLAN

Sh. No. 194

Plotted by : BGS01485 16-DEC-2025 12:50
File : ka680801-cpl-195.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	195	253

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED

Scale 1"=50'

KG20-2 END ROAD WORK

R3-33 RIGHT LANE MUST EXIT

W12-2 15-6"

8 9 410 1 2 3 4 415 6 7 8 9 420 1 2 3

12' 12' 12' WESTBOUND I-70

12' 12' 12' EASTBOUND I-70

12' 12' 12'

12' 12' 12'

Ramp A

422'

1078'

W13-4P ON RAMP

W20-1 ROAD WORK AHEAD

Cover Sign

R2-4a SPEED LIMIT MAXIMUM 65 MINIMUM 40

W7-3a NEXT XX MILES

W21-5a RIGHT SHOULDER CLOSED

E6-1 EXIT ONLY

E1-5 EXIT 364A California Avenue

LEGEND

- Arrow Display
- Channelizing Device
- Traffic Flow
- Inertial Barrier System
- Temporary Barrier
- Existing Sign Not Part of Project

KANSAS DEPARTMENT OF TRANSPORTATION

I-70 PHASE IIA FLAGGER

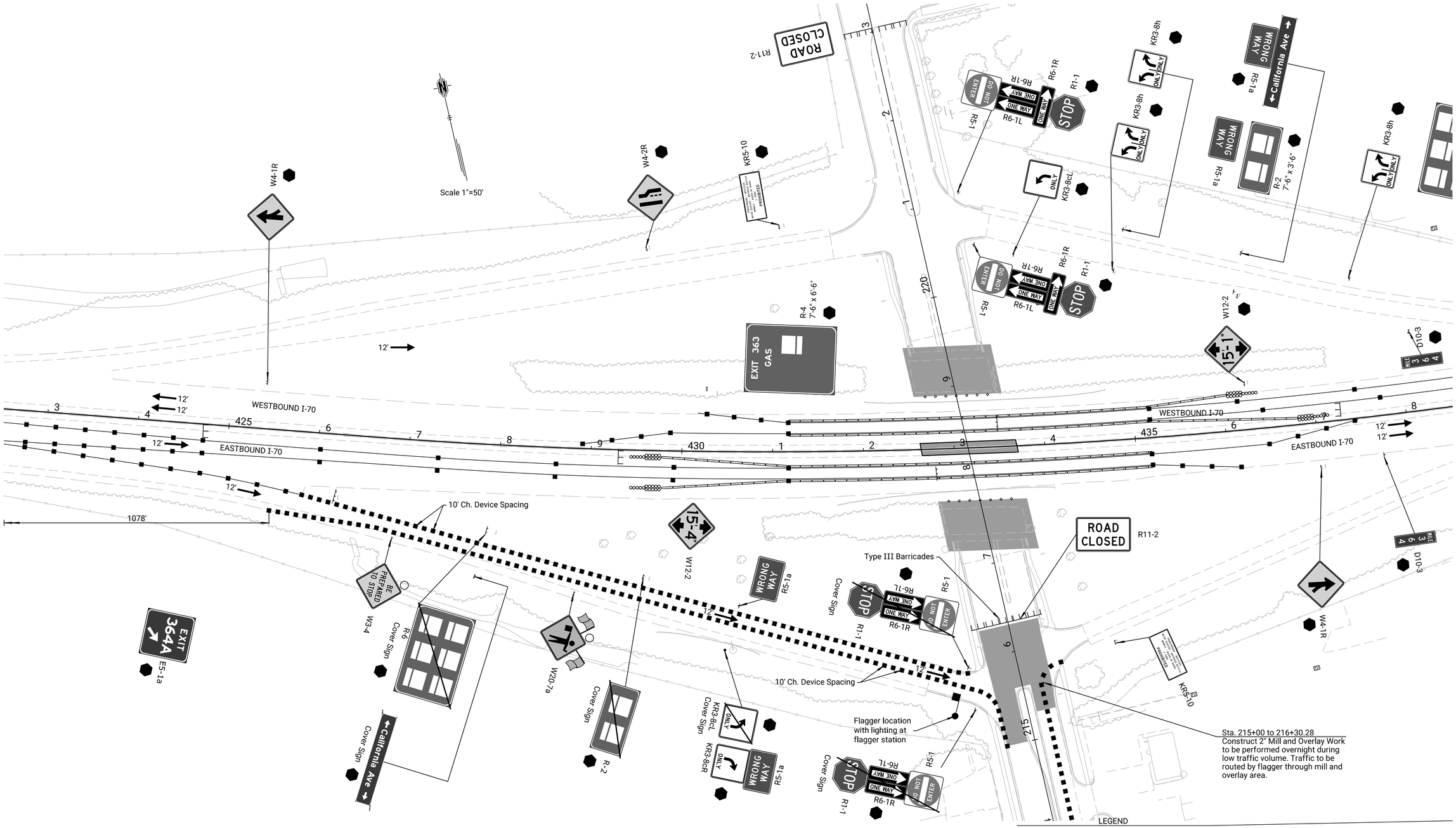
TRAFFIC CONTROL PLAN

Plotted by: BGS01485 16-DEC-2025 12:50
File: ka680801-cpl-196.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	196	253

BY	DATE
REFERENCES NOTED	
REFERENCES CHECKED	

Scale 1"=50'



KANSAS DEPARTMENT OF TRANSPORTATION

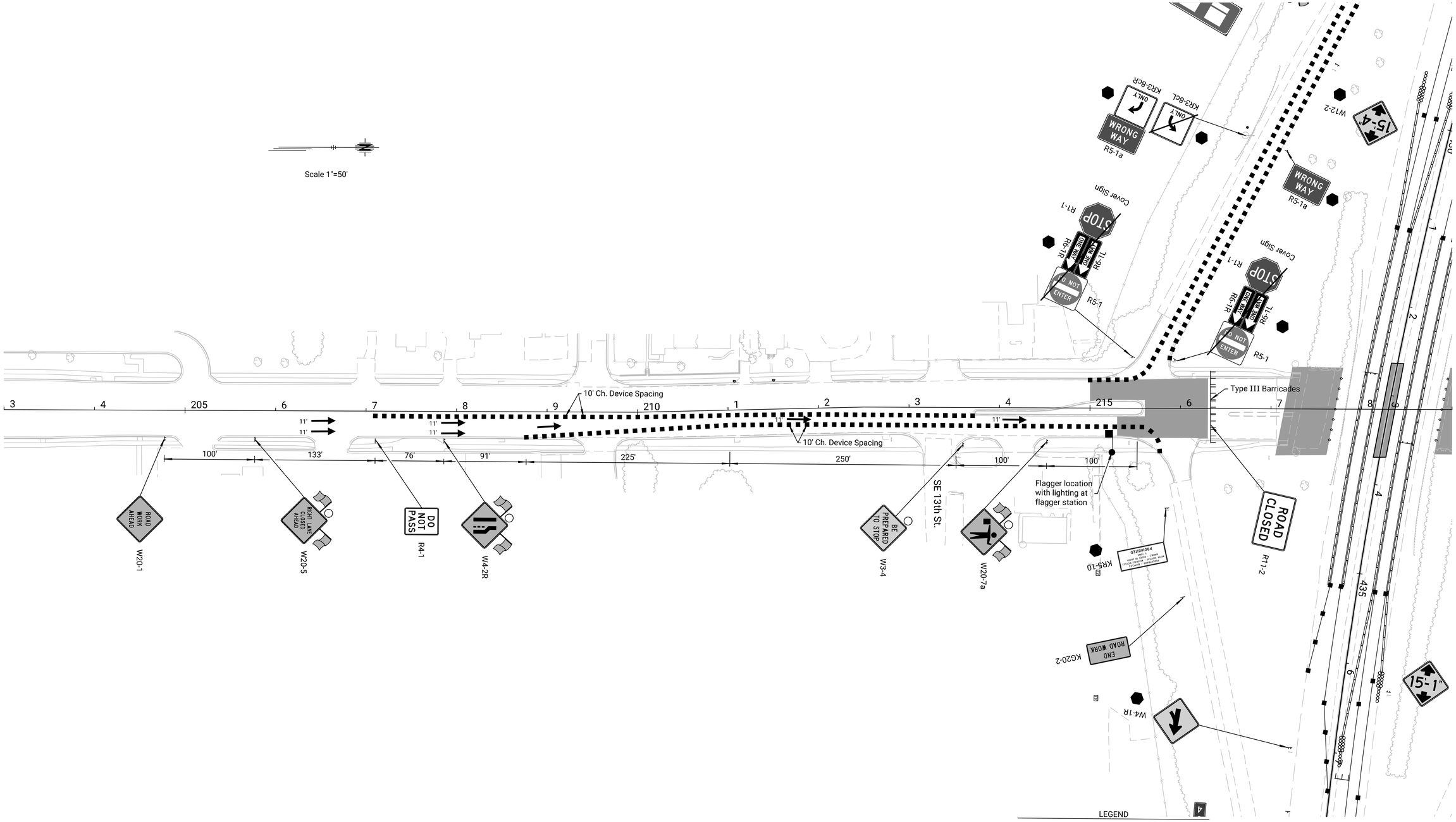
I-70 PHASE IIA FLAGGER TRAFFIC CONTROL PLAN

Plotted by : BGS01485 16-DEC-2025 12:51
File : ka680801-cpl-197.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	197	253

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED

Scale 1"=50'



LEGEND

- Arrow Display
- Channelizing Device
- Traffic Flow
- Inertial Barrier System
- Temporary Barrier
- Existing Sign Not Part of Project

KANSAS DEPARTMENT OF TRANSPORTATION

I-70 PHASE IIA FLAGGER

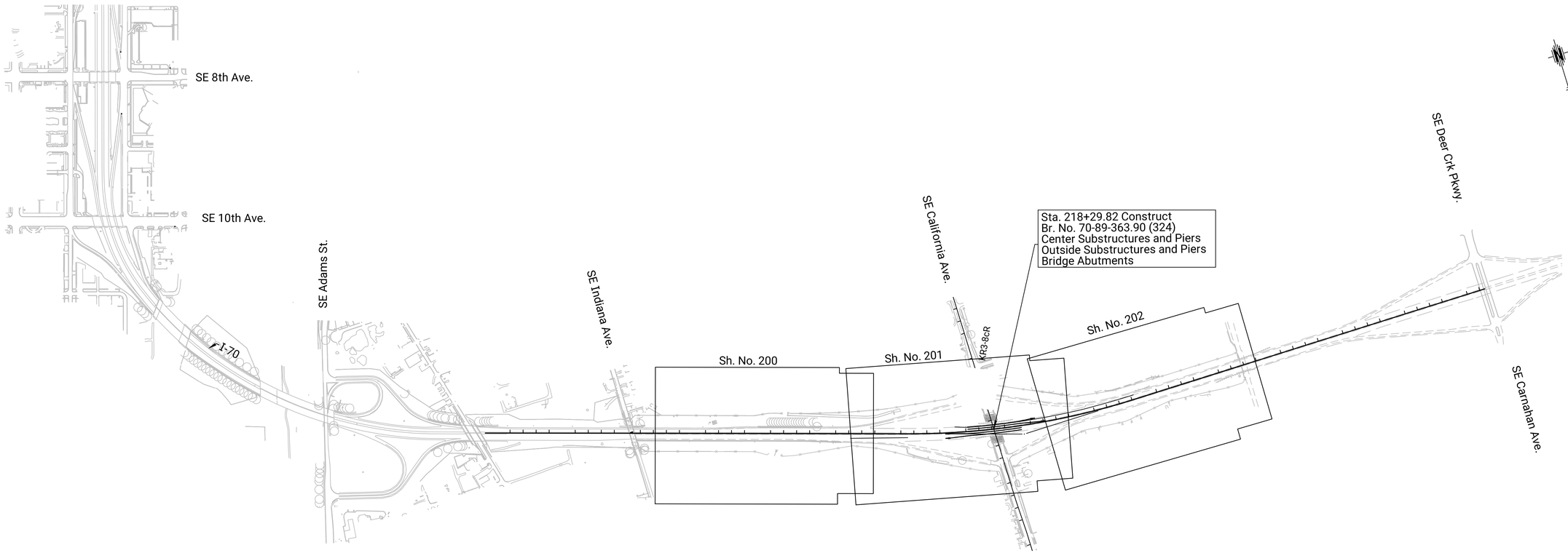
TRAFFIC CONTROL PLAN

Plotted by : BGS01485 16-DEC-2025 12:51
File : ka680801-cpl-198.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	198	253

CONSTRUCTION SEQUENCE		
PHASE	CONSTRUCTION	TRAFFIC
2	Construct Center Substructure & Piers Construct Outside Substructures & Piers Construct Bridge Abutments	California Avenue Closed between Ramp Terminals California Avenue Open North of Ramp Terminals California Avenue Open South of Ramp Terminals All Ramps Open No Left Turns allowed onto California Ave. from Off-Ramps I-70 One-Lane of Traffic in each direction in the outside drive lane (16' Lane with CSB each side)

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED



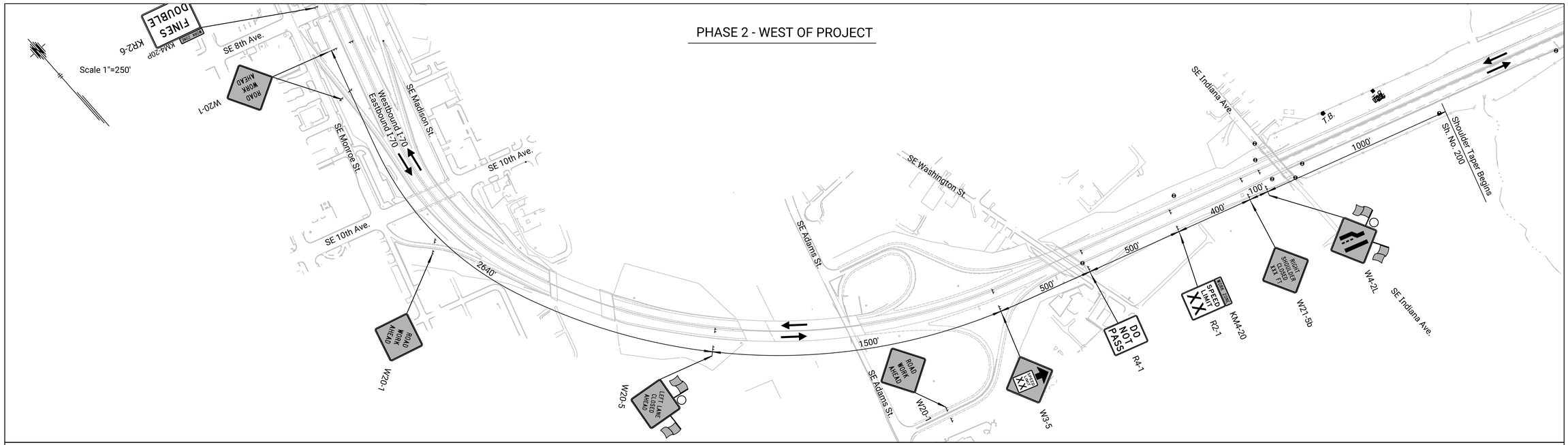
Plotted by : BGS01485 16-DEC-2025 12:52
File : ka680801-cpl-200.dgn

KANSAS DEPARTMENT OF TRANSPORTATION
PHASE 2
CONSTRUCTION PHASING
NARRATIVE & KEY MAP

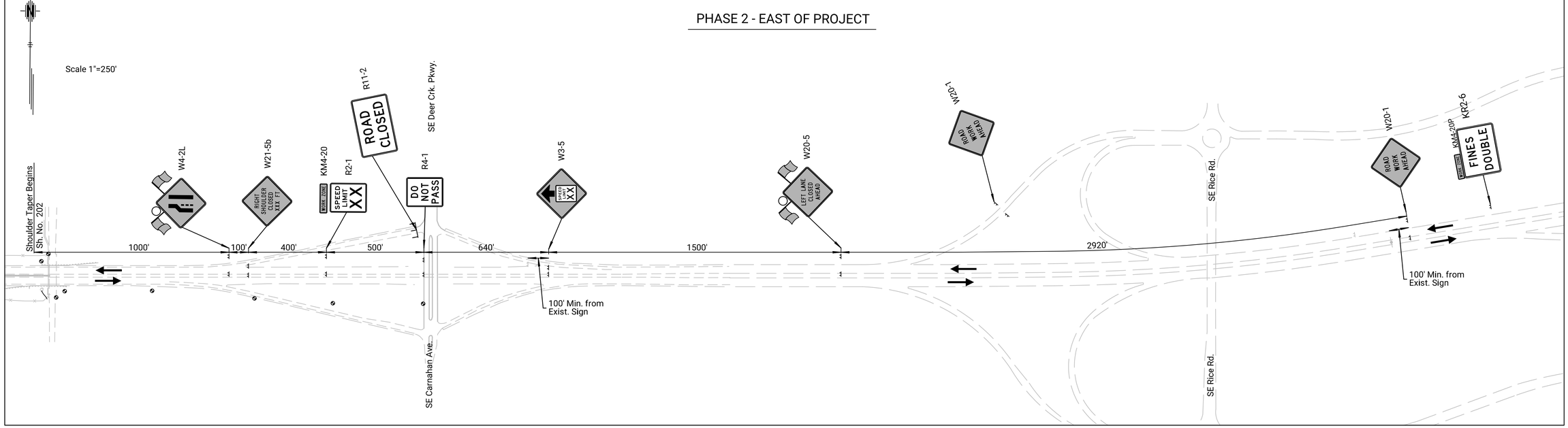
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	199	253

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED

PHASE 2 - WEST OF PROJECT



PHASE 2 - EAST OF PROJECT



LEGEND

Traffic Flow

KANSAS DEPARTMENT OF TRANSPORTATION

I-70 PHASE 2

ADVANCED WARNING SIGN LAYOUT

Sh. No. 199

Plotted by : BGS01485 16-DEC-2025 15:15
File : ka680801-cpl-200a.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	200	253

DATE	BY	REFERENCES NOTED	REFERENCES CHECKED

Scale 1"=50'

KG20-2 END ROAD WORK
KR2-11 DOUBLE FINES END
R3-33 RIGHT LANE MUST EXIT
W12-2 15-6

8 9 410 1 2 3 4 415 6 7 8 9 420 1 2 3

℄ I-70
℄ I-70

Matchline Sheet No. 199

12' 12' 12' 12' 12' 12' 12' 12' 12' 12' 12' 12' 12' 12' 12' 12' 12' 12'

WESTBOUND I-70
EASTBOUND I-70

Pavement Marking (Solid) (Temporary)(Yellow)(4")

260' Shoulder Taper
32.5' Ch. Device Spacing

260' Shoulder Taper
32.5' Ch. Device Spacing

780' Merging Taper
32.5' Ch. Device Spacing

SPEED LIMIT MAXIMUM 65 40
R2-4a
Cover Sign

NEXT XX MILES
W7-3a

RIGHT SHOULDER CLOSED
W21-5a

EXIT ONLY
California Avenue
EXIT 364 A
E6-1
E1-5

LEGEND

- Arrow Display
- Channelizing Device
- Traffic Flow
- Inertial Barrier System
- Temporary Barrier
- Existing Sign Not Part of Project

KANSAS DEPARTMENT OF TRANSPORTATION

I-70 PHASE II

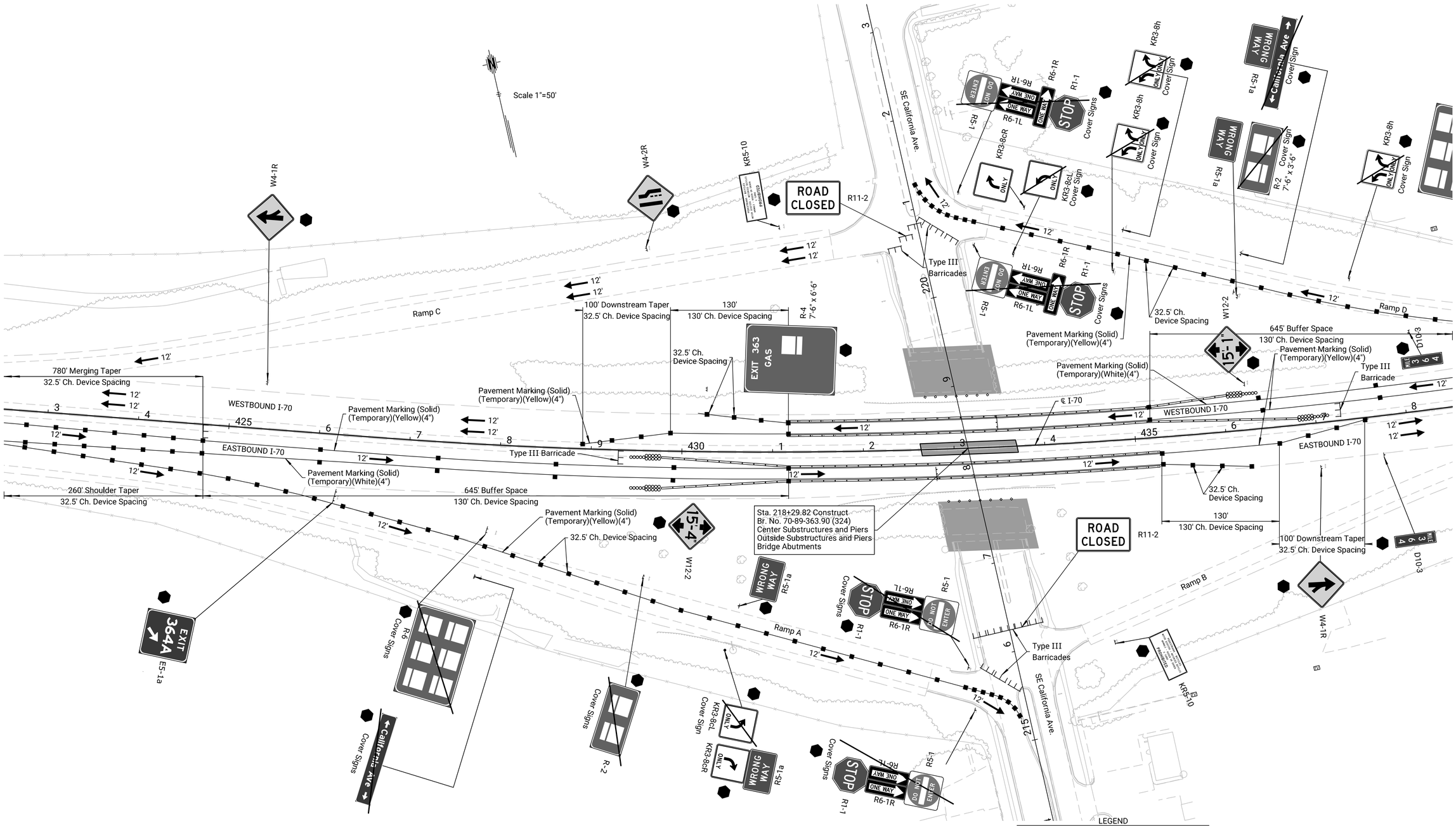
TRAFFIC CONTROL PLAN

Plotted by : BGS01485 16-DEC-2025 15:05
File : ka680801-cpl-201_dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	201	253

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED

Plotted by : BGS01485 16-DEC-2025 12:53
File : ka680801-cpl-202.dgn



KANSAS DEPARTMENT OF TRANSPORTATION

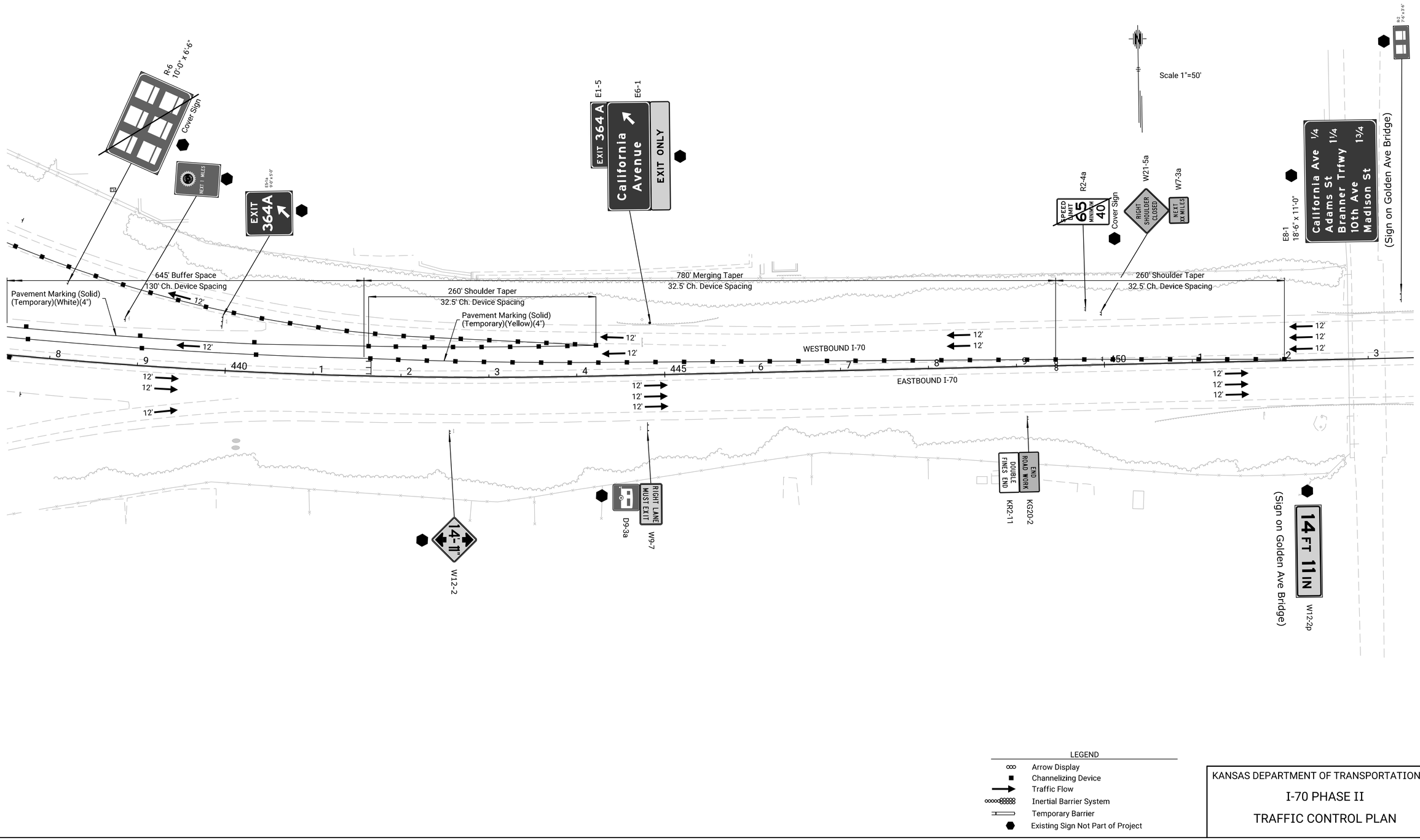
I-70 PHASE II

TRAFFIC CONTROL PLAN

Sh. No. 201

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	202	253

DATE	BY	REFERENCES NOTED / REFERENCES CHECKED



LEGEND

- Arrow Display
- Channelizing Device
- Traffic Flow
- Inertial Barrier System
- Temporary Barrier
- Existing Sign Not Part of Project

KANSAS DEPARTMENT OF TRANSPORTATION

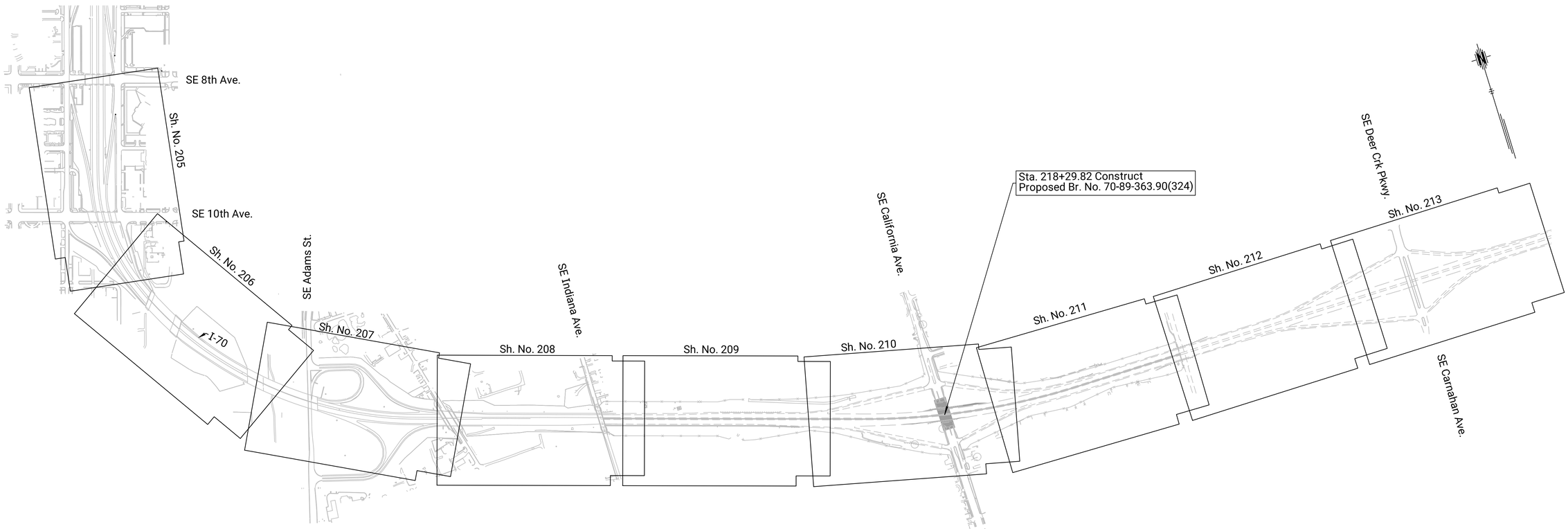
I-70 PHASE II

TRAFFIC CONTROL PLAN

Plotted by : BGS01485 16-DEC-2025 15:03
File : ka680801-cpl-203.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	203	253

CONSTRUCTION SEQUENCE		
PHASE	CONSTRUCTION	TRAFFIC
3	Construct Superstructure Construct I-70 Guardrail and Ditch Grading	I-70 Closed California Avenue Closed North of WB Ramp Terminals at SE 11th St. California Avenue Closed South of EB Ramp Terminals near SE 13th St. Close Entrance North of SE 13th St. on East Side of California Ave. EB Off-Ramp and On-Ramp to be used as Detour for EB I-70 (Single Lane) WB Off-Ramp and On-Ramp to be used as Detour for WB I-70 (Single Lane) No turns allowed in any direction onto California Ave. from Ramps



KANSAS DEPARTMENT OF TRANSPORTATION

PHASE 3

CONSTRUCTION PHASING

NARRATIVE & KEY MAP

Sh. No. 203

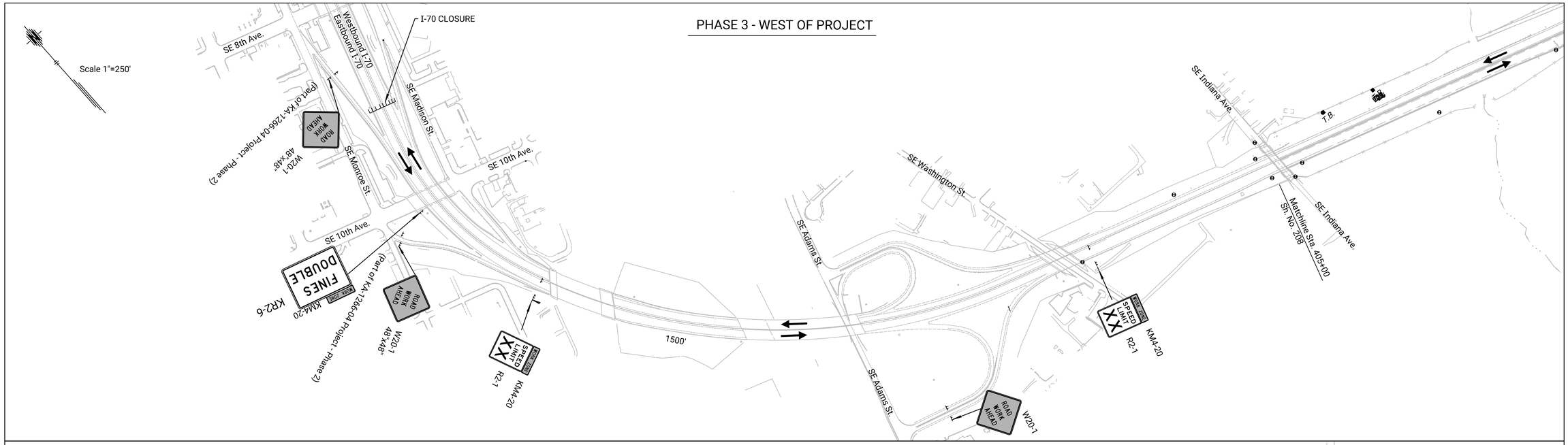
DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED

Plotted by : BGS01485 16-DEC-2025 12:54
File : ka680801-cpl-300.dgn

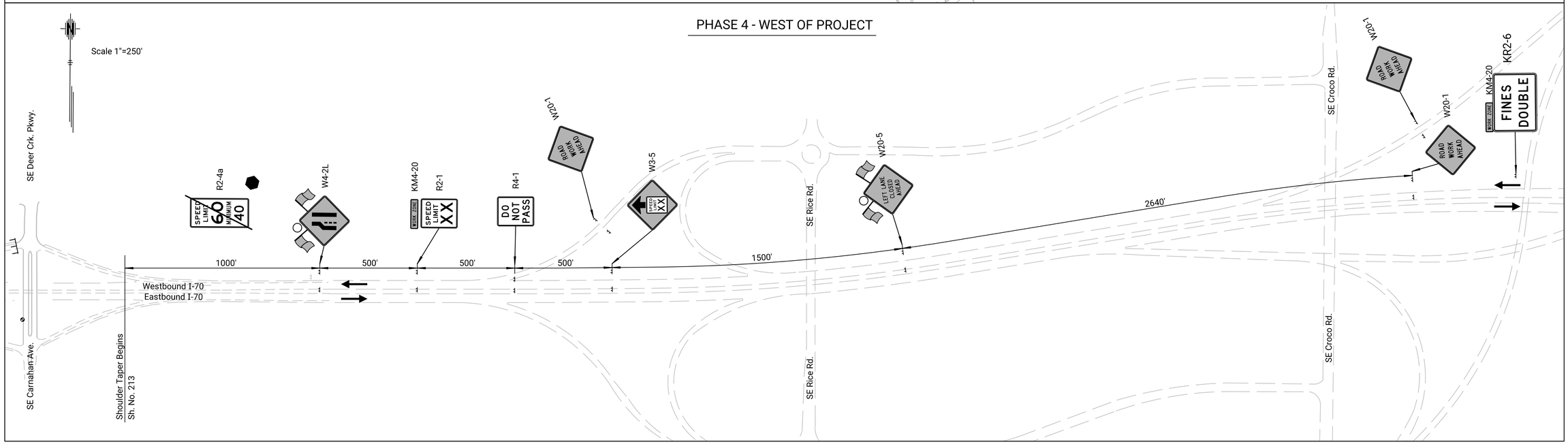
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	204	253

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED

PHASE 3 - WEST OF PROJECT



PHASE 4 - WEST OF PROJECT



LEGEND

- Existing Sign Not Part of Project
- Traffic Flow

KANSAS DEPARTMENT OF TRANSPORTATION

I-70 PHASE 3

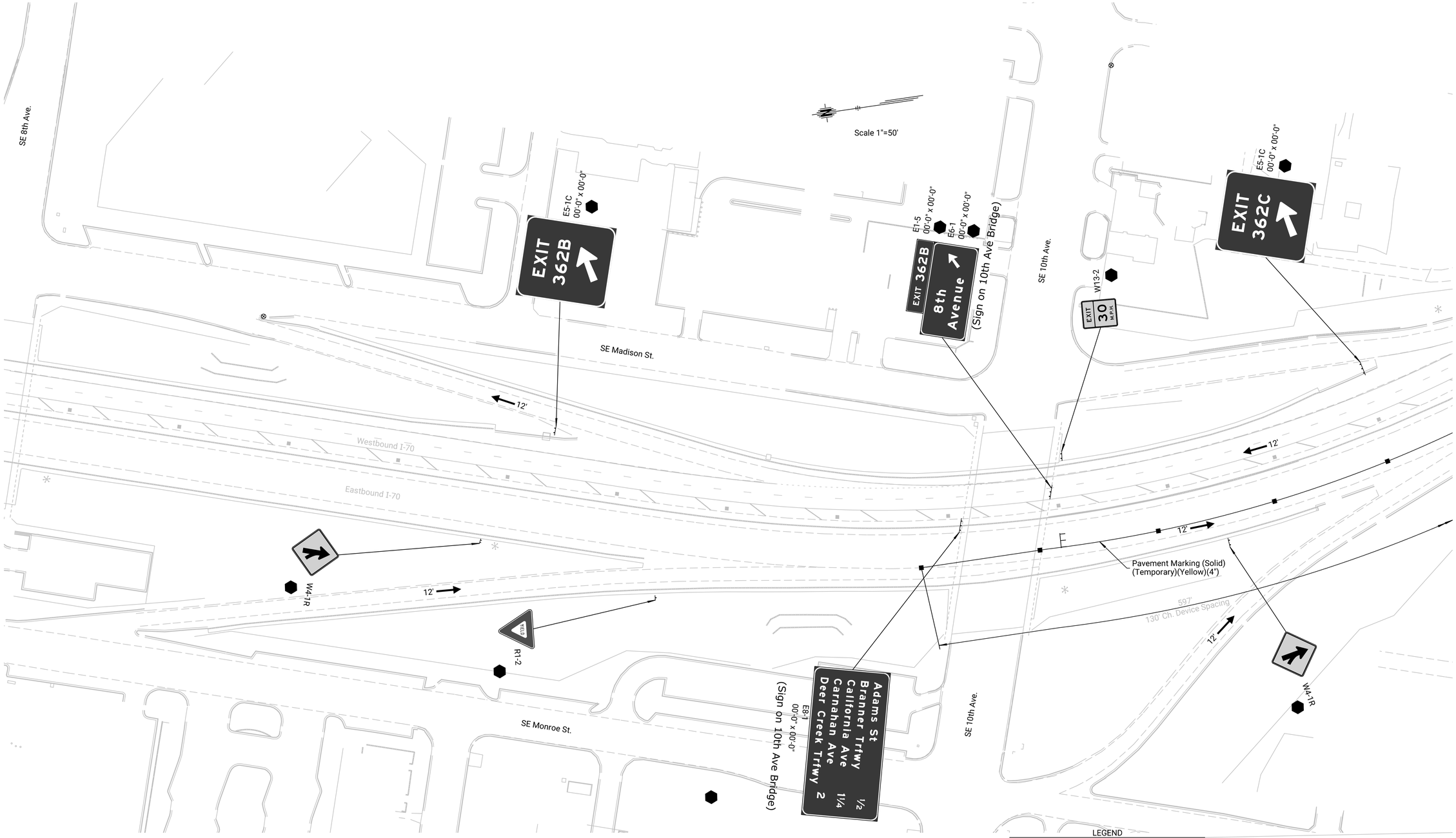
ADVANCED WARNING SIGN LAYOUT

Sh. No. 204

Plotted by : BGS01485 16-DEC-2025 14:52
File : ka680801-cpl-300a.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	205	253

	BY	DATE
REFERENCES NOTED		
REFERENCES CHECKED		



KANSAS DEPARTMENT OF TRANSPORTATION

I-70 PHASE III

TRAFFIC CONTROL PLAN

Sh. No. 205

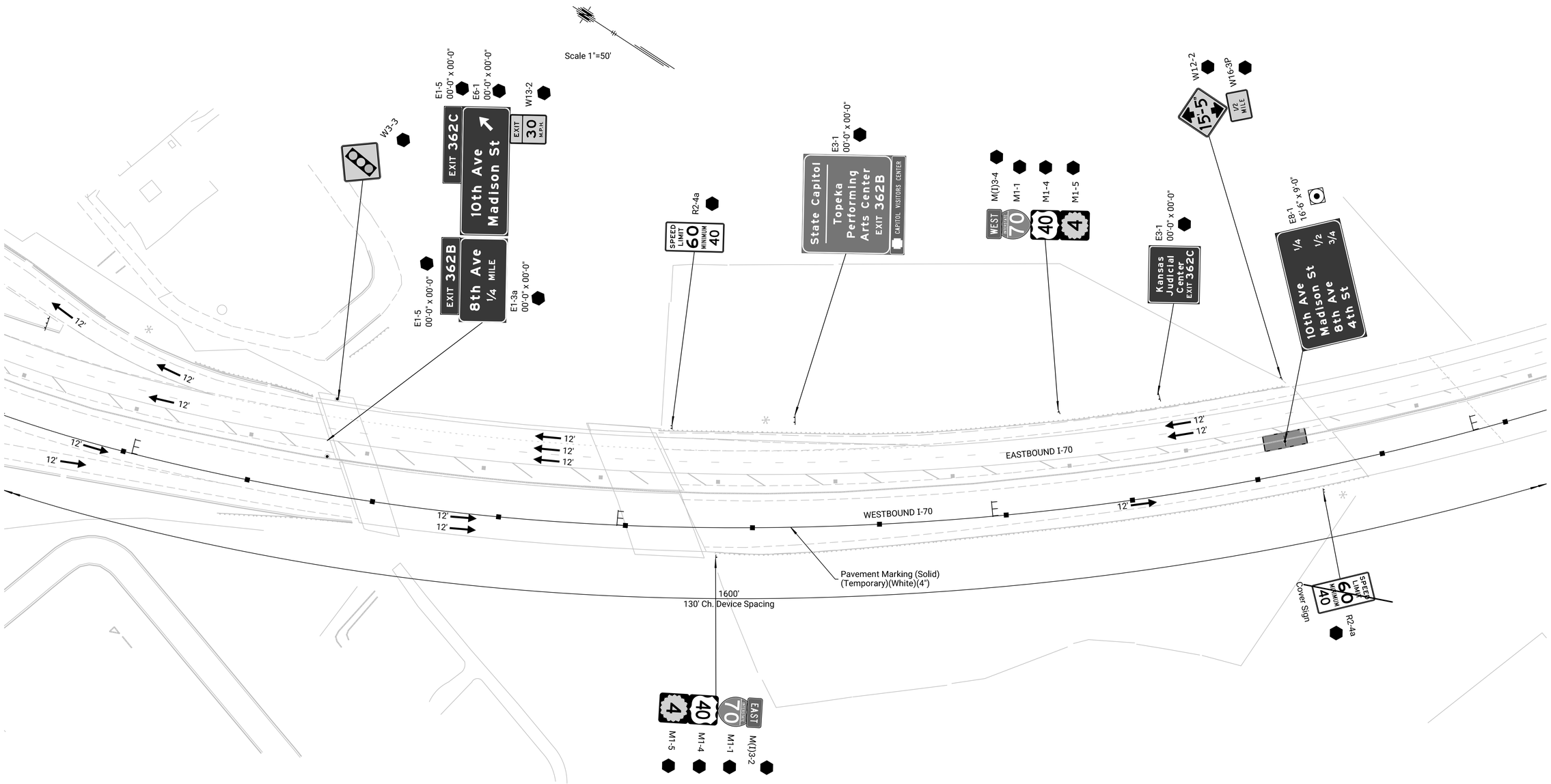
Plotted by : BGS01485 16-DEC-2025 12:54
File : ka680801-cpl-301.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	206	253

DATE	BY

REFERENCES NOTED
REFERENCES CHECKED

Scale 1"=50'



LEGEND

- Arrow Display
- Channelizing Device
- Traffic Flow
- Inertial Barrier System
- Temporary Barrier
- Existing Sign Not Part of Project

KANSAS DEPARTMENT OF TRANSPORTATION

I-70 PHASE III

TRAFFIC CONTROL PLAN

Sh. No. 206

Plotted by : BGS01485 16-DEC-2025 12:55
File : ka680801-cpl-302.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	207	253

DATE	BY	
REFERENCES NOTED		
REFERENCES CHECKED		

Scale 1"=50'

SE Adams St.

E9
9'-0" x 7'-0"
Central Business District
NEXT 3 EXITS

E5-1a
7'-6" x 5'-0"
EXIT 363

1600'
130' Ch. Device Spacing

D10-3
MILE 3 6 3

W4-3R

Type III Barricade

12'

70-89 KA-1266-04
EB I-70 - Phase 2
Stage 1 Traffic Control

70-89 KA-6808-01
EB I-70 Traffic Control

WESTBOUND I-70

EASTBOUND I-70

Pavement Marking (Solid)
(Temporary)(Yellow)(4")

2457'
130' Ch. Device Spacing

E1-3
18'-6" x 9'-0"
EXIT ONLY
California Ave
3/4 MILE
EXIT 364A

E1-5
10'-0" x 2'-6"

E6-1
21'-6" x 8'-6"
Adams St
Branner Trfwy
20 MPH
EXIT 363

E1-5
9'-0" x 2'-6"

D10-3
MILE 3 6 3

E5-1a
7'-6" x 5'-0"
EXIT 363

W7-3aP
1/4 MILE

W12-2
14'-11"

W4-1R

R6

LEGEND

- Arrow Display
- Channelizing Device
- Traffic Flow
- Inertial Barrier System
- Temporary Barrier
- Existing Sign Not Part of Project

KANSAS DEPARTMENT OF TRANSPORTATION

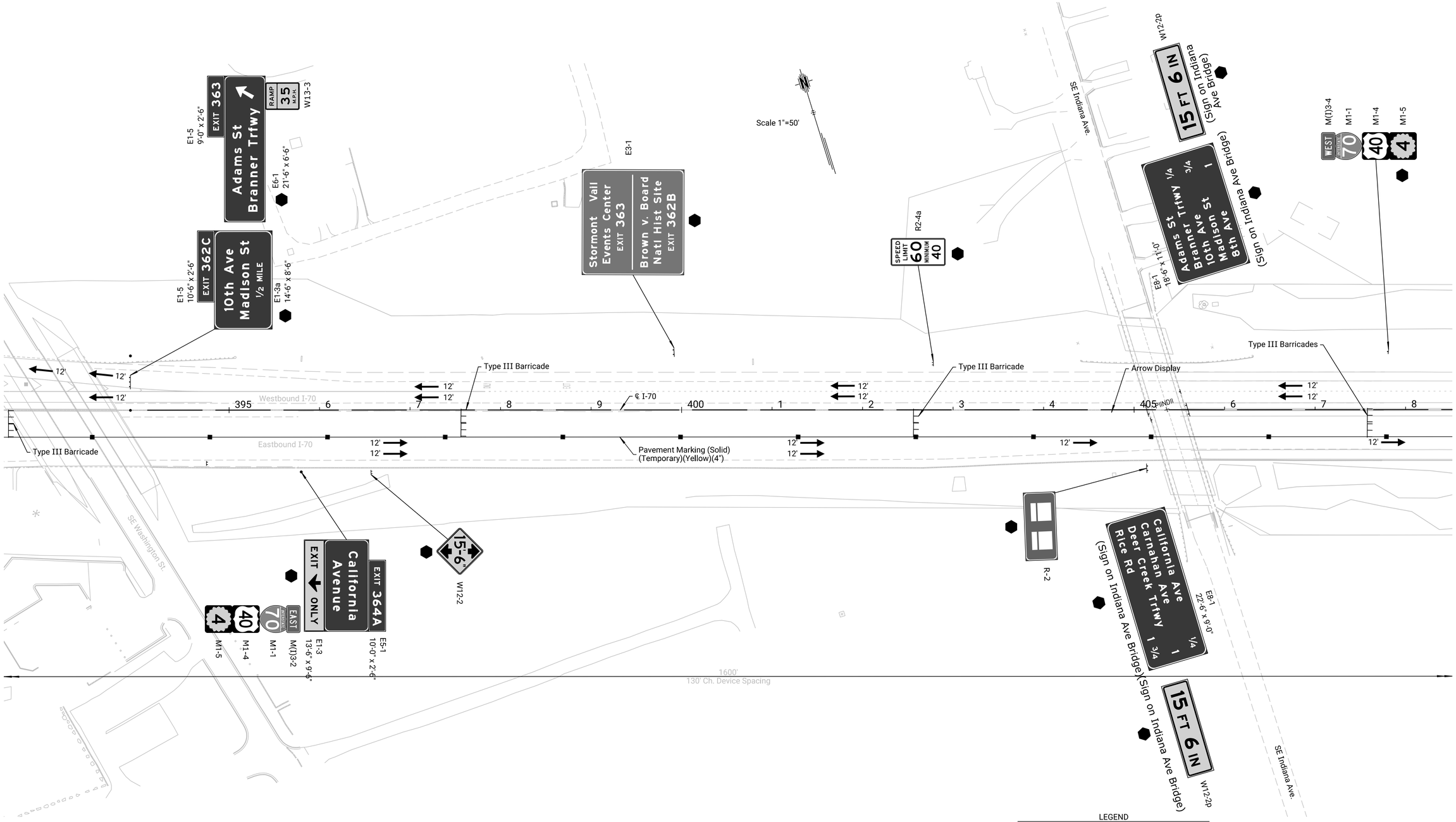
I-70 PHASE III

TRAFFIC CONTROL PLAN

Plotted by : BGS01485 16-DEC-2025 12:55
File : ka680801-cpl-303.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	208	253

DATE	BY	
REFERENCES NOTED		
REFERENCES CHECKED		



LEGEND

- Arrow Display
- Channelizing Device
- Traffic Flow
- Inertial Barrier System
- Temporary Barrier
- Existing Sign Not Part of Project

KANSAS DEPARTMENT OF TRANSPORTATION

I-70 PHASE III

TRAFFIC CONTROL PLAN

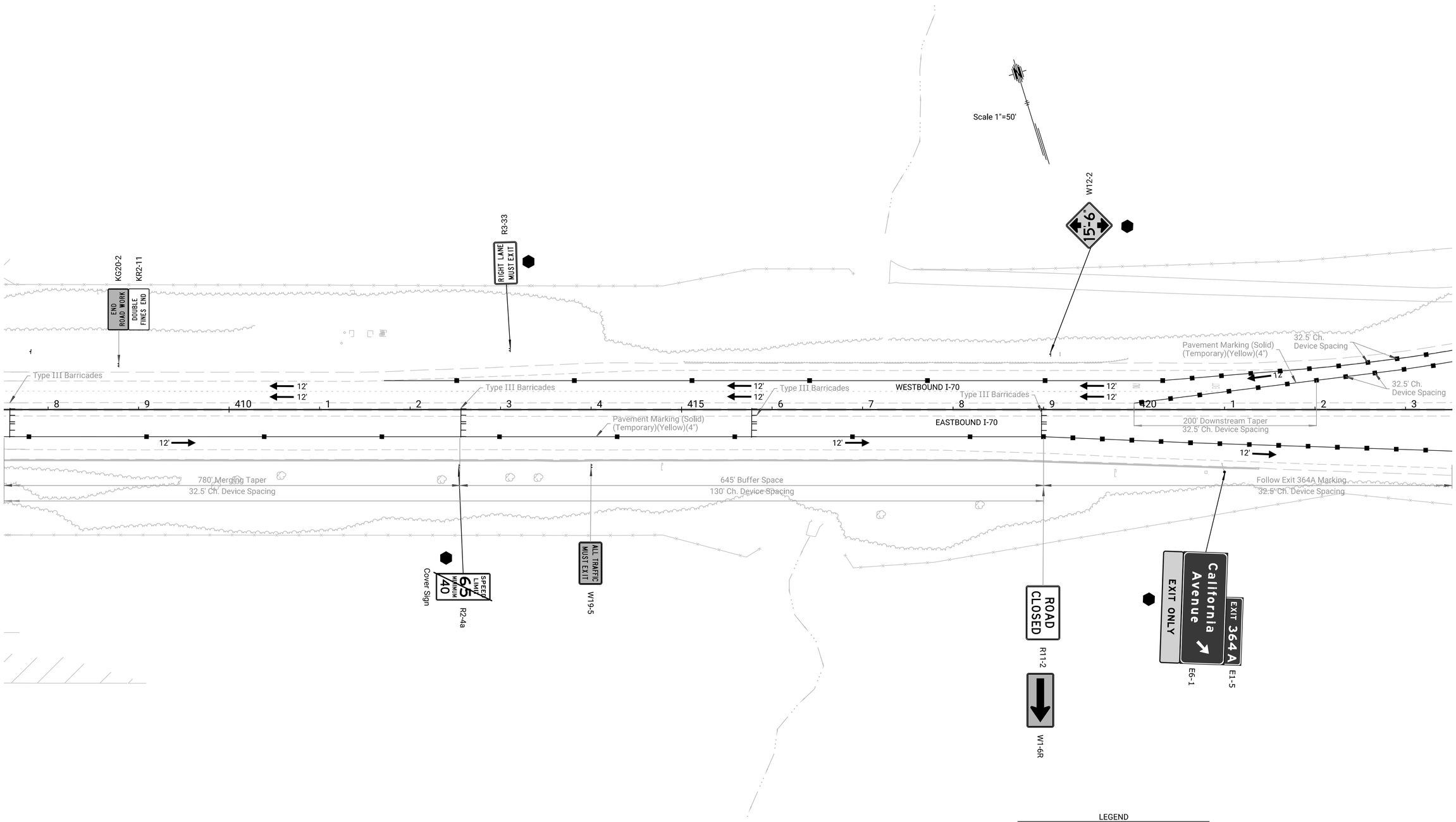
Sh. No. 208

Plotted by : BGS01485 16-DEC-2025 12:55
File : ka680801-cpl-304.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	209	253

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED

Scale 1"=50'



LEGEND

- Arrow Display
- Channelizing Device
- Traffic Flow
- Inertial Barrier System
- Temporary Barrier
- Existing Sign Not Part of Project

KANSAS DEPARTMENT OF TRANSPORTATION

I-70 PHASE III

TRAFFIC CONTROL PLAN

Plotted by : BGS01485 16-DEC-2025 14:42
File : ka680801-cpl-305.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	210	253

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED

Scale 1"=50'

Ramp C

Ramp D

Ramp A

Ramp B

Westbound I-70

Eastbound I-70

℄ I-70

California Ave.

SE California Ave.

Type III Barricades

32.5' Ch. Device Spacing

10' Ch. Device Spacing

Pavement Marking (Solid) (Temporary)(White)(4")

Pavement Marking (Solid) (Temporary)(Yellow)(4")

Follow Exit 364A Marking
32.5' Ch. Device Spacing

Sta. 218+29.82 Construct
Proposed Br. No. 70-89-363-90 (324)

W4-1R

W4-2R

KR5-10

R11-2 ROAD CLOSED

W1-8L

KR3-8cL Cover Sign

R6-1R ONE WAY

R6-1L ONE WAY

R5-1 STOP

R1-1 Cover Sign

KR3-8h ONE WAY Cover Sign

R5-1a WRONG WAY

R5-1a ← California Ave Cover Sign

R-2 7'-6" x 3'-6"

R-4 7'-6" x 6'-6"

EXIT 363 GAS

W12-2 15'-1"

W1-2L

W13-1 XX M.P.H.

D10-3 MILE 3 6 4

EXIT 364A E5-1a

R-6 Cover Sign

W13-1

W1-2L

R-2

KR3-8cR Cover Sign

KR3-8cR ONLY

R5-1a WRONG WAY

W12-2 15'-4"

← California Ave Cover Sign

R11-2 ROAD CLOSED

W1-8L

KR5-10 Pavement Marking (Solid) (Temporary)(White)(4")

215'

LEGEND

- Arrow Display
- Channelizing Device
- Traffic Flow
- Inertial Barrier System
- Temporary Barrier
- Existing Sign Not Part of Project

KANSAS DEPARTMENT OF TRANSPORTATION

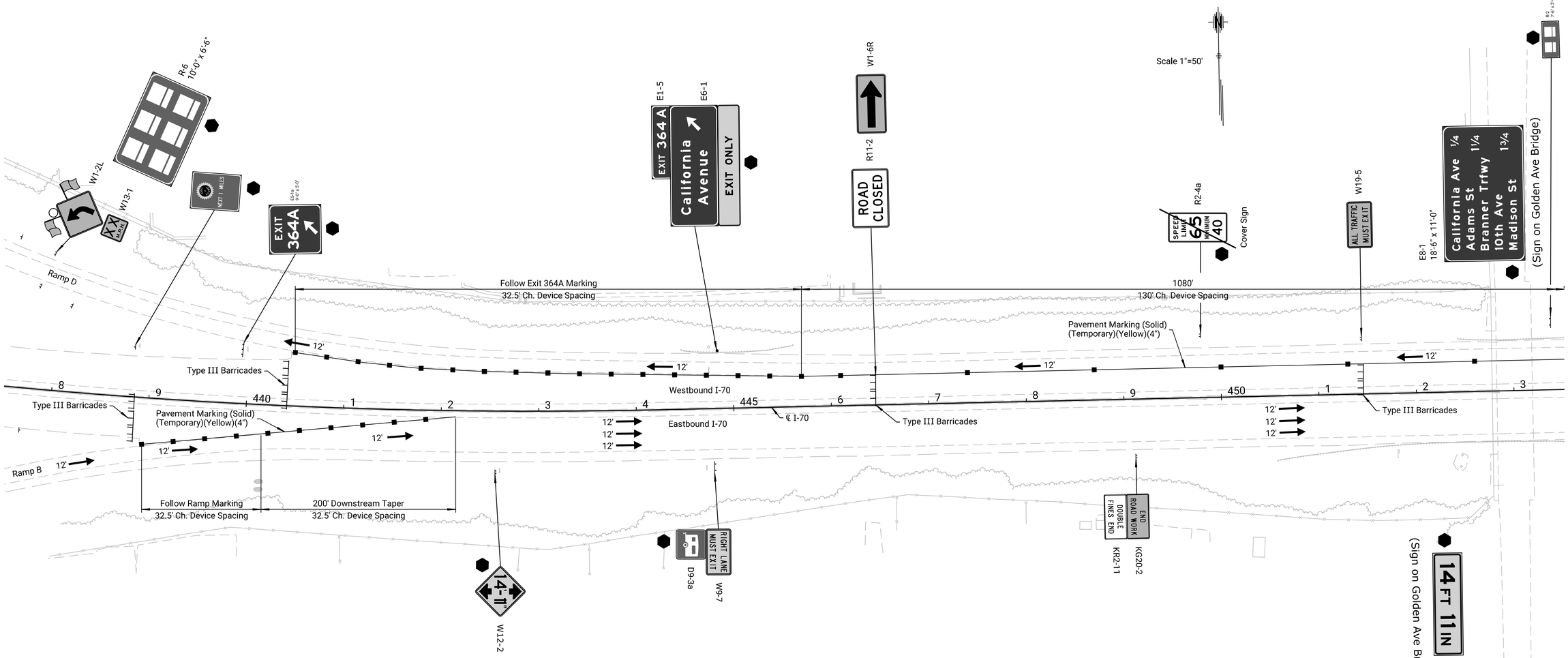
I-70 PHASE III

TRAFFIC CONTROL PLAN

Plotted by : BGS01485 16-DEC-2025 12:56
File : ka680801-cpl-306.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	211	253

DATE	BY	REFERENCES NOTED	REFERENCES CHECKED



LEGEND

- Arrow Display
- Channelizing Device
- Traffic Flow
- Inertial Barrier System
- Temporary Barrier
- Existing Sign Not Part of Project

KANSAS DEPARTMENT OF TRANSPORTATION

I-70 PHASE III

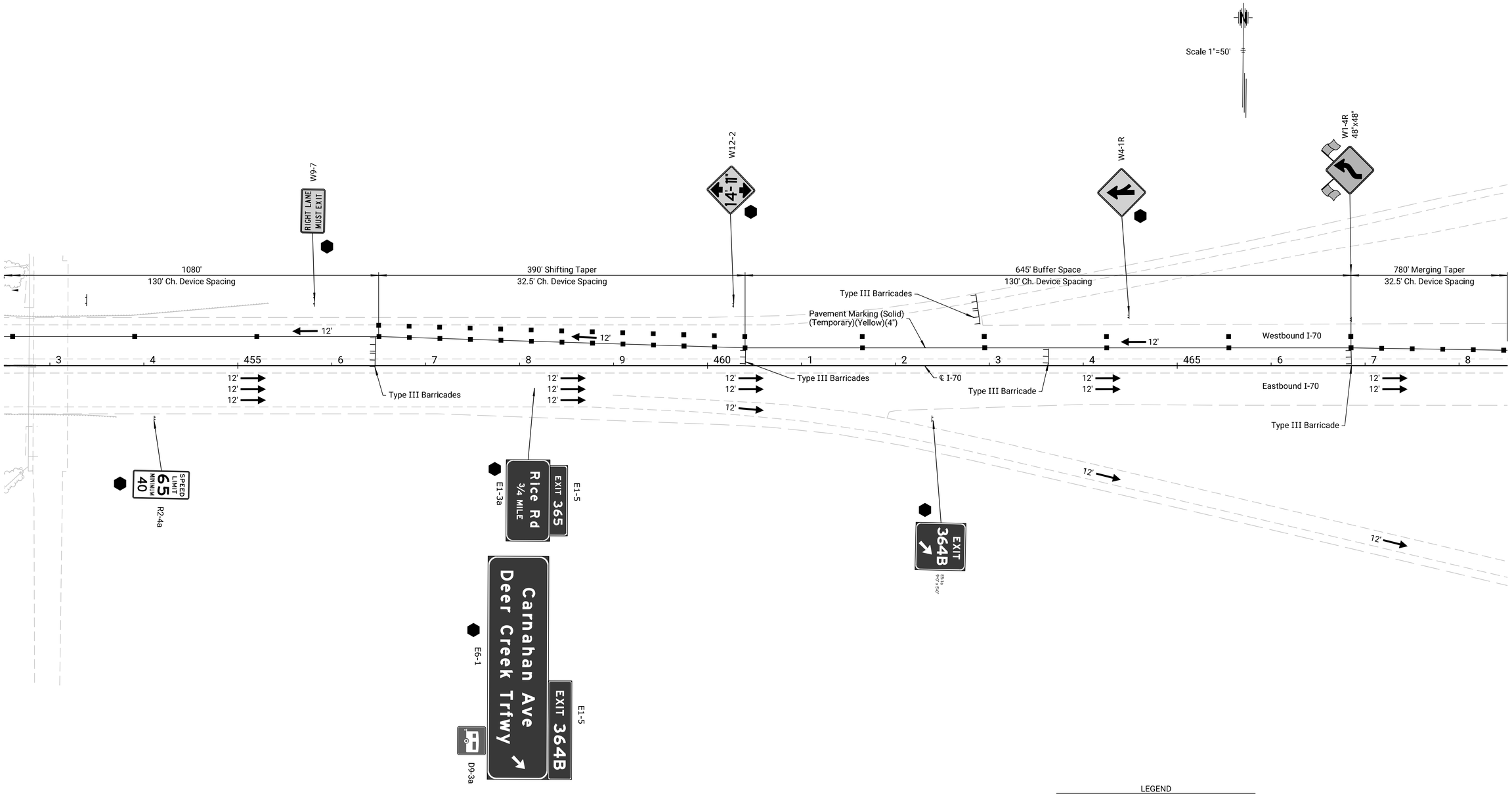
TRAFFIC CONTROL PLAN

Sh. No. 211

Plotted by : BGS01485 16-DEC-2025 14:39
File : ka680801-cpl-307.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	212	253

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED



LEGEND

- Arrow Display
- Channelizing Device
- Traffic Flow
- Inertial Barrier System
- Temporary Barrier
- Existing Sign Not Part of Project

KANSAS DEPARTMENT OF TRANSPORTATION

I-70 PHASE III

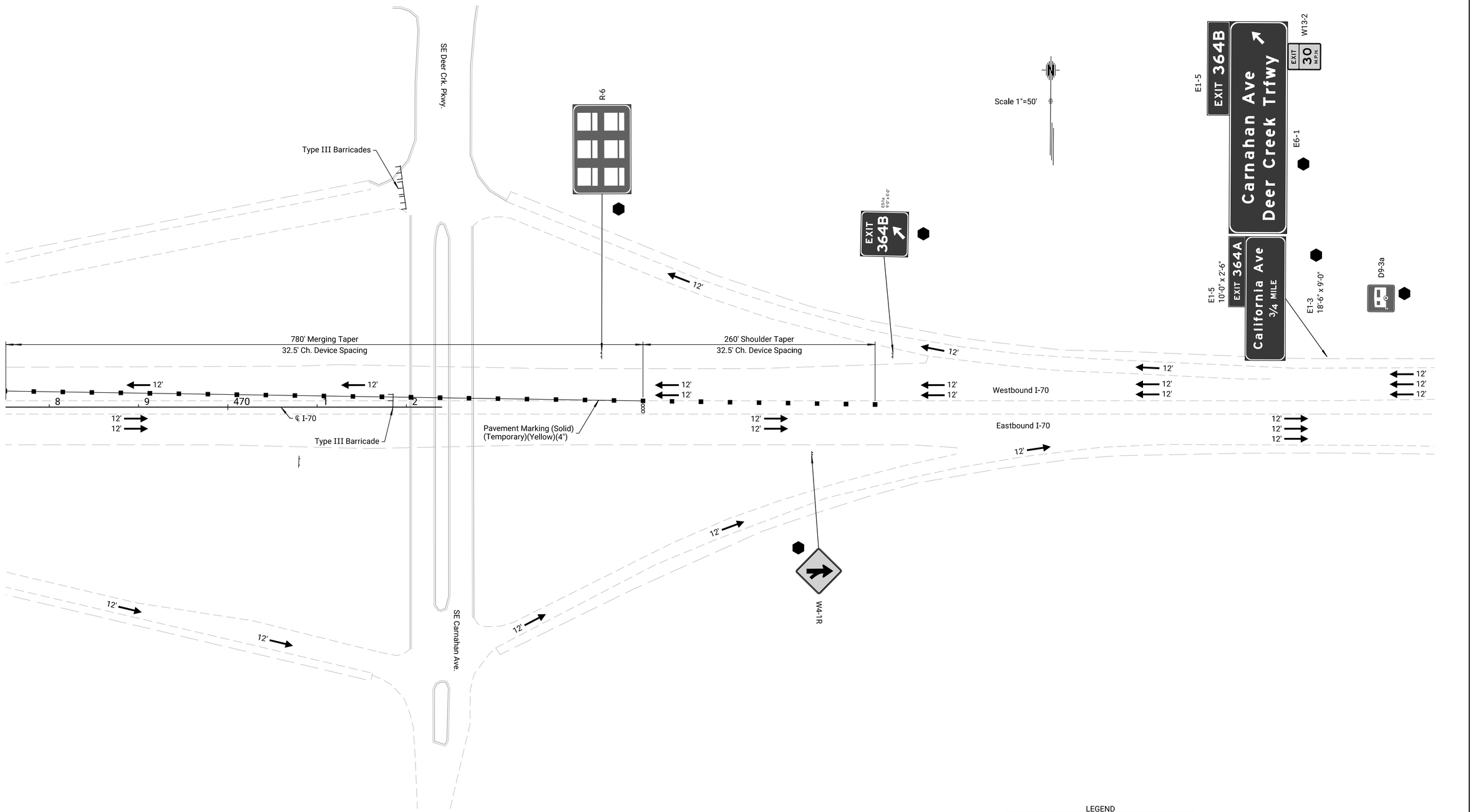
TRAFFIC CONTROL PLAN

Sh. No. 212

Plotted by : BGS01485 16-DEC-2025 12:57
File : ka680801-cpl-308.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	213	253

DATE	BY	
REFERENCES NOTED		
REFERENCES CHECKED		



LEGEND

- Arrow Display
- Channelizing Device
- Traffic Flow
- Inertial Barrier System
- Temporary Barrier
- Existing Sign Not Part of Project

KANSAS DEPARTMENT OF TRANSPORTATION

I-70 PHASE III

TRAFFIC CONTROL PLAN

Sh. No. 213

Plotted by : BGS01485 16-DEC-2025 12:57
File : ka680801-cpl-309.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	214	253

CONSTRUCTION SEQUENCE		
PHASE	CONSTRUCTION	TRAFFIC
4	Signing Pavement Marking Final Clean-up	Through Construction I-70, Ramps, and SE California all Open.

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED



KANSAS DEPARTMENT OF TRANSPORTATION

PHASE 4

CONSTRUCTION PHASING

NARRATIVE & KEY MAP

Plotted by : BGS01485 16-DEC-2025 12:58
File : ka680801-cpl-400.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	215	253

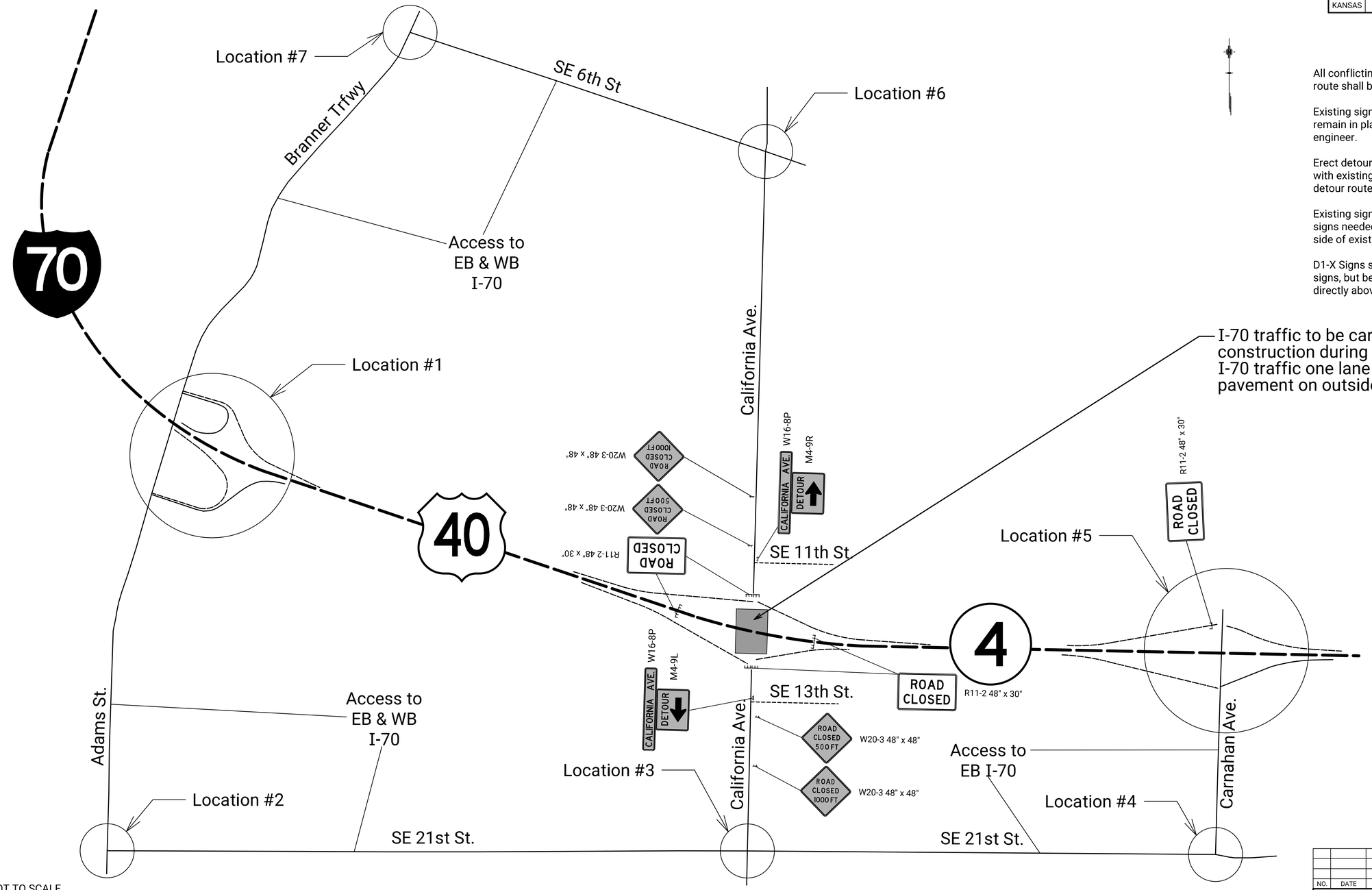
All conflicting route markers along the detour route shall be covered or removed.

Existing signs not shown at these junctions shall remain in place unless otherwise directed by the engineer.

Erect detour confirming assemblies in conjuction with existing route marker assemblies along detour route.

Existing sign posts should not be disturbed. Any signs needed for detour should be placed along side of existing sign posts, with its own post.

D1-X Signs should be shown on top of existing signs, but be placed on their own sign stand directly above and behind.



Detour Sign Size for Local Road Detour Map	
Sign No.	Sign Size
R11-2	48" x 30"
W20-3	48" x 48"
W16-8P	54" x 9"
M4-9L	30" x 24"
M4-9R	30" x 24"

NOT TO SCALE

- Type "A" Low Intensity Warning Light
- Type III Barricades
- Existing
- Project Area

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

LOCAL ROAD DETOUR MAP

FHWA APPROVAL			APP'D.	Nick Rogers	
DESIGNED	J.A.M.	DETAILED R.W.B.	QUANTITIES	TRACED	
DESIGN CK.		DETAIL CK.	QUAN.CK.	TRACE CK.	

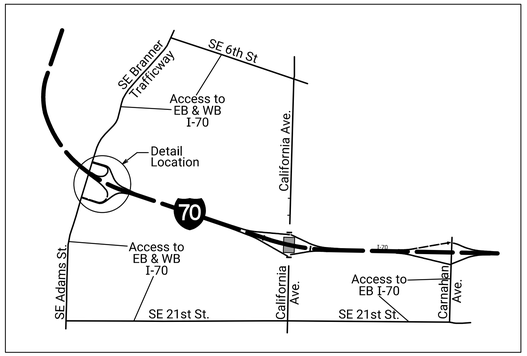
KDOT Graphics Certified 07-20-2023

Sh. No. 215

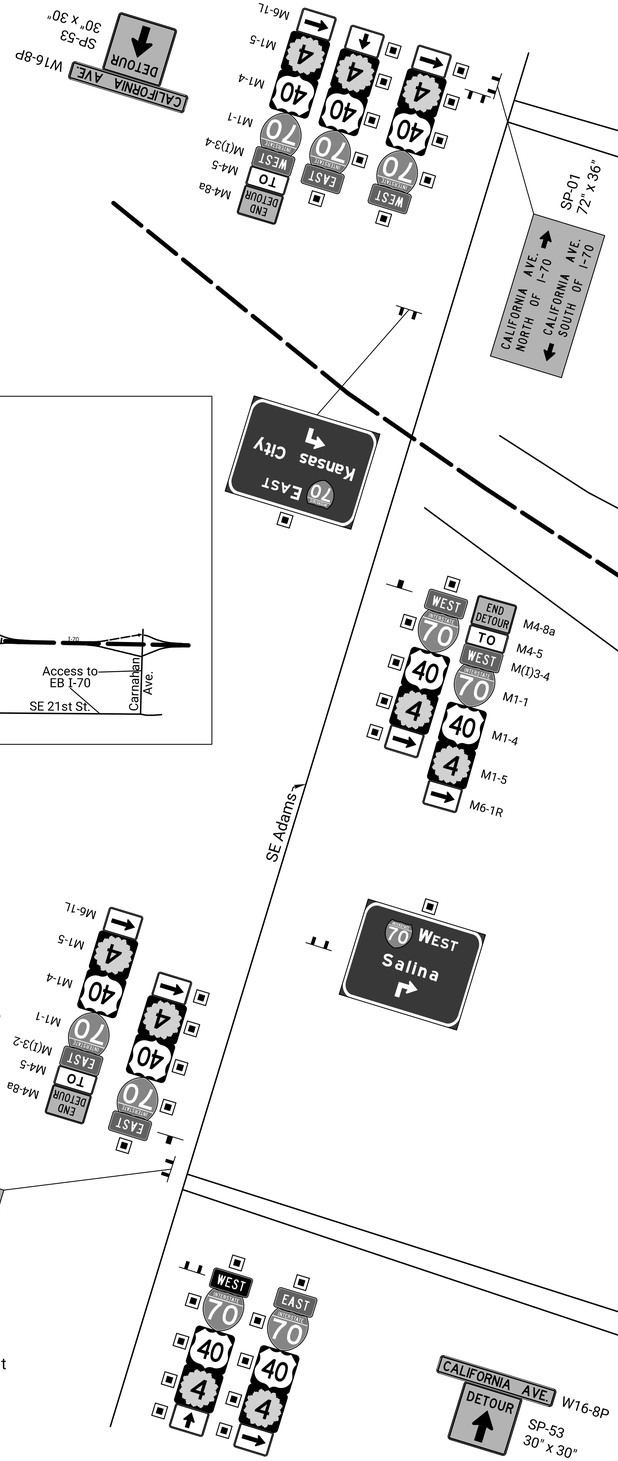
KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 12:58
File : 2901_ka680801cpl-01_DetrOvrvwMap.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	216	253



Note: Circle on Map Denotes Location On Detour



NOT TO SCALE

- ○ Type "A" Low Intensity Warning Light
- ⊔⊔ Type III Barricades
- ▣ Existing

All conflicting route markers along the detour route shall be covered or removed.

Existing signs not shown at these junctions shall remain in place unless otherwise directed by the engineer.

Erect detour confirming assemblies in conjuction with existing route marker assemblies along detour route.

Existing sign posts should not be disturbed. Any signs needed for detour should be placed along side of existing sign posts, with its own post.

D1-X Signs should be shown on top of existing signs, but be placed on their own sign stand directly above and behind.

Detour Sign Sizes for Location 6	
Sign No.	Sign Size
M1-1	24" x 24"
M1-4	24" x 24"
M1-5	24" x 24"
M4-5	24" x 12"
M4-8a	24" x 18"
M6-1L	21" x 15"
M6-1R	21" x 15"
M(I)3-2	24" x 12"
M(I)3-4	24" x 12"
SP-01	72" x 36"
SP-53	30" x 30"
W16-8P	54" x 9"

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

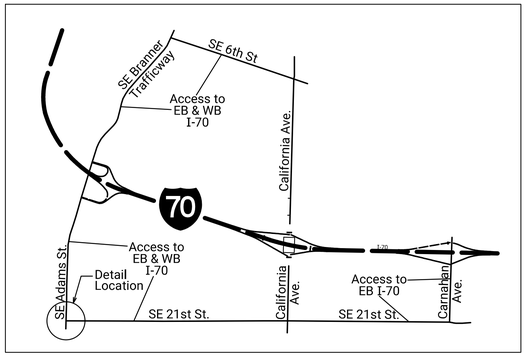
I-70/ADAMS ST INTERCHANGE (DETOUR TO CALIFORNIA AVE.) LOCATION NO. 1 OF 7

FHWA APPROVAL			APP'D.	Nick Rogers	
DESIGNED	J.A.M.	DETAILED R.W.B.	QUANTITIES	TRACED	
DESIGN CK.		DETAIL CK.	QUAN.CK.	TRACE CK.	

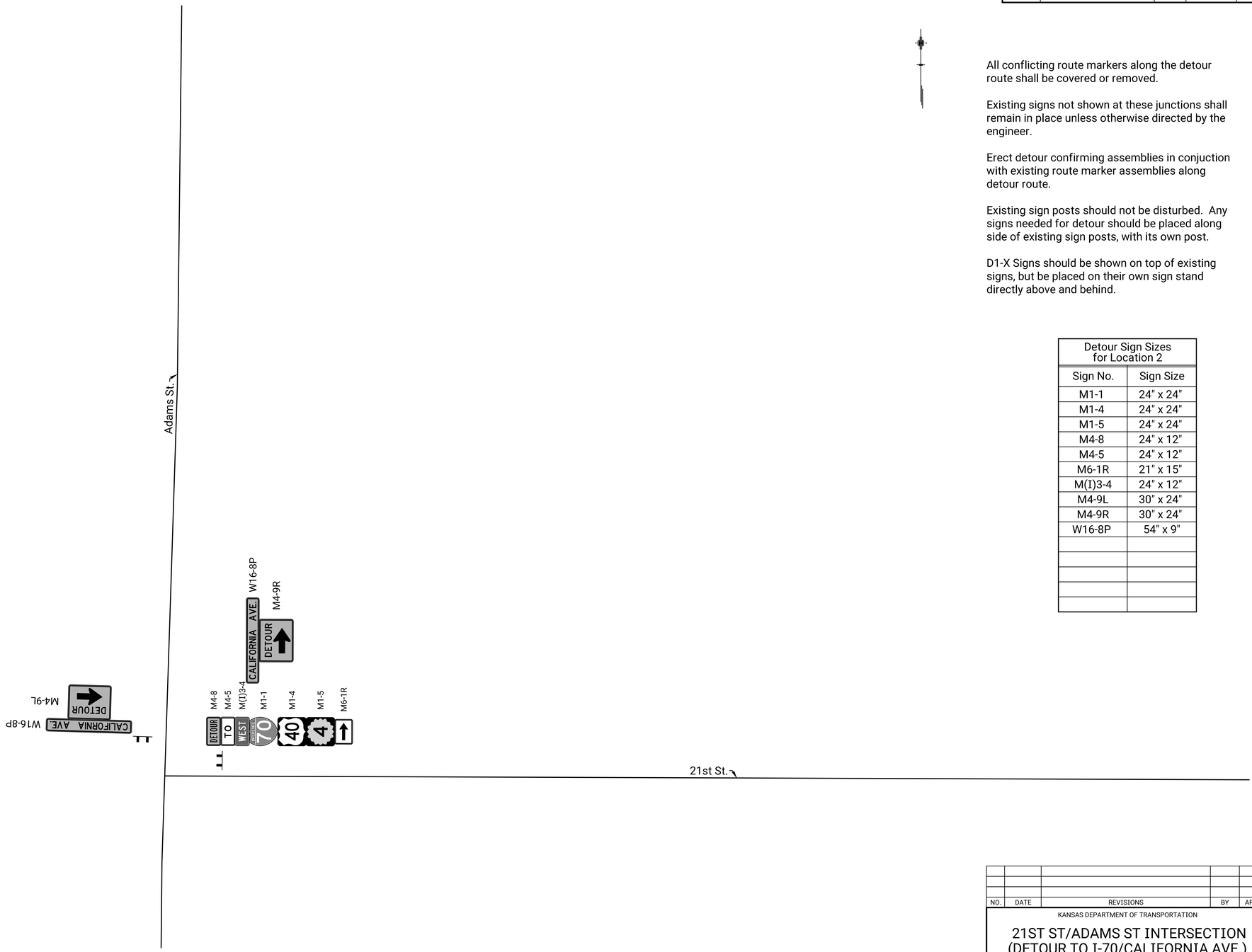
Sh. No. 216

Plotted by : BGS01485 16-DEC-2025 12:58
2902_ka680801cpl-02_JCT170&Adams.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	217	253



Note: Circle on Map Denotes Location On Detour



All conflicting route markers along the detour route shall be covered or removed.

Existing signs not shown at these junctions shall remain in place unless otherwise directed by the engineer.

Erect detour confirming assemblies in conjuction with existing route marker assemblies along detour route.

Existing sign posts should not be disturbed. Any signs needed for detour should be placed along side of existing sign posts, with its own post.

D1-X Signs should be shown on top of existing signs, but be placed on their own sign stand directly above and behind.

Detour Sign Sizes for Location 2	
Sign No.	Sign Size
M1-1	24" x 24"
M1-4	24" x 24"
M1-5	24" x 24"
M4-8	24" x 12"
M4-5	24" x 12"
M6-1R	21" x 15"
M(I)3-4	24" x 12"
M4-9L	30" x 24"
M4-9R	30" x 24"
W16-8P	54" x 9"

NOT TO SCALE

- ○ Type "A" Low Intensity Warning Light
- ⊔⊔ Type III Barricades
- ▣ Existing

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

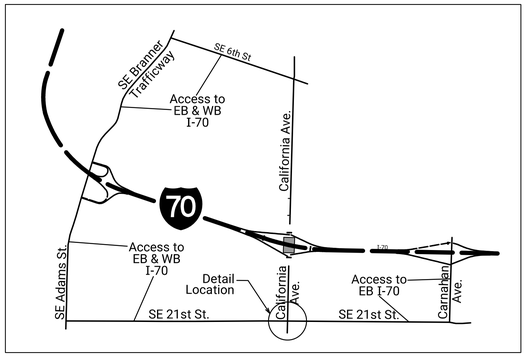
21ST ST/ADAMS ST INTERSECTION (DETOUR TO I-70/CALIFORNIA AVE.) LOCATION NO. 2 OF 7

FHWA APPROVAL			APP'D.	Nick Rogers	
DESIGNED	J.A.M.	DETAILED R.W.B.	QUANTITIES	TRACED	
DESIGN CK.		DETAIL CK.	QUAN.CK.	TRACE CK.	

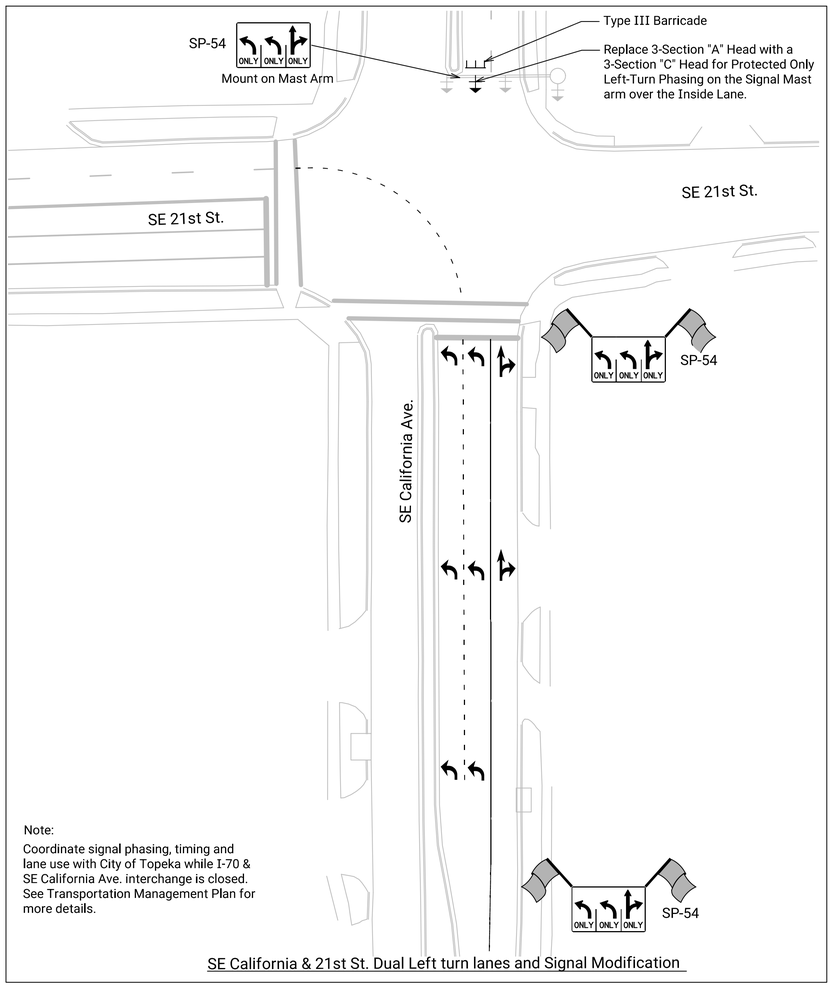
Sh. No. 217

Plotted by : BGS01485 16-DEC-2025 12:58
2903_ka680801cpl-03_21st&Adams.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	218	253

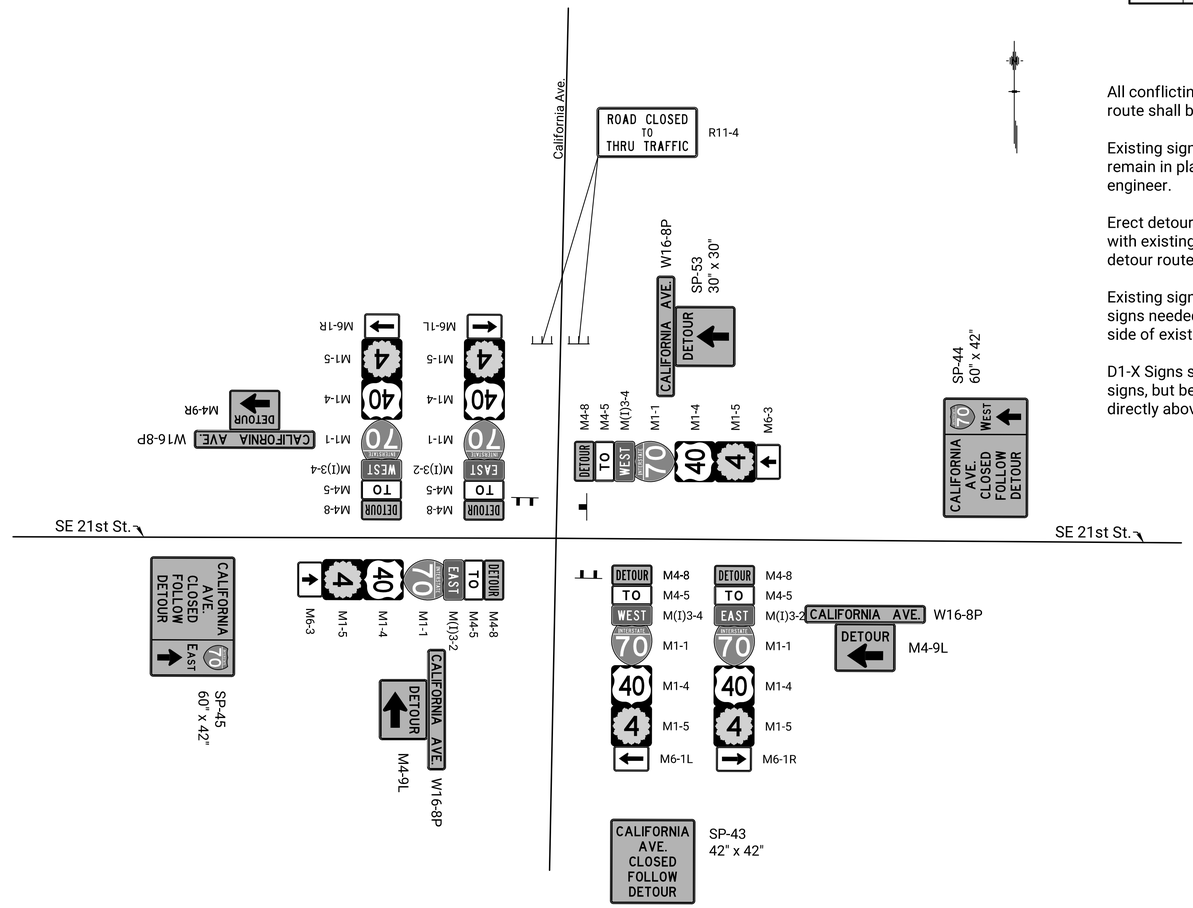


Note: Circle on Map Denotes Location On Detour



Note:
Coordinate signal phasing, timing and lane use with City of Topeka while I-70 & SE California Ave. interchange is closed. See Transportation Management Plan for more details.

SE California & 21st St. Dual Left turn lanes and Signal Modification



All conflicting route markers along the detour route shall be covered or removed.

Existing signs not shown at these junctions shall remain in place unless otherwise directed by the engineer.

Erect detour confirming assemblies in conjuction with existing route marker assemblies along detour route.

Existing sign posts should not be disturbed. Any signs needed for detour should be placed along side of existing sign posts, with its own post.

D1-X Signs should be shown on top of existing signs, but be placed on their own sign stand directly above and behind.

Detour Sign Sizes for Location 3	
Sign No.	Sign Size
M1-1	24" x 24"
M1-4	24" x 24"
M1-5	24" x 24"
M4-5	24" x 12"
M4-8	24" x 12"
M4-9L	30" x 24"
M4-9R	30" x 24"
M6-1L	21" x 15"
M6-1R	21" x 15"
M6-3	21" x 15"
M(I)3-2	24" x 12"
M(I)3-4	24" x 12"
SP-43	42" x 42"
SP-44	60" x 42"
SP-45	60" x 42"
SP-53	30" x 30"
SP-54	30" x 48"
W16-8P	30" x 24"

NOT TO SCALE

○ Type "A" Low Intensity Warning Light

Type III Barricades

▣ Existing

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

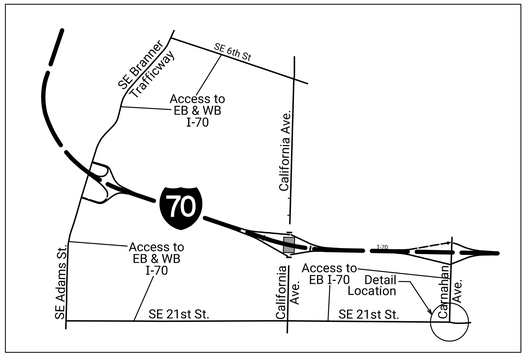
21ST ST/CALIFORNIA AVE INTERSECTION (DETOUR TO I-70/CALIFORNIA AVE.) LOCATION NO. 3 OF 7

FHWA APPROVAL				APP'D.	Nick Rogers		
DESIGNED	J.A.M.	DETAILED	R.W.B.	QUANTITIES		TRACED	
DESIGN CK.		DETAIL CK.		QUAN.CK.		TRACE CK.	

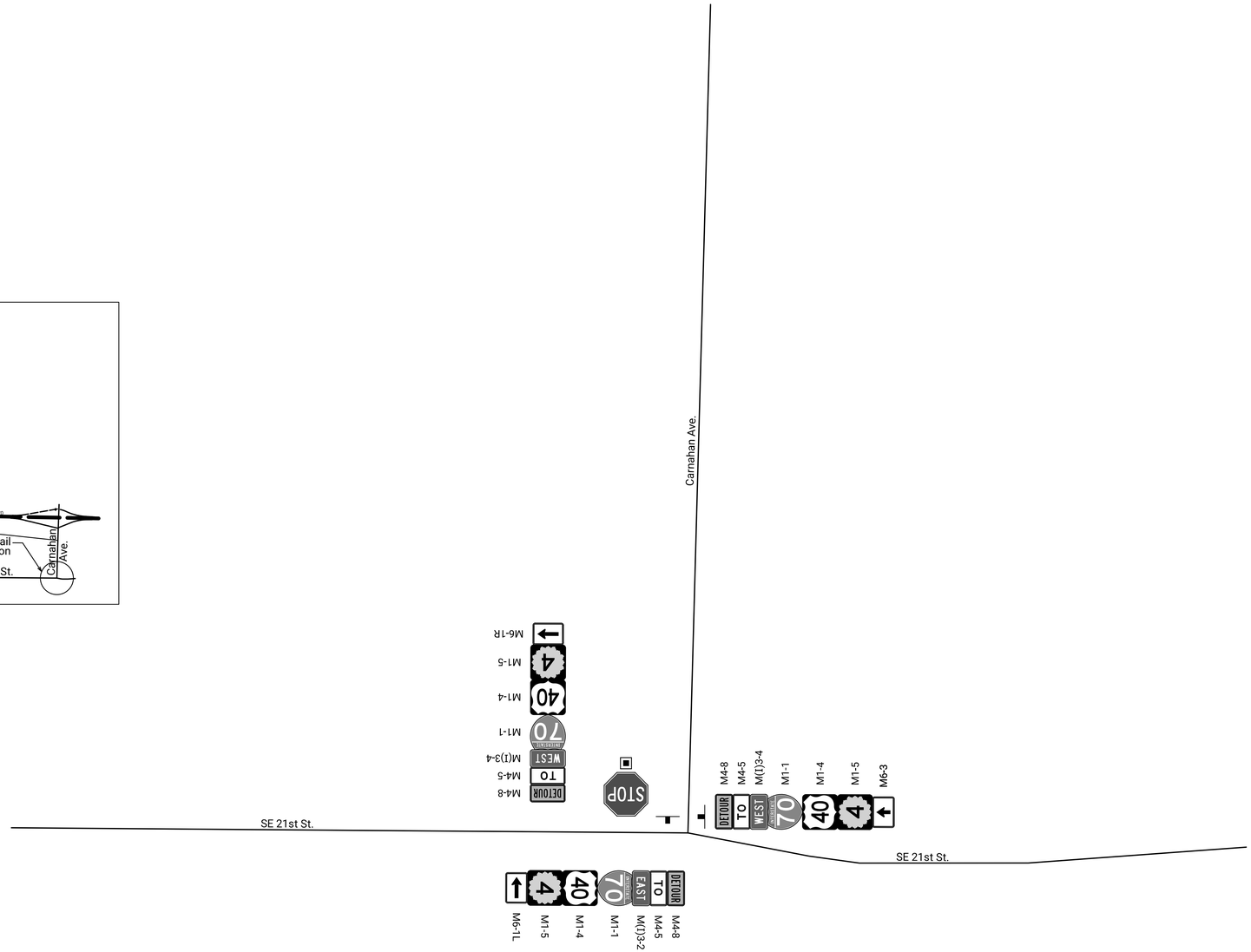
Sh. No. 218

Plotted by : BGS01485 16-DEC-2025 12:59
2904_ka6808001cpl-04_21st&California.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	219	253



Note: Circle on Map Denotes Location On Detour



All conflicting route markers along the detour route shall be covered or removed.

Existing signs not shown at these junctions shall remain in place unless otherwise directed by the engineer.

Erect detour confirming assemblies in conjuction with existing route marker assemblies along detour route.

Existing sign posts should not be disturbed. Any signs needed for detour should be placed along side of existing sign posts, with its own post.

D1-X Signs should be shown on top of existing signs, but be placed on their own sign stand directly above and behind.

Detour Sign Sizes for Location 4	
Sign No.	Sign Size
M1-1	24" x 24"
M1-4	24" x 24"
M1-5	24" x 24"
M4-5	24" x 12"
M4-8	24" x 12"
M6-1L	21" x 15"
M6-1R	21" x 15"
M(I)3-2	24" X 12"
M(I)3-4	24" X 12"
M6-3	21" x 15"

NOT TO SCALE

- ○ Type "A" Low Intensity Warning Light
- ⊔⊔ Type III Barricades
- ▣ Existing

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

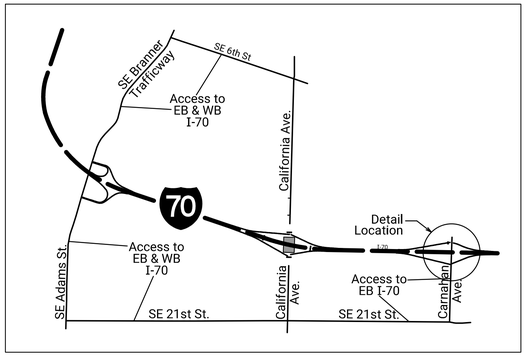
21ST ST/CARNAHAN AVE INTERSECTION (DETOUR TO I-70/CALIFORNIA AVE.) LOCATION NO. 4 OF 7

FHWA APPROVAL			APP'D.	Nick Rogers	
DESIGNED	J.A.M.	DETAILED R.W.B.	QUANTITIES	TRACED	
DESIGN CK.		DETAIL CK.	QUAN.CK.	TRACE CK.	

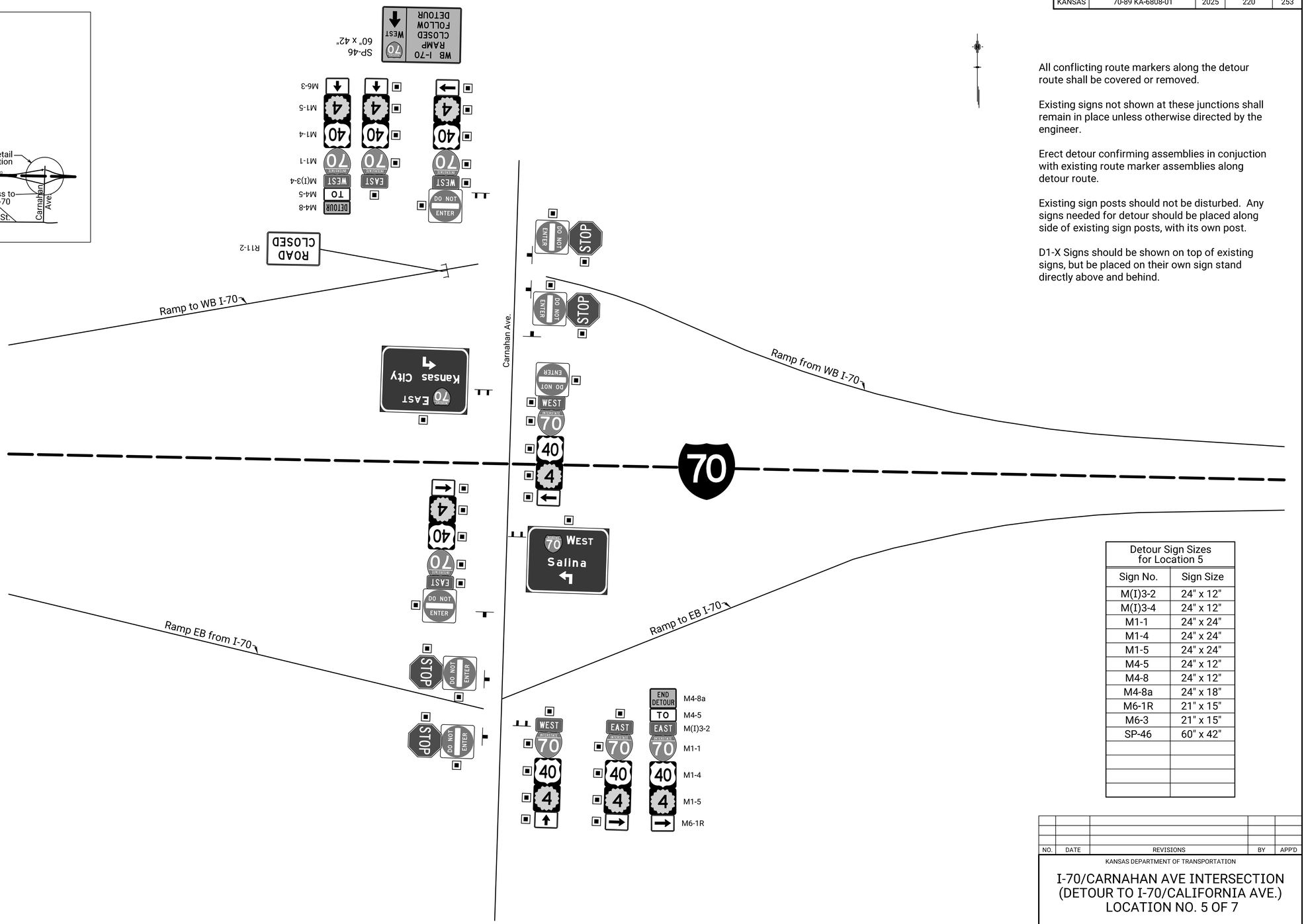
Sh. No. 219

Plotted by : BGS01485 16-DEC-2025 12:59
2905_ka680801cpl-05_21st&Carnahan.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	220	253



Note: Circle on Map Denotes Location On Detour



Detour Sign Sizes for Location 5	
Sign No.	Sign Size
M(I)3-2	24" x 12"
M(I)3-4	24" x 12"
M1-1	24" x 24"
M1-4	24" x 24"
M1-5	24" x 24"
M4-5	24" x 12"
M4-8	24" x 12"
M4-8a	24" x 18"
M6-1R	21" x 15"
M6-3	21" x 15"
SP-46	60" x 42"

All conflicting route markers along the detour route shall be covered or removed.

Existing signs not shown at these junctions shall remain in place unless otherwise directed by the engineer.

Erect detour confirming assemblies in conjuction with existing route marker assemblies along detour route.

Existing sign posts should not be disturbed. Any signs needed for detour should be placed along side of existing sign posts, with its own post.

D1-X Signs should be shown on top of existing signs, but be placed on their own sign stand directly above and behind.

NOT TO SCALE

- ○ Type "A" Low Intensity Warning Light
- ⊔⊔ Type III Barricades
- ▣ Existing

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

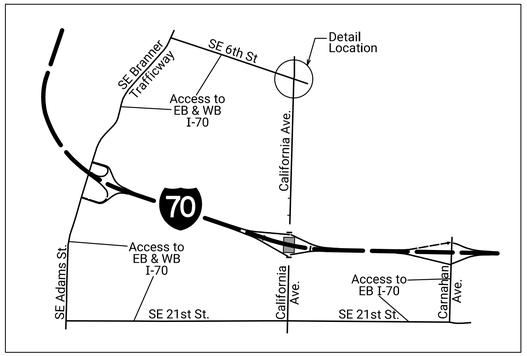
I-70/CARNAHAN AVE INTERSECTION (DETOUR TO I-70/CALIFORNIA AVE.) LOCATION NO. 5 OF 7

FHWA APPROVAL			APP'D.	Nick Rogers	
DESIGNED	J.A.M.	DETAILED R.W.B.	QUANTITIES	TRACED	
DESIGN CK.		DETAIL CK.	QUAN.CK.	TRACE CK.	

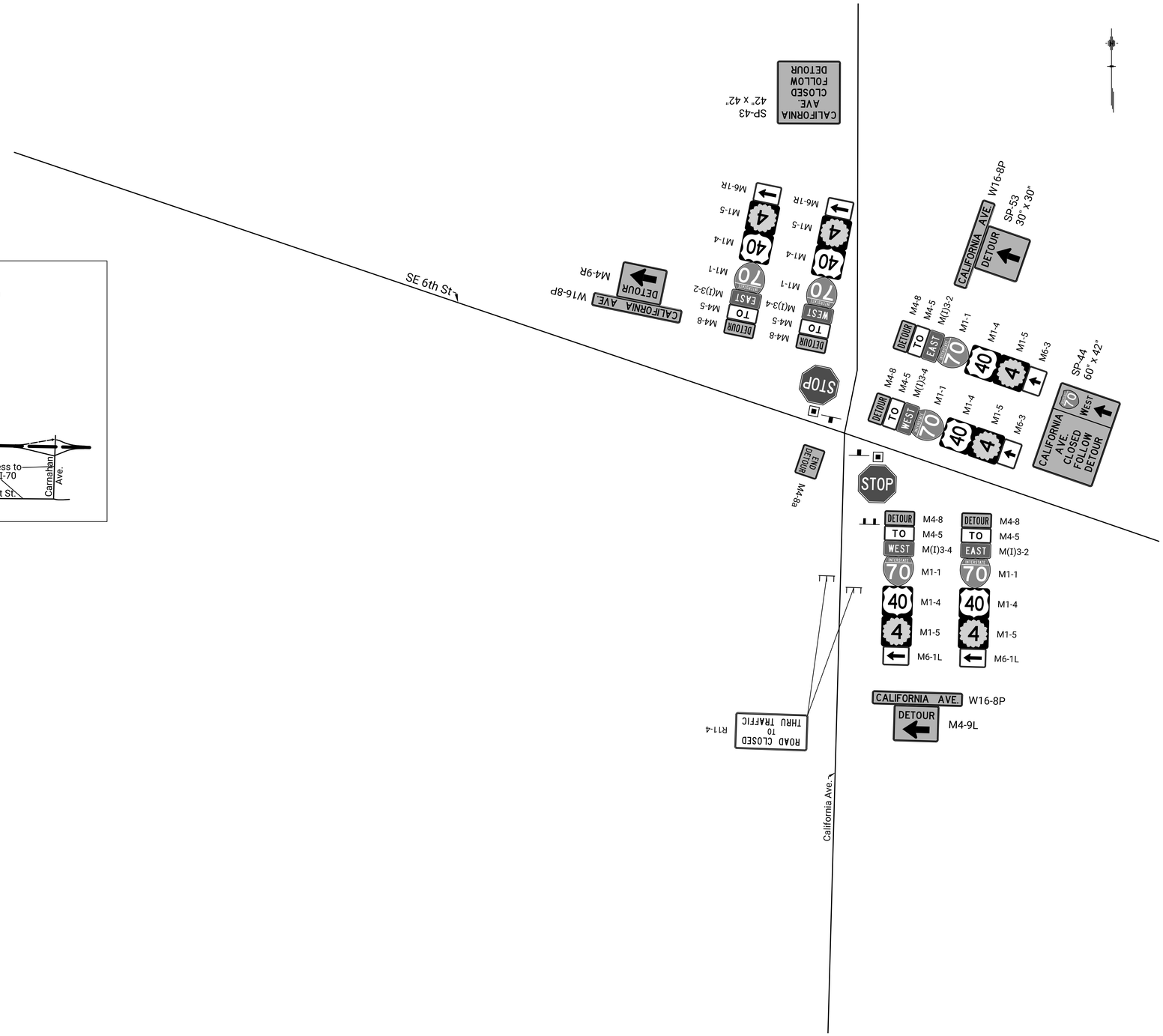
Sh. No. 220

Plotted by : BGS01485 16-DEC-2025 13:00
2906_ka680801cpl-06_JCT170&Carnahan.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	221	253



Note: Circle on Map Denotes Location On Detour



All conflicting route markers along the detour route shall be covered or removed.

Existing signs not shown at these junctions shall remain in place unless otherwise directed by the engineer.

Erect detour confirming assemblies in conjuction with existing route marker assemblies along detour route.

Existing sign posts should not be disturbed. Any signs needed for detour should be placed along side of existing sign posts, with its own post.

D1-X Signs should be shown on top of existing signs, but be placed on their own sign stand directly above and behind.

Detour Sign Sizes for Location 6	
Sign No.	Sign Size
M1-1	24" x 24"
M1-4	24" x 24"
M1-5	24" x 24"
M4-5	24" x 12"
M4-8	24" x 12"
M4-8a	24" x 18"
M6-1L	21" x 15"
M6-1R	21" x 15"
M6-3	21" x 15"
M(I)3-2	24" x 12"
M(I)3-4	24" x 12"
M4-9L	30" x 24"
M4-9R	30" x 24"
R11-4	48' x 24"
SP-43	42" x 42"
SP-44	60" x 42"
SP-53	30" x 30"
W16-8P	54" x 9"

NOT TO SCALE

- ○ Type "A" Low Intensity Warning Light
- ⊔⊔ Type III Barricades
- ▣ Existing

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

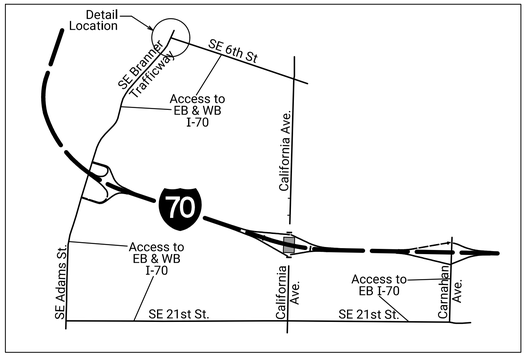
6TH ST/CALIFORNIA AVE INTERSECTION (DETOUR TO I-70/CALIFORNIA AVE.) LOCATION NO. 6 OF 7

FHWA APPROVAL			APP'D. Nick Rogers	
DESIGNED J.A.M.	DETAILED R.W.B.		QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.		QUAN.CK.	TRACE CK.

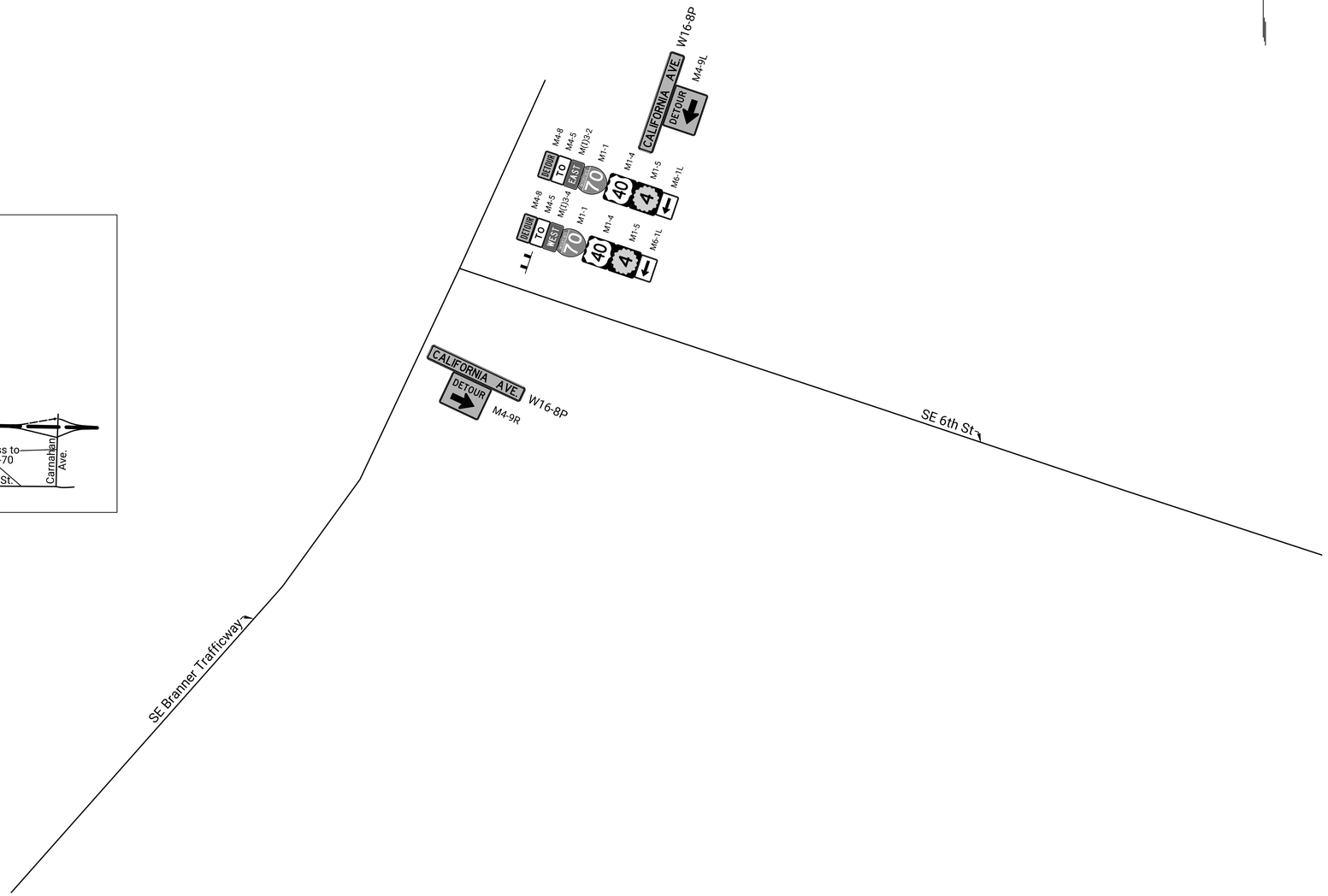
Sh. No. 221

Plotted by : BGS01485 16-DEC-2025 13:00
2907_ka680801cpl-07_6th&California.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	222	253



Note: Circle on Map Denotes Location On Detour



All conflicting route markers along the detour route shall be covered or removed.

Existing signs not shown at these junctions shall remain in place unless otherwise directed by the engineer.

Erect detour confirming assemblies in conjuction with existing route marker assemblies along detour route.

Existing sign posts should not be disturbed. Any signs needed for detour should be placed along side of existing sign posts, with its own post.

D1-X Signs should be shown on top of existing signs, but be placed on their own sign stand directly above and behind.

Detour Sign Sizes for Location 7	
Sign No.	Sign Size
M1-1	24" x 24"
M1-4	24" x 24"
M1-5	24" x 24"
M4-5	24" x 12"
M4-8	24" x 12"
M6-1L	21" x 15"
M(I)3-4	24" x 12"
M(I)3-2	24" x 12"
M4-9L	30" x 24"
M4-9R	30" x 24"
W16-8P	54" x 9"

NOT TO SCALE

- ○ Type "A" Low Intensity Warning Light
- ⊔⊔ Type III Barricades
- ▣ Existing

NO.	DATE	REVISIONS	BY	APP'D

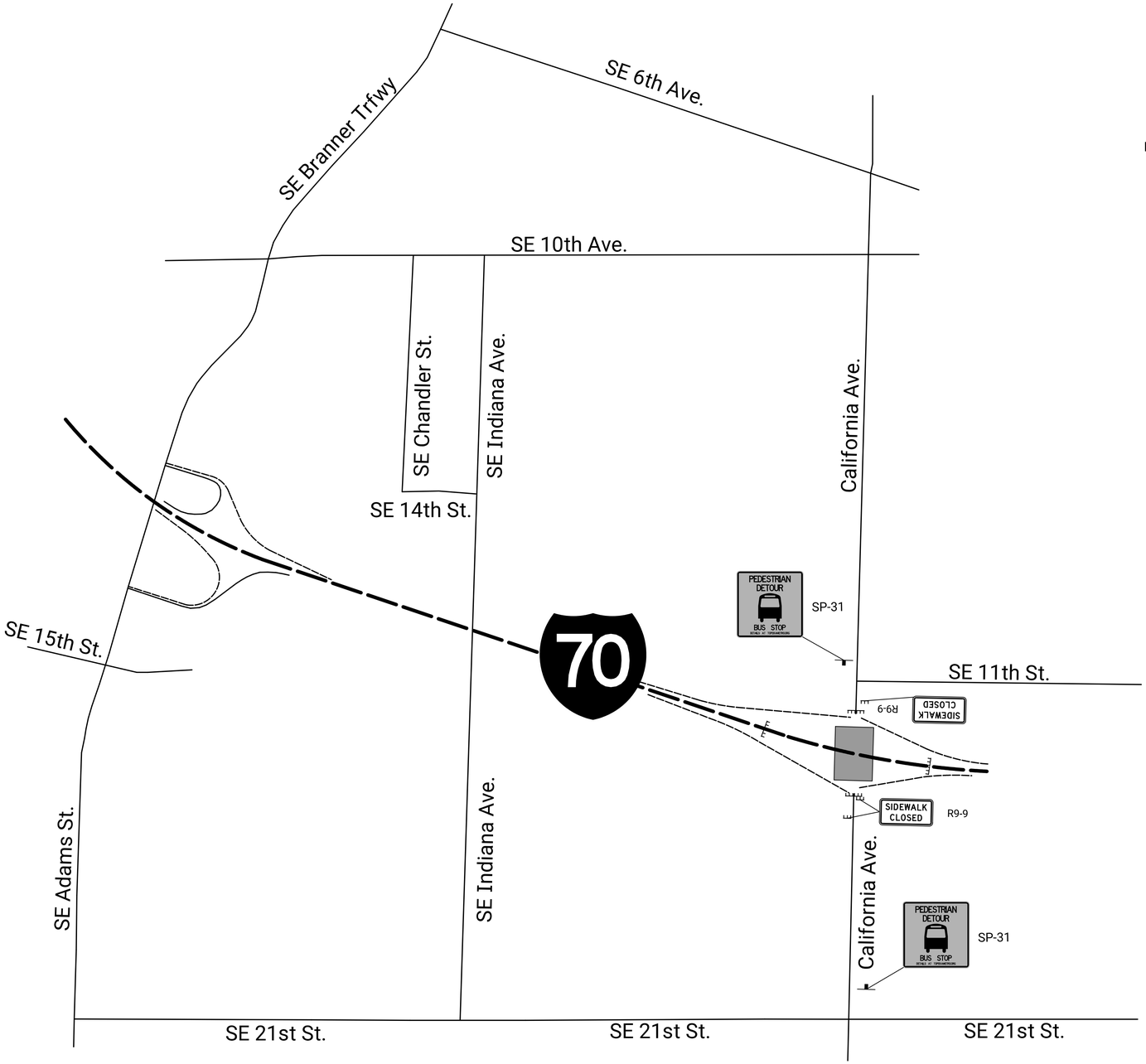
KANSAS DEPARTMENT OF TRANSPORTATION

6TH ST/BRANNER TRFWY INTERSECTION (DETOUR TO I-70/CALIFORNIA AVE.) LOCATION NO. 7 OF 7

FHWA APPROVAL		APP'D.	Nick Rogers
DESIGNED J.A.M.	DETAILED R.W.B.	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

Plotted by : BGS01485 16-DEC-2025 13:00
2908_ka680801cpl-08_6th&Branner.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	223	253



NOT TO SCALE

Detour Sign Sizes for Bicycle & Pedestrian Detour	
Sign No.	Sign Size
R9-9	24" x 12"
SP-31	30" x 30"

Type III Barricade

Project Area

Plotted by : BGS01485 16-DEC-2025 13:01
File : 2909_ka680801cpl-02_Ped-BikeDtr.dgn

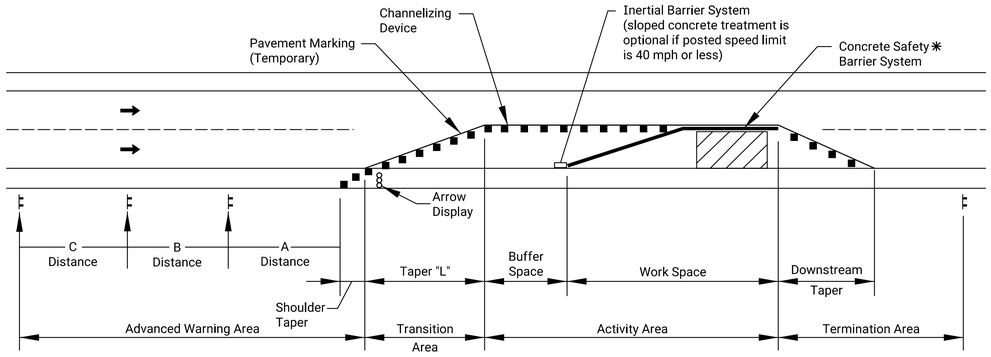
KANSAS DEPARTMENT OF TRANSPORTATION

BICYCLE & PEDESTRIAN DETOUR
CALIFORNIA AVE CLOSURE

KDOT Graphics Certified 07-20-2023 Sh. No. 223

KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	224	253



TYPICAL WORK ZONE COMPONENTS

Taper Length (L)

✳✳ Posted speed prior to work starting

Speed✳✳ (MPH)	Width of Offset (ft)												
	1	2	3	4	5	6	7	8	9	10	11	12	13
20	7	13	20	27	33	40	47	53	60	67	73	80	87
25	10	21	31	42	52	63	73	83	94	104	115	125	135
30	15	30	45	60	75	90	105	120	135	150	165	180	195
35	20	41	61	82	102	123	143	163	184	204	225	245	265
40	27	53	80	107	133	160	187	213	240	267	293	320	347
45	45	90	135	180	225	270	315	360	405	450	495	540	585
50	50	100	150	200	250	300	350	400	450	500	550	600	650
55	55	110	165	220	275	330	385	440	495	550	605	660	715
60	60	120	180	240	300	360	420	480	540	600	660	720	780
65	65	130	195	260	325	390	455	520	585	650	715	780	845
70	70	140	210	280	350	420	490	560	630	700	770	840	910
75	75	150	225	300	375	450	525	600	675	750	825	900	975

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

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

A distance of at least 2L should seperate merging and shifting tapers

Advance Warning Sign Spacing

✳✳ Posted speed prior to work starting

SPEED (MPH)✳✳	A	B	C
URBAN (40MPH 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

Minimum advance wanring sign spacing (in feet)

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.

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 Spacing

✳✳ Posted speed prior to work starting

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*

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.

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 (centerline, edge line and lane line) or as directed by the engineer. A lane width less than 10' should be closed according to the currently adopted MUTCD. Lane widths that fall between 11' and 10' should include restricted roadway signing (W5-1, W5-2, W5-4)

3) TTC plans should include bicyclists and pedestrians, including those with diabilities, and should be provided with acceses and passage through the TTC zone.

3a) Adequate warning, delineation, and channelization should be provided to assist in guiding road users in advance of and through the TTC zone with information in a usable format for pedestrians with vision disabilities. Provisions for effective continuity of accessible circulation paths for pedestrians should be incorporated into the TTC plan.

3b) When existing pedestrian facilities including transit are disrupted, closed, or relocated in a TTC zone, the temporary facilities shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility. A pedestrian channelizing device that is detectable by a person with a vision disability traveling with the aid of a long cane shall be placed across the full width of the closed pedestrian facility. Pedestrian and bicycles are not allowed on Interstate.

3c) SIDEWALK CLOSED CROSS HERE signs shall include audible information devices to provide adequate communication to pedestrians with vision disabilities.

4) 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.

5) Alternative temporary rumble strip options may be available. Please contact the Temporary Traffic Control Unit for more information at 785-296-3618

6) When detour routes impact railroad grade crossings, verify that there is no potential to cause queing , if so, install "DO NOT STOP ON TRACKS" (R8-8).

7) When Temporary Traffic Control plans impact a railroad grade crossing, a temporary traffic signal will need to be approved by KDOT Traffic engineering and the affected railroad company.

8) Temporary traffic control signs shall not restrict the motorist visibilty to railroad devices.

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

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL GENERAL NOTES

~~TE700~~

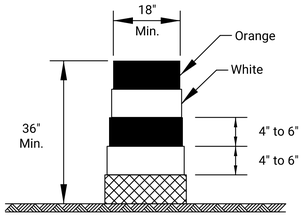
FHWA APPROVAL		03-13-18	APP'D.	Eric Kocher	
DESIGNED	B.A.H.	DETAILED R.W.B.	QUANTITIES	TRACED	
DESIGN CK.		DETAIL CK.	QUAN.CK.	TRACE CK.	

KDOT Graphics Certified 10-31-2025 Sh. No. 224

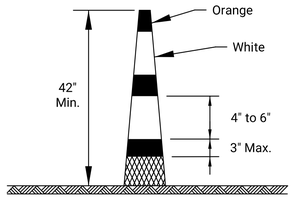
KDOT Graphics Certified

Plotted by : Nick.Caine 4-NOV-2025 08:57
File : TE700.dgn

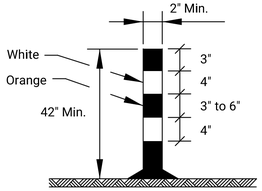
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	225	253



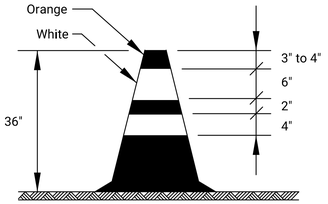
DRUM



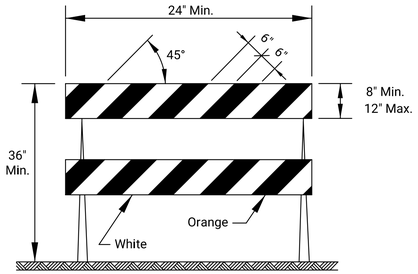
CONICAL DELINEATOR



TUBULAR MARKER

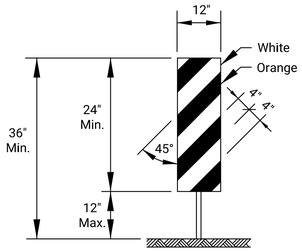


TRAFFIC CONE



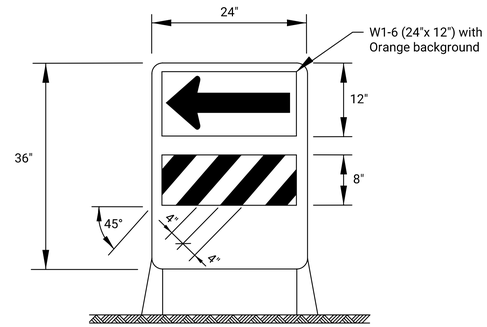
TYPE 2 BARRICADE

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



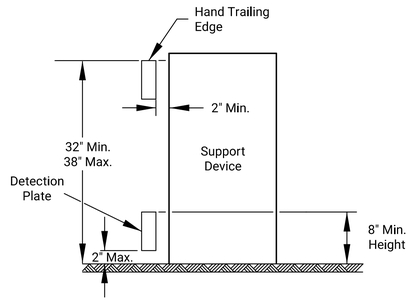
VERTICAL PANEL

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	Yes	Yes	Yes	Yes	Yes	(1)	Yes	Yes	Yes
	Direction Indicator Barricade	No	No	No	Yes	No	No	No	No	No
	Type 2 Barricade	Yes	Yes	Yes	Yes	No	No	Yes	No	No
	Traffic Cones	No	No	(3)	(3)	(3)	No	(3)	(3)	(3)
Fixed										
	Tubular Markers	(2)	(2)	(2)	No	(2)	Yes	No	Yes	Yes
	Vertical Panels	(2)	(2)	(2)	(2)	(2)	(2)	Yes	(2)	Yes

(1) Not allowed on centerline delineation along freeways or expressways.
(2) May be used upon the approval of the engineer.
(3) 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.	

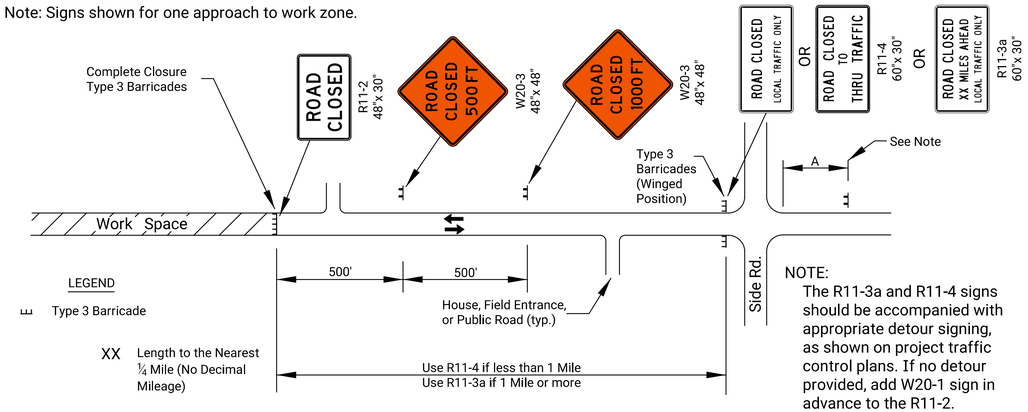
KDOT Graphics Certified 10-28-2025 Sh. No. 225

KDOT Graphics Certified

Plotted by : Nick.Caine 4-NOV-2025 08:59
File : TE702.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	226	253

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. If no detour provided, add W20-1 sign in advance to the R11-2.

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

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

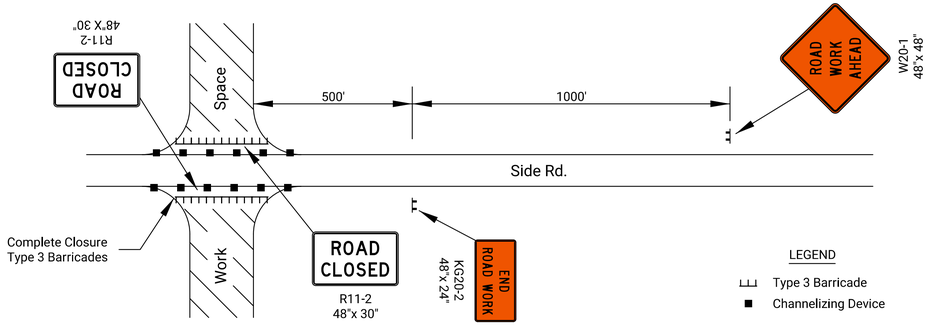


FIGURE 2: TYPICAL SIGNING FOR SIDE ROAD OPEN

Note: Signs shown for one approach to work zone.

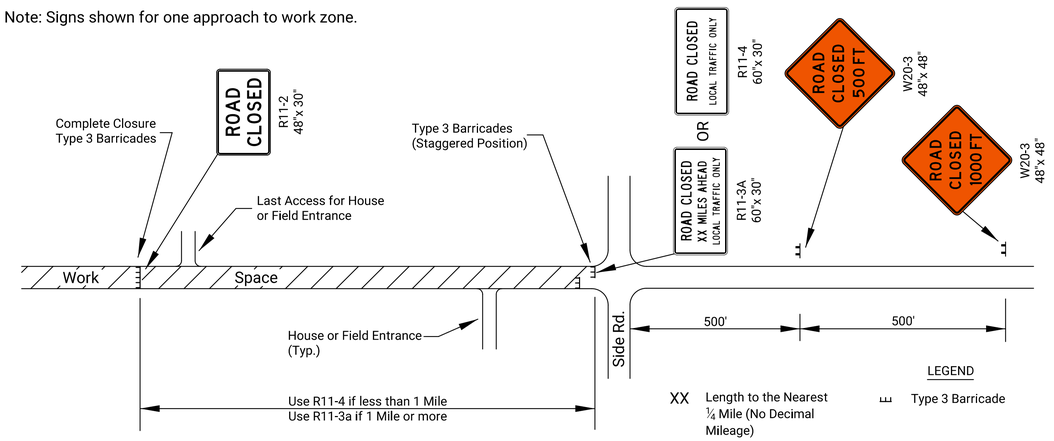


FIGURE 3: TYPICAL SIGNING FOR ROAD CLOSURE - LOCAL TRAFFIC ACCESS

ROAD CLOSED GENERAL NOTES

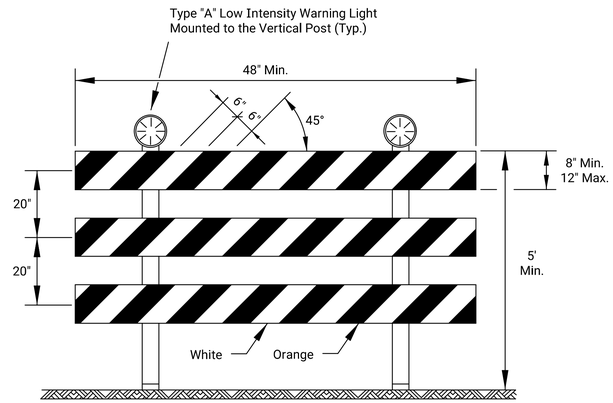
As shown in Figure 1, at the point where thru traffic must detour and local traffic can proceed to the location where the roadway is completely closed, the R11-3a (ROAD CLOSED # MILES AHEAD LOCAL TRAFFIC ONLY) or R11-4 (ROAD CLOSED LOCAL TRAFFIC ONLY or ROAD CLOSED TO THRU TRAFFIC) sign shall be used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



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.

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 10-28-2025 Sh. No. 226

KDOT Graphics Certified

Plotted by : Nick.Caine 4-NOV-2025 09:00
File : TE704.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	227	253

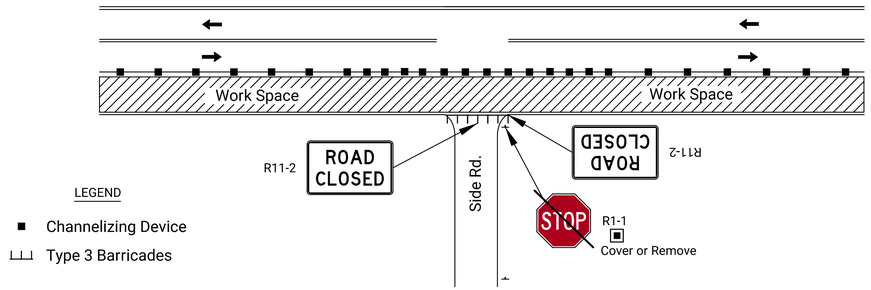


FIGURE 1: SIDE ROAD OR ENTRANCE CLOSED THROUGH WORK AREA

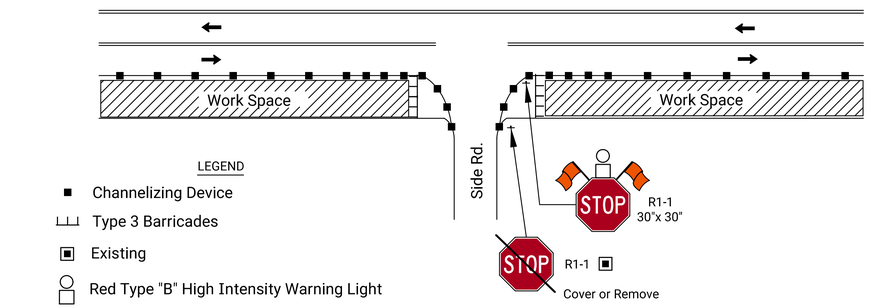


FIGURE 2: SIDE ROAD OR ENTRANCE OPEN THROUGH WORK AREA

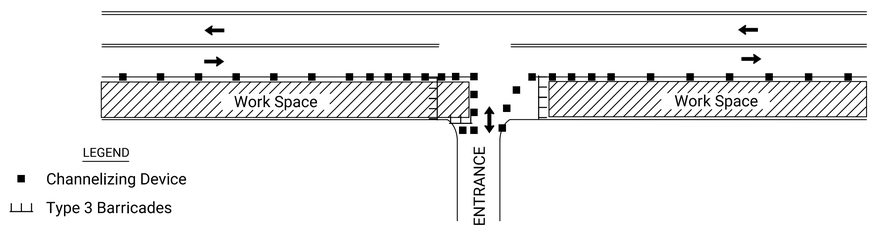


FIGURE 3: LOW VOLUME ENTRANCE CONTRUCTED HALF AT A TIME

Note: Consider large vehicles making right turns into and out of entrance
and use figure 4 as needed

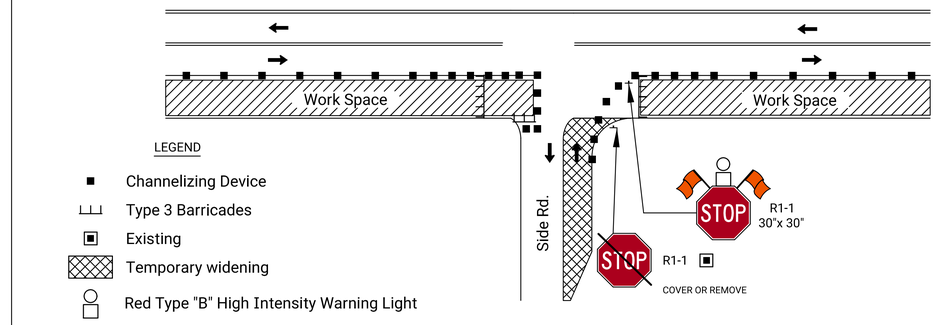


FIGURE 4: SIDE ROAD OR ENTRANCE CONSTRUCTED HALF AT A TIME:
TWO WAY TRAFFIC REQUIRED

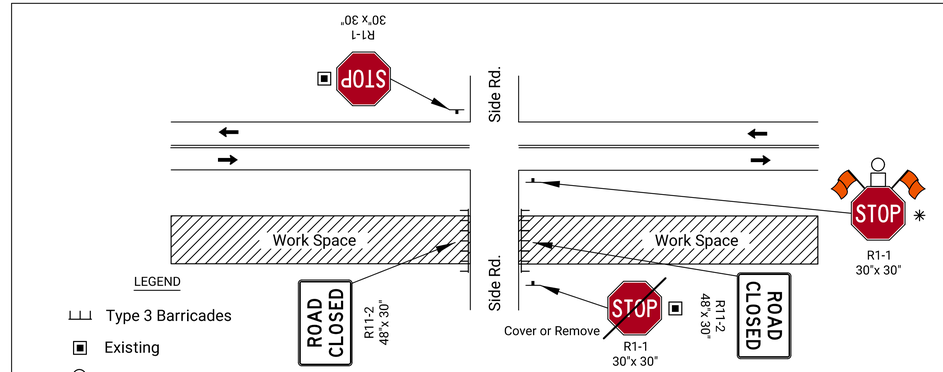


FIGURE 5: SIDE ROAD OPEN THROUGH WORK AREA ON DIVIDED ROADWAY

Note: Yield signs shall be treated as
Stop signs shown in the figures above

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL
ACCESS THROUGH THE WORK AREA

~~TE705~~

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

KDOT Graphics Certified 10-28-2025 Sh. No. 227

KDOT Graphics Certified

Plotted by : Nick.Caine 4-NOV-2025 09:02
File : TE705.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	228	253

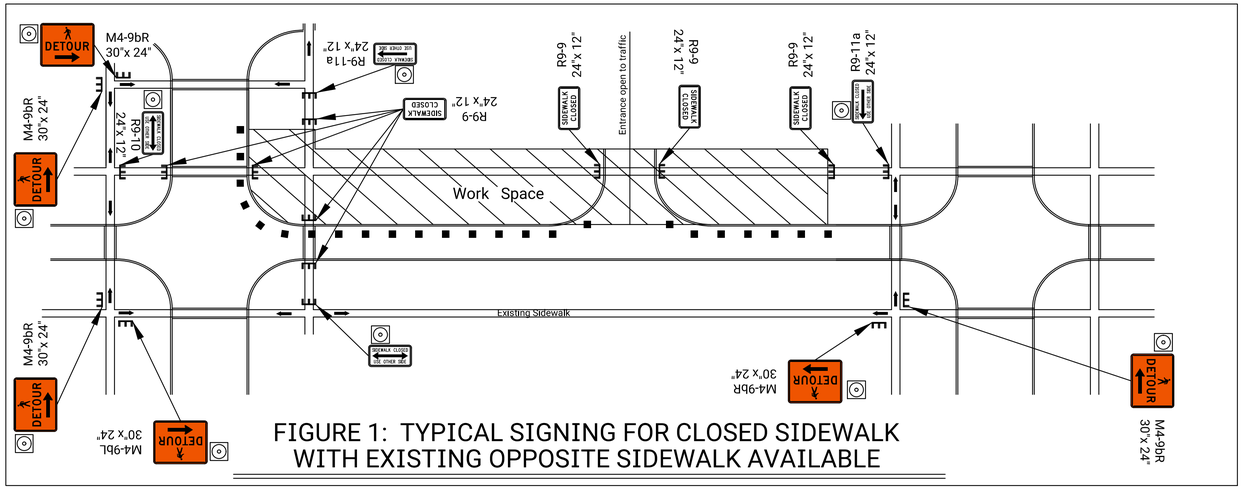


FIGURE 1: TYPICAL SIGNING FOR CLOSED SIDEWALK WITH EXISTING OPPOSITE SIDEWALK AVAILABLE

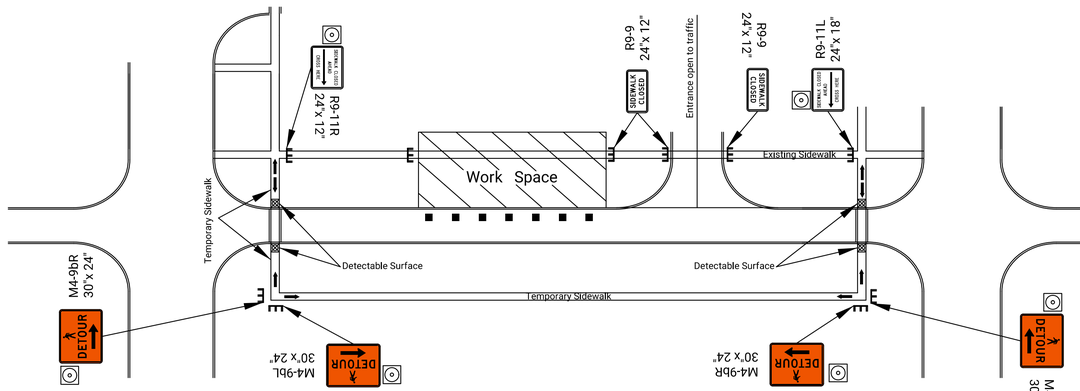


FIGURE 2: TYPICAL SIGNING FOR CLOSED SIDEWALK WITH TEMPORARY SIDEWALK CROSSINGS

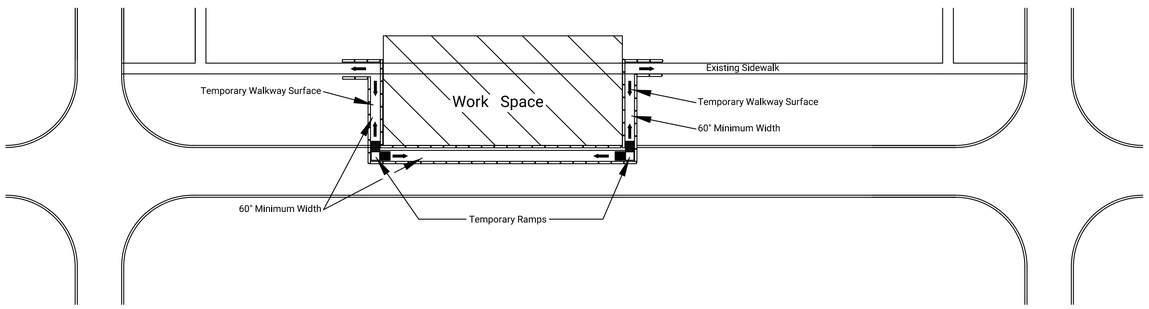


FIGURE 3: TYPICAL SIGNING FOR CLOSED SIDEWALK WITH FOUR LANE OR TWO LANE WITH PARKING

NOTE:

When existing pedestrian facilities are disrupted, closed, or relocated in a TTC zone, the temporary facilities shall be detectable and include accessibility features consistent with the currently adopted MUTCD.

Temporary walkway surface shall provide adequate support to cover rough, soft or uneven ground or hazard as approved by the Engineer.

When used, temporary ramps shall provide a 12:1 (8.33%) or flatter slope, with a slip-resistant surface. The ramp landing area shall provide a 48" x 48" minimum area with a 2% or flatter cross-slope.

If TTC for the pedestrian facility encroaches on the roadway, use the applicable traffic control layout sheet and KDOT Standards.

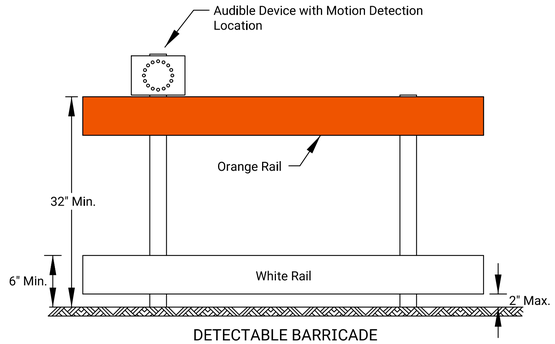
All SIDEWALK CLOSED CROSS HERE, and PEDESTRIAN DETOUR signing shall include audible information devices to provide adequate communication to pedestrians with vision disabilities.

Audible Device (with motion detection) shall be installed per manufacturer and approved by the Engineer.

ROAD WORK AHEAD and END ROAD WORK signs shall be a minimum of 100' from any existing signs.

LEGEND

- Pedestrian Barricade
- Audible Device (with motion detection)
- Pedestrian Channelizer
- Pedestrian Ramp
- Detectable Surface



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.
5. SIDEWALK CLOSED CROSS HERE, SIDEWALK CLOSED AHEAD CROSS HERE, and PEDESTRIAN DETOUR signs along with audible devices shall be installed on Detectable Barricades.
6. A pedestrian channelizing device that is detectable by a person with a vision disability traveling with the aid of a long cane shall be placed across the full width of the closed sidewalk.

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL SIDEWALK CLOSURES

~~TE706~~

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 11-03-2025 Sh. No. 228

KDOT Graphics Certified

Plotted by : Nick.Caine 4-NOV-2025 09:03
File : te706.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	229	253

SIGN LAYOUT INFORMATION

END ROAD WORK
KG20-2

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

WAIT FOR PILOT CAR
KG20-5

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

WORK ZONE
KM4-2OP

Std. Size
3" C
24"x 6"

Expwy/Freeway
6" C
48"x 12"

FINES DOUBLE
KR2-6

Std. Size Expwy/Freeway
8" D
48"x 36"

DOUBLE FINES END
KR2-11

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

KR2-11 sign shall be used whenever KR2-6 sign is used in a Work Zone.

TRUCKS TURNING AHEAD
KW21-25

Std. Size Expwy/Freeway
7" C
48"x 48"

TRUCKS ENTERING AND EXITING AHEAD
KW21-26

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

CLOSED
KE5-25P

Std. Size Expwy/Freeway
12" D
96" x 30"

NORTH 75 CLOSED FOLLOW DETOUR
SP-01
(Special Sign)

Std. Size
6" C
18" Shield

Expwy/Freeway
10" D
36" Shield

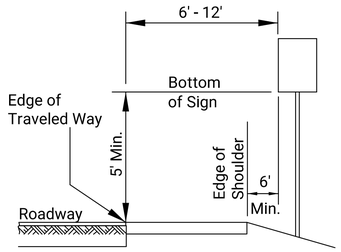
75 CLOSED NORTH OF Topeka FOLLOW DETOUR
SP-02
(Special Sign)

Std. Size
Uppercase: 6" C
Lowercase: 4.5" C
18" Shield

Expwy/Freeway
Uppercase: 10" D
Lowercase: 8" D
36" Shield

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

Routes need to be shown using correct Shield on all Special signs.

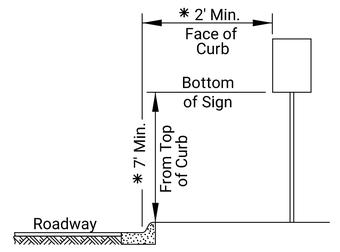


RURAL

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.

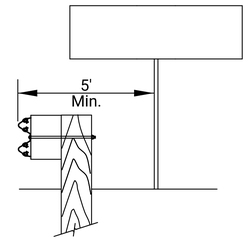
2) Neither portable nor permanent sign supports shall be located on sidewalks or areas designated for pedestrian or bicycle traffic.

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.

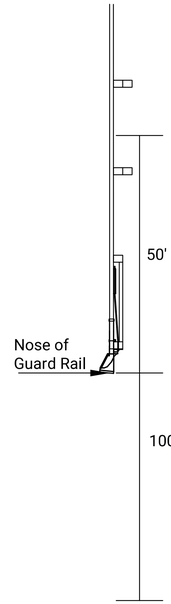
5) Large signs having an area exceeding 50 square feet installed on multiple breakaway posts shall be mounted a minimum of 7' above the ground.

* 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.

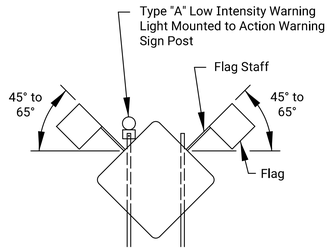


1) The edge of the sign is not to extend beyond the back side of the guard rail. The sign post shall not be located within 5' of the guard rail.

2) The mounting height for signs behind the gaurd rail shall be the same as the mounting height for shoulder mounted signs.



NO SIGN PLACEMENT AREA



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.

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.	

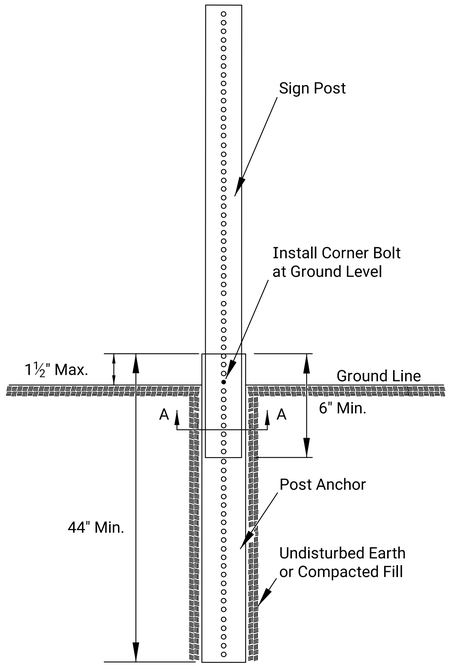
KDOT Graphics Certified 10-28-2025 Sh. No. 229

KDOT Graphics Certified

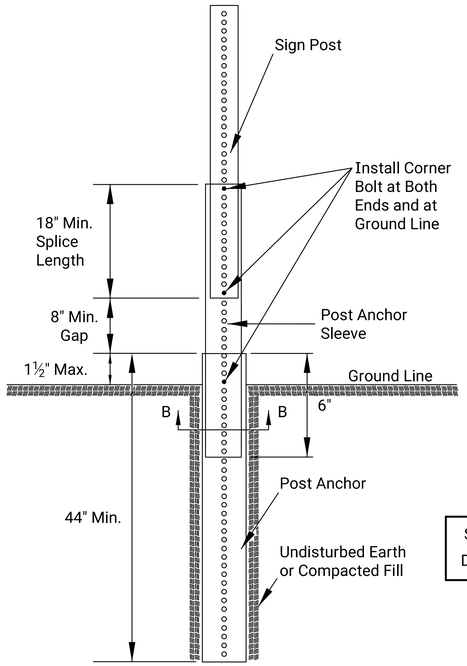
Plotted by : Nick.Caine 4-NOV-2025 09:04
File : TE710.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	230	253

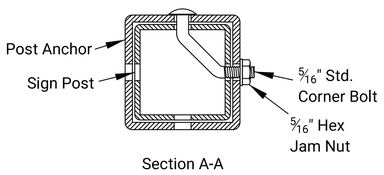
PERFORATED SQUARE STEEL TUBE (P.S.S.T.) POST SETUP



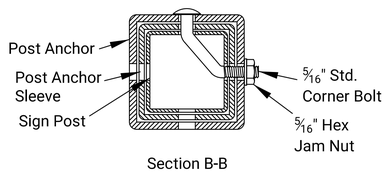
P.S.S.T. Detail



Telescoping P.S.S.T. Detail



Section A-A

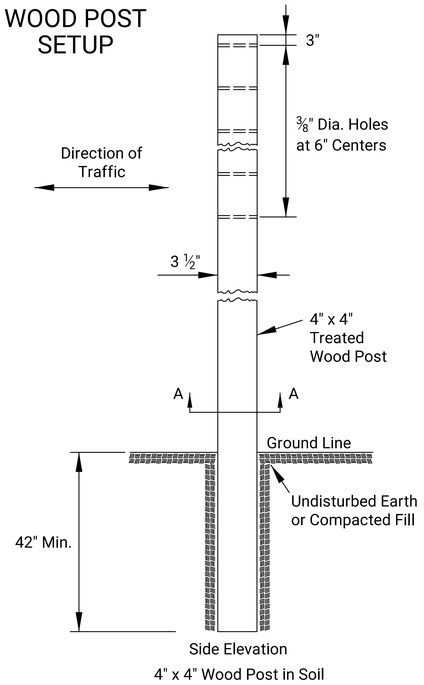


Section B-B

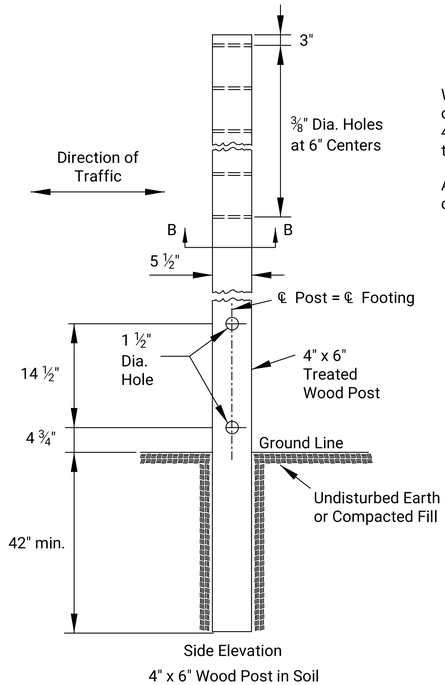
Details for 2", 2 ¼", or 2 ½" sign posts

Place bolts in the same corner along each sign post.

WOOD POST SETUP



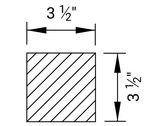
Side Elevation
4" x 4" Wood Post in Soil



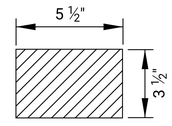
Side Elevation
4" x 6" Wood Post in Soil

When the sign width is equal to or greater than 9', three or more wood posts should 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.

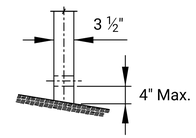
All Special signs larger than 16 sq. ft. Shall be installed on wood posts.



Section A-A



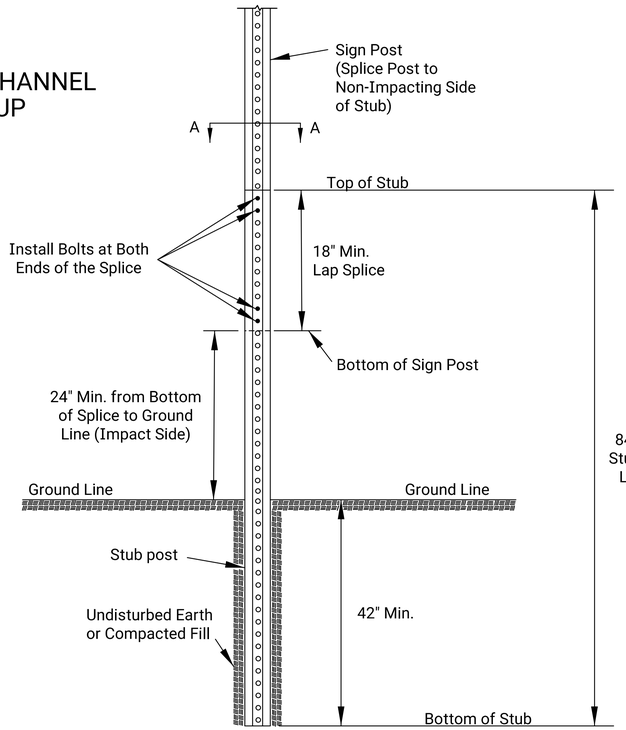
Section B-B



Front Elevation

See TE710 for Additional Details and Requirements

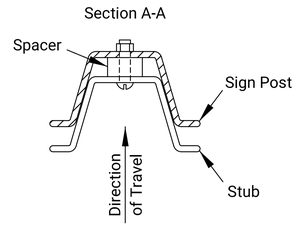
3 LB/F U-CHANNEL SETUP



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~~

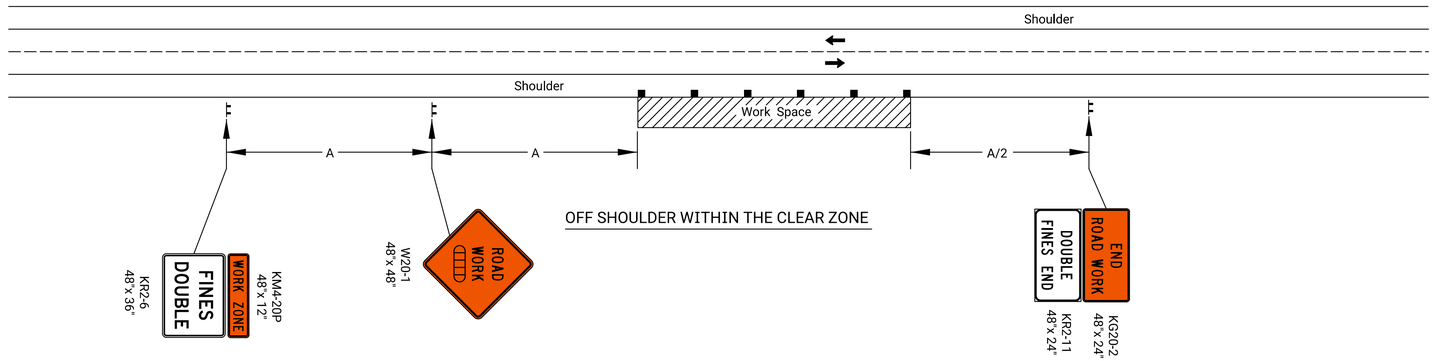
FHWA APPROVAL		06-01-15	APP'D.	Kristina Ericksen	
DESIGNED	B.A.H.	DETAILED R.W.B.	QUANTITIES	TRACED	
DESIGN CK.		DETAIL CK.	QUAN.CK.	TRACE CK.	

KDOT Graphics Certified 10-28-2025 Sh. No. 230

KDOT Graphics Certified

Plotted by : Nick.Caine 4-NOV-2025 09:06
File : TE712.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	231	253



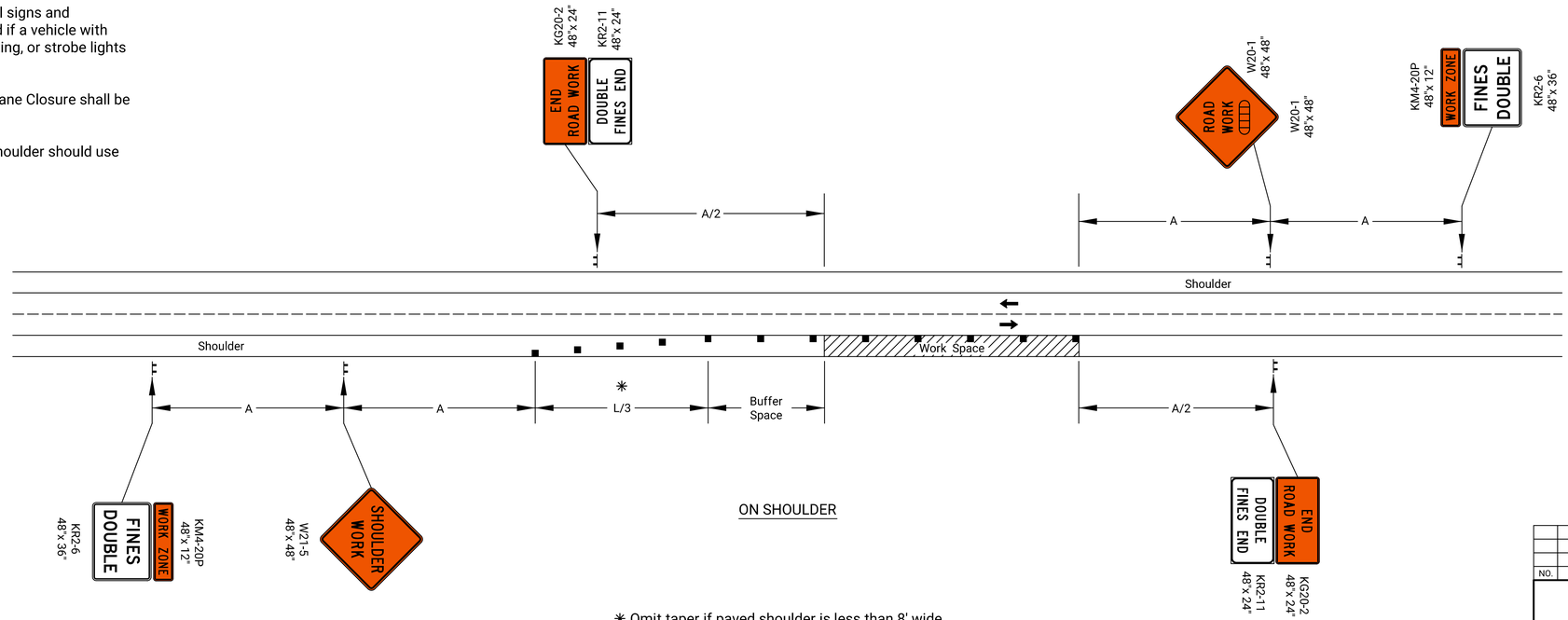
Notes:

No traffic control is required if the Work Space is located outside of the clear zone.

For operations of 60 minutes or less, all signs and channelizing devices may be eliminated if a vehicle with high-intensity rotating, flashing, oscillating, or strobe lights is used.

If traveled lane is encroached upon a Lane Closure shall be required.

If work vehicles or equipment on the shoulder should use the ON SHOULDER detail.



ON SHOULDER

✳ Omit taper if paved shoulder is less than 8' wide.

■ Channelizing Device

Ahead, 1500 ft, or 1 Mile

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL SHOULDER WORK UNDIVIDED ROADWAY

~~TE720~~

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

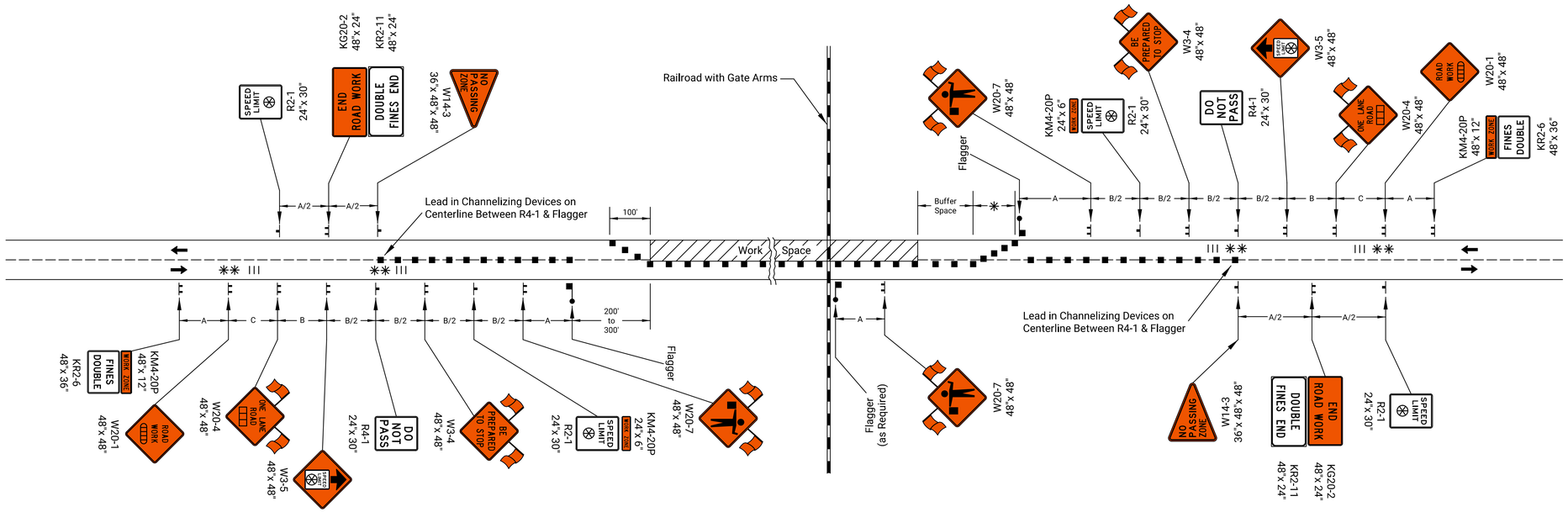
KDOT Graphics Certified 10-31-2025 Sh. No. 231

KDOT Graphics Certified

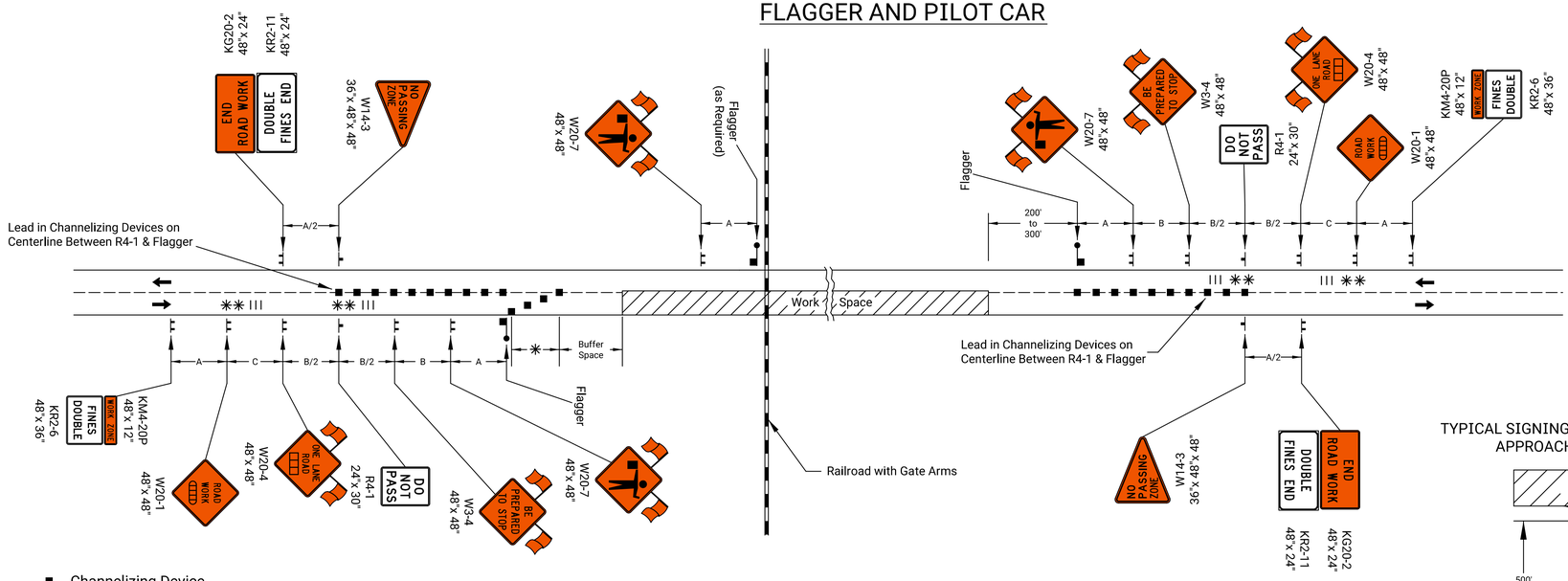
Plotted by : Nick.Caine 4-NOV-2025 09:07
File : TE720.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	232	253

FLAGGER



FLAGGER AND PILOT CAR



- ■ Channelizing Device
- Ahead, 1500 ft, or 1 Mile
- Ahead, 1000 ft, 1500 ft, or ½ Mile
- ⊗ Speed to be Determined by the Engineer
- ○ Type "A" Low Intensity Warning Light
- III Temporary Portable Rumble Strips

USE TE731 FOR FLAGGER OR PILOT CAR ON ROADWAYS WITH CONCRETE SHOULDERS GREATER THAN 8 FT.

Notes: Trucks hauling material to the project should STOP at the Flagger. After stopping, upon approval of the Engineer, trucks may be allowed to move around the Flagger.

Place a Flagger at all highway and major collector intersections and at-grade railroad intersections with lights and gates in the work space to control traffic crossing the tracks to the left of the gate arm. The need for a Flagger at minor side road intersections shall be determined by the Engineer. Place a W20-7 (Flagger symbol) sign on each side road that is controlled by a Flagger.

Existing signs shall not be covered or removed between Flagger stations.

Temporary rumble strips may be used in lieu of lead in channelizing devices when the roadway is less than or equal to 30' including paved shoulders. When extenuating circumstances exist, the Area Engineer may elect to eliminate both the lead in channelizers and the rumble strips.

Temporary Traffic Control in proximity of Highway-Rail grade crossings shall provide the following:
1.) Roadway flagger(s) shall be stationed upstream of the railroad crossing to prevent queuing on the tracks at all times.
2.) If Traffic Control Plan has the potential to cause queuing , install "DO NOT STOP ON TRACKS" (R8-8).
3.) A railroad flagger shall be present any time work is within 25ft of the nearest rail and anytime traffic is rerouted in a counterflow direction across an at-grade crossing.

✳ Minimum six (6) channelizers spaced at 20' intervals.

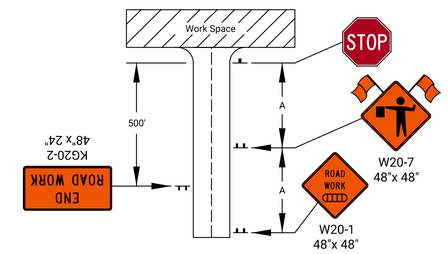
✳✳ Optional rumble strips may be placed: One set between the W20-1 and W20-4, and one set between the R4-1 and W3-4, on each approach.

△ Not required on substantial maintenance projects (1R).

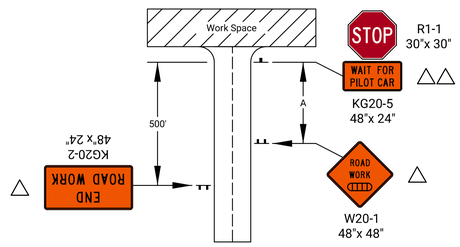
△△ The KG20-5 (WAIT FOR PILOT CAR) sign shall be mounted on an approved portable support and not attached to the existing stop sign post.

The KG20-5 sign shall be placed immediately in front of the existing stop sign, a minimum of 6" below the bottom of the stop sign. The sign should be removed or covered when there is no pilot car.

TYPICAL SIGNING FOR HIGHWAY OR MAJOR COLLECTOR APPROACH TO WORK SPACE



TYPICAL SIGNING FOR A MINOR SIDE ROAD APPROACH TO WORK SPACE



NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL FLAGGER OR PILOT CAR

~~TE730~~

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 10-29-2025 Sh. No. 232

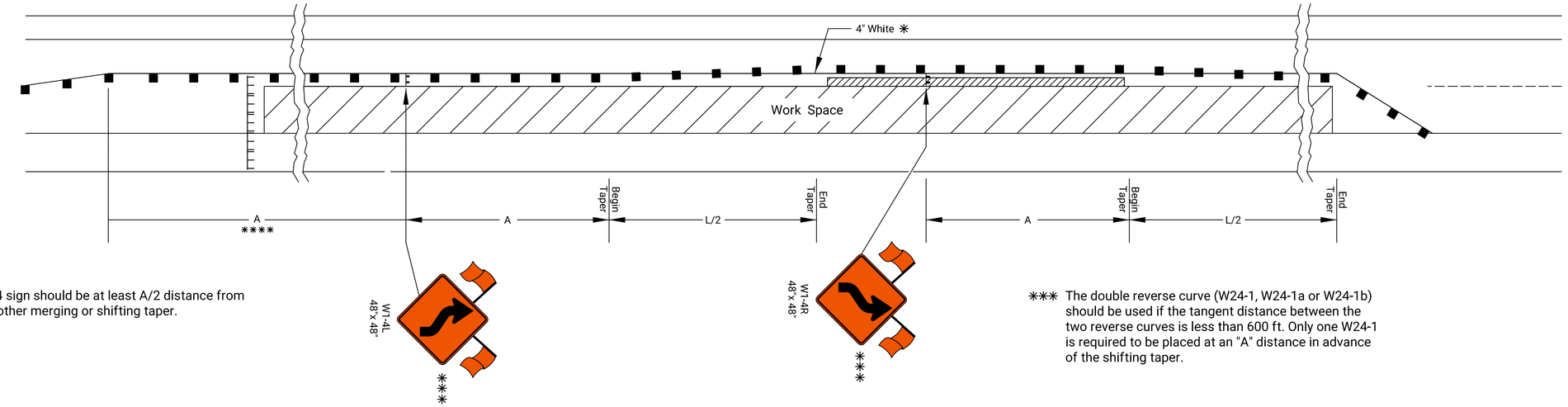
KDOT Graphics Certified

Plotted by : Nick.Caine 4-NOV-2025 09:13
File : TE730.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	233	253

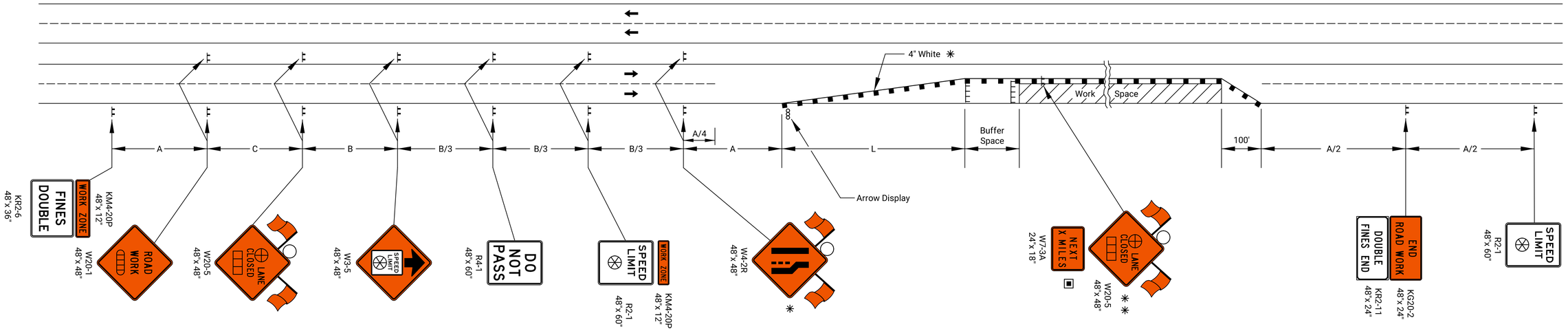
SHIFTING TAPER DETAIL

Add signs and devices as shown for work inside a closed lane that extends near to (or into) the open traffic lane.



✳✳✳✳ W1-4 sign should be at least A/2 distance from any other merging or shifting taper.

✳✳✳ The double reverse curve (W24-1, W24-1a or W24-1b) should be used if the tangent distance between the two reverse curves is less than 600 ft. Only one W24-1 is required to be placed at an "A" distance in advance of the shifting taper.



- Type 3 Barricades
- X Length to the Nearest Whole Mile
- ■ Channelizing Device
- Ahead, 1500 ft, or 1 mile
- Ahead, 1000 ft, 1500 ft, or ½ mile
- ⊕ Right or Left
- ⊗ Speed to be determined by the Engineer
- ○ Type "A" Low Intensity Warning Light

✳ For left lane closures use W4-2L and yellow edge line along channelizing devices.

✳ ✳ The W20-5 (⊕Lane Closed) and W7-3A (Next X Miles) signs should be placed at 2 mile increments on a project of 4 miles or longer.

▣ Mileage to be Determined by the Engineer.

Left-side signs shall be omitted for a four-lane undivided highway.

At least one Type 3 barricade should be placed at least every 500' in a closed lane.

Shoulder Taper is required if paved shoulder is 6' or wider.

NO.	DATE	REVISIONS	BY	APP'D
01	03-13-18	W24-1 usage changed to Should	R.W.B.	E.G.K.

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL LANE CLOSURE ON MULTILANE HWY

~~TE744~~

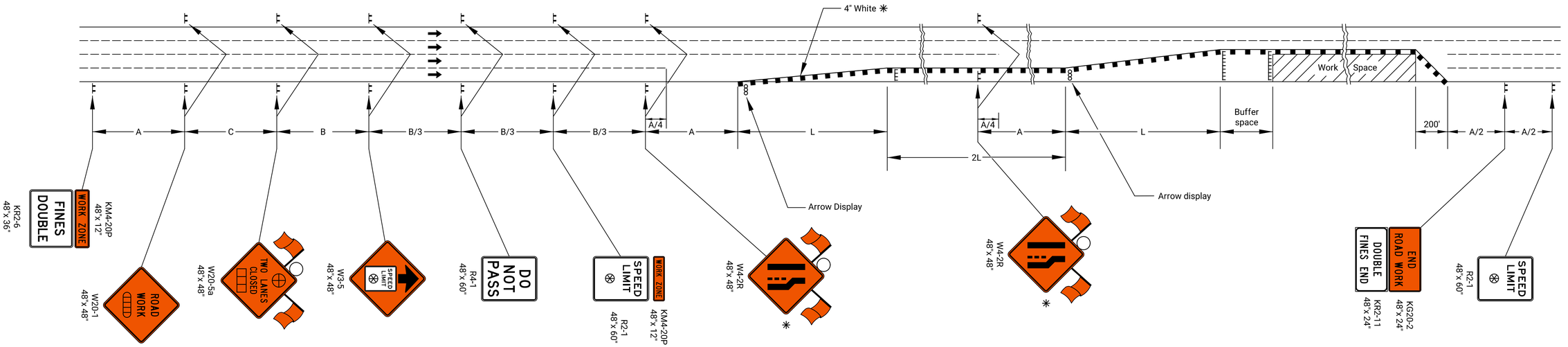
FHWA APPROVAL		03-13-18	APP'D.	Eric Kocher	
DESIGNED	B.A.H.	DETAILED R.W.B.	QUANTITIES	TRACED	
DESIGN CK.		DETAIL CK.	QUAN.CK.	TRACE CK.	

KDOT Graphics Certified 11-04-2025 Sh. No. 233

KDOT Graphics Certified

Plotted by : Nick.Caine 4-NOV-2025 11:21
File : TE744.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	234	253



✳ For left lane closures use W4-2L and yellow edge line along channelizing devices.

At least one Type 3 barricade should be placed at least every 500' in a closed lane.

Shoulder Taper is required if paved shoulder is 6' or wider.

- Type 3 Barricades
- X Length to the Nearest Whole Mile
- ■ Channelizing Device
- Ahead, 1500 ft, or 1 mile
- Ahead, 1000 ft, 1500 ft, or ½ mile
- ⊕ Right or Left
- ⊛ Speed to be Determined by the Engineer
- ○ Type "A" Low Intensity Warning Light

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL TWO LANES CLOSED

~~TE746~~

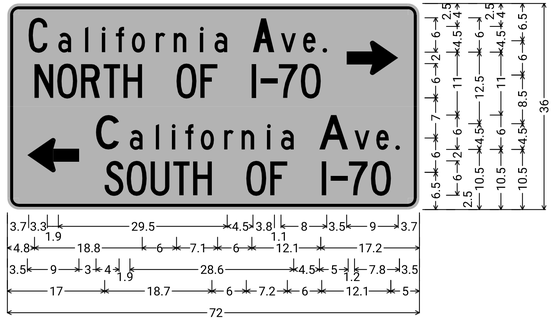
FHWA APPROVAL			06-01-15	APP'D.	Kristina Ericksen		
DESIGNED	B.A.H.	DETAILED	R.W.B.	QUANTITIES		TRACED	
DESIGN CK.		DETAIL CK.		QUAN.CK.		TRACE CK.	

KDOT Graphics Certified 11-04-2025 Sh. No. 234

KDOT Graphics Certified

Plotted by : Nick.Caine 4-NOV-2025 11:23
File : TE746.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	235	253



SP-01
2.0" Radius, 0.5" Border, 0.5" Indent, Black on Fluorescent orange;
"California Ave.", C specified length; "NORTH OF I-70", C specified length;
Standard Arrow Custom 9.0" X 6.0" 0°;
Standard Arrow Custom 9.0" X 6.0" 180°; "C" C "alifornia " C "A" C"ve.", C specified length;
"SOUTH OF I-70", C specified length;
Table of distances between letter and object lefts

| | | |

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	236	253

Pavement Work Zone (Temporary) Symbols					
Location	Type	Symbol	Phase	Direction	Qty.

SUMMARY OF TRAFFIC CONTROL DEVICES (EACH)

Work Zone Sign (Special)		
Sign No.	16.25 Sq.Ft. & Less	16.26 Sq.Ft. & Over
SP-01		2
SP-31	2	
SP-43	2	
SP-44		2
SP-45		1
SP-46		1
SP-53	5	
SP-54	3	

Barricades ✳		Channelizing Devices ✳		
Type 3 (4' to 12')	Pedestrian	Fixed	Portable	Pedestrian
87	3		732	

Lighted Devices ✳	
Work Zone Warning Light (Type "A" Low Intensity)	16
Work Zone Warning Light (Red Type "B" High Intensity)	4
Arrow Display	3
Portable Changeable Message Sign	2

SUMMARY OF TRAFFIC CONTROL DEVICES (EACH PER DAY)

✳ Quantity most used on the project at any one time

Work Zone Signs ✳			
Sign No.	Size - Sq.Ft.		
	0-9.25	9.26-16.25	16.26 & Over
W20-7		2	
W20-3		4	
W16-8P	15		
M(I)3-2	10		
M(I)3-4	13		
M1-1	23		
M1-4	23		
M1-5	23		
M4-5	12		
M4-8	19		
M4-8a	5		
M4-9L	6		
M4-9R	5		
M6-1L	9		
M6-1R	8		
M6-3	6		
KI-104			1
R11-2		14	
R11-4	4		
R2-1			3
R4-1			2
R9-9	3		
KG20-2	2		
KM4-20	3		
KM4-20p	2		
KR2-6	2		
KR2-11	2		
W1-2L		2	
W1-4R		1	
W1-6R	2		
W1-8L	6		
W3-4	2		
W3-5		2	
W4-2L		3	
W7-3a	2		
W13-1	2		
W13-4P	1		
W19-5	2		
W20-1		7	
W20-3	4		
W20-5		2	
W20-7a	2		
W21-5a		3	
W21-5b		2	

Recapitulation of Quantities		
Item	Quantity	Unit
Work Zone Signs (0 to 9.25 Sq.Ft.)	61,480	Each Per Day
Work Zone Signs (9.26 to 16.25 Sq.Ft.)	12,180	Each Per Day
Work Zone Signs (16.26 Sq.Ft. & Over)	1,740	Each Per Day
Work Zone Barricades (Type 3 - 4' to 12')	25,230	Each Per Day
Work Zone Barricades (Pedestrian)	870	Each Per Day
Channelizer (Fixed)		Each Per Day
Channelizer (Portable)	212,280	Each Per Day
Channelizer (Pedestrian)		Each Per Day
Work Zone Warning Light (Type "A" Low Intensity)	4,640	Each Per Day
Work Zone Warning Light (Red Type "B" High Intensity)	1,160	Each Per Day
Arrow Display	870	Each Per Day
Portable Changeable Message Sign	580	Each Per Day
Pavement Marking (Temporary)		
4" Solid (Type I)	300	Sta./Line
4" Solid (Type II)		Sta./Line
4" Broken (8.0') (Type I)	2	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
Symbol (Type I)	8	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	46,140	Lin. Ft.
Work Zone Sign (Special) (16.25 Sq. Ft. & Less)	9	Each
Work Zone Sign (Special) (16.26 Sq. Ft. & More)	6	Each
Rigid Raised Pavement Marker (Type I)		Each
Rigid Raised Pavement Marker (Type II)		Each
Traffic Signal Installation (Temporary)		Lump Sum
Traffic Control (Initial Set Up)	Lump Sum	Lump Sum
Traffic Control		Lump Sum
Flagger (Set Price)	1	Hour

NO.	DATE	REVISIONS	BY	APP'D

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 12-11-2025

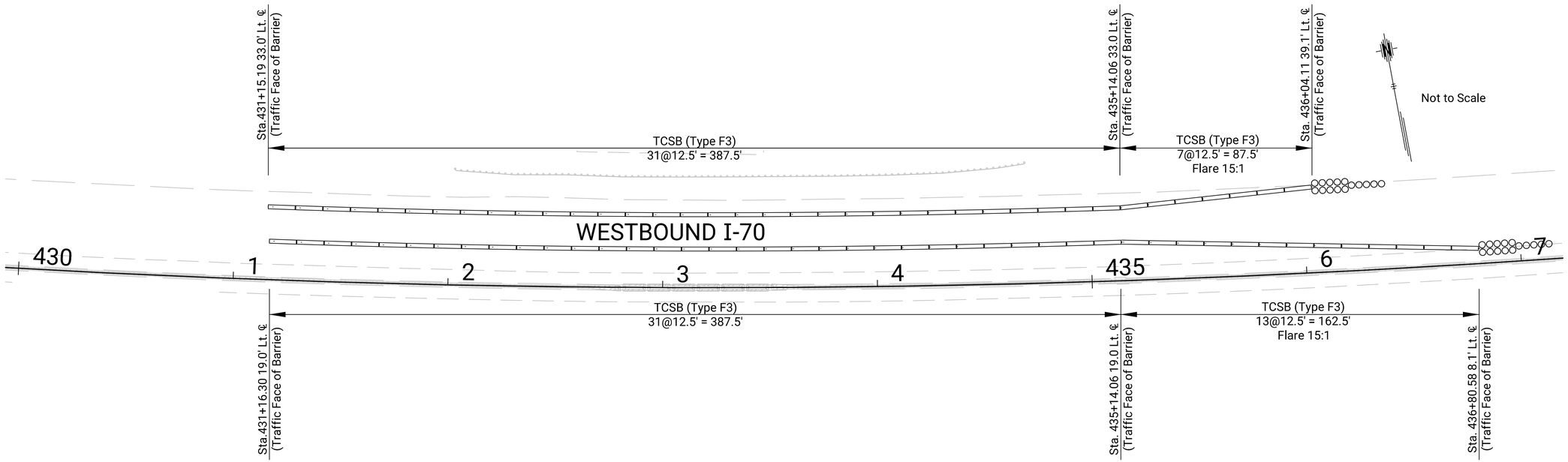
Sh. No. 236

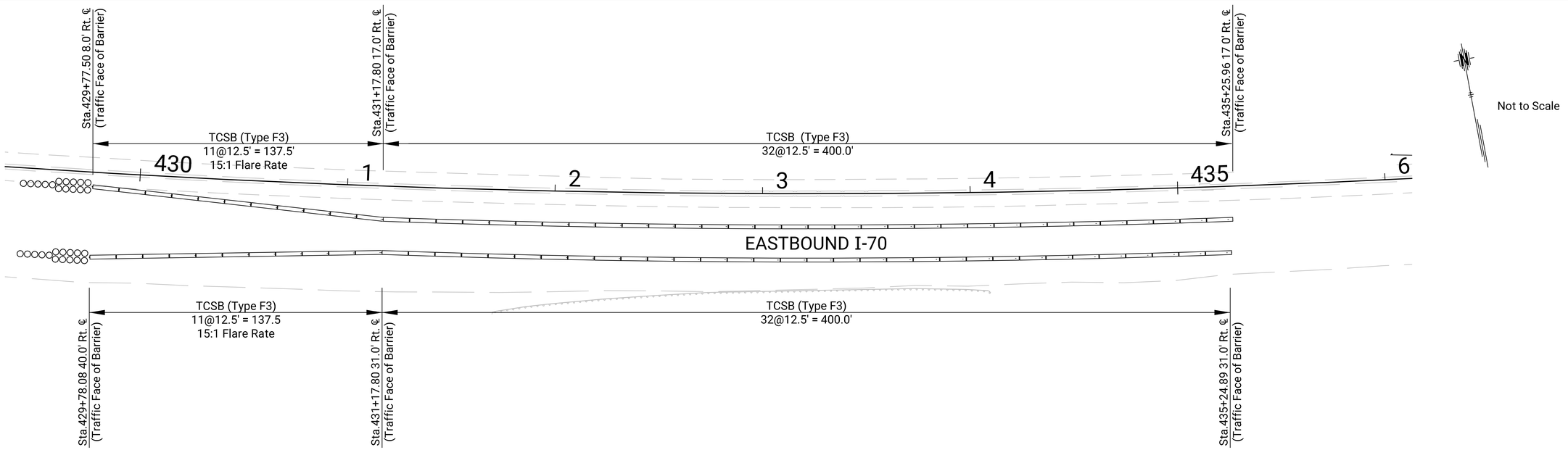
KDOT Graphics Certified

Drawn By : rak01965 Plotted : 11-DEC-2025 10:03
File : z_ka680801css795-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	237	253

DATE	BY	REFERENCES NOTED	REFERENCES CHECKED





LEGEND

Inertial Barrier System

Temporary Barrier

KANSAS DEPARTMENT OF TRANSPORTATION

CONCRETE SAFETY BARRIER
(TEMPORARY)
PLAN

Plotted by : BGS01485 16-DEC-2025 13:01
File : ka680801rsb-105.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	238	253

Note to Designer: Report the quantity for temporary concrete safety barrier in linear feet.
The quantity is calculated by multiplying the number of barrier units by 12'-6".

SUMMARY OF QUANTITIES

			⊙ CONCRETE SAFETY BARRIER (TYPE F3)					
LOCATION (ROUTE)	STATION (OR STATION RANGE)	SIDE	FLARE RATE (WHERE APPLICABLE)	TEMPORARY	TEMPORARY-RELOCATE	TEMPORARY-INSTALL ONLY	UNIT	COMMENTS
I-70								
Eastbound	429+77.50 to 435+25.96	RT	15:1	1075			86	
Westbound	431+15.19 to 436+80.58	LT	15:1	1025			82	
	Total			2100				

⊙ The quantity reported does not include the $3\frac{5}{8}$" gap between 12'-6" sections of barrier. The $3\frac{5}{8}$" gap will not be included in the pay length for Concrete Safety Barrier (Type F3) (Temporary).
See the Summary of Quantities on Sheet No. XX for Recap of Temporary Concrete Safety Barrier and End Treatments.

Design Parameters	
Design Speed (mph)	Flare Rate (a:b)
70	15:1
60	14:1
55	12:1
50	11:1
45	10:1
40	8:1
30	7:1

Note: The flare rates listed here apply only to temporary concrete safety barrier installations. See temporary concrete safety barrier layouts included in the plans for variations. Typical alternate flare rates may be used as approved by the Engineer.

NO.	DATE	REVISIONS	BY	APP'D
01	02-11-15	Initial Release	K.E.K.	S.W.K.

KANSAS DEPARTMENT OF TRANSPORTATION

SUMMARY OF QUANTITIES TEMPORARY CONCRETE SAFETY BARRIER AND END TREATMENTS

RD052

FHWA APPROVAL	09-16-15	APP'D.	James O. Brewer
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

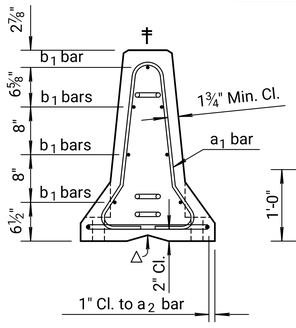
KDOT Graphics Certified 11-13-2024

Sh. No. 238

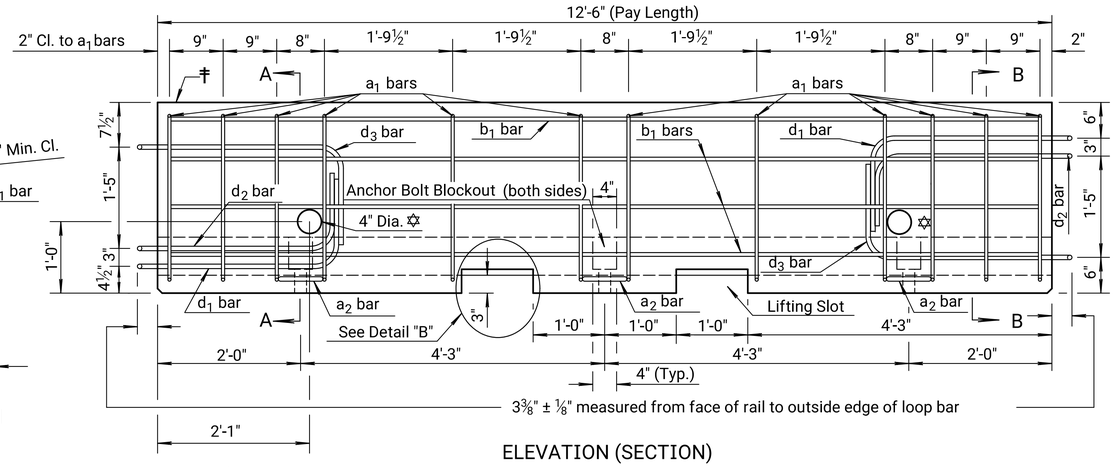
KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 13:53
File : ka680801rss052.dgn

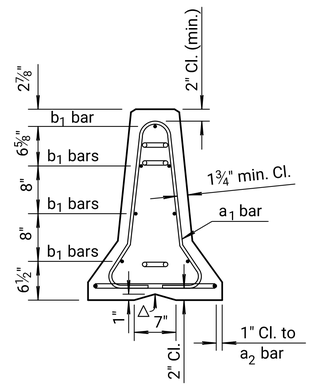
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	239	253



SECTION A-A
TYPICAL SECTION
(Stirrup Placement)

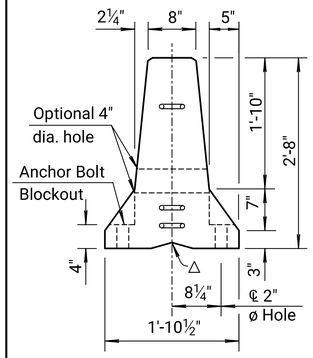


ELEVATION (SECTION)

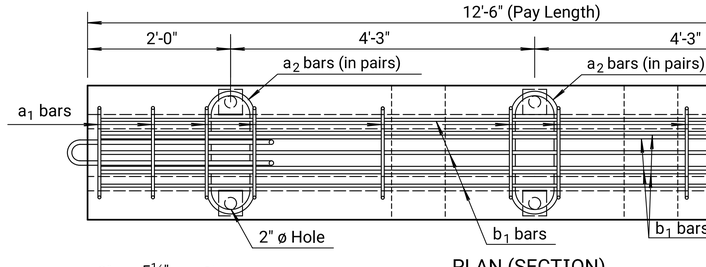


SECTION B-B
TYPICAL SECTION
(Stirrup Placement)

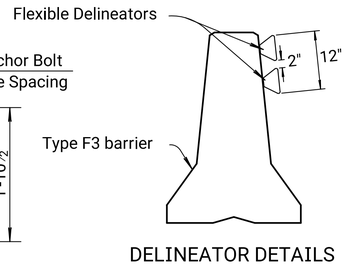
† Marked End
✡ 4" diameter - 11 gauge steel round mechanical tubing sleeve. These holes are optional.
△ V Notch is optional



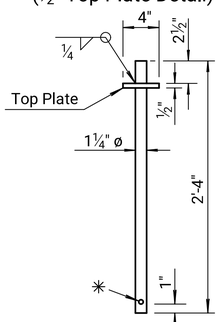
END VIEW



PLAN (SECTION)

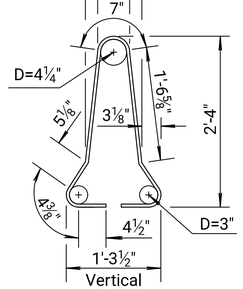


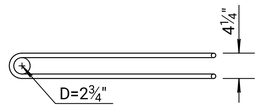
DELINEATOR DETAILS



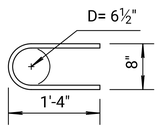
(½" Top Plate Detail)

DETAIL A
CONNECTION PIN
(A36 Steel) 10.9 lbs. each
✳ ⅝" ø hole for retainer bolt. The retainer bolt & nut are installed at Contractor's option.
Note: Retainer bolt & nut required with Tie Down Strap.

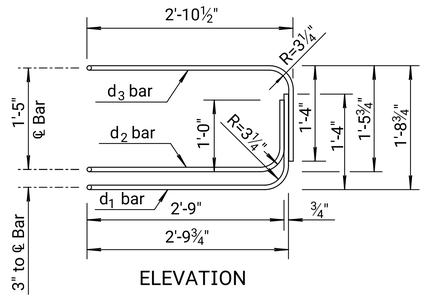




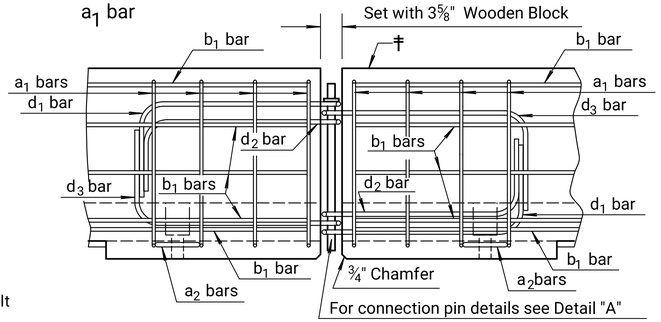
PLAN
LOOP BAR ASSEMBLY
(Marked end shown, invert for other end)
(Material as stated in General Notes)



a2 bar



ELEVATION

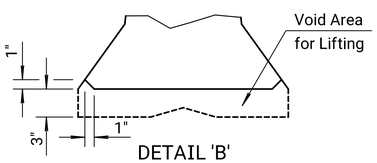


DETAILS OF BARRIER CONNECTION

Per 12'-6" Barrier Section

REINFORCING A615 Gr. 60					
Bar	Bar Size	Shape	No. of Bars	Length Ft.	Weight Lbs.
a_1	#4		12	6'-0"	48.1
a_2	#6		6	2'-11"	26.3
b_1	#5		7	12'-2"	88.8
LOOP ASSEMBLY					
d_1	#6		2	8'-5"	25.3
d_2	#6		2	7'-7"	22.8
d_3	#6		2	8'-6"	25.5

Concrete Quantity = 1.3 C.Y.
(Dimensions are out to out of bars unless otherwise noted.)



DETAIL 'B'
LIFTING SLOT DETAIL
(1" Chamfer to prevent spalling)

NOTE: At no time shall the barriers be lifted, moved, etc. by use of the loop bars: d_1, d_2 or d_3.

GENERAL NOTES:

MATERIAL: Use ASTM A615, Grade 60 reinforcing bars, except for the loop bars (d_1, d_2 and d_3). The loop bars (d_1, d_2 and d_3) shall be ¾" smooth steel bars with a minimum yield of 60 ksi, a tensile strength of not less than 1.25 times the yield strength but a minimum of 80 ksi, a minimum 14% elongation in 8 inches, and passing a 180 degree bend test using a 3.5 D pin bend diameter. The loops shall be installed within ⅛" of the plan dimensions.

Use air-entrained concrete with f'c = 5,000 p.s.i.

SECTION: The section furnished must generally comply with dimensions shown. Requests for minor variations in section geometry and attachments may be submitted to the Engineer for approval.

LIFTING SLOTS: Lifting slots shall be constructed where specified on the plans to facilitate the drainage of water after installation on the roadway.

TEMPORARY CONCRETE SAFETY BARRIER: Furnishing and placing of all materials when required and all labor and equipment required to position the temporary barrier shall be included in the Contract unit price bid for "Concrete Safety Barrier (Type F3)(Temporary)". Any relocation of the barrier required for the project shall be paid in accordance with the Special Provisions under the bid item "Concrete Safety Barrier (Type F3) (Temporary-Relocate)". Unless otherwise noted on the Plans, the Temporary Concrete Safety Barrier shall become the property of the Contractor and shall be removed from the site upon acceptance of the completed project.

Approximate weight of one unit equals 2.7 tons.

PLACEMENT: Barrier shall be placed on a paved surface. All loose dirt and sand shall be removed from the roadway surface just prior to placement of the barrier.

After the barrier is placed and the connection pin is inserted, tension or pull the barrier such that the installation is taut and the connection pin cannot freely move vertically. If the connection pin or loop bar assembly are damaged during the tensioning process, it is the responsibility of the Contractor to repair the damaged area or replace the temporary barrier section.

MARKING: The left end (†) of each barrier shall be permanently marked by stamping or forming into the barrier the following information:
- Type F3
- Manufacturer code (as specified by KDOT Bureau of Const. & Maint.)
- Date manufactured (month and year)

DELINEATION: Delineators shall be spaced on 50' centers, except through curves where they shall be spaced on 25' centers. See Standard Drawing RD610 for additional details.

The delineation shall be mounted on the side of the Temporary Concrete Safety Barrier with two delineators at each location. Each delineator shall have a minimum height-to-width ratio of 1.75, and a minimum reflective surface area of 7 sq. in.. The delineators shall be affixed to the Temporary Concrete Safety Barrier as recommended by the manufacturer.

Delineators shall be attached to bridge rail or other structures in construction zones when roadway is narrowed and traffic is adjacent to the structure. The method and location of placement shall be similar to permanent barrier delineation.

When traffic flow is in one direction, the delineators shall be yellow when used on the left, white when used on the right. When traffic flow is in both directions delineators shall be placed back-to-back, and shall correspond to the color of the edge line.

The work and materials required for the installation of delineators as mentioned shall be subsidiary to the bid item "Concrete Safety Barrier (Type F3) (Temporary).

If necessary, include Standard Drawing RD622A for Taper Section, Standard drawing RD622B for anchor and tie down details, Standard Drawing RD622C for Bridges with thermal expansion of 1½" or greater and Standard Drawing RD622D for Barrier Layouts.

The Contractor shall be responsible for maintaining a clear area, shown as dimension "A" on Standard Drawing RD622B. The clear area is located behind the Temporary Concrete Safety Barrier and shall be kept free of any equipment, material stockpiles or other obstacles. For non-anchored roadway applications, dimension "A" shall be a minimum of 2'-0".

NO.	DATE	REVISIONS	BY	APP'D
07	09-11-17	Revised Markers	A.L.R.	S.W.K.
06	07-17-17	Revised General Note	A.L.R.	S.W.K.
05	08-27-15	Added Note, Pay Length	K.E.K.	S.W.K.

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY CONCRETE SAFETY BARRIER TYPE F3

RD622

FHWA APPROVAL	03-05-18	APP'D.	Scott W. King
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 05-23-2025

Sh. No. 239

KDOT Graphics Certified

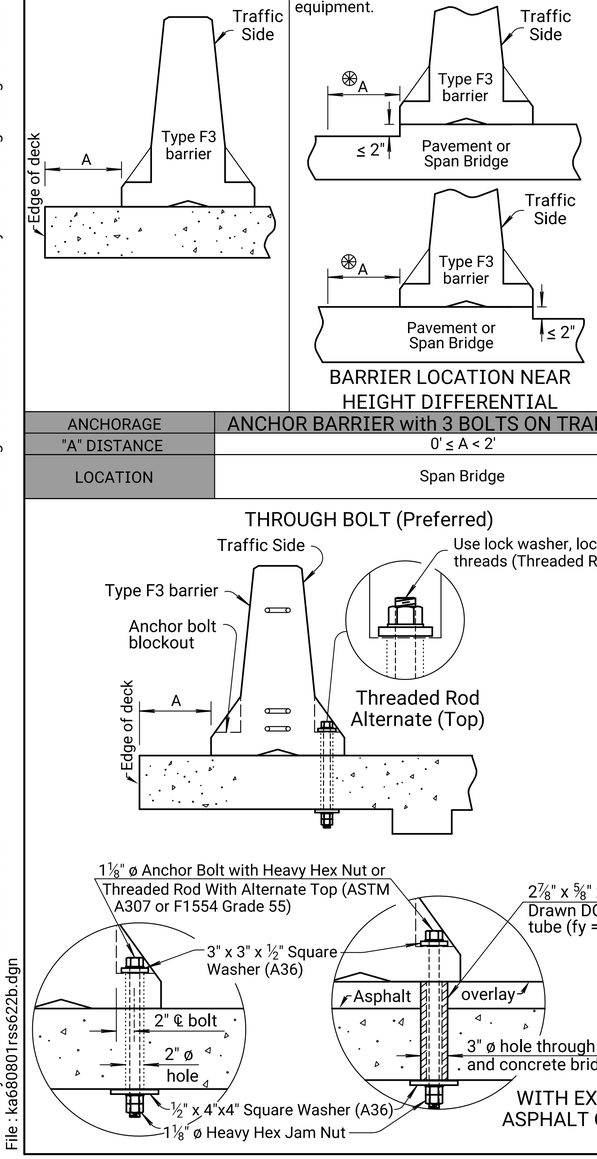
Plotted by : BGS01485 16-DEC-2025 13:02
File : ka680801rss622.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	240	253

GENERAL NOTES:
INSTALLATION: Holes into the pavement to anchor the concrete safety barrier may be drilled after positioning barrier. When anchoring with 3 bolts on traffic side, install barrier with through anchor bolt where possible, use grouted anchor bolts where through bolt can't be used. Do not drill into or otherwise damage support beams, girders, or expansion joints. All work & materials required for the installation of the anchors are subsidiary to the bid item "Concrete Safety Barrier".
UTILITIES & STRUCTURES (Stakes): Verify buried utilities & structures within stake depth. If conflicts between stake & buried elements exist, up to 2 stakes maximum in a single barrier may be omitted if adjacent barriers have 3 stakes each.

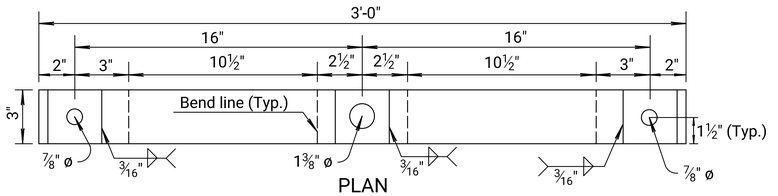
ANCHORAGE: Use galvanized grouted anchor bolts, through anchor bolts, nuts & washers that meet standard specifications. Install 3 anchor bolts or asphalt pins per barrier on the traffic side except on transition barrier as shown.
BARRIER REMOVAL: Completely remove all anchor systems. Remove grouted or drop-in anchor system by drilling the anchor with a core barrel 2x the diameter of the insert. Core to a depth equal to the installed depth & remove the core, prepare the hole by removing dust & debris. Fill hole with material that meets KDOT Pre-qualified "Non-shrink grouts for grouting anchor bolts & reinforcing into previously poured concrete". Follow the manufacturer's procedures for mixing, hole preparation & curing. To fill through bolt anchor or screw-in anchor system, remove & completely fill the hole using instructions for drop-in anchors except no coring is required.
For removed or relocated barrier on flexible pavement, fill stake holes completely with hot or cold asphalt patch material. Work & materials required to remove & patch anchor holes are subsidiary to the bid item "Concrete Safety Barrier".
TEMPORARY BARRIERS: Temporary Barriers shown in the details of this drawing are not allowed for permanent installations.
See KDOT Standard Drawing "Temporary Concrete Safety Barrier Type F3 Transition Layouts" for transition details between anchored & free-standing barriers. See KDOT Standard Drawing "Temporary Concrete Safety Barrier Type F3" for details & quantities not shown on this sheet.
SIGNING: For sign spacing, traffic control device details & reference notes, see Index of Sheets.

NO ANCHORAGE REQUIRED unless shown on plans		
"A" DISTANCE	A ≥ 4'	A ≥ 2'
LOCATION	Span Bridge	⊛ Box Culverts Roadways - Flexible or Rigid Pvmnt.

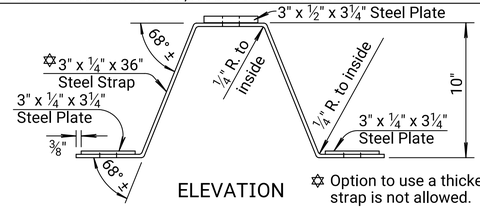


⊛Applies on span bridges when the action creates a height differential of ≤ 2". Measured from the toe of the barrier, the "A" distance should be free of obstacles and equipment.

BARRIER LOCATION NEAR HEIGHT DIFFERENTIAL



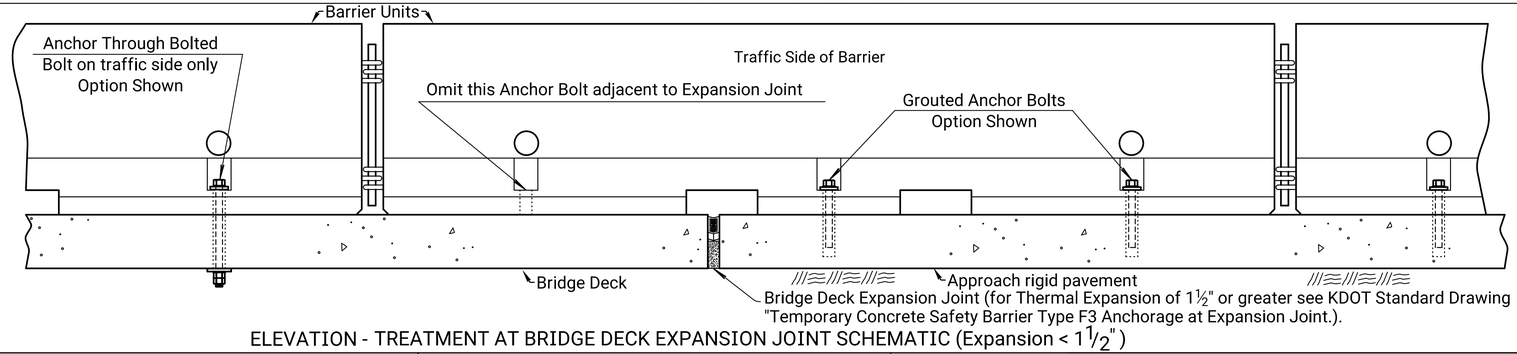
PLAN



ELEVATION

✡ Option to use a thicker steel strap is not allowed.

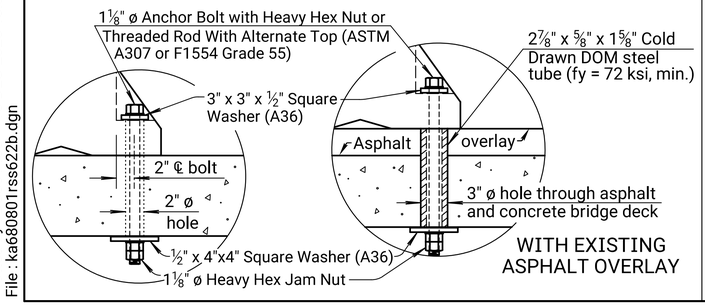
TIE-DOWN STRAP DETAILS



ELEVATION - TREATMENT AT BRIDGE DECK EXPANSION JOINT SCHEMATIC (Expansion < 1½")

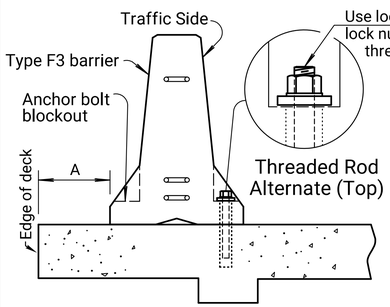
ANCHORAGE	ANCHOR BARRIER with 3 BOLTS ON TRAFFIC SIDE	ANCHOR BARRIER with 3 BOLTS ON TRAFFIC SIDE		ANCHOR BARRIER with TIE-DOWN STRAP		ANCHOR BARRIER with STAKES
"A" DISTANCE	0' ≤ A < 2'	0' ≤ A < 2'		△ 2' ≤ A < 4'	6" ≤ A < 2'	6" ≤ A < 2'
LOCATION	Span Bridge	Span Bridge	Box Culverts Roadways - RIGID Pavement	Span Bridge	Box Culverts Roadways - RIGID Pavement	Box Culverts (ceiling below stake depth) Roadways - FLEXIBLE Pavement

THROUGH BOLT (Preferred)

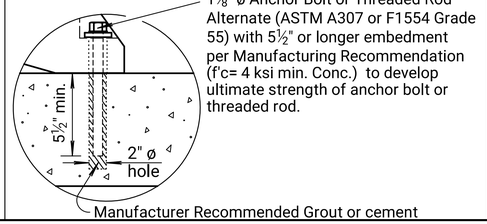


WITH EXISTING ASPHALT OVERLAY

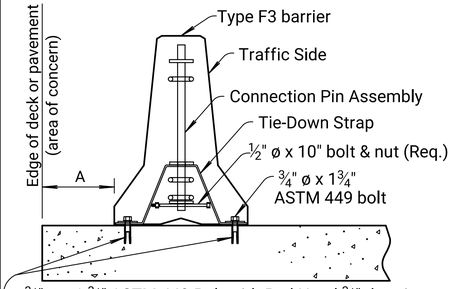
✧ALT. DRILLED AND GROUTED ANCHOR



✧Note: Alternate Drilled and Grouted Anchor installation avoids damage to the support beams, girders or expansion joint. The State Bridge Office shall approve the use of the Alternate Drilled and Grouted Anchor installation for bridge applications.

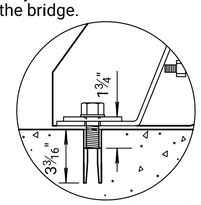


TIE-DOWN STRAP



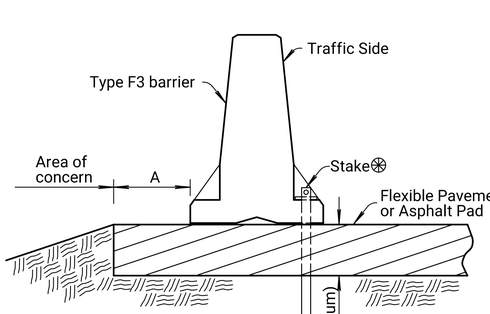
¾" ø x 1 ¾" ASTM 449 Bolt with Red Head ¾" drop in anchor, Red Head large diameter Tapcon (LDT) ¾" ø x 4 ½" long, or Simpson Titen HD ¾" ø x 5" long

△"A" distance may be reduced to 6" if traffic does not travel under the bridge.

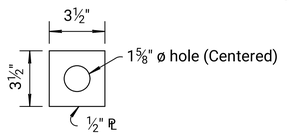


With prior approval from the State Bridge Office, anchoring the barrier with 3 bolts (Through Bolt OR Drilled & Grouted Anchor oprtions) on the traffic side may be used in lieu of tie-down straps.

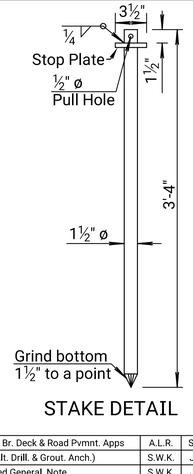
STAKED DOWN



⊛ Predrill 1½" ø holes in flexible pavement prior to installing stakes.



STOP PLATE DETAIL



STAKE DETAIL

NO.	DATE	REVISIONS	BY	APP'D
07	04-21-21	Revised Layouts for Br. Deck & Road Pvmnt. Apps	A.L.R.	S.W.K.
06	12-31-13	Rev. Note (Alt. Drill. & Grout. Anch.)	S.W.K.	J.O.B.
05	06-27-11	Revised General Note	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY CONCRETE SAFETY BARRIER TYPE F3 ANCHORAGE

RD622B

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

KDOT Graphics Certified 05-23-2025

Sh. No. 240

KDOT Graphics Certified

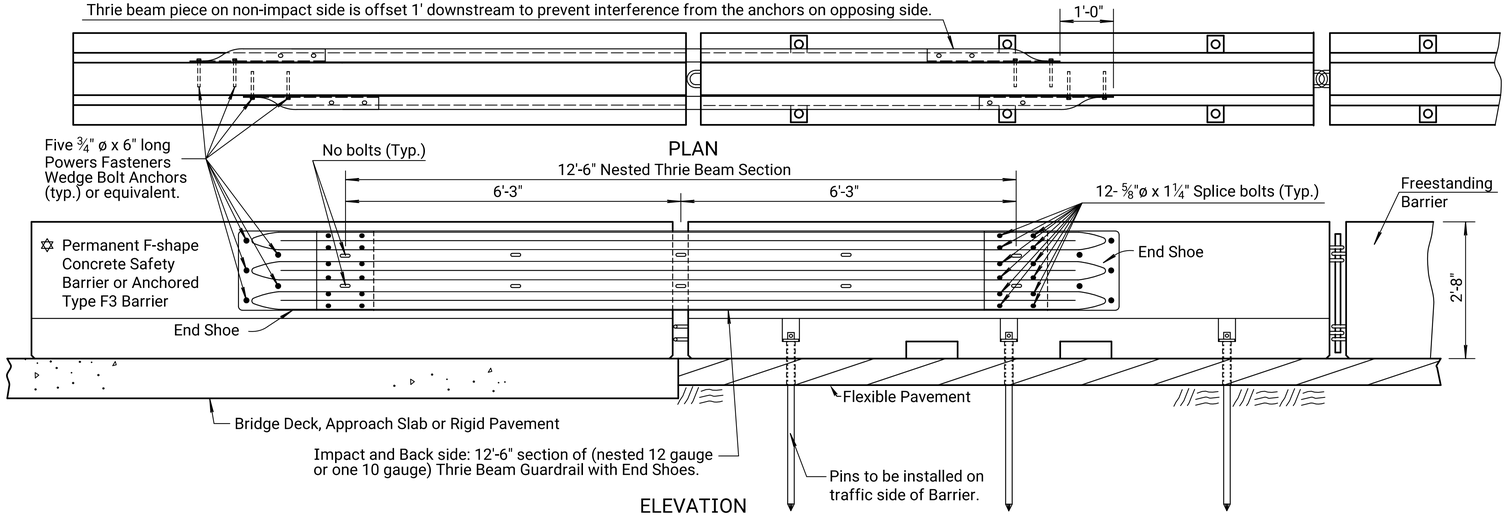
Note to Designer: For use on Haunched slab bridges, the Road Designer shall coordinate with the Bridge Designer for "corridor in the reinforcing steel layout to accommodate barrier anchoring."
Road Designer shall coordinate barrier layout with Bridge Designer to accomodate for expansion during construction.

Plotted by : BGS01485 16-DEC-2025 13:02
File : ka680801rss622b.dgn

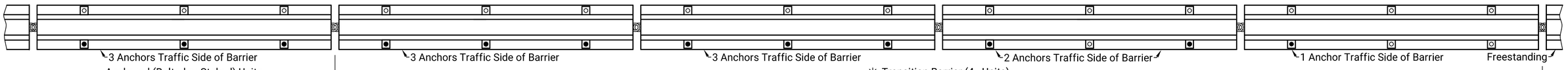
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	241	253

GENERAL NOTES:
The work and materials required for the installation & removal of the guardrail connection and barrier anchors as shown on this sheet shall be subsidiary to the "Concrete Safety Barrier" bid item.

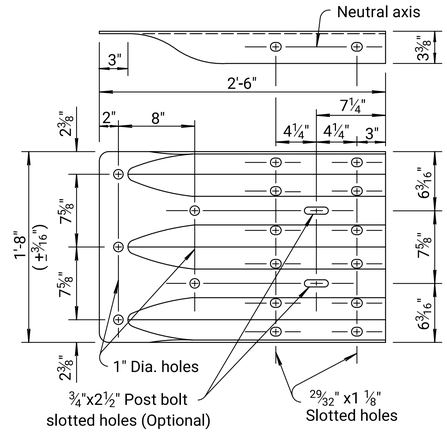
Thrie beam piece on non-impact side is offset 1' downstream to prevent interference from the anchors on opposing side.



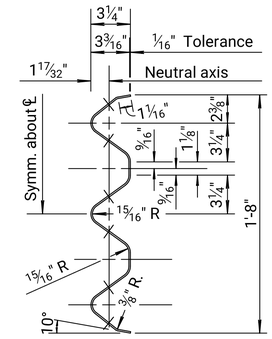
✡GUARDRAIL CONNECTION–ANCHORED/RIGID BARRIER TO FREESTANDING BARRIER



PLAN - TRANSITION BARRIER ⊛

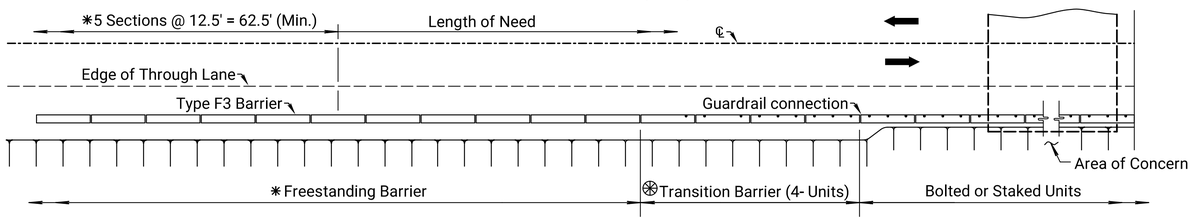


TERMINAL CONNECTOR

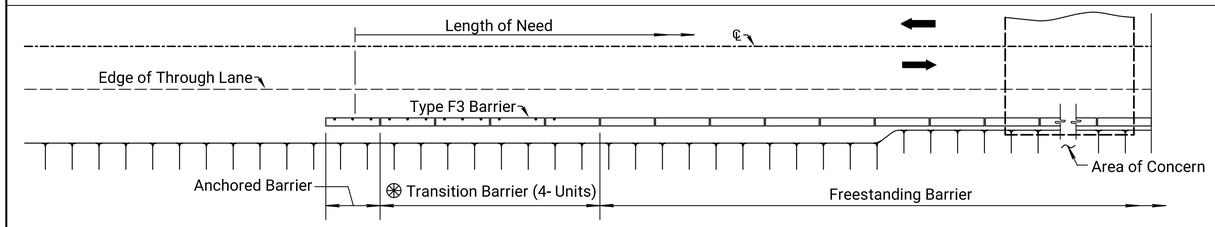


THRU RAIL ELEMENT
TYPICAL THRIE BEAM

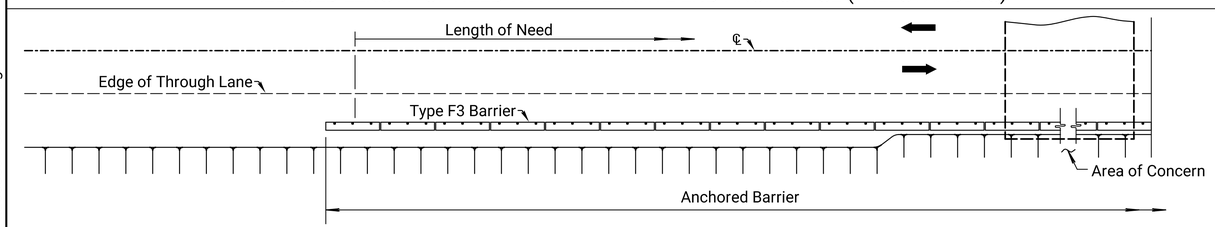
LENGTH OF NEED (LON)



LENGTH OF NEED WITH FREESTANDING TYPE F-3 CONCRETE BARRIER ENDING

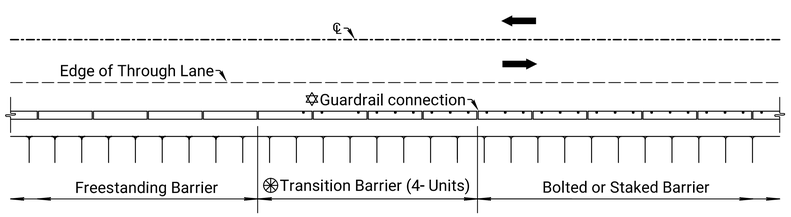


REDUCED LENGTH OF NEED WITH ALTERNATE END ANCHORAGE (FREESTANDING)



REDUCED LENGTH OF NEED WITH ALTERNATE END ANCHORAGE (ANCHORED)

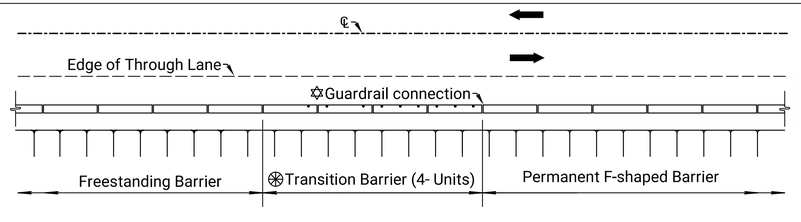
TRANSITION LAYOUTS



TRANSITION "From/To"	✡	⊛
Transition from a Freestanding Barrier to a Type F3 Barrier anchored to a rigid pavement with bolted connection or bolted to a bridge deck.	YES	YES
Transition from a Freestanding Barrier to a Type F3 Barrier pinned/staked to asphalt pavement.	NO	YES

✡ Guardrail Connection ⊛ Transition Barrier

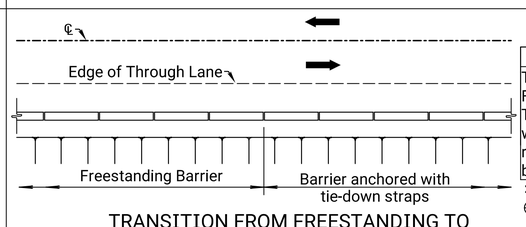
TRANSITION FROM FREESTANDING TO AN ANCHORED (BOLTED OR STAKED) TYPE F-3 BARRIER



TRANSITION "From/To"	✡	⊛
Transition from a Freestanding Barrier to a Permanent F-Shape Barrier.	YES	YES

✡ Guardrail Connection ⊛ Transition Barrier

TRANSITION FROM FREESTANDING TO PERMANENT F-SHAPED BARRIER



TRANSITION "From/To"	✡	⊛
Transition from a Freestanding Barrier to a Type F3 Barrier anchored with tie-down straps on a rigid pavement or a bridge deck.	NO	NO

✡ Guardrail Connection
⊛ Transition Barrier

TRANSITION FROM FREESTANDING TO TYPE F3 BARRIER ANCHORED WITH STRAPS

NO.	DATE	REVISIONS	BY	APP'D
02	07-19-19	Added LON & Transition Layouts	A.L.R.	T.T.R.
01	01-30-07	Rem. temp. details from perm. barrier	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY CONCRETE SAFETY BARRIER TYPE F3 TRANSITION LAYOUTS

RD622D

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

KDOT Graphics Certified 05-23-2025

Sh. No. 241

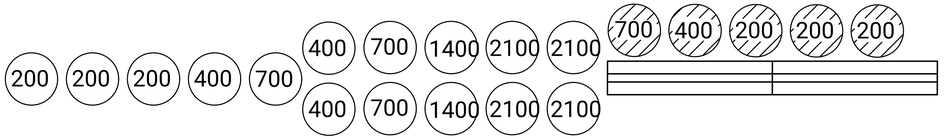
KDOT Graphics Certified

✳ Note to Designer: The minimum length for Freestanding Temporary Concrete Safey Barrier (TCSB) Installations is 11 sections @ 12.5' = 137.5'. In a Freestanding TCSB installation, if both ends are anchored, fewer than 11 sections of Freestanding TCSB may be used.
The 5 sections of Freestanding TCSB beyond the length of need may be reduced to 3 sections if the barrier is located on the exit end and traffic is traveling in a single direction.

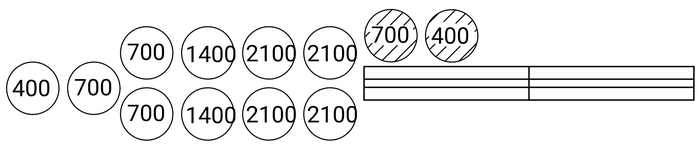
Plotted by: BGS01485 16-DEC-2025 13:03
File : ka680801rss622d.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	242	253

HIGH SPEED TL-3
(V > 45 MPH)



LOW SPEED TL-2
(V ≤ 45 MPH)



GENERAL NOTE

This drawing details general configurations for Inertial Barrier Systems. Some project specific conditions may require variations which are designed to meet prevailing criteria.

Use Inertial Barrier System consisting of the units as shown for the specified design speed, all hardware and attachments.

Install Inertial Barrier System on a flat, stable base with cross-slope no steeper than 10: 1. See Manufacturer's recommendations for module materials and method of installation.

See standard specifications for mixture to fill modules requirements.

Provide a 6" spacing between modules and one foot between the end of concrete barrier or other rigid object.

When installed as part of project traffic control, the bid item "Inertial Barrier" includes the original installation and required relocations.

Keep available replacement modules to replace any size module used on site, Engineer's direction.

Inertial Barrier System modules damaged by the Contractor during relocation of Inertial Barrier System are replaced at the Contractor's expense.

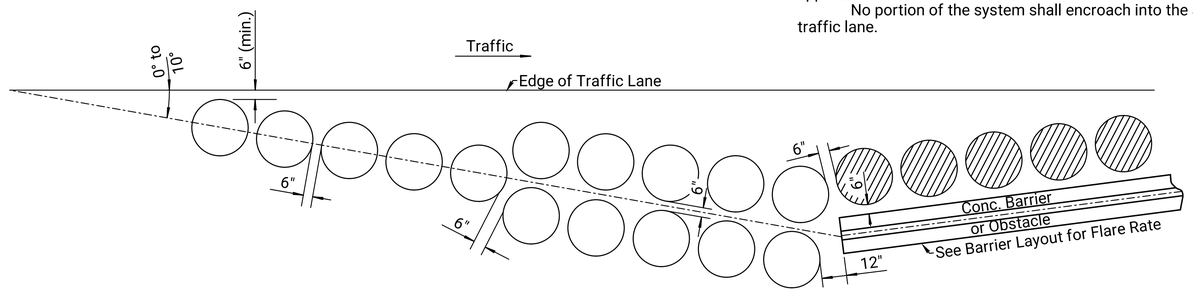
Module weights shown are in pounds.

Install 270 square inches of Type II High Performance (vertical, rectangular or diamond shape) reflective sheeting on first module of Inertial Barrier System facing traffic.

Where sufficient space is available the Inertial Barrier System may be aligned at an angle, not to exceed 10°, in the direction of approach traffic.

No portion of the system shall encroach into the approach traffic lane.

INERTIAL BARRIER SYSTEM			
Station	Side	Design Speed	Comments
429+77.50	Rt.	65 mph	Eastbound Phase II
429+78.08	Rt.	65 mph	Eastbound Phase II
436+04.11	Lt.	65 mph	Westbound Phase II
436+80.58	Lt.	65 mph	Westbound Phase II

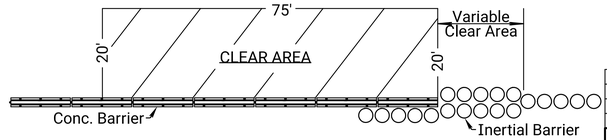


TYPICAL PLAN of INERTIAL BARRIER

When two-way traffic is adjacent to only one side of Concrete Barrier or Obstacle, these additional modules will be placed on the Traffic Side of Concrete Barrier or Obstacle. Traffic adjacent to both sides of the Concrete Barrier or Obstacle requires an additional set of modules each side if approach traffic is exposed to the back portion of the Inertial Barrier. These additional modules are not required along the sides of Concrete Barrier or Obstacle when it's location is outside the Clear Zone or one-way directional traffic.



PLAN
Replacement Module



PLAN - CLEAR AREA

NO.	DATE	REVISIONS	BY	APP'D
08	01-27-15	Rev. Layouts (TL-2/TL-3)	K.E.K.	J.O.B.
07	05-17-13	Added Detail, Clear Area	S.W.K.	J.O.B.
06	02-03-12	Revised General Note	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

INERTIAL BARRIER
(TL2 or TL3)

RD620

FHWA APPROVAL	09-16-15	APP'D.	James O. Brewer
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 05-23-2025

Sh. No. 242

KDOT Graphics Certified

Plotted by : BGS01485 16-DEC-2025 13:49
File : ka680801rss620.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	243	253

DATE
BY
REFERENCES NOTED
REFERENCES CHECKED

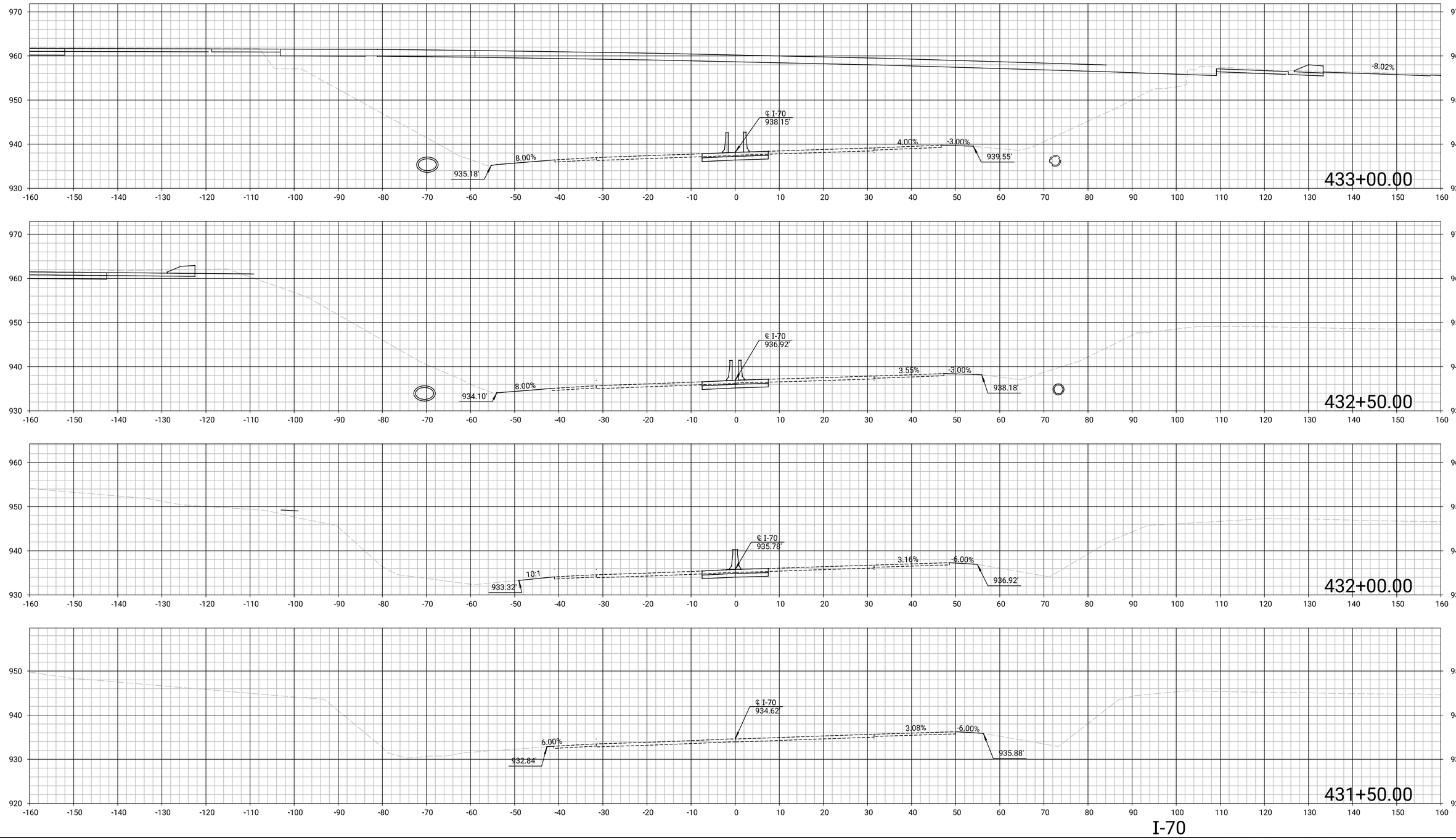
Plotted by : BGS01485 16-DEC-2025 13:03
File : KA680801-XS-CONT-02.dgn

I-70
STA. 429+50 TO STA. 431+00

Sh. No. 243

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	244	253

DATE	BY	REFERENCES NOTED	REFERENCES CHECKED



Plotted by : BGS01485 16-DEC-2025 13:03
File : KA680801-XS-CONT-02.dgn

I-70
STA. 431+50 TO STA. 433+00

Sh. No. 244

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	245	253

DATE	BY	REFERENCES NOTED	REFERENCES CHECKED

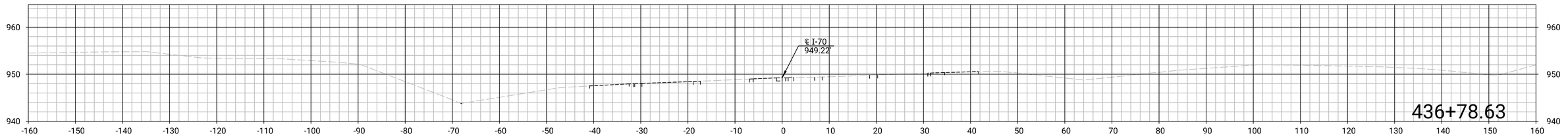
Plotted by : BGS01485 16-DEC-2025 13:03
File : KA680801-XS-CONT-02.dgn

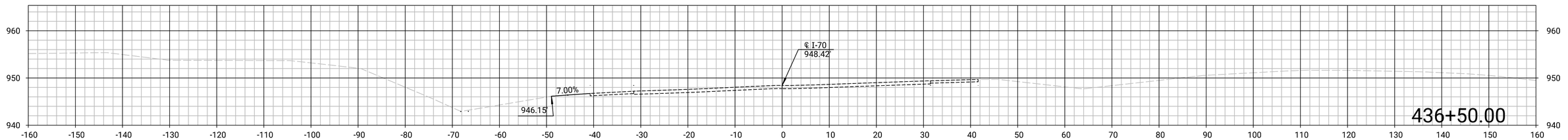
I-70
STA. 433+50 TO STA. 435+00

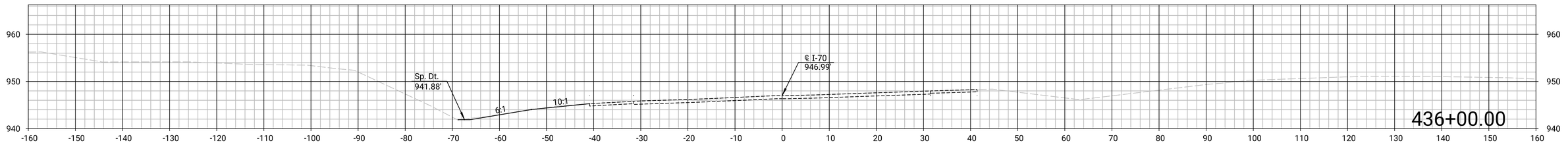
Sh. No. 245

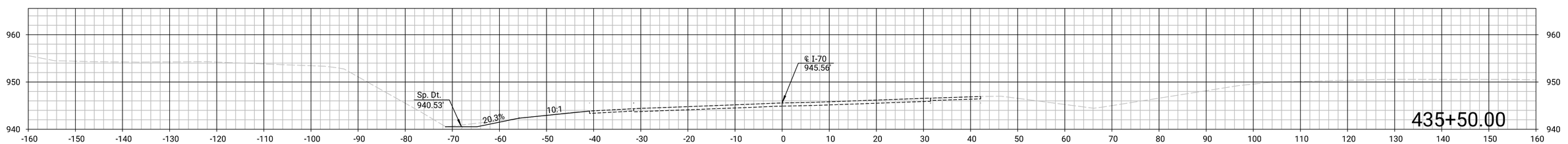
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	246	253

BY	DATE
REFERENCES NOTED	
REFERENCES CHECKED	









I-70

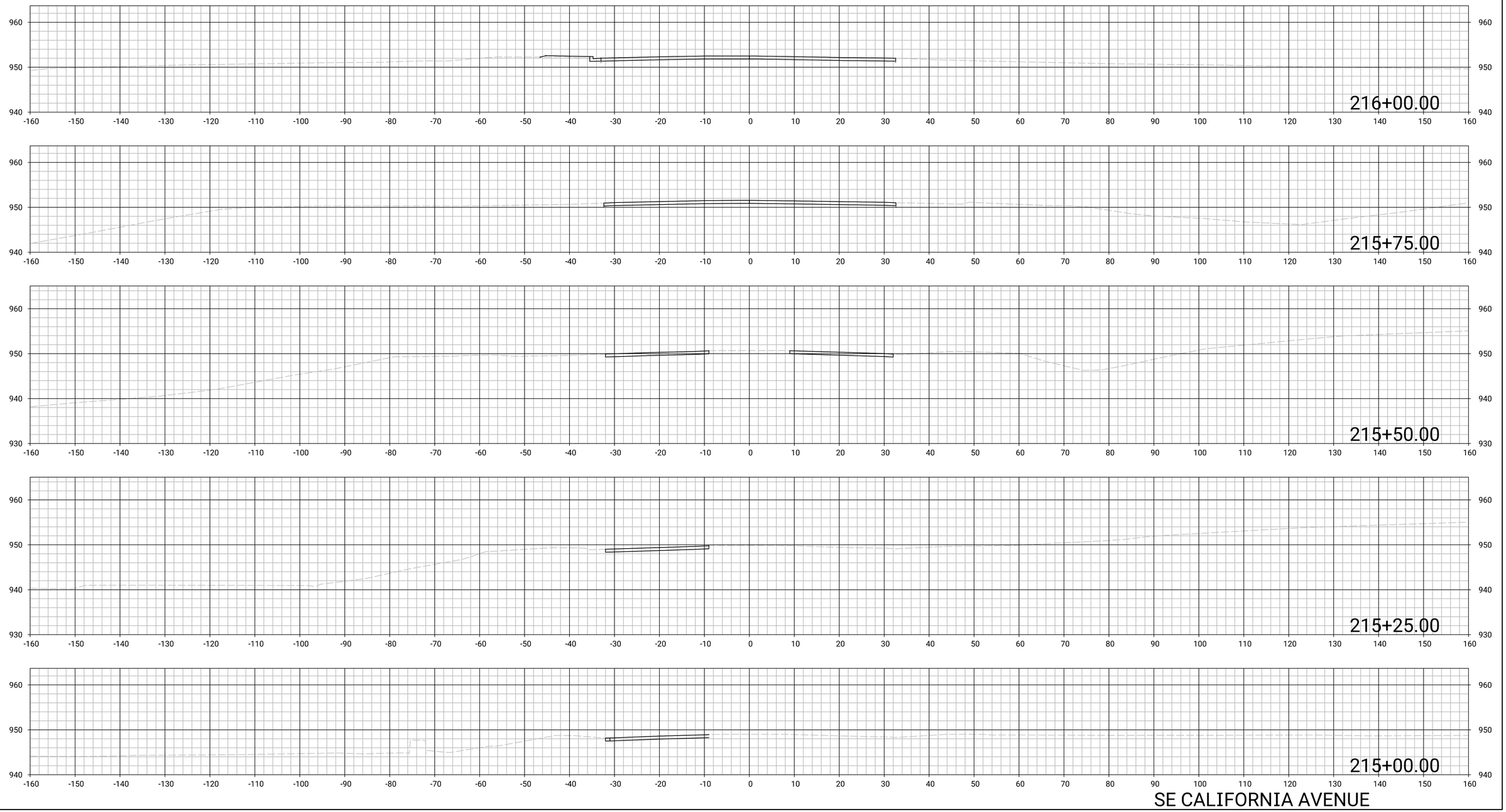
STA. 435+50 TO STA. 436+78.63

Sh. No. 246

Plotted by : BGS01485 16-DEC-2025 13:03
File : KA680801-XS-CONT-02.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	247	253

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED



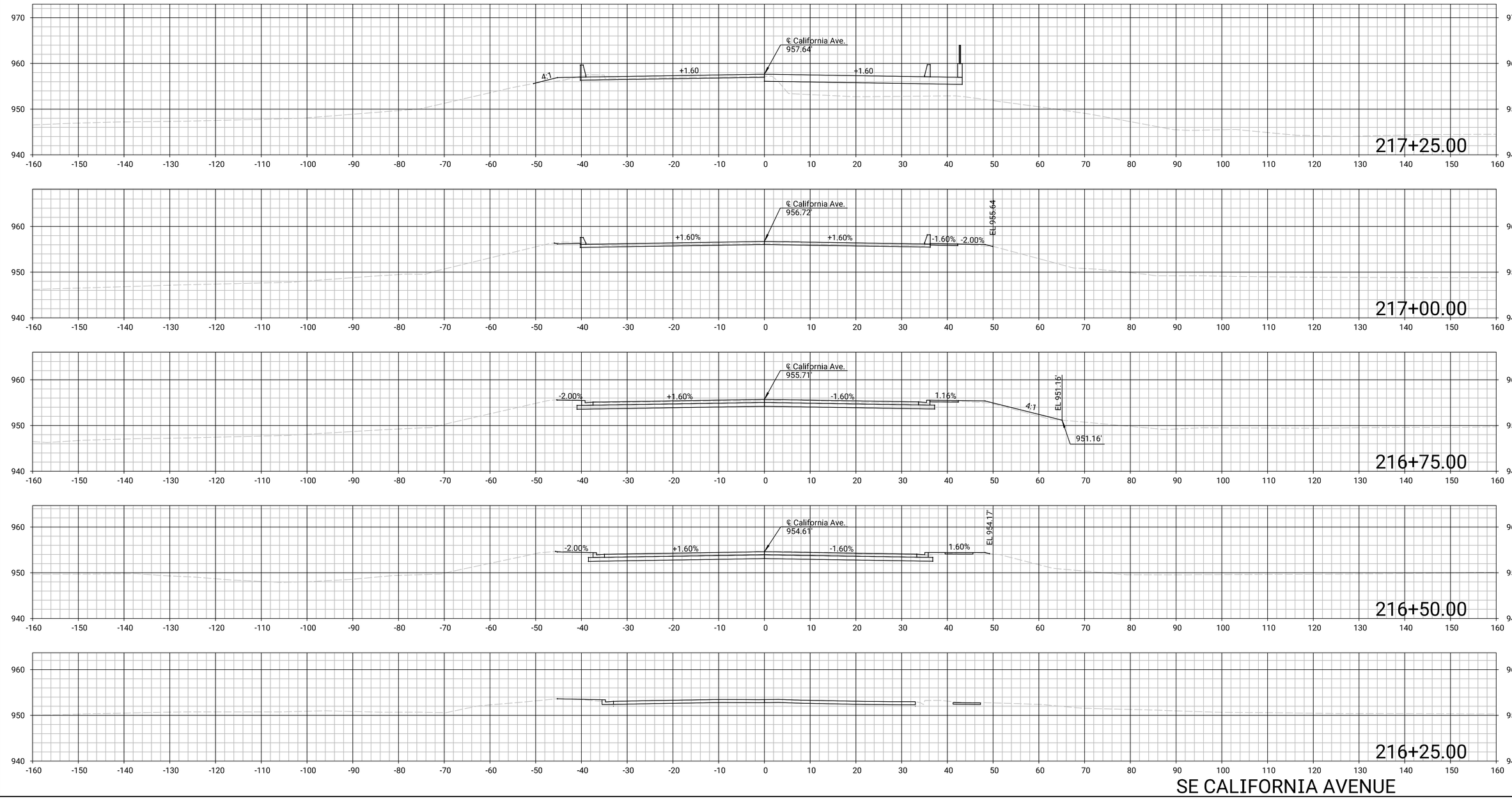
SE CALIFORNIA AVENUE
STA. 215+00 TO STA. 216+00

Sh. No. 247

Plotted by : BGS01485 16-DEC-2025 13:04
File : KA680801-XS-CONT-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	248	253

DATE	BY	REFERENCES NOTED	REFERENCES CHECKED



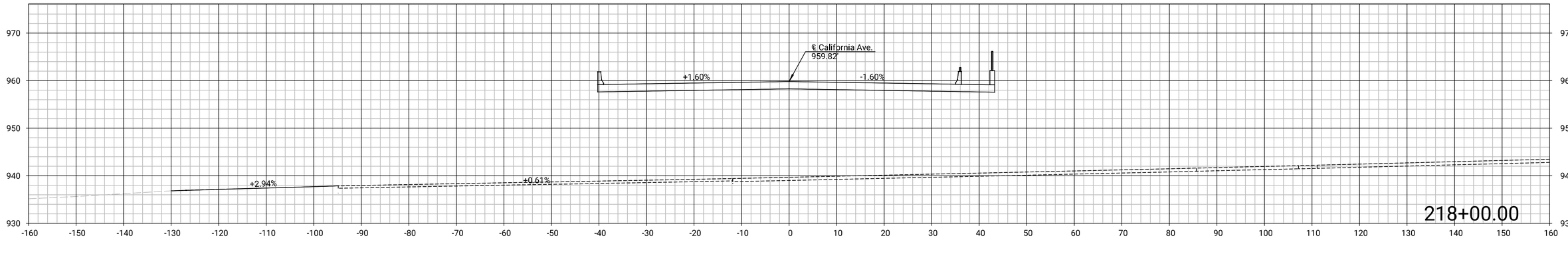
SE CALIFORNIA AVENUE
STA. 216+25 TO STA. 217+25

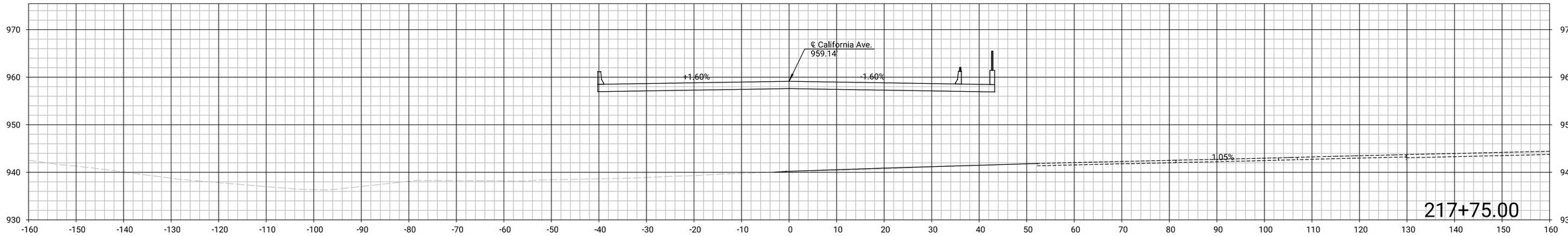
Sh. No. 248

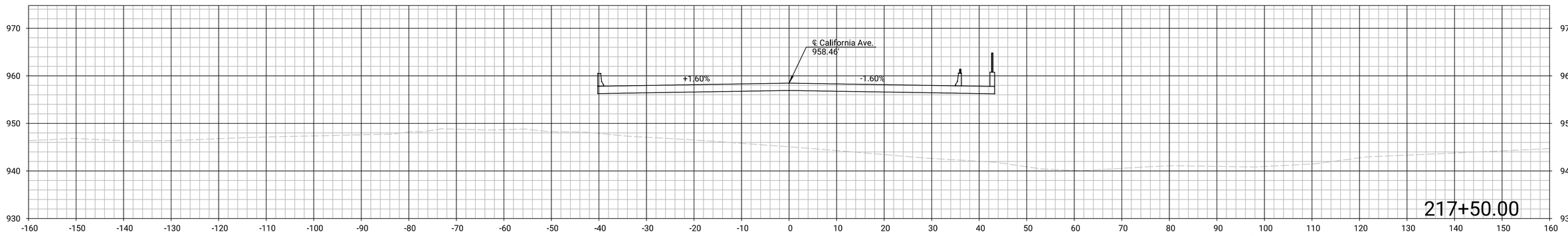
Plotted by : BGS01485 16-DEC-2025 13:04
File : KA680801-XS-CONT-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	249	253

DATE	BY	REFERENCES NOTED	REFERENCES CHECKED







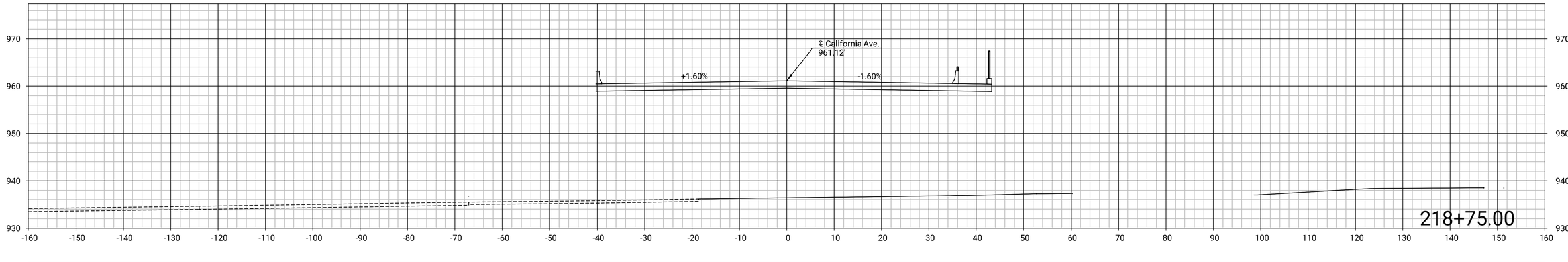
Plotted by : BGS01485 16-DEC-2025 13:04
File : KA680801-XS-CONT-01.dgn

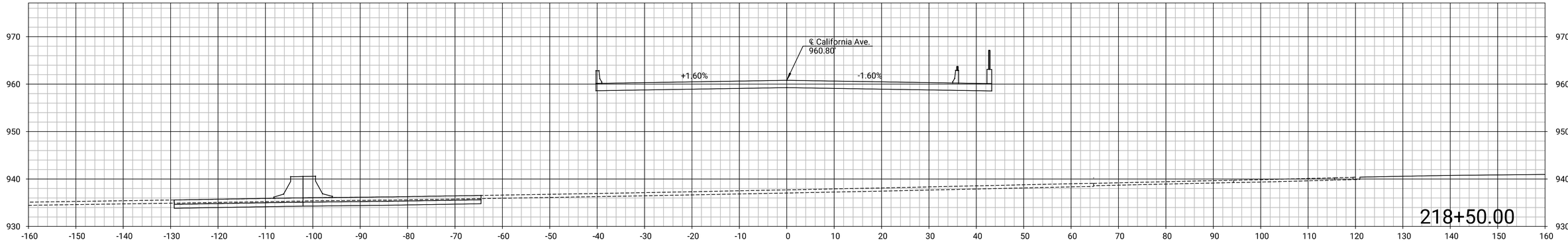
SE CALIFORNIA AVENUE
STA. 217+50 TO STA. 218+00

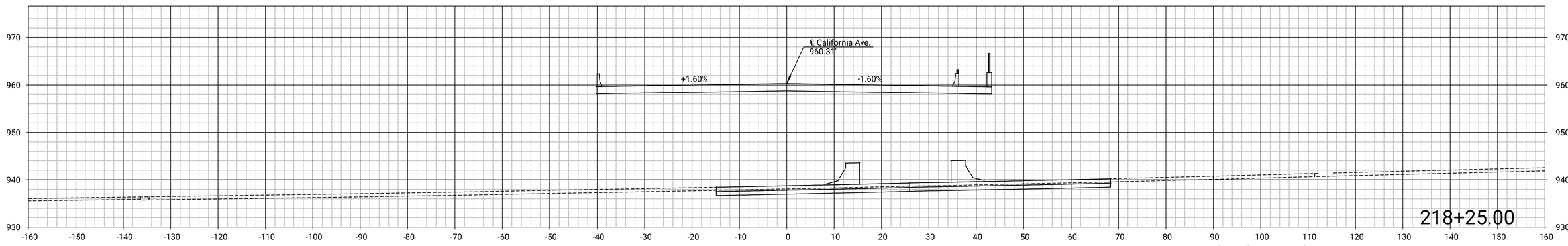
Sh. No. 249

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	250	253

DATE	BY	REFERENCES NOTED	REFERENCES CHECKED





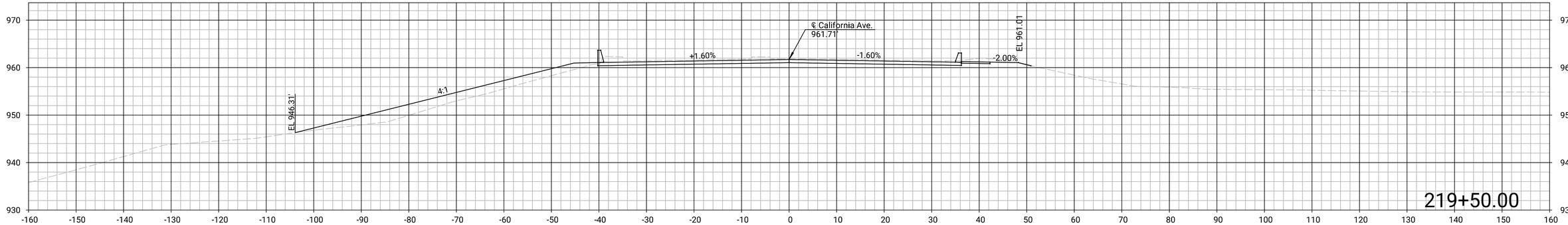


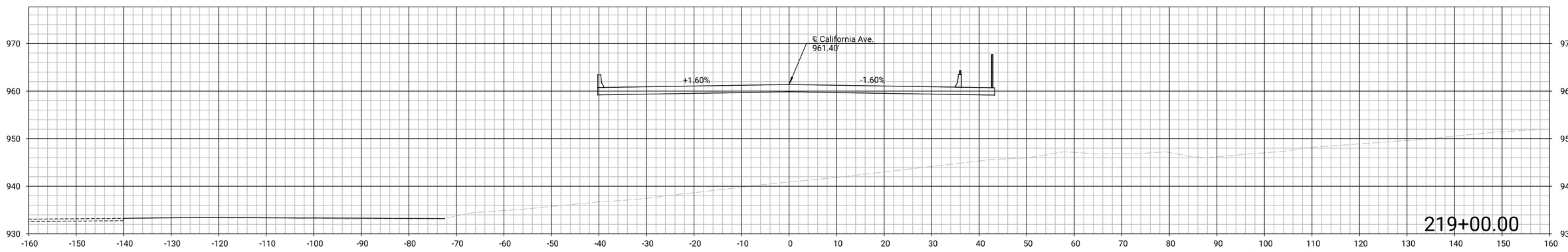
SE CALIFORNIA AVENUE
STA. 218+25 TO STA. 218+75

Sh. No. 250

Plotted by : BGS01485 16-DEC-2025 13:04
File : KA680801-XS-CONT-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	251	253





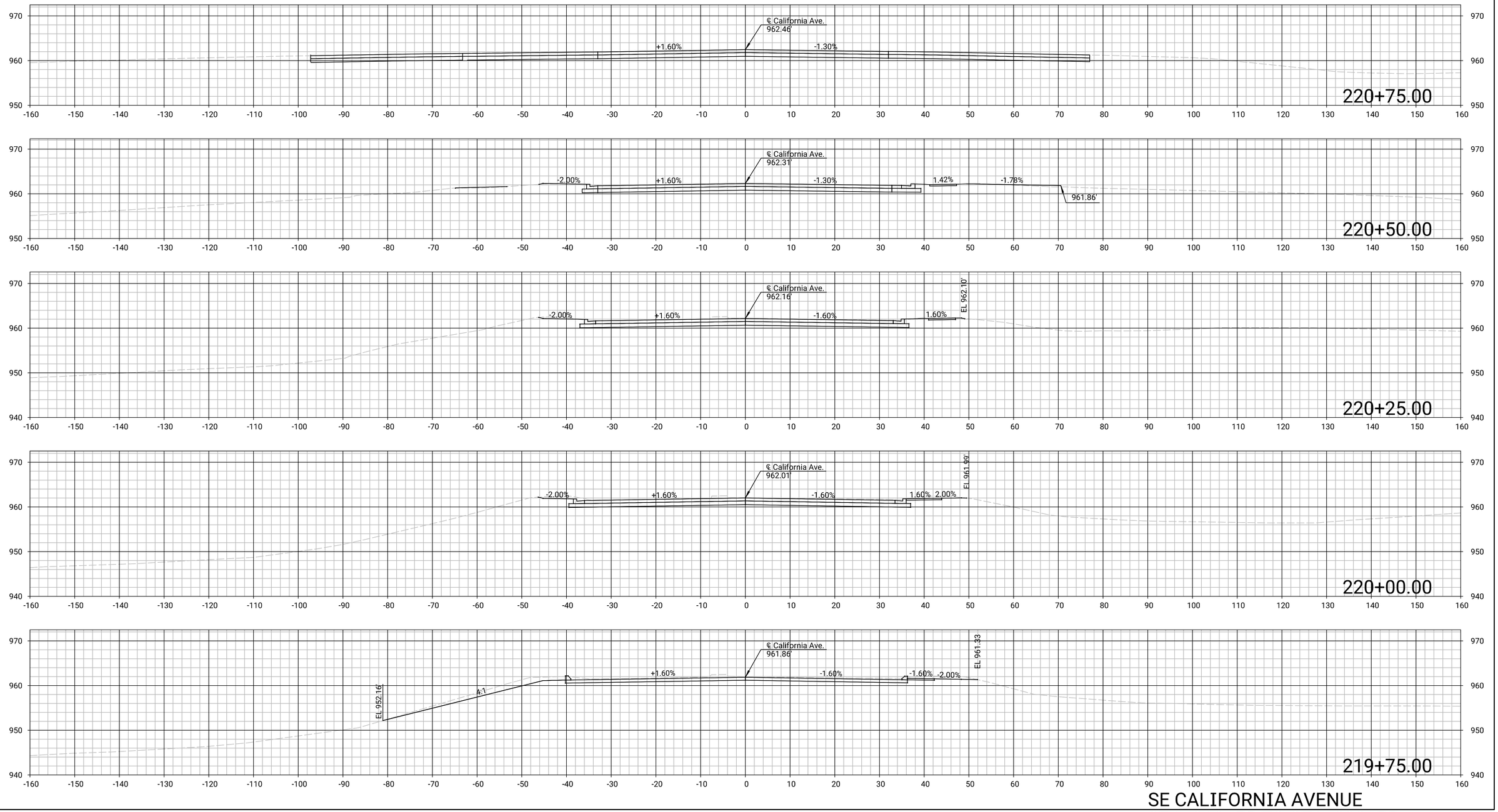
SE CALIFORNIA AVENUE
STA. 219+00 TO STA. 219+50

Sh. No. 251

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED

Plotted by : BGS01485 16-DEC-2025 13:04
File : KA680801-XS-CONT-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	252	253



DATE
BY
REFERENCES NOTED
REFERENCES CHECKED

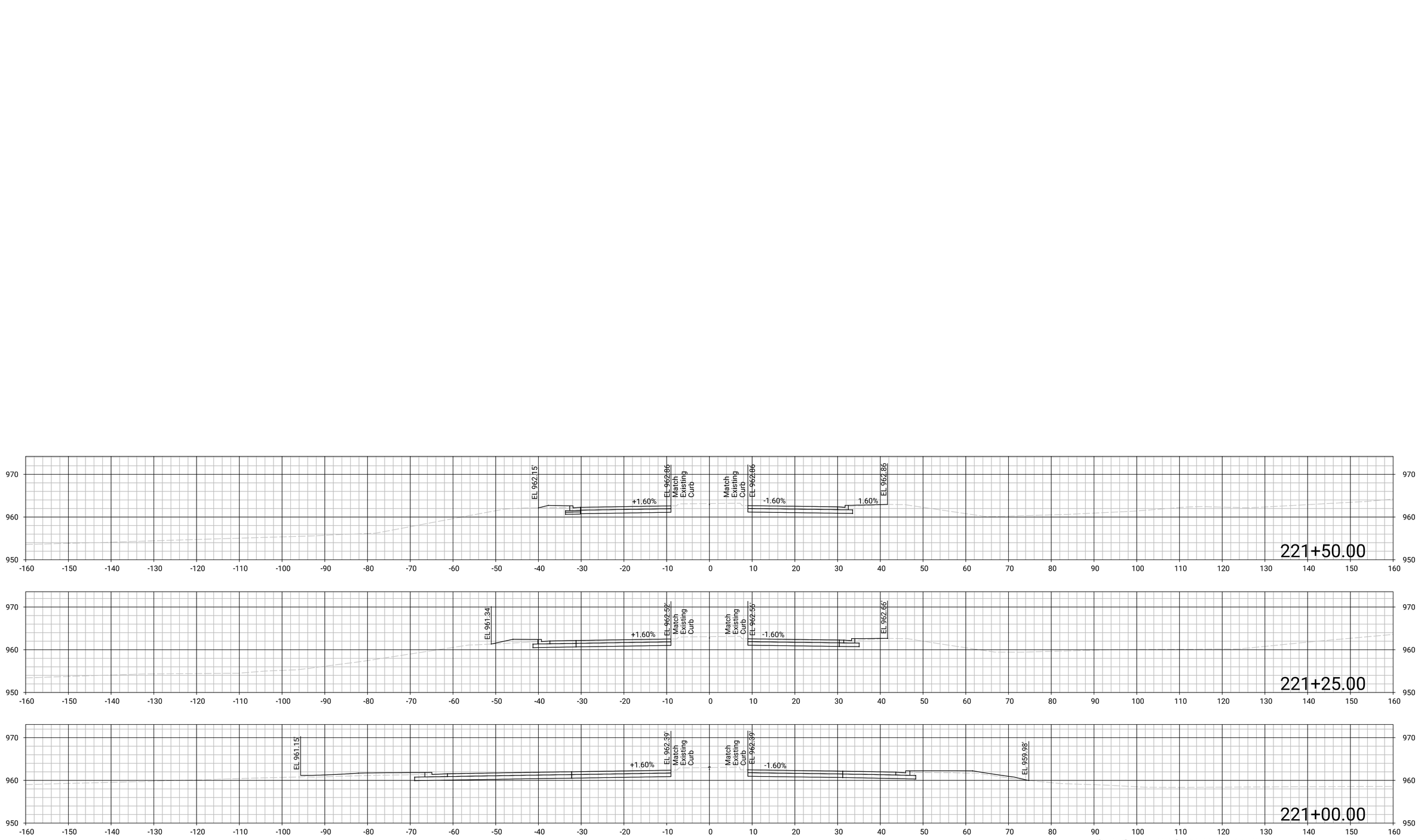
Plotted by : BGS01485 16-DEC-2025 13:04
File : KA680801-XS-CONT-01.dgn

SE CALIFORNIA AVENUE
STA. 219+75 TO STA. 220+75

Sh. No. 252

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	70-89 KA-6808-01	2025	253	253

DATE	BY	
		REFERENCES NOTED
		REFERENCES CHECKED



SE CALIFORNIA AVENUE
STA. 221+00 TO STA. 221+50

Sh. No. 253

Plotted by : BGS01485 16-DEC-2025 13:04
File : KA680801-XS-CONT-01.dgn