

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 1         | 148          |

STATE OF KANSAS  
DEPARTMENT OF TRANSPORTATION

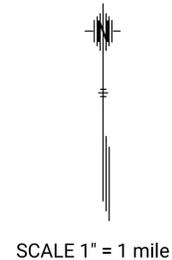


PLAN AND PROFILE OF PROPOSED  
STATE HIGHWAY

FEDERAL AID PROJECT  
GEARY COUNTY  
I-70

PROJ. NO. 70-31 KA-6483-01  
FED. AID PROJ. NO. NHPP-A648(301)

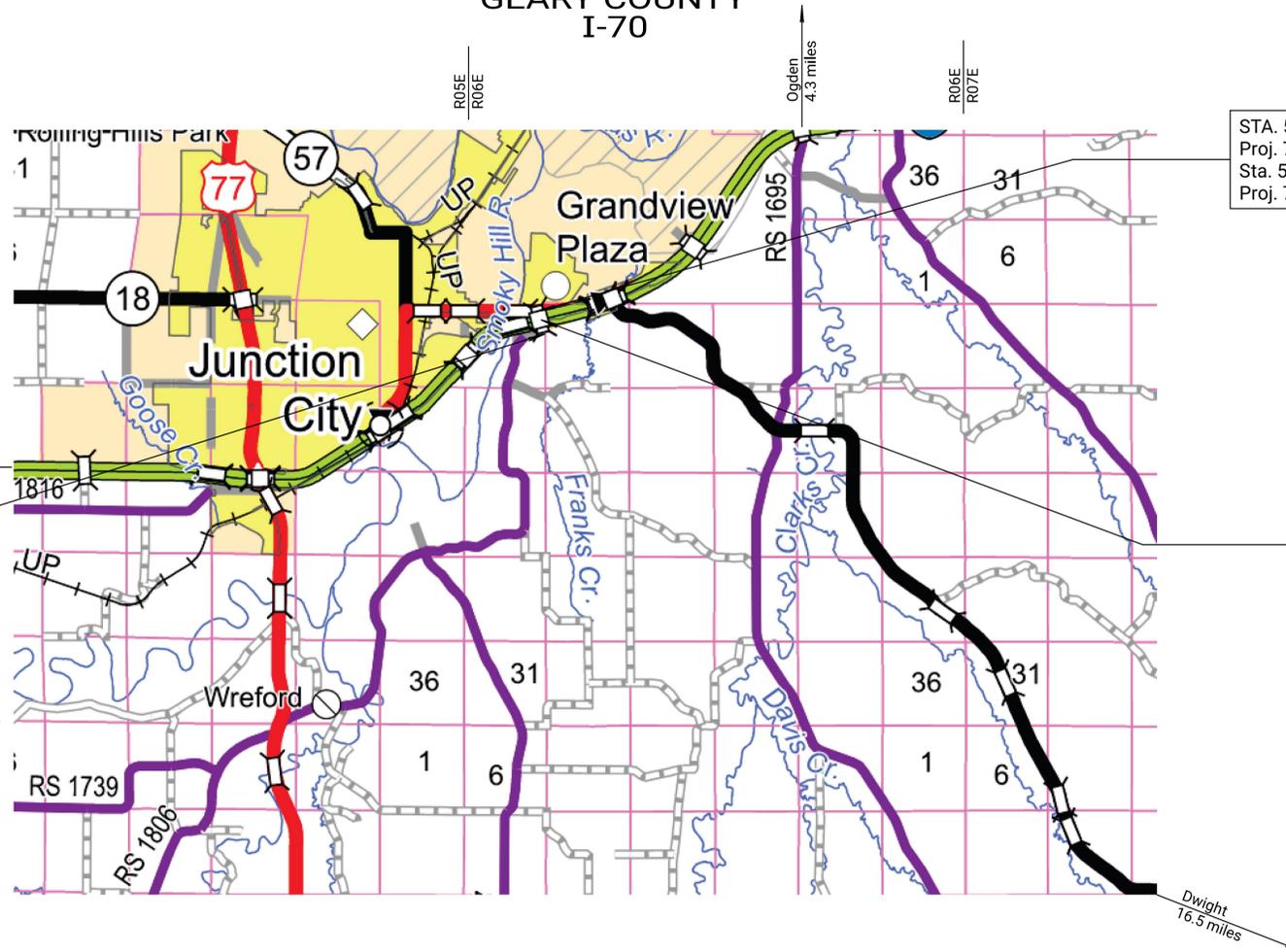
GRADING & SURFACING (CONCRETE)  
BRIDGE  
SIGNING  
SEEDING  
SIGNING & PAVEMENT MARKING



INDEX OF SHEETS

|         |   |
|---------|---|
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| 3       | TYPICAL SECTIONS                                      |
| 4       | FOUNDATION TREATMENT, COMPACTION, & SUBGRADING DETAIL |
| 5       | SALVAGED TOPSOIL                                      |
| 6       | GENERAL NOTES   |
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| 15-30   | GUARDRAIL DETAILS                                     |
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|                 |   |
|-----------------|---|
| DATE            | 5/2023                                  |
| DATE            | 5/2023                                  |
| DATE            | 7/2025                                  |
| DATE            | 7/2025                                  |
| BY              | K. LARIVIERE                            |
| BY              | J. HOLT                                 |
| BY              | B. ANDREWS (Road) / S. WEBER (Bridge)   |
| BY              | R. BOWMAN (Road) / K. PETERSON (Bridge) |
| SURVEY          |   |
| CADD TECHNICIAN |   |
| DESIGNERS       |   |
| SQUAD           |   |



STA. 48+00 BEGIN  
Proj. 70-31 KA-6483-01  
Sta. 48+00 on  
Proj. 70-31 K-2611-02

STA. 52+00 END  
Proj. 70-31 KA-6483-01  
Sta. 52+00 on  
Proj. 70-31 K-2611-02

STA. 50+00.00  
Br. No. 70-31-298.98 (095)  
54'-6" - 68' - 68' - 54'-6" Weathering Steel  
Beam, Composite, Continuous (WMCC)  
36'-0" Roadway

DESIGN DESIGNATION J HILL RD.

DESIGN DESIGNATION I-70

|             |         |             |         |
|-------------|---------|-------------|---------|
| AADT (2027) | =2,950  | AADT (2027) | =14,325 |
| AADT (2047) | =3,825  | AADT (2047) | =18,525 |
| DHV         | =11%    | DHV         | =9%     |
| D           | =60%    | D           | =55%    |
| T           | =5.5%   | T           | =14.5%  |
| V           | =45 MPH | V           | =75 MPH |
| C of A      | NONE    | C of A      | FULL    |
| Clear Zone  | =20'    | Clear Zone  | =34'    |

CONVENTIONAL SIGNS

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

GROSS LENGTH OF PROJECT 400 FT. (Includes Equations)

EXCEPTIONS

|                       |         |             |
|-----------------------|---------|-------------|
| NET LENGTH OF PROJECT | 400 FT. | 0.076 MILES |
| NET LENGTH OF BRIDGES | 248 FT. | 0.047 MILES |
| NET LENGTH OF ROAD    | 152 FT. | 0.029 MILES |

Note: I-70 Traffic to be carried through construction.  
See Sh. No. 103 for details.

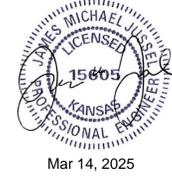
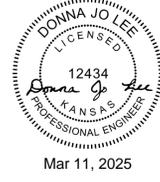
Approved: \_\_\_\_\_ Mar 17, 2025  
Date

*By M. Mil*  
State Transportation Engineer

By: *Debra D'Gy*  
Chief, Bureau of Road Design

KANSAS DEPARTMENT OF TRANSPORTATION

| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 2         | 148          |



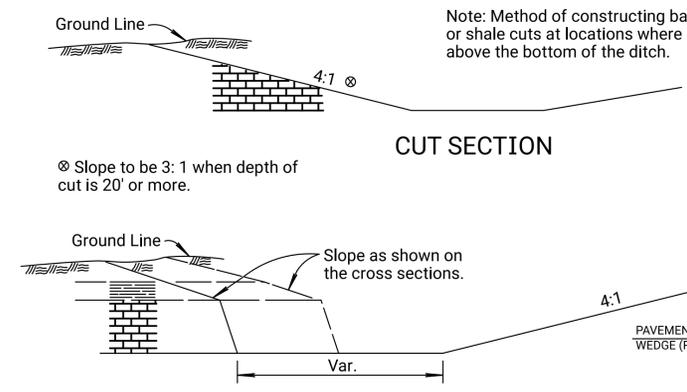
|  |                      |                                 |                             |
|--|----------------------|---------------------------------|-----------------------------|
| Name: Ryan Bowman                      | Name: Karen Peterson | Name: Donna Lee                 | Name: James M. Jussek       |
| Co. Name: KDOT - Road                  | Co. Name: KDOT BSGS  | Co. Name: KDOT Pavement Marking | Co. Name: Benesch           |
| Sheet Range: 1-35, 64-76, 103, 135-148 | Sheet Range: 36-63   | Sheet Range: 100-102            | Sheet Range: 77-99; 104-134 |

Plotted by : Kylee.Sims@ks.gov 21-JUL-2022 19:13  
 File : rd048.dgn

|                                     |            |                 |           |               |        |
|-------------------------------------|------------|-----------------|-----------|---------------|--------|
|                                     |            |                 |           |               |        |
| 01                                  | 01-24-18   | Initial Release |           | A.L.R.        | S.W.K. |
| NO.                                 | DATE       | REVISIONS       |           | BY            | APPD   |
| KANSAS DEPARTMENT OF TRANSPORTATION |            |                 |           |               |        |
| <b>Signature Seal Sheet</b>         |            |                 |           |               |        |
| RD048                               |            |                 |           |               |        |
| FHWA APPROVAL                       |            | APPD.           |           | Scott W. King |        |
| DESIGNED                            | DETAILED   | QUANTITIES      | TRACED    |               |        |
| DESIGN CK.                          | DETAIL CK. | QUAN. CK.       | TRACE CK. |               |        |

KDOT Graphics Certified

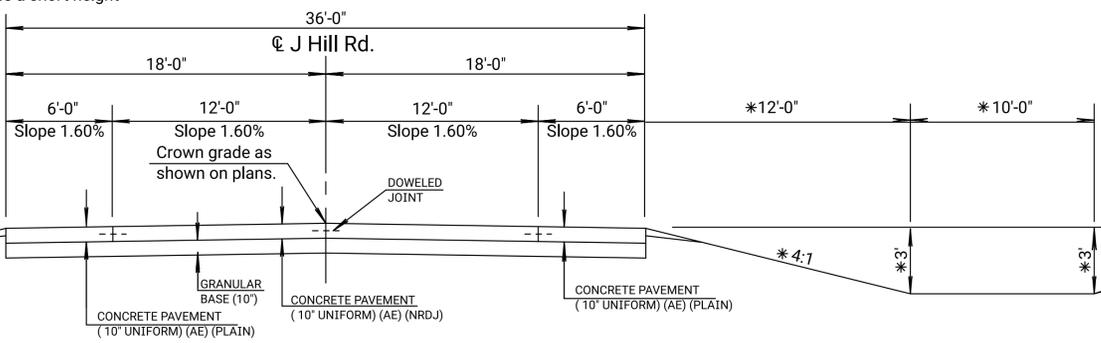
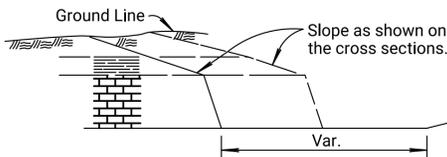
|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 3         | 148          |



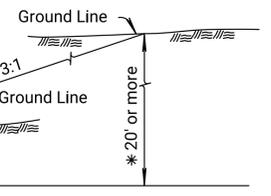
Note: Method of constructing backslope through shallow rock or shale cuts at locations where rock protrudes a short height above the bottom of the ditch.

CUT SECTION

⊗ Slope to be 3:1 when depth of cut is 20' or more.



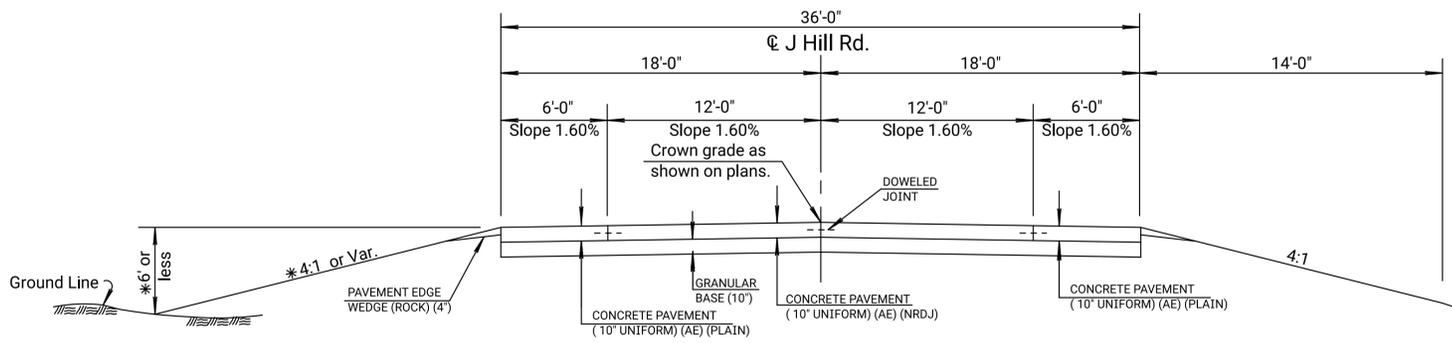
CUT SECTION



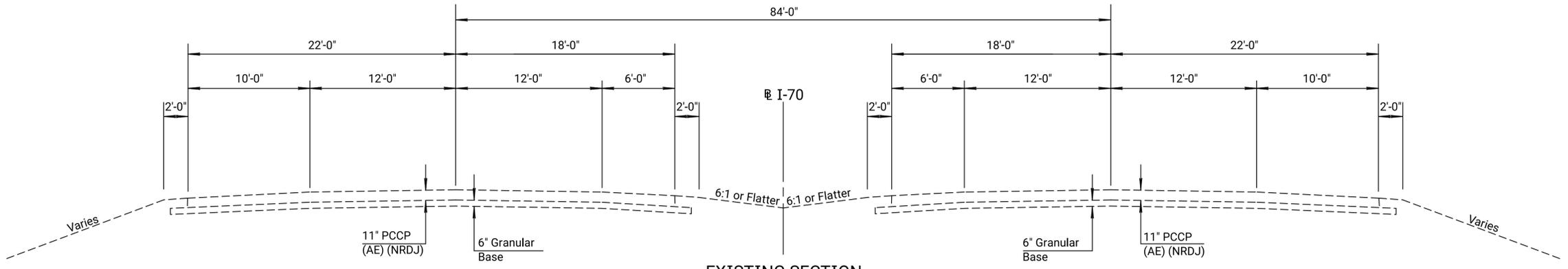
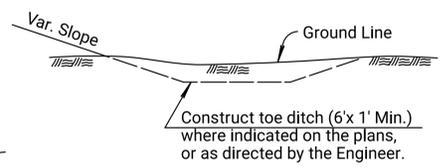
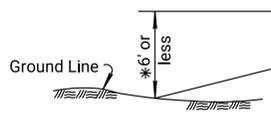
\*Dimensions and slopes for standard ditches and fills. See plan and cross-sections for variations.

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

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

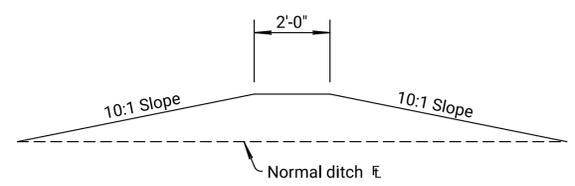


FILL SECTION

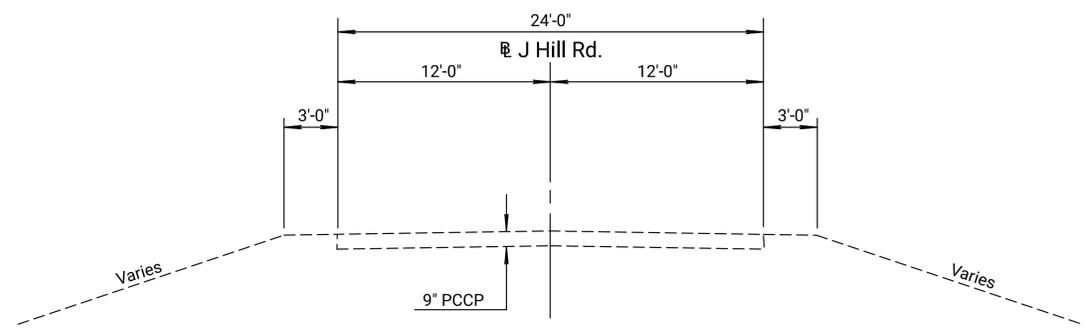


EXISTING SECTION  
I-70

◊ Typical section is based off of future projects. Westbound is to be constructed in 2024 and Eastbound is to be constructed in 2025.



SKETCH OF DITCH PLUG



EXISTING SECTION  
J Hill Rd

Guide to designer: Use this sheet when subgrading in rock or shale is not required. See Soils and Geology Reports for additional plan notes.

Plotted by : Elias Esquivel@ks.gov 13-MAR-2025 15:02  
File : KA64830Trts-01.dgn

| NO. | DATE     | REVISIONS                               | BY     | APPD   |
|-----|----------|---|--------|--------|
| 21  | 01-25-13 | Removed Slope, Pvm. Edge                | S.W.K. | J.O.B. |
| 20  | 05-20-09 | 8:1/6:1 over 10' fill mound ent./sd.rd. | S.W.K. | J.O.B. |
| 19  | 11-10-04 | Changed slope labels to percent         | S.W.K. | J.O.B. |

KANSAS DEPARTMENT OF TRANSPORTATION

**TYPICAL SECTION  
GRADING & SURFACING**

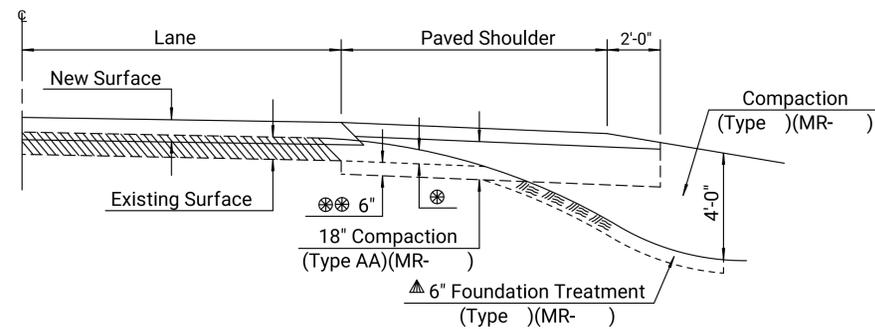
**RD600**

|               |            |            |                 |
|---------------|------------|------------|-----------------|
| FHWA APPROVAL | 05-21-13   | APPD.      | James O. Brewer |
| DESIGNED      | DETAILD    | QUANTITIES | TRACED          |
| DESIGN CK.    | DETAIL CK. | QUAN. CK.  | TRACE CK.       |

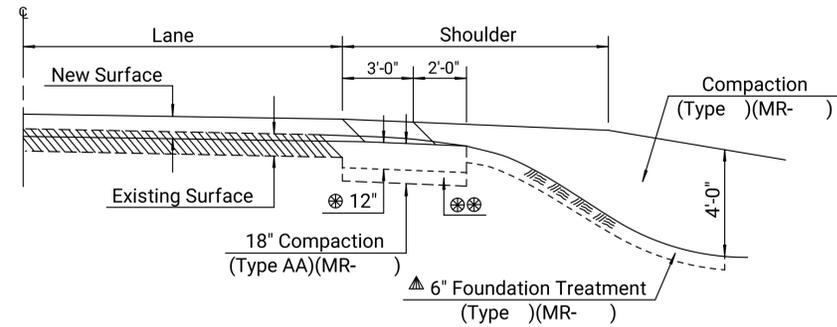
DOT Graphics Certified

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 4         | 148          |

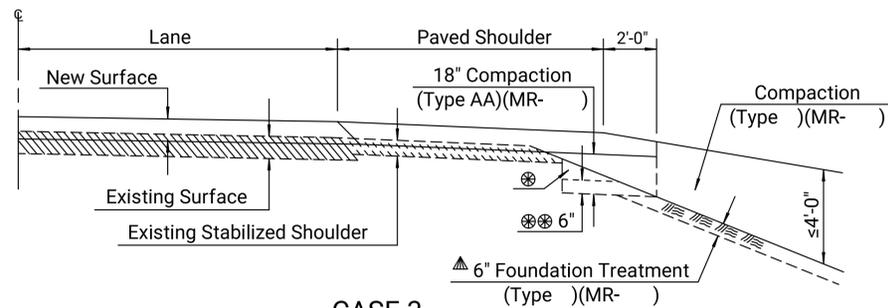
## REHABILITATION



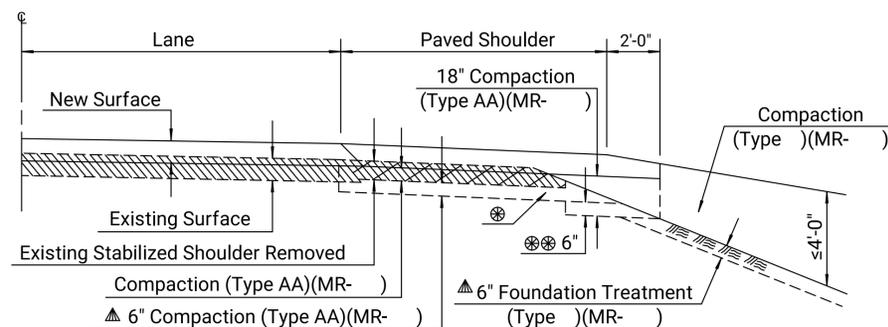
**CASE 1**  
Overlay with Paved Shoulder



**CASE 2**  
Overlay with Composite Shoulder



**CASE 3**  
Overlay with Existing Paved Shoulder

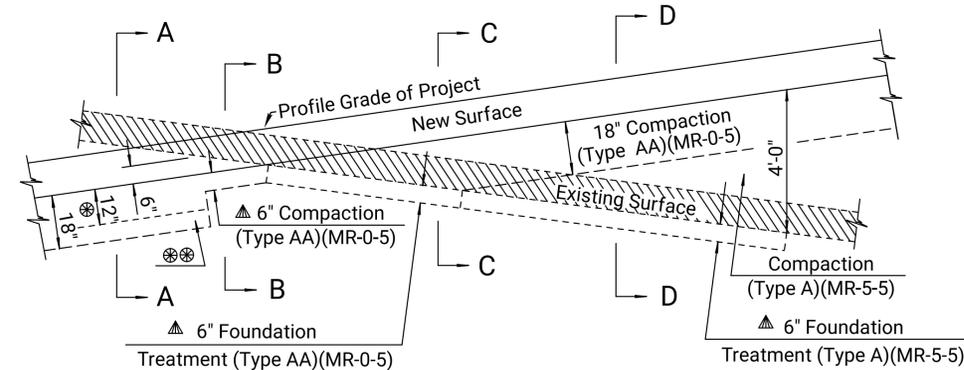


**CASE 4**  
Overlay with Shoulder Replacement

- ⊗ Excavation thru Cuts not Subgraded
- ⊗⊗ The lower 6" of Compaction is subsidiary.
- ▲ Compaction of this material shall be subsidiary.

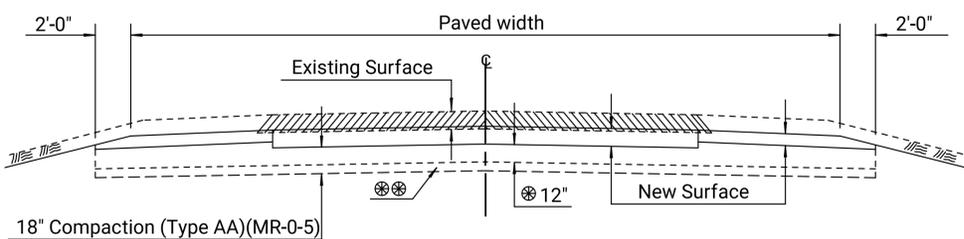
Note: These are 4 general cases. Specific compaction requirements are determined on a project-by-project basis.

## RECONSTRUCTION

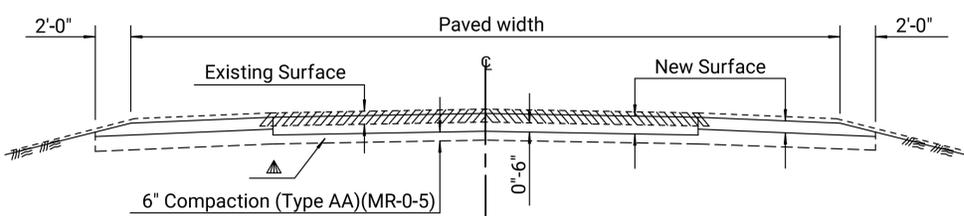


PROFILE

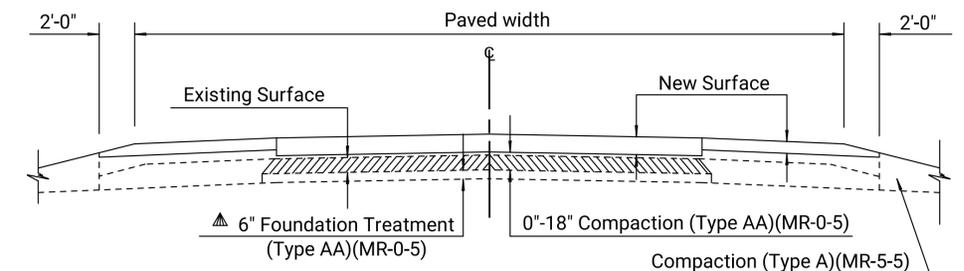
- ⊗ Excavation thru Cuts not Subgraded
- ⊗⊗ The lower 6" of Compaction is subsidiary.
- ▲ Compaction of this material shall be subsidiary.



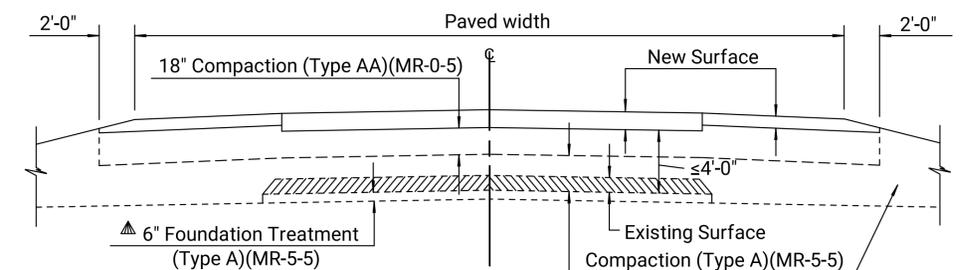
SECTION A-A



SECTION B-B

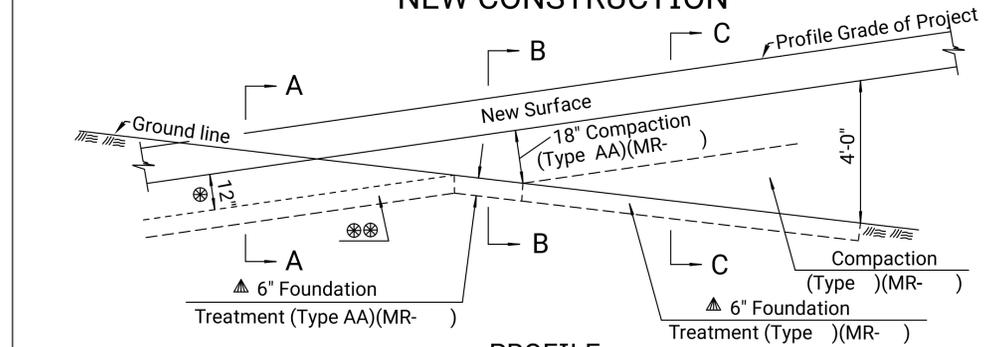


SECTION C-C



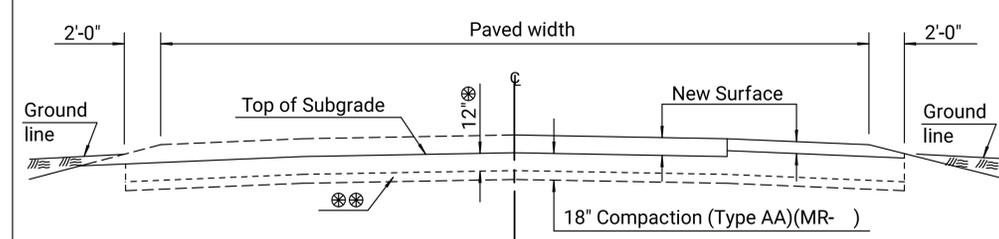
SECTION D-D

## NEW CONSTRUCTION

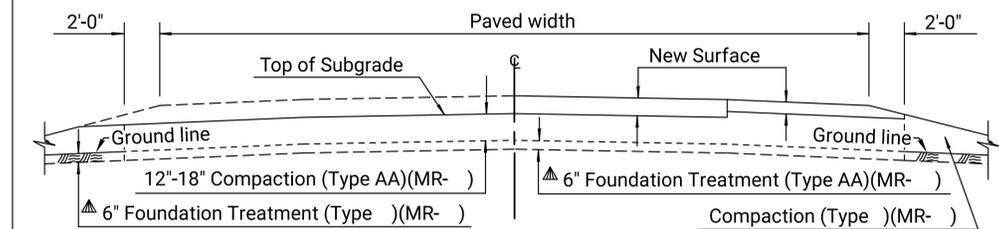


PROFILE

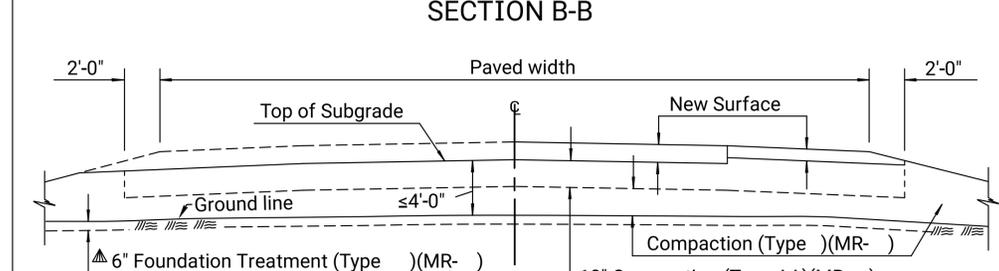
- ⊗ Excavation thru Cuts not Subgraded
- ⊗⊗ The lower 6" of Compaction is subsidiary.
- ▲ Compaction of this material shall be subsidiary.



GRADING SECTION A-A SURFACING



GRADING SECTION B-B SURFACING



GRADING SECTION C-C SURFACING

### 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     | APPD   |
|-----|----------|-------------------------------------|--------|--------|
| 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

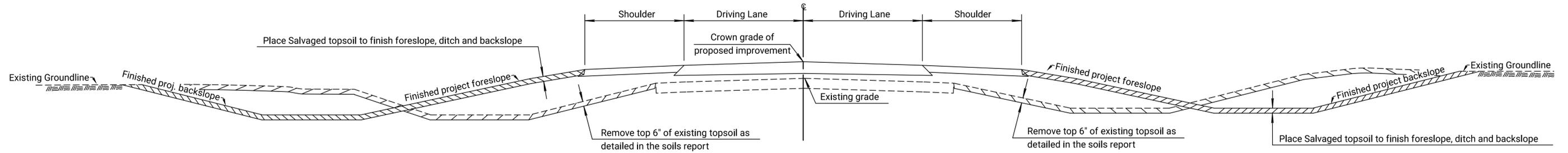
## FOUNDATION TREATMENT & COMPACTION OF EARTHWORK

|            |            |            |           |       |                 |
|------------|------------|------------|-----------|-------|-----------------|
| RD605      |            | 12-05-11   |           | APPD. | James O. Brewer |
| DESIGNED   | DETAILED   | QUANTITIES | TRACED    |       |                 |
| DESIGN CK. | DETAIL CK. | QUAN. CK.  | TRACE CK. |       |                 |

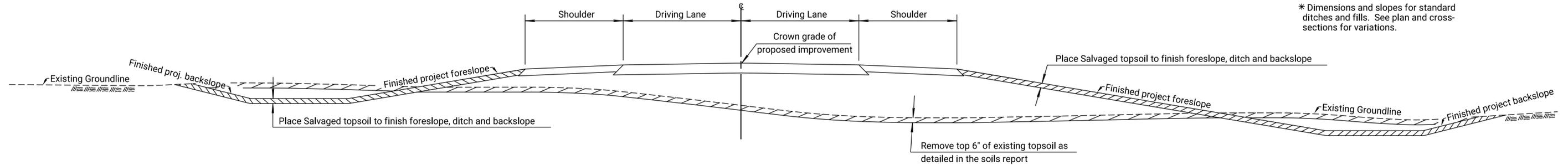
|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
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Note to Designer: Acceptable Topsoil locations on a project will be detailed in the Soils Report. The locations will be used in conjunction with the plans to measure a horizontal area in Sq. Yds of "Salvaged Topsoil" within the R/W limits.

**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.



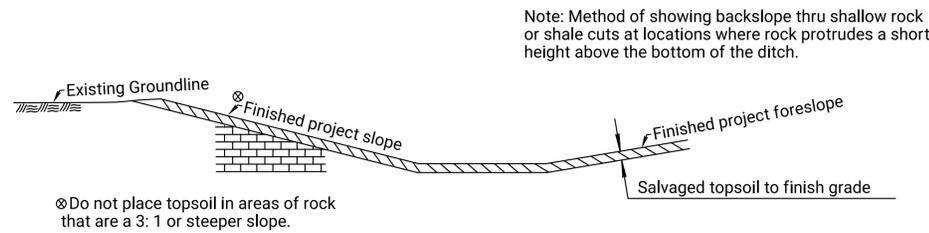
**RECONSTRUCTION/REHABILITATION OF EXISTING ROADWAY**  
 (Removal and Placement of Salvaged Topsoil)



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

**NEW ROADWAY ALIGNMENT**  
 (Removal and Placement of Salvaged Topsoil)

- LEGEND**
- Topsoil to be Salvaged
  - Placement of Salvaged Topsoil



**CUT SECTION**

Plotted by : Elias.Esquivel@ks.gov 13-MAR-2025 15:05  
 File : KA64830Trss599a.dgn

|                                     |            |                 |           |                 |        |
|-------------------------------------|------------|-----------------|-----------|-----------------|--------|
|                                     |            |                 |           |                 |        |
| 01                                  | 12-16-09   | Initial Release |           | S.W.K.          | J.O.B. |
| NO.                                 | DATE       | REVISIONS       |           | BY              | APPD   |
| KANSAS DEPARTMENT OF TRANSPORTATION |            |                 |           |                 |        |
| <b>SALVAGED TOPSOIL</b>             |            |                 |           |                 |        |
| RD599A                              |            |                 |           |                 |        |
| FHWA APPROVAL                       |            | APPD.           |           | James O. Brewer |        |
| DESIGNED                            | DETAILED   | QUANTITIES      | TRACED    | B.N.B.          |        |
| DESIGN CK.                          | DETAIL CK. | QUAN. CK.       | TRACE CK. | S.W.K.          |        |

| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 6         | 148          |

**GENERAL NOTE**

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

SOIL FOR EMBANKMENT: ALL SOIL USED IN THE TOP 18 INCHES OF THE EMBANKMENT SHALL CONFORM TO THE FOLLOWING REQUIREMENTS: 10 < PI < 30 AND 20 < LL < 50. SOILS WHICH CONTAIN SUBSTANTIAL ORGANIC MATTER, 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 0.75 WAS USED TO COMPUTE EARTHWORK QUANTITIES FOR THIS PROJECT.

EMBANKMENT QUANTITIES FOR INITIAL CONSOLIDATION AND SETTLEMENT SHOWN IN THE EARTHWORK QUANTITIES ARE SUBSIDIARY TO OTHER EARTHWORK ITEMS. MATERIAL FOR THE EMBANKMENT IS INCLUDED IN THE EXCAVATION QUANTITIES.

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

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

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

EXCAVATION 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.

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.

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.

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.

THE EXISTING RIGHT OF WAY DEPICTED FOR THIS PROJECT IS FOR INFORMATION ONLY AND ARE BASED UPON HISTORIC PLANS (70-31 K-2611-02 (1990)) AND RECORD DOCUMENTS AND NOT FROM FIELD SURVEYS.

EXISTING BRIDGE METAL HANDRAIL FOR REMOVAL SHALL BE SALVAGED AND WILL BECOME THE PROPERTY OF KDOT AND STOCKPILED WITHIN THE PROJECT RIGHT-OF-WAY AS DIRECTED BY THE ENGINEER. KDOT FORCES WILL REMOVE THIS ITEM FROM THE SITE.

PROJECT SURVEY CONTROL

HORIZONTAL PROJECT DATUM:

Kansas Regional Coordinate System Zone 8 (Manhattan) using NAD 83 (2001)

VERTICAL PROJECT DATUM:

North American Vertical Datum (NAVD) 1988, using Geoid 18

DATUM BENCH MARK:

GE1  
Set ½" x 24" rebar w/ Alum cap  
stamped (GE1), 0.3' deep  
NAVD 88 Elev. = 1130.21'

UTILITY OWNERS

- F1 Century Link (Fiber Optic Line)  
(800) 244-1111
- W1 City of Grandview Plaza (Water Line)  
(785) 223-7330
- E1 KDOT (Power Line) (On West Side of Bridge)

Plotted by : Elias.Esquivel@ks.gov 13-MAR-2025 15:03  
File : KA648301rgrn-01.dgn

|                                     |            |                 |           |        |
|-------------------------------------|------------|-----------------|-----------|--------|
|                                     |            |                 |           |        |
| 01                                  | 06-06-23   | Initial Release | A.L.R.    | D.D.T. |
| NO.                                 | DATE       | REVISIONS       | BY        | APPD   |
| KANSAS DEPARTMENT OF TRANSPORTATION |            |                 |           |        |
| <b>General Note Sheet</b>           |            |                 |           |        |
| <del>RD040</del>                    |            |                 |           |        |
| FHWA APPROVAL                       |            | APPD.           |           |        |
| DESIGNED                            | DETAILED   | QUANTITIES      | TRACED    |        |
| DESIGN CK.                          | DETAIL CK. | QUAN.CK.        | TRACE CK. |        |

KDOT Graphics Certified

| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 7         | 148          |

P.O.T. Sta. 46+10.00  
 N. 549,588.590 E. 8,414,686.041  
 1) Set 1/2" x 15" Rebar 0.3' Deep  
 2) Top E end RCP  
 3) TW of J Hill Rd.  
 4) Set Spk. & KDOT Wshr. E face of post

51.5' E  
 1.0' E  
 56.8' ENE

© Bridge Sta. 50+00.00 = I-70 Hwy. Sta. 606+31.00  
 =Plan Sta. 50+00.00 & I-70 Sta. 606+18.00 in 1990 KDOT Proj. No. 70-31 2611-02  
 N. 549,209.789 E. 8,414,778.589  
 1) Set Mag nail & KDOT Wshr. Flush  
 2) NE Cor of Hubguard of bridge  
 3) NW Cor of Hubguard of Bridge

127.1' NNW  
 127.1' NNE

P.O.T. Sta. 53+10.00  
 N. 548,908.585 E. 8,414,852.152  
 1) Set 1/2" x 15" Rebar 0.3' Deep  
 2) TW of J Hill Rd.  
 3) TW of Smokey Ln Rd. to E  
 4) Top E End of RCP

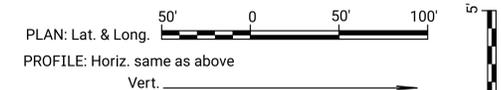
0.5' E  
 32.0' S  
 46.6' ENE

- Traverse Point #100  
 N. 548,943.788 E. 8,414,805.739  
 1) Set 1/2" x 15" Rebar w/ orange KDOT Cap 0.3' Deep  
 2) 36.73' Rt. of © J Hill Rd. Sta. 50+64.79
- Traverse Point #101  
 N. 549,071.808 E. 8,414,791.708  
 1) Set 1/2" x 15" Rebar w/ orange KDOT Cap 0.3' Deep  
 2) 19.49' Rt. of © J Hill Rd. Sta. 49+36.17
- Traverse Point #102  
 N. 549,349.055 E. 8,414,765.962  
 1) Set 1/2" x 15" Rebar w/ orange KDOT Cap 0.3' Deep  
 2) 20.80' Lt. of © J Hill Rd. Sta. 46+60.66
- Traverse Point #105  
 N. 549,189.722 E. 8,414,616.565  
 1) Set 1/2" x 15" Rebar w/ orange KDOT Cap 0.3' Deep  
 2) 162.14' Rt. of © J Hill Rd. Sta. 47+80.99

UTILITY KEY

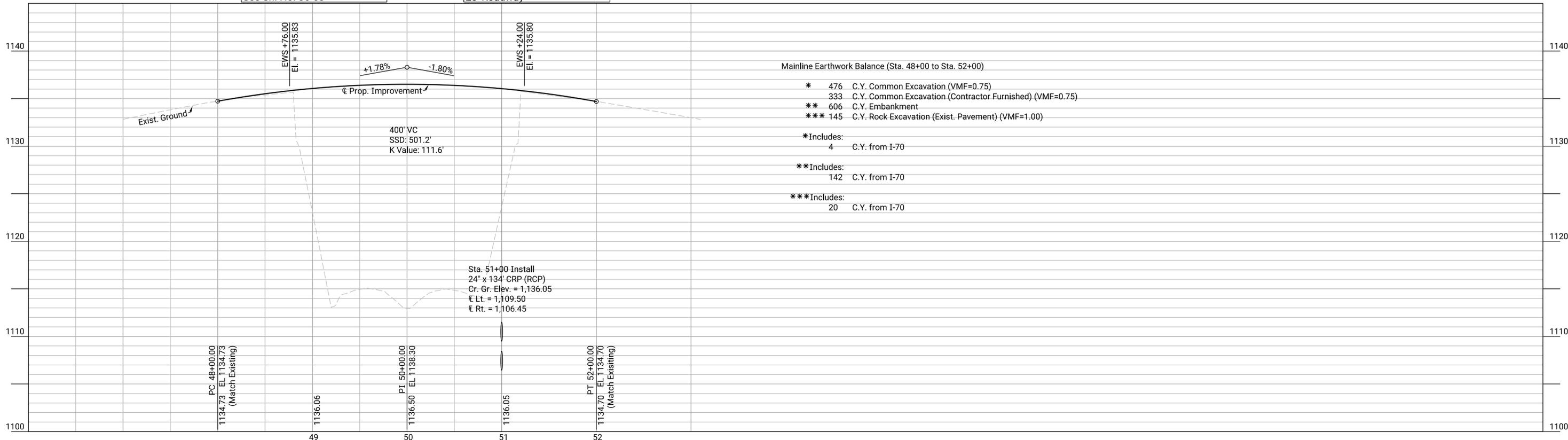
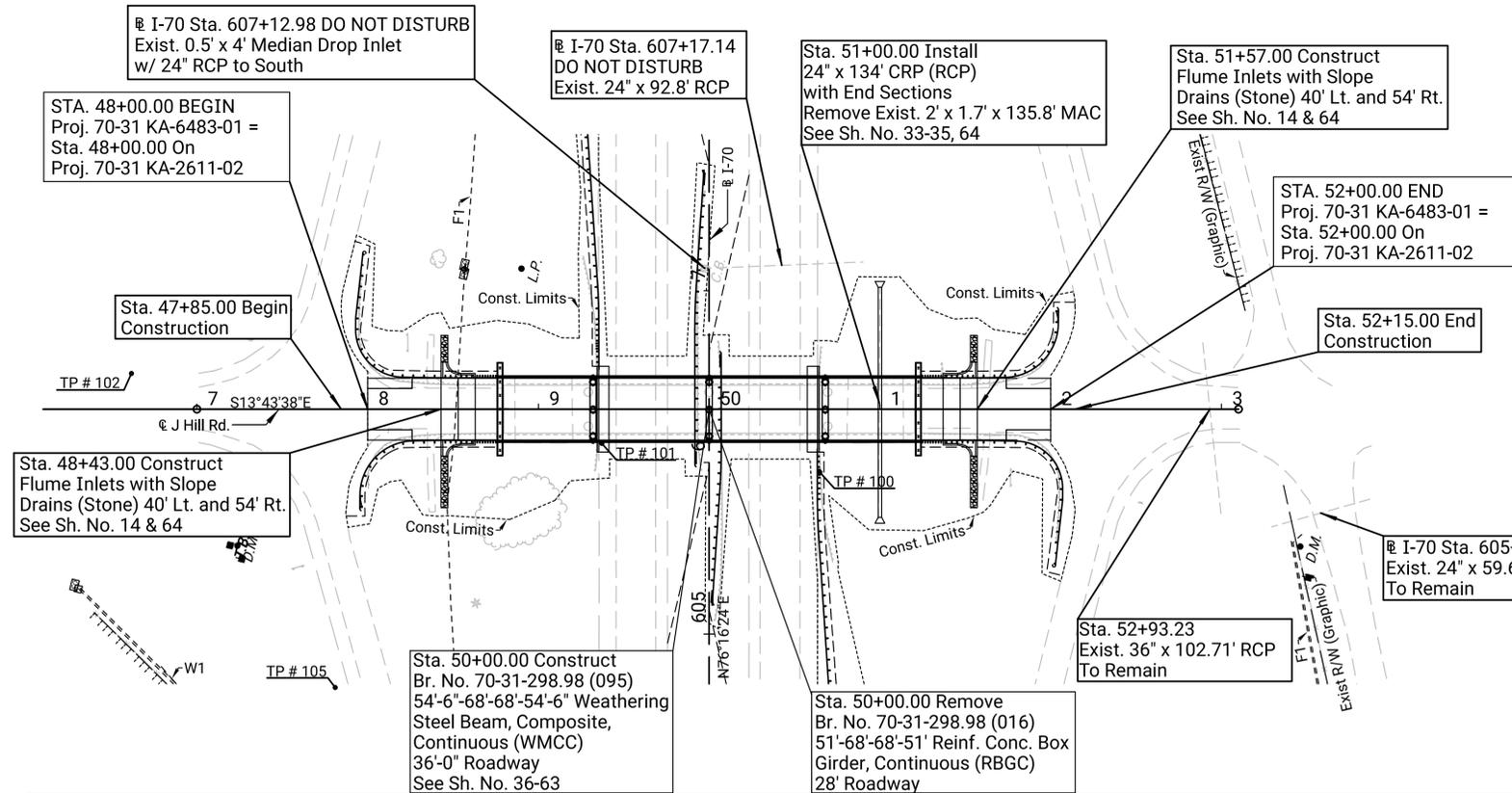
- F1 Century Link (Fiber Optic Line)
- W1 City of Grandview Plaza (Water Line)
- E1 KDOT

SCALE



| DATE   | BY        |
|--------|-----------|
| 5/2023 | J. HOLT   |
| 7/2023 | R. BOWMAN |

| REFERENCES NOTED | REFERENCES CHECKED |
|------------------|--------------------|
|                  |                    |

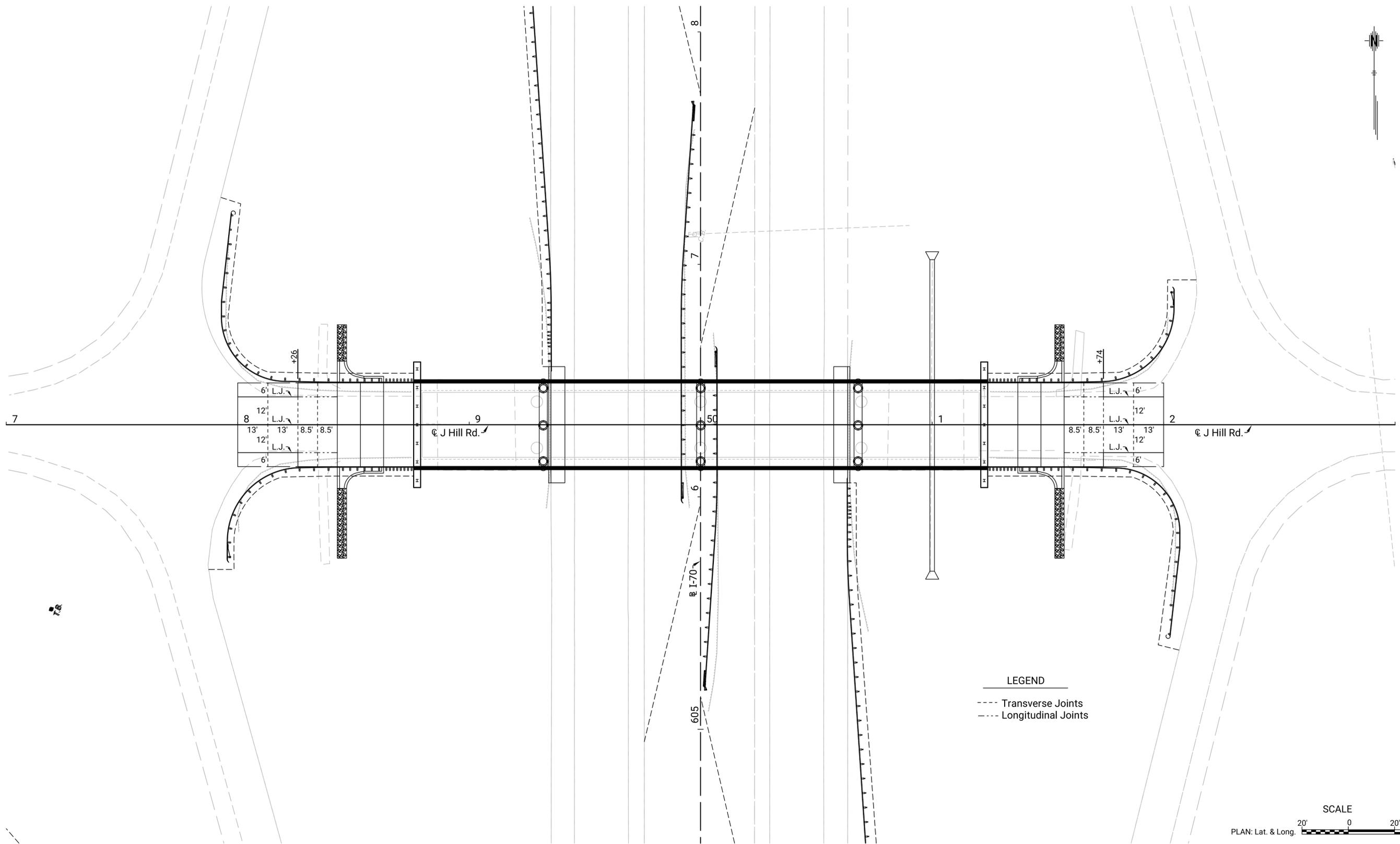


Plotted by : Elias.Esquivel@ks.gov 13-MAR-2025 15:03  
 File : KA648301rpp-01.dgn

|  |   |   |  |  |
|--|---|---|--|--|
| BM10<br>N 548,694.947 E 8,414,812.829 ELEV. 1130.21'<br>1) Set 1/2" x 24" rebar w/ Alum cap stamped GE1<br>508.27' Rt. ; I-70 Sta. 605+42.11 | BM11<br>N 549,088.351 E 8,414,827.790 ELEV. 1136.10'<br>1) Set Rivet & KDOT wshr. in SE end of bridge wing wall<br>129.65' Rt. ; I-70 Sta 606+50.00 | BM12<br>N 549,330.018 E 8,414,730.789 ELEV. 1136.02'<br>1) Set Rivet & KDOT wshr. in NW end of bridge wing wall<br>128.13' Lt. ; I-70 Sta 606+13.11 | BM13<br>N 549,644.678 E 8,414,435.455 ELEV. 1121.34'<br>1) Set 1/2" x 24" rebar w/ Alum cap stamped GE2<br>503.89' Lt. ; I-70 Sta. 604+00.88 | BM14<br>N 549,229.309 E 8,414,485.205 ELEV. 1114.90'<br>1) Set Rivet & KDOT wshr S end median drop inlet<br>0.07' Lt. ; I-70 Sta 607+12.99 |
|--|---|---|--|--|

KANSAS DEPARTMENT OF TRANSPORTATION  
 PLAN AND PROFILE  
 STA. 46+10 TO STA. 53+10  
 Sh. No. 7

| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 8         | 148          |



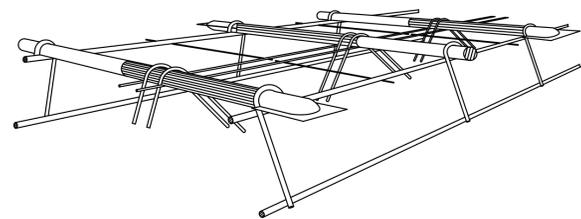
**LEGEND**  
 - - - Transverse Joints  
 - - - Longitudinal Joints

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

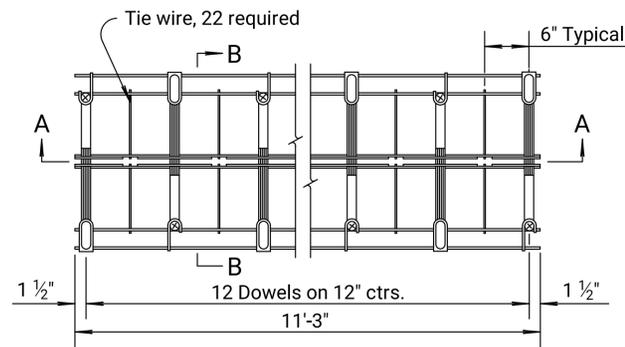
KANSAS DEPARTMENT OF TRANSPORTATION  
 J HILL RD.  
 JOINT DETAILS

Plotted by : Elias Esquivel@ks.gov 13-MAR-2025 15:03  
 File : KA64830Trpd-01.dgn

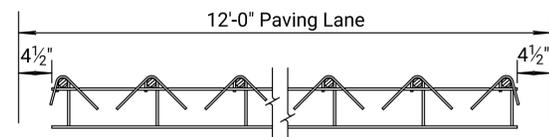
|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 9         | 148          |



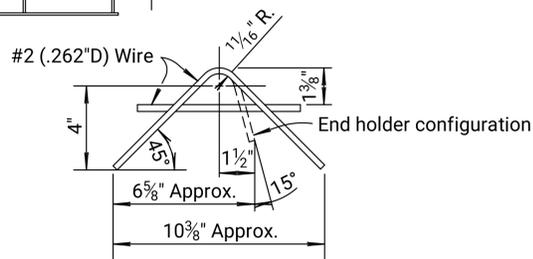
PERSPECTIVE VIEW



PLAN VIEW

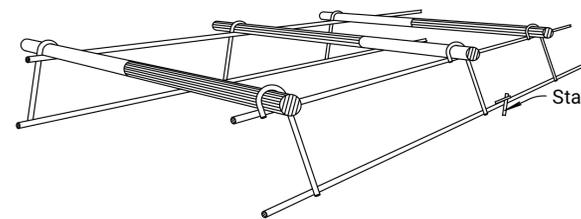


SEC. A-A

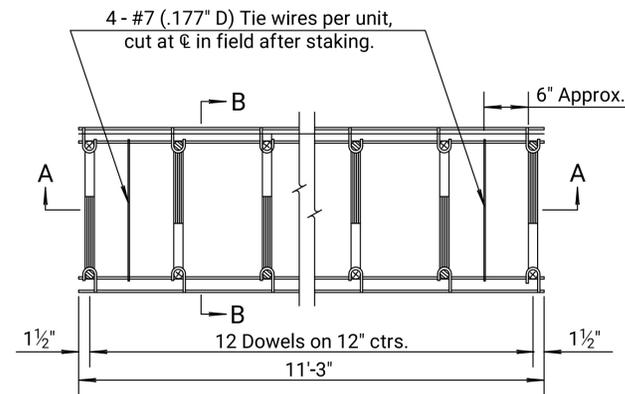


**GENERAL NOTE**  
 Coat each dowel bar with an epoxy coating that meets the standard specifications. Uniformly apply the powdered epoxy coating according to accepted practices and the coating manufacturer's recommendations. The coating need not be applied to the end faces of the bars and will not be 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.

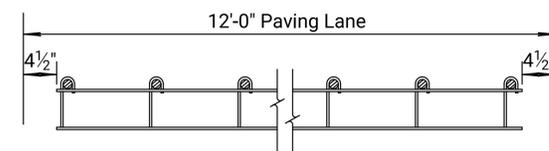
**Dowel Baskets**  
 Wire sizes shown are minimum required.  
 Stake baskets to subgrade as shown. Use ramset or similar type fastener with clip when subgrade condition requires it.  
 Sides held together with tie wire, allowing quick separation of sides and insertion of expansion material, provided 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

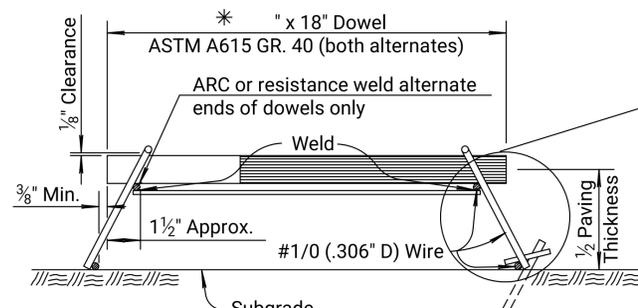


PLAN VIEW



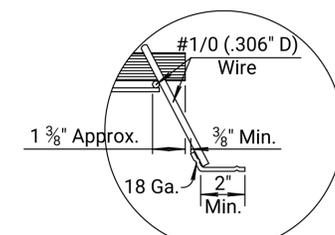
SEC. A-A

\* See pavement details for size of dowels.

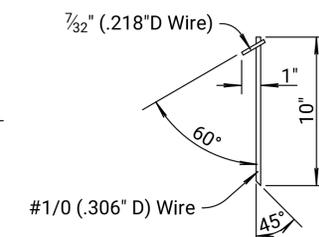


SEC. B-B

CONTRACTION JOINT



SAND PLATE (Alt. 1)

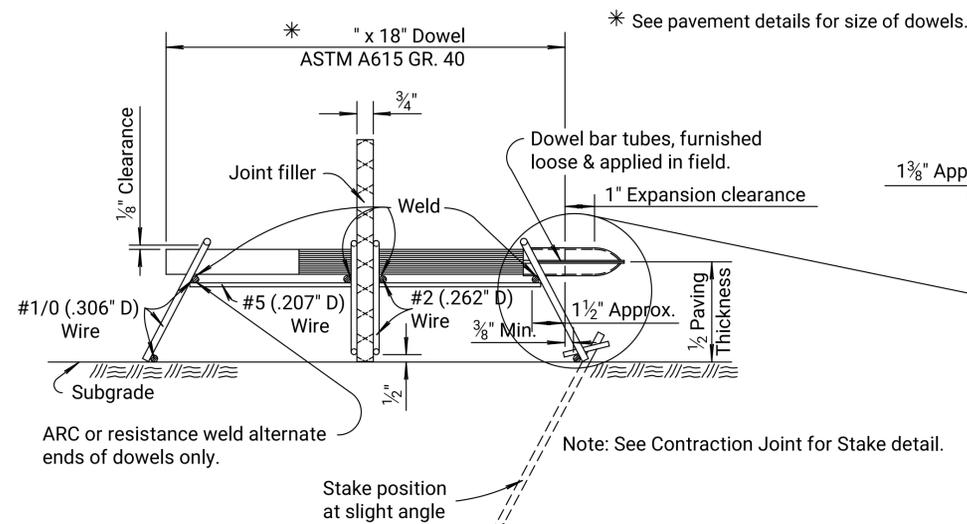


STAKE DETAIL

(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.



SEC. B-B

EXPANSION JOINT

SAND PLATE (Alt. 1)

Plotted by : Elias.Esquivel@ks.gov 13-MAR-2025 15:01  
 File : KA64830Trss735.dgn

| NO. | DATE     | REVISIONS                       | BY     | APPD   |
|-----|----------|---------------------------------|--------|--------|
| 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

|            |            |            |           |
|------------|------------|------------|-----------|
| DESIGNED   | DETAILER   | QUANTITIES | TRACED    |
| DESIGN CK. | DETAIL CK. | QUAN. CK.  | TRACE CK. |

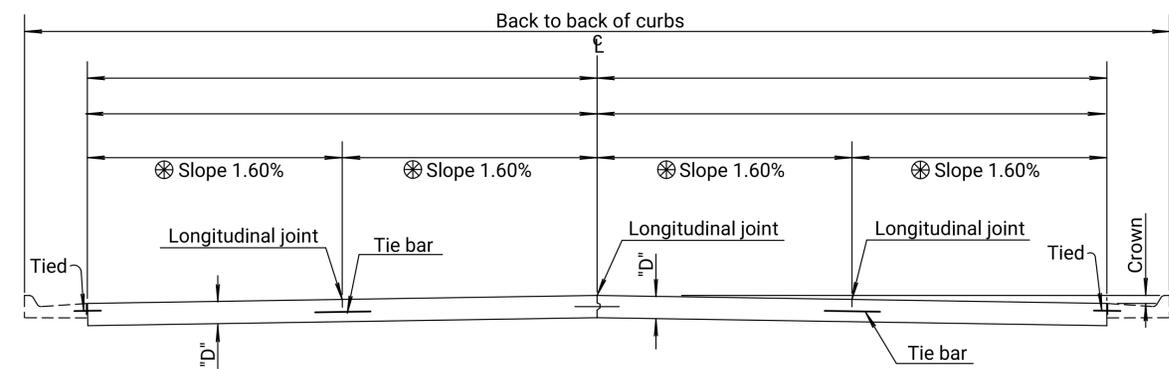
Scott W. King

KDOT Graphics Certified 05-18-2022 Sh. No. 9

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
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**GENERAL NOTE**

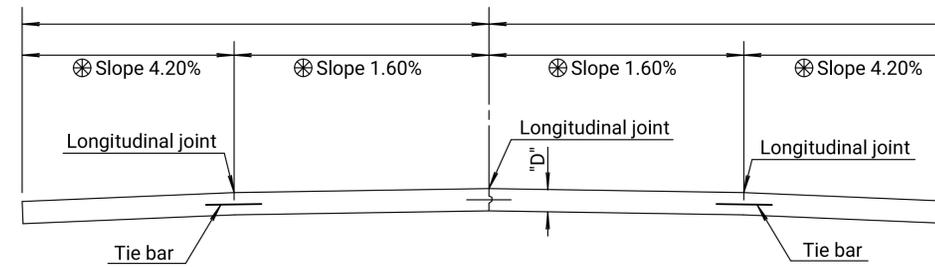
Epoxy coat all deformed tie bars that are straight. Patch any damage to the epoxy coating in accordance with the Standard Specifications.  
 Use billet steel Grade 40 reinforcing for deformed tie bars that require bending, may be epoxy coated at the Contractor's option.  
 Place pressure relief joint 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, 1/8" wide, joint in pavement constructed over Cement or Asphalt Treated Base (Non-Sealed Joint Sawcut). Use single saw cut, 1/8" 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.



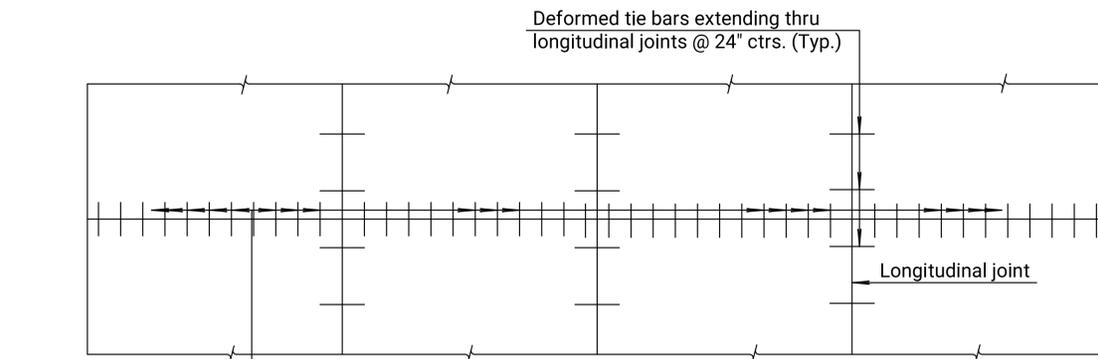
For Curb & Gutter details See Standard Drawing RD635.

**TRANSVERSE SECTION (4-LANE WITH CURB & GUTTER)**

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

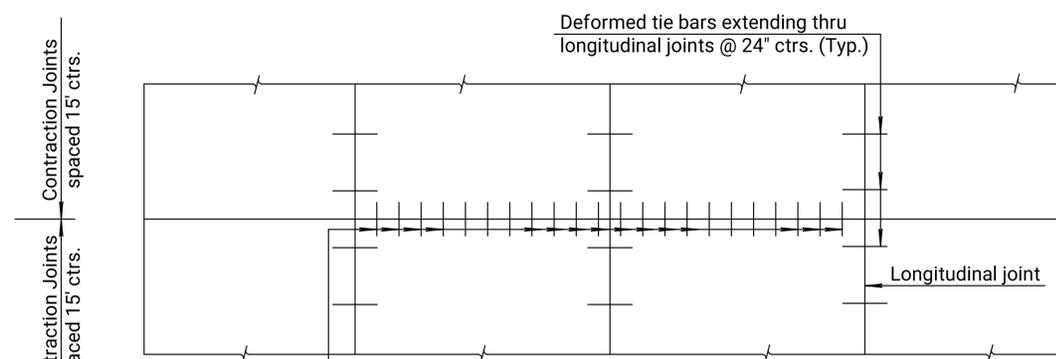


**TRANSVERSE SECTION (2-LANE WITH SHOULDERS)**



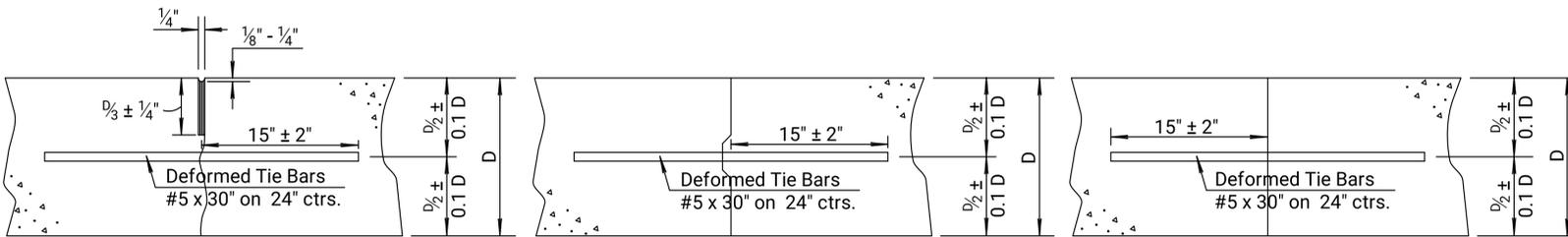
∅ x 18" Smooth Dowel bars  
 Dowel bars @ 12" ctrs. thru contraction joint (Typical).

**PLAN (4-LANE WITH CURB & GUTTER)**



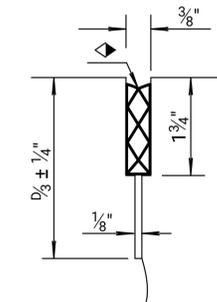
∅ x 18" Smooth Dowel bars  
 Dowel bars @ 12" ctrs. thru contraction joint (Typical).

**PLAN (2-LANE WITH SHOULDERS)**



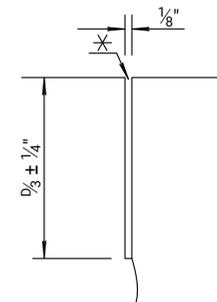
Note: For longitudinal construction joints the contractor has the option of using either the keyed or butt type. Place deformed tie bars mid-depth of the shoulder.

**LONGITUDINAL JOINTS**



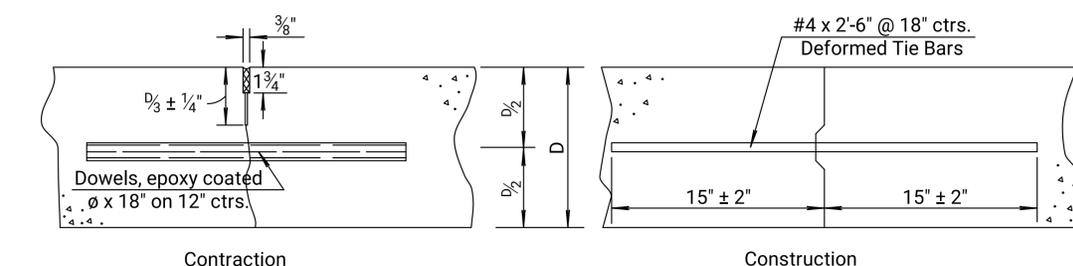
**DETAIL OF SEALED JOINT SAWCUT**

Make an initial 1/8" saw cut (D/3 ± 1/4" depth); the second 3/8" saw cut is a separate operation done after concrete has gained sufficient strength to avoid spalling as determined by the Engineer.



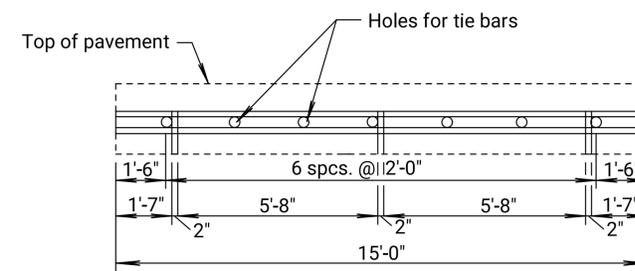
**DETAIL OF NON-SEALED JOINT SAWCUT**

Make only the initial 1/8" saw cut after concrete has gained sufficient strength to avoid spalling as determined by the Engineer.



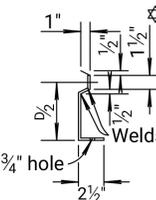
**TRANSVERSE JOINTS**

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.

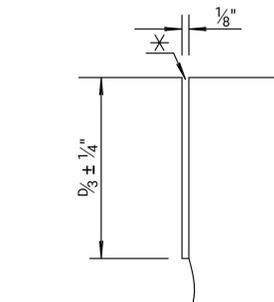


**SECTION OF RECESSED FORM LEG**

| DOWEL SIZE |          |
|------------|----------|
| D (in.)    | Diameter |
| 6 < D < 9  | 1"       |
| 9 ≤ D < 11 | 1 1/4"   |
| D ≥ 11     | 1 1/2"   |

**PAVEMENT DEPTH**

D = 10"



**DETAIL OF NON-SEALED JOINT SAWCUT**

Make only the initial 1/8" saw cut after concrete has gained sufficient strength to avoid spalling as determined by the Engineer.

|     |          |                                   |        |        |
|-----|----------|-----------------------------------|--------|--------|
| 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. |
| NO. | DATE     | REVISIONS                         | BY     | APPROV |

**CONCRETE PAVEMENT DOWEL JOINTED NON-REINFORCED**

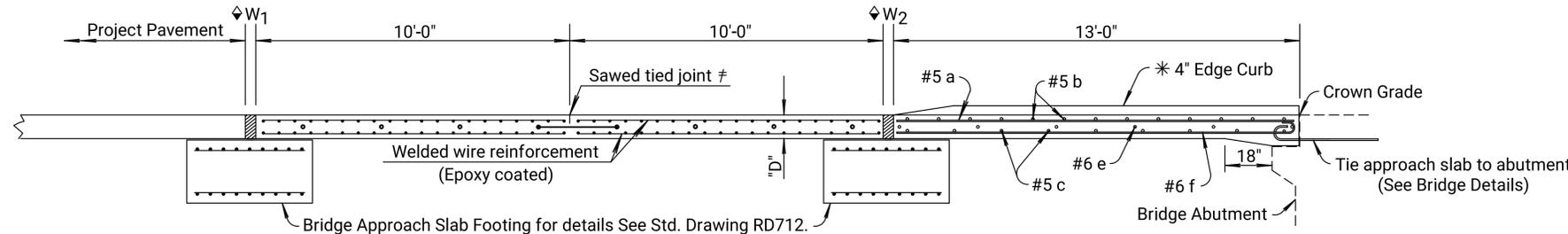
|            |            |            |           |       |                 |
|------------|------------|------------|-----------|-------|-----------------|
| RD708      |            | 10-23-13   |           | APPD. | James O. Brewer |
| DESIGNED   | DETAILED   | QUANTITIES | TRACED    |       |                 |
| DESIGN CK. | DETAIL CK. | QUAN. CK.  | TRACE CK. |       |                 |

Note: Designer to add applicable dowel sizes.

Plotted by : Elias.Esquivel@ks.gov 13-MAR-2025 15:06  
 File : KA648301rss708.dgn

KDOT Graphics Certified

| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 11        | 148          |

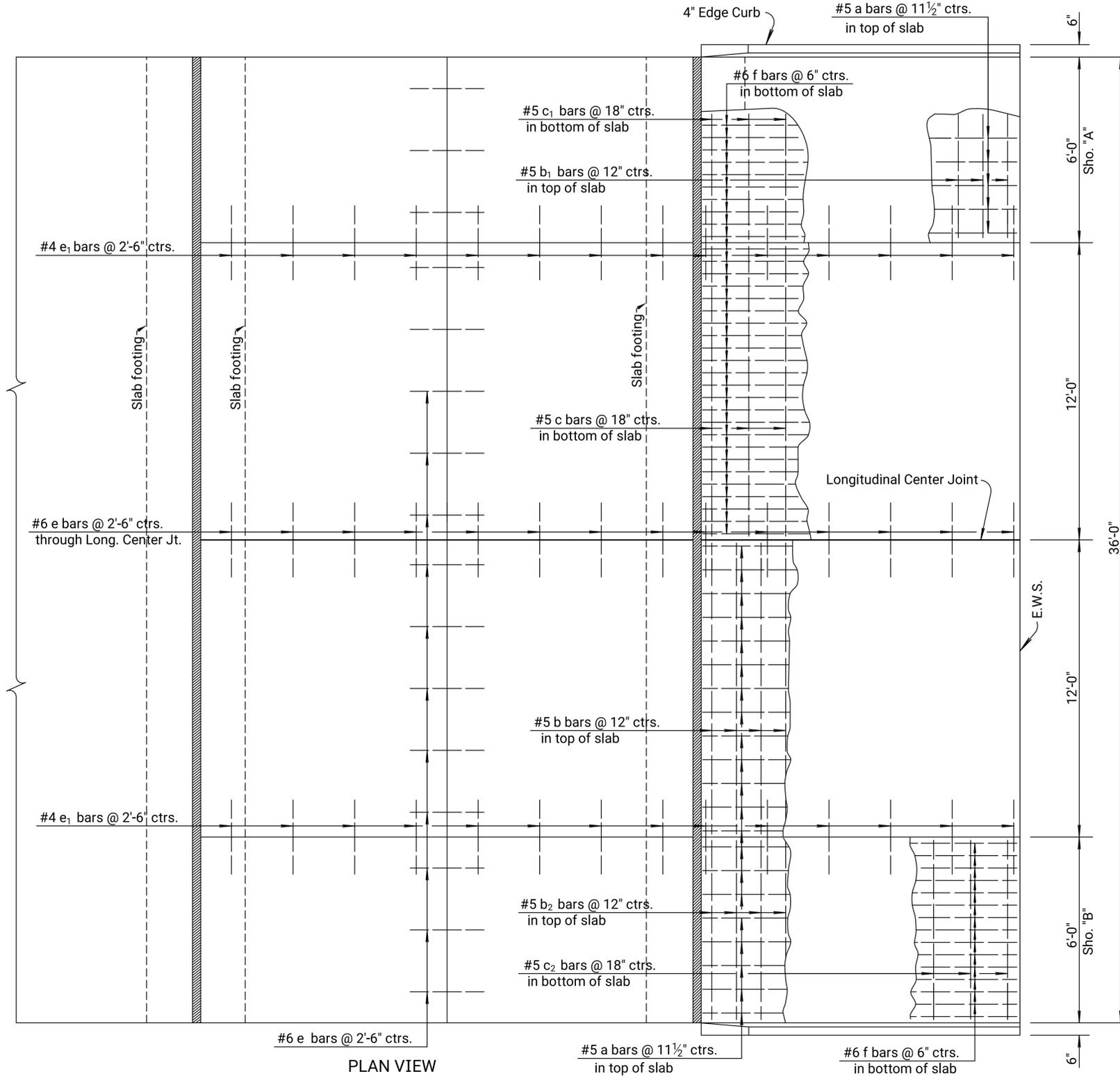


\* For details of 4" Edge Curb, See Standard Drawing RD711.  
 ♦ W<sub>1</sub> and W<sub>2</sub> for Expansion/Pressure Relief Joint width and details See Standard Drawing RD712.  
 † Contractor has the option of substituting a Tied Keyed Construction Joint.

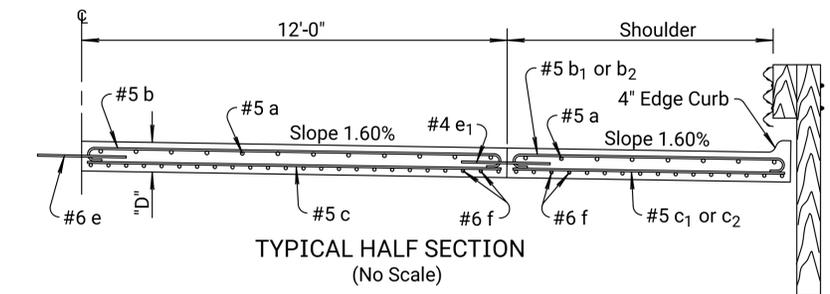
"D" Thickness = Thickness of Project Concrete Pavement (10" minimum).

LONGITUDINAL SECTION

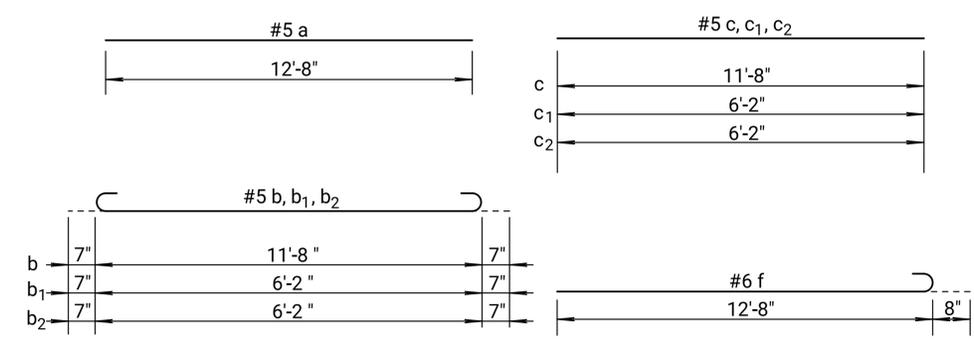
**GENERAL NOTE**  
 Special Concrete Bridge Approach shall be paid for as Sq. Yds. of Concrete Pavement (10" Unif.)(AE)(Br. App.) and includes all work and materials required to construct the approach slab as shown on this sheet.  
 All work and materials required for installation of expansion joints 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, welded wire reinforcement and edge curb.  
 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.



PLAN VIEW



TYPICAL HALF SECTION  
(No Scale)



BENDING DIAGRAMS

| BILL OF MATERIALS                           |        |         |                |                |        |                |                |       |                |                 |
|---|--------|---------|----------------|----------------|--------|----------------|----------------|-------|----------------|-----------------|
| Bar Schedule                                |        |         |                |                |        |                |                |       |                |                 |
| Bar No.                                     | a      | b       | b <sub>1</sub> | b <sub>2</sub> | c      | c <sub>1</sub> | c <sub>2</sub> | e     | e <sub>1</sub> | f               |
| 40  | 26     | 13      | 13             | 18             | 9      | 9              | 29             | 28    | 74             |                 |
| Size  | #5     | #5      | #5             | #5             | #5     | #5             | #5             | #6    | #4             | #6              |
| Length                                      | 12'-8" | 12'-10" | 7'-4"          | 7'-4"          | 11'-8" | 6'-2"          | 6'-2"          | 3'-0" | 3'-0"          | 13'-4"          |
| Reinforcing Steel (Grade 60) (Epoxy Coated) |        |         |                |                |        |                |                |       |                | 3,079 lbs.      |
| Concrete Pavement ( 10" Unif.)(AE)          |        |         |                |                |        |                |                |       |                | 133.44 Sq. Yds. |
| Expansion Jt. Membrane Sealant              |        |         |                |                |        |                |                |       |                | 36 Lin. Ft.     |
| Pressure Relief Jt. Membrane Sealant        |        |         |                |                |        |                |                |       |                | 36 Lin. Ft.     |

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

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.

Plotted by : Elias.Esquivel@ks.gov 13-MAR-2025 18:04  
 File : KA64830Trss713.dgn

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

KANSAS DEPARTMENT OF TRANSPORTATION

**CONCRETE BRIDGE  
 APPROACH PAVEMENT  
 NORMAL APPROACH**

**RD713-**

|            |            |            |           |
|------------|------------|------------|-----------|
| DESIGNED   | DATE       | APPD.      | BY        |
| DESIGN CK. | DETAIL CK. | QUANTITIES | TRACE CK. |
|            |            | QUAN. CK.  |           |

James O. Brewer

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 12        | 148          |

**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).

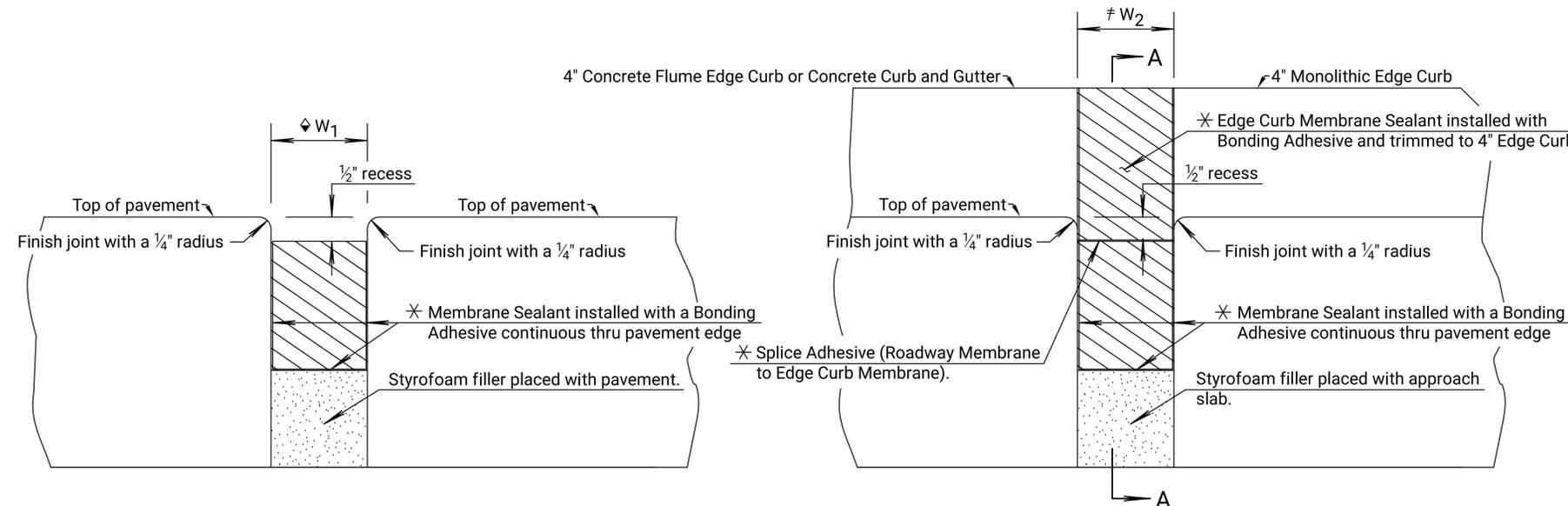
Do not allow traffic on the joint for a minimum of 3 hours unless otherwise directed by the Engineer.

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.

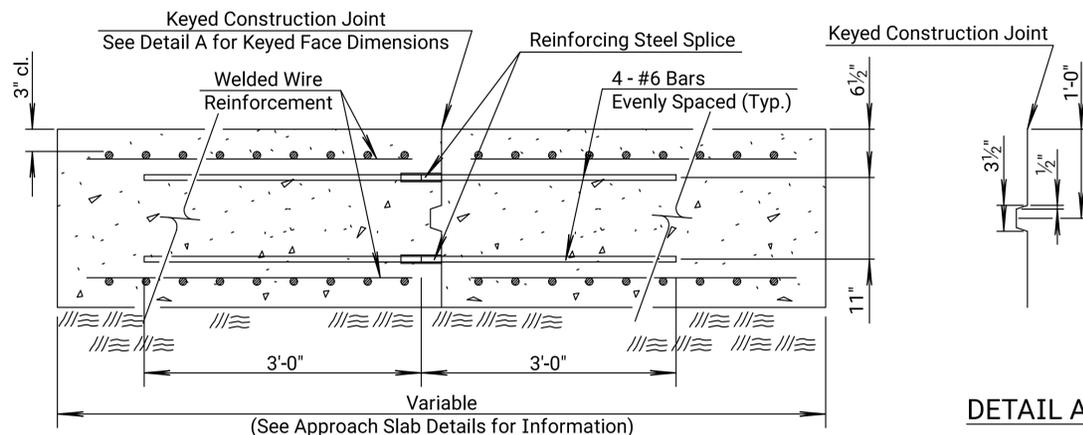
**BRIDGE APPROACH SLAB FOOTING**

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.

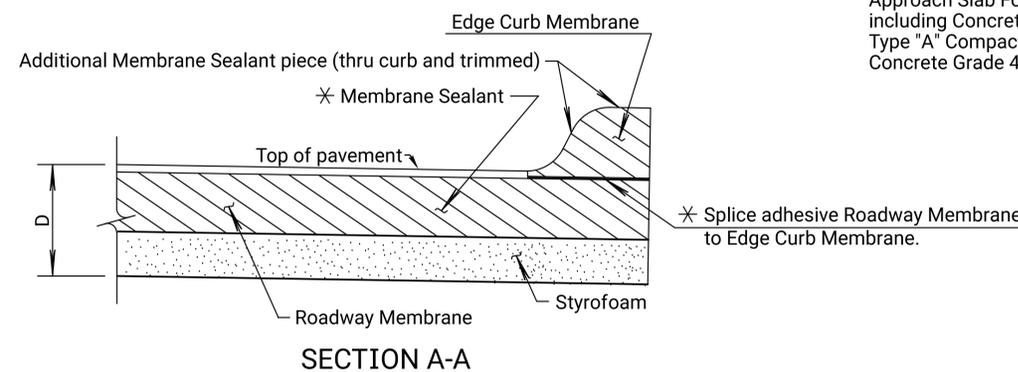


**ELEVATION PRESSURE RELIEF JT.**

**ELEVATION EXPANSION JT.**



**DETAIL A**



**SECTION A-A**

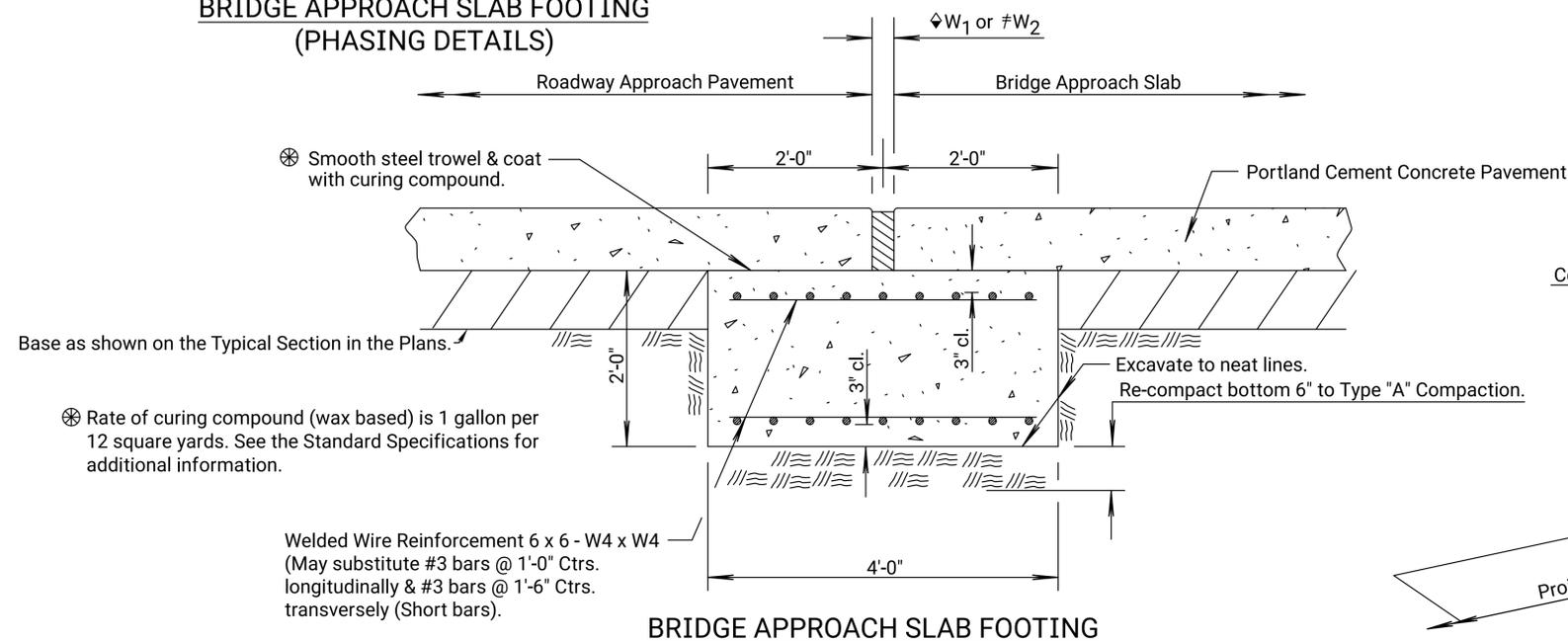
(See Std. Drawing RD711 for details of 4" Edge Curb.)

| ♦ PRESSURE RELIEF JOINT WIDTH DETAILS (W <sub>1</sub> ) |      |        |        |        |      |        |        |
|---|------|--------|--------|--------|------|--------|--------|
| Temperature (F°)  | 40°  | 50°    | 60°    | 70°    | 80°  | 90°    | 100°   |
| Formed Concrete Opening Size                            | 4.0" | 3 3/4" | 3 1/2" | 3 1/4" | 3.0" | 2 3/4" | 2 1/2" |

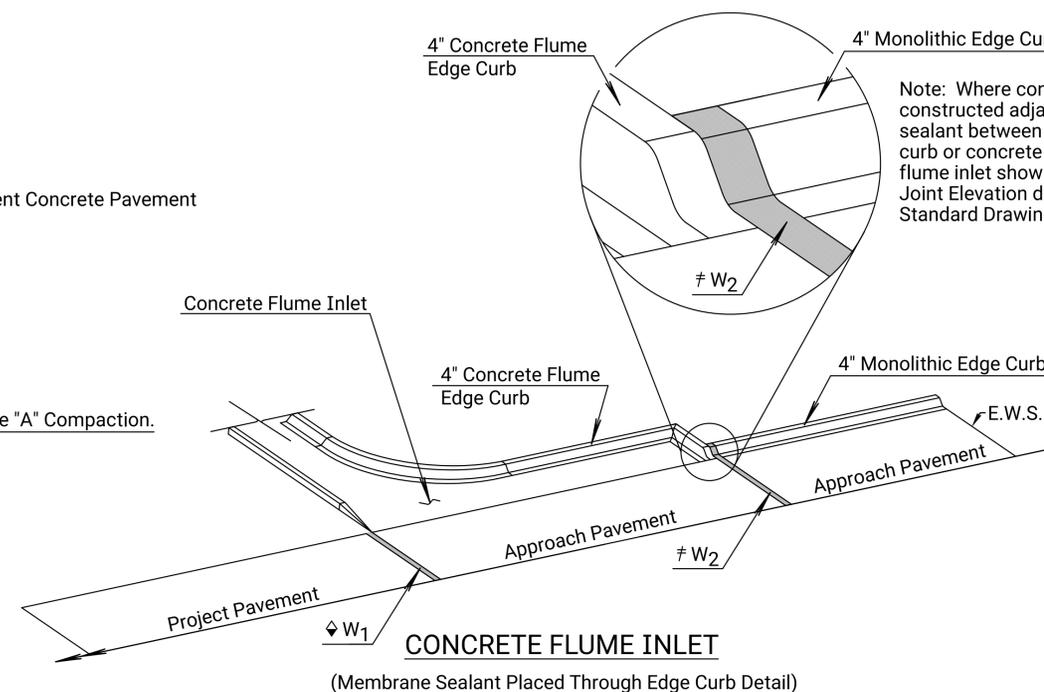
Temperature: Average Ambient Temperature over previous 24 hours.

| # EXPANSION JOINT WIDTH DETAILS (W <sub>2</sub> ) |  |
|---|--|
| 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     | APPRD  |
|-----|----------|--------------------------------------|--------|--------|
| 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**

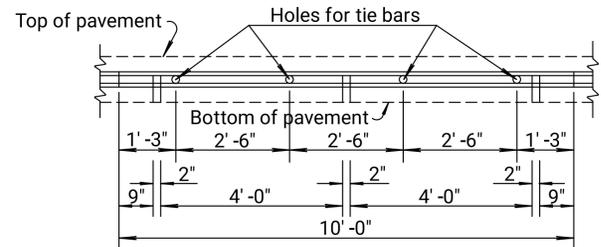
|            |            |            |           |
|------------|------------|------------|-----------|
| DESIGNED   | DETAIL CK. | QUANTITIES | TRACED    |
| DESIGN CK. | DETAIL CK. | QUAN. CK.  | TRACE CK. |

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.

Plotted by: Elias Esquivel@ks.gov 13-MAR-2025 15:03 File: KA648301rss712.dgn

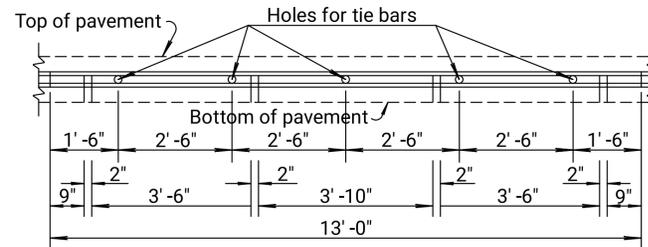
KDOT Graphics Certified

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 13        | 148          |



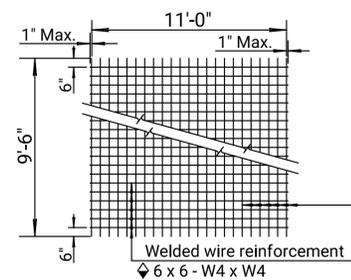
To be used only against forms. Shall not extend through contraction joints.

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



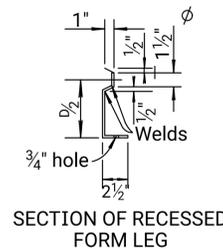
To be used only against forms. Shall not extend through contraction joints.

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.

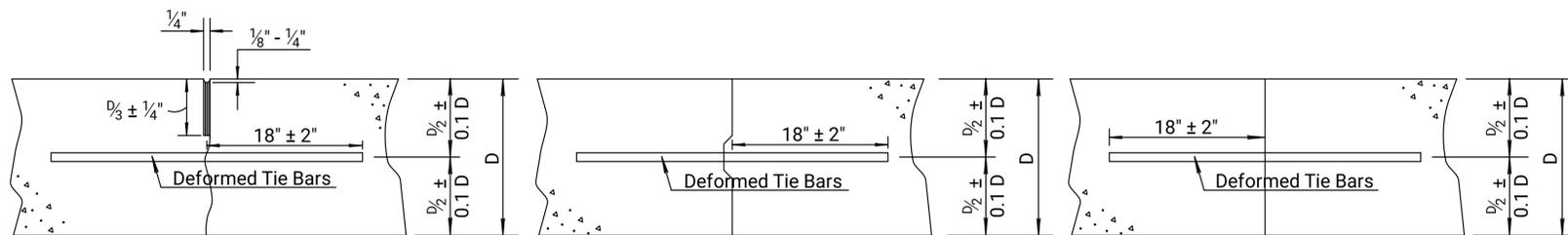


Snap-in leg or other approved designs may be used in lieu of welded leg.



DETAIL OF LAP FOR WELDED WIRE REINFORCEMENT

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



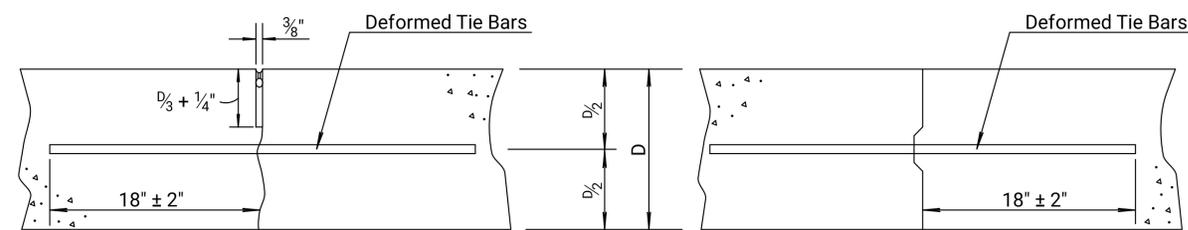
Tied Non-Keyed

Tied Keyed Construction

Tied Butt Construction

LONGITUDINAL JOINTS

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

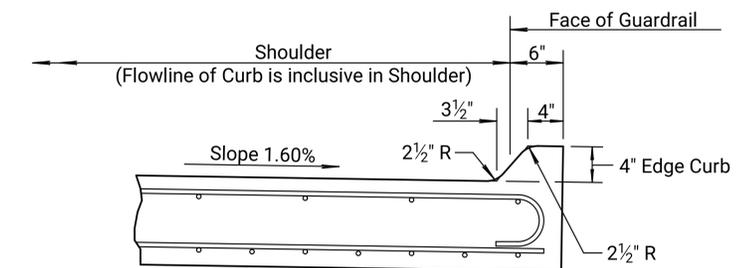


Monolithic Pour

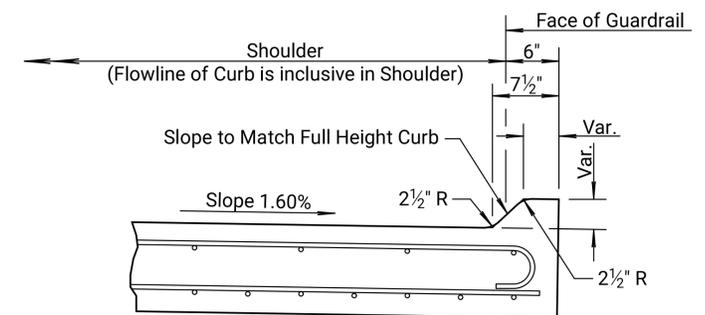
Construction Joint

TRANSVERSE JOINTS

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

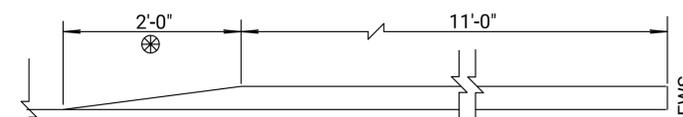


SECTION A-A

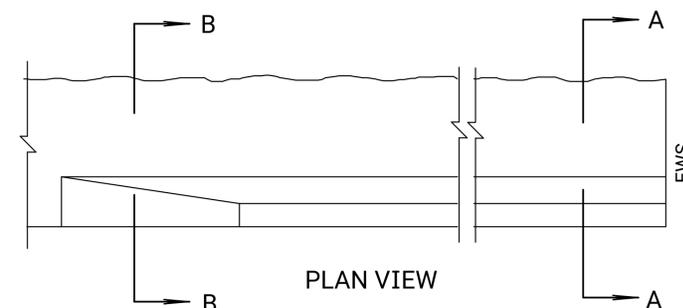


SECTION B-B

No 4" Curb transition when adjacent to Flume Inlet.



ELEVATION



PLAN VIEW

4" EDGE CURB DETAIL

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.

| NO. | DATE     | REVISIONS                              | BY     | APPROV. |
|-----|----------|--|--------|---------|
| 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

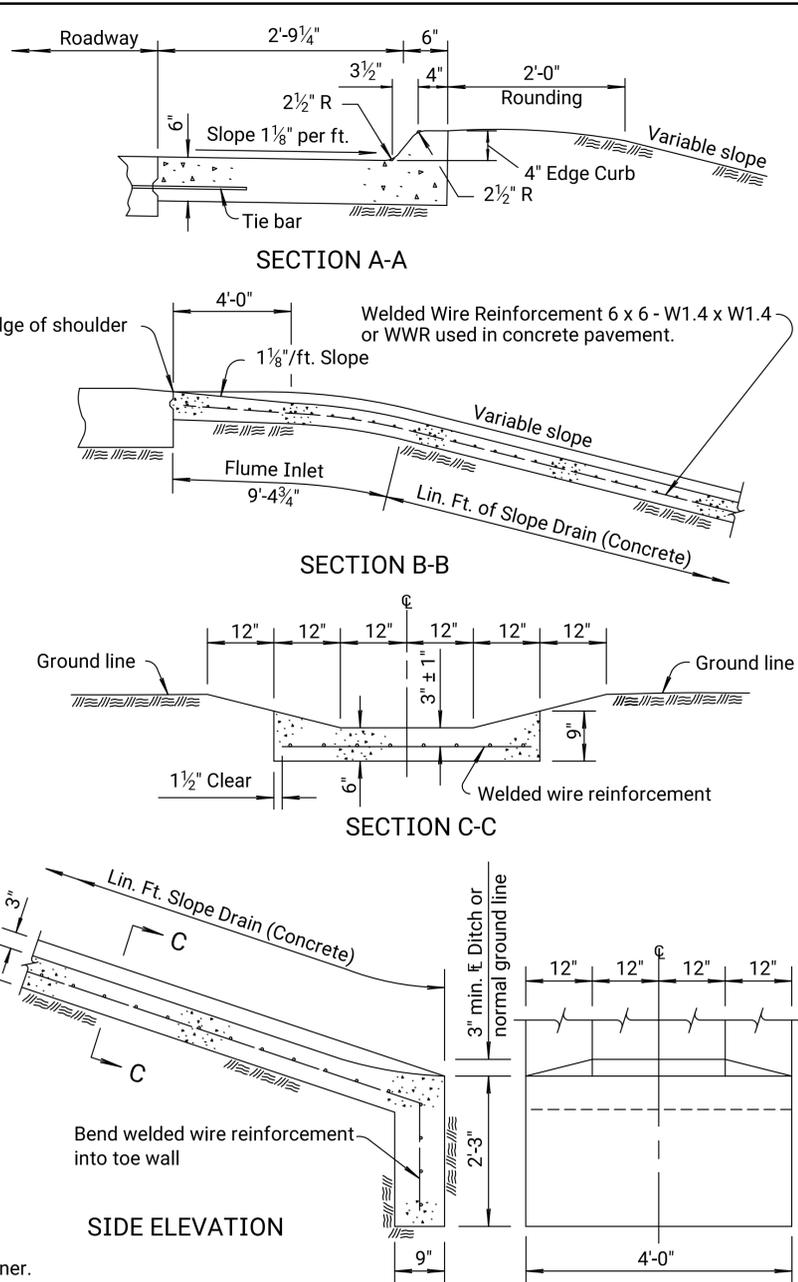
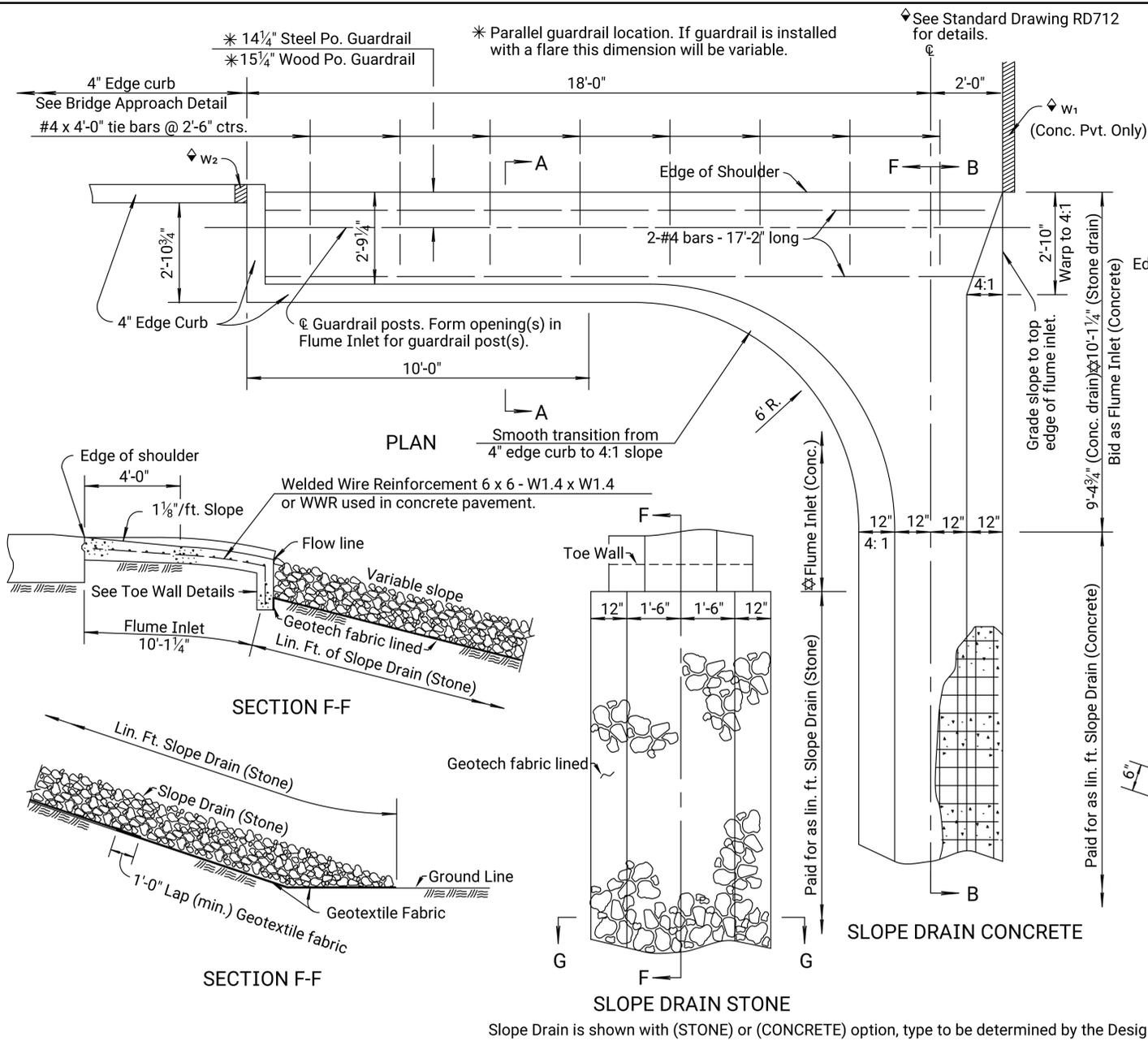
RD711

|            |            |            |                 |
|------------|------------|------------|-----------------|
| DESIGNED   | 10-23-13   | APPD.      | James O. Brewer |
| DESIGN CK. | DETAIL CK. | QUANTITIES | TRACED          |
| DESIGN CK. | DETAIL CK. | QUAN. CK.  | TRACE CK.       |

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| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
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Note to Designer: When concrete flume inlets are used on projects with asphalt pavement use a 33'-0" bridge approach.



**GENERAL NOTE**  
 Flume Inlets shall be paid for by unit price per each. Slope Drains (Stone or Concrete) shall be paid for by unit price per linear foot. Reinforcing steel & welded wire reinforcement are subsidiary to Flume Inlet and Slope Drain.  
 Flume Inlets will be constructed without Guide Vanes except at locations noted in plans or as directed by the Engineer. Construction of guide vanes, when required, shall be subsidiary to the bid item "Flume Inlet".  
 The entire area of the Flume Inlet & Slope Drain shall be placed monolithic and struck off with a uniform thickness of 6 inches. Guide Vanes may be formed monolithic with the Flume Inlet or tied to the Flume Inlet in the manner shown if constructed separately. Alternate methods of constructing Guide Vanes may be used with approval of the Engineer.  
 Concrete Grade 3.0 (AE) shall be used in Flume Inlet and Slope Drain. On concrete pavement projects, the contractor may substitute the mix used in concrete pavement.  
 Transverse expansion and contraction joints of same type in pavement are to extend through the flume inlet and 4" edge curb, omitting load transfer devices. The edge curb section will be made continuous through any expansion joint by using a filler material approved by the Engineer to fill the void to the full height of the curb.  
 Joints will not extend into the Slope Drain.  
 All exposed edges shall be finished with an edging tool. For details of 4" edge curb see Standard Drawing RD711.  
 No adjustment of guardrail post spacing will be permitted. Flume inlet shall only be constructed adjacent to concrete pavement. Flume inlet shall be tied to the pavement with #4 x 4'-0" tie bars at 2'-6" centers. Tie bars shall be subsidiary to the Flume Inlet.  
 Shape of guide vane shown is approximate and may be altered slightly to simplify construction. Height and width dimension shall be as shown regardless of shape.  
 Aggregate for the Slope Drain (STONE) shall meet the requirements of stone for Aggregate Ditch Lining and have a D<sub>50</sub> of 4" unless otherwise noted on the plans. The Contractor shall place stone from bottom to the top of slope to produce a well graded mass without segregation of material sizes. Placement, measurement, and payment shall conform to KDOT Standard Specifications.  
 Slope Drain (STONE) shall be underlain with geotextile fabric that meets the KDOT Standard Specification. All work and materials for the geotextile fabric shall be subsidiary to the Slope Drain (STONE).

QUANTITIES (For information only)

| SLOPE DRAIN (CONCRETE)           |  |
|----------------------------------|--|
| Flume Inlet Concrete:            | 1.9 cu. yds. Concrete                                      |
|                                  | 42 lbs. reinf. steel and WWR                               |
| Slope Drain (CONCRETE):          | 0.0833 cu. yds. Concrete per lin. ft.                      |
|                                  | 0.79 lbs. WWR per lin. ft.                                 |
|                                  | Toe wall shall be paid for as 1.5 lin. ft. of Slope drain. |
| SLOPE DRAIN (STONE)              |  |
| Flume Inlet & Toe Wall Concrete: | 2.2 cu. yds. Concrete                                      |
|                                  | 44 lbs. reinf. steel and WWR                               |
| Slope Drain (STONE):             | 4" Aggregate (D50)   |
|                                  | 0.25 cu. yds. 4" Agg. (D50) per lin. ft.                   |
|                                  | 0.90 sq. yds. Geotextile fabric per lin. ft.               |

⊗ Does not include guide vanes.

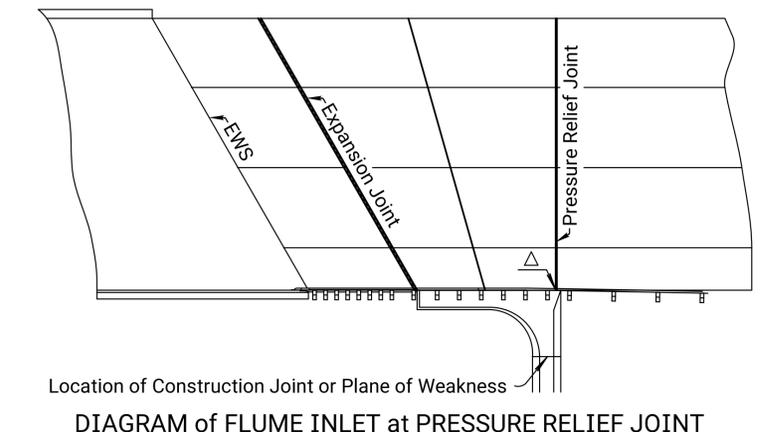
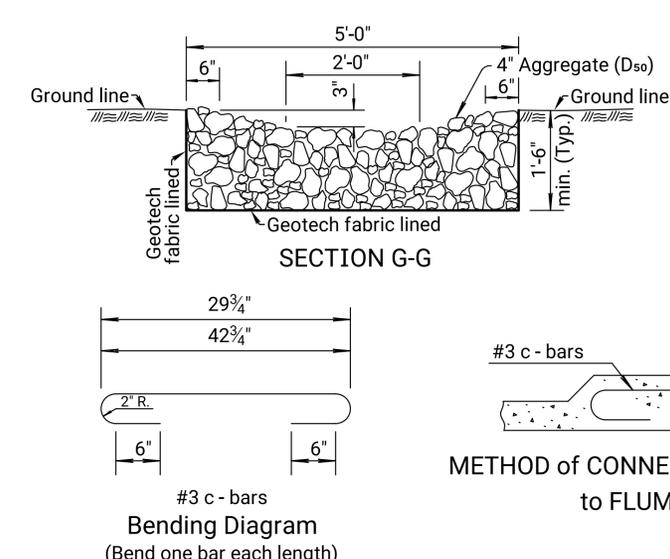
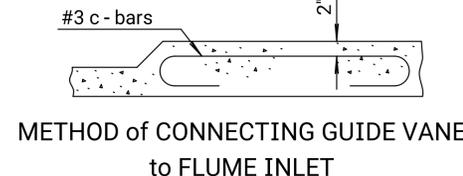


DIAGRAM of FLUME INLET at PRESSURE RELIEF JOINT

△ On projects with concrete paved shoulders where, due to skew of the bridge, the flume inlet extends beyond the 4" pressure relief joint of the special concrete bridge approach, the portion of inlet or gutter extending beyond the pressure relief joint shall not be tied to the concrete shoulder with tie bars.

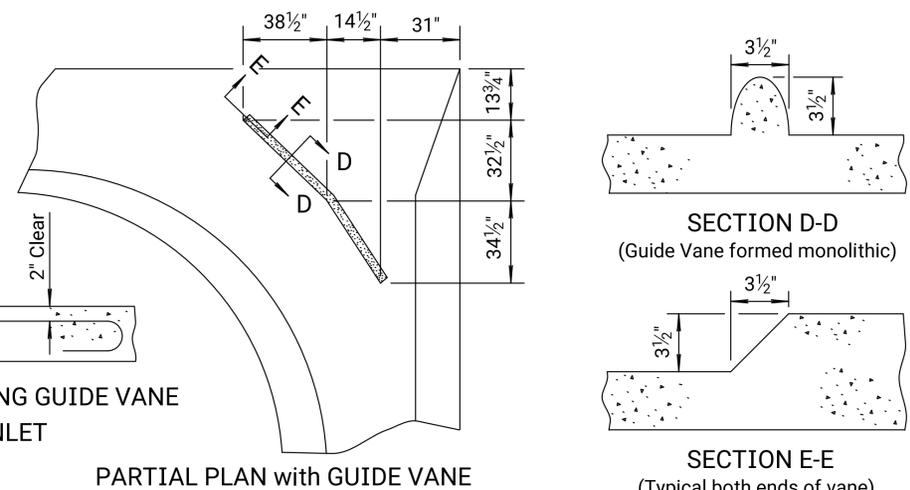


Bending Diagram (#3 c-bars) (Bend one bar each length)

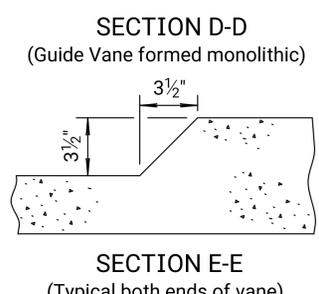


METHOD of CONNECTING GUIDE VANE to FLUME INLET

SLOPE DRAIN & TOE WALL DETAILS



PARTIAL PLAN with GUIDE VANE



SECTION D-D (Guide Vane formed monolithic)  
 SECTION E-E (Typical both ends of vane)

| NO. | DATE     | REVISIONS                            | BY     | APPD   |
|-----|----------|--------------------------------------|--------|--------|
| 06  | 01-25-16 | Added Note to Designer               | T.T.R. | S.W.K. |
| 05  | 09-12-07 | Reorg. sheet, add. slope drain stone | S.W.K. | J.O.B. |
| 04  | 01-28-05 | Chg. Class to Grade conc., reinf.    | S.W.K. | J.O.B. |

KANSAS DEPARTMENT OF TRANSPORTATION

**FLUME INLET and SLOPE DRAIN (CONCRETE/STONE)**

RD628

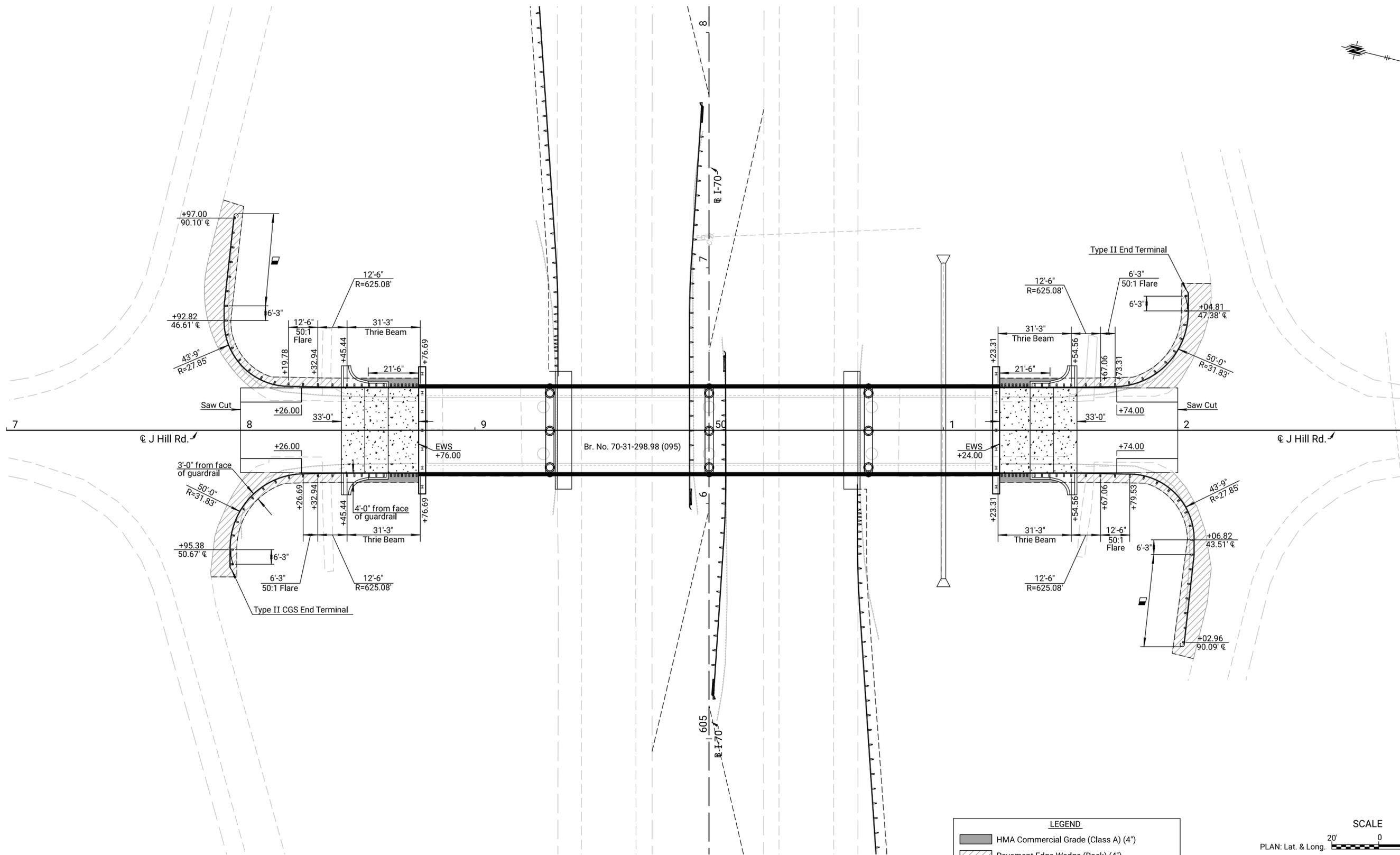
| DESIGNED   | DETAILED   | QUANTITIES | TRACED    |
|------------|------------|------------|-----------|
| DESIGN CK. | DETAIL CK. | QUAN. CK.  | TRACE CK. |

KDOT Graphics Certified 05-13-2022 Scott W. King

Plotted by: Elias.Esquivel@ks.gov 13-MAR-2025 15:02  
 File: KA648301rss628.dgn

KDOT Graphics Certified

| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 15        | 148          |



**LEGEND**

- HMA Commercial Grade (Class A) (4")
- Pavement Edge Wedge (Rock) (4")
- Concrete Pavement (10" Uniform) (AE) (Br App)
- CGS SRT or FLEAT End Terminal

Note: All Stations and Offsets are to face of rail.

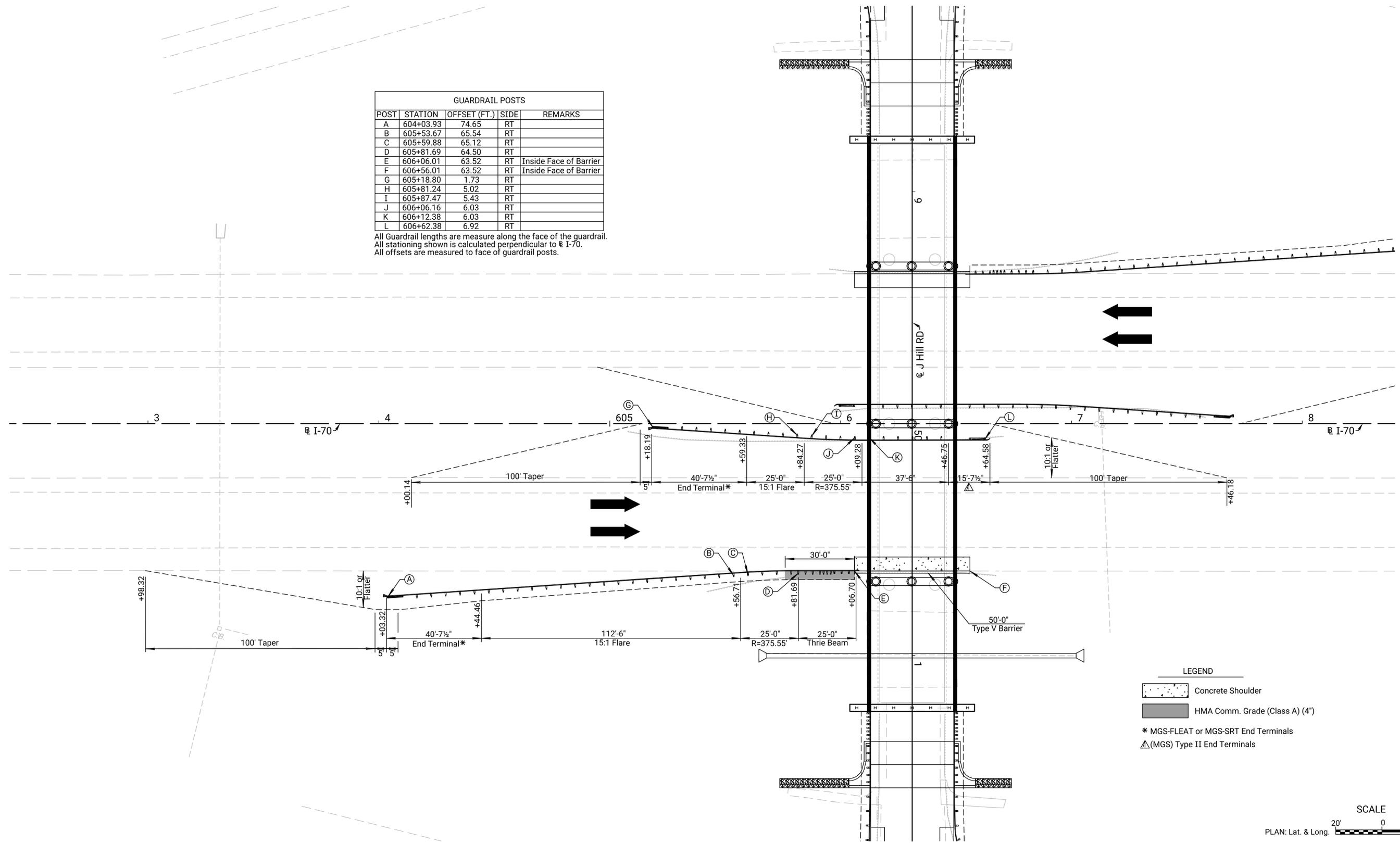


KANSAS DEPARTMENT OF TRANSPORTATION  
**GUARDRAIL LAYOUT DETAIL**  
 J. HILL RD.

Plotted by : Elias.Esquivel@ks.gov 13-MAR-2025 15:02  
 File : KA648301rgr-04.dgn

| GUARDRAIL POSTS |           |              |      |                        |
|-----------------|-----------|--------------|------|------------------------|
| POST            | STATION   | OFFSET (FT.) | SIDE | REMARKS                |
| A               | 604+03.93 | 74.65        | RT   |                        |
| B               | 605+53.67 | 65.54        | RT   |                        |
| C               | 605+59.88 | 65.12        | RT   |                        |
| D               | 605+81.69 | 64.50        | RT   |                        |
| E               | 606+06.01 | 63.52        | RT   | Inside Face of Barrier |
| F               | 606+56.01 | 63.52        | RT   | Inside Face of Barrier |
| G               | 605+18.80 | 1.73         | RT   |                        |
| H               | 605+81.24 | 5.02         | RT   |                        |
| I               | 605+87.47 | 5.43         | RT   |                        |
| J               | 606+06.16 | 6.03         | RT   |                        |
| K               | 606+12.38 | 6.03         | RT   |                        |
| L               | 606+62.38 | 6.92         | RT   |                        |

All Guardrail lengths are measure along the face of the guardrail.  
 All stationing shown is calculated perpendicular to R I-70.  
 All offsets are measured to face of guardrail posts.



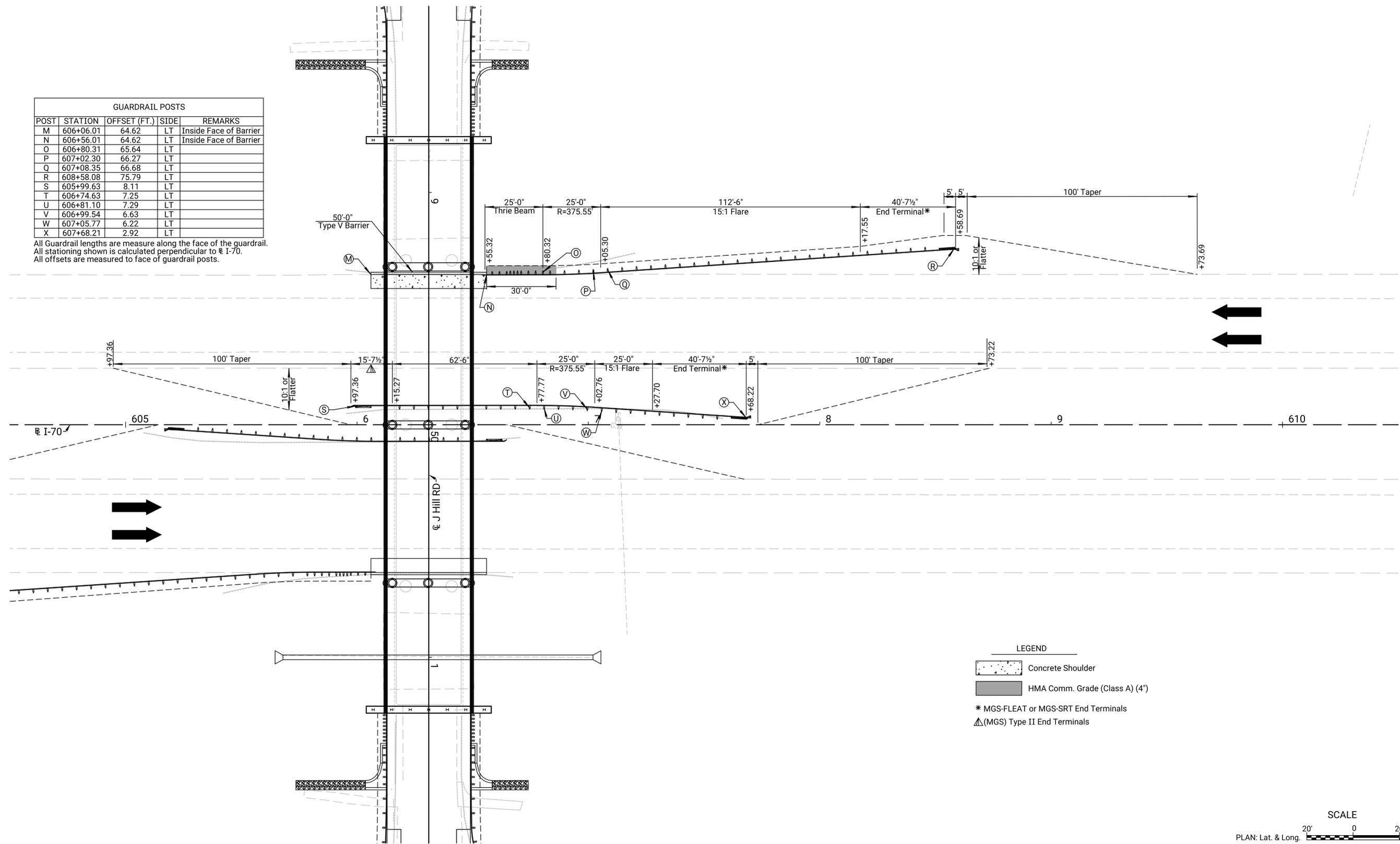
- LEGEND**
- Concrete Shoulder
  - HMA Comm. Grade (Class A) (4")
  - \* MGS-FLEAT or MGS-SRT End Terminals
  - (MGS) Type II End Terminals



KANSAS DEPARTMENT OF TRANSPORTATION  
 GUARDRAIL LAYOUT DETAIL  
 EB I-70

| GUARDRAIL POSTS |           |              |      |                        |
|-----------------|-----------|--------------|------|------------------------|
| POST            | STATION   | OFFSET (FT.) | SIDE | REMARKS                |
| M               | 606+06.01 | 64.62        | LT   | Inside Face of Barrier |
| N               | 606+56.01 | 64.62        | LT   | Inside Face of Barrier |
| O               | 606+80.31 | 65.64        | LT   |                        |
| P               | 607+02.30 | 66.27        | LT   |                        |
| Q               | 607+08.35 | 66.68        | LT   |                        |
| R               | 608+58.08 | 75.79        | LT   |                        |
| S               | 605+99.63 | 8.11         | LT   |                        |
| T               | 606+74.63 | 7.25         | LT   |                        |
| U               | 606+81.10 | 7.29         | LT   |                        |
| V               | 606+99.54 | 6.63         | LT   |                        |
| W               | 607+05.77 | 6.22         | LT   |                        |
| X               | 607+68.21 | 2.92         | LT   |                        |

All Guardrail lengths are measure along the face of the guardrail.  
 All stationing shown is calculated perpendicular to  $\text{CL I-70}$ .  
 All offsets are measured to face of guardrail posts.



- LEGEND**
- Concrete Shoulder
  - HMA Comm. Grade (Class A) (4")
  - \* MGS-FLEAT or MGS-SRT End Terminals
  - (MGS) Type II End Terminals



KANSAS DEPARTMENT OF TRANSPORTATION  
 GUARDRAIL LAYOUT DETAIL  
 WB I-70

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.

Plotted by : Elias.Esquivel@ks.gov 13-MAR-2025 15:03  
 File : KA64830Trss606.dgn

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 18        | 148          |

**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-beam guardrail installations are paid for under the appropriate bid items for either CGS or MGS guardrail depending on the type of installation.

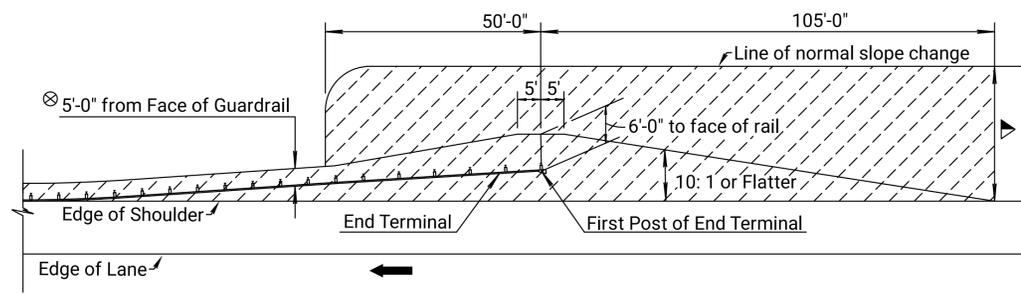
All work and materials required for guardrail end terminal installations are paid for under the bid item for the selected guardrail end terminal. See the table on this sheet for the appropriate end terminal bid item information.

 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.

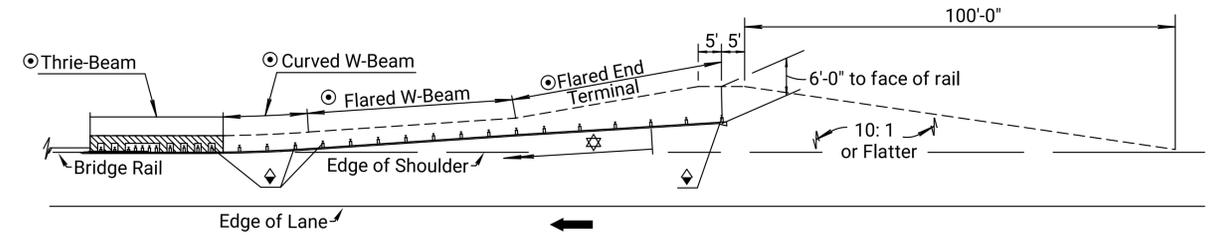
 Normal Project Side Slope.

 Deflection Distance for Normal Post Spacing

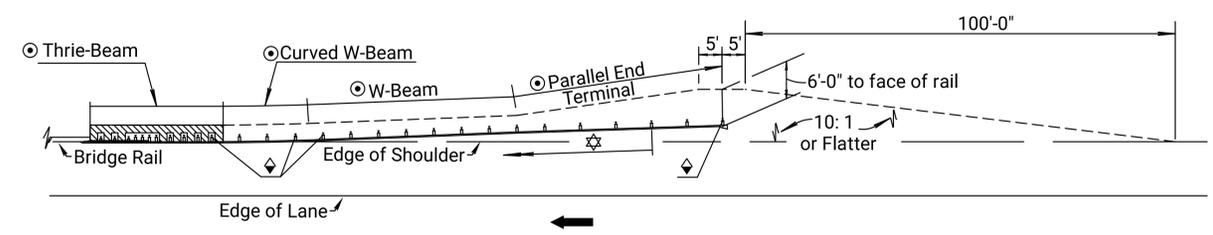
**GUARDRAIL CLEAR AREA**  
 Applies to all guardrail installations unless otherwise shown in the plans.



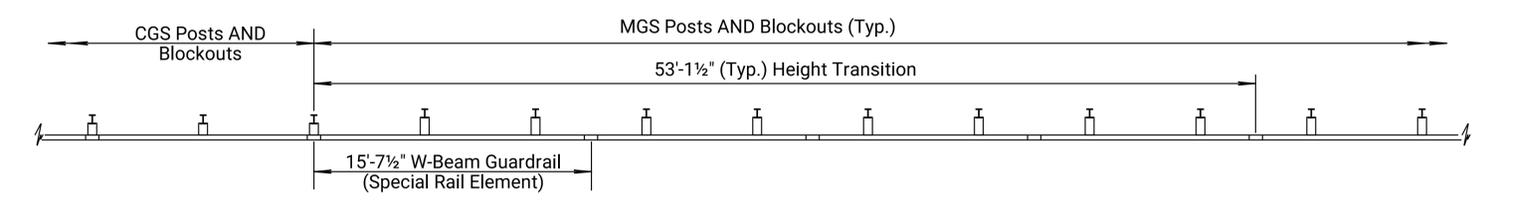
**FLARED GUARDRAIL DETAIL**  
 Applies to CGS AND MGS (MGS Shown)



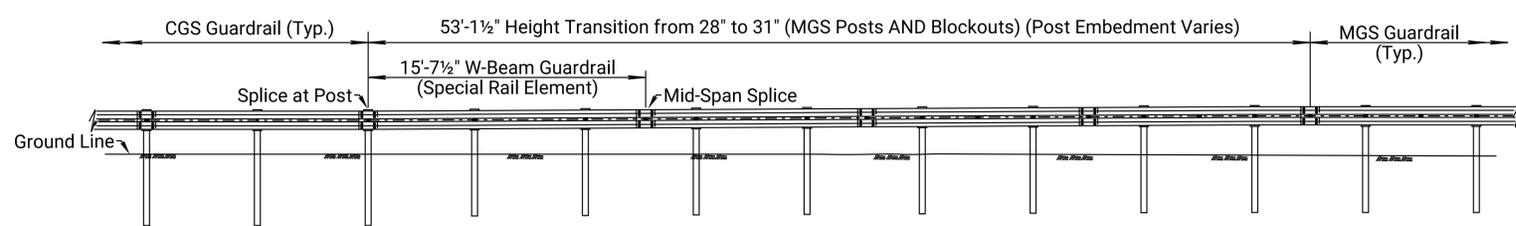
**PARALLEL GUARDRAIL DETAIL**  
 Applies to CGS AND MGS (MGS Shown)



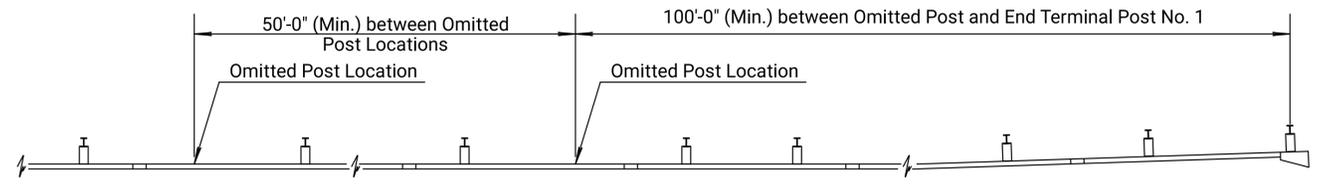
- ⊙ See Guardrail Layout Sheets for Details
- ◇ On Guardrail Layout Sheets, Show Station AND Offset from the Roadway Alignment to the Face of Post at these Locations.
- ☆ Length of Need (Begins at Post 3)



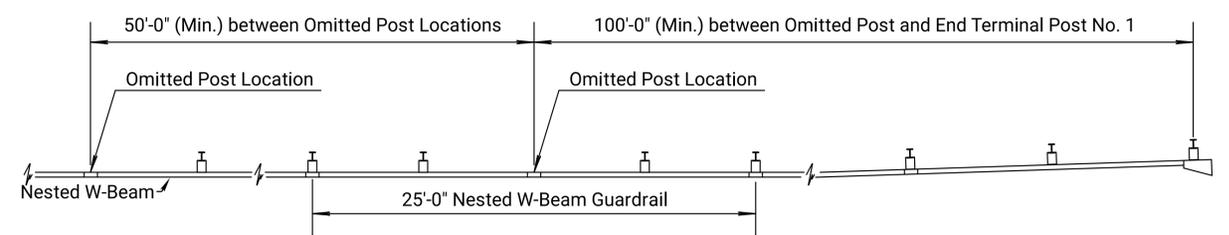
**CGS TO MGS TRANSITION DETAILS (PLAN)**



**CGS TO MGS TRANSITION DETAILS (ELEVATION)**



**MGS OMITTED POST DETAIL**



**CGS OMITTED POST DETAIL**

**MIDWEST GUARDRAIL SYSTEM (MGS) END TERMINALS**

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

**CONVENTIONAL GUARDRAIL SYSTEM (CGS) END TERMINALS**

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

|     |          |                                      |        |        |
|-----|----------|--------------------------------------|--------|--------|
| 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. |
| NO. | DATE     | REVISIONS                            | BY     | APPD   |

KANSAS DEPARTMENT OF TRANSPORTATION

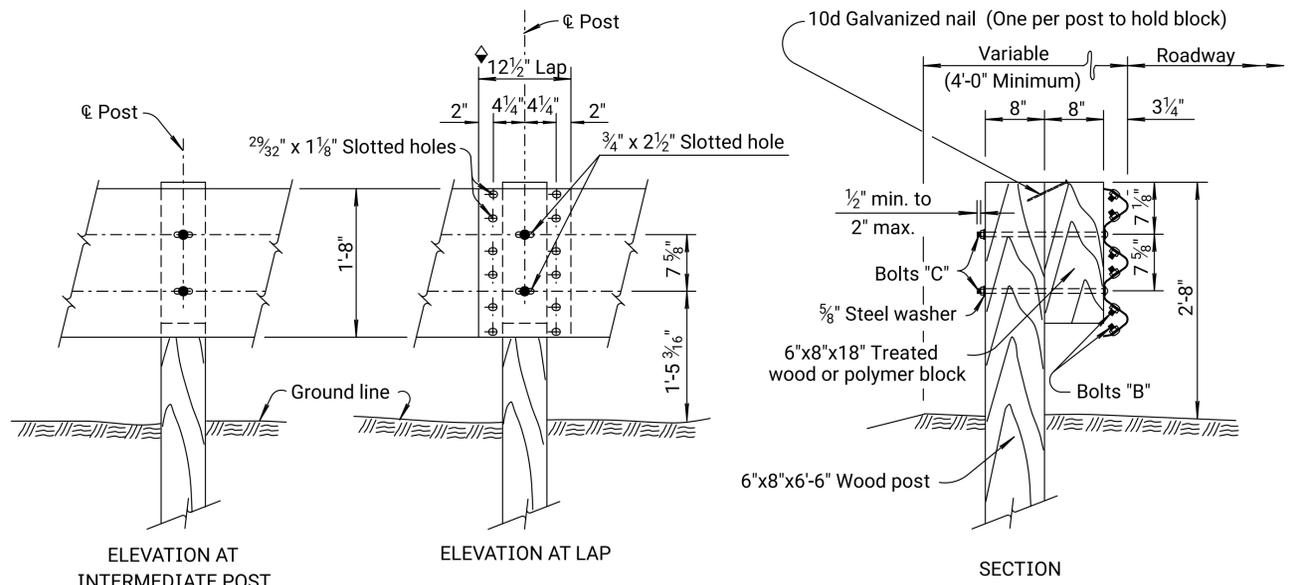
**GUARDRAIL AUXILIARY DETAILS**

**RD606**

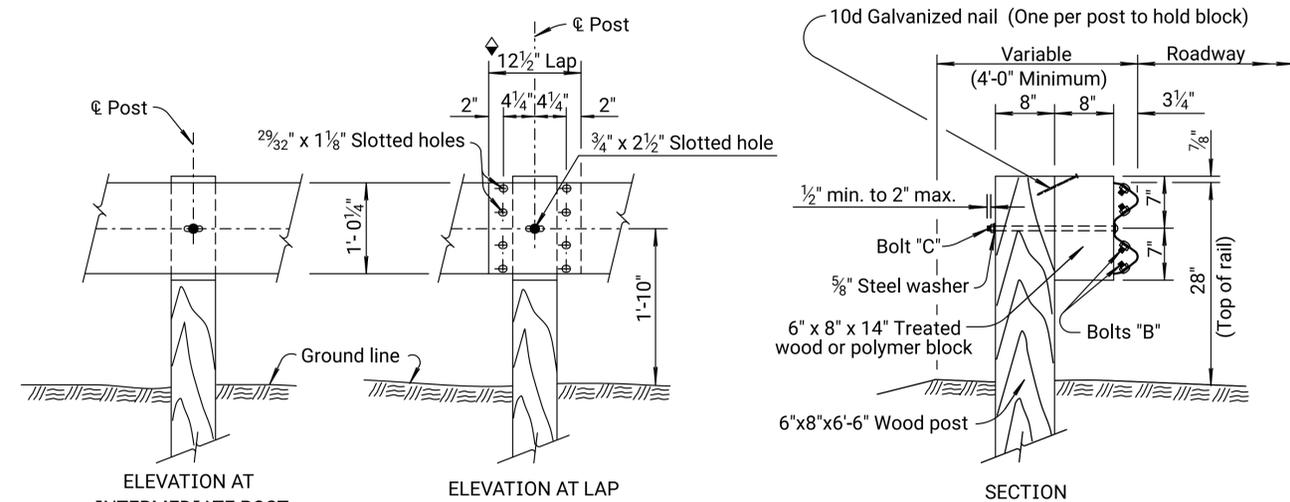
|            |            |            |               |
|------------|------------|------------|---------------|
| DESIGNED   | 09-25-18   | APPD.      | Scott W. King |
| DESIGN CK. | DETAIL CK. | QUANTITIES | TRACED        |
| DESIGN CK. | DETAIL CK. | QUAN. CK.  | TRACE CK.     |

| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 19        | 148          |

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.



THRIE BEAM POST DETAILS



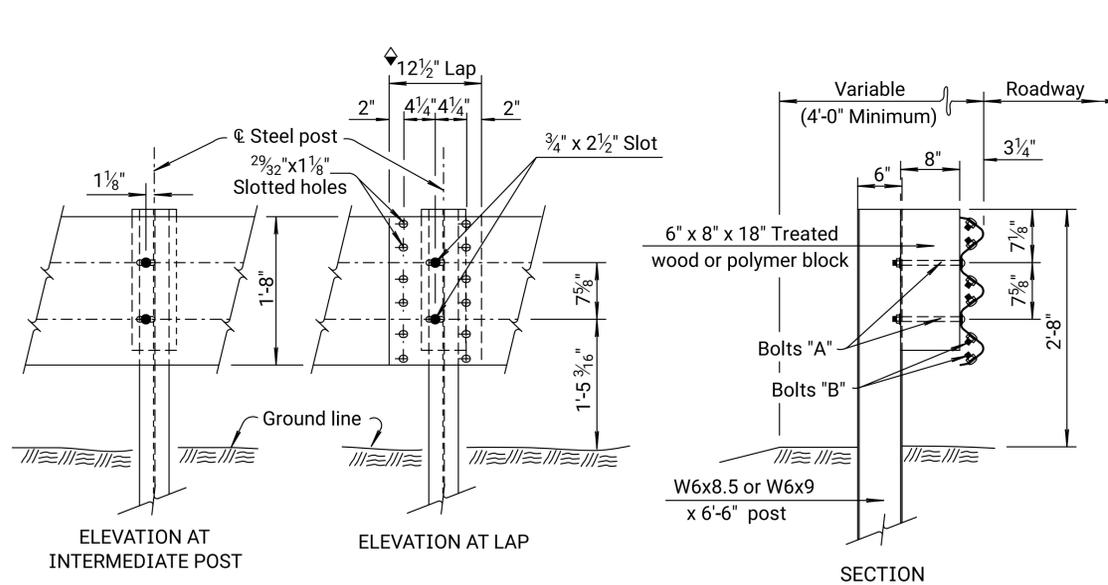
W-BEAM POST DETAILS

◆ 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.

### WOOD POSTS

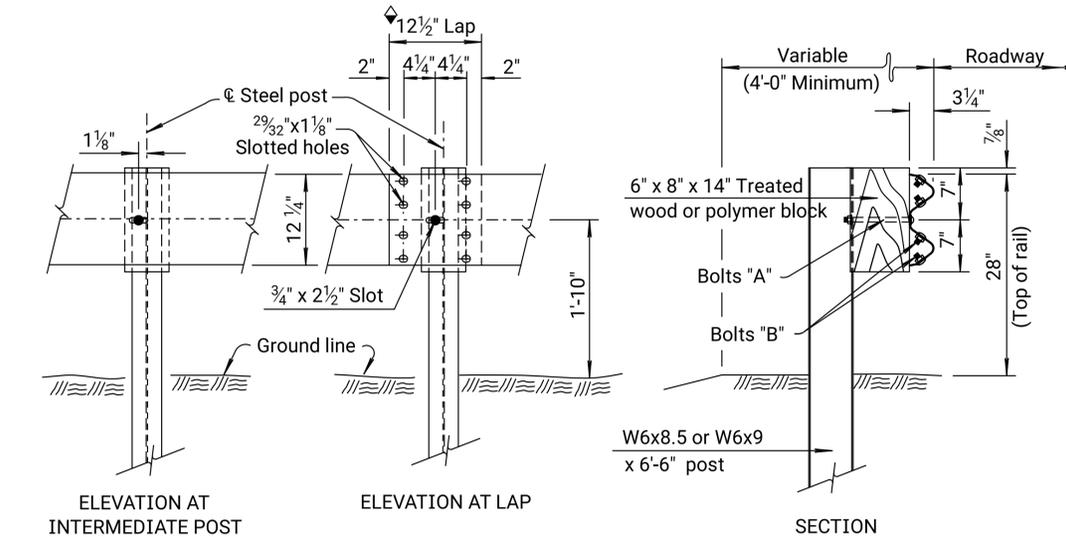
#### GENERAL NOTES (Wood Posts)

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.



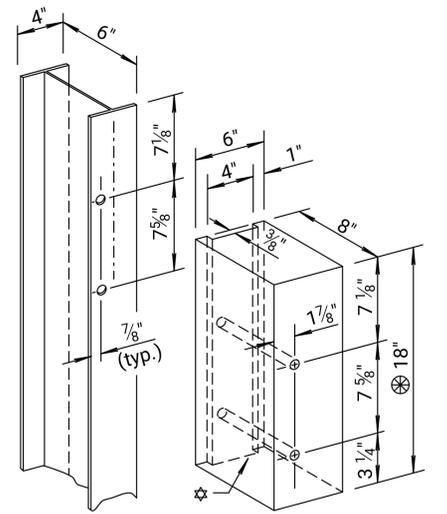
W-BEAM POST DETAILS

### STEEL POSTS

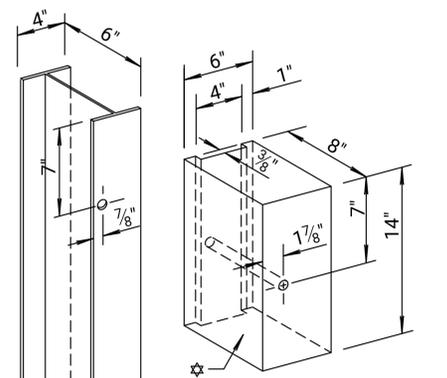
#### GENERAL NOTES (Steel Posts)

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 requirements 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.

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

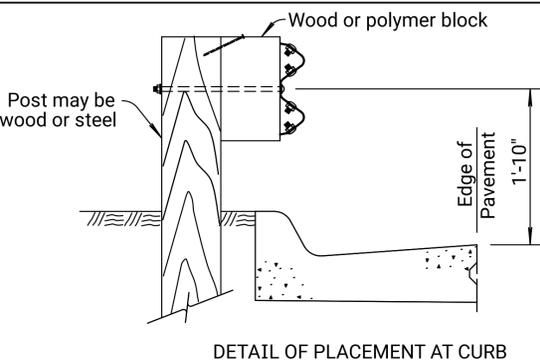


Note: All holes 1 3/16 inch dia.  
THRIE BEAM HOLE PUNCHING DETAILS



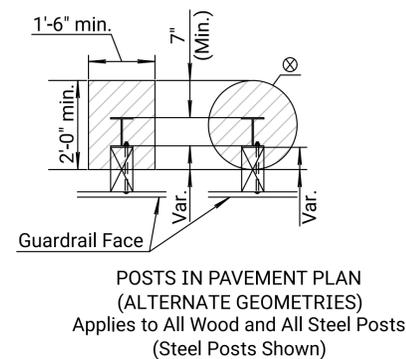
Note: All holes 1 3/16 inch dia.  
"W" BEAM HOLE PUNCHING DETAILS

⊛ Non-Metallic (Polymer) or Treated Wood Block



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.

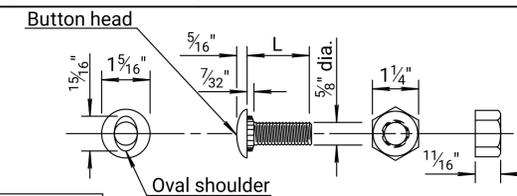


POSTS IN PAVEMENT PLAN (ALTERNATE GEOMETRIES) Applies to All Wood and All Steel Posts (Steel Posts Shown)

- ☑ 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.

| BOLT SIZE SCHEDULE |        |
|--------------------|--------|
| Bolt               | L      |
| A                  | 8 1/2" |
| B                  | 1 1/4" |
| C                  | 18"    |



BOLT & NUT DETAILS

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

| NO. | DATE     | REVISIONS                       | BY     | APPD   |
|-----|----------|---------------------------------|--------|--------|
| 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. |

KANSAS DEPARTMENT OF TRANSPORTATION

RD611

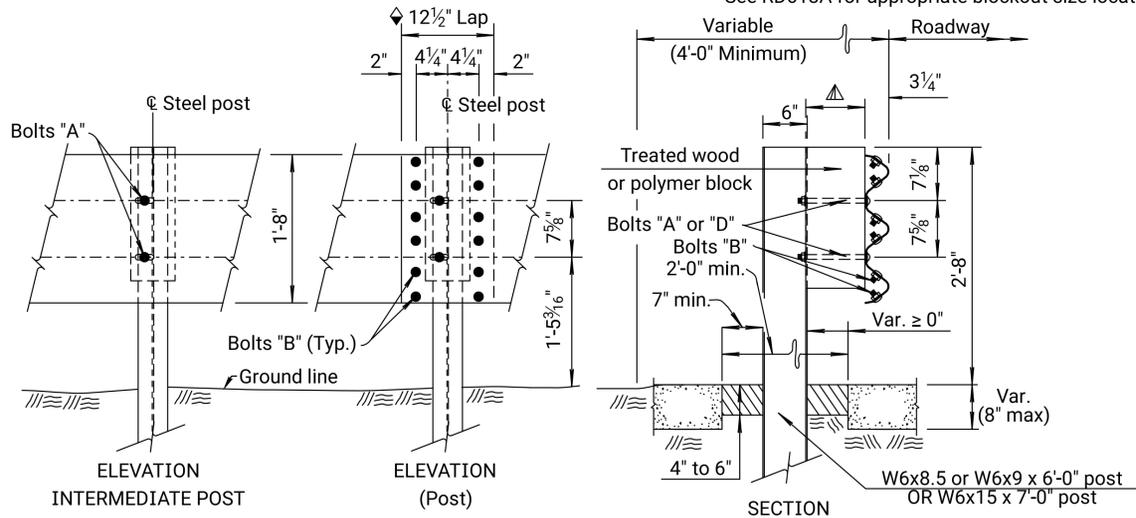
| DESIGNED   | QUANTITIES | TRACED    |
|------------|------------|-----------|
| DESIGN CK. | DETAIL CK. | QUAN. CK. |

KDOT Graphics Certified 11-13-2024 Sh. No. 19

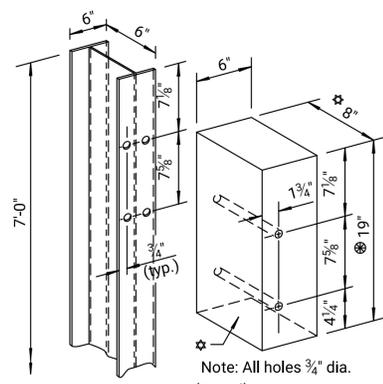
|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 20        | 148          |

◆ 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.

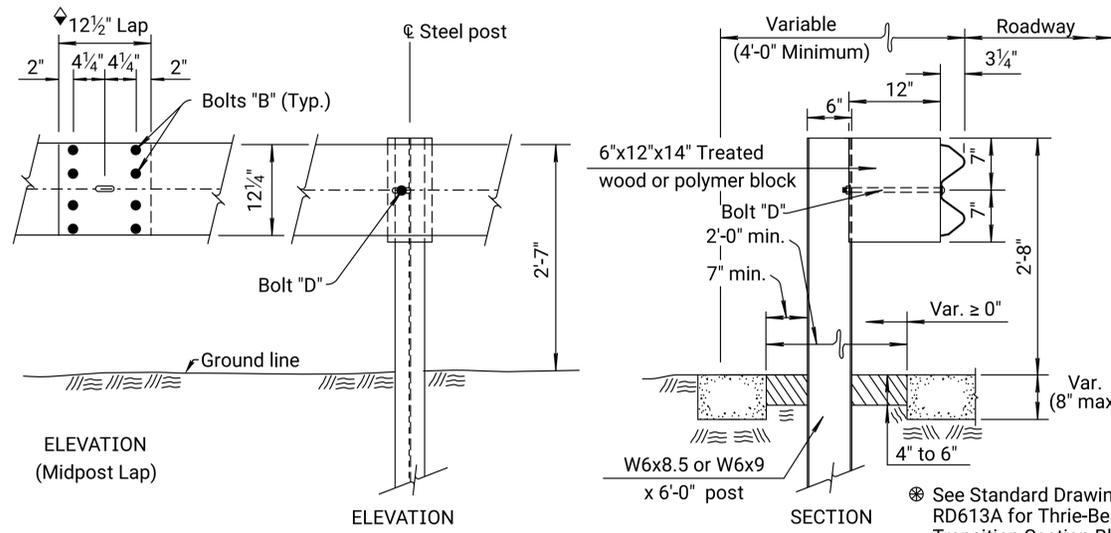
▲ See RD613A for appropriate blackout size location.



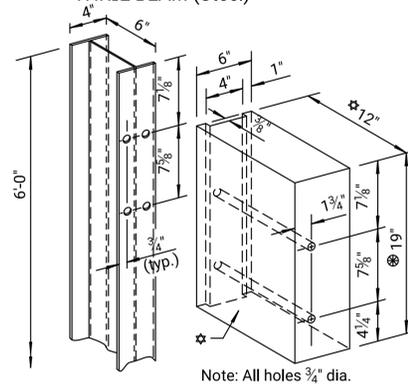
THRIE BEAM POST DETAILS/POSTS IN PAVEMENT



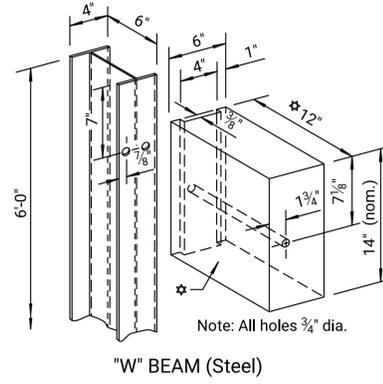
THRIE BEAM (Steel)



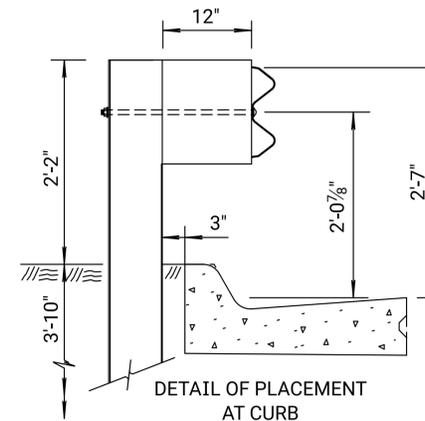
W-BEAM (MGS) POST DETAILS/POSTS IN PAVEMENT



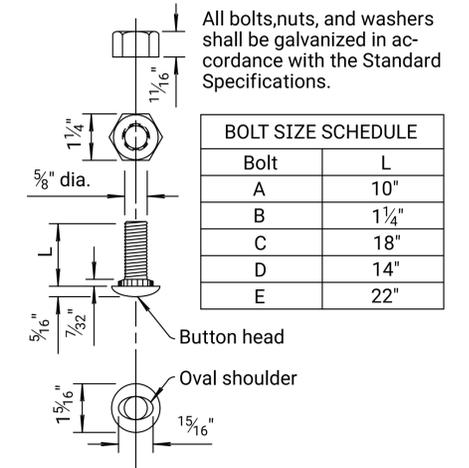
THRIE BEAM (Steel)



W BEAM (Steel)

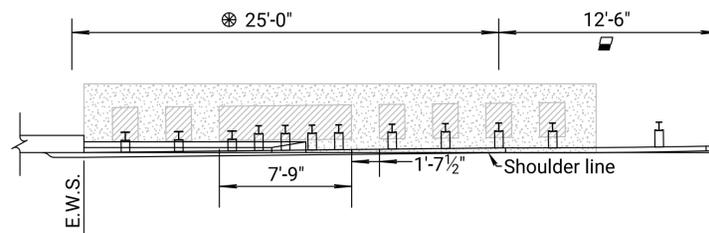


Note: Measure height of rail from the pavement surface at the curb/pavement joint as shown. A special design is needed when guardrail is not located as detailed. A Type II (laydown) curb & gutter is preferred when guardrail is adjacent to curb.



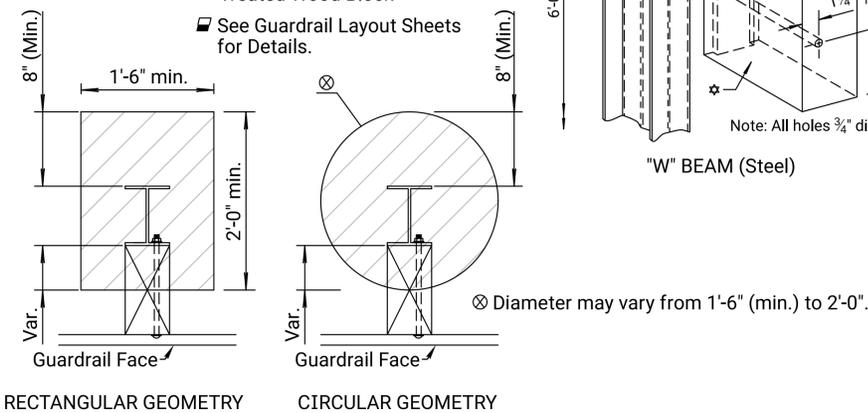
BOLT & NUT DETAILS

| BOLT SIZE SCHEDULE |        |
|--------------------|--------|
| Bolt               | L      |
| A                  | 10"    |
| B                  | 1 1/4" |
| C                  | 18"    |
| D                  | 14"    |
| E                  | 22"    |



POSTS IN PAVEMENT (Not to Scale)

- ▨ Slurry Grout (Low Strength) See KDOT's Standard Specifications
- ▨ Pavement (Concrete or Asphalt)



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.

**GENERAL NOTES (Steel Posts)**  
 Use grade of steel for steel posts that meet the requirements of the standard specifications.  
 Hot dip galvanize the posts after fabrication, see standard specifications.  
 Wood blockouts may be used through the 25'-0" thrie-beam section with wood or polymer blockouts used throughout the remainder of the w-beam installation. The blackout size and material used in the guardrail end terminal may be independent from the remainder of the installation. For wood/polymer blackout 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.

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: Elias.Esquivel@ks.gov 13-MAR-2025 15:01  
 File: KA648301rss611a.dgn

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

KANSAS DEPARTMENT OF TRANSPORTATION

## GUARDRAIL POST (STEEL) (MGS) DETAILS

RD611A

|            |            |           |
|------------|------------|-----------|
| DESIGNED   | QUANTITIES | TRACED    |
| DESIGN CK. | DETAIL CK. | QUAN. CK. |

Scott W. King

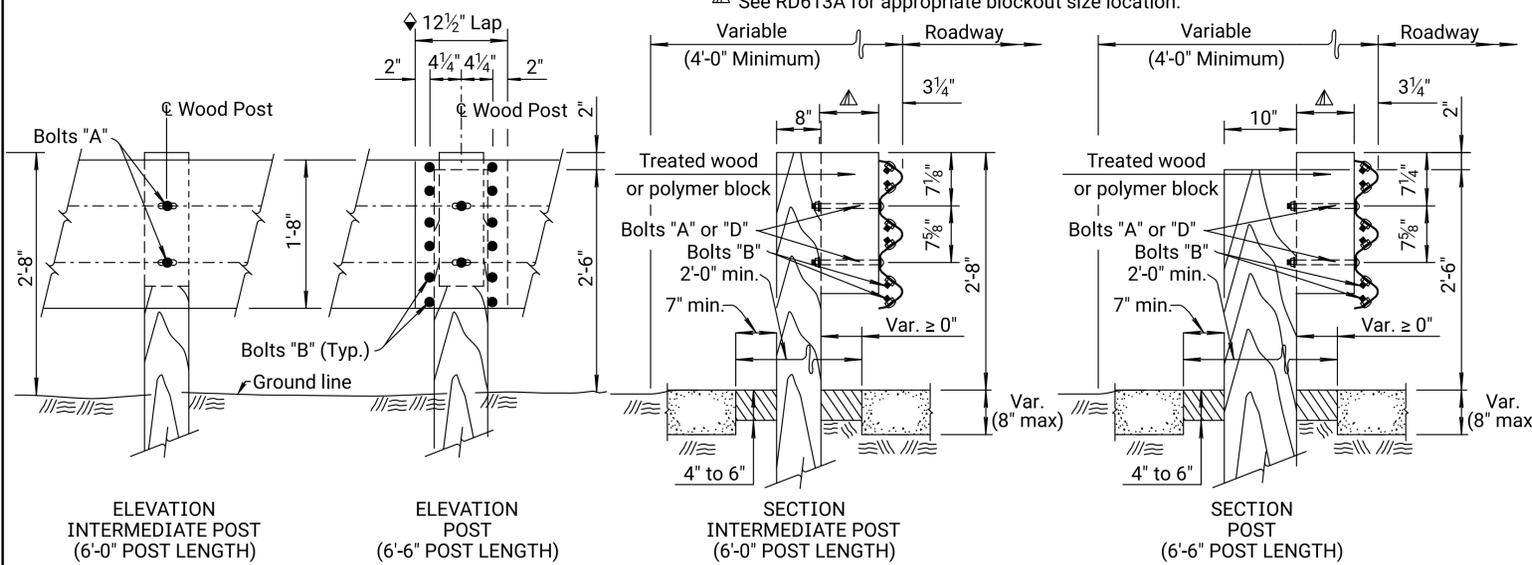
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KDOT Graphics Certified

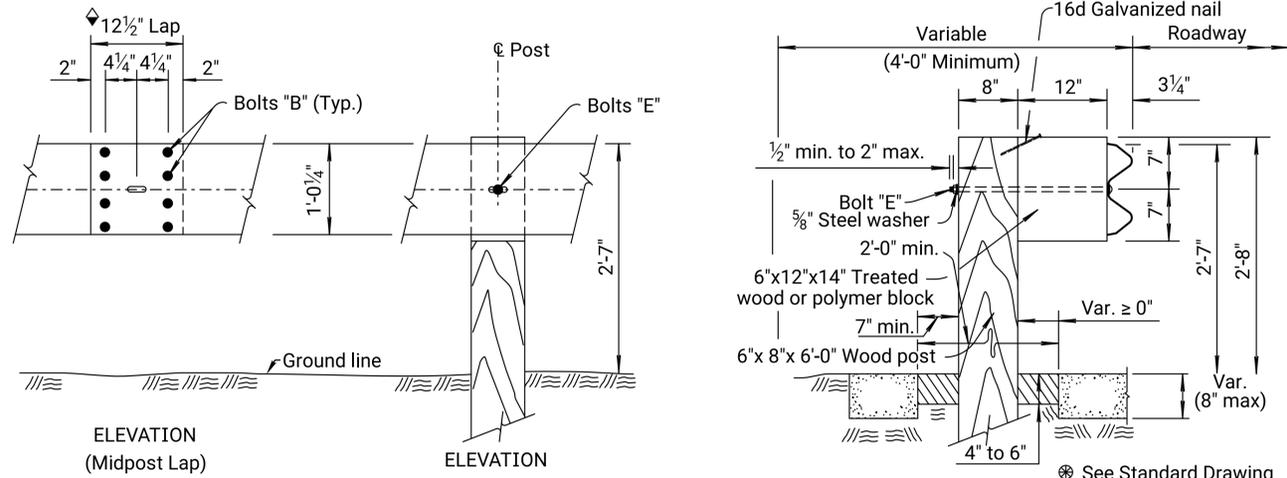
|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 21        | 148          |

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

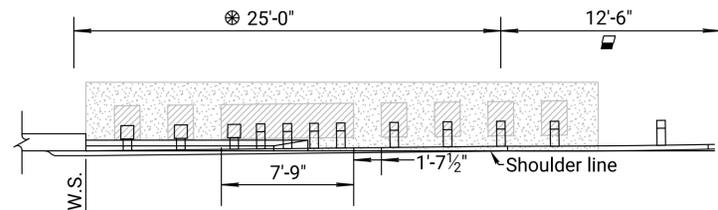
▲ See RD613A for appropriate blockout size location.



**THRIE BEAM POST DETAILS/POSTS IN PAVEMENT**



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

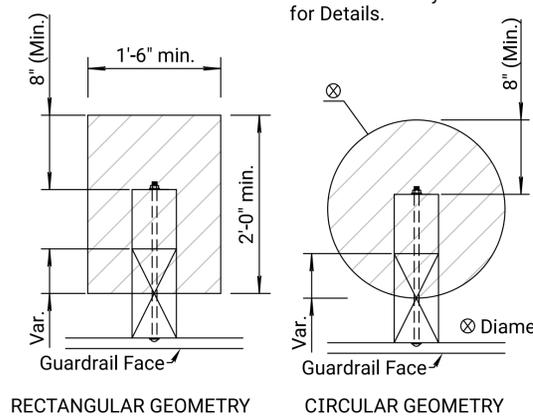


**POSTS IN PAVEMENT**

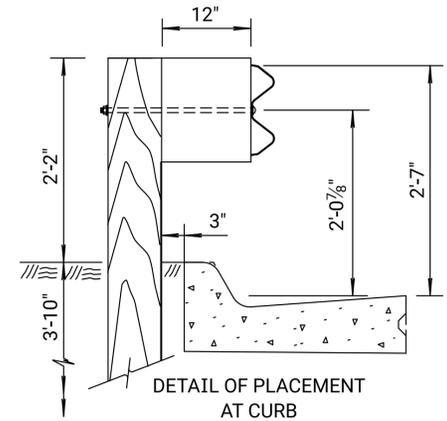
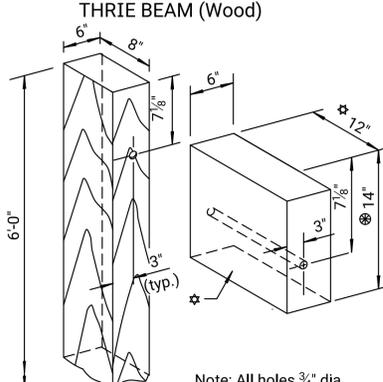
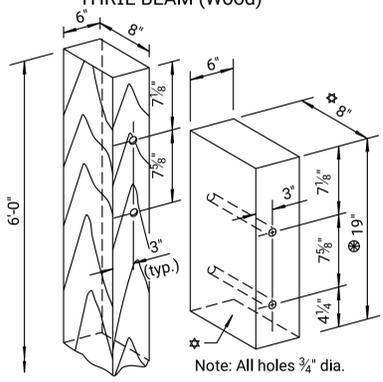
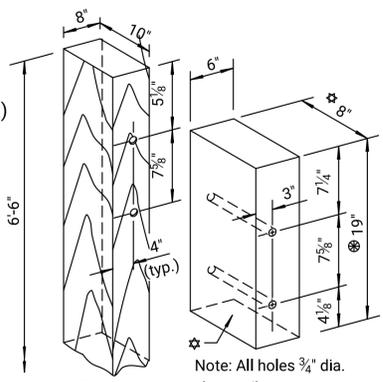
(Not to Scale)

- ▣ Slurry Grout (Low Strength)  
See KDOT's Standard Specifications
- ▣ Pavement (Concrete or Asphalt)

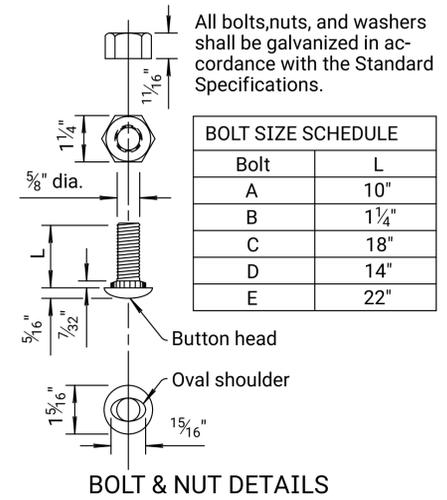
Note: Low Strength Grout must have a 28-day compressive strength of 120 psi or less. All work and materials related to posts in pavement are subsidiary to other guardrail bid items. Rectangular geometry shown in Posts in Pavement detail. Circular geometry, as shown on this sheet, may be used at the Contractor's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



**PLAN (ALTERNATE GEOMETRIES)**



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.



| BOLT SIZE SCHEDULE |        |
|--------------------|--------|
| Bolt               | L      |
| A                  | 10"    |
| B                  | 1 1/4" |
| C                  | 18"    |
| D                  | 14"    |
| E                  | 22"    |

**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 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.

- 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.

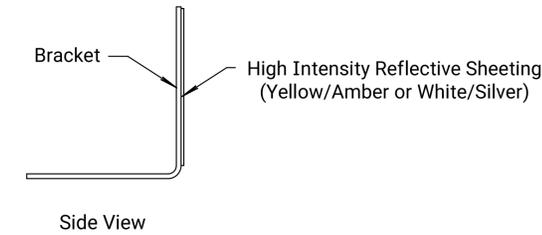
Notes to Designer: For posts installed in pavement thicker than 8" or posts installed in rock formations refer to AASHTO's Roadside Design Guide for details then revise this drawing and all supporting drawings appropriately.

Plotted by : Elias.Esquivel@ks.gov 13-MAR-2025 15:04  
File : KA648301r6611b.dgn

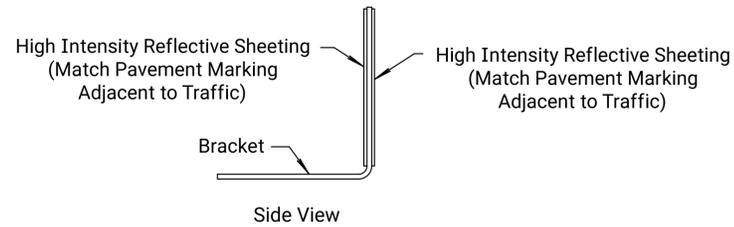
|  |            |                 |            |               |
|--|------------|-----------------|------------|---------------|
| 04 09-24-15                                |            | Initial Release | T.T.R.     | S.W.K.        |
| NO.  | DATE       | REVISIONS       | BY         | APPD          |
| KANSAS DEPARTMENT OF TRANSPORTATION        |            |                 |            |               |
| <b>GUARDRAIL POST (WOOD) (MGS) DETAILS</b> |            |                 |            |               |
| RD611B                                     |            |                 |            |               |
| FHWA APPROVAL                              |            | 01-29-16        | APPD.      | Scott W. King |
| DESIGNED                                   | DETAILED   | QUANTITIES      | TRACED     |               |
| DESIGN CK.                                 | DETAIL CK. | QUAN. CK.       | TRACE CK.  |               |
| KDOT Graphics Certified                    |            | 05-11-2022      | Sh. No. 21 |               |

KDOT Graphics Certified

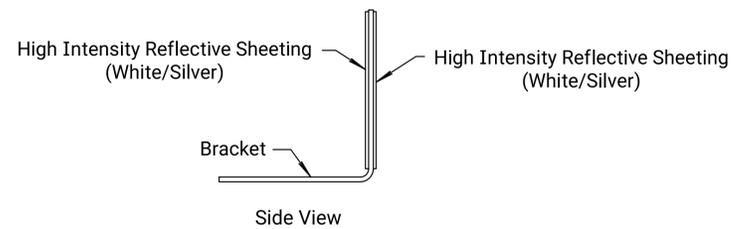
|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 22        | 148          |



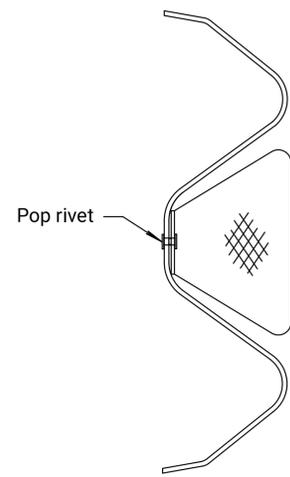
**Flexible Marker One-Way Traffic**



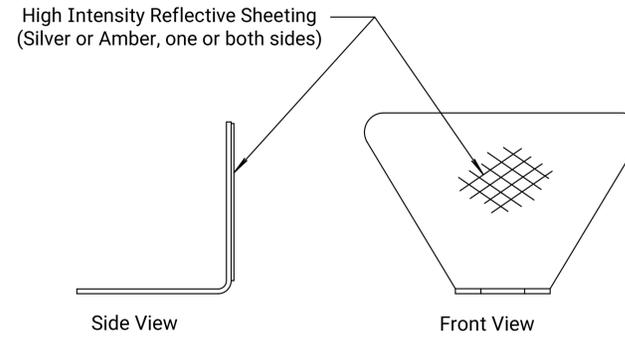
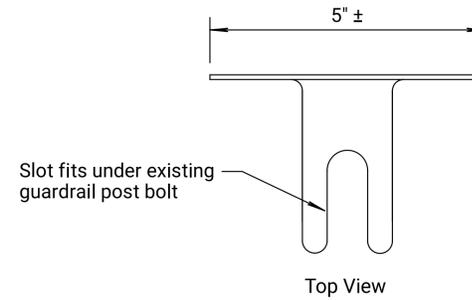
**Flexible Marker Median Locations**



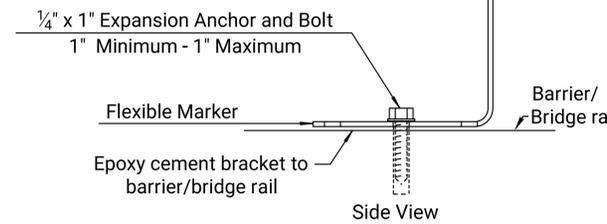
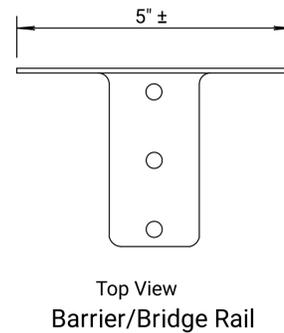
**Flexible Marker Two-Way Traffic**



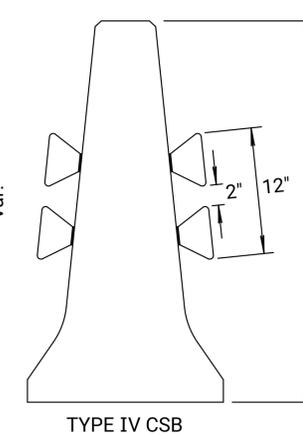
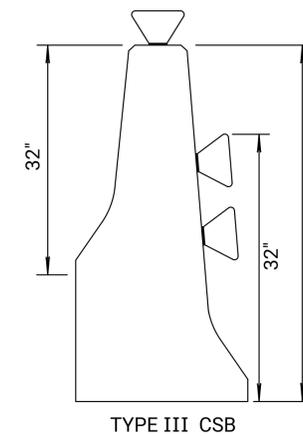
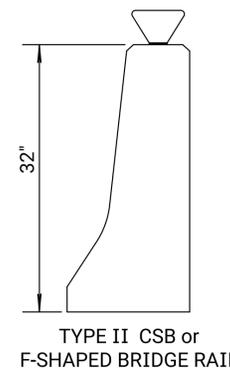
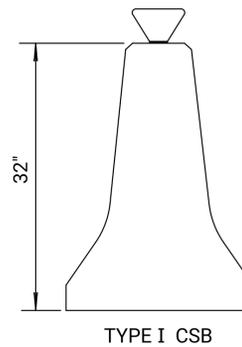
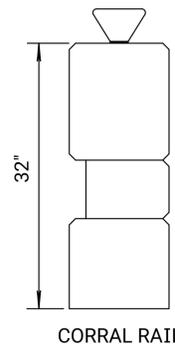
**Typical Mounting on W-Beam**  
Pop rivet attachment to Guardrail when necessary.



**Flexible Guardrail Marker**  
(High Impact Polycarbonate approx. .085" thick, 5 1/4" x 3")



**Method of Attaching Flexible Marker to Barrier/Bridge Rail**



**TYPICAL BARRIER/BRIDGE RAIL MOUNTING DETAILS**

**GENERAL NOTES**

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

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

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

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

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

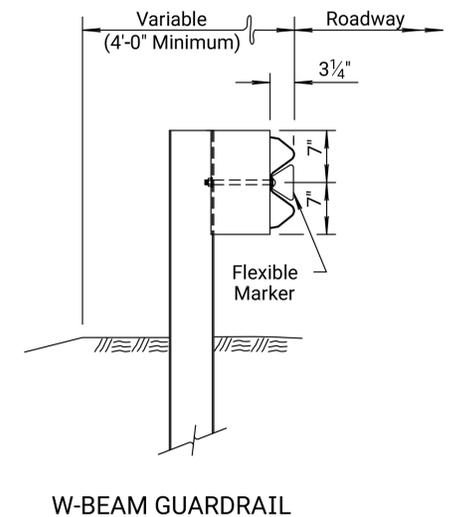
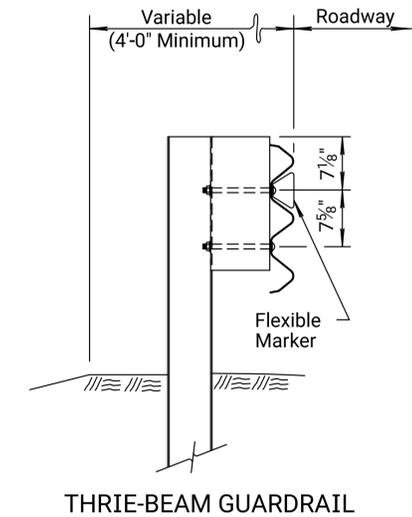
For guardrail located on one-way or divided roadways, use flexible markers with reflective sheeting installed on the approach traffic side of the bracket only. For bridge rail or concrete safety barrier located on the outside edge of one-way or divided roadways, use flexible markers with reflective sheeting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

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

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

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

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

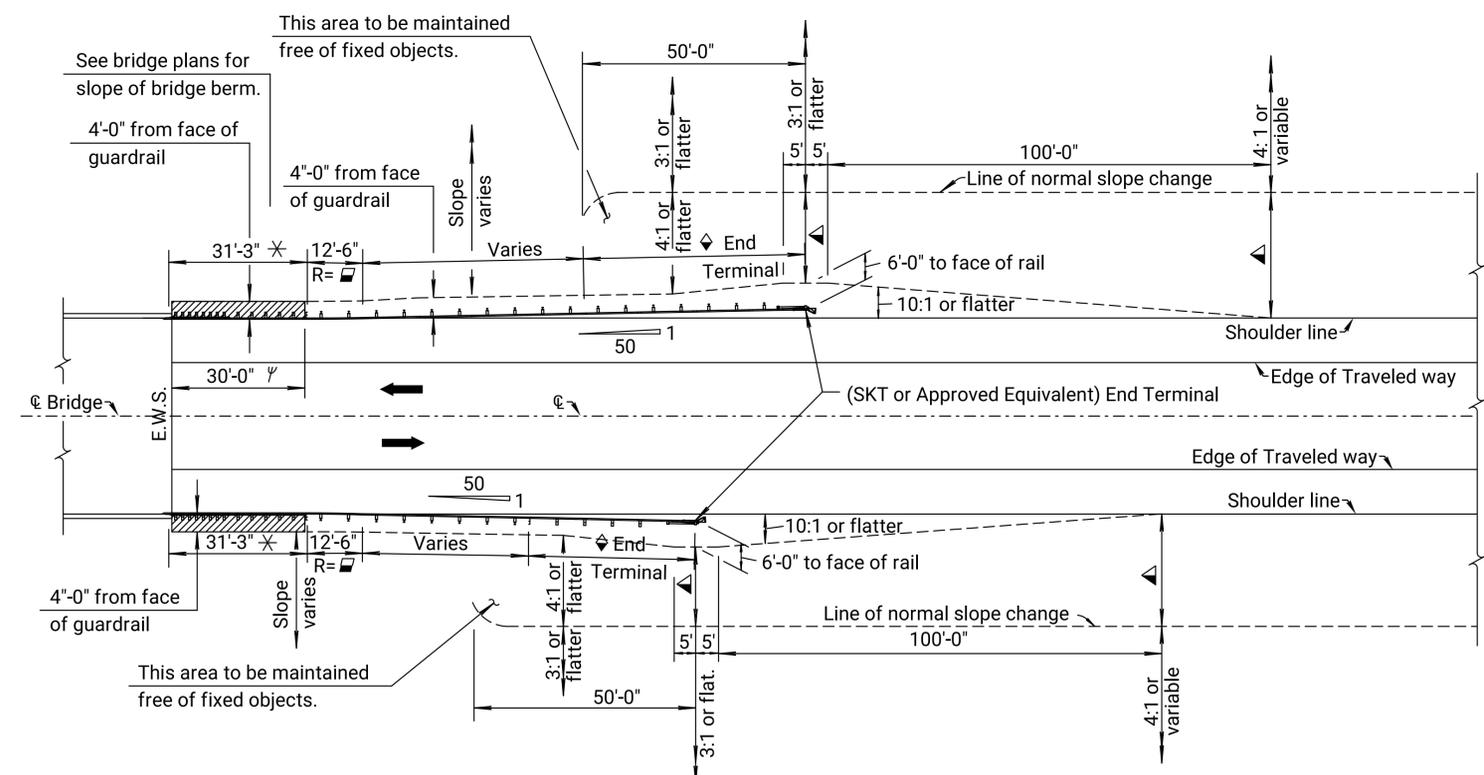


|     |          |                                   |        |        |
|-----|----------|-----------------------------------|--------|--------|
| 09  | 09-11-17 | Rev. Det. Markers, Rev. Gen. Note | A.L.R. | S.W.K. |
| 08  | 11-15-10 | Revised notes                     | S.W.K. | J.O.B. |
| 07  | 12-21-08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

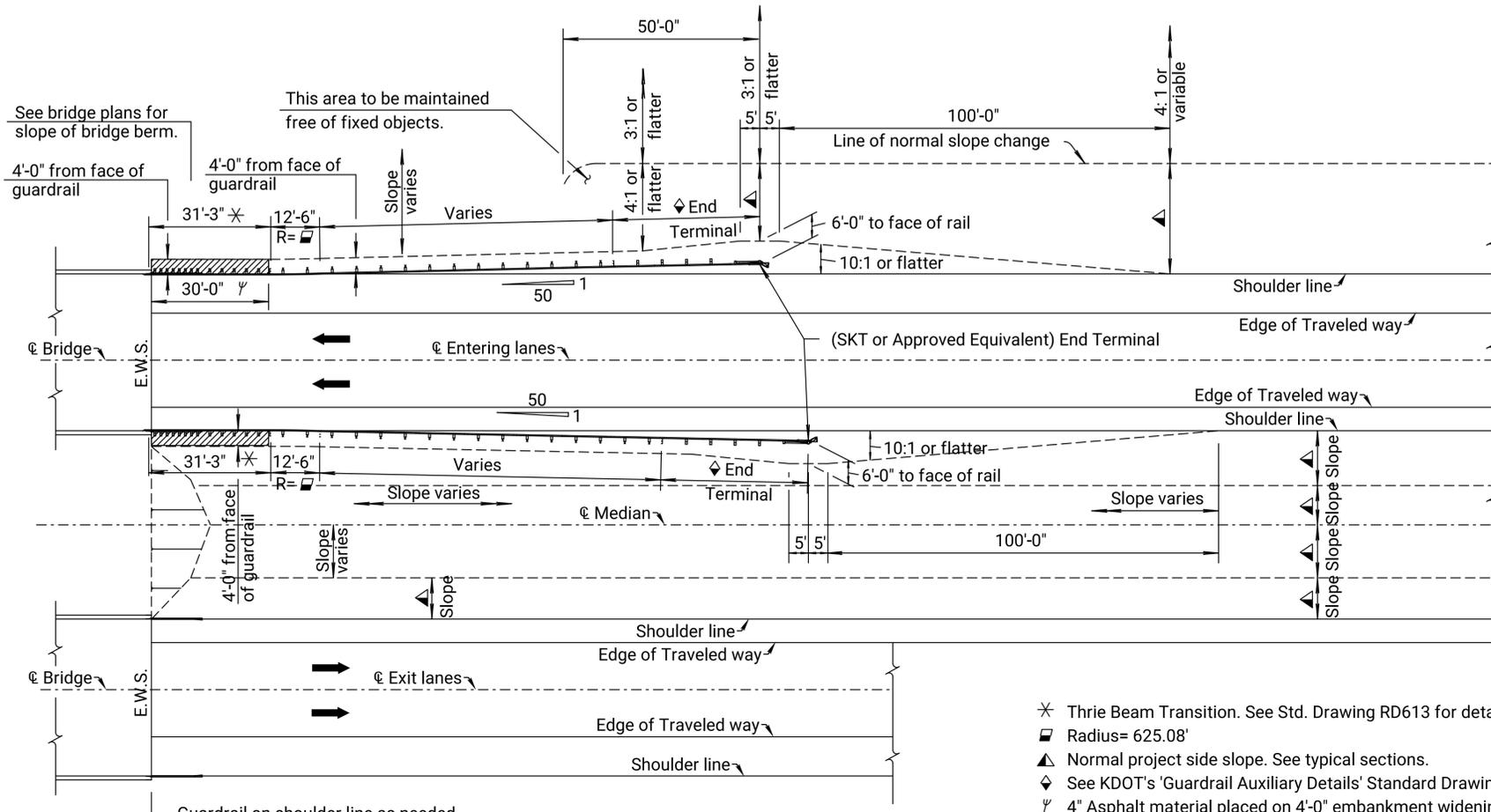
|  |            |            |               |  |
|--|------------|------------|---------------|--|
| KANSAS DEPARTMENT OF TRANSPORTATION                            |            |            |               |  |
| <b>MARKER DETAILS FOR GUARDRAIL, BARRIER, AND BRIDGE RAILS</b> |            |            |               |  |
| RD610  |            |            |               |  |
| FHWA APPROVAL  | 03-15-18   | APPD.      | Scott W. King |  |
| DESIGNED   | DETAILD    | QUANTITIES | TRACED        |  |
| DESIGN CK.   | DETAIL CK. | QUAN. CK.  | TRACE CK.     |  |

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 23        | 148          |

Note to Designer: Guardrail length of need shall be determined in accordance with the AASHTO Roadside Design Guide, L<sub>1</sub> for length of need calculation on flared alignment shown is 37.5'. Under certain conditions, the designer may elect to reduce the length of flare to include only the end terminal. This sheet shall be used when the parallel guardrail design is selected. Material for asphalt guardrail widening shall be included in the plan quantities.

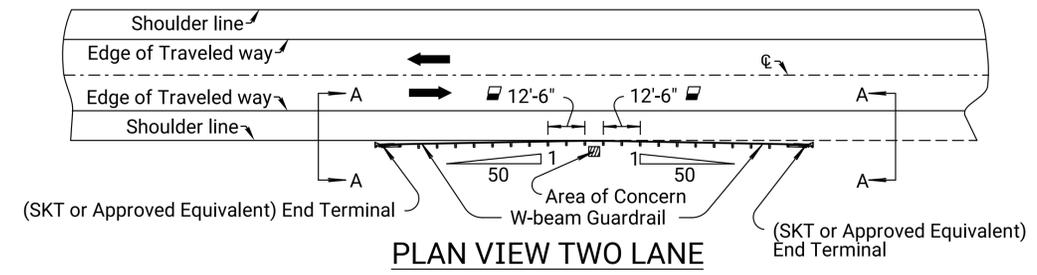
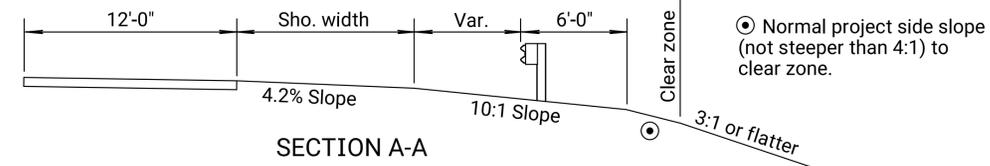


**THRIE BEAM TRANSITION - TWO LANES**

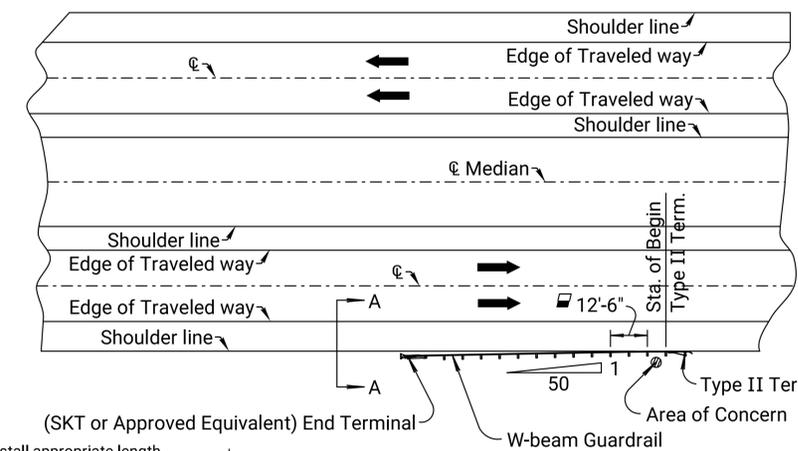


**THRIE BEAM TRANSITION - FOUR LANES (DIVIDED)**

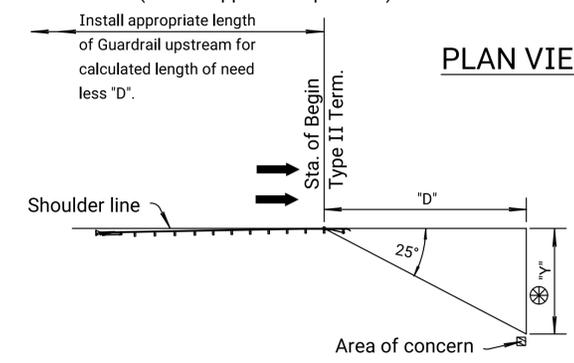
- ✱ Thrie Beam Transition. See Std. Drawing RD613 for details and general note.
- Radius= 625.08'
- ▲ Normal project side slope. See typical sections.
- ◆ See KDOT's 'Guardrail Auxiliary Details' Standard Drawing.
- ∩ 4" Asphalt material placed on 4'-0" embankment widening unless flume inlet and slope drain is constructed.



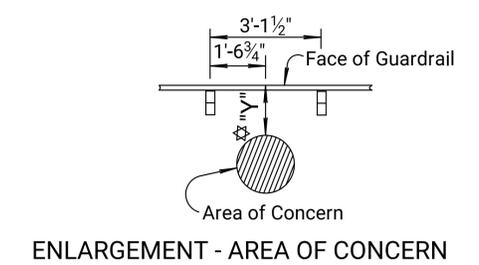
**PLAN VIEW TWO LANE**



**PLAN VIEW FOUR LANE**



**DETAILS OF GUARDRAIL PROTECTION AT ROADSIDE OBSTACLE**



**ENLARGEMENT - AREA OF CONCERN**

Plotted by : Elias.Esquivel@ks.gov 13-MAR-2025 15:01  
 File : KA64830Trss612.dgn

| NO. | DATE     | REVISIONS                       | BY     | APPD   |
|-----|----------|---------------------------------|--------|--------|
| 13  | 05-15-17 | Removed X-LITE                  | A.L.R. | S.W.K. |
| 12  | 07-02-09 | Added Roadside obstacle details | S.W.K. | J.O.B. |
| 11  | 01-10-07 | Changed Bituminous to Asphalt   | S.W.K. | J.O.B. |

KANSAS DEPARTMENT OF TRANSPORTATION

**THRIE BEAM GUARDRAIL  
BRIDGE APPROACH TRANSITION  
TYPICAL ALIGNMENTS (PARALLEL)**

**RD612**

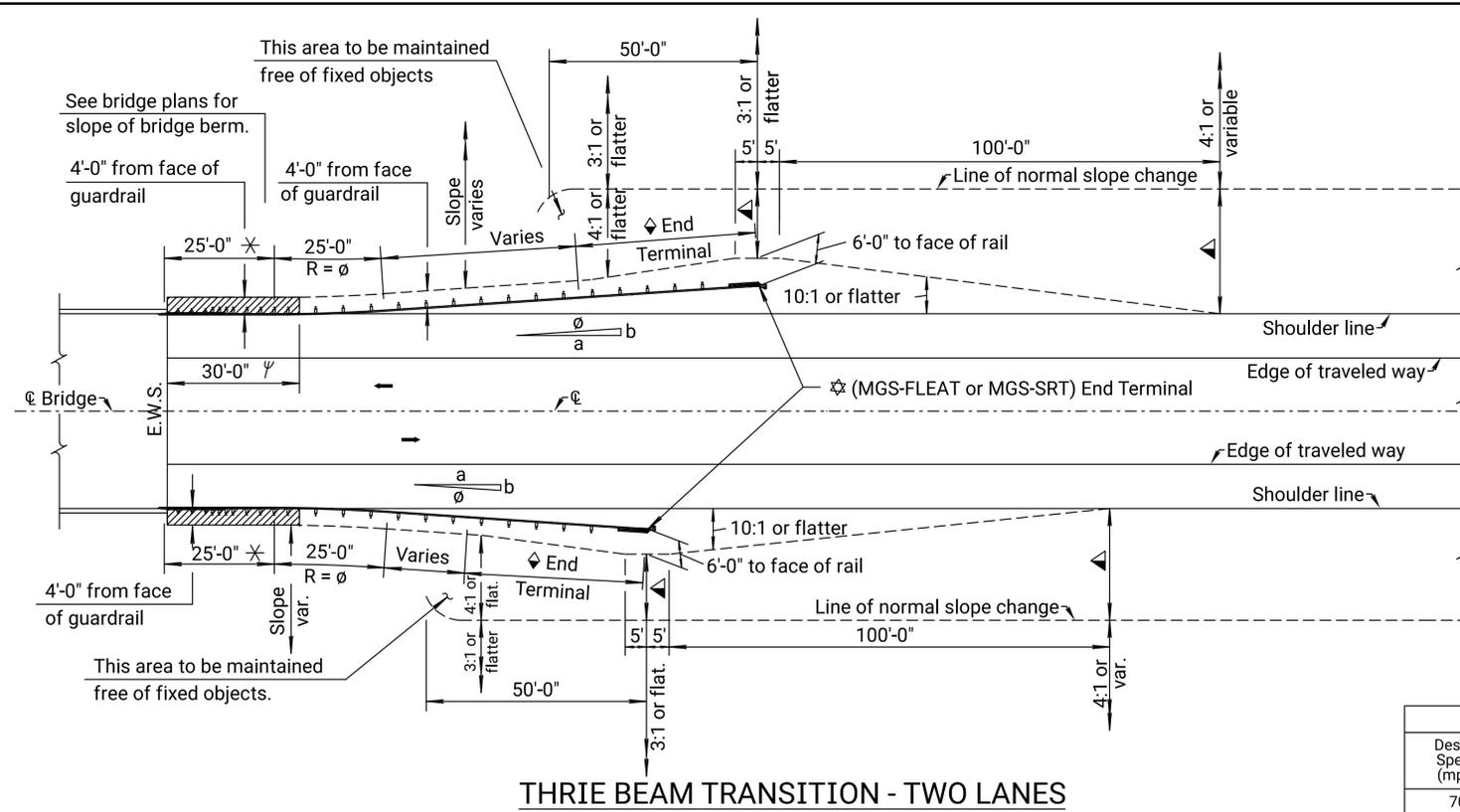
|            |            |            |                |
|------------|------------|------------|----------------|
| DESIGNED   | 10-12-17   | APPD.      | Scott, W. King |
| DESIGN CK. | DETAIL CK. | QUANTITIES | TRACED         |
| DESIGN CK. | DETAIL CK. | QUAN. CK.  | TRACE CK.      |

KDOT Graphics Certified 05-16-2022 Sh. No. 23

Notes to Designer: Determine guardrail length of need using either KDOT's Length of Need Equation or a graphic design approach with an L<sub>1</sub> distance measured from the edge of concern to the P.I. of the curved guardrail section. Combine materials for asphalt widening in the plan quantities.

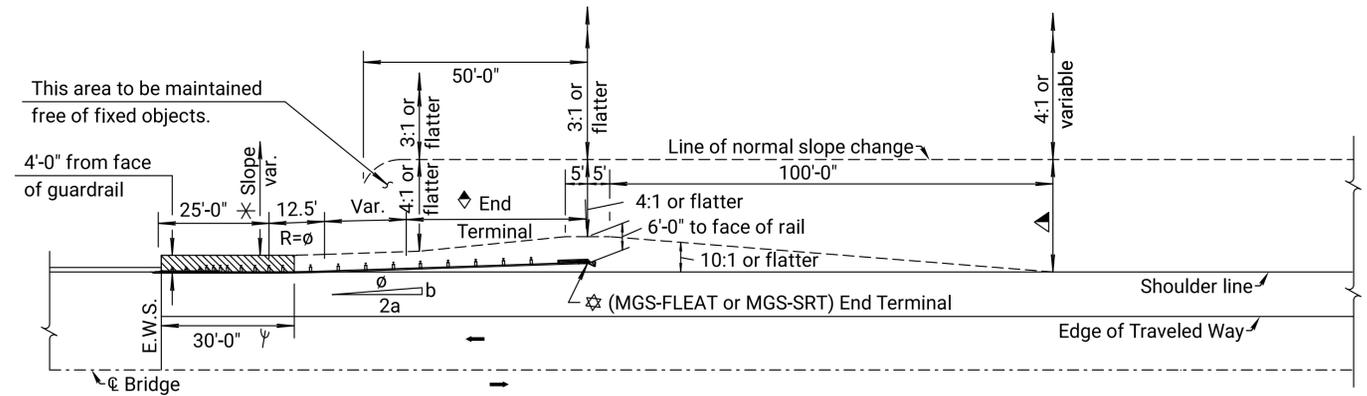
Optional: If approach side is within the shyline, use a flare rate of 2a:b for all quadrants.

Plotted by: Elias.Esquivel@ks.gov 13-MAR-2025 15:04  
File: KA64830Trss612c.dgn



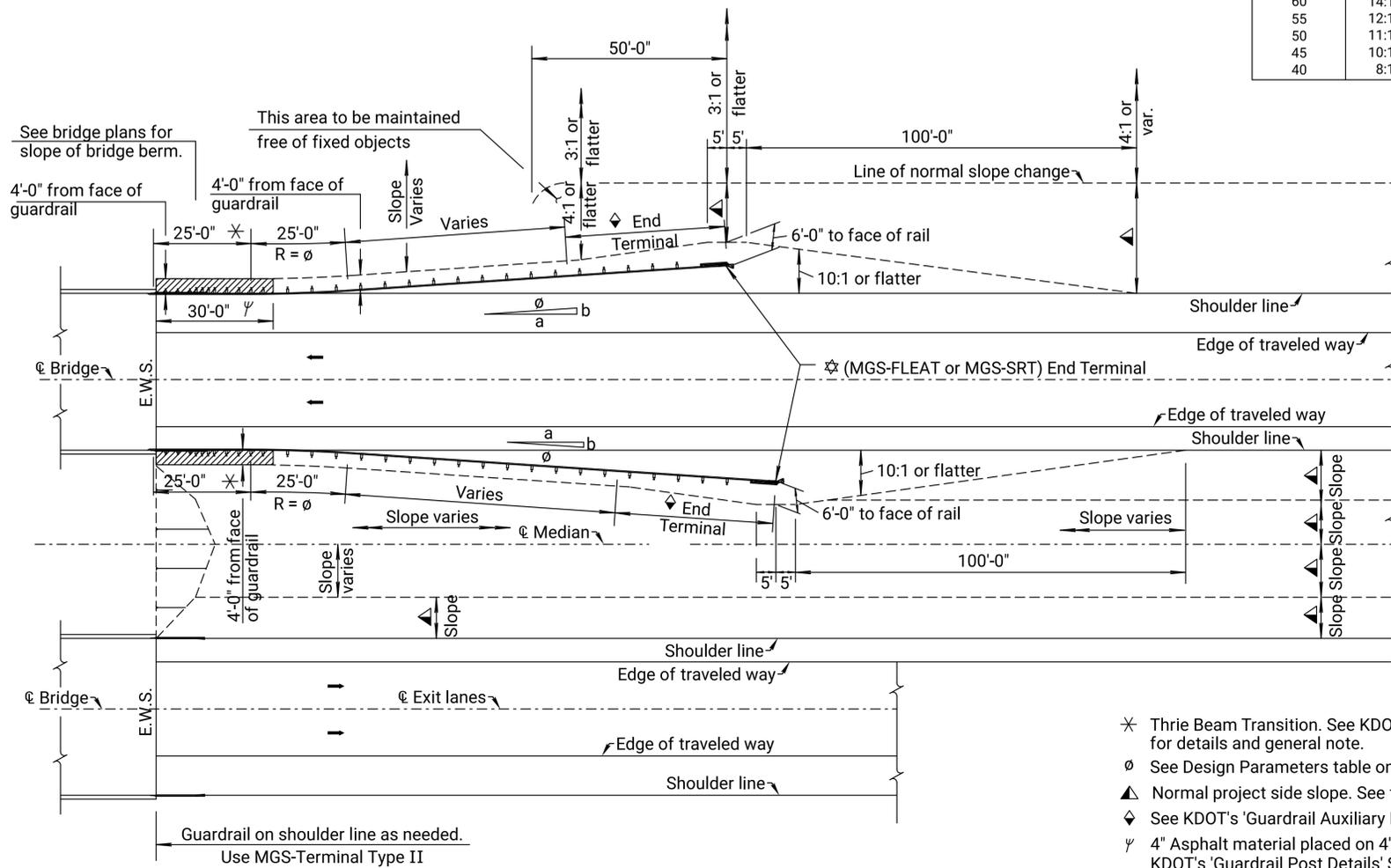
**THRIE BEAM TRANSITION - TWO LANES**

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



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

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



**THRIE BEAM TRANSITION - FOUR LANES (DIVIDED)**

- \* Thrie Beam Transition. See KDOT's 'Thrie Beam Guardrail Transition Details' Standard Drawings for details and general note.
- ∅ See Design Parameters table on this sheet for radius, length of curve and flare rate information.
- ▲ Normal project side slope. See typical sections.
- ◆ See KDOT's 'Guardrail Auxiliary Details' Standard Drawing.
- ∩ 4" Asphalt material placed on 4'-0" embankment widening unless flume inlet and slope drain is constructed. See KDOT's 'Guardrail Post Details' Standard Drawings for "Post in Pavement" details.
- ☆ The minimum length of w-beam guardrail required between the guardrail end terminal and any transition section, including the thrie-beam transition, is 12'-6".

| NO. | DATE     | REVISIONS                      | BY     | APPD   |
|-----|----------|--------------------------------|--------|--------|
| 04  | 06-05-18 | Removed Flare-beyond-the-Flare | A.L.R. | T.T.R. |
| 03  | 05-15-17 | Removed X-LITE                 | A.L.R. | S.W.K. |
| 02  | 06-07-12 | Revised Note to Designer       | S.W.K. | J.O.B. |

KANSAS DEPARTMENT OF TRANSPORTATION

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

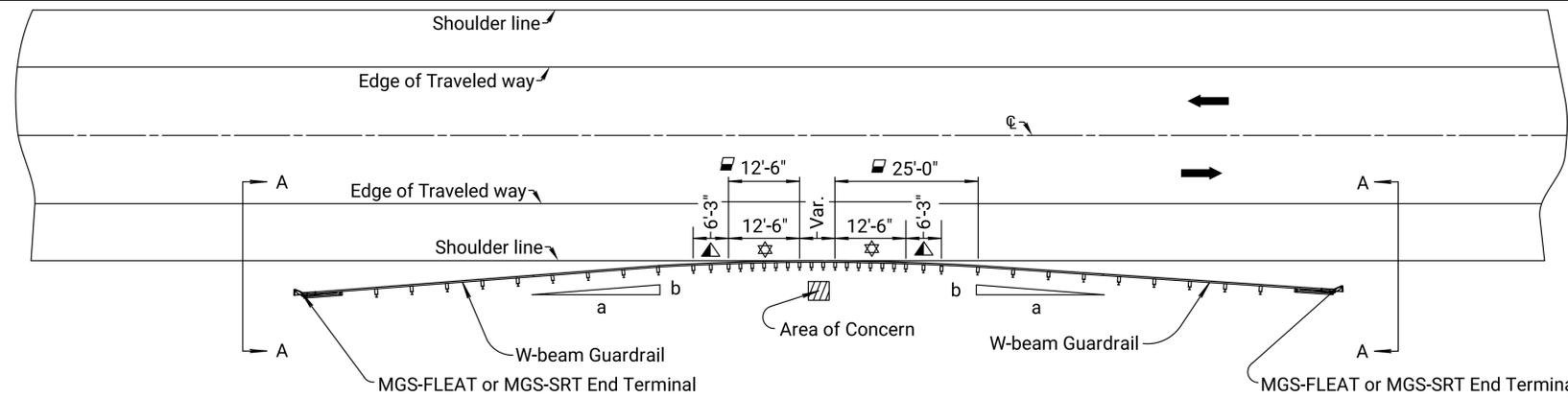
RD612C

|            |            |            |                |
|------------|------------|------------|----------------|
| DESIGNED   | 06-19-18   | APPD.      | Scott, W. King |
| DESIGN CK. | DETAIL CK. | QUANTITIES | TRACED         |
| DESIGN CK. | DETAIL CK. | QUAN. CK.  | TRACE CK.      |

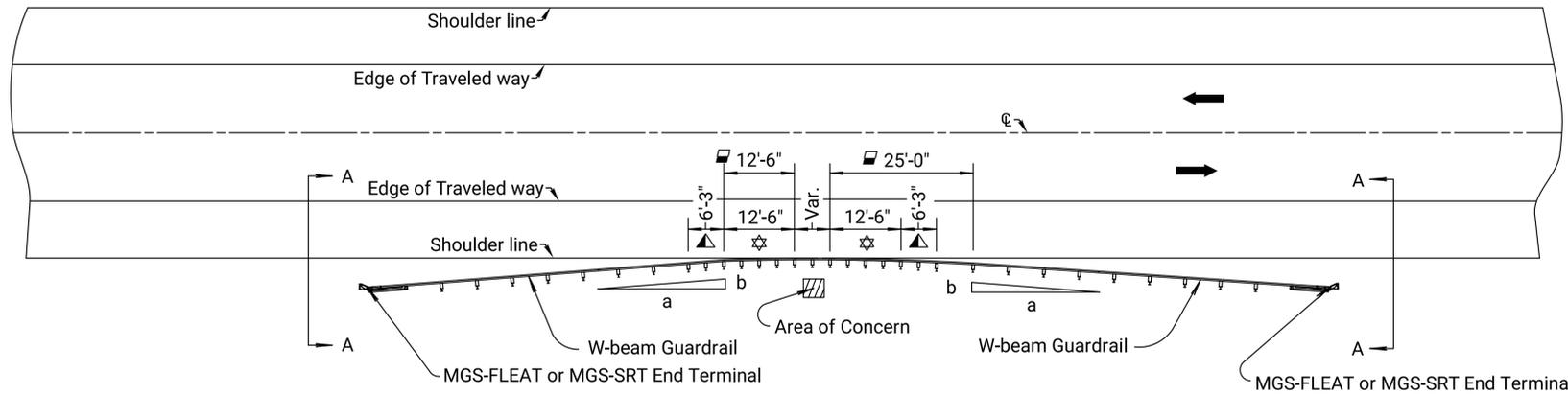
KDOT Graphics Certified 08-21-2022 Sh. No. 24

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 25        | 148          |

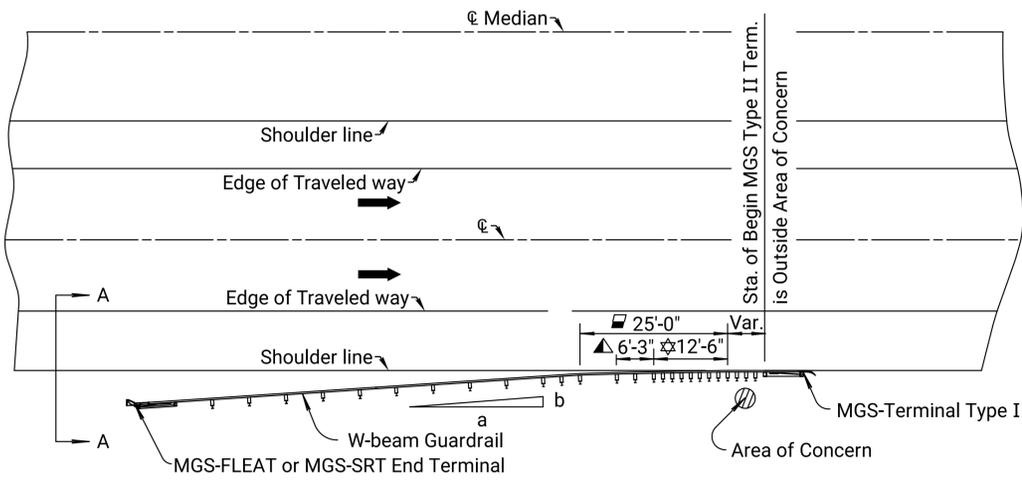
Note to Designer: Coordinate with the Bureau of Structures for pier protection.



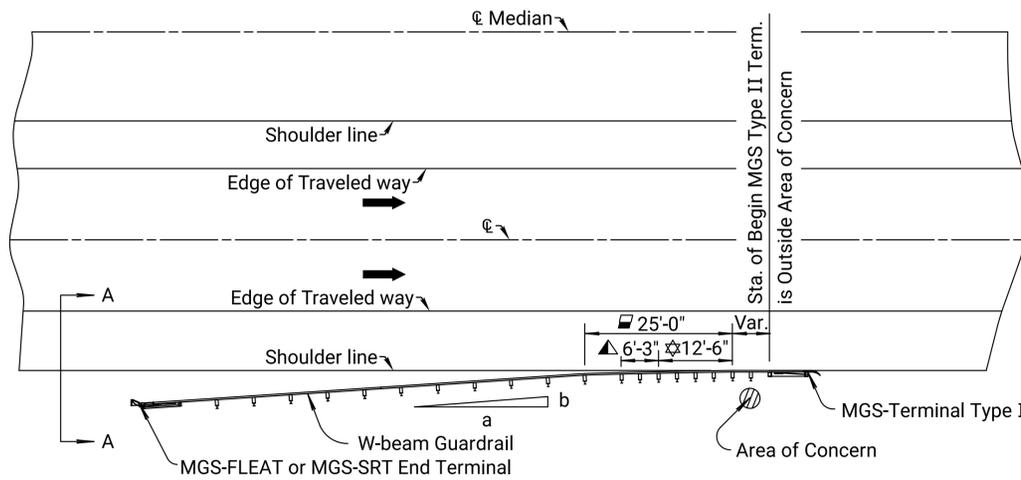
**PLAN VIEW TWO LANE (1/4 Post Spacing)**



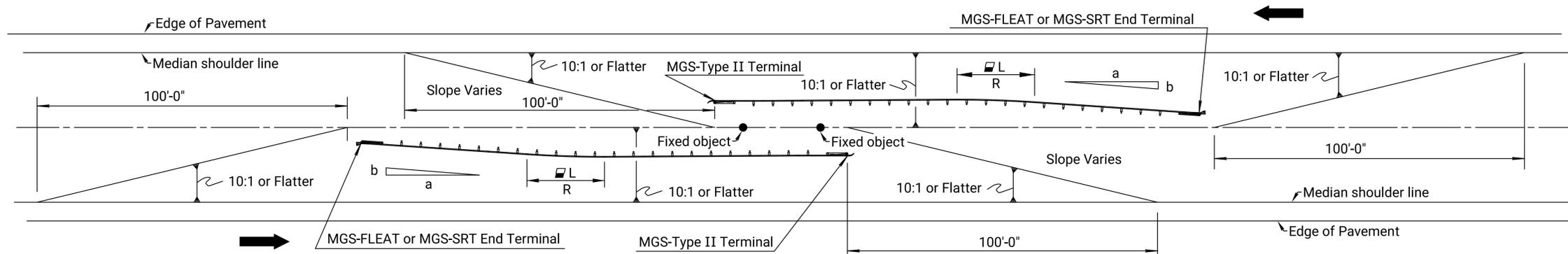
**PLAN VIEW TWO LANE (1/2 Post Spacing)**



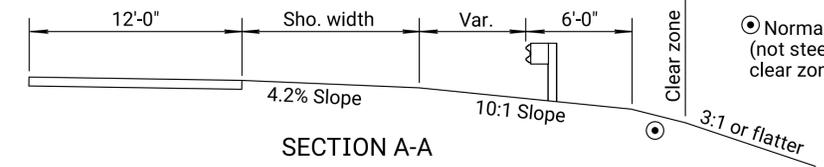
**PLAN VIEW FOUR LANE (1/4 Post Spacing)**



**PLAN VIEW FOUR LANE (1/2 Post Spacing)**

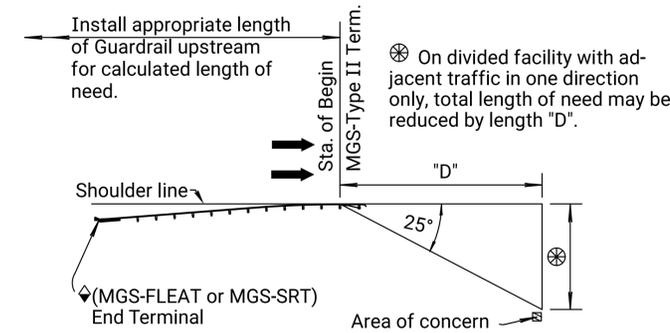


**MEDIAN PIER PROTECTION (WIDE MEDIAN)**

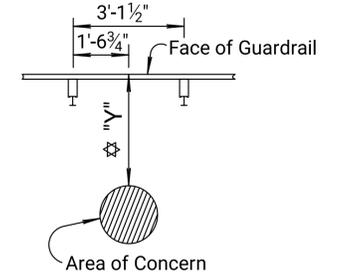


**SECTION A-A**

- See Design Parameters table on this sheet for radius, length of curve and flare rate information.
- Additional 1/2 post spacing



**DETAILS OF GUARDRAIL PROTECTION AT ROADSIDE OBSTACLE**



**ENLARGEMENT - AREA OF CONCERN**

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

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

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

Plotted by : Elias.Esquivel@ks.gov 13-MAR-2025 15:04  
File : KA64830Trss6174a.dgn

| NO. | DATE     | REVISIONS                               | BY     | APPD   |
|-----|----------|---|--------|--------|
| 04  | 06-05-18 | Removed Flare-beyond-the-Flare          | A.L.R. | T.T.R. |
| 03  | 05-15-17 | Removed X-LITE                          | A.L.R. | S.W.K. |
| 02  | 05-20-14 | Added Det., Med. Pier Prot. (Wide Med.) | S.W.K. | J.O.B. |

KANSAS DEPARTMENT OF TRANSPORTATION

**(MGS) GUARDRAIL at ROADSIDE OBSTACLE (FLARED INSTALLATION)**

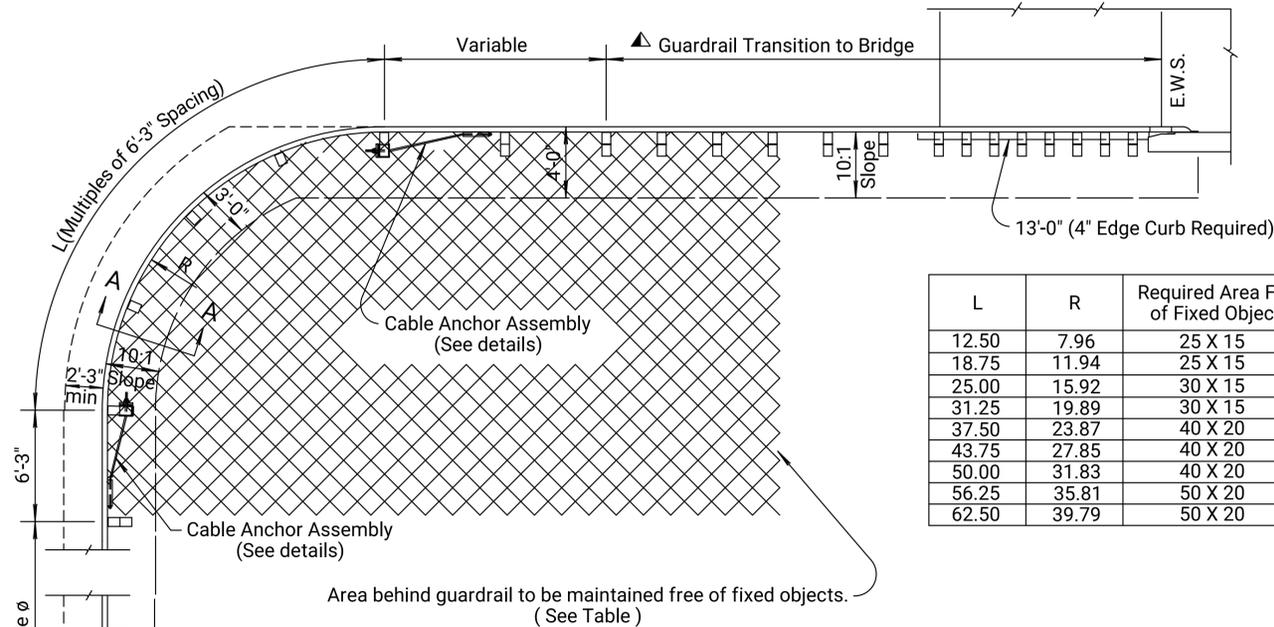
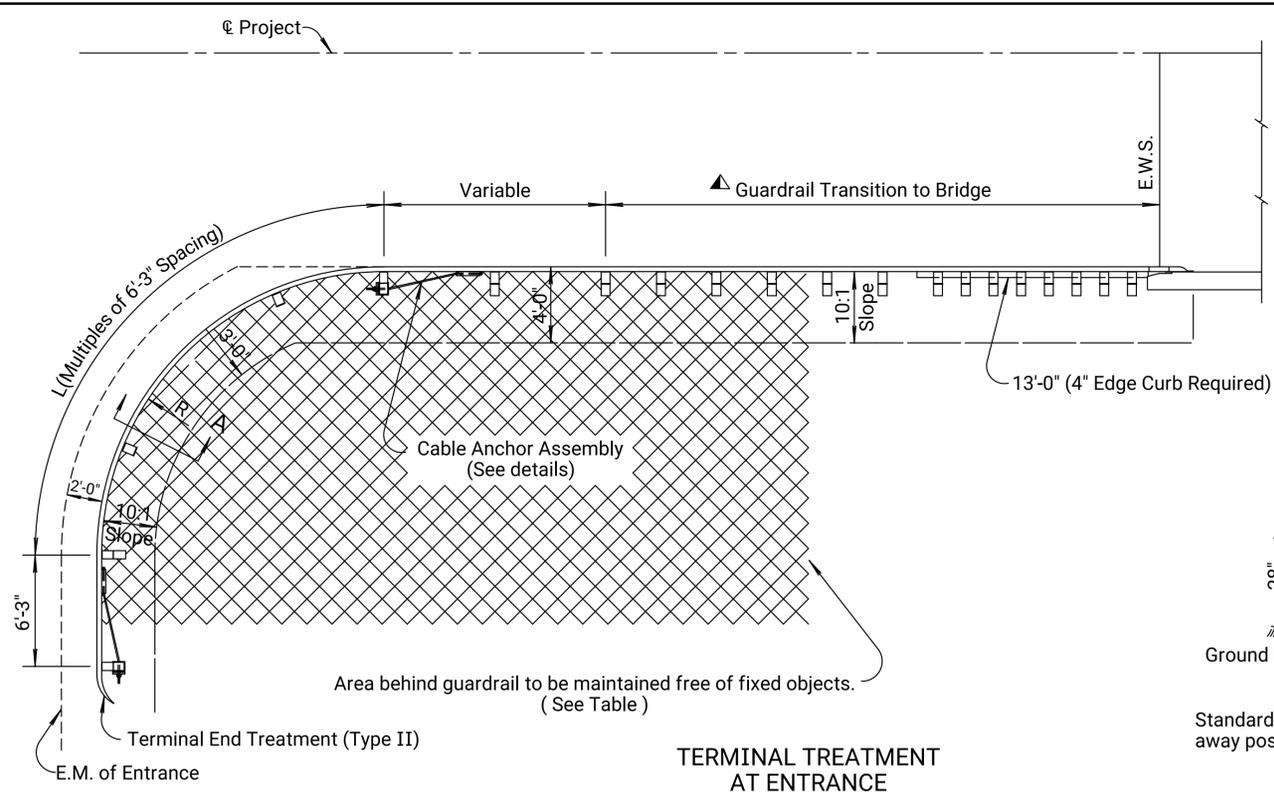
RD614A

|            |            |            |               |
|------------|------------|------------|---------------|
| DESIGNED   | 06-19-18   | APPD.      | Scott W. King |
| DESIGN CK. | DETAIL CK. | QUANTITIES | TRACED        |
| DESIGN CK. | DETAIL CK. | QUAN. CK.  | TRACE CK.     |

KDOT Graphics Certified 05-16-2022 Sh. No. 25

KDOT Graphics Certified

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 26        | 148          |

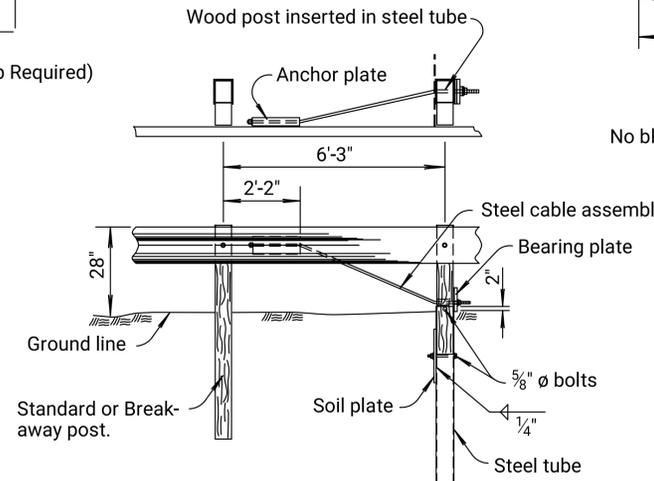


| L     | R     | Required Area Free of Fixed Objects |
|-------|-------|-------------------------------------|
| 12.50 | 7.96  | 25 X 15                             |
| 18.75 | 11.94 | 25 X 15                             |
| 25.00 | 15.92 | 30 X 15                             |
| 31.25 | 19.89 | 30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

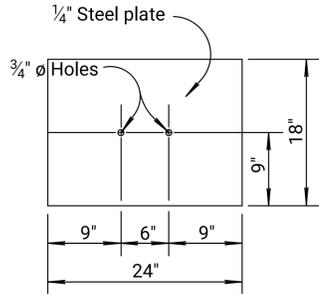
⊗ SRT shown. Other crashworthy terminals may be utilized. See the guardrail layout sheets for additional details.

⌀ Variable length must be in multiple of 6'-3". Length required is based on length of need for approach sideroad traffic. See guardrail layout details for length.

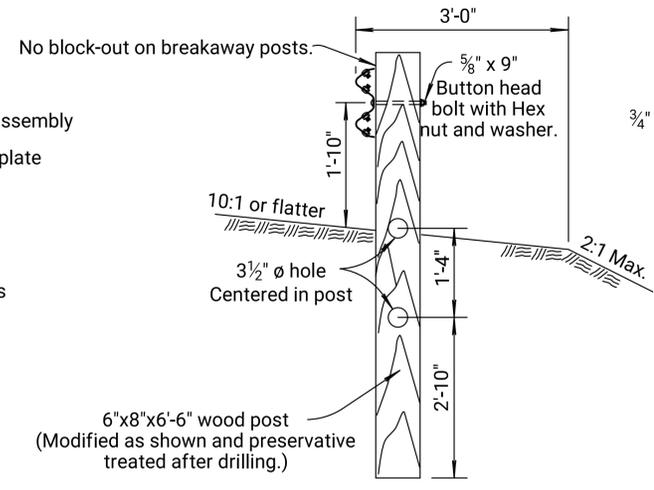
▲ 31'-3" Minimum length for thrie beam transition. See Standard Drawings RD612 & RD613.  
 25'-0" Minimum length for W-beam with rubrail transition. See Standard Drawing RD615.



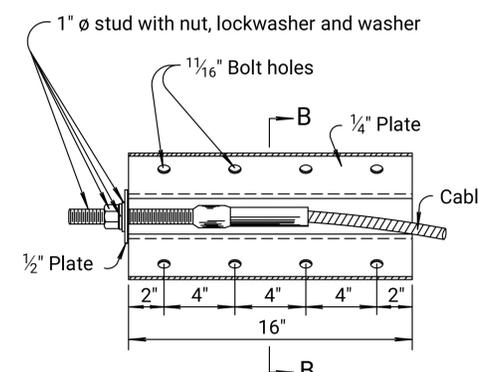
ANCHOR ASSEMBLY



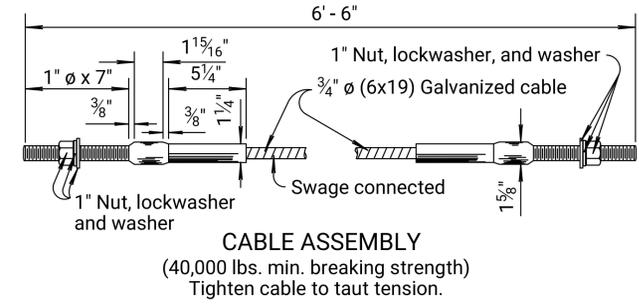
SOIL PLATE



ANCHOR ASSEMBLY POST

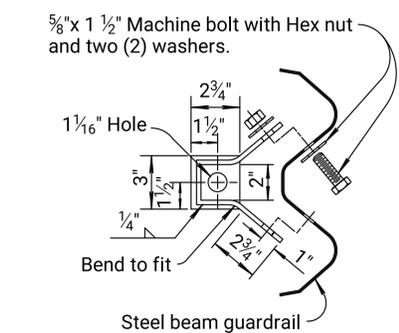


ANCHOR PLATE

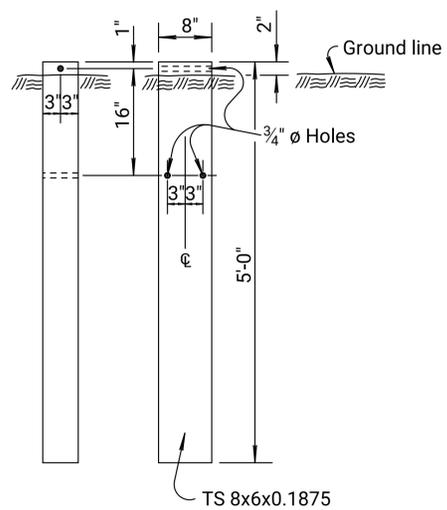


CABLE ASSEMBLY  
 (40,000 lbs. min. breaking strength)  
 Tighten cable to taut tension.

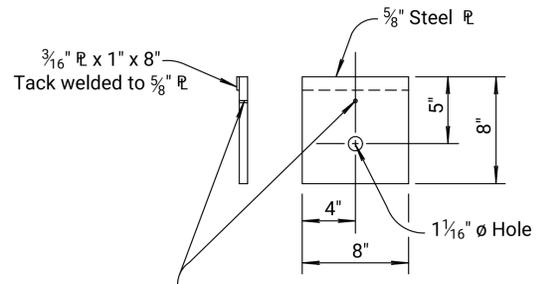
SECTION A-A  
 (Typical through curved portion of guardrail.)



MODIFIED SECTION B-B



STEEL TUBE



BEARING PLATE

General notes:  
 The curved rail element is 12 ga, and shop bent.  
 See Standard Drawing RD611 for notes applying to guardrail posts.  
 See Standard Drawing RD618 for details of Type II End Terminal.  
 Use wood Breakaway Posts through curved section of guardrail, all other posts may be either wood or steel with no mixing of types.  
 Set steel tube and soil plate in place prior to the installation of the wood anchor assembly post.  
 Use Type II Terminal at entrances or locations where end-on impacts with the terminal are not considered likely to occur.  
 Use a crashworthy end terminal at sideroad locations and appropriate length of guardrail to satisfy length of need requirements.

| NO. | DATE     | REVISIONS                                 | BY     | APPROV |
|-----|----------|---|--------|--------|
| 07  | 12-14-10 | Rev. notes, details & 28" rail height     | S.W.K. | J.O.B. |
| 06  | 07-20-04 | Rev. layout, notes, g.d.f.c. to guardrail | R.J.S. | J.O.B. |
| 05  | 03-05-01 | Add sideroad detail                       | R.J.S. | J.O.B. |

KANSAS DEPARTMENT OF TRANSPORTATION

**DETAILS FOR GUARDRAIL INSTALLATION AT INTERSECTING ROADWAY**

RD619

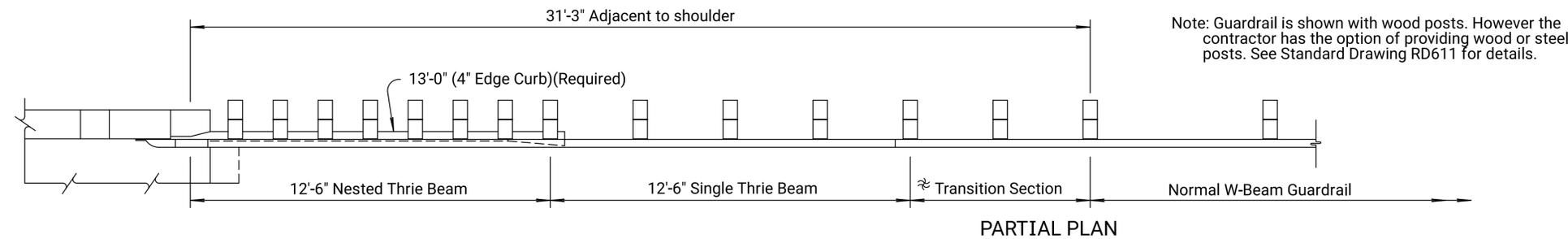
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|------------|------------|-----------|-----------------|
| DESIGNED   | QUANTITIES | TRACED    | James O. Brewer |
| DESIGN CK. | DETAIL CK. | QUAN. CK. | Trace King      |

KDOT Graphics Certified 06-14-2022 Sh. No. 26

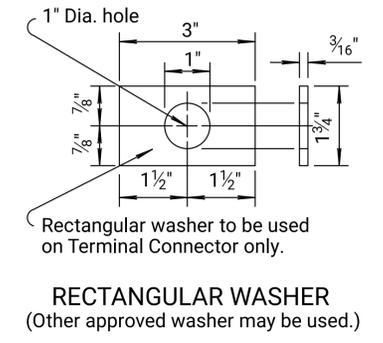
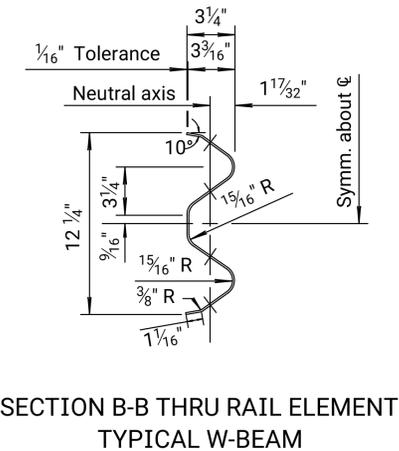
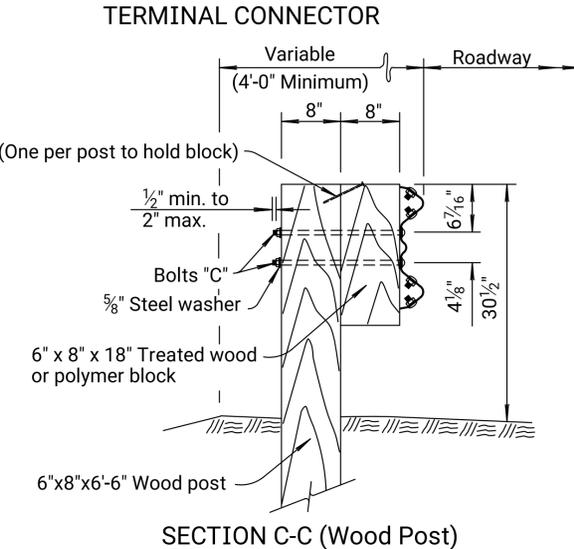
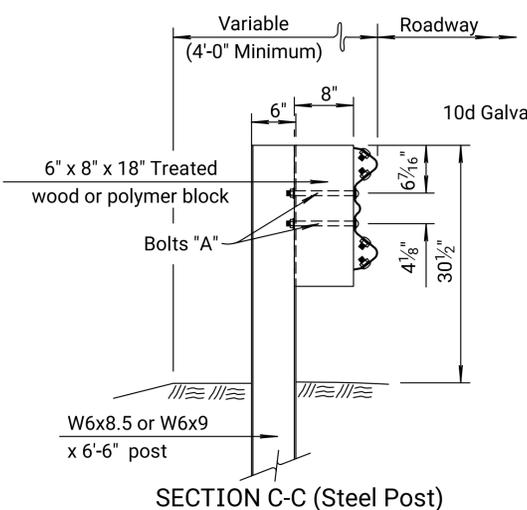
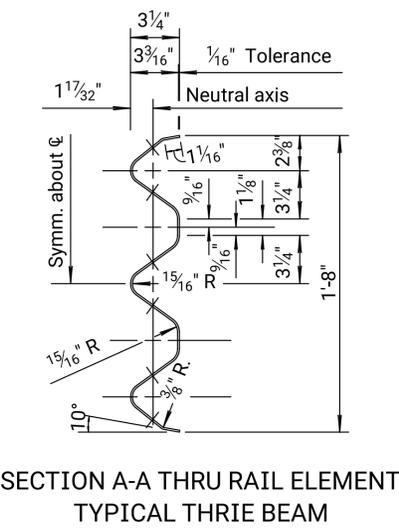
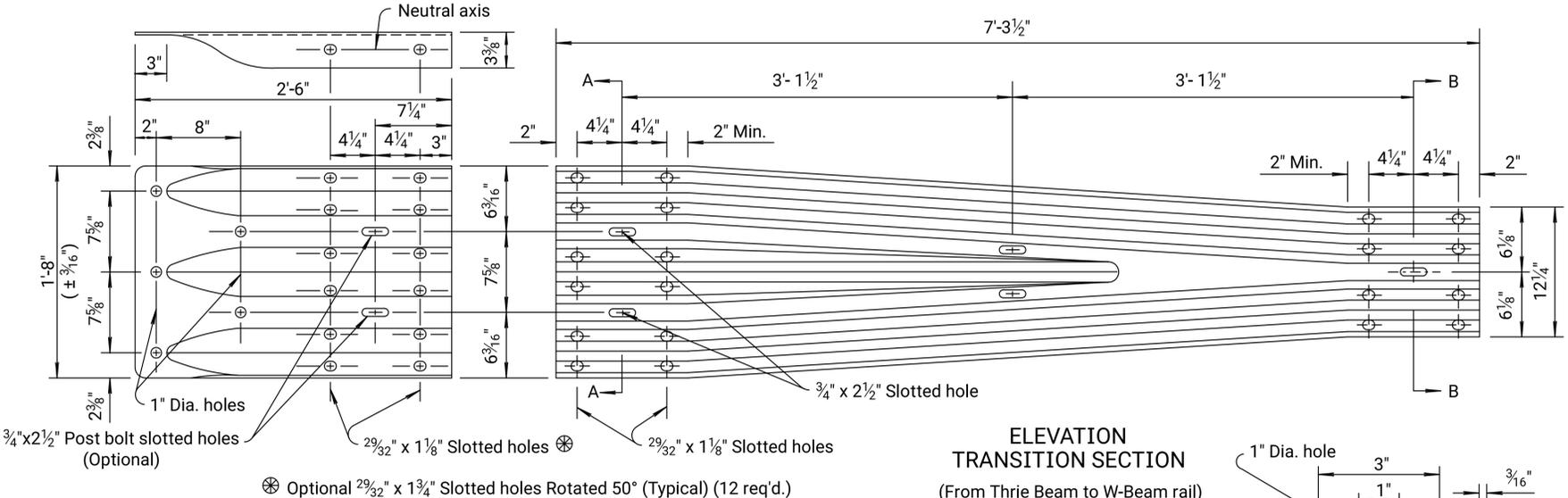
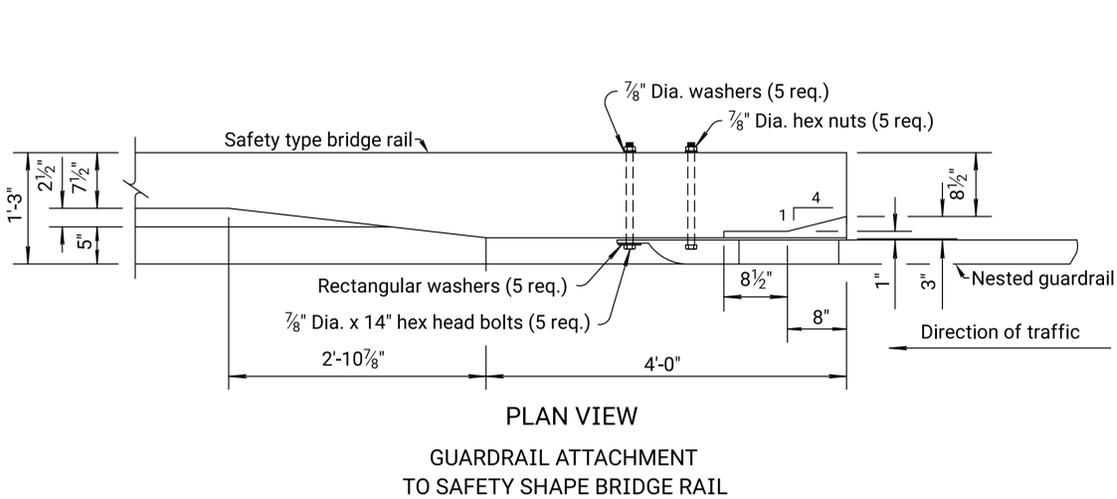
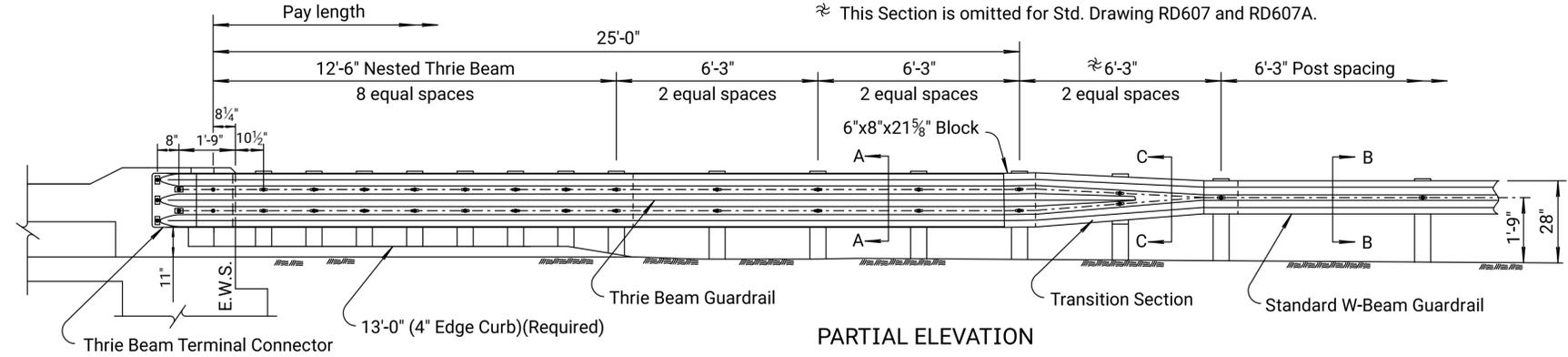
Plotted by: Elias.Esquivel@ks.gov 13-MAR-2025 15:05  
 File: KA648301rss619.dgn

KDOT Graphics Certified

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 27        | 148          |



**GENERAL NOTE**  
 Use galvanized 12 gauge steel rail elements unless otherwise noted. Use galvanized anchor bolts and post rail fittings, see Standard Specifications. Supply guard rail parts that are interchangeable with similar parts regardless of source or manufacturer.  
 Fabricate Terminal Connector from 10 gauge steel, see standard specification. The connector has the same section as thrie beam guardrail Terminal connector is subsidiary to the bid item "Steel Plate Guardrail".  
 Shop curve rails when radius is less than 150'.  
 Lap guardrail splices, including terminal connector, in the direction of traffic. Where traffic is temporarily carried in the opposite direction of final configuration, lap rail splices in the direction of permanent traffic.  
 Bridge to guardrail transition consists of 1- 25'-0" Thrie beam with 1- 12'-6" Thrie beam section nested in back of 25'-0" section (see layout), & 1- Thrie beam to W-beam Asymmetrical transition section. Use associated hardware with post spacing shown. Use w-beam guardrail with 6'-3" post spacing with rail furnished in 12'-6" or 25'-0" sections.  
 All material and work required for this installation are paid under the bid item "Steel Plate Guardrail".



| NO. | DATE     | REVISIONS                              | BY     | APPD   |
|-----|----------|--|--------|--------|
| 13  | 12-06-10 | Rev. Sec. C-C, notes & 28" rail height | S.W.K. | J.O.B. |
| 12  | 07-02-09 | Rev. Safety Shape Br. Rail detail      | S.W.K. | J.O.B. |
| 11  | 01-05-04 | Added 4" Edge Curb, revised note       | S.W.K. | J.O.B. |

KANSAS DEPARTMENT OF TRANSPORTATION

**DETAILS OF THRIE BEAM GUARDRAIL TRANSITION**

RD613

|            |            |           |                 |
|------------|------------|-----------|-----------------|
| DESIGNED   | QUANTITIES | TRACED    | James O. Brewer |
| DETAIL CK. | QUAN. CK.  | TRACE CK. |                 |

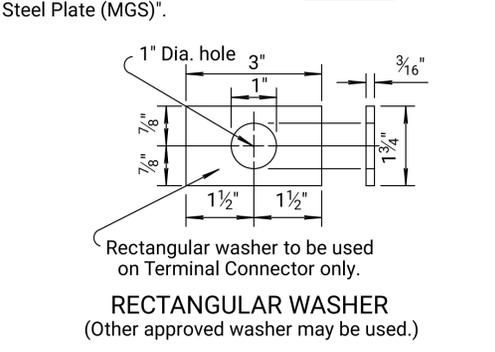
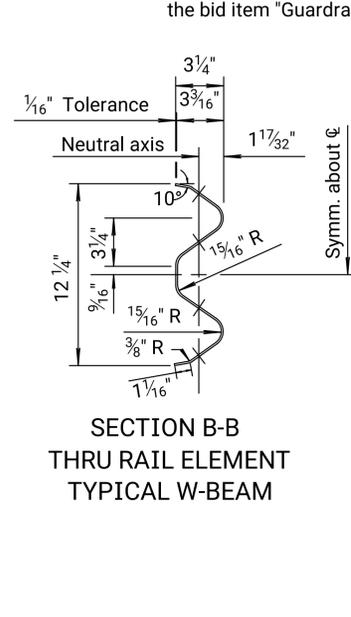
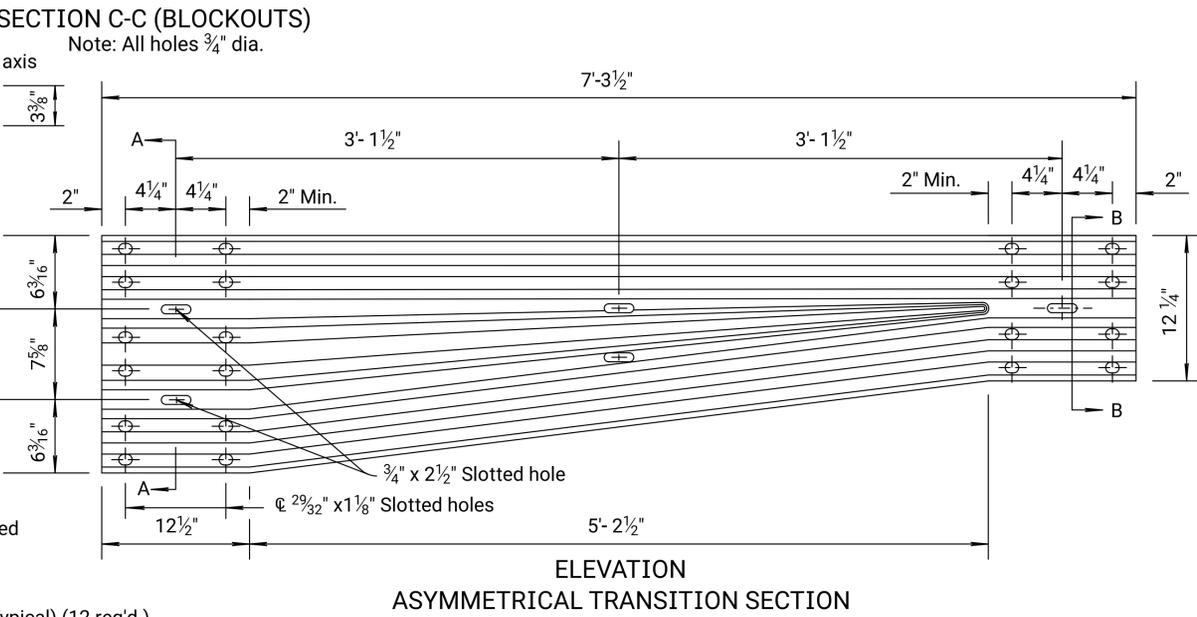
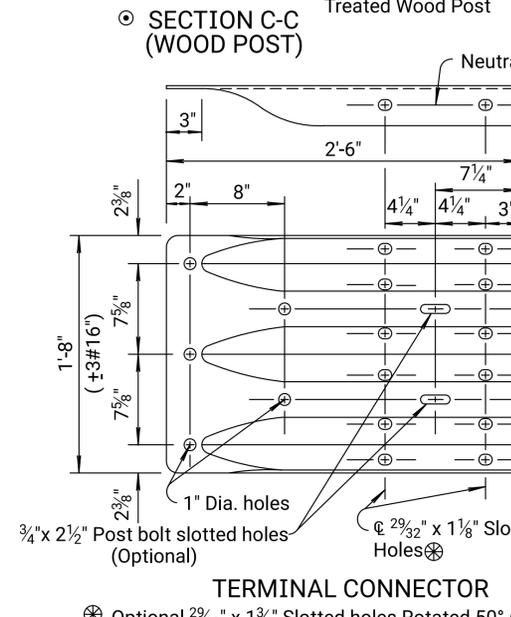
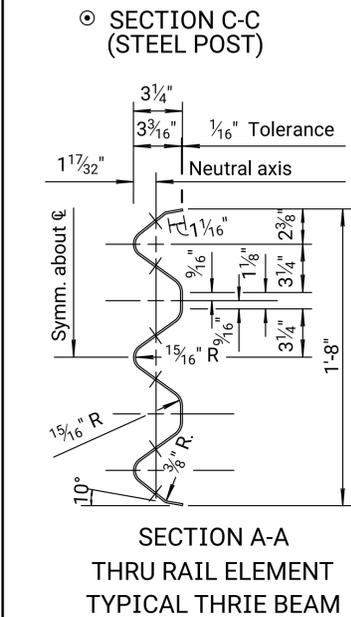
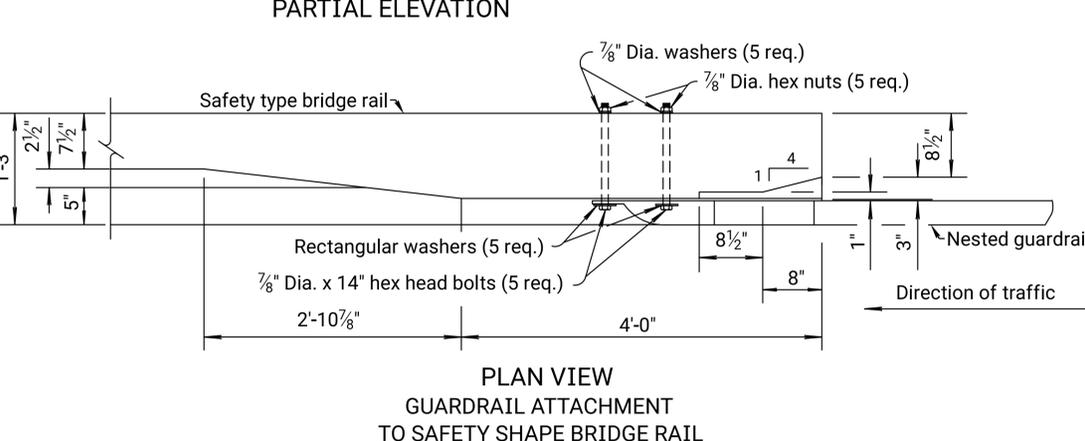
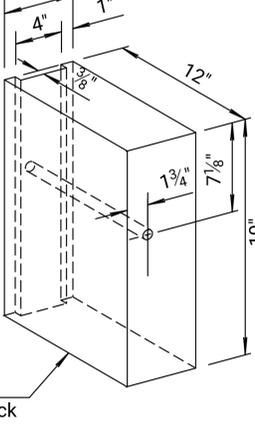
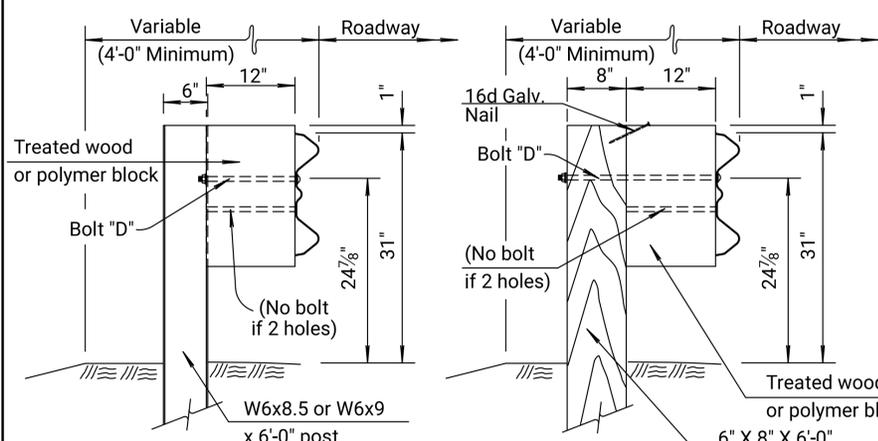
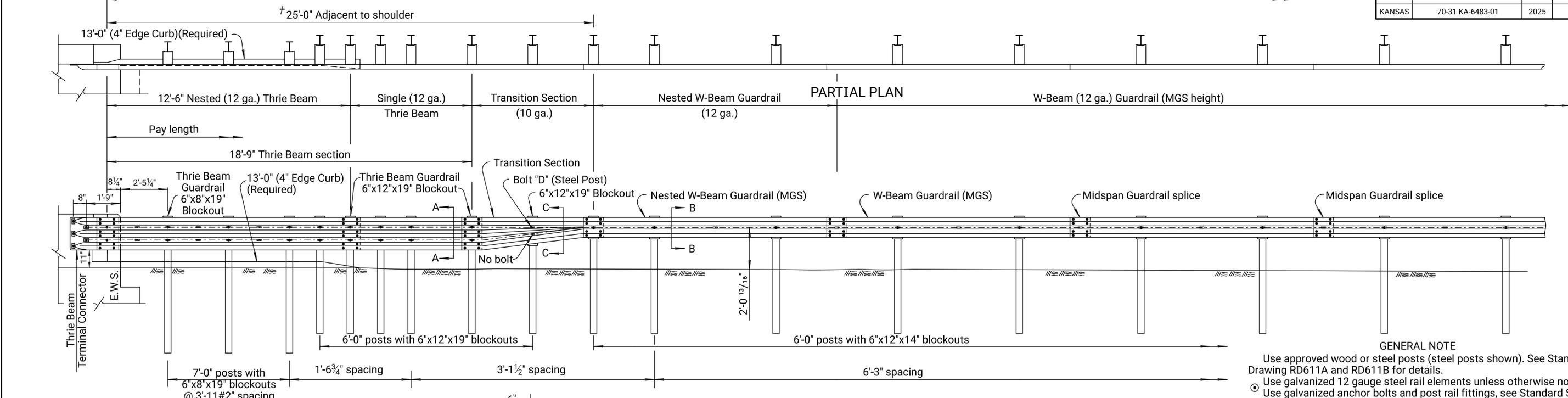
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Plotted by: Elias.Esquivel@ks.gov 13-MAR-2025 15:04  
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KDOT Graphics Certified

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 28        | 148          |

⊙ Use Steel or Wood Posts (Steel Posts Shown)



**GENERAL NOTE**

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

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

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

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

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

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

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

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

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

| NO. | DATE     | REVISIONS                   | BY     | APPD   |
|-----|----------|-----------------------------|--------|--------|
| 02  | 02-10-16 | Added Detail, Wood Post     | T.T.R. | S.W.K. |
| 01  | 01-25-12 | Revised Details, Thrie-Beam | S.W.K. | J.O.B. |

KANSAS DEPARTMENT OF TRANSPORTATION

**DETAILS OF THRIE BEAM to (MGS) GUARDRAIL TRANSITION**

RD613A

|            |            |            |           |
|------------|------------|------------|-----------|
| DESIGNED   | DATE       | APPROVED   | BY        |
| DESIGN CK. | DETAIL CK. | QUANTITIES | TRACE CK. |
|            |            | QUAN. CK.  | TRACE CK. |

Scott W. King

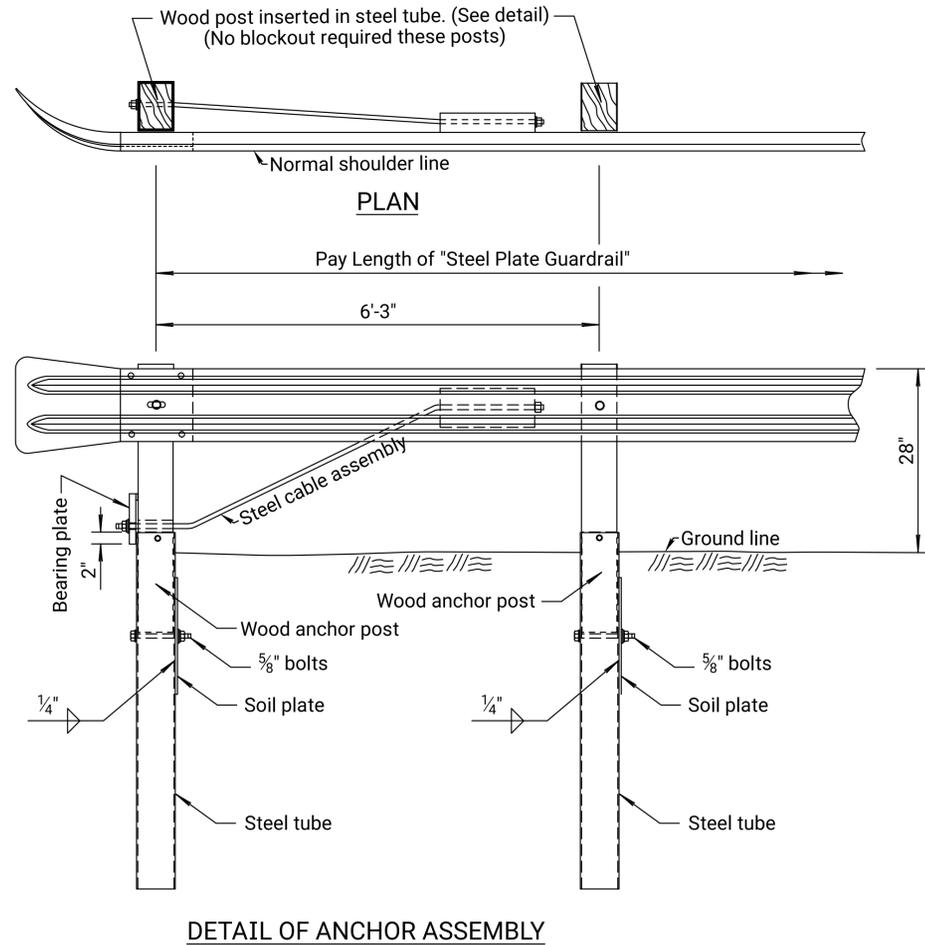
KDOT Graphics Certified 11-18-2022 Sh. No. 28

Plotted by: Elias.Esquivel@ks.gov 13-MAR-2025 15:01  
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|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 29        | 148          |

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



**GENERAL NOTE**

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

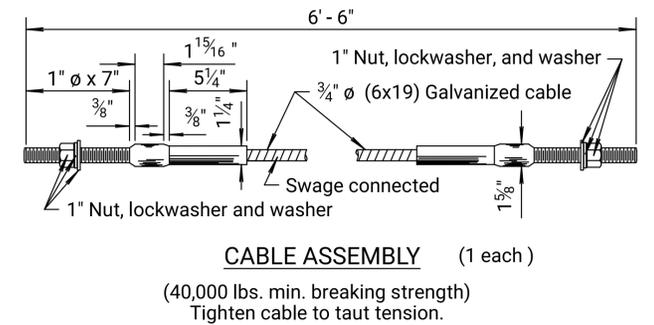
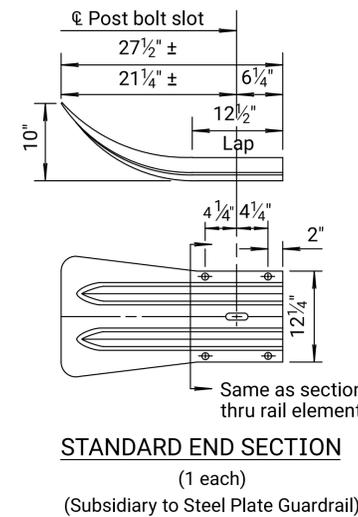
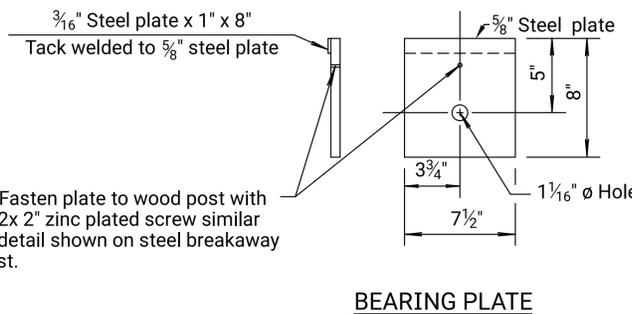
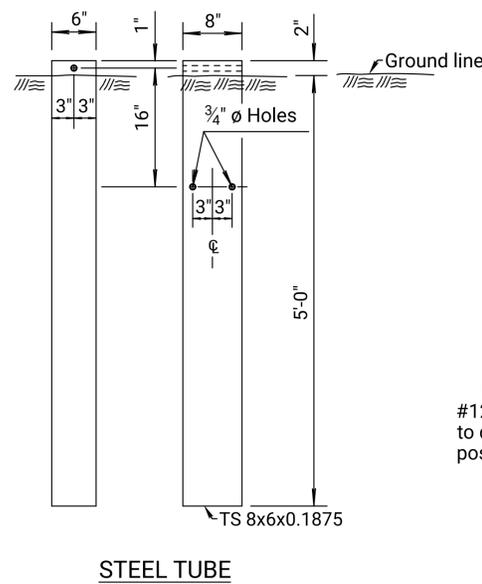
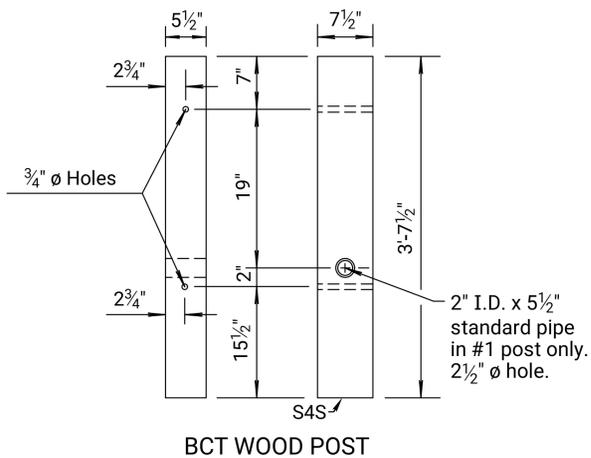
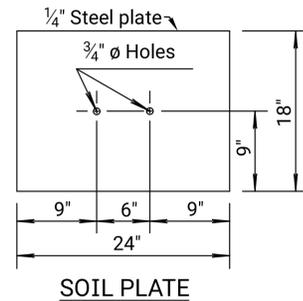
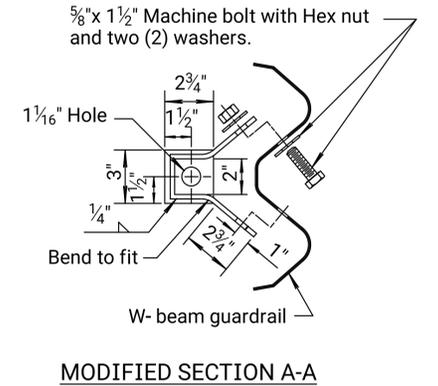
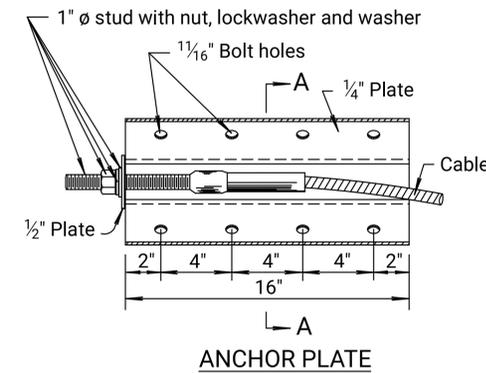
The steel soil tubes may be driven with an approved driving head. Set steel tube and soil plate before installing wood anchor post assembly. Do not drive steel soil tubes with wood post in the tube. Backfill and satisfactorily compact around steel soil tubes placed in drilled holes to prevent tube settlement.

Galvanize all steel parts after fabrication.

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

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

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



| NO. | DATE     | REVISIONS                             | BY     | APPD   |
|-----|----------|---------------------------------------|--------|--------|
| 06  | 12-14-10 | Rev. notes, details & 28" rail height | S.W.K. | J.O.B. |
| 05  | 07-20-04 | Changed Guard Fence to Guardrail      | S.W.K. | J.O.B. |
| 04  | 05-18-00 | Added note for temporary traffic      | R.J.S. | J.O.B. |

KANSAS DEPARTMENT OF TRANSPORTATION

**GUARDRAIL END TERMINAL TYPE II**

RD618

|            |            |            |                 |
|------------|------------|------------|-----------------|
| DESIGNED   | 01-11-11   | APPD.      | James O. Brewer |
| DESIGN CK. | DETAIL CK. | QUANTITIES | TRACED          |
| DESIGN CK. | DETAIL CK. | QUAN. CK.  | TRACE CK.       |

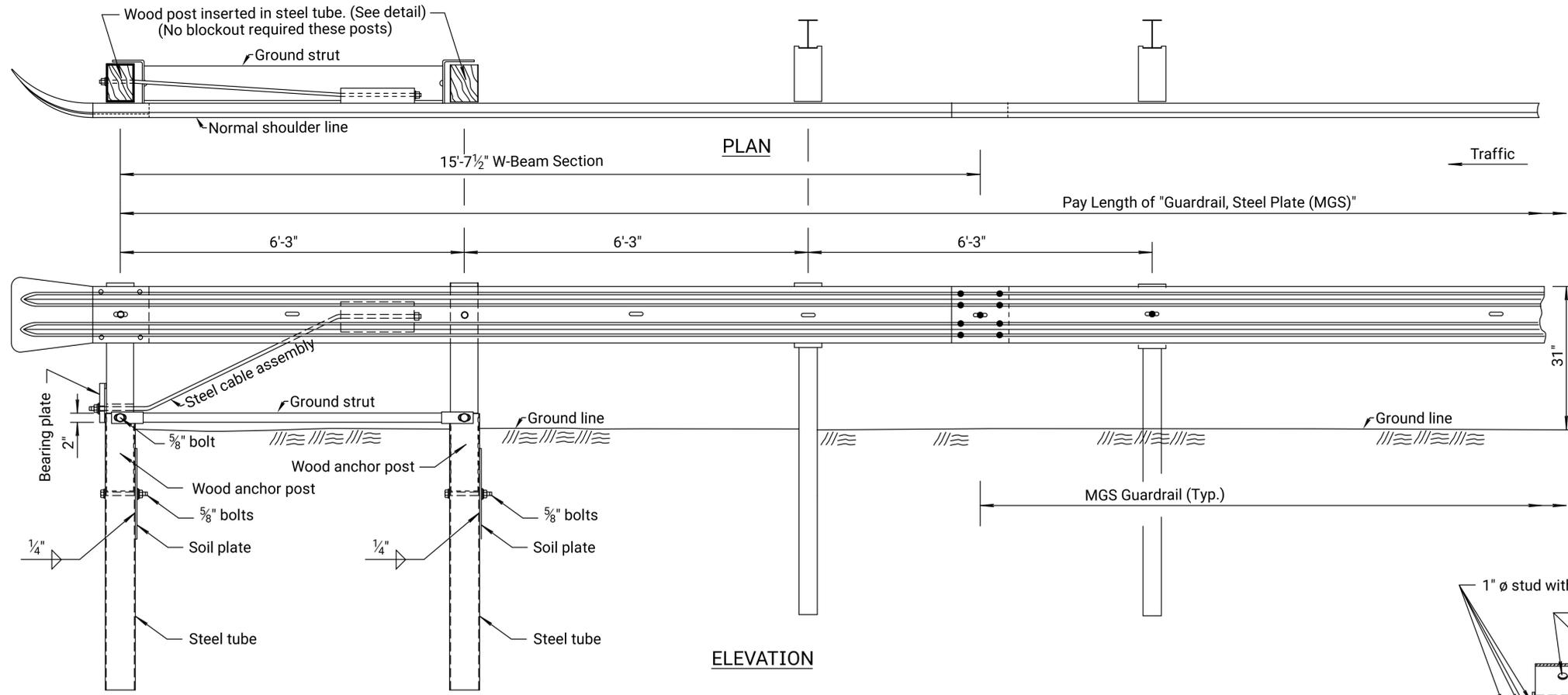
DOT Graphics Certified 05-11-2022 Sh. No. 29

Plotted by : Elias.Esquivel@ks.gov 13-MAR-2025 15:05  
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DOT Graphics Certified

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|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 30        | 148          |

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.

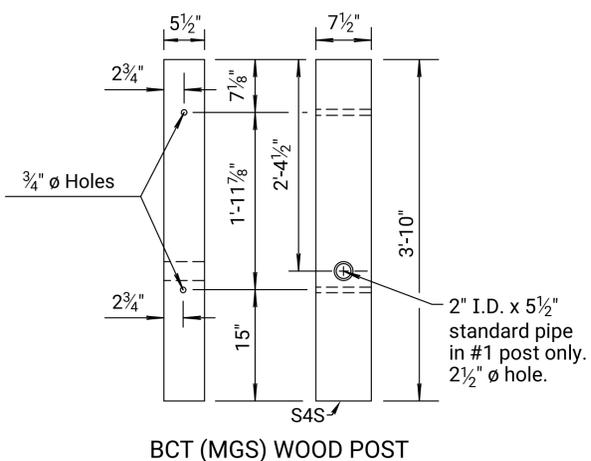
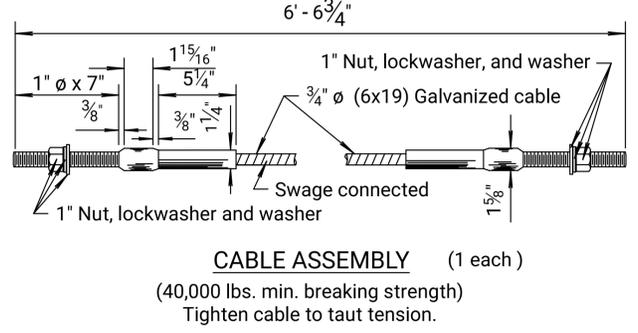
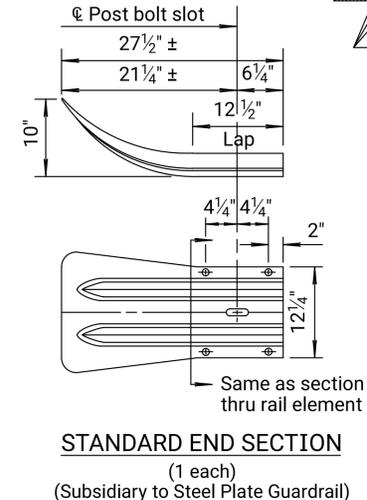
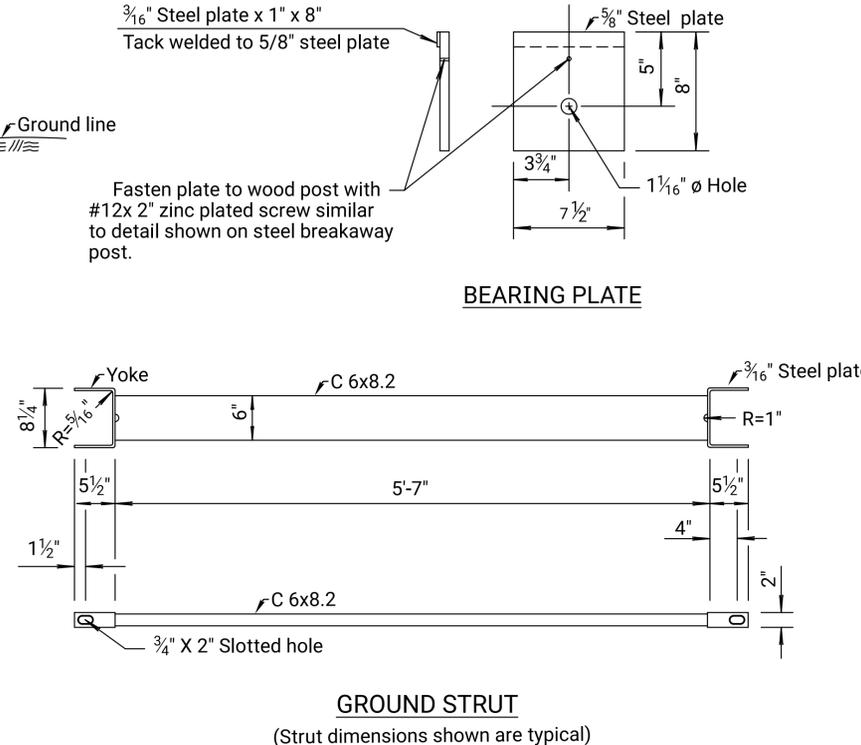
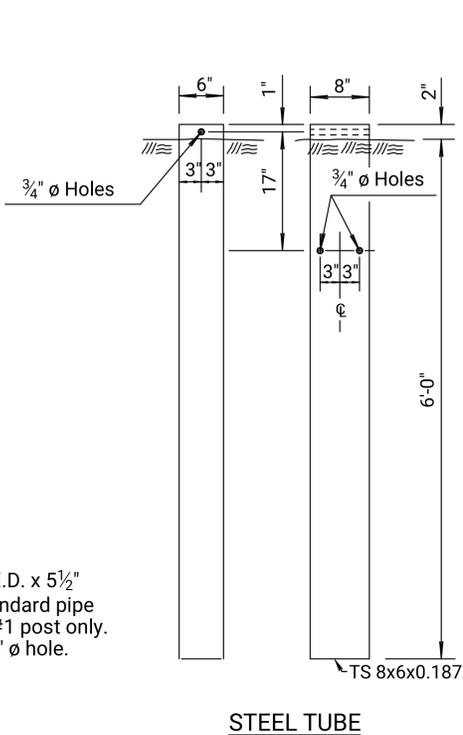
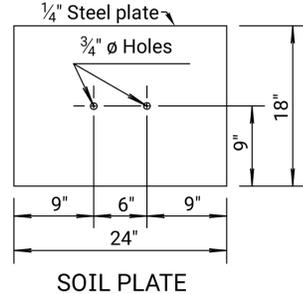
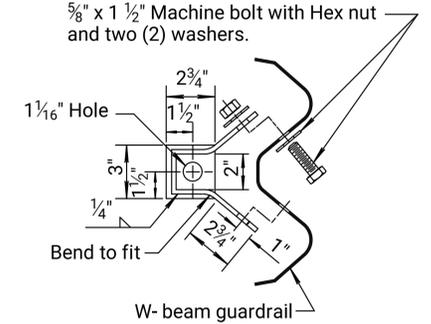
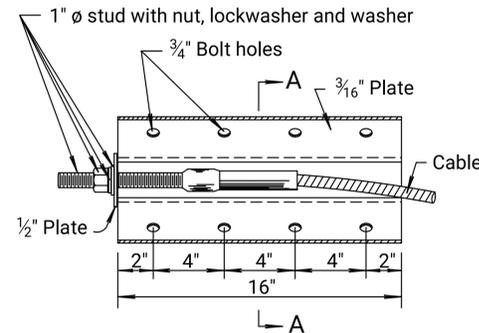
Galvanize all steel parts after fabrication.

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)".



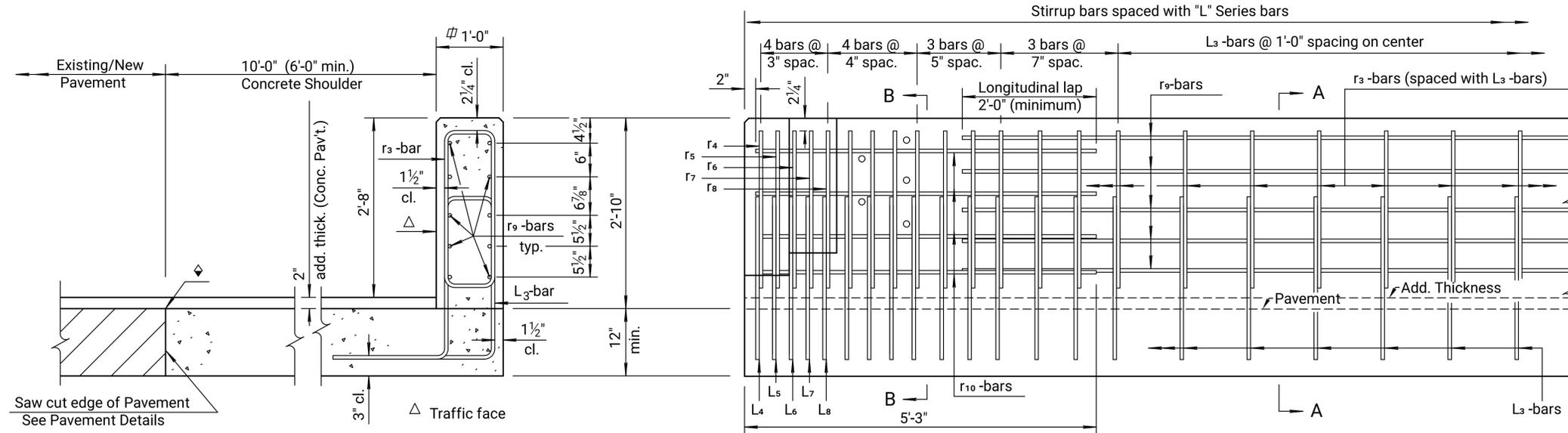
| KANSAS DEPARTMENT OF TRANSPORTATION  |            |                                 |       |               |
|--------------------------------------|------------|---------------------------------|-------|---------------|
| GUARDRAIL END TERMINAL (MGS) TYPE II |            |                                 |       |               |
| RD618A                               |            |                                 |       |               |
| FHWA APPROVAL                        |            | 01-06-16                        | APPD. | Scott W. King |
| DESIGNED                             | QUANTITIES | TRACED                          |       |               |
| DESIGN CK.                           | DETAIL CK. | QUAN. CK.                       |       |               |
| 02 01-05-16                          |            | Revised Layout, End Terminal    |       | T.T.R.        |
| 01 01-25-12                          |            | Revised Dimension, End Terminal |       | S.W.K.        |
| NO.                                  | DATE       | REVISIONS                       | BY    | APPD.         |

Plotted by : Elias.Esquivel@ks.gov 13-MAR-2025 15:03  
File : KA648301r618a.dgn

| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 31        | 148          |

Note to Designer: This barrier (TL-3) is intended for applications such as traffic protection at piers. If longer barrier applications are used please coordinate with Bridge Design to modify this Standard Drawing and the barrier reinforcing appropriately.

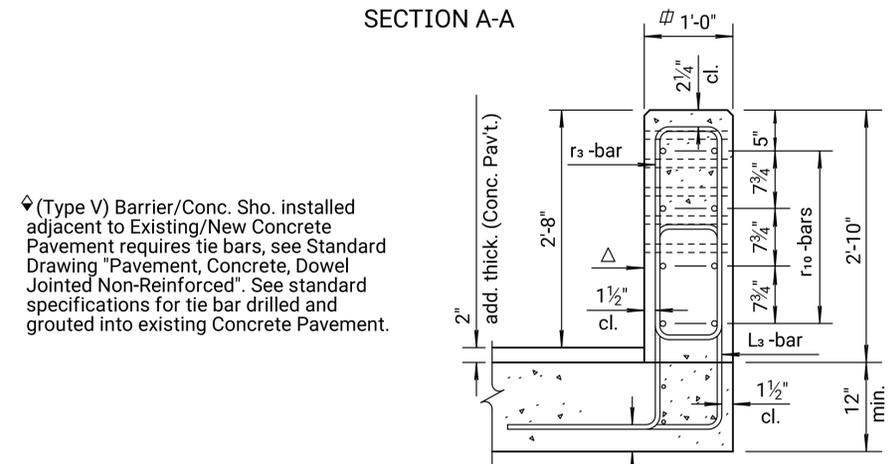
**GENERAL NOTE**  
 Use Concrete Grade 3.0 (AE) or Concrete Pavement Mix (Contractor's Option) except where noted, see standard specifications.  
 Use Grade 60 Epoxy Coated reinforcing steel. See details for spacing, keep a minimum reinforcing steel clear distance of 1 1/2".  
 The section furnished must generally comply with the dimensions shown. Requests for minor variations in section geometry may be submitted for review. Permanent Concrete barriers are cast in place or slip formed construction only. Precast barriers are not permitted.  
 Bevel all exposed edges with a 3/8" triangular molding.  
 See Standard Specification to cut and epoxy coat dowel bars.



SECTION A-A

ELEVATION (Section) OF CONCRETE SAFETY BARRIER

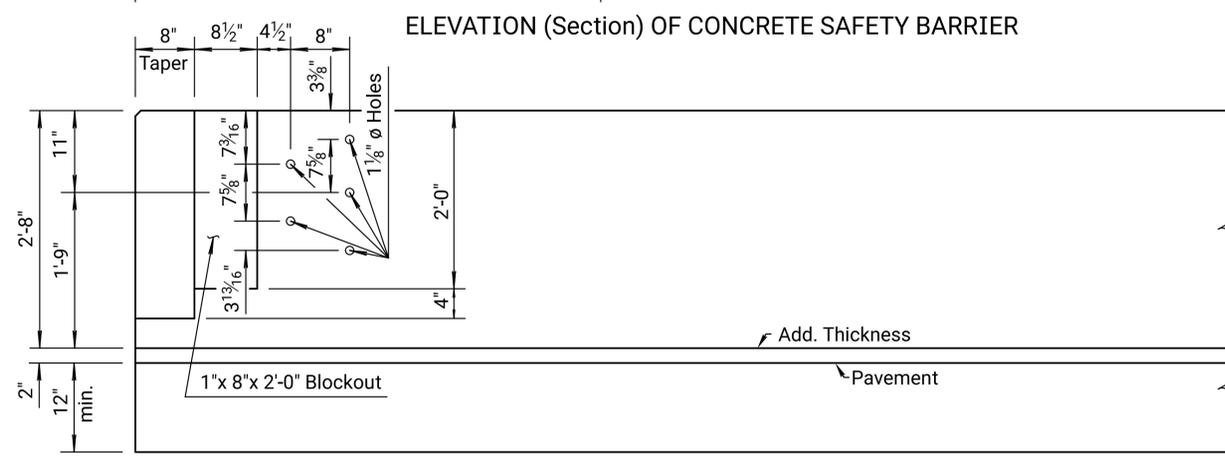
**DELINEATION**  
 See Standard Drawing RD624 for details of barrier delineation.  
**CONSTRUCTION JOINTS**  
 Place Joint Material (Nonextruding, Type B) where shown for structures and at the end of day construction joint.  
**CONTRACTION JOINTS**  
 50'-0" (Type V) Barrier shown does not require Contraction Joint unless directed by the Engineer. Longer (Type V) Barrier designs require formed or sawed Contraction joints on 20' centers maximum. Where barrier is adjacent to concrete pavement space joints to match contraction joints and definite transverse cracks in the pavement. Contraction joints not to exceed 20' centers.  
 Work and materials required for installation of joint material is subsidiary to Concrete Safety Barrier (Type V) and conforms to the standard specifications. Payment for all work and material to install Concrete Safety Barrier (Type V) (Permanent) is per lin. ft. Concrete Pavement (Uniform 12") (AE) per Sq. Yd. included in Summary of Quantities. Asphalt Overlay (2") (when needed). See Summary of Quantities (Surfacing).



SECTION B-B STIRRUPS

SECTION ("L" Series bar placed in Conc. Sho.) Phasing

Note: Place Concrete Barrier Shoulder with "L" Series bars and cure before adding (Type V) Barrier wall. (Type V) Barrier base (1'-0") placed congruent with 10' Concrete Shoulder.

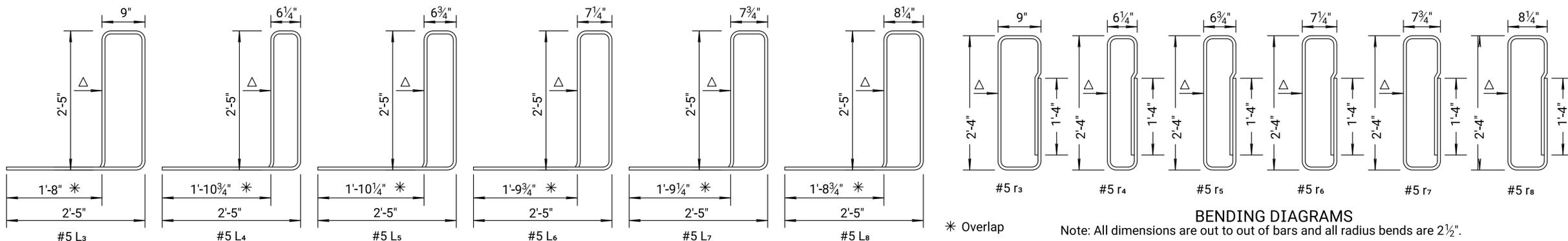
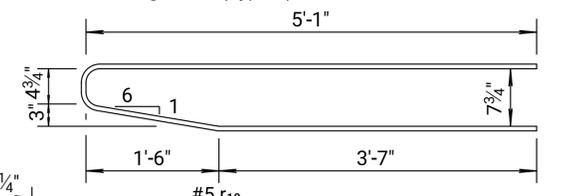


ELEVATION - ENTRANCE/EXIT END

PLAN (Section) - ENTRANCE/EXIT END

| 50' (TYPE V) BARRIER/CONCRETE SHOULDER |          |       |             |            |              |
|--|----------|-------|-------------|------------|--------------|
| Bar                                    | Bar Size | Shape | No. of Bars | Length ft. | Weight lbs.  |
| L3                                     | #5       |       | 58          | 9'-8"      | 584.8        |
| L4                                     | #5       |       | 2           | 9'-8"      | 20.2         |
| L5                                     | #5       |       | 2           | 9'-8"      | 20.2         |
| L6                                     | #5       |       | 2           | 9'-8"      | 20.2         |
| L7                                     | #5       |       | 2           | 9'-8"      | 20.2         |
| L8                                     | #5       |       | 2           | 9'-8"      | 20.2         |
| r3                                     | #5       |       | 58          | 7'-6"      | 453.7        |
| r4                                     | #5       |       | 2           | 7'-1"      | 14.8         |
| r5                                     | #5       |       | 2           | 7'-2"      | 14.9         |
| r6                                     | #5       |       | 2           | 7'-3"      | 15.1         |
| r7                                     | #5       |       | 2           | 7'-4"      | 15.3         |
| r8                                     | #5       |       | 2           | 7'-5"      | 15.5         |
| r9                                     | #5       |       | 10          | 43'-8"     | 455.4        |
| r10                                    | #5       |       | 8           | 10'-7"     | 88.3         |
| ⊗ Concrete Pavement (14" Uniform) (AE) |          |       |             |            | 33.4 Sq. Yd. |
| Barrier Conc. Gr. 3.0 (AE)             |          |       |             |            | 7.0 Cu. Yd.  |
| Reinf. Steel (Grade 60 Epoxy Coated)   |          |       |             |            | 1,758.8 Lbs. |

Quantities shown are for 50'-0" Barrier Section, 6' x 50' of Concrete Pavement (12" Uniform)(AE) with 2" HMA overlay. Modification of design length or shoulder width requires revision of this sheet.  
 ⊗ No HMA overlay bid as Concrete Pavement (14" Uniform) (AE).  
 # 1'-0" Conc. Sho. widening bid as (Type V) Barrier.



BENDING DIAGRAMS

\* Overlap  
 Note: All dimensions are out to out of bars and all radius bends are 2 1/2".

| NO. | DATE     | REVISIONS                     | BY     | APPD   |
|-----|----------|-------------------------------|--------|--------|
| 03  | 07-14-17 | Revised 'L-Bar' Reinforcement | A.L.R. | S.W.K. |
| 02  | 06-13-13 | Revised Note to Designer      | S.W.K. | J.O.B. |
| 01  | 07-19-12 | Revised Quantities            | S.W.K. | J.O.B. |

KANSAS DEPARTMENT OF TRANSPORTATION

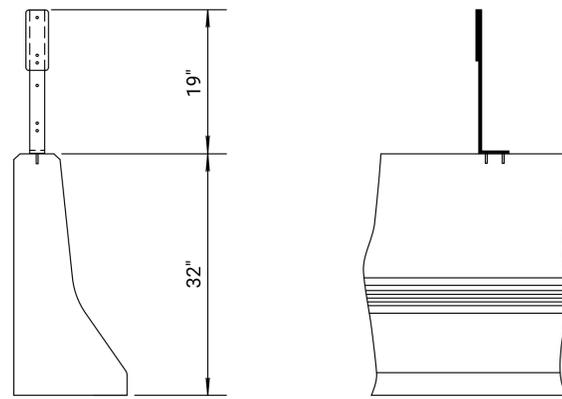
**PERMANENT CONCRETE SAFETY BARRIER (TYPE V)**

RD625C

|            |            |            |           |
|------------|------------|------------|-----------|
| DESIGNED   | DETAIL     | QUANTITIES | TRACED    |
| DESIGN CK. | DETAIL CK. | QUAN. CK.  | TRACE CK. |

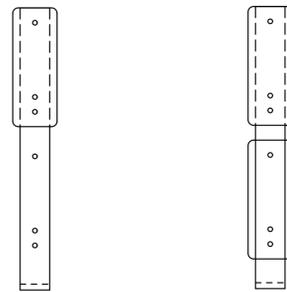
Scott W. King

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 32        | 148          |

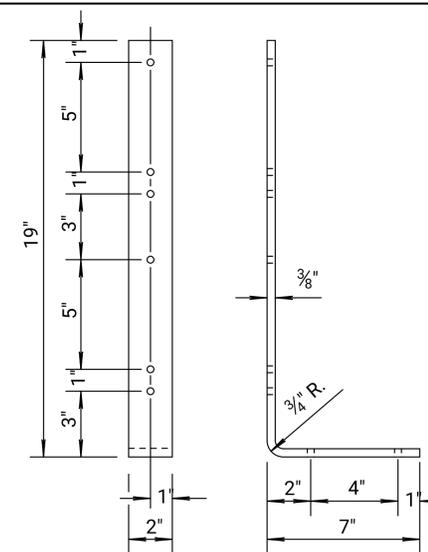


TYPICAL MOUNTING DETAIL

DESIGN DETAILS FOR DELINEATION ON 32" CONCRETE SAFETY BARRIER SECTION



TYPE "A" TYPE "B"  
DELINEATOR POSITION DETAILS



DELINEATOR BRACKET DETAILS

**GENERAL NOTES**

The delineators shall be spaced on 200' centers, except through curves greater than 1900' radius curvature and along ramps and ramp tapers where the spacing shall be on 100' centers. Delineators should be installed back to back when used on 32" median barrier for two-way roadways. The delineator color shall be yellow when used on the left side or white when used on the right side of the roadway.

The flat sheet sign blank shall be made of the aluminum alloy and thickness shown.

The 3" x 8" delineator sign face shall be covered with high performance white or yellow retroreflective sheeting.

The type of adhesive for reflective sheeting shall be heat activated or pressure sensitive.

The delineator bracket shall be fabricated from aluminum in the thickness and sizes shown. The material for the brackets shall comply with the Standard Specifications. All holes for mounting the delineator to the bracket shall be 3/8" diameter. The holes for mounting the bracket to the barrier shall be 7/16" diameter. All burrs and sharp edges shall be smoothed off. The brackets shall not be fabricated by the use of welding.

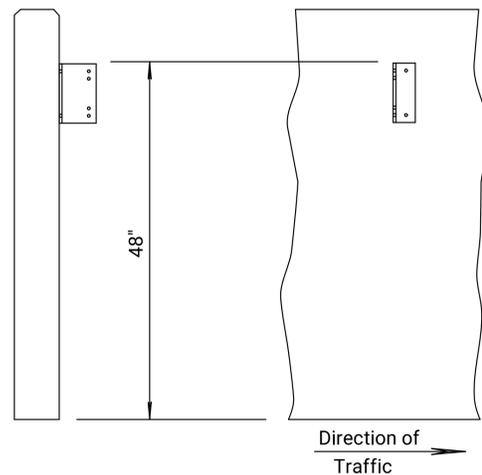
All items of the fastening accessories shall be Zinc or Cadmium plated.

The machine screws, nuts, and washers used to fasten the delineator to the bracket shall comply with the Standard Specifications.

All work and materials required for the installation of the delineators shall be Subsidiary to the bid item "Concrete Safety Barrier".

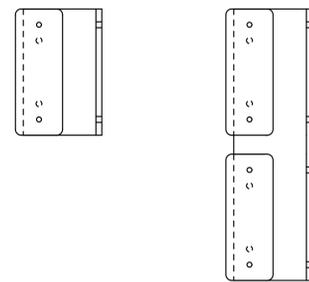
When delineators are installed on median or roadside barriers approaching a bridge, they shall be installed on the bridge rail in accordance with the spacing and details on this sheet.

The color of delineation (white or yellow) shall match the color of the pavement marking edge line.

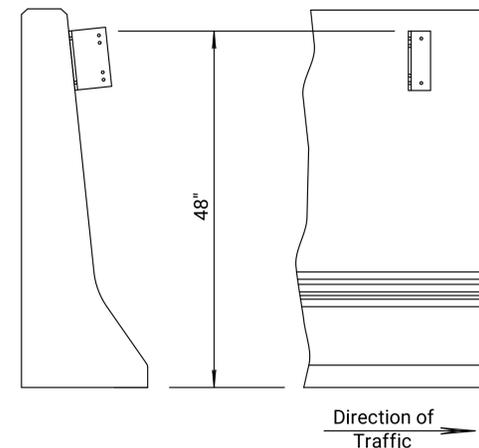


TYPICAL MOUNTING DETAIL FOR RETAINING WALL SECTION

DESIGN DETAILS FOR DELINEATION ON RETAINING WALL & 51" CONCRETE SAFETY BARRIER SECTION



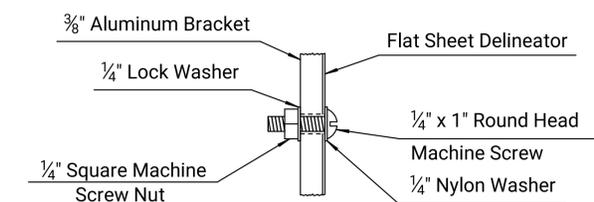
TYPE "A" TYPE "B"  
DELINEATOR POSITION DETAILS



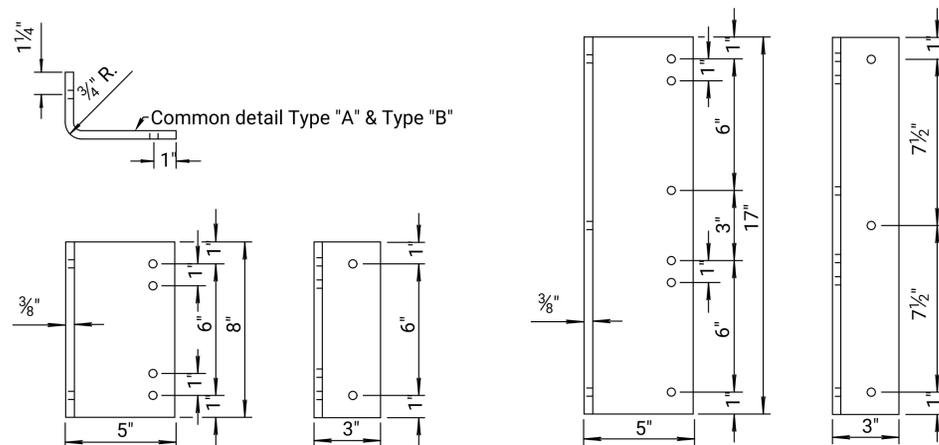
TYPICAL MOUNTING DETAIL

| Road Type                              | Right Edge Delineator | Left Edge Delineator |
|--|-----------------------|----------------------|
| Main Line                              | Type "A" White        | Type "A" Yellow      |
| Acceleration Lane<br>Deceleration Lane | Type "B" White        | Type "B" Yellow      |
| Ramp                                   | Type "A" White        | Type "A" Yellow      |

PATTERN OF DELINEATION

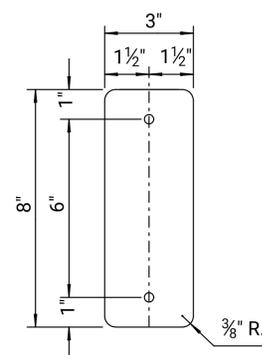


FLAT SHEET DELINEATOR MOUNTING  
DETAILS FOR ATTACHING  
DELINEATORS TO BRACKETS



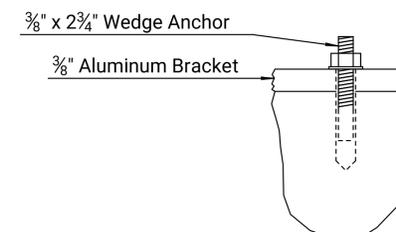
TYPE "A"  
DELINEATOR BRACKET DETAILS

TYPE "B"  
DELINEATOR BRACKET DETAILS



NOTE: The aluminum sign blanks are to be ASTM B-209(H), Alloy 6061-t6, or 5154-H38, or 5052-H38. The aluminum sign blank shall be 0.040" thick. Both faces and all cut edges of sign to be degreased and etched. All holes shall be 3/16" in diameter.

FLAT SHEET SIGN BLANK DETAILS



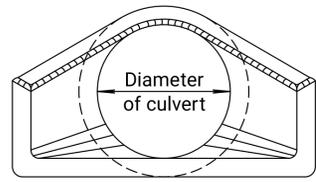
DETAILS FOR ATTACHING BRACKETS  
TO SAFETY BARRIER

| NO. | DATE    | REVISIONS                         | BY     | APP'D  |
|-----|---------|-----------------------------------|--------|--------|
| 3   | 6-03-09 | Removed button & diamond details  | S.W.K. | J.O.B. |
| 2   | 6-05-07 | Changed degree of curve to radius | S.W.K. | J.O.B. |
| 1   | 2-28-03 | Revised layout and details.       | S.W.K. | J.O.B. |

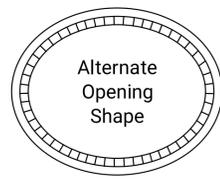
| KANSAS DEPARTMENT OF TRANSPORTATION                       |            |            |                 |  |
|---|------------|------------|-----------------|--|
| DESIGN DETAILS FOR DELINEATION ON CONCRETE SAFETY BARRIER |            |            |                 |  |
| RD624   |            |            |                 |  |
| DESIGNED  | 12-18-09   | APP'D      | James O. Brewer |  |
| DESIGN CK.  | DETAILED   | QUANTITIES | TRACE Bowser    |  |
| DESIGN CK.  | DETAIL CK. | QUAN. CK.  | TRACE CK. King  |  |

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 33        | 148          |

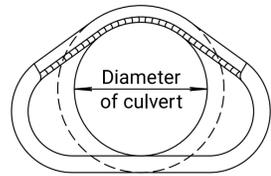
Note to Designer: KDOT Pipe Policy provides guidance in identifying the prohibited and/or restricted uses of CSP, ACSP, PEP, PVC, CAP & RCP. Provide end sections of the same type and coating as the pipe. Exceptions to this are noted in the Standard Specifications. Refer to the KDOT Design Manual, Volume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

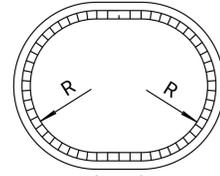


Alternate Opening Shape

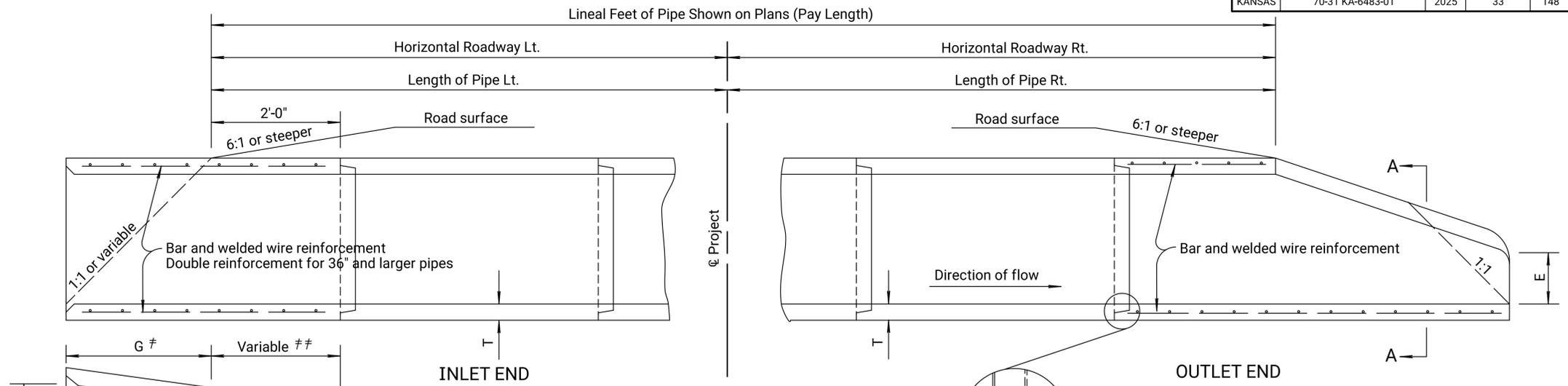


SECTION A-A

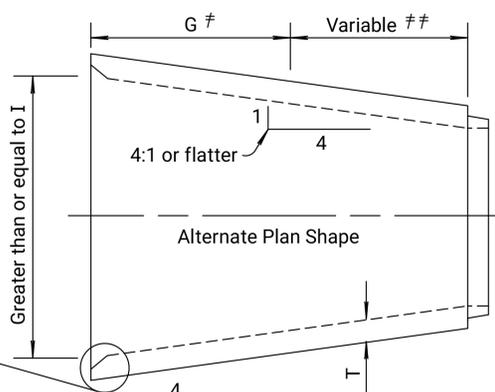
Showing rounding of inside edge of end section.



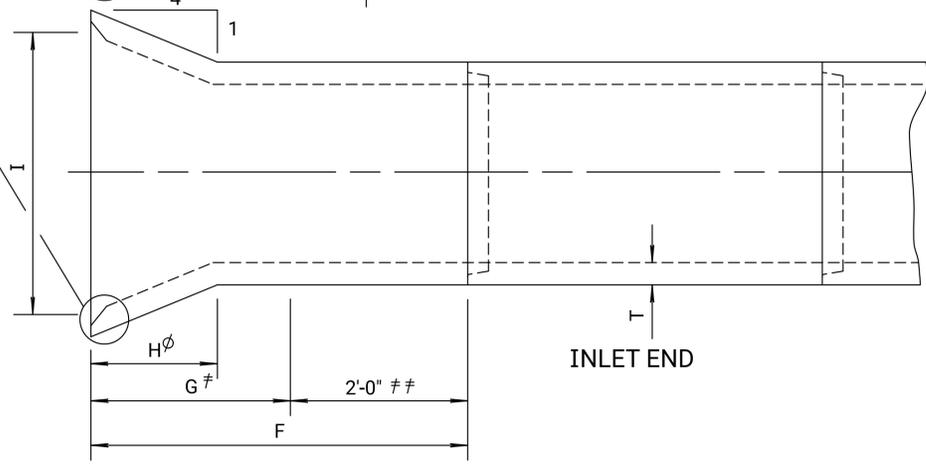
END ELEVATION (TYPE III)



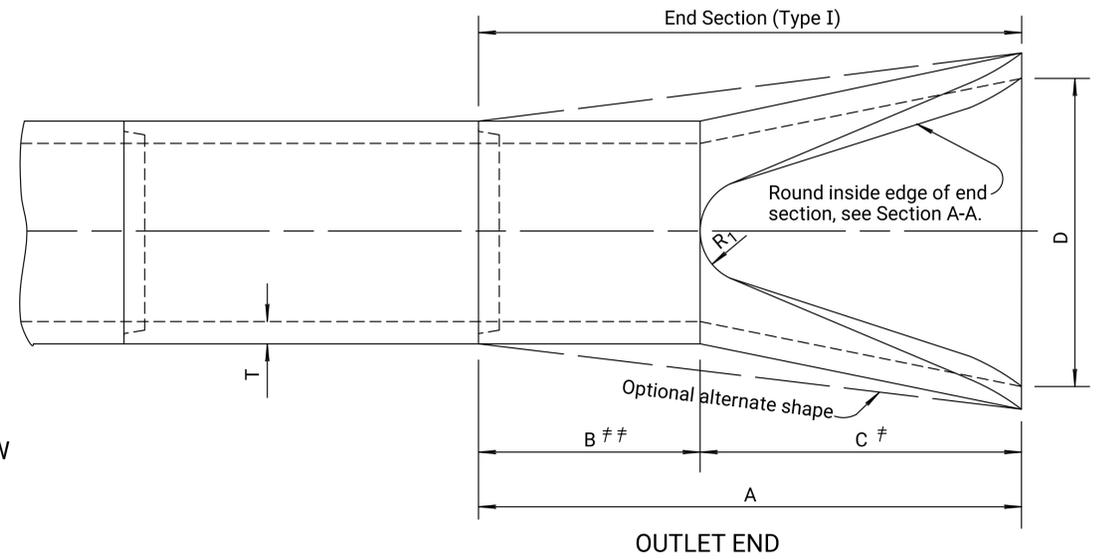
ELEVATION SECTION



Alternate Plan Shape



PLAN VIEW



OUTLET END

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

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

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

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

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

Plotted by: Elias.Esquivel@ks.gov 13-MAR-2025 15:05  
File: KA64830Trss662.dgn

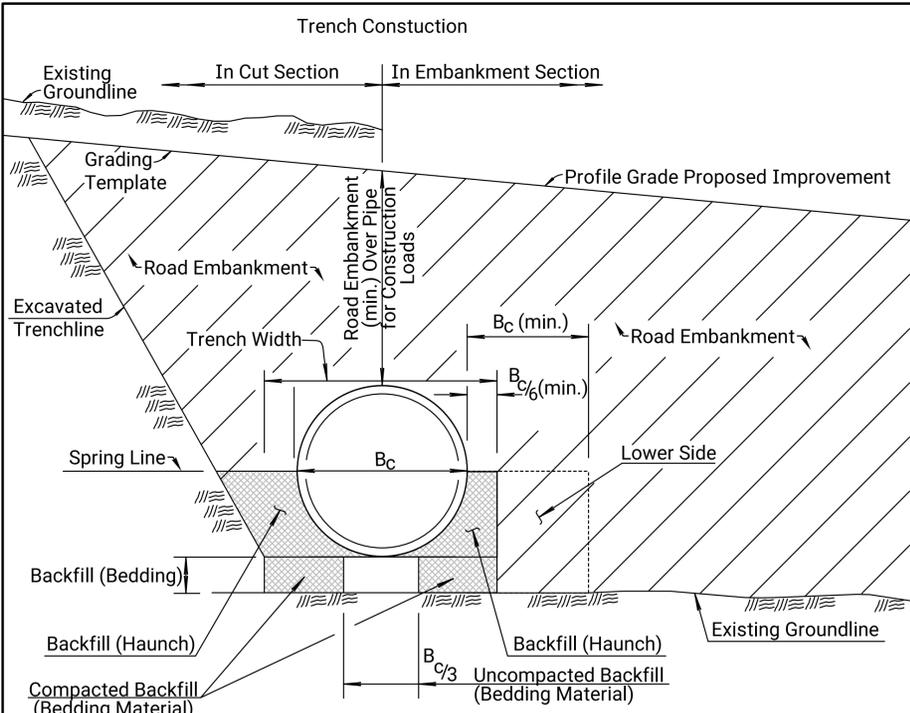
|     |          |                                |        |        |
|-----|----------|--------------------------------|--------|--------|
| 02  | 04-18-08 | Added ref. to KDOT Pipe Policy | S.W.K. | J.O.B. |
| 01  | 04-05-05 | Revised reinforcement callout  | S.W.K. | J.O.B. |
| NO. | DATE     | REVISIONS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

KANSAS DEPARTMENT OF TRANSPORTATION  
**CONCRETE END SECTIONS FOR CONCRETE PIPES**  
TYPE I & SIDE TAPERED INLET SECTION (TYPE III)  
RD662

|               |            |            |                 |
|---------------|------------|------------|-----------------|
| FHWA APPROVAL | 06-27-08   | APPD.      | James O. Brewer |
| DESIGNED      | DETAILED   | QUANTITIES | TRACED          |
| DESIGN CK.    | DETAIL CK. | QUAN. CK.  | TRACE CK.       |

KDOT Graphics Certified 05-16-2022 Sh. No. 33

KDOT Graphics Certified



**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.

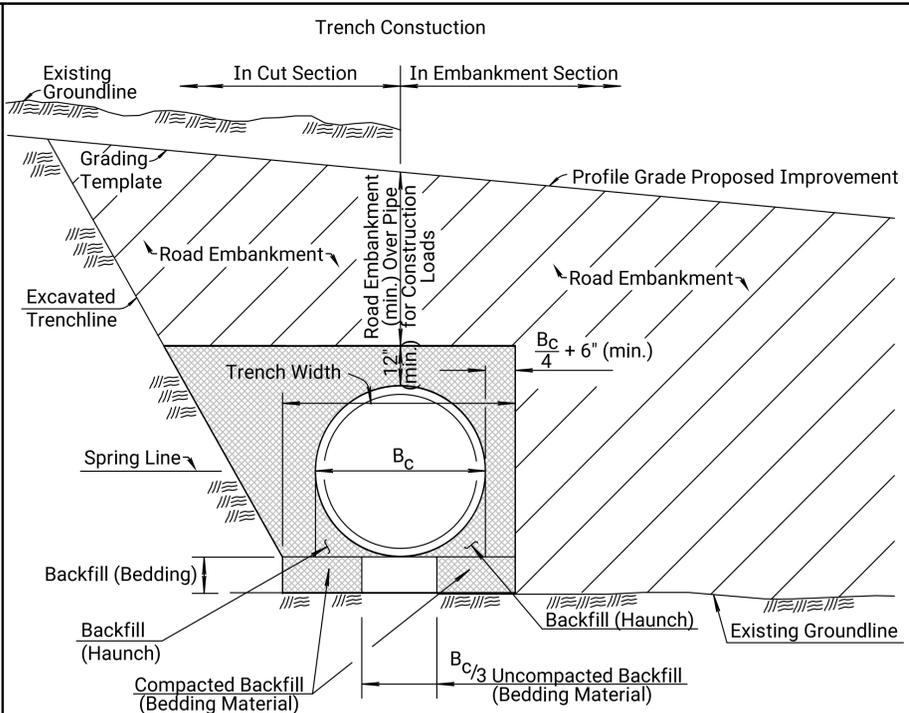
Trench Width: The minimum required trench width is the greater of:  
 $1.33 \times B_c$  or  $B_c + 24$ "

$B_c$ : Outside Pipe Diameter

| 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" |

| 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  $\frac{1}{2}$  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.

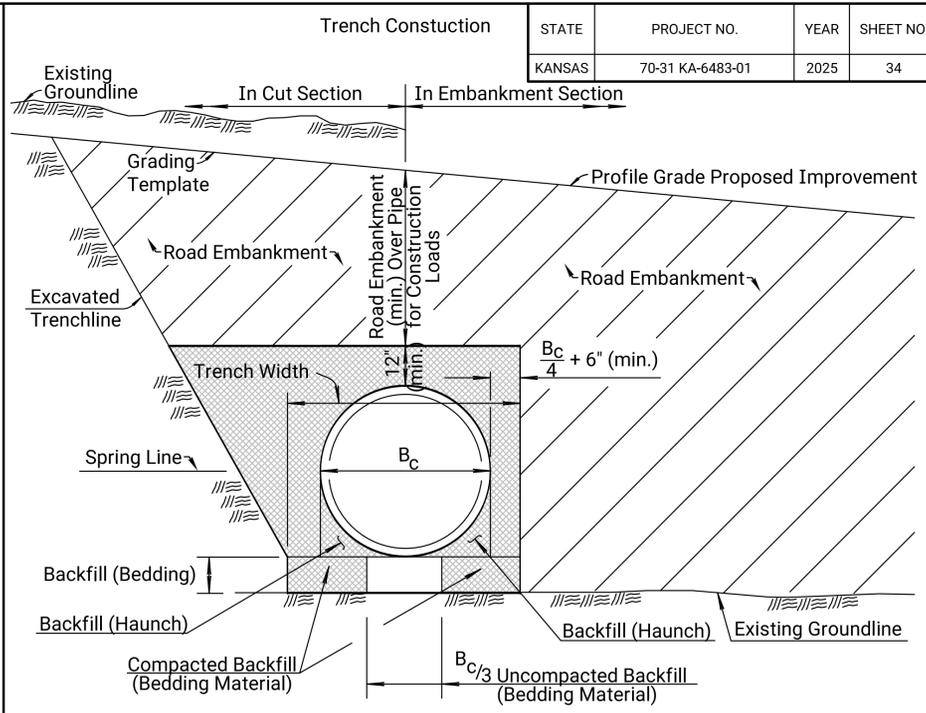
Road Embankment: For compaction See KDOT Road Standard Drawing, Foundation Treatment & Compaction of Earthwork

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

| 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  $\frac{1}{2}$  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

| 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 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.

Plotted by : Elias.Esquivel@ks.gov  
File : KA648301rss658.dgn  
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|     |          |                 |        |        |
|-----|----------|-----------------|--------|--------|
| 01  | 05-09-22 | Initial Release | A.L.R. | T.T.R. |
| NO. | DATE     | REVISIONS       | BY     | APPD   |

KANSAS DEPARTMENT OF TRANSPORTATION

## PIPE INSTALLATION DETAILS

RD658

|            |            |            |           |
|------------|------------|------------|-----------|
| DESIGNED   | DETAIL CK. | QUANTITIES | TRACED    |
| DESIGN CK. | DETAIL CK. | QUAN. CK.  | TRACE CK. |

KDOT Graphics Certified    06-10-2022    Sh. No. 34

KDOT Graphics Certified



| Item<br>Location | SUMMARY OF QUANTITIES               |   |                                      |                                 |                                    |                    |                             |                           |                          |  |  |                                     |   |   |  |  |  |   |                                     |                                   |
|------------------|-------------------------------------|---|--------------------------------------|---------------------------------|------------------------------------|--------------------|-----------------------------|---------------------------|--------------------------|--|--|-------------------------------------|---|---|--|--|--|---|-------------------------------------|-----------------------------------|
|                  | Excavation<br>Class III<br>Cu. Yds. | Core Hole<br>(Investigative)<br>Lin.Ft. | Concrete                             |                                 | Reinforcing Steel                  |                    | Structural Steel            |                           |                          | Bearings<br>(Steel Reinf.)<br>(Elast.)<br>Each | Welded Stud<br>Shear<br>Connectors<br>Each | Bridge Deck<br>Grooving<br>Sq. Yds. | Piles<br>(Steel)<br>(HP12x53)<br>Lin. Ft. | Drilled Shaft<br>(48")<br>(Cased)<br>Lin. Ft. | Sonic Test<br>(Drill Shaft)<br>(Set Price)<br>Each | Bridge<br>Backwall<br>Prot. System<br>Sq. Yds. | Abutment<br>Aggregate<br>Drain<br>Cu. Yds. | Slope Protection<br>(Aggregate)<br>Cu. Yds. | Falsework<br>Inspection<br>Lump Sum | Cast Steel<br>Pile Points<br>Each |
|                  |                                     |   | (Grade 4.0)<br>(AE) (SA)<br>Cu. Yds. | (Grade 4.0)<br>(AE)<br>Cu. Yds. | Epoxy Coated<br>(Grade 60)<br>Lbs. | (Grade 60)<br>Lbs. | M270<br>(Gr. 50WT3)<br>Lbs. | A709<br>(Gr. 50W)<br>Lbs. | A709<br>(Gr. 50)<br>Lbs. |  |  |                                     |   |   |  |  |  |   |                                     |                                   |
| Abutment No. 1   | 120                                 |   | **                                   | 18                              | **                                 |                    |                             |                           |                          |  |  |                                     | 315                                       |   |  | 37   | 45   | 232   |                                     | 7                                 |
| Pier No. 1       |                                     | 54                                      |                                      | 62.8                            |                                    | 12,900             |                             |                           |                          | 5  |  |                                     |   | 141   |  |  |  |   |                                     |                                   |
| Pier No. 2       |                                     | 53                                      |                                      | 64.4                            |                                    | 13,200             |                             |                           |                          | 5  |  |                                     |   | 135   |  |  |  |   |                                     |                                   |
| Pier No. 3       |                                     | 54                                      |                                      | 62.8                            |                                    | 12,900             |                             |                           |                          | 5  |  |                                     |   | 141   |  |  |  |   |                                     |                                   |
| Abutment No. 2   | 120                                 |   | **                                   | 18                              | **                                 |                    |                             |                           |                          |  |  |                                     | 322                                       |   |  | 37   | 45   | 250   |                                     | 7                                 |
| Substr. Total    | 240                                 | 161                                     |                                      | 226                             |                                    | 39,000             |                             |                           |                          | 15   |  |                                     | 637                                       | 417   | 1  |  |  |   |                                     | 14                                |
| Superstr. Total  |                                     |   |                                      | 350                             |                                    | 87,930             |                             | 170,113                   | 23,720                   | 1,062  | 4740                                       | 882                                 |   |   |  | 74   | 90   | 482   |                                     |                                   |
| Total            | 240                                 | 161                                     | 350                                  | 226                             | 87,930                             | 39,000             | 170,113                     | 23,720                    | 1,062                    | 15   | 4740                                       | 882                                 | † 637                                     | 417   | 1  | 74   | 90   | 482   | Lump Sum                            | 14                                |

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

\*\* Quantities are included in the Superstr. Total Quantity.

† Summary of Piling  
Abutment No. 1 7@ 45'  
Abutment No. 2 7@ 46'

NOTE: Only steel pile HP12x53 shall be used on this project.

GENERAL NOTES

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

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

SUBSTRUCTURE CONCRETE STAIN PROTECTION AND SANDBLASTING: Protect the exposed surface of the piers and the front face of the abutments (by covering with polyethylene sheeting or other approved method) prior to erecting the structural steel and until after the deck slab has been placed. After the bridge is completed and prior to acceptance; sandblast the piers and front face of the abutment to a uniform appearance by removing all laitance, staining, any visible form lines, etc. This work will be subsidiary to structural steel.

DEMOLITION PLANS: This is a Category C Demolition. Submit detailed Demolition Plans to the State Bridge Office (or Bureau of Local Projects) at least 6 weeks before beginning the demolition process. Portions of the submitted details shall bear the seal of a Licensed Professional Engineer. Identify, on the plans, the Demolition Supervisor meeting the requirements of the KDOT Specifications. The Demolition Supervisor will attend the required pre-demolition meeting before these operations begin, as described in KDOT Specifications. No demolition work will begin without approved Demolition Plans.

PILING: Drive all piling to penetrate or bear upon the Funston Formations. Driving shall stop when in the opinion of the Engineer additional driving may damage the piling. Drive all piling to the Pile Driving Formula Load of:

Abutment No. 1 86.6 Tons  
Abutment No. 2 86.6 Tons

DESIGN DATA

DESIGN SPECIFICATIONS: AASHTO Specifications, 2020 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  
Structural Steel (M270 Gr. 50W T3) Fy = 50 ksi  
Structural Steel (A709 Gr. 50W) Fy = 50 ksi  
Structural Steel (A709 Gr. 50) Fy = 50 ksi  
Steel Piles Fy = 50 ksi

DESIGN DESIGNATION J HILL RD DESIGN DESIGNATION I70

|                     |                      |
|---------------------|----------------------|
| AADT (2027) = 2,950 | AADT (2027) = 14,325 |
| AADT (2047) = 3,825 | AADT (2047) = 18,525 |
| DHV = 11%           | DHV = 9%             |
| D = 60%             | D = 55%              |
| T = 5.5%            | T = 14.5%            |
| V = 45 MPH          | V = 75 MPH           |
| C of A = NONE       | C of A = FULL        |
| Clear Zone = 20'    | Clear Zone = 34'     |

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

As a minimum drive each pile to the load and penetration, but in no case shall the pile be driven to more than 110% of Pile Driving Formula Driving Load. At any location where problems are experienced, pile damage is suspected, or the Pile Driving Formula Load occurs significantly above the design pile tip elevation, the Engineer may request that the Pile Driving Analyzer (PDA) equipment be used.

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 M 32, and are included in the bid item "Reinforcing Steel (Gr. 60)". Where noncoated bars come in contact with epoxy coated bars, they need not be coated.

PILING SPLICE LOCATION: Integral pile splice locations and weld testing criteria for, Abutments No. 1 & 2 will follow the "Standard Pile Details" Sheet (BR110).

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

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

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

BACKFILL COMPACTION: Compact backfill at the abutments and piers

BROKEN CONCRETE: Waste the broken concrete from the existing bridge on sites provided by the Contractor and approved by the Engineer.

PROTECTION OF I-70 TRAFFIC: The Contractor shall submit a plan, for the protection of I-70 traffic during deck construction, for approval by the Engineer.

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

METAL HANDRAIL: Salvage the metal handrail from Existing Bridge, to remain the property of KDOT. Coordinate with the Engineer on site for pickup.

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.

All Piers are designed with "crashwalls", to meet AASHTO requirements for a Vehicle Impact Loading = 600 Kips in any direction.

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.

ABUTMENT AGGREGATE DRAIN: See the General Notes on the "Abutment Aggregate Drain" sheet.

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

| LRFR RATING FACTORS               |               |           |           |
|-----------------------------------|---------------|-----------|-----------|
| Design Load                       | Rating Level  | Inventory | Operating |
|                                   | HL-93 Loading |           | 1.383     |
| 2008 Manual for Bridge Evaluation |               |           |           |

| LFD RATING FACTORS                   |              |           |           |
|--------------------------------------|--------------|-----------|-----------|
| Truck                                | Rating Level | Inventory | Operating |
|                                      | HS-20 (36T)  |           | 1.786     |
| Type HET (110T)                      |              |           | 1.399     |
| 2002 LFD Rating, 17th Edition AASHTO |              |           |           |

| INDEX TO BRIDGE DRAWINGS |  |
|--------------------------|--|
| Sheet No.                | Drawing  |
| 36-37                    | General Notes and Quantities                   |
| 38                       | Contour Map                                    |
| 39                       | Construction Layout                            |
| 40                       | Engineering Geology                            |
| 41-42                    | Abutment Details                               |
| 43                       | Abutment Aggregate Drain                       |
| 44                       | Bridge Berm and Slope Protection               |
| 45                       | Pier Details                                   |
| 46                       | Auxiliary Pier Details                         |
| 47                       | Drilled Shaft Details                          |
| 48                       | Framing Plan                                   |
| 49                       | Beam Details                                   |
| 50                       | Bolted Field Splice Details                    |
| 51                       | Steel Erection, Fit Up, and Bolting Procedures |
| 52                       | Diaphragm Details                              |
| 53                       | Abutment Frame Details                         |
| 54-55                    | Bearing Device Details                         |
| 56-57                    | Superstructure Details                         |
| 58                       | Superstructure Auxiliary Details               |
| 59                       | F4 Barrier Details                             |
| 60                       | Bill of Reinforcing Steel and Bending Diagrams |
| Standards                |  |
| 61                       | Bridge Excavation                              |
| 62                       | Standard Pile Details                          |
| 63                       | Supports and Spacers for Reinforcing Steel     |

| NO.                                 | DATE       | REVISIONS  | BY            | APPD       |
|-------------------------------------|------------|------------|---------------|------------|
| KANSAS DEPARTMENT OF TRANSPORTATION |            |            |               |            |
| Br. No. 70-31-298.98 (095)          |            |            | Sta. 50+00.00 |            |
| GENERAL NOTES AND QUANTITIES        |            |            |               |            |
| Proj. 70-31 KA-6483-01              |            |            | Geary Co.     |            |
| DESIGNED                            | HD         | DETAILED   | HD            | QUANTITIES |
| CADD                                | ECM        | DESIGN CK. | SGBAJH        | DETAIL CK. |
| SGBAJH                              | DETAIL CK. | SGBAJH     | QUAN. CK.     | SGBAJH     |
| CADD CK.                            | HD         |            |               |            |

GENERAL NOTES

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 37        | 148          |

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

**FABRICATION OF FIELD SPLICES:** Prepare joints for the field splices in accordance with KDOT Specifications. Use Type "B" shop laydown.

**STRUCTURAL STEEL:** The rolled girders and flange and web splice plates shall meet AASHTO M270 Gr. 50W T3 requirements. All other structural steel shall meet ASTM 709 Gr. 50W, unless noted otherwise. Shop and Field Splices shall be made only where shown on the Contract Plans as a "splice" or as an "optional splice." Elimination of any "splice" may be requested.

**SHOP DETAILS:** Reference blocking diagrams on the shop details to a level line running the entire length of the girder.

**ANCHOR BOLTS:** Place the reinforcing bars below the bearing devices to clear the anchor bolts

**ANCHOR BOLTS:** Anchor bolts will adhere to KDOT Standard Specification Division 1600 (Grade55) with the following exception. Do not use cut threads. Use rolled threads

**COLUMN CONSTRUCTION:** Cure the Crash Wall 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.

**PAINTING:** The shop and field coats applied to Structural Steel shall conform to an inorganic zinc primer with a waterborne acrylic finish coat. The finish coat will be Kansas (Color), this color will match Federal Standard #20045

**PAINTING:** Blast clean all surfaces of all weathering steel, including all contact surfaces of bolted connections, to meet SSPC-SP6 Specifications (latest Revision). Blast clean to meet SSPC-SP10 Specifications and prime coat the embedded portion of the girders, including the abutment diaphragms; the top flanges, including the shear studs; and the top flange splice plates in accordance with KDOT Specifications.

**TOUCH-UP:** Prepare and paint all bolts, nuts, studs, and other small areas of damaged paint (1 square yard or less) requiring touch-up, with an approved organic zinc primer.

**PAINTING TOP FLANGES:** (Studs applied in the shop) Apply a 3 mil primer coat of an approved inorganic zinc primer to the tops of the top flanges and to the studs.

(Studs applied in the field) Shop Work Blast clean the tops of the top flanges to SSPC-SP10 Specifications (latest Revision).

Field Work Blast clean the tops of the top flanges to SSPC-SP6 Specifications (latest Revision) before the studs are applied. After the studs are applied, blast clean the tops of the top flanges and the studs to SSPC-SP6 Specifications and paint with an approved organic zinc primer to a minimum dry film thickness of 3 mils.

**PLACING SEQUENCE:** The Contractor will adhere to the placing direction/sequence shown on the plans. Changes will be accepted only if the Contractor's Engineer adjusts the deflection diagram so that the Contractor can adjust the fillet depth [and Headed Stud Anchor heights] accordingly. This revised diagram will be approved by the design Engineer prior to deck forming.

**BEARING (Steel Reinforced Elastomeric)(Method A):** Bearing Devices at all piers shall be fabricated with an elastomer satisfying:  
 - Shore A Durometer Hardness of 60  
 - Low Temperature Grade 3 requirements  
 - Type A certification for elastomeric bearing device acceptance is required  
 - Include design method and all material properties on shop details.

**WELDING:** Material, Fabrication and Construction shall conform to KDOT Specifications. On the shop drawings, show a code or symbol at the tail of the weld symbol, which refers to an approved prequalified weld procedure.

**ERECTION:** Bring each line of girders to the correct line, grade (or relative grade) and camber, and secure in place prior to connection of the girder field splices. Provide falsework bents as necessary to maintain the correct line and elevation. Leave the falsework bents in place until all girder splice connections are completed. Submit information which clearly shows the proposed layout and use of falsework bents. The Engineer shall approve such information prior to erection of structural steel.

**ERECTION PLANS:** This is a Category C Structure. Submit detailed Erection Plans to the State Bridge Office (or Bureau of Local Projects) at least 4 weeks before beginning the erection process. Portions of the submitted details shall bear the seal of a licensed Professional Engineer. Identify, on the Erection Plans, the Erection Supervisor required by KDOT Specifications. No structural erection work will begin without approved erection plans.

**ERECTION ELEVATION CHECKS:** After the abutment and pier concrete has cured and before setting any structural steel, present verification to the Engineer that the elevations at the bearings match plan elevation ( $\pm \frac{1}{4}$ "). Present verification to the Engineer that the elevations at all field splice locations match the elevations ( $\frac{1}{2}$ ") in the plans before any connection is fully tightened. (For steel girders that are blocked on the ground, fully tighten the bolted connections prior to erection.)

**BOLTS:** All bolts, nuts and hardened flat washers shall conform to the heavy hex structural requirements of ASTM F3125 Grade A325, Type 3, and KDOT Specifications unless otherwise noted. Direct Tension Indicators (DTIs) are to comply with the requirements of the latest edition of ASTM F959. No allowance will be made for high strength bolts used for permanent or temporary connections. This work is subsidiary to the bid item, "Structural Steel". The number of bolts is shown for the convenience of the Contractor.

**BOLTED CONNECTIONS:** Girder Connections: Use  $\frac{7}{8}$ " diameter heavy hex structural bolts for the main member connections. Use  $\frac{13}{16}$ " diameter bolt holes. Do not ream during field erection. Accurately align all connections by driving  $\frac{13}{16}$ " diameter drift pins in all corners and in , of the remaining holes in each plate. See KDOT Specifications.

Secondary Member Connections: Use  $\frac{3}{4}$ " diameter heavy hex structural bolts for the secondary member connections. Use  $\frac{13}{16}$ " diameter bolt holes. Oversized and/or slotted holes, as specified in the KDOT Specifications, may be used in only one of the two members connected and must be shown in the approved shop drawings. Oversized and/or slotted holes may require additional standard hardened washers or plate washers. Report to the Engineer prior to any required field reaming that will remove more than  $\frac{1}{4}$ " of material from one ply of the connected parts. Use Direct Tension Indicators (DTIs) on all high strength bolts. Place the DTI under the bolt head and turn the nut to tighten. This method is preferred whenever possible. Face the protrusions on the DTI to the underside of the bolt head. Place a hardened flat washer under the nut. See KDOT Specifications.

**CONSTRUCTION JOINTS:** The construction joints shown are optional with the Contractor, except where noted as required. If used, place the construction joints only at locations shown or at locations approved by the Engineer.

**CONCRETE:** Superstructure concrete is bid as Concrete (Grade 4.0)(AE)(SA). Substructure concrete is bid as Concrete (Grade 4.0)(AE). If desired, the Contractor may use Concrete (Grade 4.0) in the footings and in the abutments below the construction joint. Bevel all exposed edges of all concrete with a f" triangular molding, except where noted on the plans.

**CONCRETE PLACING:** Place and hand vibrate all concrete for the abutment above the construction joint to the bottom of deck elevation just prior to the normal paving train operations. Do this work in a manner to avoid cold joints in either the slab or in the abutment.

**FILLETS:** Construct the finished deck to plan grade by varying the depth of the fillet over the beam to provide for beam profile, concrete dead load deflection and, if necessary, vertical curvature. After the beams are completely erected and the falsework bents are removed, profile each beam. Correct any variation between the actual profile and the concrete dead load deflection shown in the plans by varying the depth of the concrete fillets over the beams so that the finished floor is constructed to the theoretical grade. The minimum depth of the slab over the beam shall be 9".

The theoretical amount of concrete required for the fillets is 8.68 C.Y. This amount of concrete is included in the Summary of Quantities. Any additional concrete required to construct the fillets will be subsidiary.

**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.

**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.

**BEARING (STEEL REINFORCED ELASTOMERIC):** Elastomeric Bearing Device shall be factory bonded to the steel sole plate by a vulcanization process. The steel sole plate and swedge anchor bolt are subsidiary to the bid item, "Bearing (Steel Reinforced Elastomeric)" and shall be furnished by the bearing device fabricator

**WELDED STUD SHEAR CONNECTORS:** Weld Shear Stud Connectors with automatically timed stud welding equipment connected to a suitable power source. All stud welding shall conform to KDOT Specifications.

**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.

**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 columns as required by the KDOT Specifications before placing pier beam concrete. Do not remove falsework used to support the pier beam until the pier beam concrete has cured as required by the KDOT Specifications. Do not set girders or beams on the pier beam until after the falsework is removed or the pier beam concrete has 0.75 f'c strength as tested.

**DRILLED SHAFTS:** Construct the drilled shafts using the cased method. A permanent casing is required. All excavation, concrete, reinforcing steel, pipes for Sonic Testing, casings, labor, and incidentals necessary to complete the shaft as shown on the details and as directed by KDOT Specifications shall be included in the bid item "Drilled Shafts (48)". Use Concrete (Gr. 4.0) 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 drilled shaft without the approval of the Chief Geologist.

**PREFORMED ANCHOR BOLT HOLES:** Preform 3 inch diameter holes using only corrugated polyethylene tubing (Type C) at the locations shown. When temperatures are expected to go below freezing, seal the preformed holes or fill them with a propylene glycol-based antifreeze to prevent expansion damage. The holes will be free of water, antifreeze or other foreign materials at the time of grouting the anchor bolts. The polyethylene tubing may remain in-place. Trim the tubing flush with the top of the concrete. This work shall be subsidiary to Concrete Grade 4.0 (AE).

**FALSEWORK INSPECTION:** This project has falsework plan requirements which are considered "Category 1" by KDOT specifications. The falsework designer of record will conduct an inspection of the as-built falsework. The bid item, "Falsework Inspection" is full compensation for all materials, labor and equipment. See KDOT specifications.

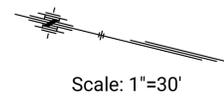
|                                     |         |            |               |            |    |
|-------------------------------------|---------|------------|---------------|------------|----|
|                                     |         |            |               |            |    |
| NO.                                 | DATE    | REVISIONS  | BY            | APPD       |    |
| KANSAS DEPARTMENT OF TRANSPORTATION |         |            |               |            |    |
| Br. No. 70-31-298.98 (095)          |         |            | Sta. 50+00.00 |            |    |
| <b>GENERAL NOTES AND QUANTITIES</b> |         |            |               |            |    |
| Proj. 70-31 KA-6483-01              |         |            |               | Geary Co.  |    |
| DESIGNED                            | HD      | DETAILED   | HD            | QUANTITIES | HD |
| CADD                                | ECM     |            |               |            |    |
| DESIGN CK.                          | SGB,AJH | DETAIL CK. | SGB,AJH       | CADD CK.   | HD |

| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 38        | 148          |

P.O.T. Sta. 46+10.00  
 N 549,588.590 E 8,414,686.041  
 1. Set 1/2" x 15" Rebar 0.3' Deep  
 2.  $\phi$  Top E end RCP 51.5' E  
 3. TW of J. Hill Rd. 1.0' E  
 4. Set Spike & Washer E. Face of Post 46.6' ENE

$\phi$  Bridge Sta. 50+00 =  $\phi$  I-70 Hwy Sta. 606+31.00  
 =Plan sta. 50+00 @ I-70 Sta. 606+18.00 In 1990 Proj.  
 No. 70-31 2611-02  
 1. Set Mag Nail & KDOT Washer 0.0' Deep  
 2. NE Cor of Hubguard of Bridge 127.1' NNW  
 3. NW Cor of Hubguard of Bridge 127.1' NNE

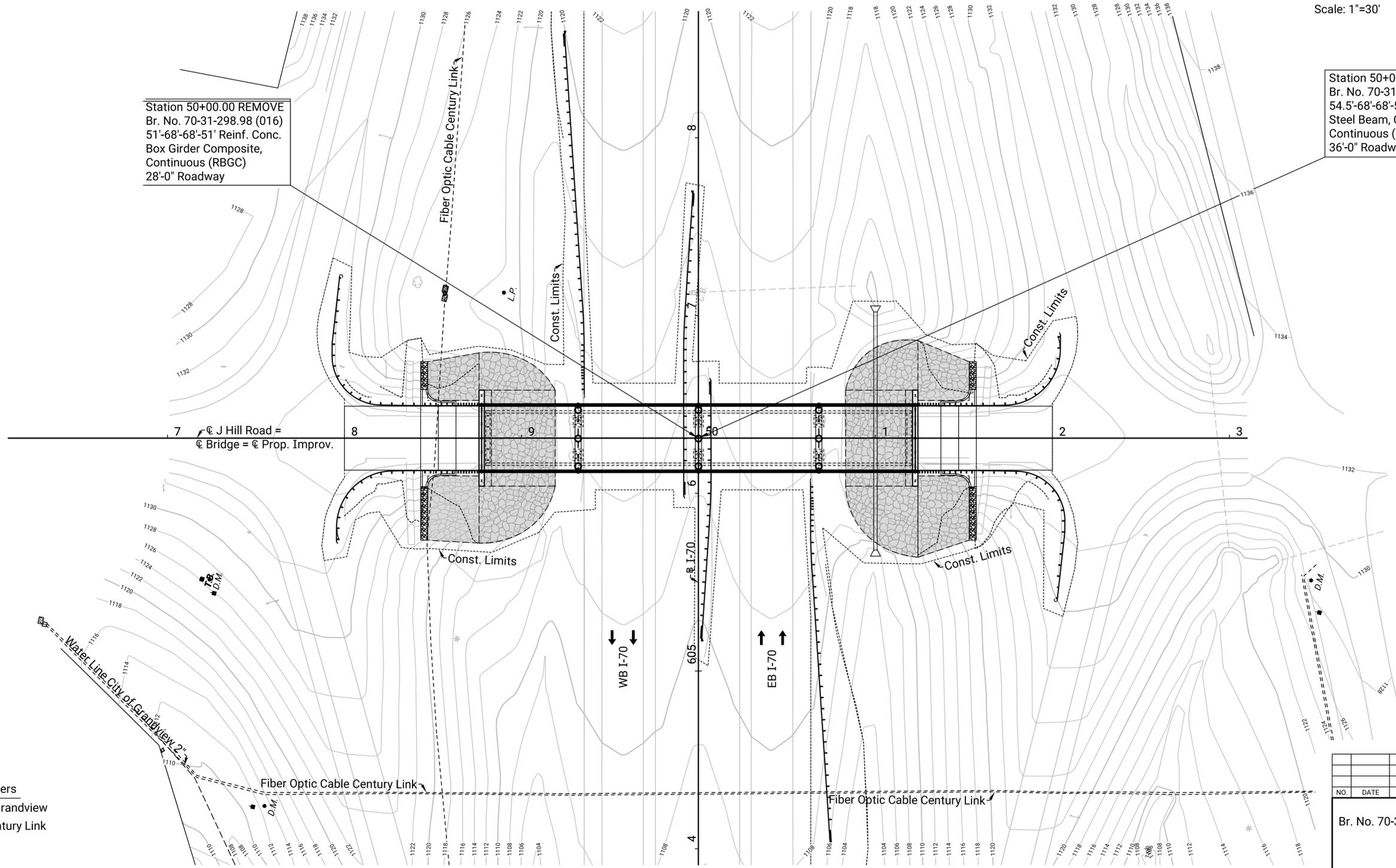
P.O.T. Sta. 53+10.00  
 N 548,908.585 E 8,414,852.152  
 1. Set 1/2" x 15" Rebar 0.3' Deep  
 2. TW of J Hill Road 0.5' E  
 3. TW of Smokey Ln. 32.0' S  
 4.  $\phi$  Top E. End of RCP 46.6' ENE



Scale: 1"=30'

Station 50+00.00 REMOVE  
 Br. No. 70-31-298.98 (016)  
 51'-68'-68'-51' Reinf. Conc.  
 Box Girder Composite,  
 Continuous (RBGC)  
 28'-0" Roadway

Station 50+00.00 CONSTRUCT  
 Br. No. 70-31-298.98 (095)  
 54.5'-68'-68'-54.5' Weathering  
 Steel Beam, Composite,  
 Continuous (WMCC)  
 36'-0" Roadway



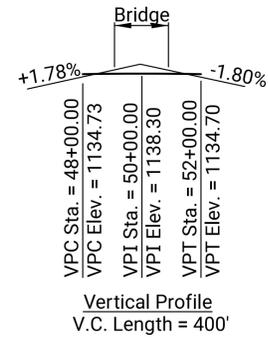
Utility Owners  
 Water - City of Grandview  
 Fiber Optic - Century Link

Vertical Datum: NAVD88

Plotted by : Erik Meyer@ks.gov 13-MAR-2025 15:45  
 File : ka648301bbr0091-001.dgn

| NO.   | DATE       | REVISIONS  | BY       | APPD          |
|---|------------|------------|----------|---------------|
| KANSAS DEPARTMENT OF TRANSPORTATION         |            |            |          |               |
| Br. No. 70-31-298.98 (095)                  |            |            |          | Sta. 50+00.00 |
| <b>CONTOUR MAP</b><br>J-Hill Road over I-70 |            |            |          |               |
| Proj. 70-31 KA-6483-01                      |            |            |          | Geary Co.     |
| DESIGNED                                    | DETAILED   | QUANTITIES | CADD     |               |
| DESIGN CK.                                  | DETAIL CK. | QUAN. CK.  | CADD CK. |               |

| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 39        | 148          |



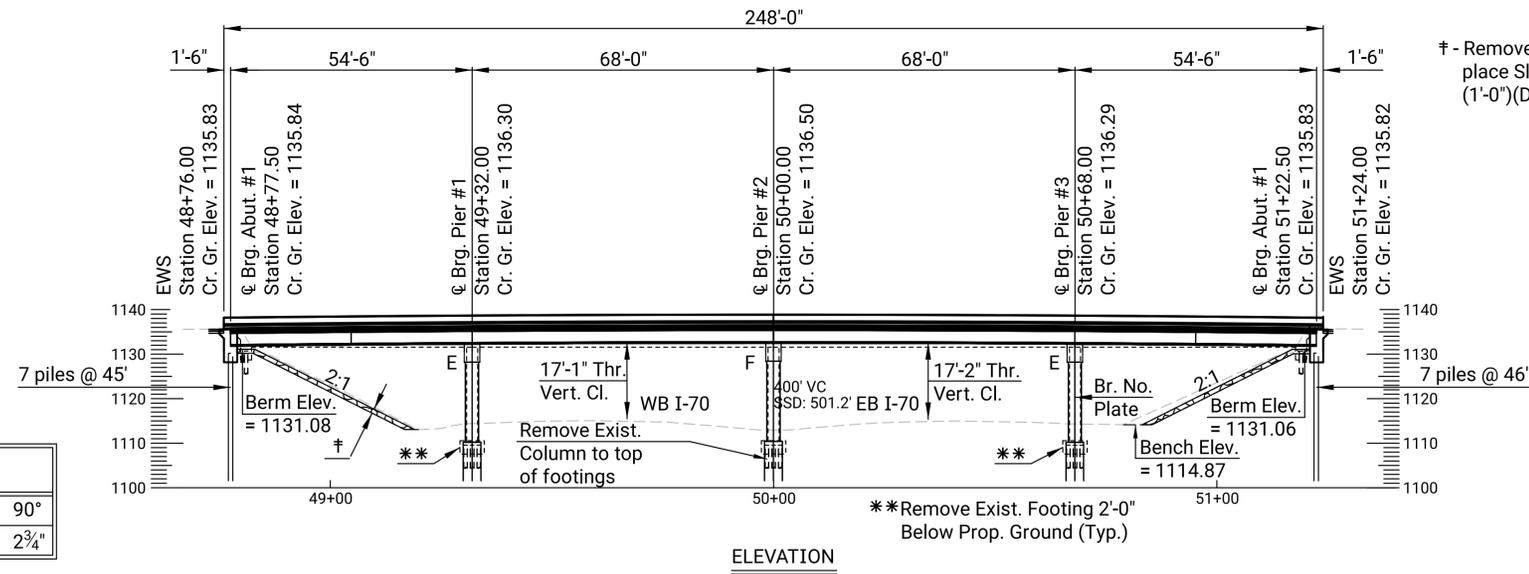
| Temperature (F°)             | 40°    | 50°    | 60° | 70° | 80°    | 90°    |
|------------------------------|--------|--------|-----|-----|--------|--------|
| Formed Concrete Opening Size | 3 1/4" | 3 1/8" | 3"  | 3"  | 2 7/8" | 2 3/4" |

Temperature (F°) Average Ambient Temperature over previous 24 hours.

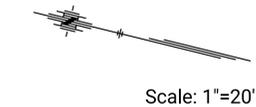
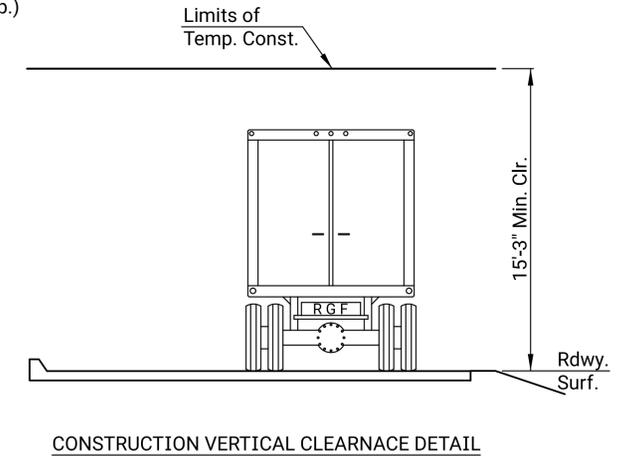
B.M. #10 Set 1/2" x 24" rebar with alum. cap stamped GE1  
508.27' Rt. I-70 @ Sta. 605+42.11 Elev. = 1130.21

54'-6" - 68' - 68' - 54'-6" Weathering Steel  
Beam Composite, Continuous (WMCC)  
Pile Bent Abut. and Column Bent Piers  
36'-0" Roadway

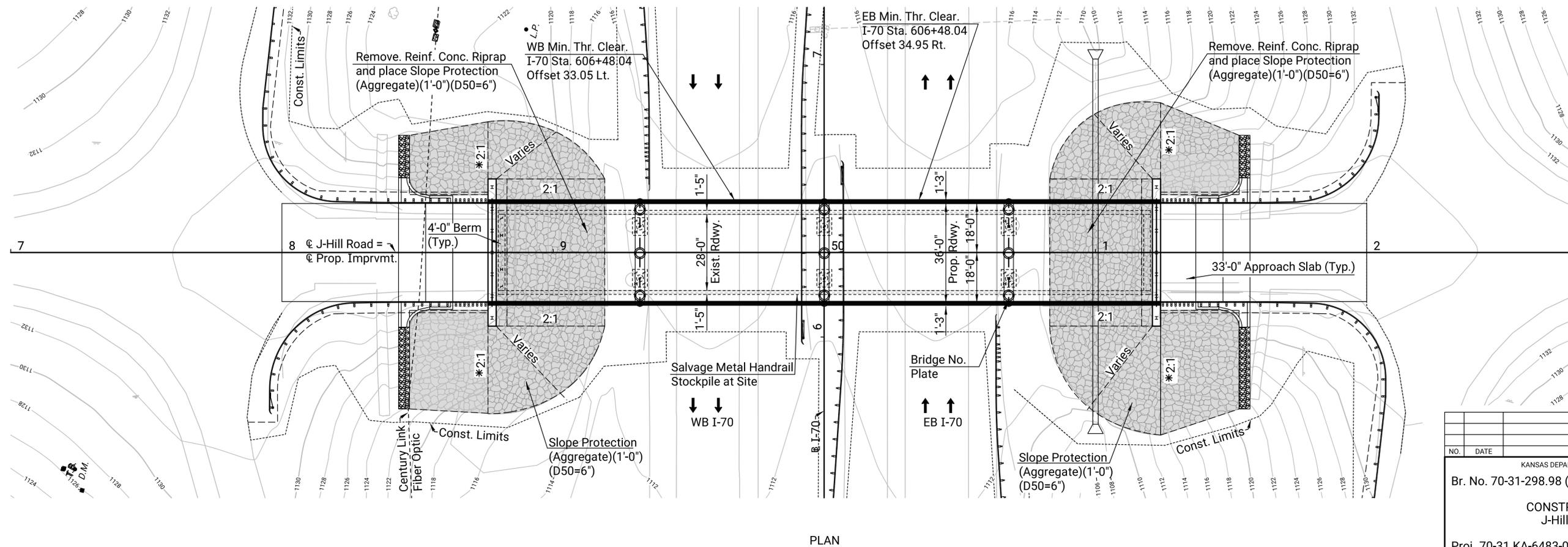
B.M. #12 Set 1/2" x 24" rebar with alum. cap stamped GE2  
503.89' Lt. I-70 @ Sta. 640+00.88 Elev. = 1121.34



† - Remove Reinf. Conc. riprap and place Slope Protection (Aggregate) (1'-0") (D50=6") (Typ.)



\* See road cross section sheets for transition to typical section.



| NO.  | DATE | REVISIONS | BY            | APPD       |
|--|------|-----------|---------------|------------|
| KANSAS DEPARTMENT OF TRANSPORTATION          |      |           |               |            |
| Br. No. 70-31-298.98 (095)                   |      |           | Sta. 50+00.00 |            |
| CONSTRUCTION LAYOUT<br>J-Hill Road over I-70 |      |           |               |            |
| Proj. 70-31 KA-6483-01                       |      |           | Geary Co.     |            |
| DESIGNED                                     | HD   | DETAILED  | HD            | QUANTITIES |
| CADD   | HD   | CADD      | HD            | ECM        |
| DESIGN CK.                                   | CK   | SGBAJH    | DETAIL CK.    | SGBAJH     |
| QUAN. CK.                                    | CK   | SGBAJH    | CADD CK.      | HD         |

CADconform Certify This File

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 40        | 148          |

**PILING**

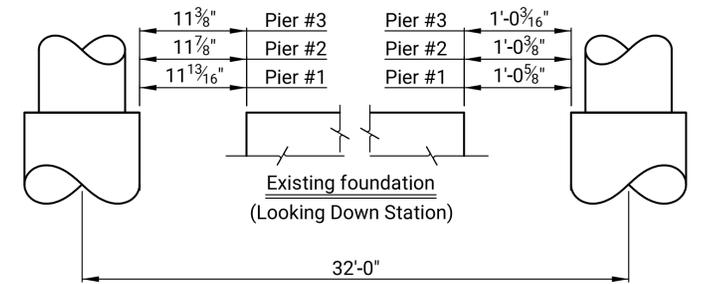
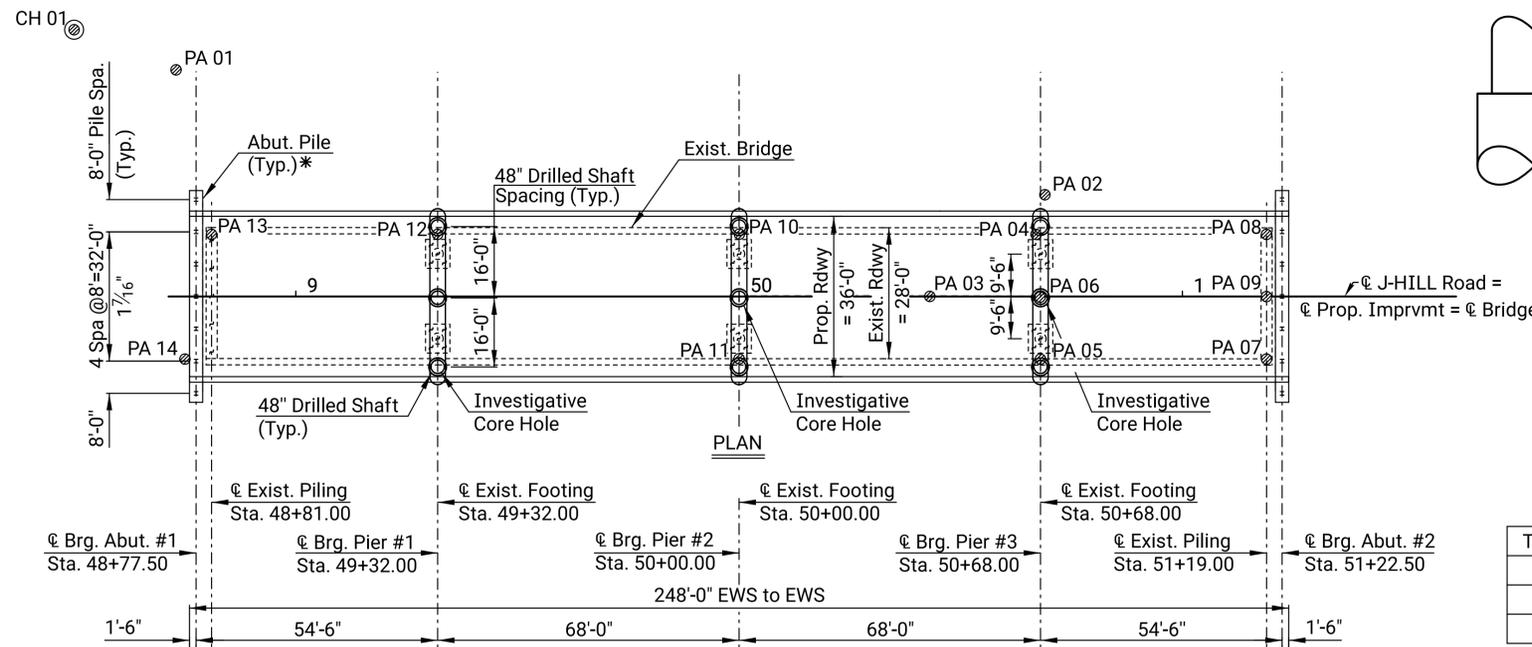
**Investigative Core Holes:**

Please contact the Topeka Regional Geology Office when the schedule for the investigative core holes have been established so that a member of the staff may be on site when the work is being performed.

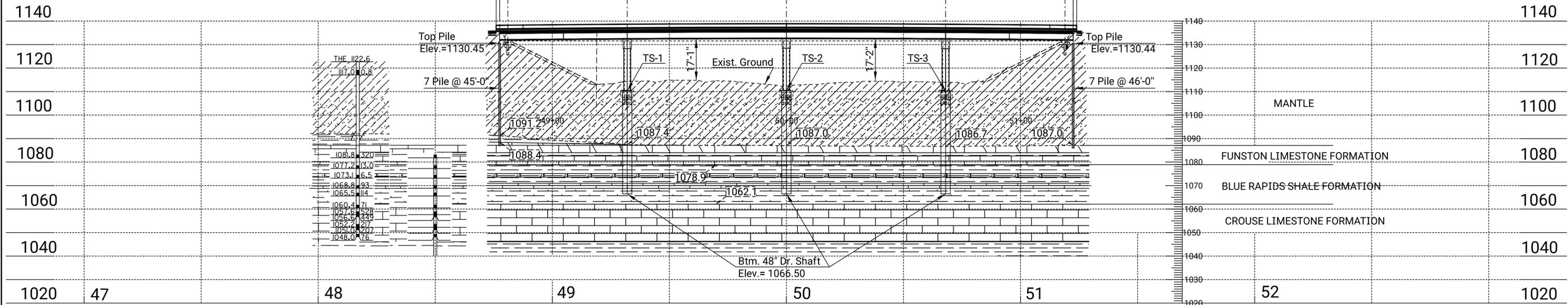
\* Note: Abutment piles shall be spaced as shown and are symmetrical about C Bridge. Spacing is typical for both abutments

Note: Drive H-pile with pile points be driven to bear into the Funston Limestone Formation. Pile driving should be monitored carefully as the piling will be driven into a hard limestone.

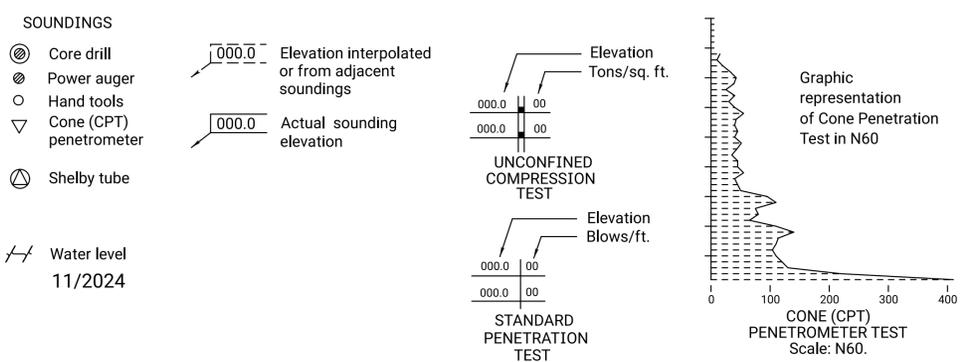
Only Gr. 50 HP12x53 Steel Piles with Cast Steel Pile Points shall be used on this bridge.



| Top of Drilled Shaft Elev. |         |
|----------------------------|---------|
| TS-1                       | 1113.53 |
| TS-2                       | 1111.73 |
| TS-3                       | 1113.52 |



| STANDARD          | GEOLOGIC               | SYMBOLS                | GEOLOGIC                      | PROFILE          |
|-------------------|------------------------|------------------------|-------------------------------|------------------|
| Clay or Underclay | Caliche                | Weathered Shale        | Limestone                     | Mortar bed       |
| Silty Clay        | Silty Clayey Shale     | Sandstone              | Cherty Limestone              | Coal             |
| Silt              | Limy Shale             | Shaly Sandstone        | Shaly Limestone               | Siltstone        |
| Sand              | Black or Fissile Shale | Gypsum bed             | Bentonite                     | Chalk            |
| Gravel            | Sandy Shale            | Dolomite               | Weathered or Broken Limestone | Wavy limestone   |
| Boulders          | Gypsiferous Shale      | Cross-bedded Sandstone | Loess                         | Chalky limestone |



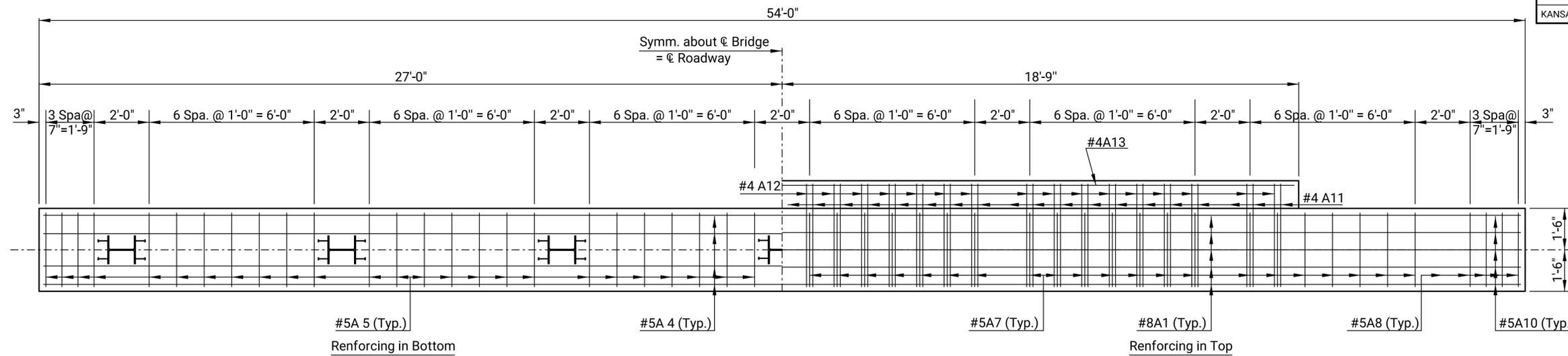
NOTE: Soundings shown on these plans are taken from notes obtained in the field and represent the best information available. Logs of these soundings are provided with the bid documents, or are available from the Kansas Department of Transportation in Topeka for inspection by interested and qualified bidders.

SCALE: 1" = 20' Horiz. 1" = 20' Vert.

|                                     |        |            |        |            |               |          |     |      |  |
|-------------------------------------|--------|------------|--------|------------|---------------|----------|-----|------|--|
| NO.                                 |        | DATE       |        | REVISIONS  |               | BY       |     | APPD |  |
| KANSAS DEPARTMENT OF TRANSPORTATION |        |            |        |            |               |          |     |      |  |
| Br. No. 70-31-298.98 (095)          |        |            |        |            | Sta. 50+00.00 |          |     |      |  |
| ENGINEERING GEOLOGY                 |        |            |        |            |               |          |     |      |  |
| Proj. 70-31 KA-6483-01              |        |            |        |            | Geary Co.     |          |     |      |  |
| DESIGNED                            | HD     | DETAILED   | HD     | QUANTITIES | HD            | CADD     | ECM |      |  |
| DESIGN CK.                          | SGBAJH | DETAIL CK. | SGBAJH | QUAN. CK.  | SGBAJH        | CADD CK. | HD  |      |  |

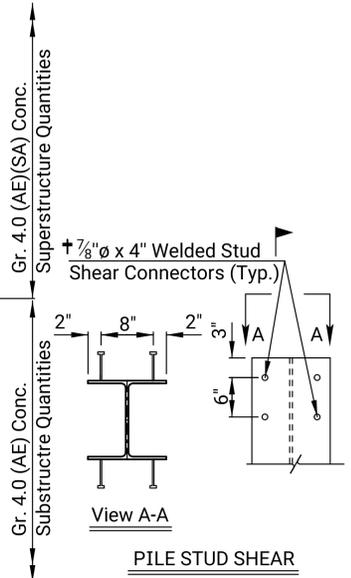
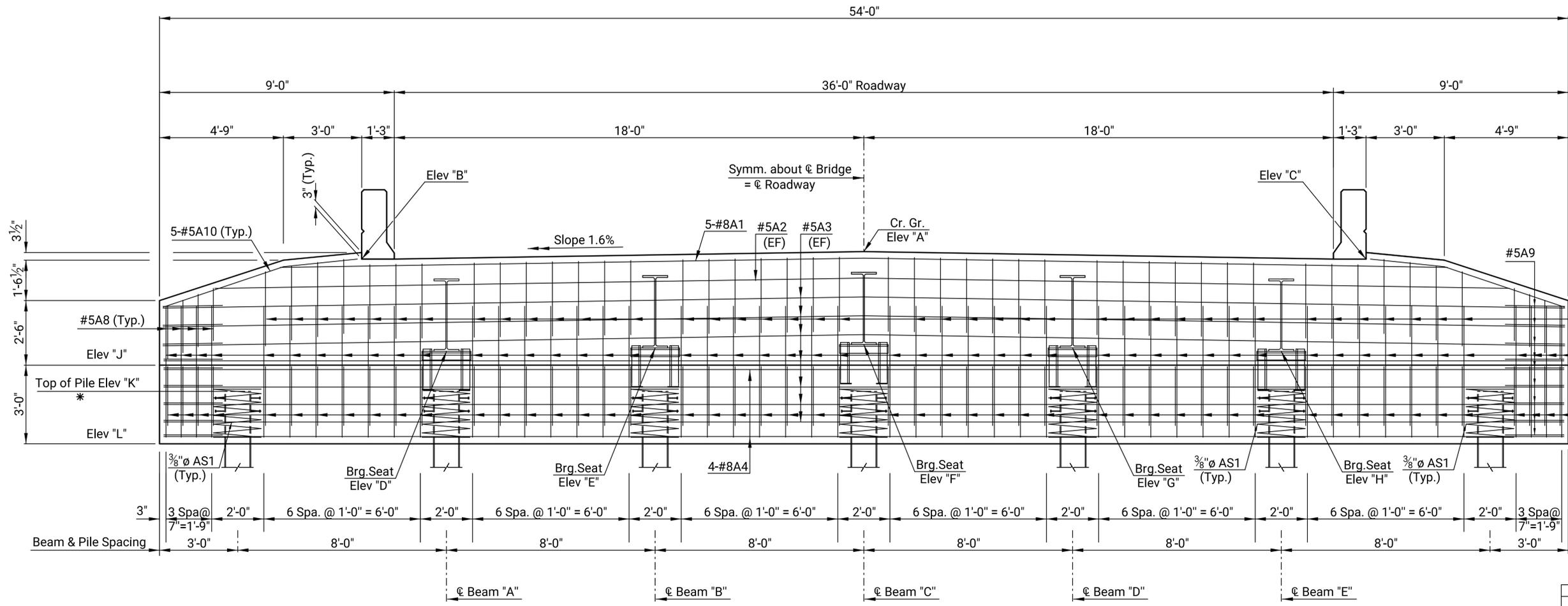
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File : ka648301bbr0091-002 Egn Geo\_Updated.dgn

| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 41        | 148          |



| ELEVATIONS |          |         |
|------------|----------|---------|
|            | Abut. #1 | Abut.#2 |
| Elev. A    | 1135.84  | 1135.83 |
| Elev. B    | 1135.53  | 1135.52 |
| Elev. C    | 1135.53  | 1135.52 |
| Elev. D    | 1131.95  | 1131.94 |
| Elev. E    | 1132.08  | 1132.07 |
| Elev. F    | 1132.21  | 1132.20 |
| Elev. G    | 1132.08  | 1132.07 |
| Elev. H    | 1131.95  | 1131.94 |
| Elev. J    | 1131.45  | 1131.44 |
| Elev. K    | 1130.45  | 1130.44 |
| Elev. L    | 1128.45  | 1128.44 |

PLAN



† Welded Stud Shear connectors are subsidiary to HP 12X53 Steel Piles

\* Top of Pile Elevations are based on 2'-0" Maximum embedment

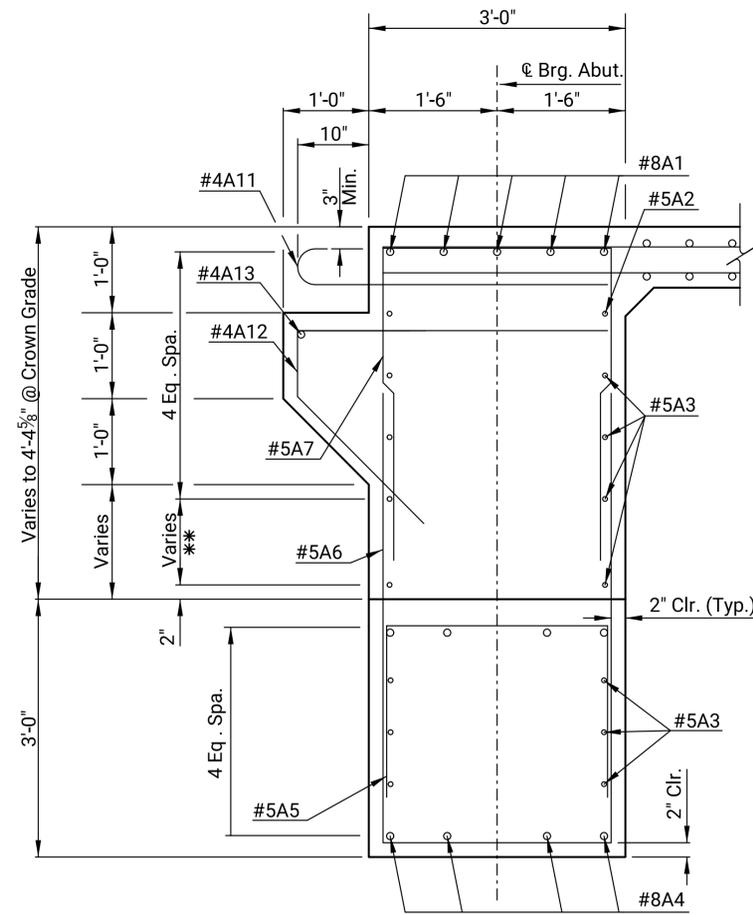
ELEVATION

| NO.                                 | DATE   | REVISIONS  | BY            | APPD       |
|-------------------------------------|--------|------------|---------------|------------|
| KANSAS DEPARTMENT OF TRANSPORTATION |        |            |               |            |
| Br. No. 70-31-298.98 (095)          |        |            | Sta. 50+00.00 |            |
| ABUTMENT DETAILS                    |        |            |               |            |
| Proj. 70-31 KA-6483-01              |        |            | Geary Co.     |            |
| DESIGNED                            | HD     | DETAILED   | HD            | QUANTITIES |
| DESIGN CK.                          | SGBAJH | DETAIL CK. | SGBAJH        | QUAN. CK.  |
| CADD                                | ECM    | CADD       | ECM           | CADD       |
| HD                                  | HD     | HD         | HD            | HD         |

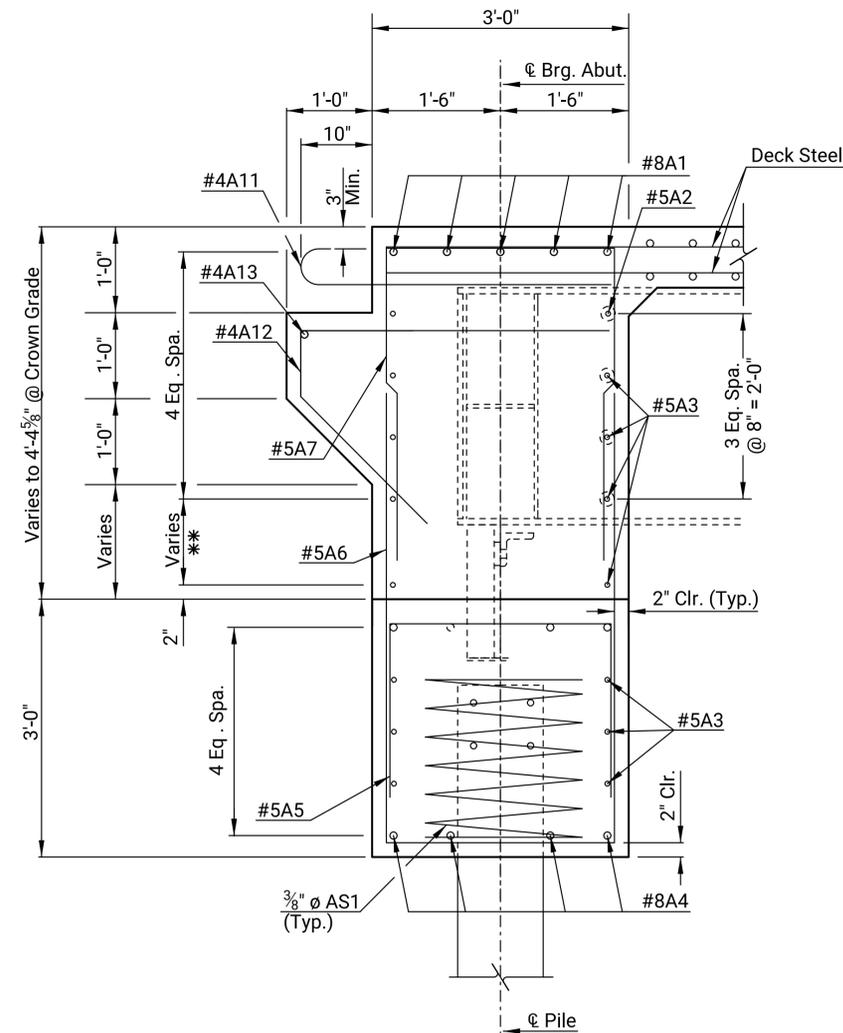
LEGEND  
EF = Each Face

Plotted by : Erik Meyer@ks.gov 13-MAR-2025 15:47  
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|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 42        | 148          |

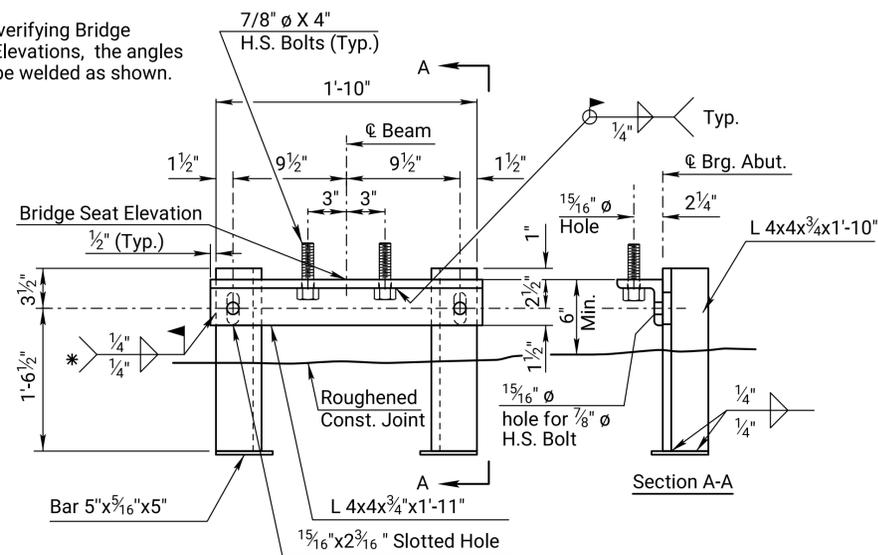


TYPICAL SECTION BETWEEN BEAMS



TYPICAL SECTION NEAR BEAMS

\* After verifying Bridge Seat Elevations, the angles shall be welded as shown.



ABUTMENT BEAM SUPPORTS  
(10 Required)

\*\* The depth of 1 foot applies only to Beam "C". the depth of the remaining Bars vary to prevent any conflict between the holes and the bottom flange.

Note: Abutment Beam Supports shall be paid for as ASTM A709 Gr. 36 Structural Steel. (Primed)

Plotted by : Erik Meyer@ks.gov 13-MAR-2025 15:47  
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| NO.                                 | DATE   | REVISIONS  | BY            | APPD       |
|-------------------------------------|--------|------------|---------------|------------|
| KANSAS DEPARTMENT OF TRANSPORTATION |        |            |               |            |
| Br. No. 70-31-298.98 (095)          |        |            | Sta. 50+00.00 |            |
| ABUTMENT DETAILS                    |        |            |               |            |
| Proj. 70-31 KA-6483-01              |        |            | Geary Co.     |            |
| DESIGNED                            | HD     | DETAILED   | HD            | QUANTITIES |
| DESIGN CK.                          | SGBAJH | DETAIL CK. | SGBAJH        | QUAN. CK.  |
| CADD                                | ECM    | DHD        |               |            |

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 43        | 148          |

**GENERAL NOTES**

**GEOSYNTHETICS:** Use material that complies with KDOT Specification Section 1710 Class 2 subsurface drainage fabric. Place the Class 2 subsurface drainage fabric on graded and compacted material shaped as shown. Allow for enough material so that the sides can be overlapped and that the ends fully separate the aggregate drain from the embankment soils. Place the perforated drain pipe and couple to non-perforated pipe as shown. Allow the non-perforated pipe to pass through a hole carefully cut in fabric. Place aggregate within fabric to just leave the top of the pipe visible. Verify the slope of the pipe, that it is not damaged or displaced and that the couplers are firmly coupled. Continue to backfill to the elevation and shape shown.

**AGGREGATE:** Use aggregates that complies with KDOT Specifications for SB-1 or SB-2.

**BASE COURSE REINFORCEMENT:** Use "Base Course Reinforcement" that complies with KDOT Specification Division 1700 or approved material. Place this material in uniform layers without gaps or sags per the manufacturer's recommendations.

**GEOFOAM:** Use "Geofoam" that complies with ASTM D6817 EPS 12. Acceptance according to Type "C" certification. Bond this material to the backwall protection using materials recommended by the manufacturer.

**PIPE:** Place perforated pipe within the limits and use non-perforated pipe outside the limits of the Abutment Aggregate Drain.

**ABUTMENT AGGREGATE DRAIN:** The Bridge Contractor shall excavate to the limits shown on the Bridge Excavation Sheet. Backfill, compact & grade the cohesive soil to the limits shown. Place the bridge backwall protection, geofabric, geotextile, perforated pipe, alternating layers of aggregate and base course reinforcement as shown. Place the outlet pipe, the CMP, and the backfill. Separate as shown the entire Abutment Aggregate Drain with the geotextile.

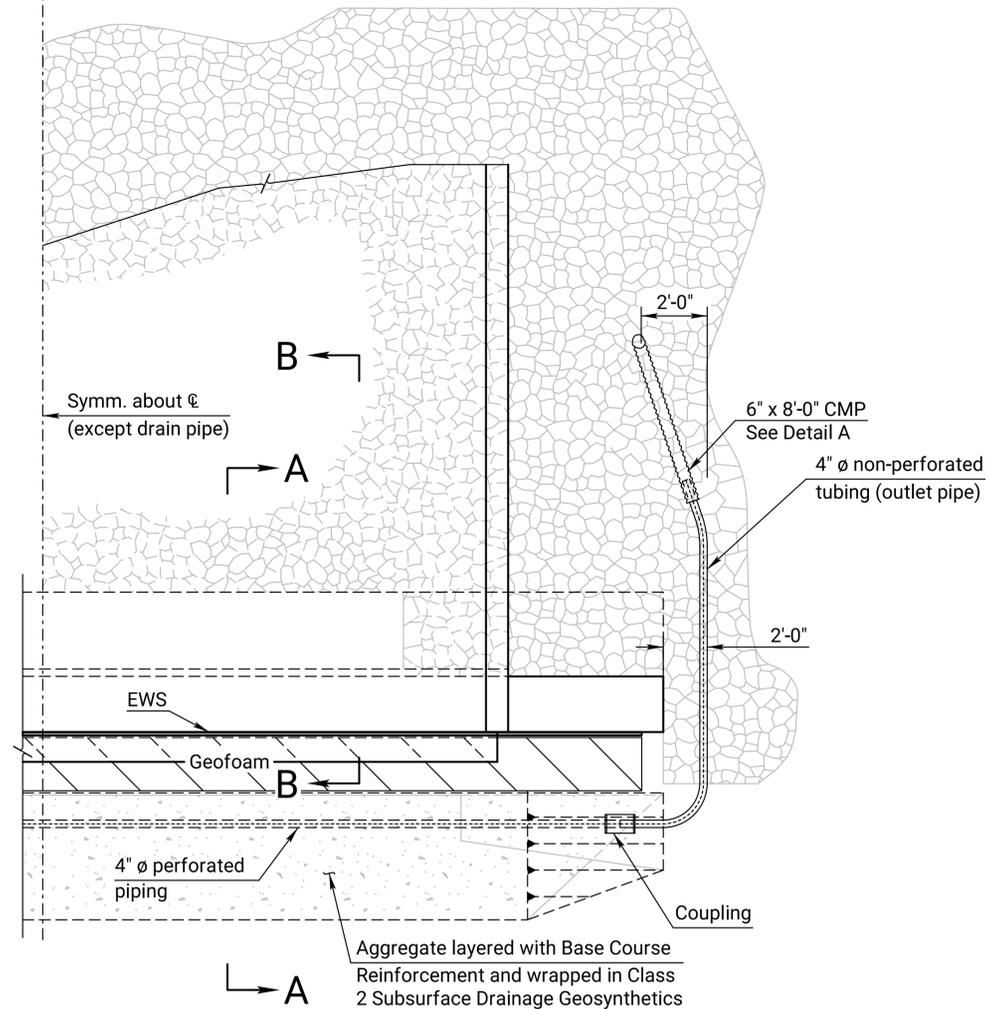
**BRIDGE BACKWALL PROTECTION SYSTEM:** Apply a non coal-tar Bridge Backwall Protection System to the approach side of the abutments and the wings in accordance with KDOT Specifications and the manufacturer's recommendations. Cover the abutments and wings to the limits shown on the details. Repair any damage done at no charge to the state.

Compact the abutment backfill. See the KDOT Specifications.

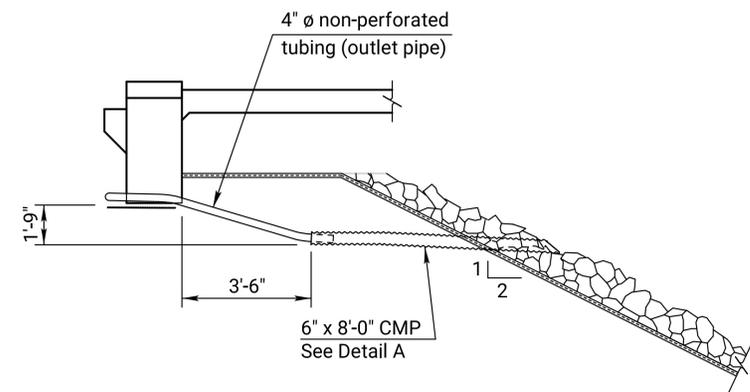
Perforated pipe and non-perforated outlet pipe shall be corrugated polyethylene tubing conforming to the KDOT Specifications.

Fit the CMP end section with 1/4" galvanized mesh screen to prevent the entrance of rodents. Seal the joint between the outlet pipe and the end section with a joint sealer.

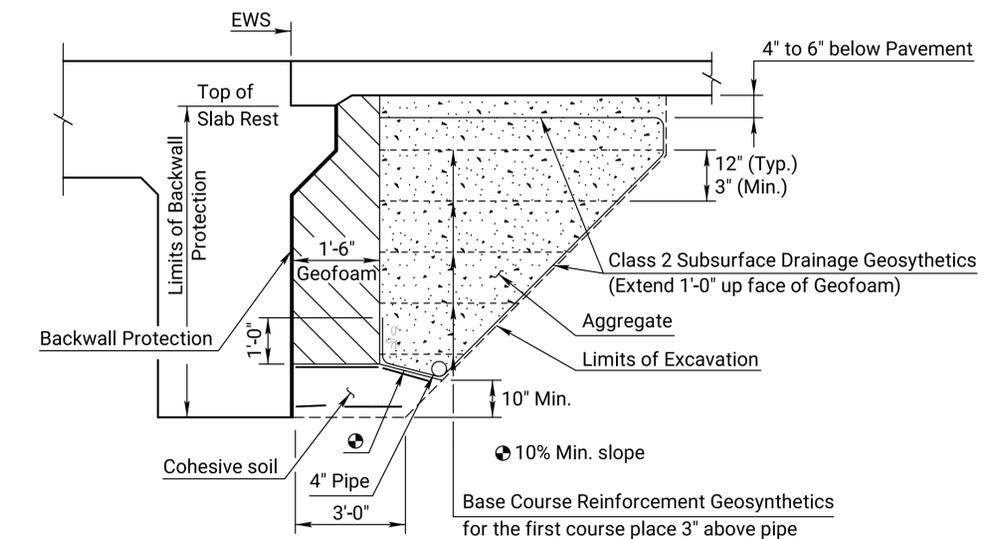
**COHESIVE SOILS:** Grade the bottom surface of the excavated area to drain as shown. Backfill this area with a cohesive type of soil. The soil will have a Unified Soil Classification of CL, CH, ML or MH according to ASTM D2487 Classification System with a minimum plasticity index of 13. Compact the 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.



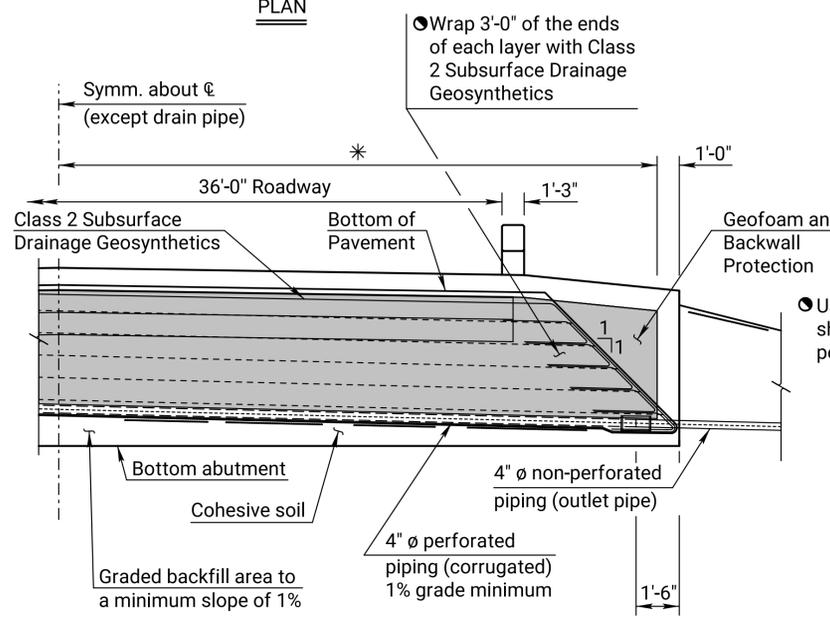
**PLAN**



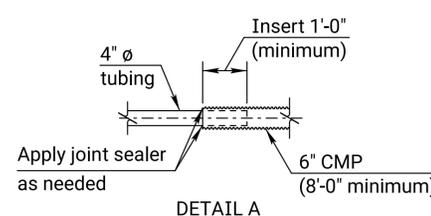
**SECTION B-B**



**SECTION A-A (Abutment Aggregate Drain)**



**ELEVATION**



**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. For stream crossings place outlet on downstream side of bridge.

| SUMMARY OF QUANTITIES (2 Abutments)          |              |
|--|--------------|
| Abutment Aggregate Drain                     | 90 Cu. Yds.  |
| Bridge Backwall Protection System            | 74 Sq. Yds.  |
| Items subsidiary to Abutment Aggregate Drain |              |
| 4" Perforated Pipe                           | 104 Lin. Ft. |
| 4" Outlet Pipe                               | 36 Lin. Ft.  |
| 6" CMP                                       | 16 Lin. Ft.  |
| Geosynthetics (Class 2 Subsurface Drainage)  | 608 Sq. Yds. |
| Geosynthetics (Base Course Reinforcement)    | 260 Sq. Yds. |
| Geofoam                                      | 24 Cu. Yds.  |

| 08  | 05-05-23 | Removed soil cap; Geofoam bottom flat | M.L.L. | M.A.H. |
|-----|----------|---------------------------------------|--------|--------|
| 07  | 12-11-18 | Corrected std. base file name         | M.L.L. | J.P.J. |
| 06  | 02-04-15 | Modified Per 2015 Specification       | J.P.J. | C.E.R. |
| NO. | DATE     | REVISIONS                             | BY     | APPD   |

KANSAS DEPARTMENT OF TRANSPORTATION  
 Br. No. 70-31-298.98 (095) Sta. 50+00.00  
**ABUTMENT AGGREGATE DRAIN**  
 Proj. 70-31 KA-6483-01 Geary Co.  
 DESIGNED J.P.J. DETAILED J.P.J. QUANTITIES CADD M.L.L.  
 DESIGN CK. DETAIL CK. QUAN. CK. CADD CK.

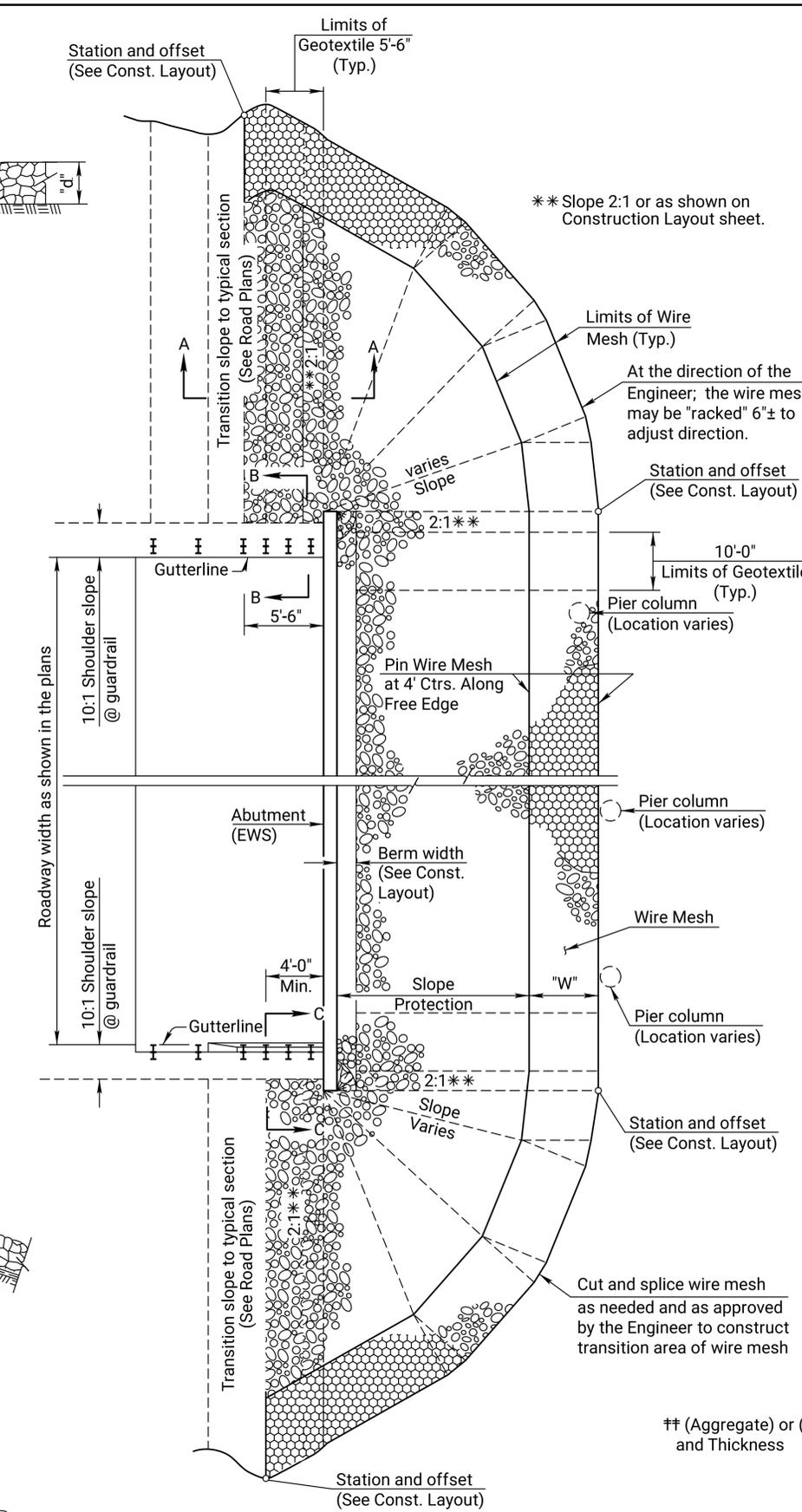
Plotted by: Erik Meyer@ks.gov 13-MAR-2025 15:47  
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\* Limits of Bridge Backwall Protection System & Geofoam

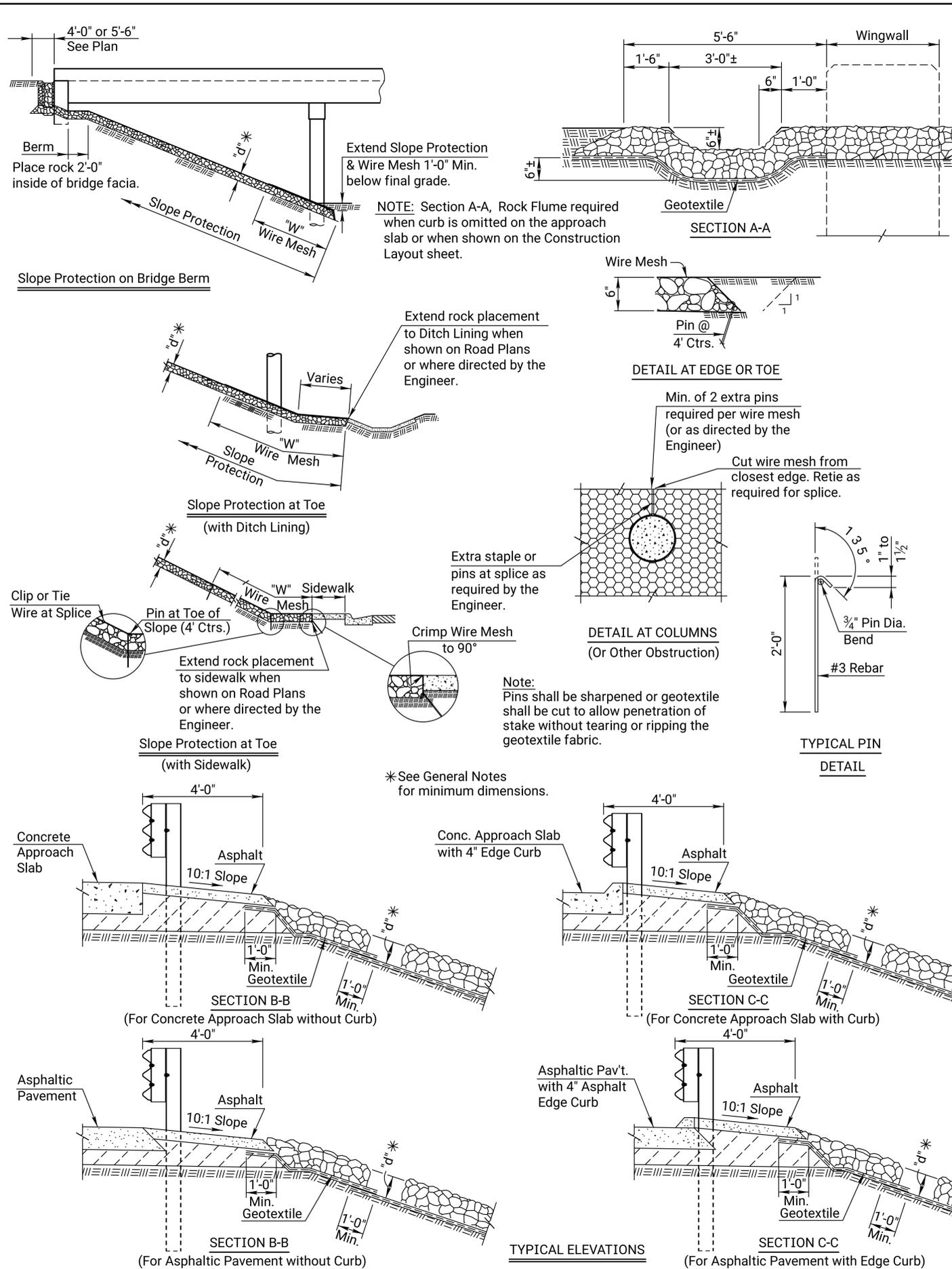
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 44        | 148          |

**GENERAL NOTES**

- 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.
- 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.
- Wire mesh shall be PVC coated and have a nominal mesh opening of  $2\frac{1}{2} \times 3\frac{3}{4}$ ". 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 selvaged to prevent raveling 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.
- Excavation and grading for placement of slope protection and all work and material to install geotextile fabric shall be subsidiary to slope protection.
- Slope protection shall be underlain with geotextile fabric with 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.
- Unless noted otherwise on the Construction Layout, "d" shall be a minimum of 6 in., "W" shall be 12.0 ft.
- 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.



**BERM AND SLOPE PROTECTION PLAN**  
(Straight Wingwall Abutment)



NOTE: Section A-A, Rock Flume required when curb is omitted on the approach slab or when shown on the Construction Layout sheet.

Note: Pins shall be sharpened or geotextile shall be cut to allow penetration of stake without tearing or ripping the geotextile fabric.

\* See General Notes for minimum dimensions.

## (Aggregate) or (Special) and Thickness

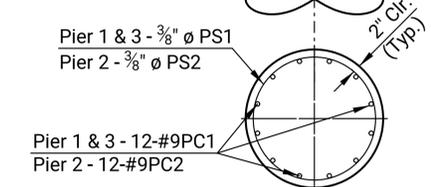
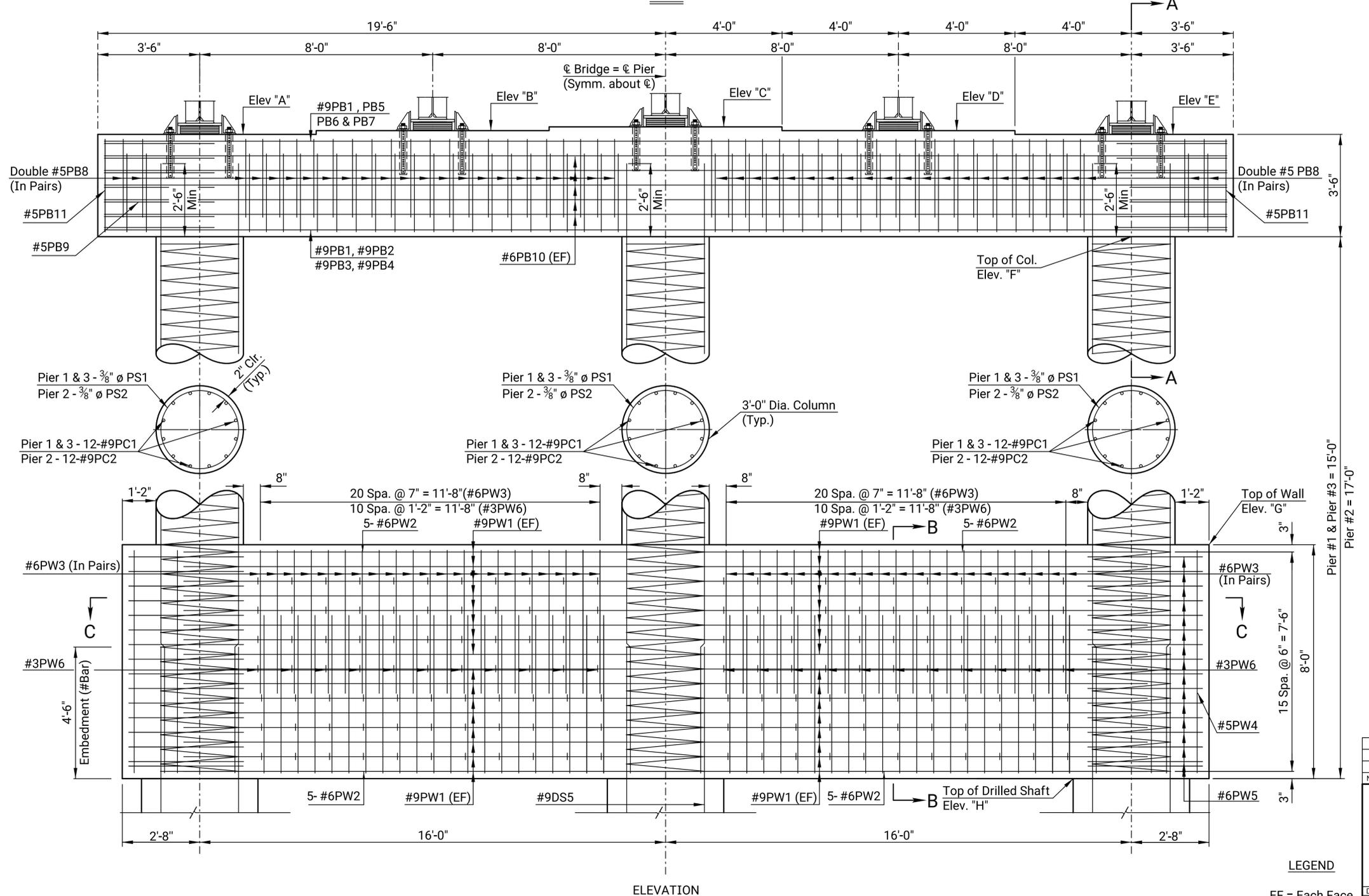
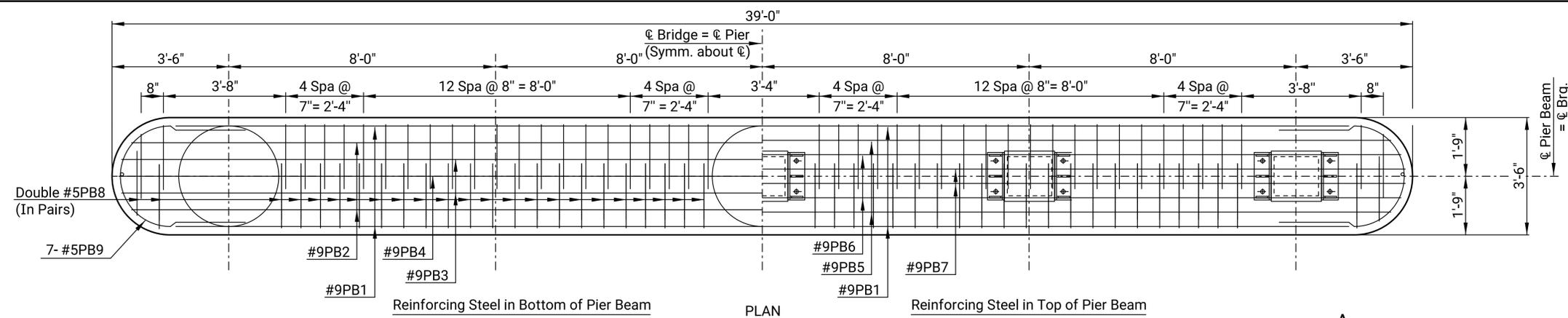
| QUANTITIES             |                                |                      |                     |
|------------------------|--------------------------------|----------------------|---------------------|
| † For Information Only |                                |                      |                     |
| Bridge Number          | Slope Protection (##) Cu. Yds. | #Geotextile Sq. Yds. | #Wire Mesh Sq. Yds. |
| 095                    | 482                            | 98                   | N/A                 |
|                        |                                |                      |                     |
|                        |                                |                      |                     |

| 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.    |
| NO.   | DATE       | REVISIONS               | BY               | APPD      |
| KANSAS DEPARTMENT OF TRANSPORTATION                                       |            |                         |                  |           |
| <b>BRIDGE BERM AND SLOPE PROTECTION STRAIGHT WINGWALL ABUTMENT BR132A</b> |            |                         |                  |           |
| DESIGNED  | R.R.R.     | APPD.                   | Kenneth F. Hurst |           |
| TRACED  | P.G.F.     | QUANTITIES              | TRACED           | P.G.F.    |
| DESIGN CK.  | DETAIL CK. | R.R.R.                  | QUAN. CK.        | TRACE CK. |

Plotted by: Erik Meyer@ks.gov 13-MAR-2025 15:48  
File: ka648301bbr0091-004-02(Final).dgn

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 45        | 148          |

All Piers are designed with "crashwalls", to meet AASHTO requirements for a Vehicle Impact Loading = 600 Kips in any direction.



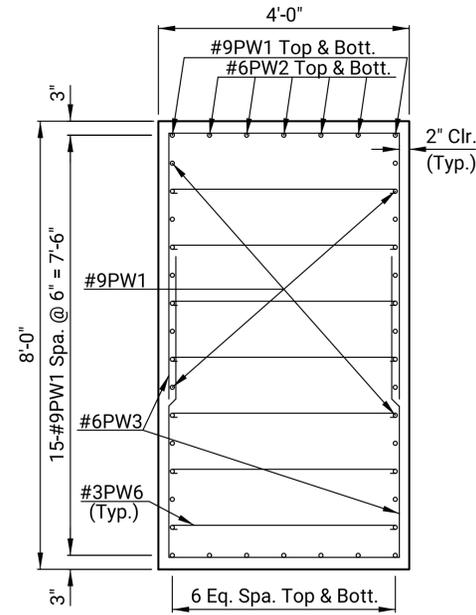
| NO. | DATE | REVISIONS | BY | APPD |
|-----|------|-----------|----|------|
|     |      |           |    |      |

KANSAS DEPARTMENT OF TRANSPORTATION  
 Br. No. 70-31-298.98 (095) Sta. 50+00.00  
**PIER DETAILS**  
 Proj. 70-31 KA-6483-01 Geary Co.  
 DESIGNED: HD DETAILED: HD QUANTITIES: HD CADD: ECM  
 DESIGN CK: SGB/AJH DETAIL CK: SGB/AJH QUAN CK: SGB/AJH CADD CK: HD  
 CADconform Certify This File Sh. No. 45

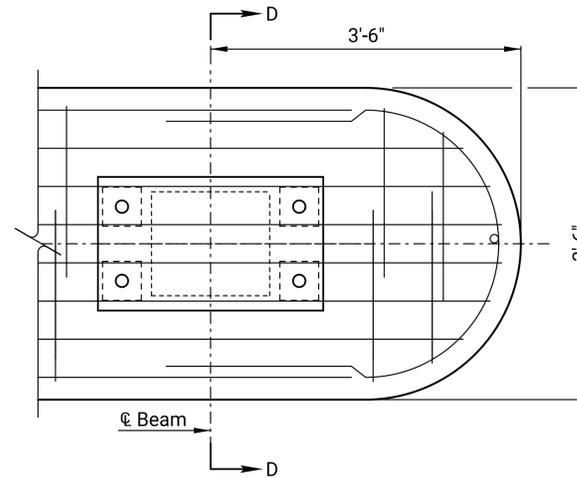
Plotted by: Erik Meyer@ks.gov 13-MAR-2025 15:47  
 File: ka648301bbr0091-010-01 (Final).dgn

LEGEND  
 EF = Each Face

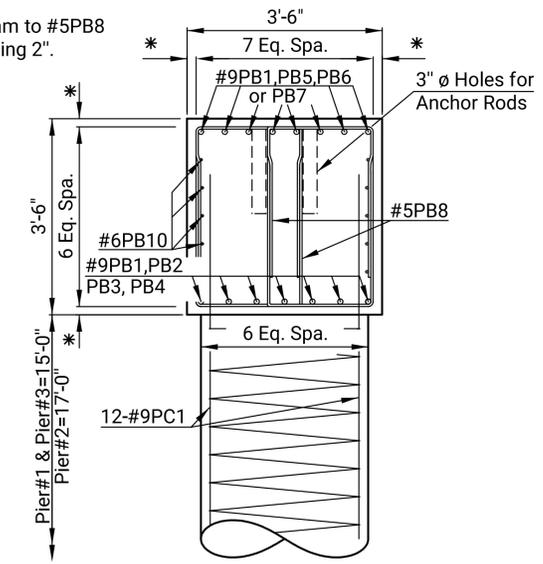
\* Notes: Clearance from top of pier beam to #5PB8 Stirrups will carry with the minimum being 2".



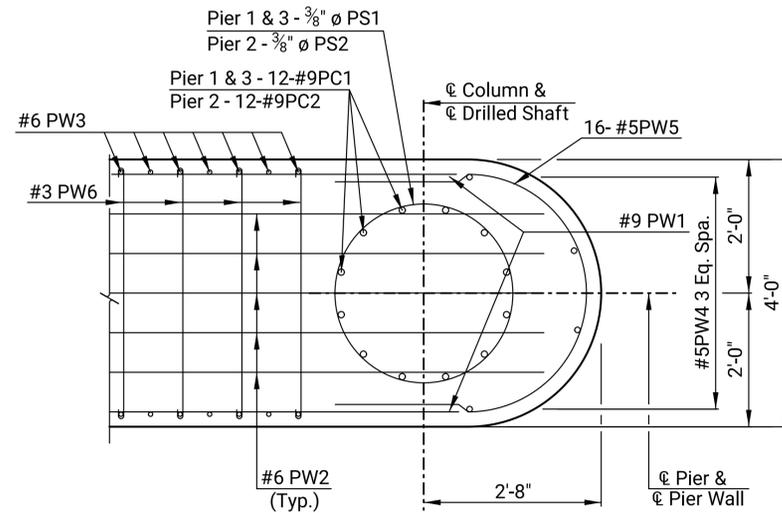
SECTION B-B



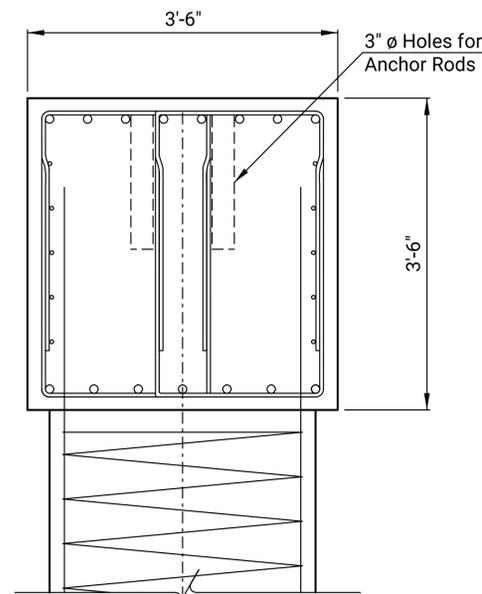
PLAN  
PIER #2



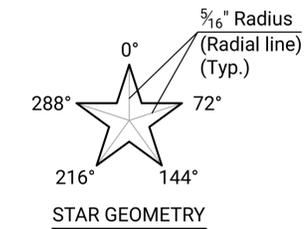
SECTION A-A



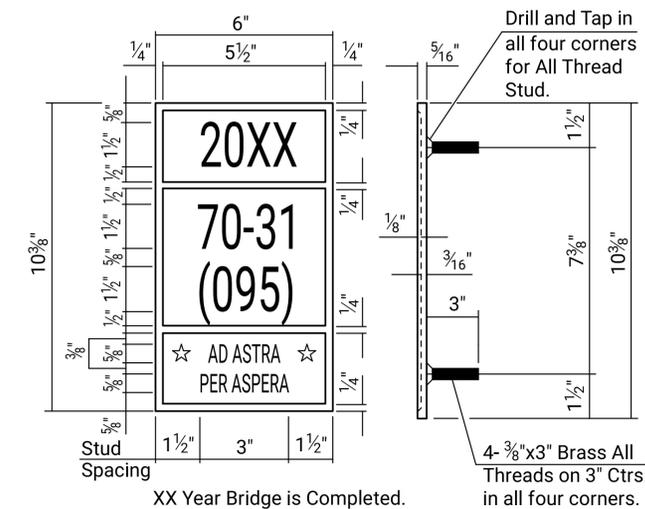
SECTION C-C



SECTION D-D  
PIER #2



STAR GEOMETRY



XX Year Bridge is Completed.

BRIDGE NUMBER PLATE

(1 Required)  
(See Construction Layout for Location)

| ELEVATION TABLE     |         |         |         |
|---------------------|---------|---------|---------|
| Location            | Pier #1 | Pier #2 | Pier #3 |
| A                   | 1132.03 | 1132.23 | 1132.02 |
| B                   | 1132.15 | 1132.35 | 1132.14 |
| C                   | 1132.28 | 1132.48 | 1132.27 |
| D                   | 1132.15 | 1132.35 | 1132.14 |
| E                   | 1132.03 | 1132.23 | 1132.02 |
| F                   | 1128.53 | 1128.73 | 1128.52 |
| H                   | 1113.53 | 1111.73 | 1113.52 |
| Ground Elev.        | 1114.46 | 1112.94 | 1114.36 |
| Top of Crash Wall G | 1121.53 | 1119.73 | 1121.52 |

Design Note: The structural design for Pier 1 & 3 and Pier 2 is identical. All dimensions and reinforcement details shall be applied consistently to both piers. The only difference between the two is the type of bearing device specified for each pier.

| KANSAS DEPARTMENT OF TRANSPORTATION |         |               |           |            |
|-------------------------------------|---------|---------------|-----------|------------|
| NO.                                 | DATE    | REVISIONS     | BY        | APPD       |
| Br. No. 70-31- (095)                |         | Sta. 50+00.00 |           |            |
| AUXILIARY PIER DETAILS              |         |               |           |            |
| Proj. 70-31 KA-6483-01              |         |               | Geary Co. |            |
| DESIGNED                            | HD      | DETAILED      | HD        | QUANTITIES |
| HD                                  | CADD    | ECM           |           |            |
| DESIGN CK.                          | SGB,AJH | DETAIL CK.    | SGB,AJH   | QUAN. CK.  |
| SGB,AJH                             | HD      |               |           |            |

**NOTES**

**PRECONSTRUCTION MEETING:** A preconstruction meeting will be held for the drilled shafts. Contact the Topeka Regional Geology Office when this meeting is scheduled. A geologist will be on site during drilled shaft construction.

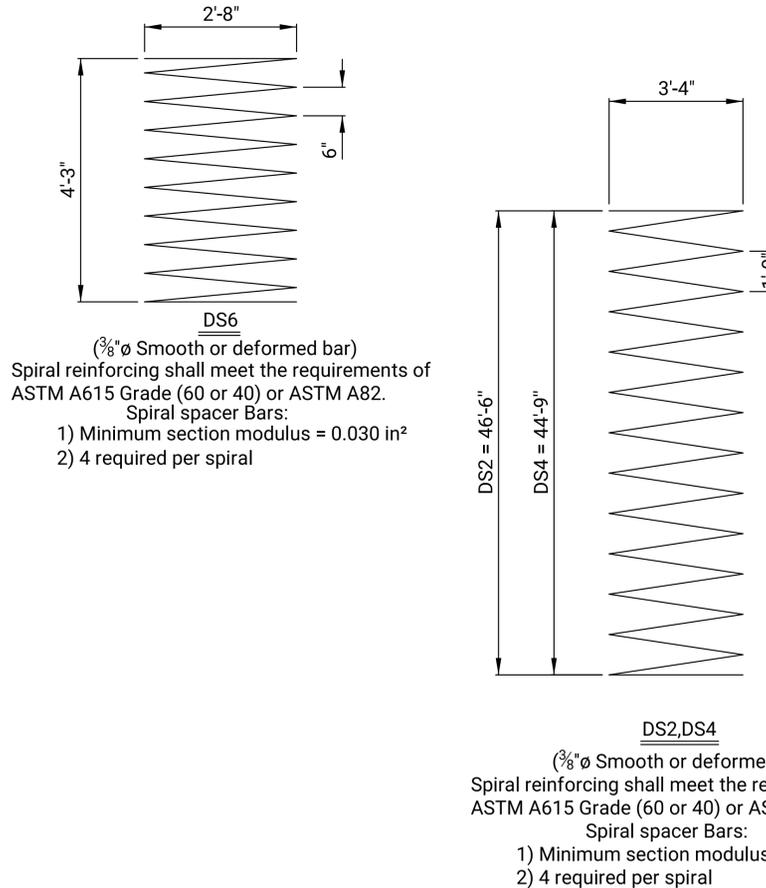
**CASING:** Penetrate the bedrock with casing only far enough to seal out the soil overburden. Do not lower the bottom-of-casing elevation without permission of the Regional Geologist; the casing may be left higher, at the driller's discretion. Extending the casing further than designed may result in delays while the shaft is redesigned.

**TEMPORARY CASING:** Use of Temporary Casing is optional. Permanent Casing is required.

**BEARING:** Drilled shafts are designed to bear within the Blue Rapids Shale Formation. A KDOT geologist will be on site during shaft construction to assist in verifying the proper bearing material.

**WET POUR:** Groundwater may flow into all drilled shaft excavations. The wet pour method should be anticipated on each shaft.

**SONIC TUBES:** Install four tubes into each shaft reinforcing cage for cross-hole sonic logging. Tubes must extend to the base of every shaft regardless of the location of the reinforcing steel.

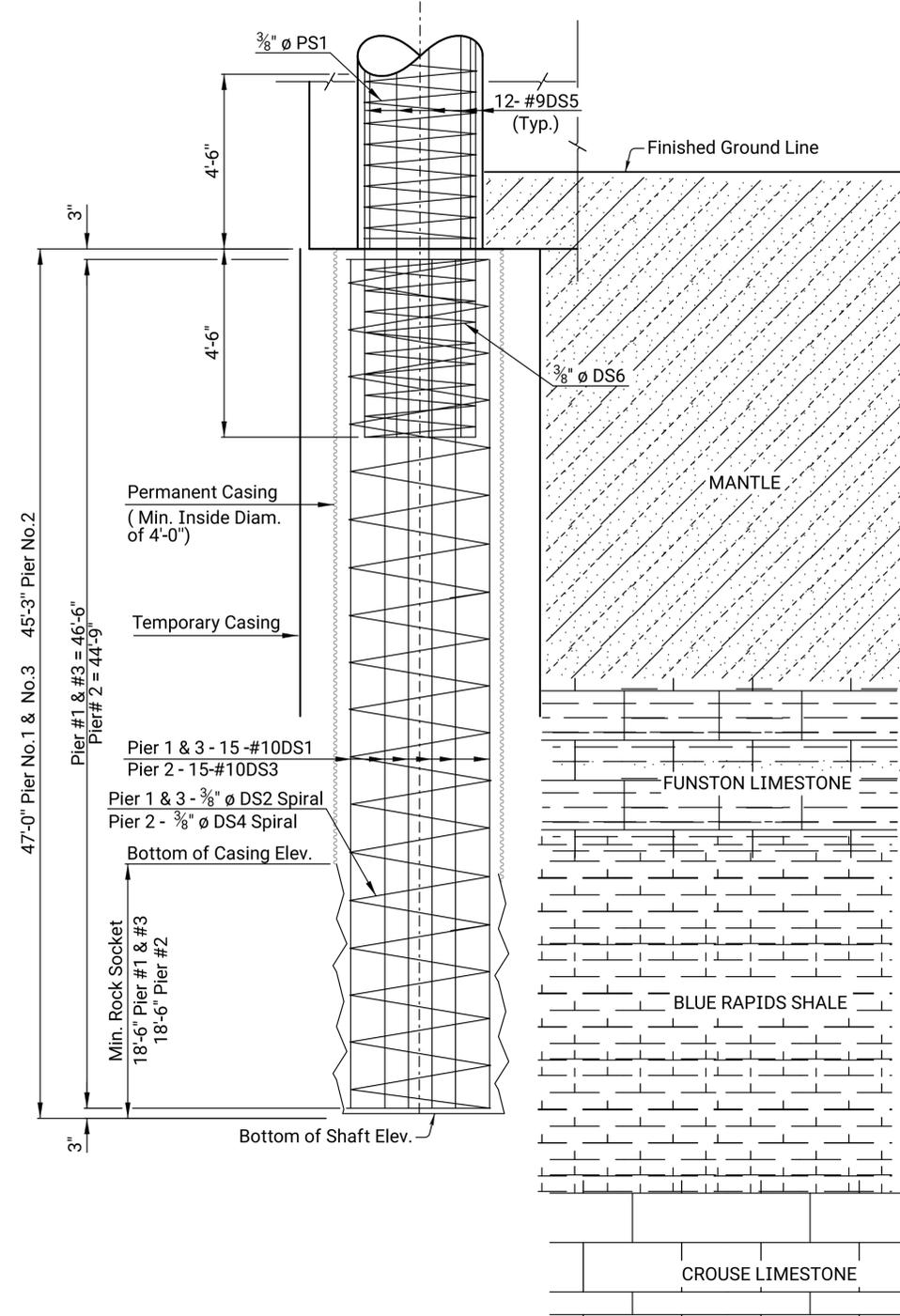
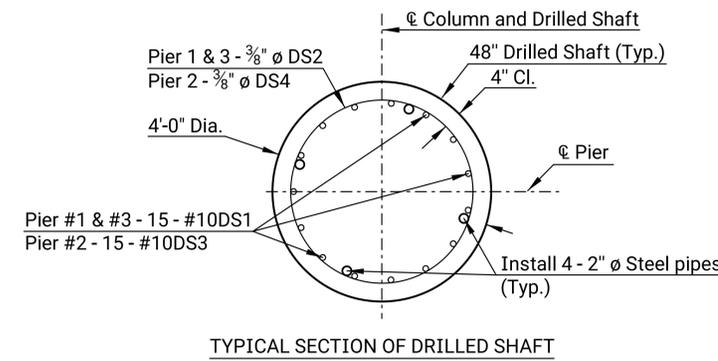


| BILL OF REIN. STEEL<br>Grade 60 (Non-Epoxy) |      |        |        |        |
|---|------|--------|--------|--------|
| Mark  | Size | Number | Length |        |
| PIER NO. 1                                  | DS1  | #10    | 45     | 46'-6" |
|   | DS2  | 3/8"Ø  | 3      | *      |
|   | DS5  | #9     | 36     | 9'-0"  |
|   | DS6  | 3/8"Ø  | 3      | *      |
| PIER NO. 2                                  | DS3  | #10    | 45     | 44'-9" |
|   | DS4  | 3/8"Ø  | 3      | *      |
|   | DS5  | #9     | 36     | 9'-0"  |
|   | DS6  | 3/8"Ø  | 3      | *      |
| PIER NO. 3                                  | DS1  | #10    | 45     | 46'-6" |
|   | DS2  | 3/8"Ø  | 3      | *      |
|   | DS5  | #9     | 36     | 9'-0"  |
|   | DS6  | 3/8"Ø  | 3      | *      |

\* See bending diagram for length of spirals

| TABLE OF ELEVATIONS        |            |            |            |
|----------------------------|------------|------------|------------|
|                            | Pier No. 1 | Pier No. 2 | Pier No. 3 |
| Finished Ground Line       | 1114.46    | 1112.94    | 1114.35    |
| Top of Shaft               | 1113.53    | 1111.73    | 1113.52    |
| Bottom of Permanent Casing | 1085.00    | 1085.00    | 1085.00    |
| Bottom of Shaft            | 1066.50    | 1066.50    | 1066.50    |

**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.



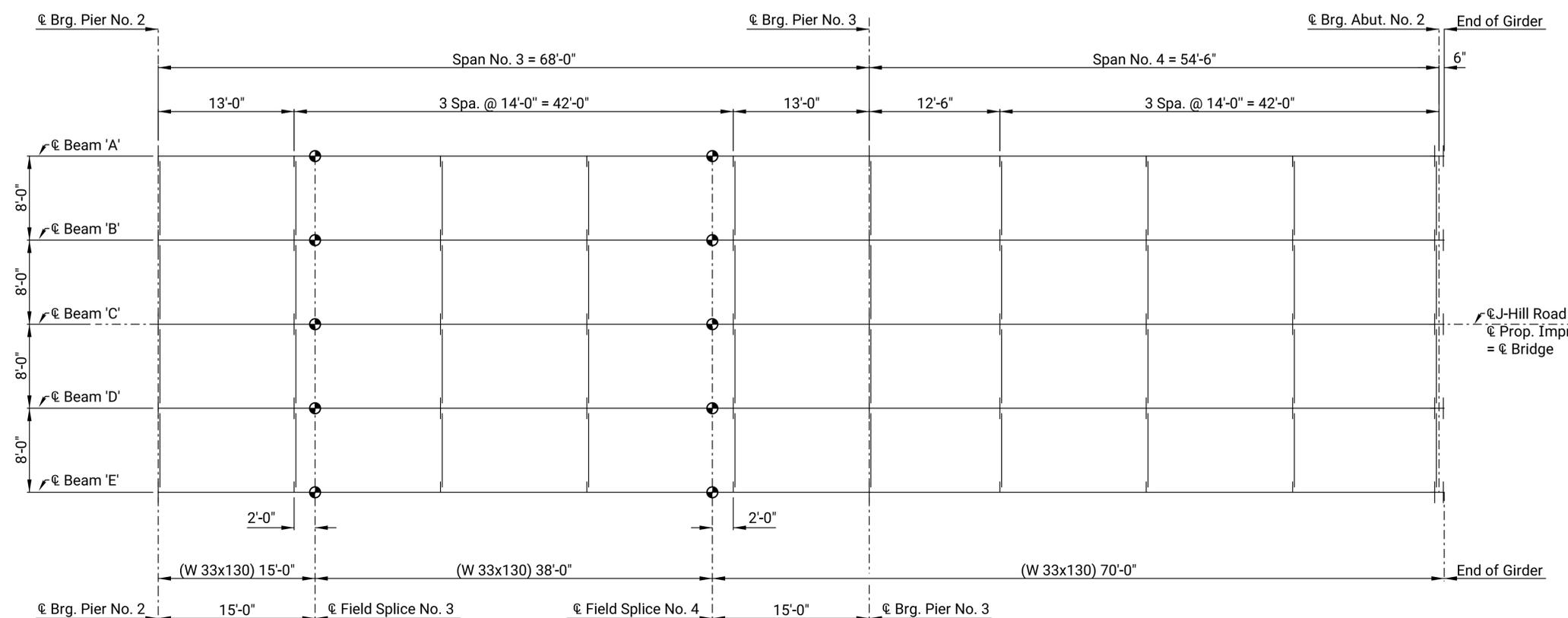
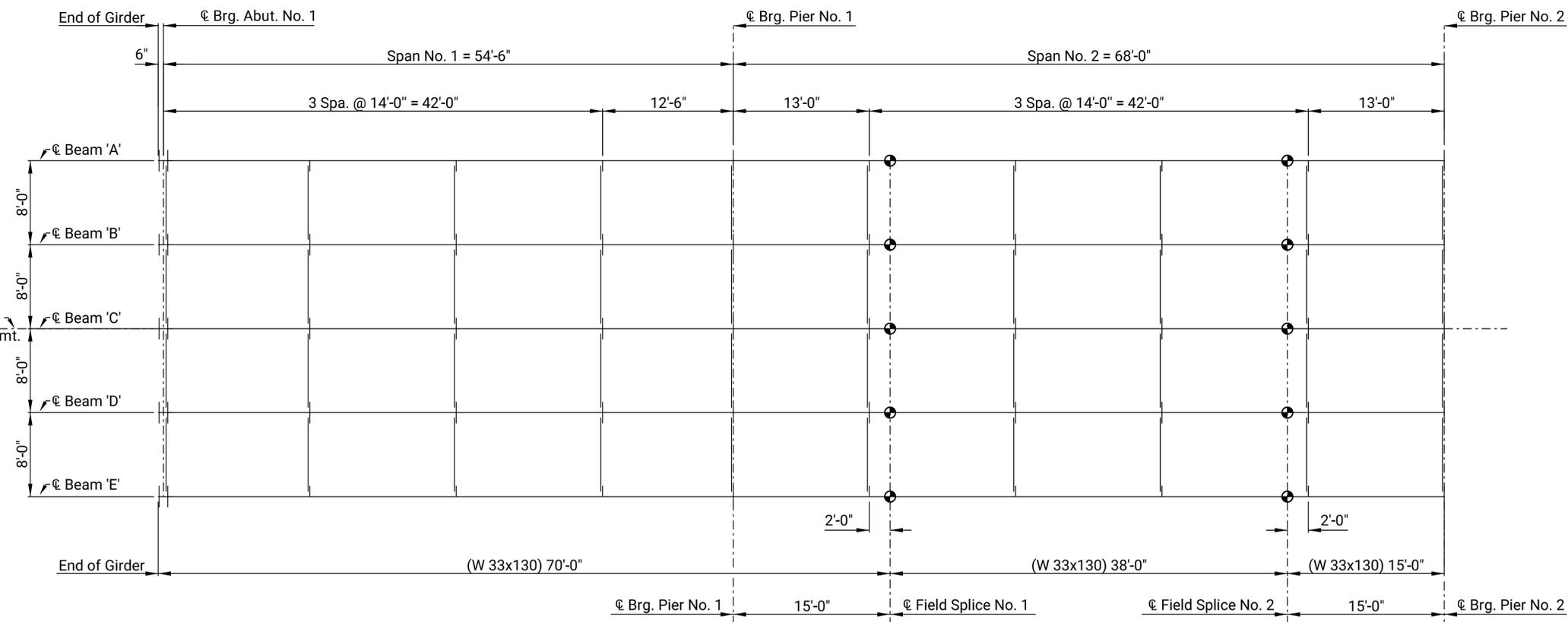
|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 48        | 148          |

Scale: 1" = 8'-0"

†† Note: Installed tension tie-rods at the top of the rolled beams and timber blocks at the bottom of the rolled beams. These shall be centered between the diaphragms. The tie-rods shall brace the top flange and extend from the outer edge of one exterior beam to the other exterior beam. The timber blocks shall brace the bottom flange in all bays. The tie-rods and its connections shall have a minimum ultimate tensile strength of 20 Kips and a minimum cross-sectional area of 0.44 in<sup>2</sup>. The timber blocks shall have a minimum cross-sectional area of 13.14 in<sup>2</sup>.

This work will be considered subsidiary to the bid item "Structural Steel AASHTO M270 (Gr. 50WT 3)".

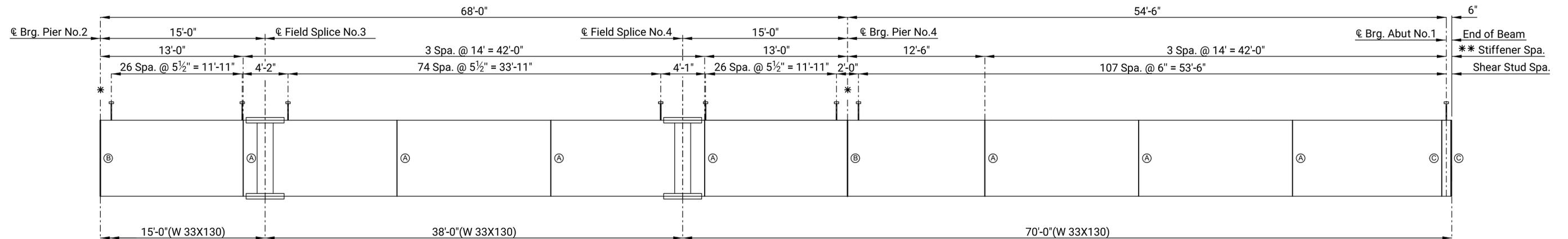
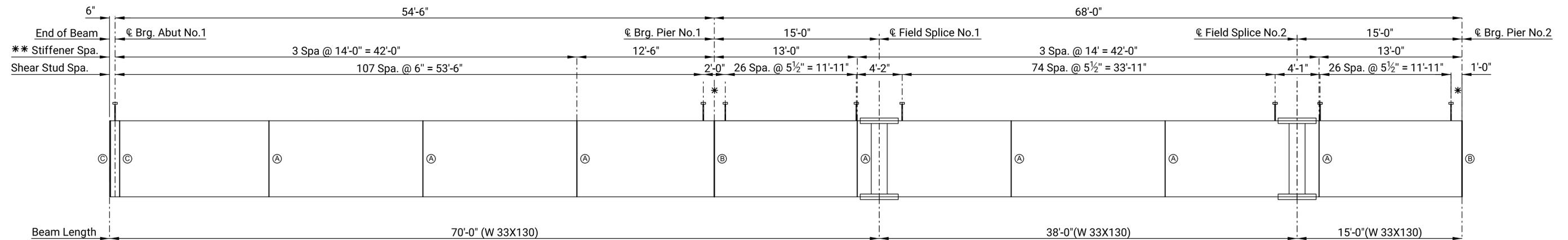
| STRUCTURAL STEEL SUMMARY      |                              |                         |                        |
|-------------------------------|------------------------------|-------------------------|------------------------|
| Item                          | AASHTO M270 Gr. 50W T3 (lbs) | ASTM A709 Gr. 50W (lbs) | ASTM A709 Gr. 36 (lbs) |
| W33x169                       | 159,900                      |                         |                        |
| Flange Splice Plates          | 7,349                        |                         |                        |
| Web Splice Plates             | 2,851                        |                         |                        |
| Intermediate Stiffeners       |                              | 2,054                   |                        |
| Bearing Stiffeners (Pier)     |                              | 1,100                   |                        |
| Bearing Stiffeners (Abutment) |                              | 978                     |                        |
| Horizontal Stiffeners         |                              | 108                     |                        |
| Abutment Frames               |                              | 1,309                   |                        |
| Bent Plate Diaphragms         |                              | 18,140                  |                        |
| Beam Supports                 |                              |                         | 1,062                  |
| <b>TOTAL STRUCTURAL STEEL</b> | <b>170,100</b>               | <b>23,689</b>           | <b>1,062</b>           |



FRAMING PLAN

| NO.                                 | DATE    | REVISIONS  | BY            | APPD       |
|-------------------------------------|---------|------------|---------------|------------|
| KANSAS DEPARTMENT OF TRANSPORTATION |         |            |               |            |
| Br. No. 70-31-298.98 (095)          |         |            | Sta. 50+00.00 |            |
| FRAMING PLAN                        |         |            |               |            |
| Proj. 70-31 KA-6483-01              |         |            | Geary Co.     |            |
| DESIGNED                            | HD      | DETAILED   | HD            | QUANTITIES |
| DESIGN CK.                          | SGB,AJH | DETAIL CK. | SGB,AJH       | QUAN. CK.  |
|                                     |         |            |               | ECM        |
|                                     |         |            |               | HD         |

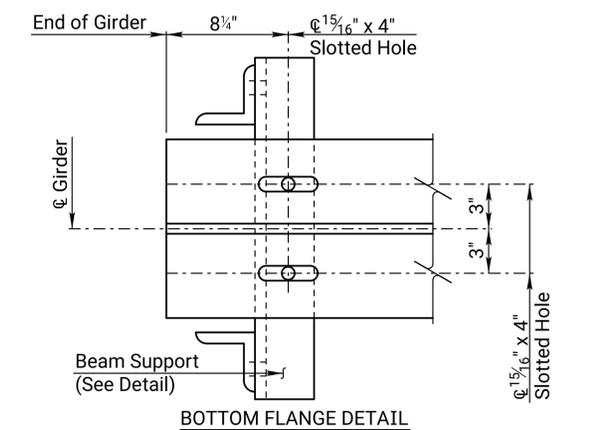
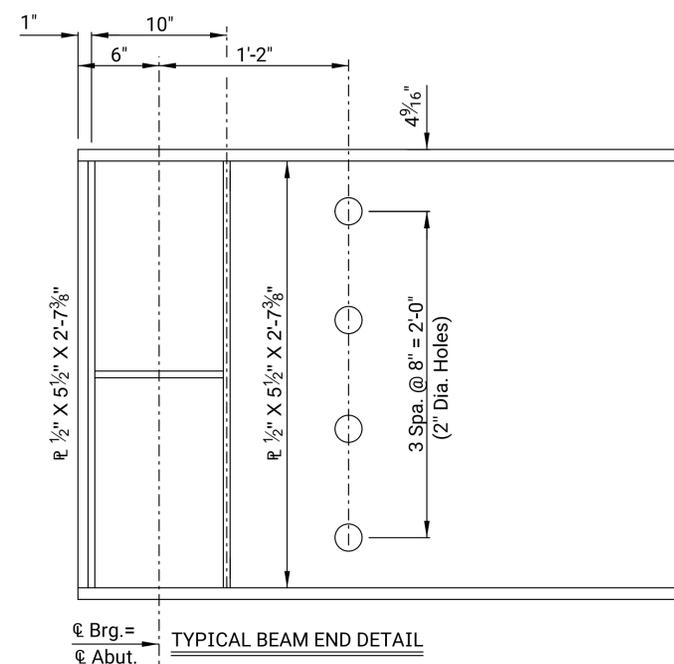
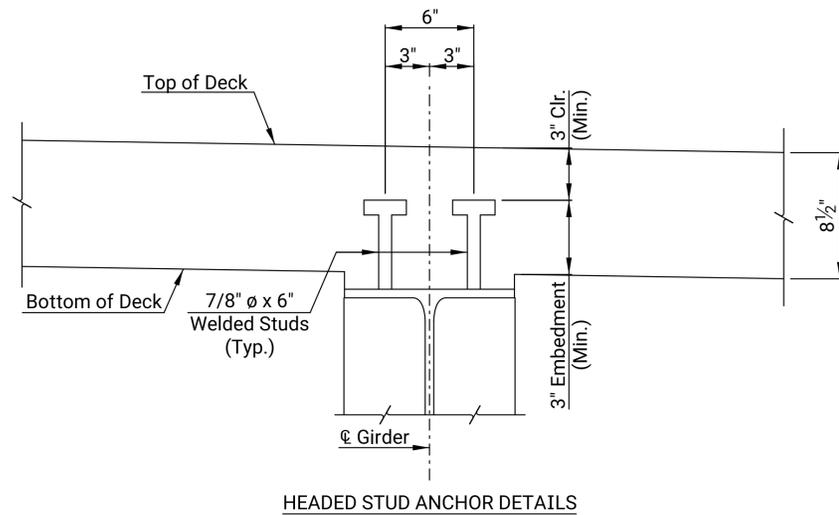
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**ELEVATION**

- \* Avoid placing studs at centerline of bearing, offset the stud a minimum of 12 inches at the piers to avoid maximum stress regions.
- \*\* Interior Beam: Place stiffeners on both web faces. Exterior Beam: Place stiffeners on interior web face only at non-bearing location. Place stiffeners on both web faces at piers and abutments.

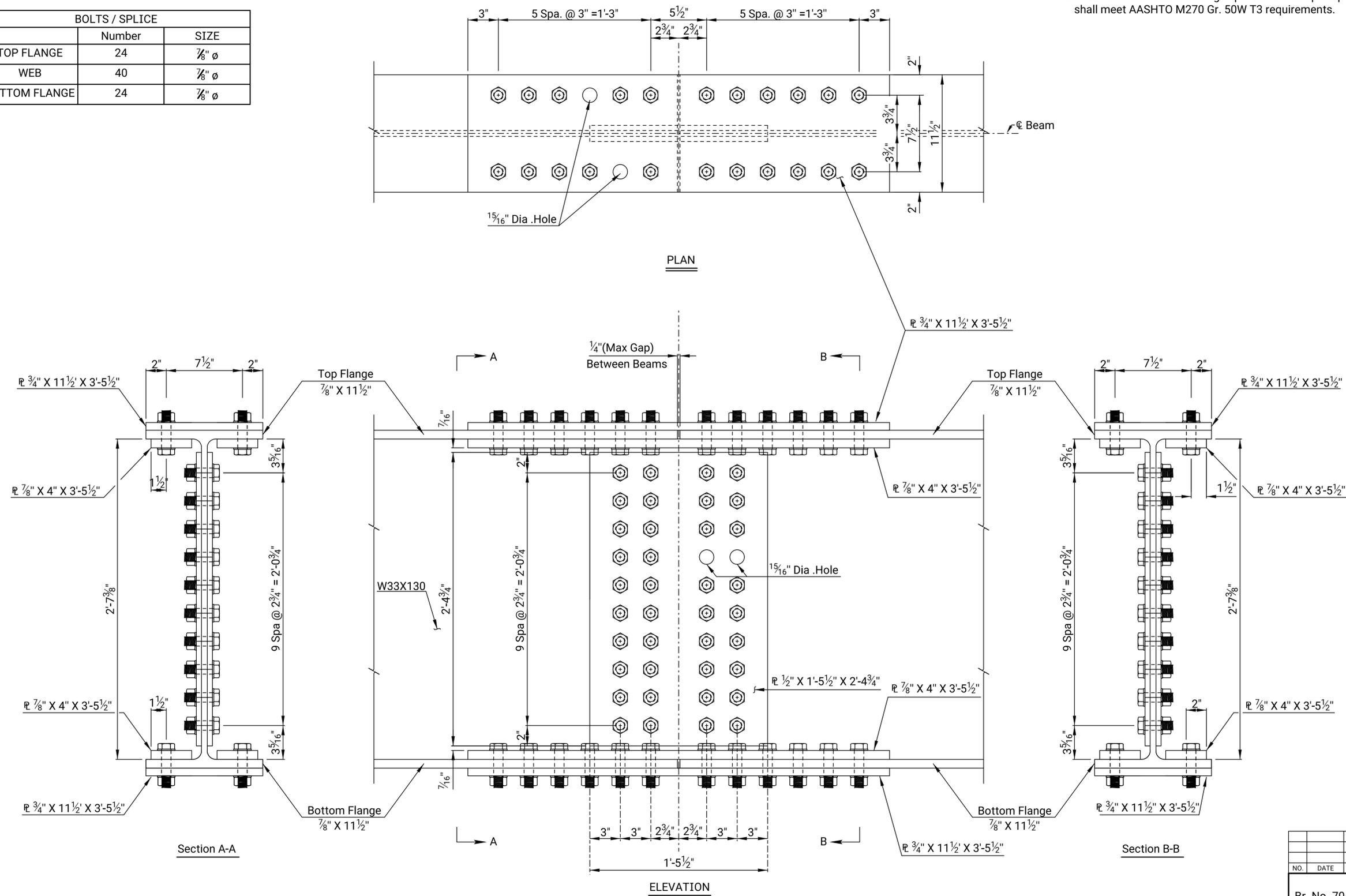
| Bill of Stiffeners       |     |          |        |              |
|--------------------------|-----|----------|--------|--------------|
| Location                 | No. | Size     | Length | Type         |
| A                        | 112 | ¾" X 5½" | 2'-7¾" | Intermediate |
| B                        | 30  | ¾" X 5½" | 2'-7¾" | Pier         |
| C                        | 40  | ½" X 5½" | 2'-7¾" | Abutment     |
| Bill of Studs            |     |          |        |              |
| 948 7/8" Diameter / Beam |     |          |        |              |



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|-------------------------------------|---------|------------|---------------|------------|
| KANSAS DEPARTMENT OF TRANSPORTATION |         |            |               |            |
| Br. No. 70-31-298.98 (095)          |         |            | Sta. 50+00.00 |            |
| <b>BEAM DETAILS</b>                 |         |            |               |            |
| Proj. 70-31 KA-6483-01              |         |            | Geary Co.     |            |
| DESIGNED                            | HD      | DETAILED   | HD            | QUANTITIES |
| DESIGN CK.                          | SGB,AJH | DETAIL CK. | SGB,AJH       | QUAN. CK.  |
| CADD                                | ECM     | CADD       | CK.           | HD         |

| BOLTS / SPLICE |        |                        |
|----------------|--------|------------------------|
|                | Number | SIZE                   |
| TOP FLANGE     | 24     | $\frac{7}{8}$ " $\phi$ |
| WEB            | 40     | $\frac{7}{8}$ " $\phi$ |
| BOTTOM FLANGE  | 24     | $\frac{7}{8}$ " $\phi$ |

STRUCTURAL STEEL: the flange splice and web splice plates shall meet AASHTO M270 Gr. 50W T3 requirements.



| NO.                                 | DATE   | REVISIONS  | BY            | APPD       |
|-------------------------------------|--------|------------|---------------|------------|
| KANSAS DEPARTMENT OF TRANSPORTATION |        |            |               |            |
| Br. No. 70-31-298.98 (095)          |        |            | Sta. 50+00.00 |            |
| BEAM SPLICE DETAILS                 |        |            |               |            |
| Proj. 70-31 KA-6483-01              |        |            | Geary Co.     |            |
| DESIGNED                            | HD     | DETAILED   | HD            | QUANTITIES |
| DESIGN CK.                          | SGBAJH | DETAIL CK. | SGBAJH        | QUAN. CK.  |
|                                     |        |            |               | HD         |

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|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 51        | 148          |

**Production Bolt Tightening**

1. Install bolts and tighten to "snug tight" in a pattern, starting at the center of the splice and working toward the edge. On large girders this may have to be done twice, as the center bolts will become loose as plates are "Ironed out". This step is important because typically, any variation in results during production bolting is the result of a change in the materials, lubricant or equipment used to take the bolts to a "snug tight" condition during the calibration process.
2. Mark all of the bolts, nuts and the plate as shown in the marking detail. Mark the socket with a start and stop point. The stop point corresponds to the target rotation determined earlier.
3. Align the start mark on the socket with the line on the plate. While the bolt is being backed up, turn the nut until the stop mark on the socket lines up with the start mark on the plate.
4. Repeat with all bolts of the same length in the splice.

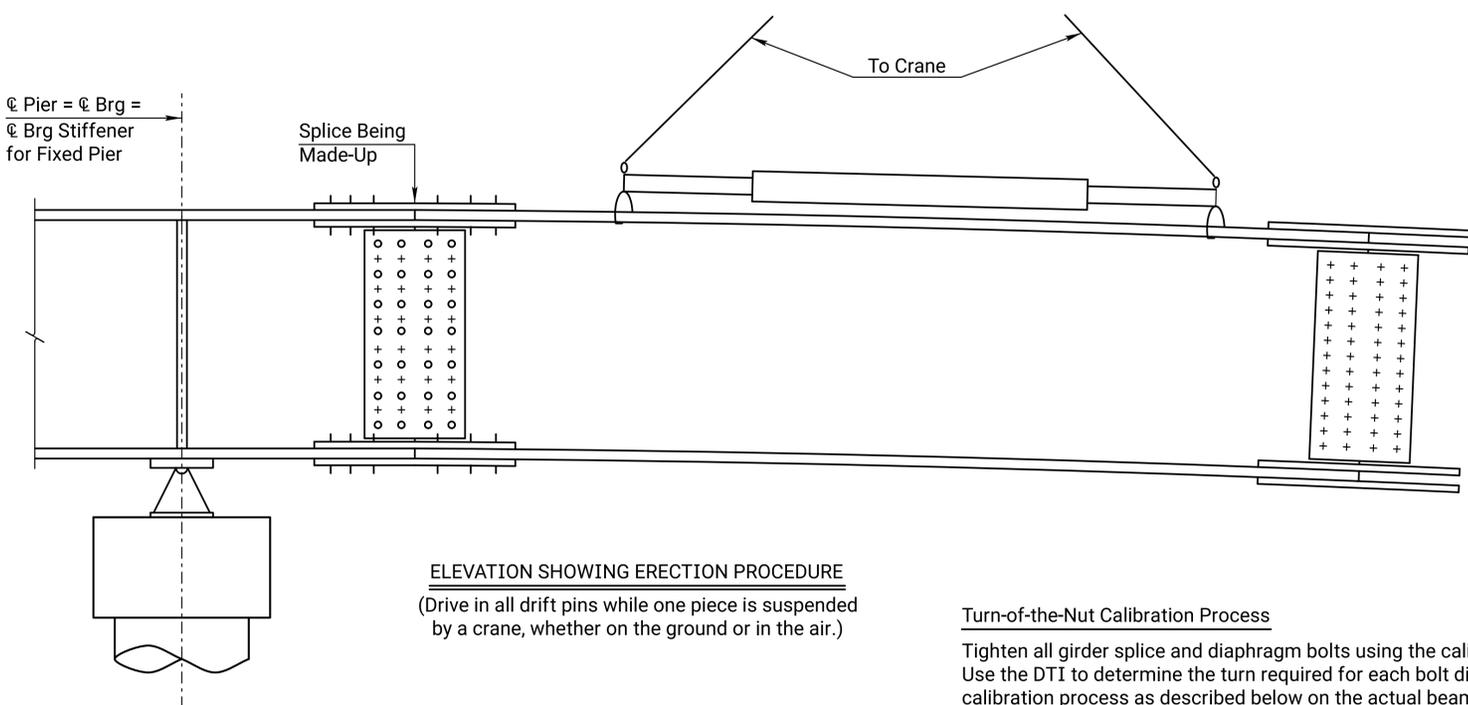
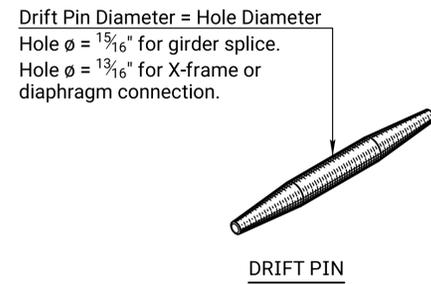
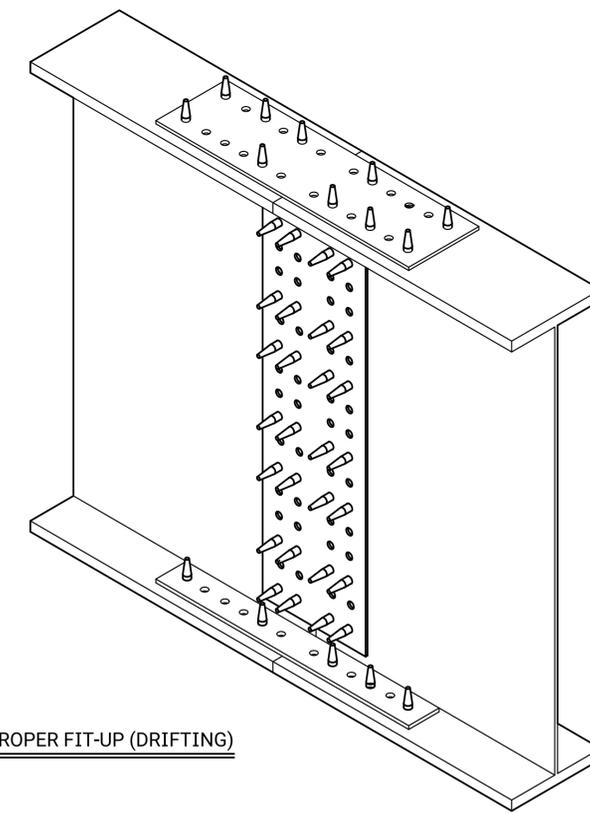
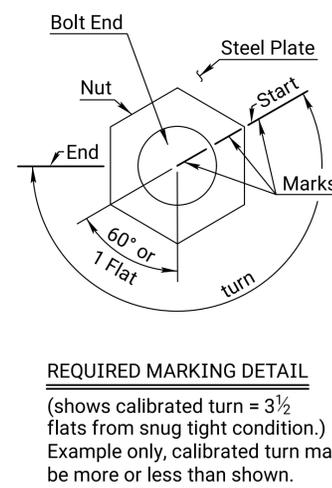
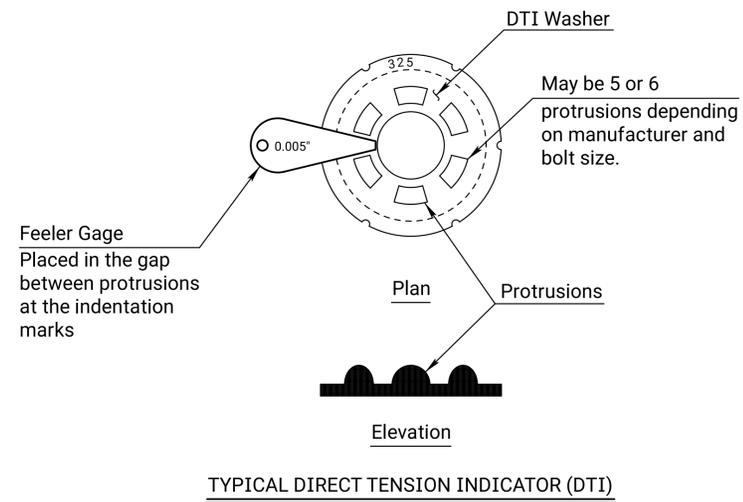
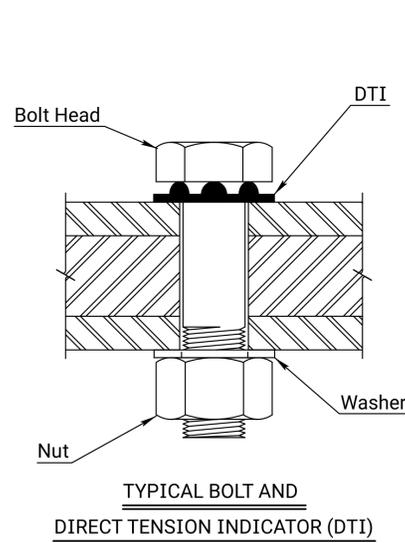
**Acceptance and Rejection of Bolts**

1. The Engineer will check all bolts with a feeler gage.
2. All nuts must be turned at least the target rotation beyond "snug tight".
3. All DTI's must have at least 3 refusals of the 0.005" gage.
4. If all gaps refuse the 0.005" gage, and the nut, plate and bolt are not marked, reject the bolt.
5. If all gaps refuse the 0.005" gage, and the turned element has not been rotated more than 45° beyond the calibrated turn, accept the bolt.
6. If all gaps refuse the 0.005" gage, and the turned element has been rotated more than 45° beyond the calibrated turn, reject the bolt.

For additional information see the structural steel section of the Bridge Construction Manual.

**Suggested Impact wrench models:**

- CP 611
- IR 2940
- Cleco WS2110
- ATP 1011/1040
- Norbar PT1500



**Fit Up**

During the fit up, install drift pins in all corner bolt holes, plus 25 percent of the bolt holes (as a min.), evenly distributed throughout the splice. Fill at least 25 percent of the bolt holes with high strength bolts. Fully tighten these bolts by the calibrated turn-of-the-nut method before removing any drift pins or moving the members. These bolts may be either erection bolts or production bolts. Erection bolts are used during fit up, to compress the plies of the splice to achieve a snug condition. Erection bolts are the property of the Contractor and do not remain in the bridge permanently. Erection bolts must be A325, and can be reused. Erection bolts are required when the abutting plates are of different thickness and no fill plate is provided. This situation usually results in a slight bending of the splice plates. If erection bolts are not used, the DTI's may fully compress before the plates are in firm contact. This would be cause for rejecting the splice. Clearly mark the erection bolts so that they are not left in the splice.

**Erection**

Two independent crews will survey the bearing seat elevations. The Engineer will verify that the results of those surveys show that the bearing seat elevations are within ±1/4 inch of the plan elevations before erection begins. Use the blocking diagram, as shown on the shop drawings, when erecting the beams/girders on the ground. Do not lift the assembled pieces into position until at least 25 percent of the holes are filled with fully tightened bolts. Locate the centerline of the bearing stiffener with the centerline of bearing device. Secure the beams/girders to the top of the pier cap prior to placement of the bearing device anchor bolts.

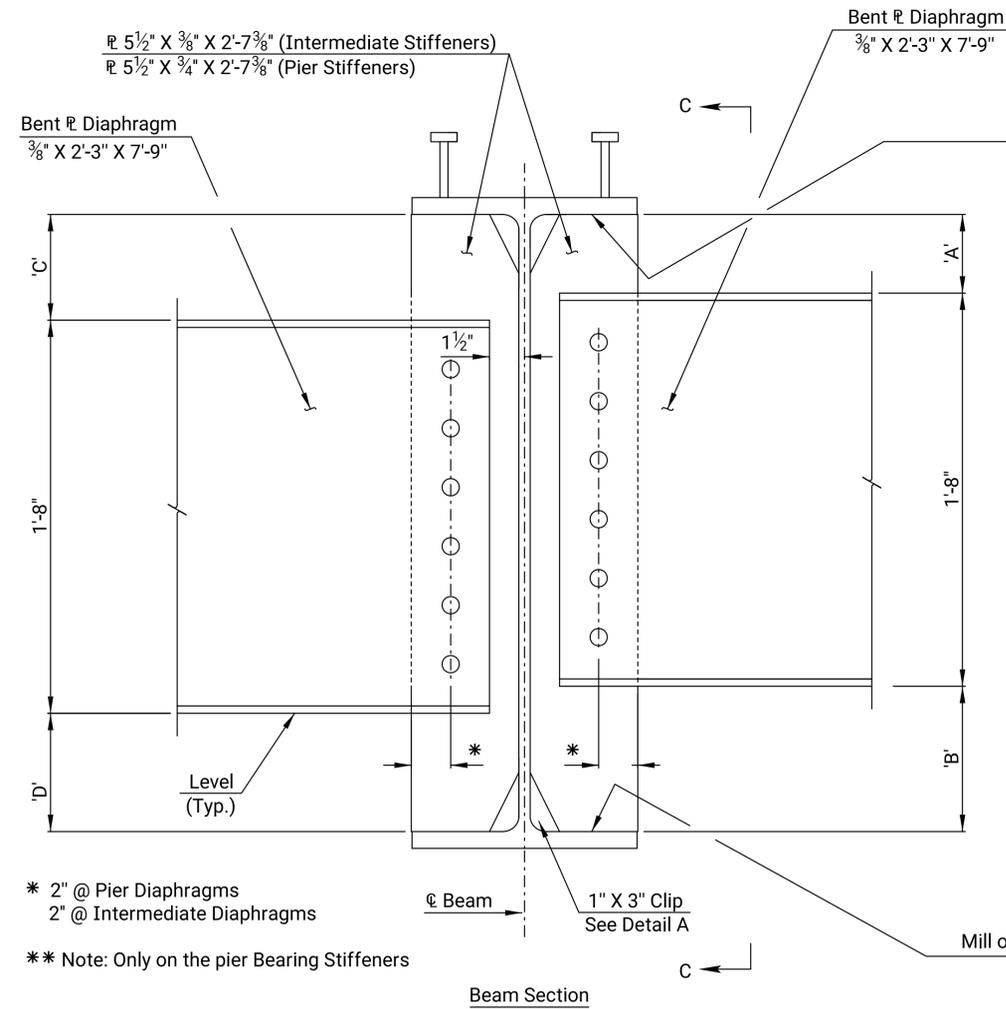
**Turn-of-the-Nut Calibration Process**

Tighten all girder splice and diaphragm bolts using the calibrated turn-of-the-nut method. Use the DTI to determine the turn required for each bolt diameter & length. Perform the calibration process as described below on the actual beam splice or using 3 plies of steel plate with the same thickness as the actual splice.

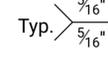
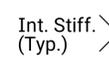
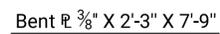
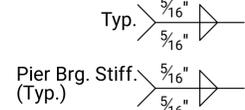
1. Bring at least 25 percent of the bolts in the splice to a "snug-tight-condition". "Snug tight condition" is defined as (with all plies in firm contact) "the full effort of a man on a spud wrench". Usually a smaller impact gun (1/2" drive) is used to snug the splice and a larger impact gun (1" drive) is used for final tightening. This is preferred over the use of a spud wrench. Production bolting and calibration must use the same tools and lubricating procedures. If an impact wrench is used to "iron the plates" and snug the bolts for calibration, then an impact wrench must be used during the snugging process during production bolting.
2. See "Required Marking Detail" (choose a bolt at the center of the splice and recheck snug on adjacent bolts).
  - a. Mark the outside of the socket at one of the corners.
  - b. Mark the bolt, plate, and nut at a corner with a start line.
  - c. Align the mark on the socket with the start mark on the bolt end.
  - d. While holding a backup wrench on the head of the bolt, turn the nut 1/2 turn (3 flats).
  - e. Record the number of refusals.
  - f. If all of the gaps refuse, go to another bolt and turn the nut 2 flats (1/3 turn).
  - g. If there are fewer than 3 refusals turn the nut an additional 1/4 of a flat (15 degrees).
  - h. Repeat step g., turning the nut 1/3 of a flat or less each time, until all of the gaps refuse the feeler gage. Record the amount required to cause all of the gaps to refuse the feeler gage. This is the target rotation.
3. Repeat this process for each bolt diameter and length.

|   |          |                 |               |            |         |
|---|----------|-----------------|---------------|------------|---------|
| 03  |          |                 |               |            |         |
| 02  |          |                 |               |            |         |
| 01  | 04-25-05 | Current Release |               | R.A.M.     | K.F.H.  |
| NO.   | DATE     | REVISIONS       |               | BY         | APPD    |
| KANSAS DEPARTMENT OF TRANSPORTATION                 |          |                 |               |            |         |
| Br. No. 70-31-298.98 (095)                          |          |                 | Sta. 50+00.00 |            |         |
| <b>STEEL ERECTION, FIT-UP AND BOLTING PROCEDURE</b> |          |                 |               |            |         |
| Proj. 70-31 KA-6483-01                              |          |                 | Geary Co.     |            |         |
| DESIGNED  | HD       | DETAILED        | HD            | QUANTITIES | HD      |
| CADD  | ECM      |                 |               |            |         |
| DESIGN CK.  | SGB,AJH  | DETAIL CK.      | SGB,AJH       | QUAN.CK.   | SGB,AJH |
| CADD CK.  | HD       |                 |               |            |         |
| DOT Graphics Certified 07-15-2022 Sh. No. 51        |          |                 |               |            |         |

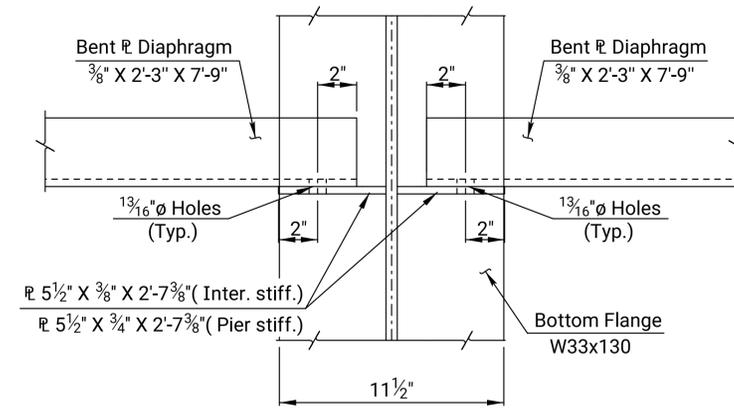
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|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 52        | 148          |



Tight Fit \*\*

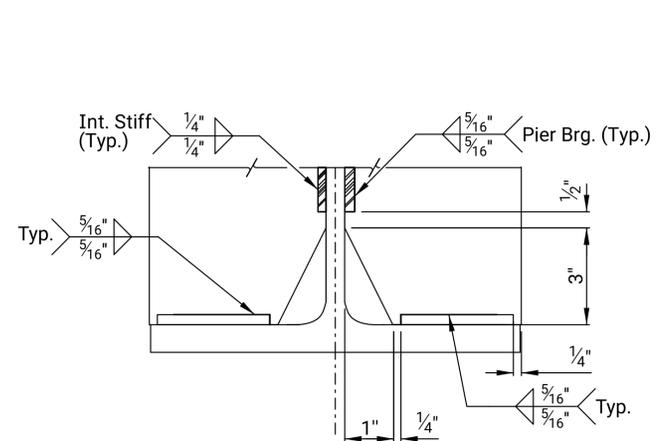


Mill or Grind to bear \*\*

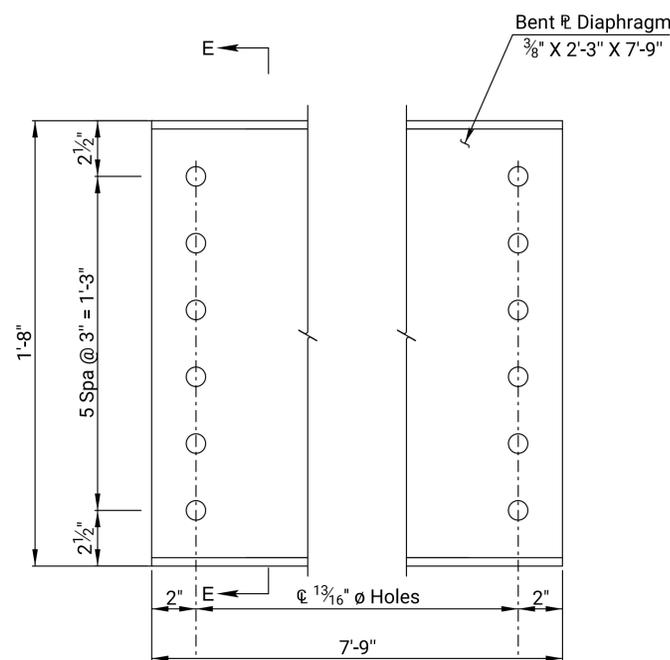


DIAPHRAGM CONNECTION DETAIL

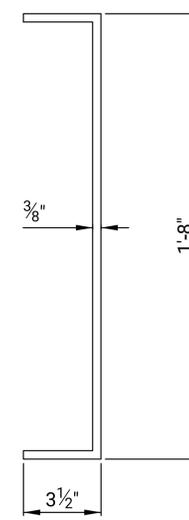
| PIER No. 1, 2 & 3 INTERMEDIATE DIMENSIONS |          |          |          |          |
|---|----------|----------|----------|----------|
| Bay Between Beams                         | Dim. 'A' | Dim. 'B' | Dim. 'C' | Dim. 'D' |
| A-B                                       | 6"       | 5 3/8"   | 7 9/16"  | 3 13/16" |
| B-C                                       | 6"       | 5 3/8"   | 7 9/16"  | 3 13/16" |
| C-D                                       | 7 9/16"  | 3 13/16" | 6"       | 5 3/8"   |
| D-E                                       | 7 9/16"  | 3 13/16" | 6"       | 5 3/8"   |



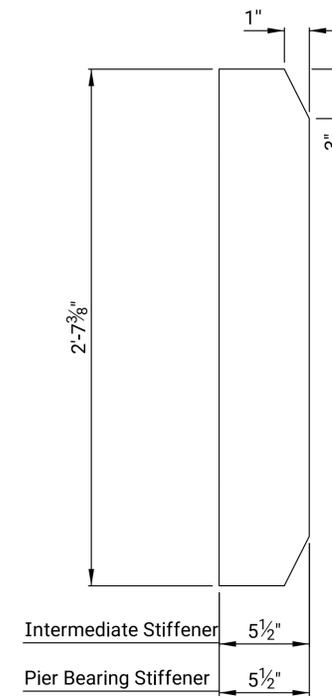
Detail A



DIAPHRAGMS  
(ASTM A709 Gr. 50w)



Section E-E



STIFFENERS

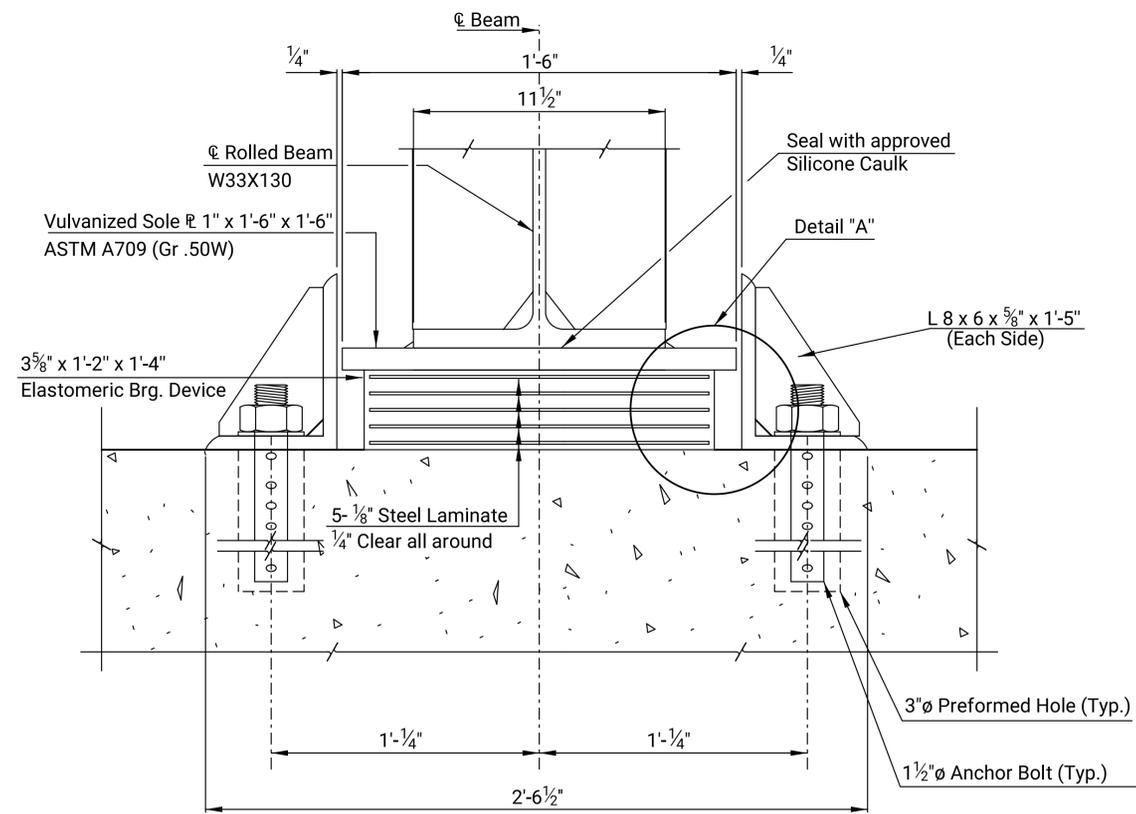
| Stiffeners   |                           |                   |     |
|--------------|---------------------------|-------------------|-----|
|              | Size                      | Grade             | No. |
| Intermediate | 5 1/2" X 3/8" X 2'-7 3/8" | ASTM A709 Gr. 50W | 112 |
| Pier Bearing | 5 1/2" X 3/4" X 2'-7 3/8" | ASTM A709 Gr. 50W | 30  |

|   |        |               |        |            |
|---|--------|---------------|--------|------------|
| KANSAS DEPARTMENT OF TRANSPORTATION     |        |               |        |            |
| Br. No. 70-31-298.98 (095)              |        | Sta. 50+00.00 |        |            |
| PIER AND INTERMEDIATE DIAPHRAGM DETAILS |        |               |        |            |
| Proj. 70-31 KA-6483-01                  |        | Geary Co.     |        |            |
| DESIGNED                                | HD     | DETAILED      | HD     | QUANTITIES |
| DESIGN CK.                              | SGBAJH | DETAIL CK.    | SGBAJH | QUAN. CK.  |
| CADD                                    |        | ECM           |        |            |
| HD                                      |        | HD            |        |            |

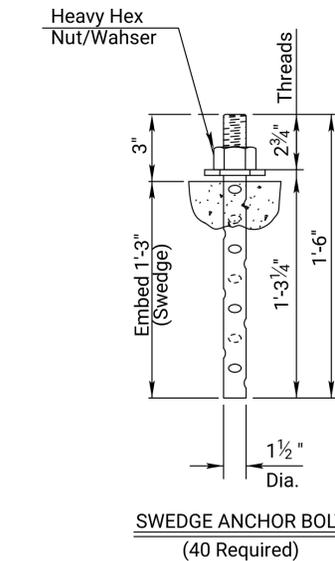
CADconform Certify This File



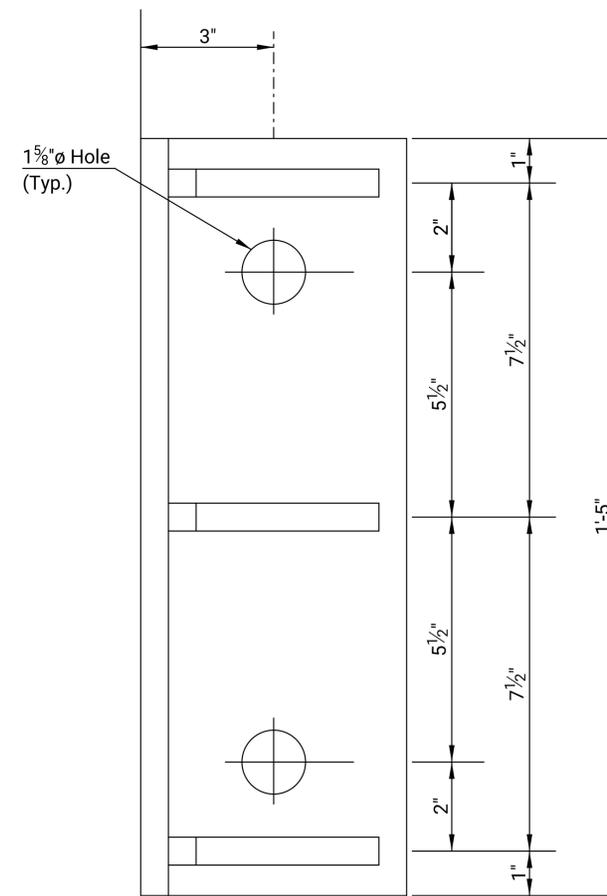
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|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 54        | 148          |



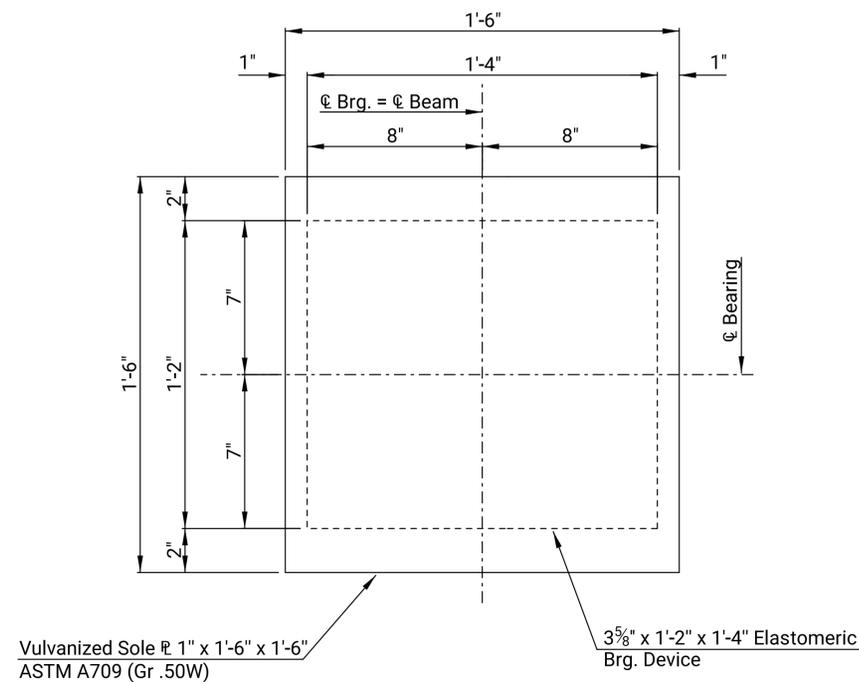
**SECTION THRU BEARING DEVICE**  
(10 Required)



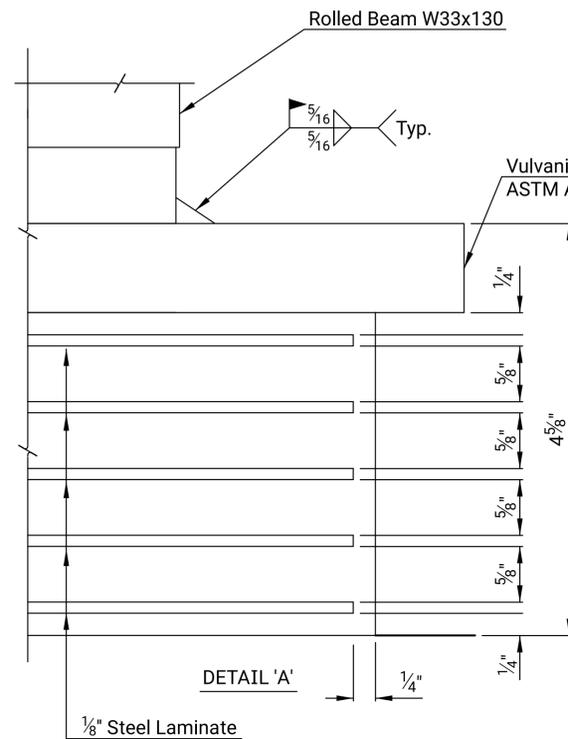
**ANCHOR BOLTS:** Anchor bolts will adhere to KDOT Standard Specification Division 1600 (Grade 55\_) with the following exception. The threads may be rolled or cut.



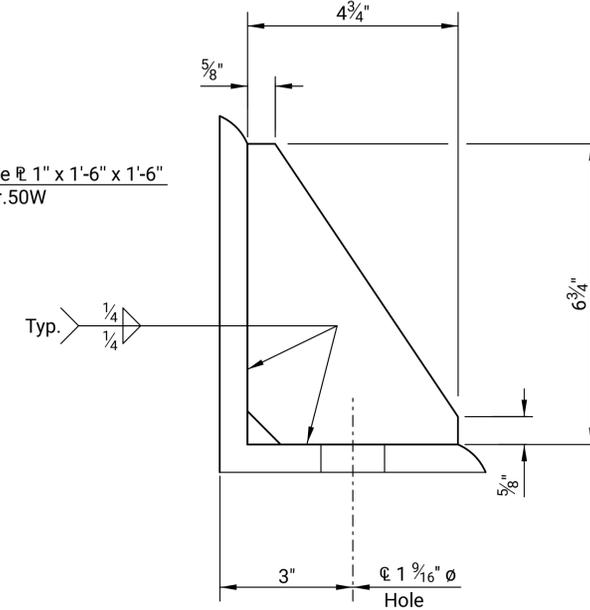
**PLAN**



**BEARING DEVICE PLAN**  
(10 Required)



**DETAIL 'A'**



**ELEVATION**

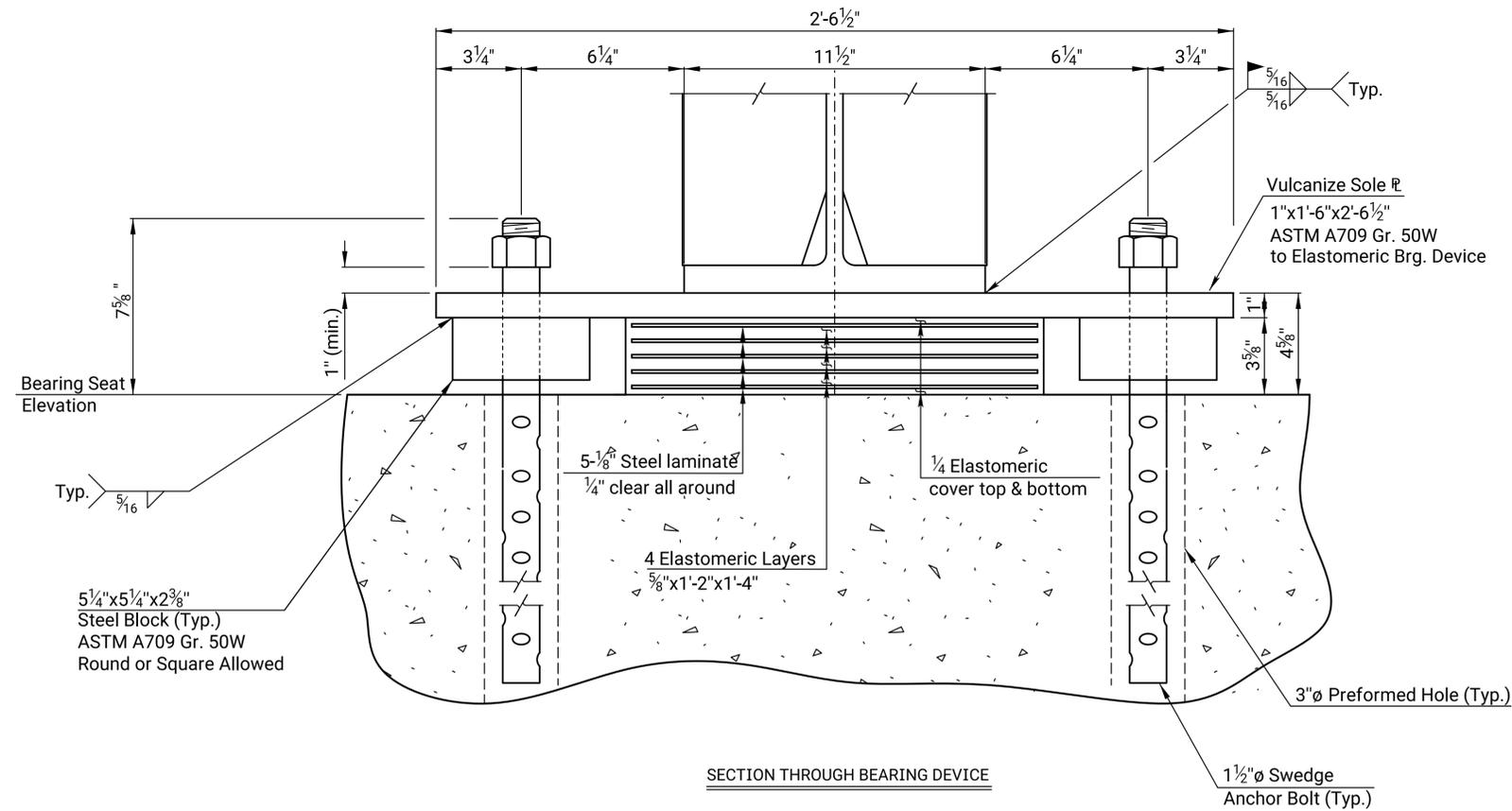
L 8 x 6 x 5/8" x 1'-5"  
(20 Required)  
ASTM A709 Gr. 50W  
(Galvanized)

**BEARING (STEEL REINFORCED ELASTOMERIC):**  
Elastomeric Bearing Device shall be factory bonded to the steel sole plate and swedge anchor bolt are subsidiary to the bid item, "Bearing (Steel Reinforced Elastomeric)" and shall be furnished by the bearing device fabricator.

**BEARING (Bearing Type Steel Reinforced Elastomeric, Method A):** Bearing devices at piers shall be fabricated with an elastomer satisfying: Shore A Durometer Hardness of 60. Low Temperature Grade 3 requirements Type A certification for elastomeric bearing device acceptance is required including design method and all material properties on shop details.

| NO.                                     | DATE    | REVISIONS  | BY            | APPD       |
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|   |         |            |               |            |
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| Br. No. 70-31-298.98 (095)              |         |            | Sta. 50+00.00 |            |
| PIER NO.1 & 3<br>BEARING DEVICE DETAILS |         |            |               |            |
| Proj. 70-31 KA-6483-01                  |         |            | Geary Co.     |            |
| DESIGNED                                | HD      | DETAILED   | HD            | QUANTITIES |
| DESIGN CK.                              | SGB,AJH | DETAIL CK. | SGB,AJH       | QUAN. CK.  |
|   |         |            |               |            |

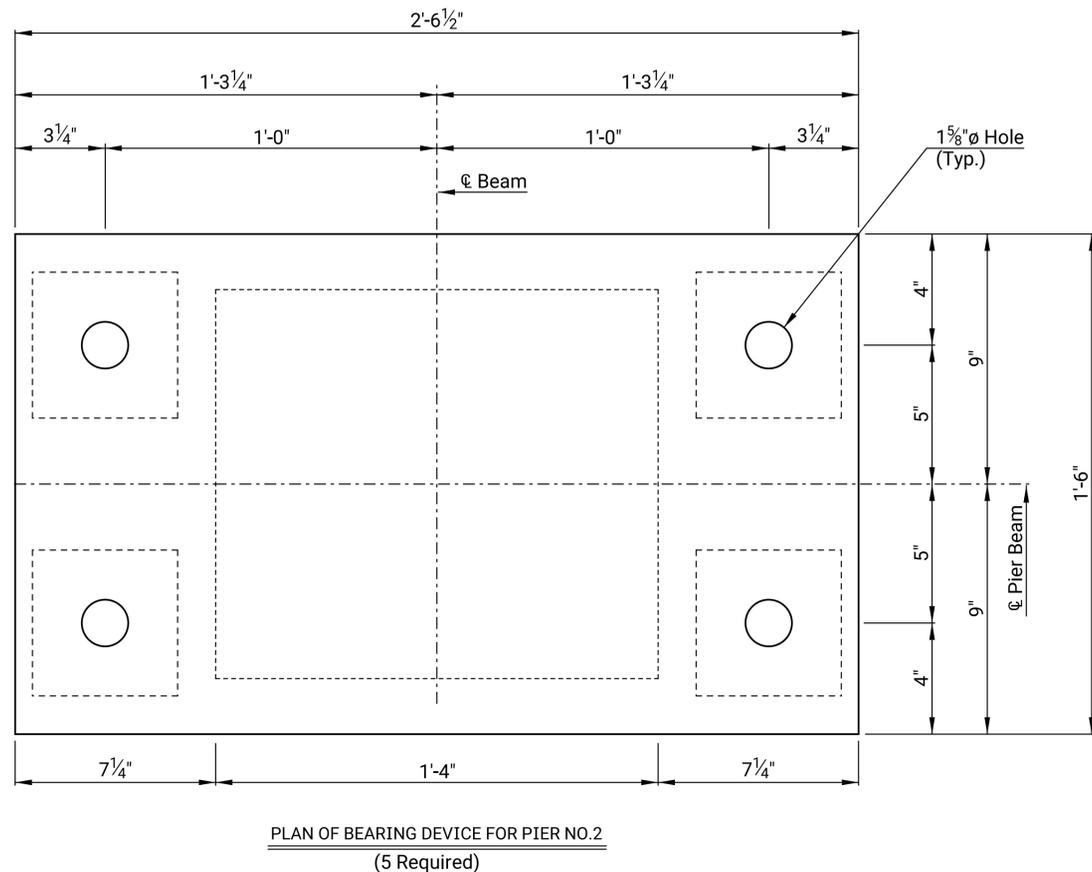
|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 55        | 148          |



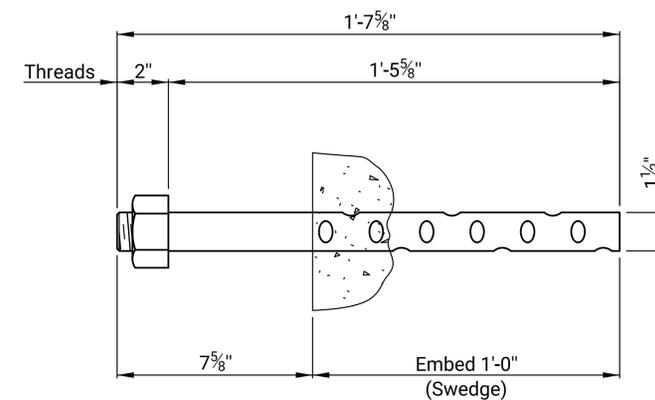
**BEARING (STEEL REINFORCED ELASTOMERIC) (Method A):**  
 Bearing devices at all piers shall be fabricated with an elastomer satisfying:  
 - Shore A Durometer Hardness of 60  
 - Low Temperature Grade 3 requirements  
 - Type A certification for elastomeric bearing device acceptance is required  
 - Include design method and material properties on shop details

**BEARING (STEEL REINFORCED ELASTOMERIC):** Elastomeric Bearing device shall be factory bonded to the steel sole plate by a vulcanization process. the steel sole plate and swedge anchor bolt are subsidiary to the bid item. "Bearing (Steel Reinforced Elastomeric)" and shall be furnished by the bearing device fabricator.

The sole plate shall be ASTM A709 Gr. 50W structural steel.



PLAN OF BEARING DEVICE FOR PIER NO.2  
(5 Required)



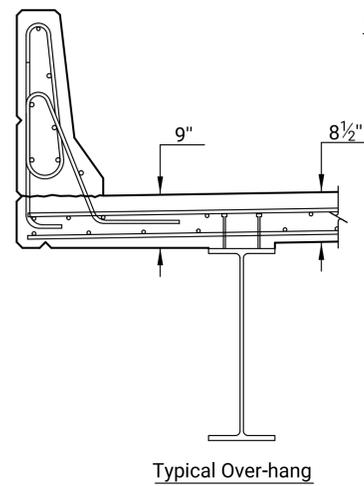
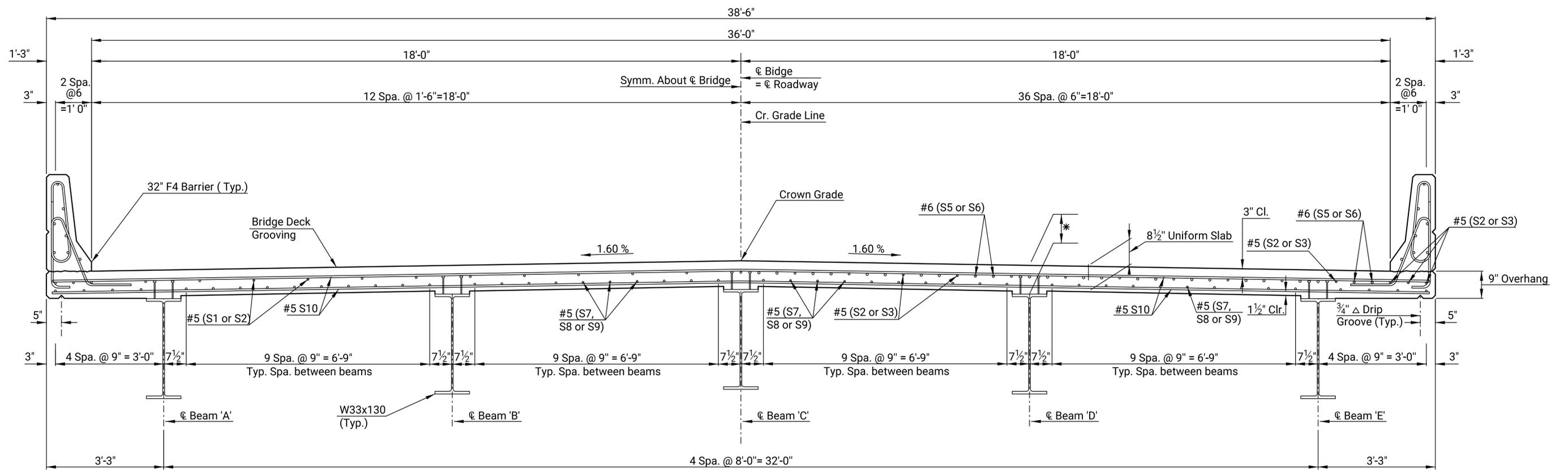
SWEDGE ANCHOR BOLTS  
(20 Required)

**ANCHOR BOLTS:** Anchor bolts and nuts will adhere to KDOT Standard Specification Section 1615 (Grade 55) with the following exception: The threads may be rolled or cut. The bolts and nuts shall be galvanized.

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 File : ka648301bbr0091-018-01 (Final).dgn

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| KANSAS DEPARTMENT OF TRANSPORTATION |        |            |               |            |
| Br. No. 70-31-298.98 (095)          |        |            | Sta. 50+00.00 |            |
| PIER NO.2<br>BEARING DEVICE DETAILS |        |            |               |            |
| Proj. 70-31 KA-6483-01              |        |            | Geary Co.     |            |
| DESIGNED                            | HD     | DETAILED   | HD            | QUANTITIES |
| DESIGN CK.                          | SGBAJH | DETAIL CK. | SGBAJH        | QUAN. CK.  |
|                                     |        |            |               | CADD CK.   |
|                                     |        |            |               | HD         |

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 56        | 148          |

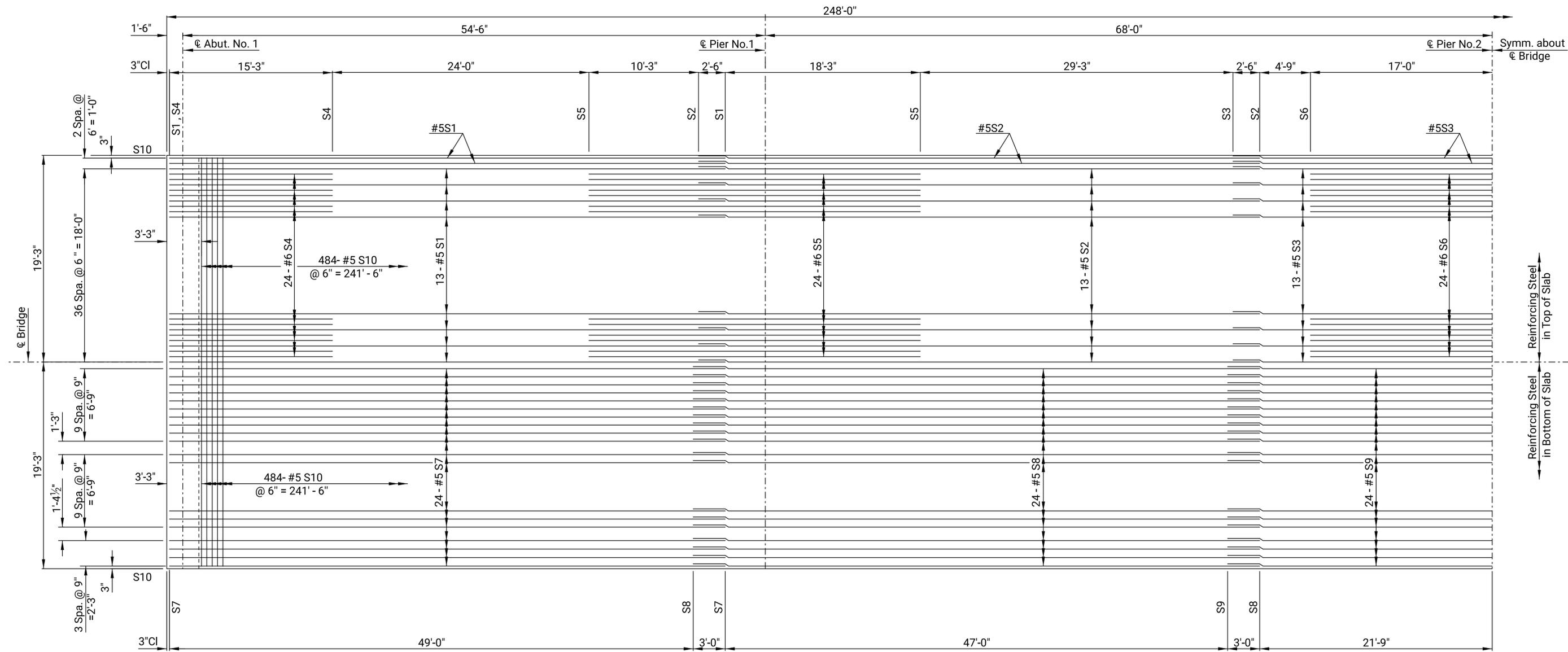


\* The distance between the top of the slab and the top of the beam is 10 1/2" at the abutment and piers. That distance will vary along the beams between those points.

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File : ka648301bbr0091-019(Final).dgn

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|-------------------------------------|--------|------------|---------------|------------|
| KANSAS DEPARTMENT OF TRANSPORTATION |        |            |               |            |
| Br. No. 70-31-298.98 (095)          |        |            | Sta. 50+00.00 |            |
| TYPICAL SECTION                     |        |            |               |            |
| Proj. 70-31 KA-6483-01              |        |            | Geary Co.     |            |
| DESIGNED                            | HD     | DETAILED   | HD            | QUANTITIES |
| DESIGN CK.                          | SGBAJH | DETAIL CK. | SGBAJH        | QUAN. CK.  |
| CADD                                | HD     | CADD       | HD            | ECM        |
| CADD CK.                            | HD     | CADD CK.   | HD            | HD         |

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 57        | 148          |

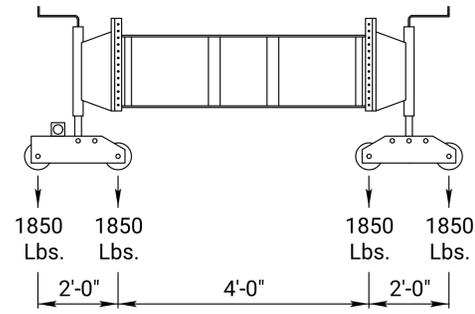


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| NO.                                 | DATE    | REVISIONS  | BY            | APPD       |
|-------------------------------------|---------|------------|---------------|------------|
| KANSAS DEPARTMENT OF TRANSPORTATION |         |            |               |            |
| Br. No. 70-31-298.98 (095)          |         |            | Sta. 50+00.00 |            |
| SUPERSTRUCTURE DETAILS              |         |            |               |            |
| Proj. 70-31 KA-6483-01              |         |            | Geary Co.     |            |
| DESIGNED                            | HD      | DETAILED   | HD            | QUANTITIES |
| DESIGN CK.                          | SGB,AJH | DETAIL CK. | SGB,AJH       | QUAN.CK.   |
| CADD                                | ECM     | CADD       | HD            | ECM        |
| CADD CK.                            | HD      | CADD CK.   | HD            | HD         |

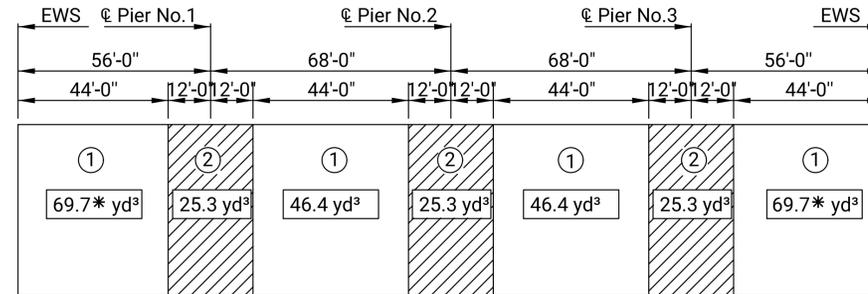
††Note: Installed tension tie-rods at the top of the rolled beams and timber blocks at the bottom of the rolled beams. These shall be centered between the diaphragms. The tie-rods shall brace the top flange and extend from the outer edge of one exterior beam to the other exterior beam. The timber blocks shall brace the bottom flange in all bays. The tie-rods and its connections shall have a minimum ultimate tensile strength of 20 Kips and a minimum cross-sectional area of 0.44 in<sup>2</sup>. The timber blocks shall have a minimum cross-sectional area of 13.14 in<sup>2</sup>.

This work will be considered subsidiary to the bid item "Structural Steel AASHTO M270 (Gr. 50WT 3)".



ASSUMED FINISHING MACHINE  
VALUES LOADING DIAGRAM

Rotation in the exterior girder was calculated assuming screed wheel loads as shown and placed 3" beyond the outside of the deck. The maximum overhang bracket spacing was assumed at 2 ft. When the actual screed loadings are greater than these assumed loads, the Contractor shall submit to the Engineer design calculations for a torsional analysis of the exterior girder and bracing using the actual screed loads. The design calculations shall bear the seal of a licensed Professional Engineer. Submit according to KDOT Specifications Section 700 for falsework and formwork.



CONCRETE PLACING SEQUENCE \* Include Superstructure portion of Abutment concrete.

PLACING SEQUENCE: The Contractor will adhere to the placing direction/sequence shown on the plans. Changes will be accepted only if the Contractor's Engineer adjusts the deflection diagram so that the Contractor can adjust the fillet depth [ and Headed Stud Anchor heights] accordingly. This revised diagram will be approved by the design Engineer prior to deck forming.

PLACING SEQUENCE: Place and hand vibrate all concrete for the abutments above the construction joint to the bottom of deck elevation just prior to the normal paving train operations. Do this work in a manner to avoid cold joints in either the slab or in the abutment.

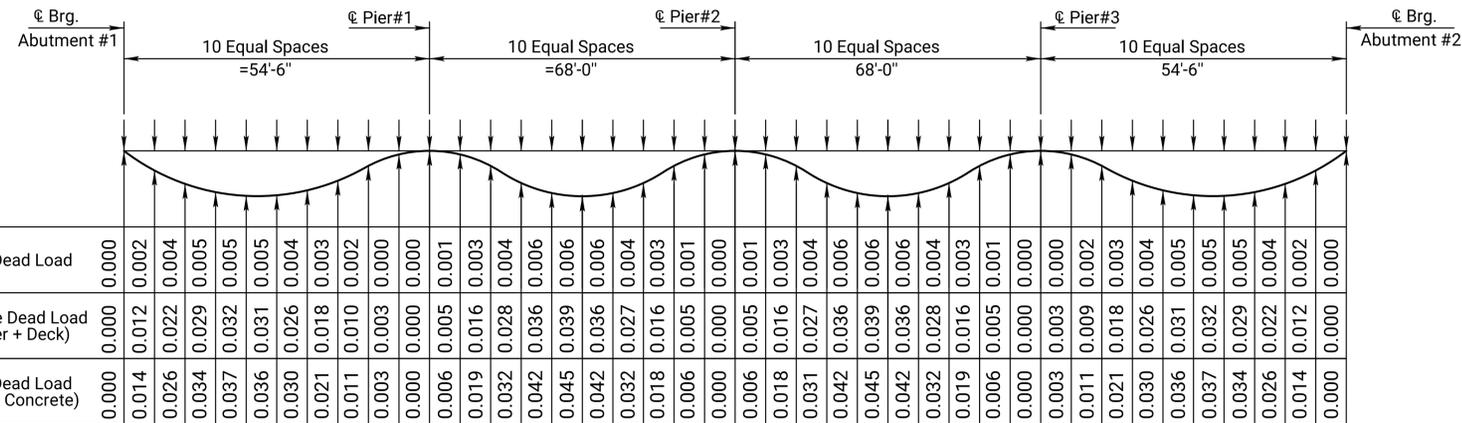
BEAM SPLICE ELEVATIONS \*\*

| LOCATION | SPLICE #1 | SPLICE #2 | SPLICE #3 | SPLICE #4 |
|----------|-----------|-----------|-----------|-----------|
| BEAM "A" | 1135.35   | 1135.44   | 1135.44   | 1135.34   |
| BEAM "B" | 1135.48   | 1135.56   | 1135.56   | 1135.47   |
| BEAM "C" | 1135.61   | 1135.68   | 1135.68   | 1135.60   |
| BEAM "D" | 1135.48   | 1135.56   | 1135.56   | 1135.47   |
| BEAM "E" | 1135.35   | 1135.44   | 1135.44   | 1135.34   |

\*\* Elevations are the top of the top Flange Splice Plates and are used for the erection elevation check. They are computed as straight lines through control points, with adjustments made for the effect of the steel dead load deflections.

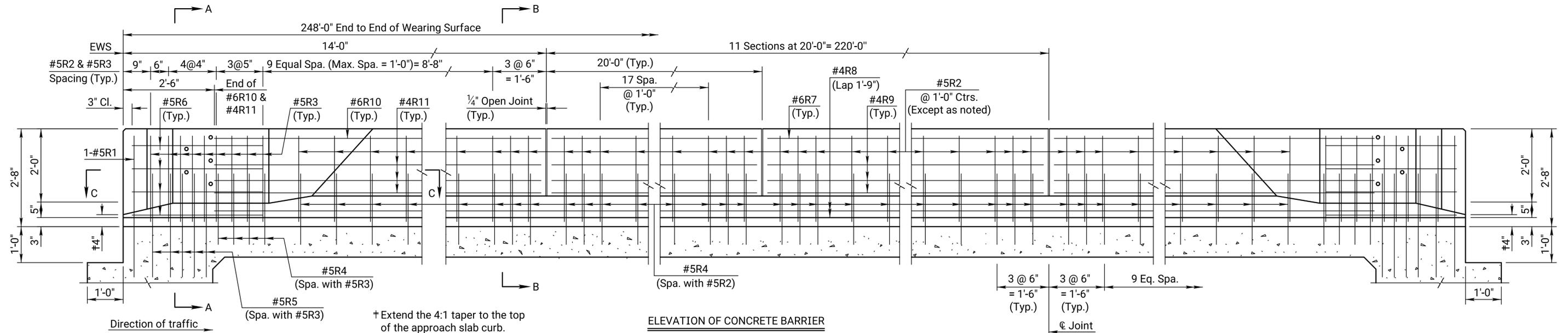
DEAD LOAD DEFLECTION AT SPLICE (Ft.)

| LOCATION  | STEEL | CONCRETE | TOTAL |
|-----------|-------|----------|-------|
| Splice #1 | 0.004 | 0.022    | 0.026 |
| Splice #2 | 0.003 | 0.021    | 0.024 |
| Splice #3 | 0.003 | 0.021    | 0.024 |
| Splice #4 | 0.004 | 0.022    | 0.026 |

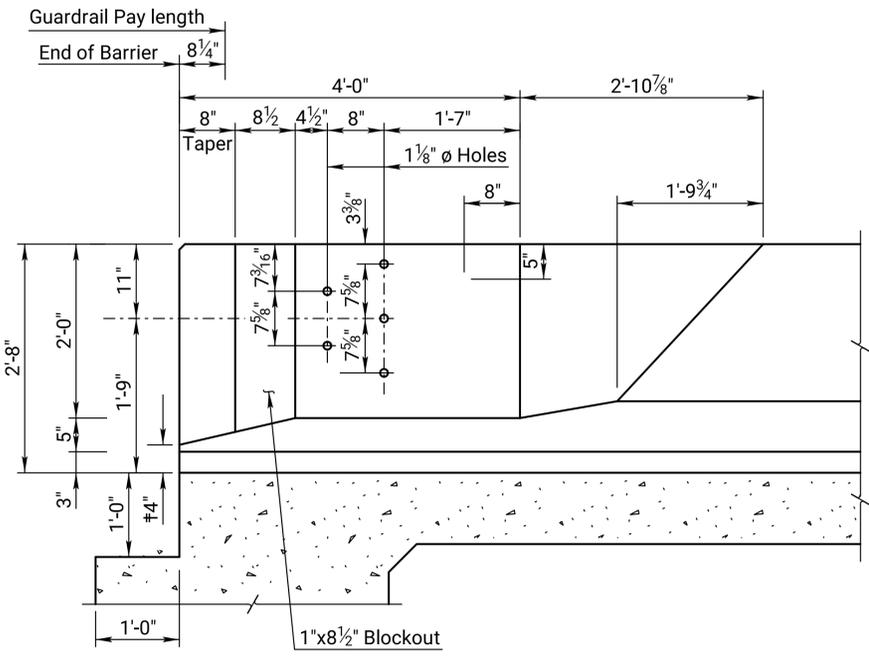


DEAD LOAD DEFLECTION DEAGRAM AT TENTH POINT  
(All deflection are in Ft.)  
(E=29,000 Ksi)

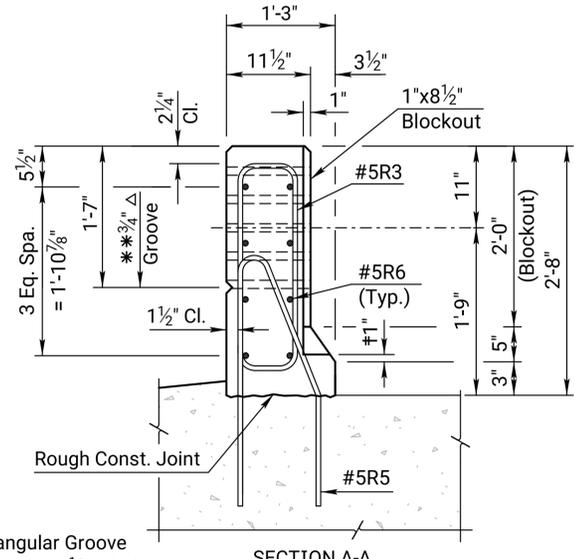
|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 59        | 148          |



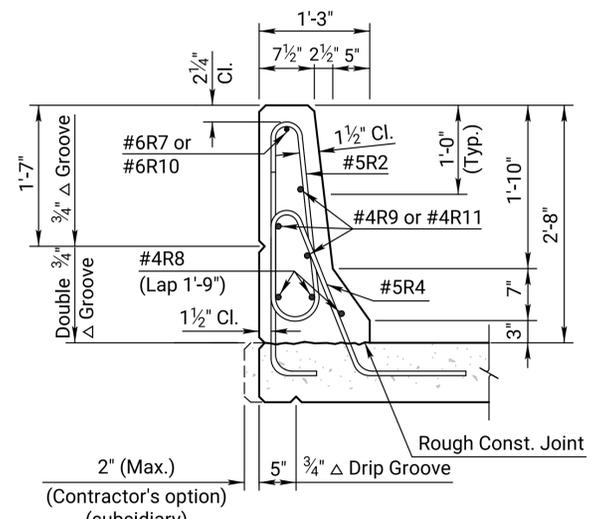
ELEVATION OF CONCRETE BARRIER



ELEVATION OF BARRIER END

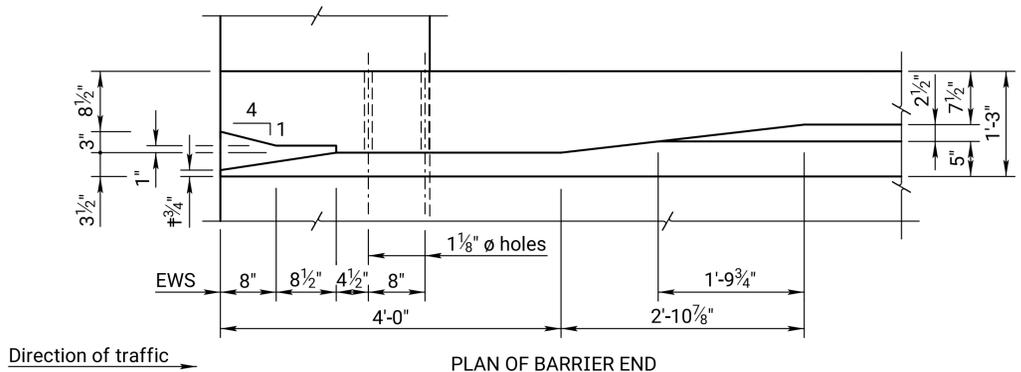


SECTION A-A  
(At Abutment)

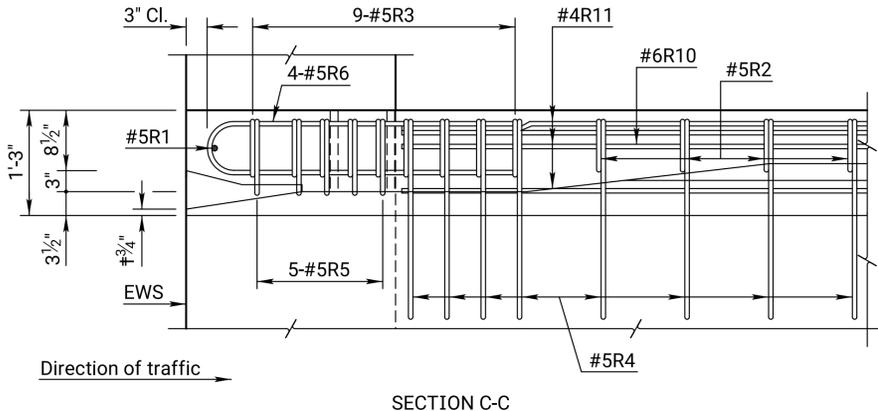


SECTION B-B  
(Section thru Barrier)

\*\*Eliminate the 3/4" Triangular Groove where it conflicts with the 1/8" ø hole.



PLAN OF BARRIER END



SECTION C-C

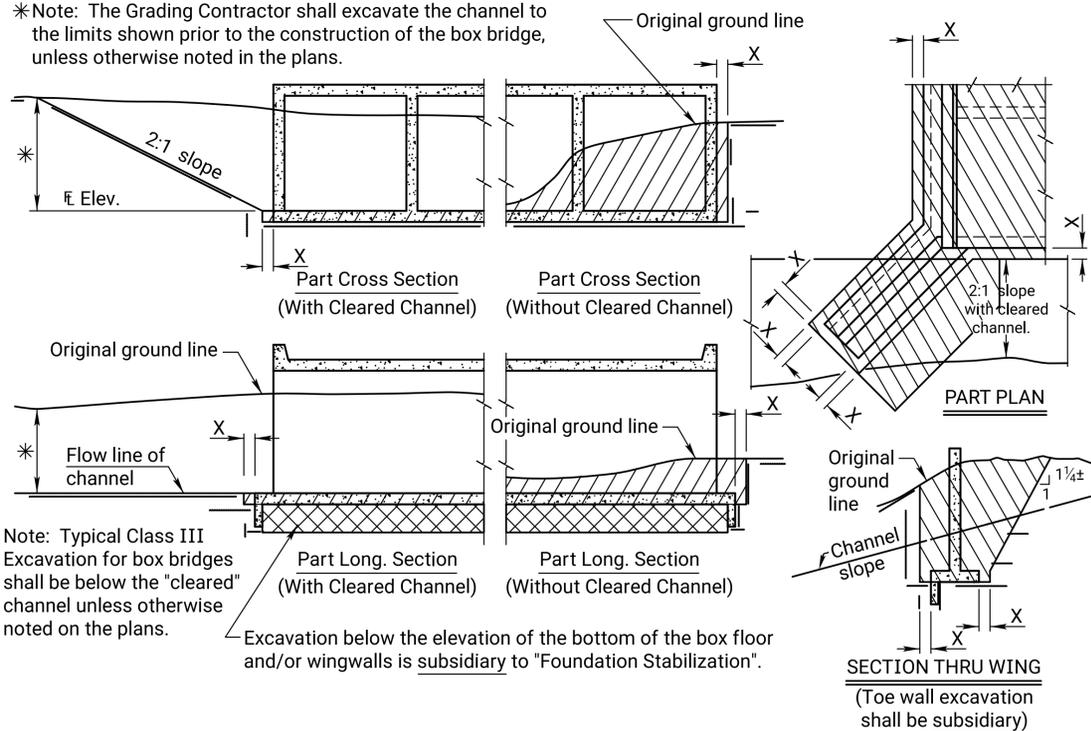
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| 03  |          |                 |         |            |
| 02  |          |                 |         |            |
| 01  | 07-07-23 | Current Release | M.L.L.  | M.A.H.     |
| NO.   | DATE     | REVISIONS       | BY      | APPD       |
| KANSAS DEPARTMENT OF TRANSPORTATION                 |          |                 |         |            |
| Br. No. 70-31-298.98 (095)                          |          | Sta. 50+00.00   |         |            |
| F4 BARRIER<br>(Bridges)<br>(Without 1 1/2" Overlay) |          |                 |         |            |
| Proj. 70-31 KA-6483-01                              |          | Geary Co.       |         |            |
| DESIGNED  | HD       | DETAILED        | HD      | QUANTITIES |
| DESIGN CK.  | SGB,AJH  | DETAIL CK.      | SGB,AJH | QUAN. CK.  |
|   |          |                 |         | CADD CK.   |
|   |          |                 |         | HD         |



|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 61        | 148          |

\*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.

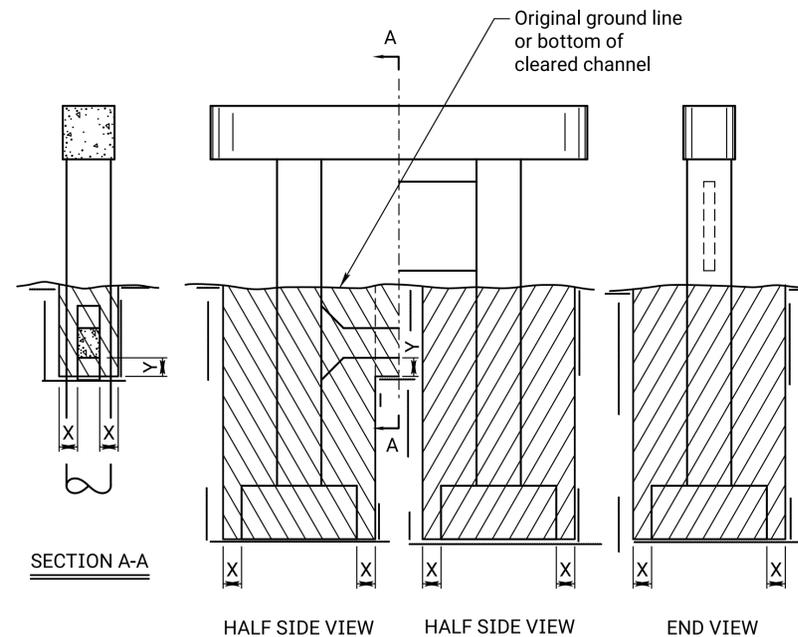


Note: Typical Class III Excavation for box bridges shall be below the "cleared" channel unless otherwise noted on the plans.

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

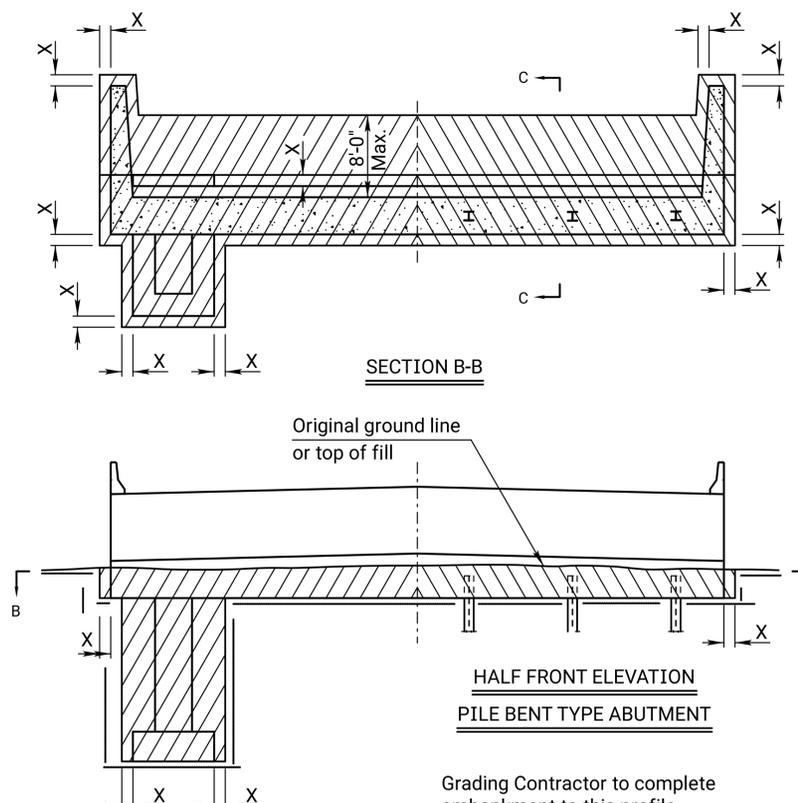
**EXCAVATION DETAILS FOR REINFORCED CONCRETE BOX CULVERT**

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.



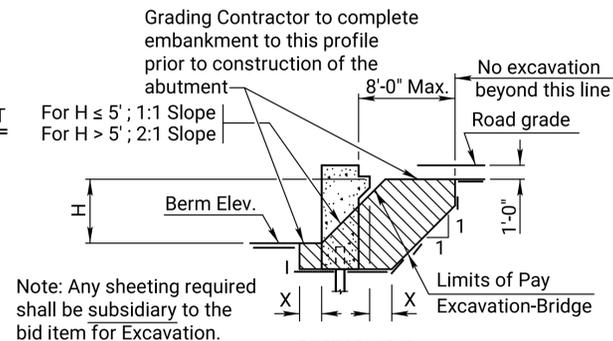
**EXCAVATION DETAILS FOR TYPICAL PIERS**

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

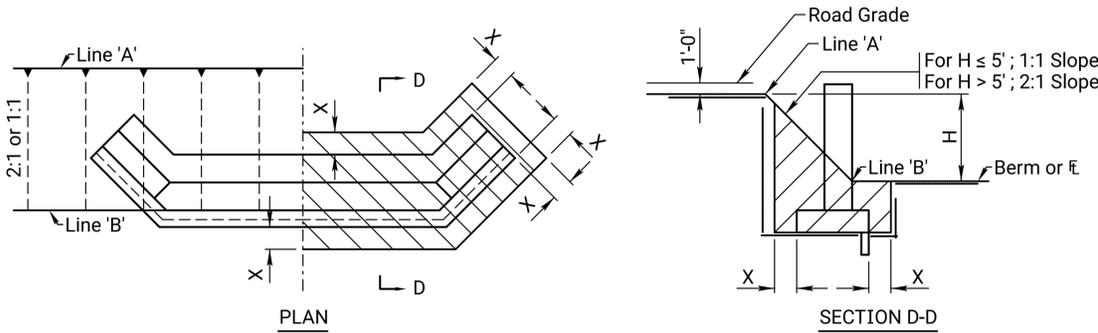


**EXCAVATION DETAILS FOR TYPICAL ABUTMENTS**

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.

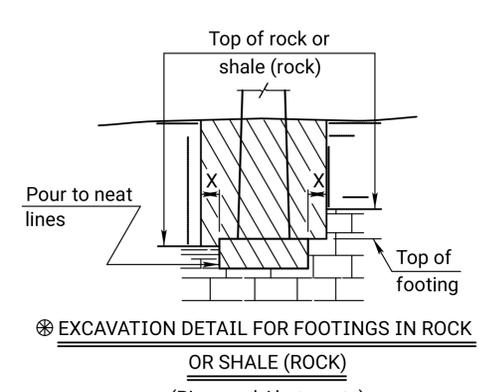
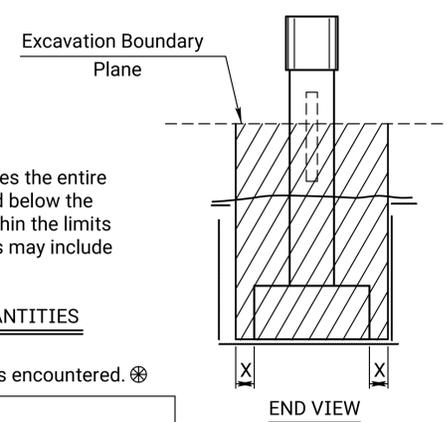


**EXCAVATION DETAILS FOR ABUTMENTS WITH FLARED WINGWALLS**

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**

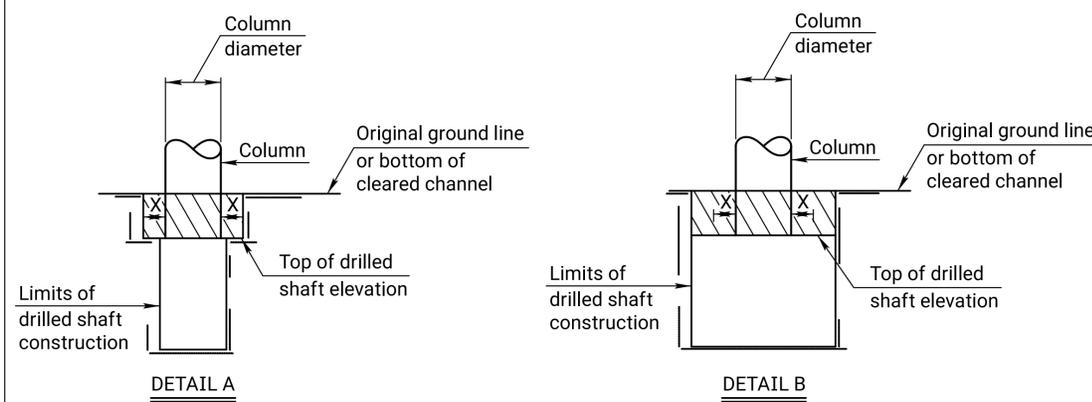
See detail when rock or shale (rock) is encountered. Ⓢ



**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.

|     |          |                                 |        |        |
|-----|----------|---------------------------------|--------|--------|
| 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. |
| NO. | DATE     | REVISIONS                       | BY     | APPD   |

**BRIDGE EXCAVATION (LRFD)**

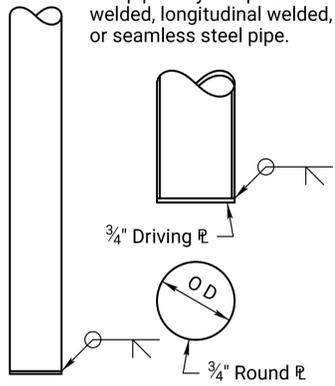
|               |            |          |            |                |
|---------------|------------|----------|------------|----------------|
| FHWA APPROVAL |            | 04-17-10 | APPD       | Terry L. Fleck |
| DESIGNED      | DETAILED   | R.D.R.   | QUANTITIES | TRACED         |
| DESIGN CK.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

|    |         |         |
|----|---------|---------|
| OD | 10 3/4" | T. = ¶¶ |
| OD | 12 3/4" | T. = ¶¶ |
| OD | 14"     | T. = ¶¶ |

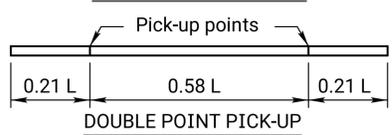
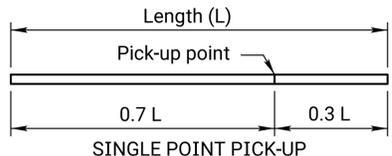
¶¶ See the Geology Report or "Summary of Quantities" for Pipe Pile wall thickness

Note: Pipe shall be driven with a steel head having a projecting ring fitting inside the pipe. Clearance between ring and pipe should be 1/4".

Note: Pipe pipe may be spiral welded, longitudinal welded, or seamless steel pipe.



**PLAIN ROUND CAST-IN-PLACE CONCRETE PILES**



**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.

**12" OR 14" PRESTRESSED CONCRETE PILES**



**SHELL PILE POINT**



**H-Pile Point**

**CAST STEEL PILE POINT**

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

**Weld Symbology Definition**

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

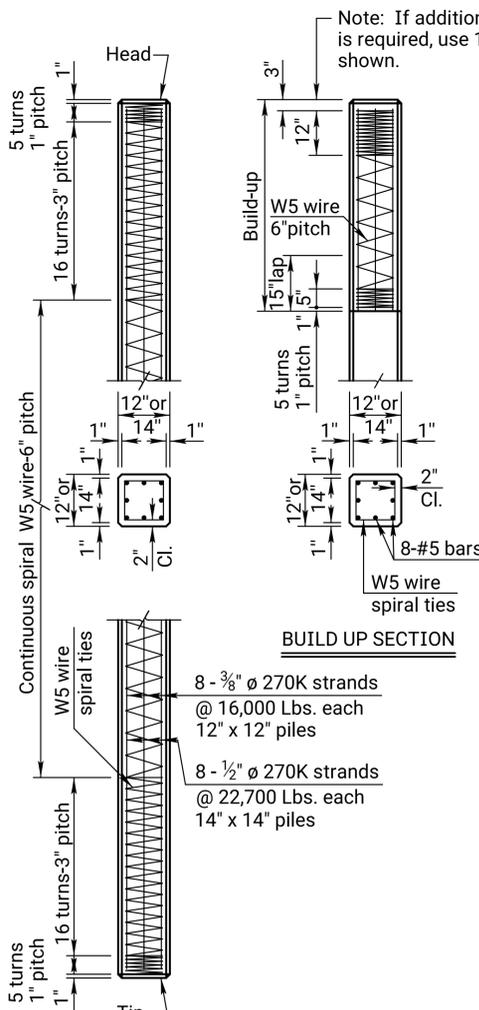
Lay full penetration root weld from beveled side of splice.

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

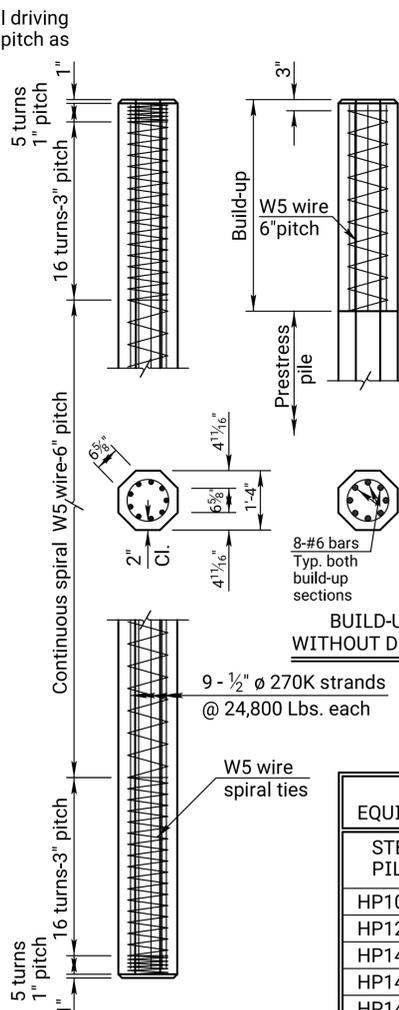
Finish welding beveled side of the splice while removing slag, foreign materials, porous steel, and inclusions in between welding passes, use of a grinder may be needed.

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

**CAST STEEL PILE POINT**



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



| FOR INFORMATION ONLY<br>EQUIVALENT POINT BEARING PILES |                |            |
|--|----------------|------------|
| STEEL PILES  | CONCRETE PILES |            |
|  | Pipe           | Pre-stress |
| HP10x42  | 10 3/4"        |            |
| HP12x53  | 12 3/4"        |            |
| HP14x73  | 14             | 12         |
| HP14x102   |                | 14         |
| HP14x117   |                | 16         |

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

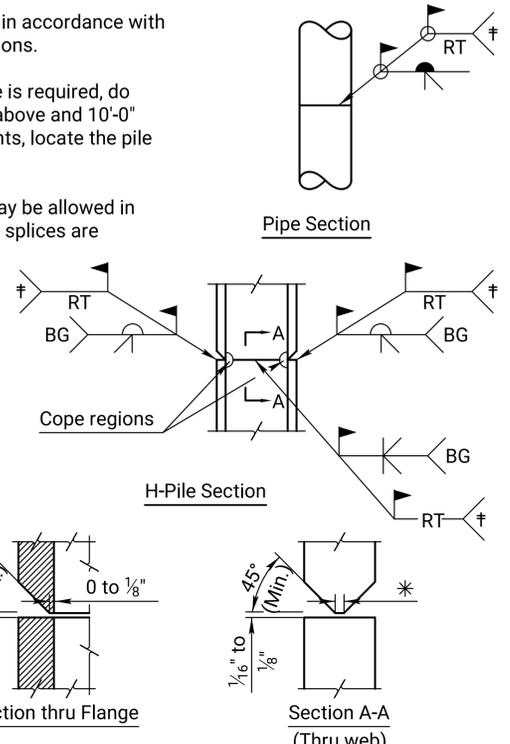
For integral pile bent abutments and piers, if a pile splice is required, do not locate the pile splice within a region extending 2'-0" above and 10'-0" below the bottom of the concrete web wall. For abutments, locate the pile splice at least 10'-0" below top of fill.

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 SPICE DETAILS**

**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.

| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 62        | 148          |

**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.

| NO. | DATE     | REVISIONS                            | BY     | APPD   |
|-----|----------|--------------------------------------|--------|--------|
| 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

|            |        |            |        |            |           |        |
|------------|--------|------------|--------|------------|-----------|--------|
| DESIGNED   | J.P.J. | DETAILED   | J.P.J. | QUANTITIES | TRACED    | R.A.A. |
| DESIGN CK. |        | DETAIL CK. |        | QUAN. CK.  | TRACE CK. |        |

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 63        | 148          |

**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.

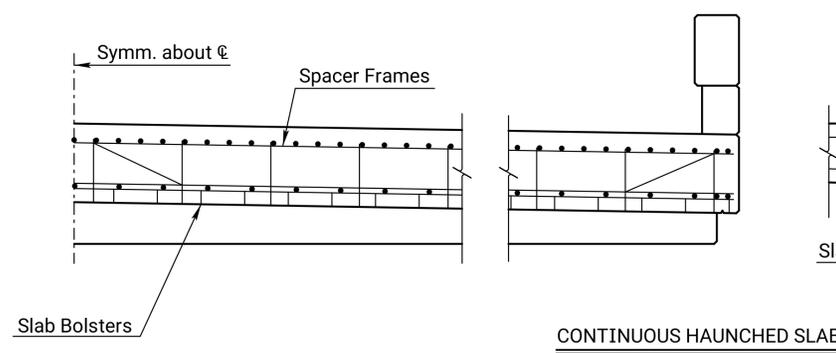
Where more than one length of bar support is required, lap the end legs so they are locked or tied together.

Use proper height supports to maintain the distance between the reinforcing and the formed surface or the top surface of deck slabs within 1/4" of that indicated on the plans.

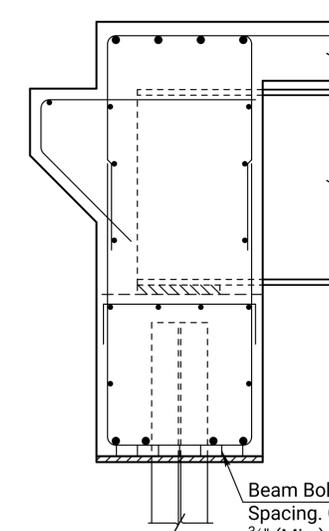
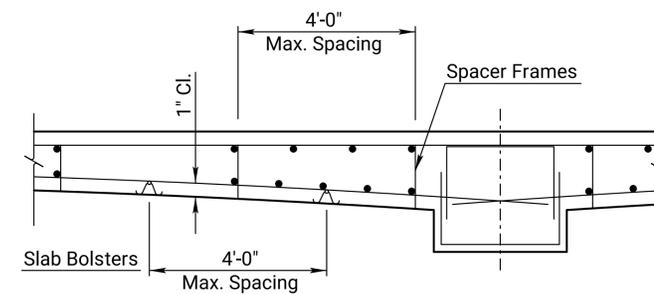
Spacings shown are maximums. Use sufficient supports, as determined by the Engineer, to retain the reinforcing steel in position.

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.

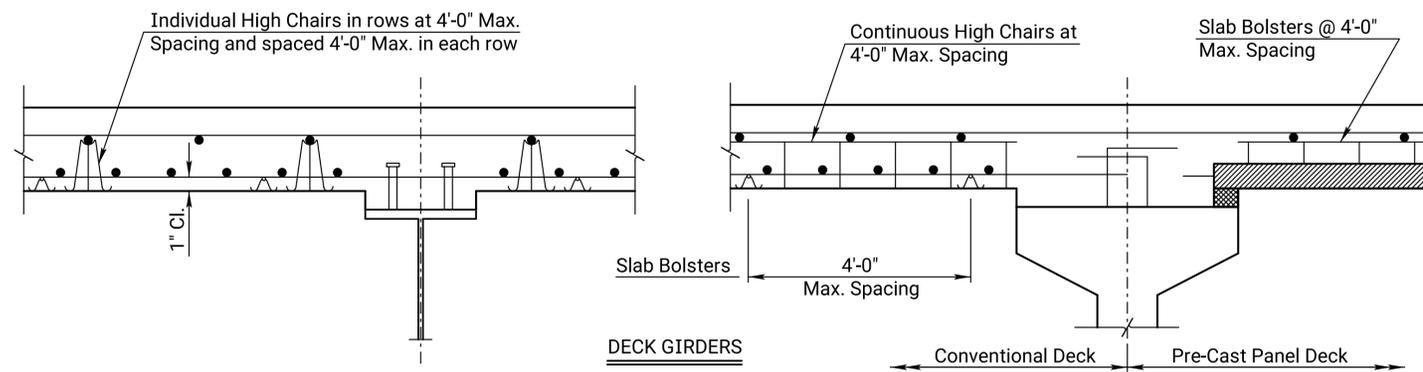
Designs and arrangements of Supports or Spacers other than as shown on this sheet, may be used with the permission of the Engineer.



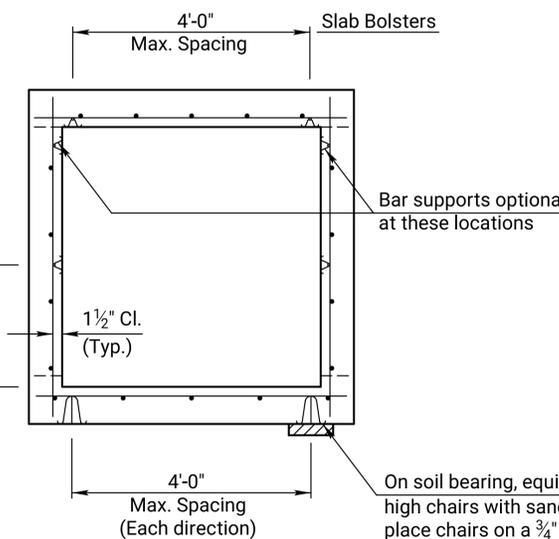
**CONTINUOUS HAUNCHED SLAB**



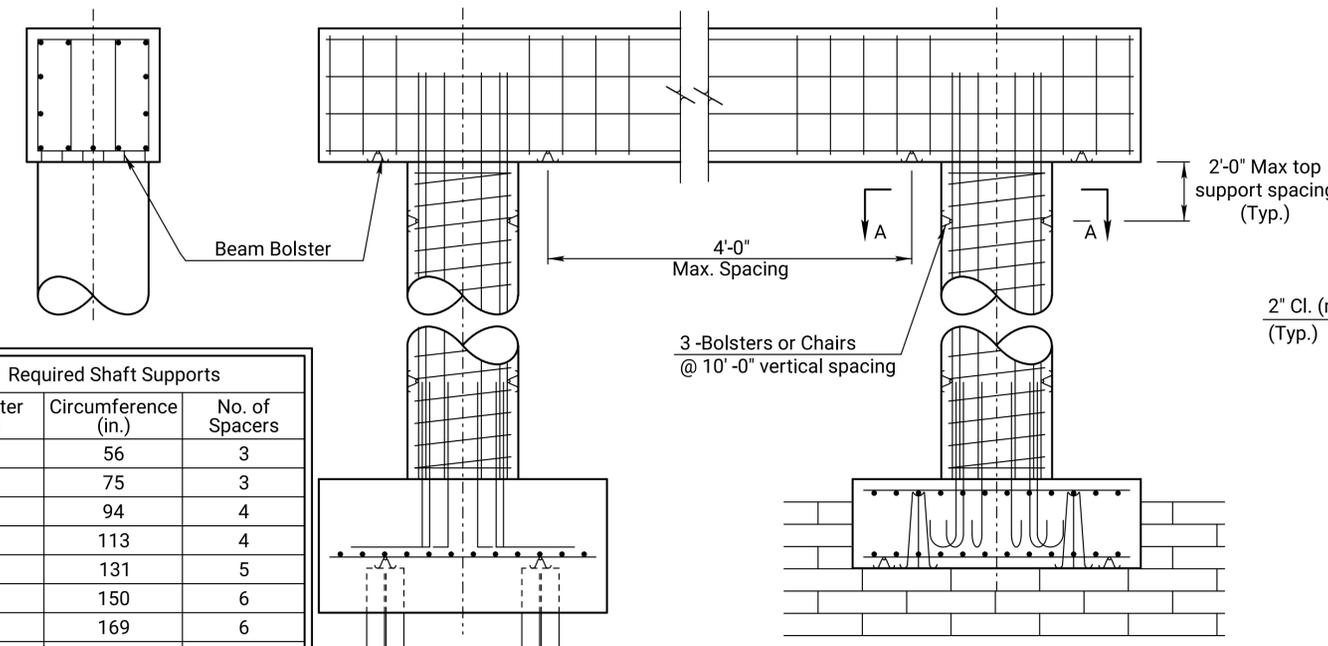
**ABUTMENT**



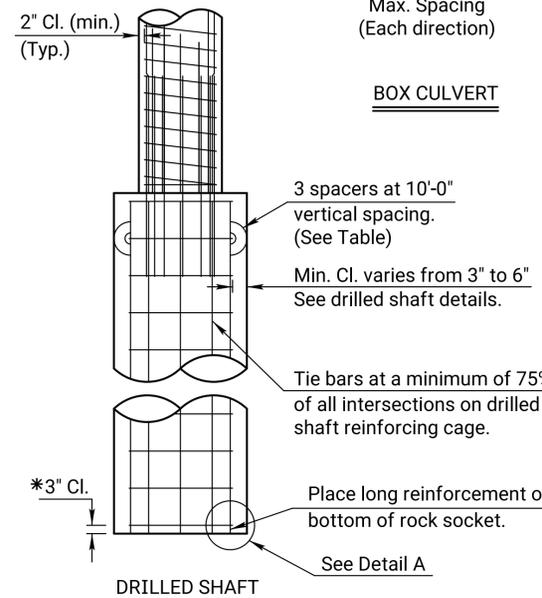
**DECK GIRDERS**



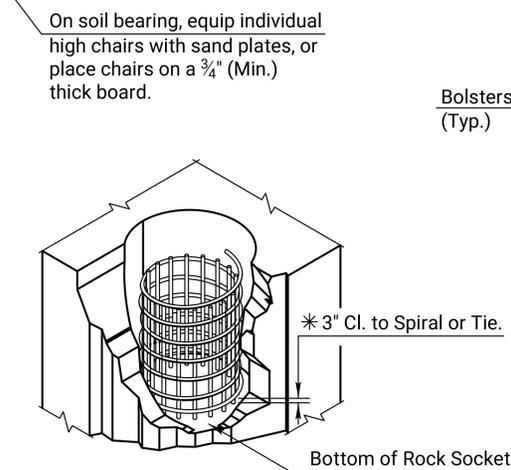
**BOX CULVERT**



**PIER**

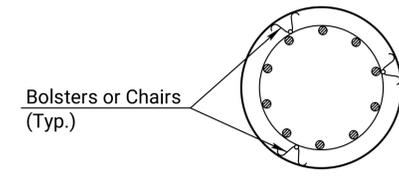


**DRILLED SHAFT**



**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**

| 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             |

|     |          |                                      |        |        |
|-----|----------|--------------------------------------|--------|--------|
| 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. |
| NO. | DATE     | REVISIONS                            | BY     | APPD   |

KANSAS DEPARTMENT OF TRANSPORTATION

**SUPPORTS AND SPACERS FOR REINFORCING STEEL**

BR120

|            |        |            |        |            |           |        |
|------------|--------|------------|--------|------------|-----------|--------|
| 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. |

Terry L. Fleck

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 64        | 148          |

| DRAINAGE STRUCTURES |         |        |      |      |      |                        |  |                     |  |      |         |         |
|---------------------|---------|--------|------|------|------|------------------------|--|---------------------|--|------|---------|---------|
| LOCATION            | STATION | OFFSET | SIDE | SIZE | TYPE | CROSS ROAD PIPES (FT.) |  | END SECTIONS (EACH) |  |      | REMARKS |         |
|                     |         |        |      |      |      | RCP                    |  | (RC)                |  | LEFT |         | RIGHT   |
|                     |         |        |      |      |      | 24"                    |  | 24"                 |  |      |         |         |
| € J Hill Rd.        | 51+00   |        | €    | 24"  | CRP  | 134                    |  | 2                   |  |      | 1109.50 | 1106.45 |
| TOTAL               |         |        |      |      |      | 134                    |  | 2                   |  |      |         |         |

Ø See Summary of Pipe Culverts Sheet No. 35 for Allowable End Section Types

| APPROACH SLAB PAVEMENT QUANTITIES |                    |                    |       |            |             |   |  |         |
|-----------------------------------|--------------------|--------------------|-------|------------|-------------|---|--|---------|
| LOCATION                          | BRIDGE             | STATION TO STATION |       | WIDTH FEET | LENGTH FEET | CONCRETE PAVEMENT (10" UNIFORM) (AE)(BR APP) (SQ.YD.) | BRIDGE APPROACH SLAB FOOTING (CU. YD.) | REMARKS |
| € J Hill Rd.                      | 70-31-298.98 (091) | 48+43              | 48+76 | 36         | 33          | 133.4   | 21.33                                  |         |
| € J Hill Rd.                      | 70-31-298.98 (091) | 51+24              | 51+57 | 36         | 33          | 133.4   | 21.33                                  |         |
| TOTAL                             |                    |                    |       |            |             | 266.8   | 42.66                                  |         |

| STEEL PLATE GUARDRAIL |                        |      |                 |                      |                      |  |                 |                      |                  |  |                                  |         |
|-----------------------|------------------------|------|-----------------|----------------------|----------------------|--|-----------------|----------------------|------------------|--|----------------------------------|---------|
| ROUTE                 | STATION TO STATION     | SIDE | MGS LENGTH (FT) | END TERMINALS FLARED |                      | MGS THRIE BEAM BRIDGE CONNECTION (INFO ONLY) | CGS LENGTH (FT) | END TERMINALS FLARED |                  | CGS THRIE BEAM BRIDGE CONNECTION (INFO ONLY) | TYPE II END TERMINAL (INFO ONLY) | REMARKS |
|                       |                        |      |                 | MGS SRT Alt. 1       | MGS FLEAT Alt. 2     |  |                 | CGS SRT Alt. 1       | CGS FLEAT Alt. 2 |  |                                  |         |
|                       |                        |      |                 | € J Hill Rd.         | 47+92.82 to 48+76.69 |  |                 | Lt.                  |                  |  |                                  |         |
| € J Hill Rd.          | 47+95.38 to 48+76.69   | Rt.  |                 |                      |                      | 106.25                                       |                 |                      | 1                | 1  |                                  |         |
| € J Hill Rd.          | 51+23.31 to 52+04.81   | Lt.  |                 |                      |                      | 106.25                                       |                 |                      | 1                | 1  |                                  |         |
| € J Hill Rd.          | 51+23.31 to 52+06.82   | Rt.  |                 |                      |                      | 106.25                                       | 1               | 1                    | 1                |  |                                  |         |
| € I-70                | 604+03.32 to 606+06.70 | Rt.  | 162.50          | 1                    | 1                    |  |                 |                      |                  |  |                                  |         |
| € I-70                | 605+18.19 to 606+64.58 | Rt.  | 103.13          | 1                    | 1                    |  |                 |                      |                  | 1  |                                  |         |
| € I-70                | 605+97.36 to 607+68.22 | Lt.  | 128.13          | 1                    | 1                    |  |                 |                      |                  | 1  |                                  |         |
| € I-70                | 606+55.32 to 608+58.08 | Lt.  | 162.50          | 1                    | 1                    |  |                 |                      |                  |  |                                  |         |
| TOTAL                 |                        |      | 556.26          | 4                    | 4                    | 425.00                                       | 2               | 2                    | 4                | 4  |                                  |         |

| FLUME INLET/SLOPE DRAIN |         |      |                                |                               |
|-------------------------|---------|------|--------------------------------|-------------------------------|
| STATION                 | STATION | SIDE | SLOPE DRAIN (STONE) (LIN. FT.) | FLUME INLET (CONCRETE) (EACH) |
| € J Hill Rd.            | 48+43   | Rt.  | 54                             | 1                             |
| € J Hill Rd.            | 48+43   | Lt.  | 40                             | 1                             |
| € J Hill Rd.            | 51+57   | Lt.  | 40                             | 1                             |
| € J Hill Rd.            | 51+57   | Rt.  | 54                             | 1                             |
| TOTAL                   |         |      | 188                            | 4                             |

| RECAPITULATION OF ROAD QUANTITIES               |          |          |
|---|----------|----------|
| ITEM  | QUANTITY | UNIT     |
| Contractor Construction Staking                 | Lump Sum | Lump Sum |
| Field office & Laboratory (Type A)              | 1        | Each     |
| Foundation Stabilization (Set Price)            | 1        | Cu. Yd.  |
| Mobilization                                    | Lump Sum | Lump Sum |
| Mobilization (DBE)                              | Lump Sum | Lump Sum |
| Removal of Existing Structures                  | Lump Sum | Lump Sum |
| Concrete for Seal Course (Set Price)            | 1        | 1        |
| Clearing and Grubbing                           | Lump Sum | Lump Sum |
| Common Excavation (Rural Small)                 | 476      | Cu. Yd.  |
| Common Excavation (Contractor Furnished)        | 333      | Cu. Yd.  |
| Rock Excavation                                 | 145      | Cu. Yd.  |
| Compaction of Earthwork (Type A) (MR-5-5)       | 569      | Cu. Yd.  |
| Compaction of Earthwork (Type AA) (MR-5-5)      | 37       | Cu. Yd.  |
| Water (Grading) (Set Price)                     | 1        | M. Gal.  |
| Salvaged Topsoil                                | 4,095    | Sq. Yd.  |
| Cross Road Pipe (24") (RCP)                     | 134      | Lin. Ft. |
| End Section (24") (RC)                          | 2        | Each     |
| Concrete Safety Barrier (Type V)                | 100      | Lin. Ft. |
| Guardrail, Steel Plate                          | 425.00   | Lin. Ft. |
| Guardrail, Steel Plate (MGS)                    | 556.25   | Lin. Ft. |
| Guardrail End Terminal (MGS-SRT) Alt. 1         | 4        | Each     |
| Guardrail End Terminal (MGS-FLEAT) Alt. 2       | 4        | Each     |
| Guardrail End Terminal (SRT) Alt. 1             | 2        | Each     |
| Guardrail End Terminal (FLEAT) Alt. 2           | 2        | Each     |
| Flume Inlet (Concrete)                          | 4        | Each     |
| Slope Drain (Stone)                             | 188      | Lin. Ft. |
| Impact Attenuator (TL-3) (Temporary)            | 4        | Each     |
| Replacement Modules (Impact Attenuator)         | 10       | Each     |
| Concrete Safety Barrier (Type F3) (Temporary)   | 1,338    | Lin. Ft. |
| Concrete Pavement (14" Uniform) (AE)            | 67       | Sq. Yd.  |
| Concrete Pavement (10" Uniform) (AE) (NRDJ)     | 275      | Sq. Yd.  |
| Concrete Pavement (10" Uniform) (AE) (Plain)    | 69       | Sq. Yd.  |
| Concrete Pavement (10" Uniform) (AE) (Br. App.) | 267      | Sq. Yd.  |
| Bridge Approach Slab Footing                    | 42.7     | Cu. Yd.  |
| Granular Base (10")                             | 608      | Sq. Yd.  |
| Water (Granular Base) (Set Price)               | 1        | M. Gal.  |
| Curing Environment                              | Lump Sum | Lump Sum |
| Towing (Courtesy) (Set Price)                   | 1        | Each     |

| TEMPORARY CONCRETE SAFETY BARRIER |                    |                                |                                      |         |                                     |
|-----------------------------------|--------------------|--------------------------------|--------------------------------------|---------|-------------------------------------|
| LOCATION                          | STATION TO STATION | TYPE F3 (TEMPORARY) (LIN. FT.) | IMPACT ATTENUATOR (TEMPORARY) (TL-3) | REMARKS |                                     |
| € I-70 Lt.                        | 603+77             | 609+91                         | 600.0                                | 2       | Phase 1B & 2A Outside Shoulder Work |
| € I-70 Lt.                        | 602+17             | 609+67                         | 737.5                                | 2       | Phase 1B & 2A Median Work           |
| TOTAL                             |                    | 1,337.5                        | 4                                    |         |                                     |

| TYPE V PERMANENT BARRIER |           |          |  |  |  |                        |    |
|--------------------------|-----------|----------|--|--|--|------------------------|----|
| STATION TO STATION       | SIDE      | LOCATION | CONCRETE PAVEMENT (14" UNIFORM) (AE) (SQ. YD.) | BARRIER CONC. GR. 3.0 (AE) # (CU. YD.) | REINF. STEEL (GRADE 60) (EPOXY #COATED) (LBS.) | BARR. TYPE V (LIN FT.) |    |
| 606+06.01                | 606+56.01 | Lt.      | I-70   | 33.4                                   | 7.0  | 1,760                  | 50 |
| 606+06.01                | 606+56.01 | Rt.      | I-70   | 33.4                                   | 7.0  | 1,760                  | 50 |
| TOTAL                    |           |          | 66.8   | 13.6                                   | 3,520  | 100                    |    |

\* For Information Only

| CONCRETE PAVEMENT |      |                    |       |            |             |  |   |                               |
|-------------------|------|--------------------|-------|------------|-------------|--|---|-------------------------------|
| LOCATION          | SIDE | STATION TO STATION |       | WIDTH FEET | LENGTH FEET | CONCRETE PAVEMENT (10" UNIFORM) (AE)(NRDJ) (SQ. YD.) | CONCRETE PAVEMENT (10" UNIFORM) (AE)(PLAIN) (SQ. YD.) | GRANULAR BASE (10") (SQ. YD.) |
| € J Hill Rd.      | €    | 48+00              | 48+43 | 24-36      | 43          | 137.3  |   |                               |
| € J Hill Rd.      | LT   | 48+00              | 48+26 | 6          | 26          |  | 17.3  |                               |
| € J Hill Rd.      | RT   | 48+00              | 48+26 | 6          | 26          |  | 17.3  |                               |
| € J Hill Rd.      | €    | 51+57              | 52+00 | 24-36      | 43          | 137.3  |   |                               |
| € J Hill Rd.      | LT   | 51+74              | 52+00 | 6          | 26          |  | 17.3  |                               |
| € J Hill Rd.      | RT   | 51+74              | 52+00 | 6          | 26          |  | 17.3  |                               |
| € J Hill Rd.      | €    | 48+00              | 48+76 | 36         | 76          |  |   | 304.0                         |
| € J Hill Rd.      | €    | 51+24              | 52+00 | 36         | 76          |  |   | 304.0                         |
| TOTAL             |      |                    |       |            |             | 274.6  | 69.2  | 608.0                         |

| EARTHWORK    |                    |                |      |              |            |                      |                        |                            |               |                 |                         |
|--------------|--------------------|----------------|------|--------------|------------|----------------------|------------------------|----------------------------|---------------|-----------------|-------------------------|
| LOCATION     | STATION TO STATION | EXCAVATION     |      |              | COMPACTION |                      |                        | NOT SUBGRADED THROUGH CUTS |               |                 | SALVAGE TOPSOIL SQ. YD. |
|              |                    | COMMON CU.YDS. | VMF  | ROCK CU.YDS. | VMF        | CONTR. FURN. CU.YDS. | TYPE AA MR-5-5 CU.YDS. | TYPE A MR-5-5 CU.YDS.      | COMM. CU.YDS. | TYPE AA CU.YDS. |                         |
| € J Hill Rd. | 48+00 to 52+00     | 476            | 0.75 | 145          | 1.00       | 333                  | 37                     | 569                        |               |                 | 4,095.0                 |
| TOTALS       |                    | 476            |      | 145          |            | 333                  | 37                     | 569                        |               |                 | 4,095.0                 |

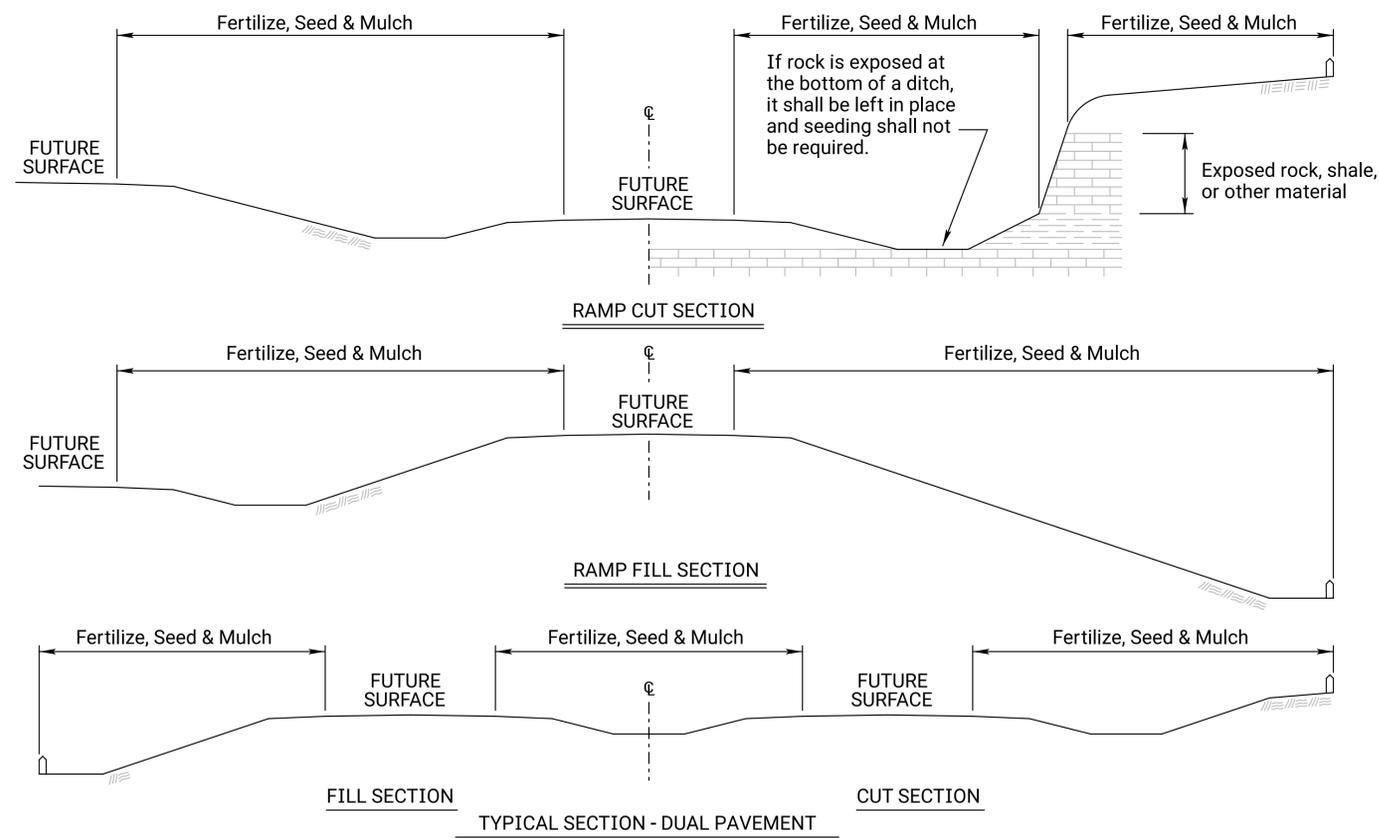
| REMOVAL OF EXISTING STRUCTURES (FOR INFORMATION ONLY) |                        |      |                               |
|---|------------------------|------|-------------------------------|
| ROUTE   | STATION                | SIDE | REMARKS                       |
| J Hill Rd.  | 47+94.82 to 48+74.96   | Lt.  | 131.8' Existing Guardrail     |
| J Hill Rd.  | 47+99.91 to 48+74.89   | Rt.  | 94.4' Existing Guardrail      |
| J Hill Rd.  | 50+00                  | €    | Bridge No. 70-31-298.98 (016) |
| J Hill Rd.  | 51+00                  | €    | 2' x 1.7' x 135.8' MAC        |
| J Hill Rd.  | 51+24.58 to 52+05.19   | Rt.  | 132.3' Existing Guardrail     |
| J Hill Rd.  | 51+25.21 to 52+01.93   | Lt.  | 94.5' Existing Guardrail      |
| I-70  | 605+07.89 to 606+70.58 | Rt.  | 163.0' Existing Guardrail     |
| I-70  | 605+42.05 to 606+27.62 | Rt.  | 125.9' Existing Guardrail     |
| I-70  | 605+95.21 to 607+20.15 | Lt.  | 125.7' Existing Guardrail     |
| I-70  | 605+95.32 to 607+57.97 | Lt.  | 163.0' Existing Guardrail     |

The listing shown may not be complete and is for information only. Additional structures not listed but whose removal is required during construction as determined by the Engineer will not be paid for directly, but will be subsidiary to the bid item, "Removal of Existing Structures".

For Bridge Quantities, See Sh. No. 36  
 For Surfacing Quantities, See Sh. No. 65  
 For Temporary Erosion and Pollution Control Quantities, See Sh. No. 66-67  
 For Seeding Quantities, See Sh. No. 76  
 For Signing Quantities, See Sh. No. 85  
 For Traffic Control Quantities, See Sh. No. 134  
 For Permanent Pavement Marking Quantities, See Sh. No. 102

|                                     |            |                                 |           |                 |
|-------------------------------------|------------|---------------------------------|-----------|-----------------|
| 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.          |
| NO.                                 | DATE       | REVISIONS                       | BY        | APPD            |
| KANSAS DEPARTMENT OF TRANSPORTATION |            |                                 |           |                 |
| <b>SUMMARY OF QUANTITIES</b>        |            |                                 |           |                 |
| RD050                               |            |                                 |           |                 |
| FHWA APPROVAL                       |            | 05-28-08                        | APPD.     | James O. Brewer |
| DESIGNED                            | DETAILED   | QUANTITIES                      | TRACED    | B.N.B.          |
| DESIGN CK.                          | DETAIL CK. | QUAN. CK.                       | TRACE CK. | S.W.K.          |
| DOT Graphics Certified              |            |                                 |           | Sh. No. 64      |





| SUMMARY OF SEEDING / EROSION CONTROL QUANTITIES |       |       |       |                                     |          |       |
|---|-------|-------|-------|-------------------------------------|----------|-------|
| P.L.S. RATE/ ACRE                               |       | ACRES |       | BID ITEM                            | QUANTITY | UNIT  |
| CLT   | SL/CH | CLT   | SL/CH |                                     |          |       |
| 150   | 150   | 0.11  | 0.10  | Temporary Fertilizer (16-20-0)      | 15       | LB    |
|   |       |       |       | Temporary Seed (Canada Wildrye)     |          | LB    |
|   |       |       |       | Temporary Seed (Grain Oats)         |          | LB    |
|   |       |       |       | Temporary Seed (Sterile Wheatgrass) |          | LB    |
|   | 109.9 |       | 0.10  | Soil Erosion Mix                    | 11       | LB    |
|   |       |       |       | Erosion Control (Class 1, Type C)   | 1,708    | SQ YD |
|   |       |       |       | Erosion Control (Class 2, Type Y)   |          | SQ YD |
|   |       |       |       | Sediment Removal (Set Price)        | 1        | CU YD |
|   |       |       |       | Synthetic Sediment Barrier          |          | LF    |
|   |       |       |       | Temporary Berm (Set Price)          | 1        | LF    |
|   |       |       |       | Temporary Ditch Check (Rock)        |          | CU YD |
|   |       |       |       | Temporary Inlet Sediment Barrier    |          | EACH  |
|   |       |       |       | Temporary Sediment Basin            |          | CU YD |
|   |       |       |       | Temporary Slope Drain               |          | LF    |
|   |       |       |       | Temporary Stream Crossing           |          | EACH  |
|   |       |       |       | Biodegradable Log (9")              |          | LF    |
|   |       |       |       | Biodegradable Log (12")             |          | LF    |
|   |       |       |       | Biodegradable Log (20")             |          | LF    |
|   |       |       |       | Filter Sock (****)                  |          | LF    |
|   |       |       |       | Geotextile (Erosion Control)        | 1,114    | SQ YD |
|   |       |       |       | Silt Fence                          |          | LF    |
|   |       |       |       | Water (Erosion Control) (Set Price) | 1        |       |

NOTE: Projects less than 1 acre shall be bid as "Seeding" by the lump sum. See Permanent Seeding Summary of Seeding Quantities sheet LA850 for further details.

Geotextile (Erosion Control) shall be removed prior to placement of permanent slope protection.

Regreen and Quick Guard are the approved sterile wheatgrass products.

† If the total disturbed area of the project, not just the seeding area, is 1 acre or more, then these bid items must be included.

\*\*\*\* List size of material.

The amount of mulch and mulch tacking slurry in the bid quantities is estimated. (Mulch = Acres of Seeding X 1.5 X 2 Tons/Acre), (Mulch Tacking Slurry = Acres of Seeding X 1.5 X 900 Lbs/acre). The estimated quantity includes mulching associated with both temporary and permanent seeding operations. The total mulch and mulch tacking slurry required shall be determined in the field. The bid item for mulching and mulch tacking slurry shall be paid for according to the Standard Specifications.

Quantities for all erosion control items are estimated to give full flexibility for compliance with the NPDES permit. Final quantities will be determined in the field.

| SOIL EROSION MIX |   |          |
|------------------|---|----------|
| PLS RATE         | NAME  | QTY (lb) |
| 0.5              | Seed (Blue Grama Grass Seed) (Lovington)    | 0.05     |
| 4.5              | Seed (Buffalograss Seed) (Treated)          | 0.45     |
| 45               | Seed (Perennial Ryegrass)                   | 4.50     |
| 2.6              | Seed (Prairie Junegrass)                    | 0.26     |
| 6.3              | Seed (Side Oats Grama Grass Seed) (El Reno) | 0.63     |
| 45               | Seed (Tall Fescue) (Endophyte Free)         | 4.50     |
| 6                | Seed (Western Wheatgrass Seed) (Barton)     | 0.60     |
|                  | Total (lb)                                  | 10.99    |

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.

FERTILIZER: A ratio and application rate that equals or exceeds the required minimum rate per acre of N, P<sub>2</sub>O<sub>5</sub>, K<sub>2</sub>O listed in Summary of Quantities will be acceptable.

- \* - N = Nitrogen Rate of Application
- \*\* - P<sub>2</sub>O<sub>5</sub> = Phosphorous Rate of Application
- \*\*\* - K<sub>2</sub>O = 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.

|     |          |                  |        |        |
|-----|----------|------------------|--------|--------|
| 03  | 08-03-20 | Added Note       | M.R.D. | M.L.   |
| 02  | 12-01-17 | Revised Standard | M.R.D. | S.H.S. |
| 01  | 06-01-17 | Revised Standard | M.R.D. | S.H.S. |
| NO. | DATE     | REVISIONS        | BY     | APPD   |

KANSAS DEPARTMENT OF TRANSPORTATION

**TEMPORARY EROSION AND POLLUTION CONTROL**

**LA852A**

|            |        |            |        |            |           |
|------------|--------|------------|--------|------------|-----------|
| DESIGNED   | M.R.D. | DETAILS    | M.R.D. | QUANTITIES | TRACED    |
| DESIGN CK. | S.H.S. | DETAIL CK. | S.H.S. | QUAN. CK.  | TRACE CK. |

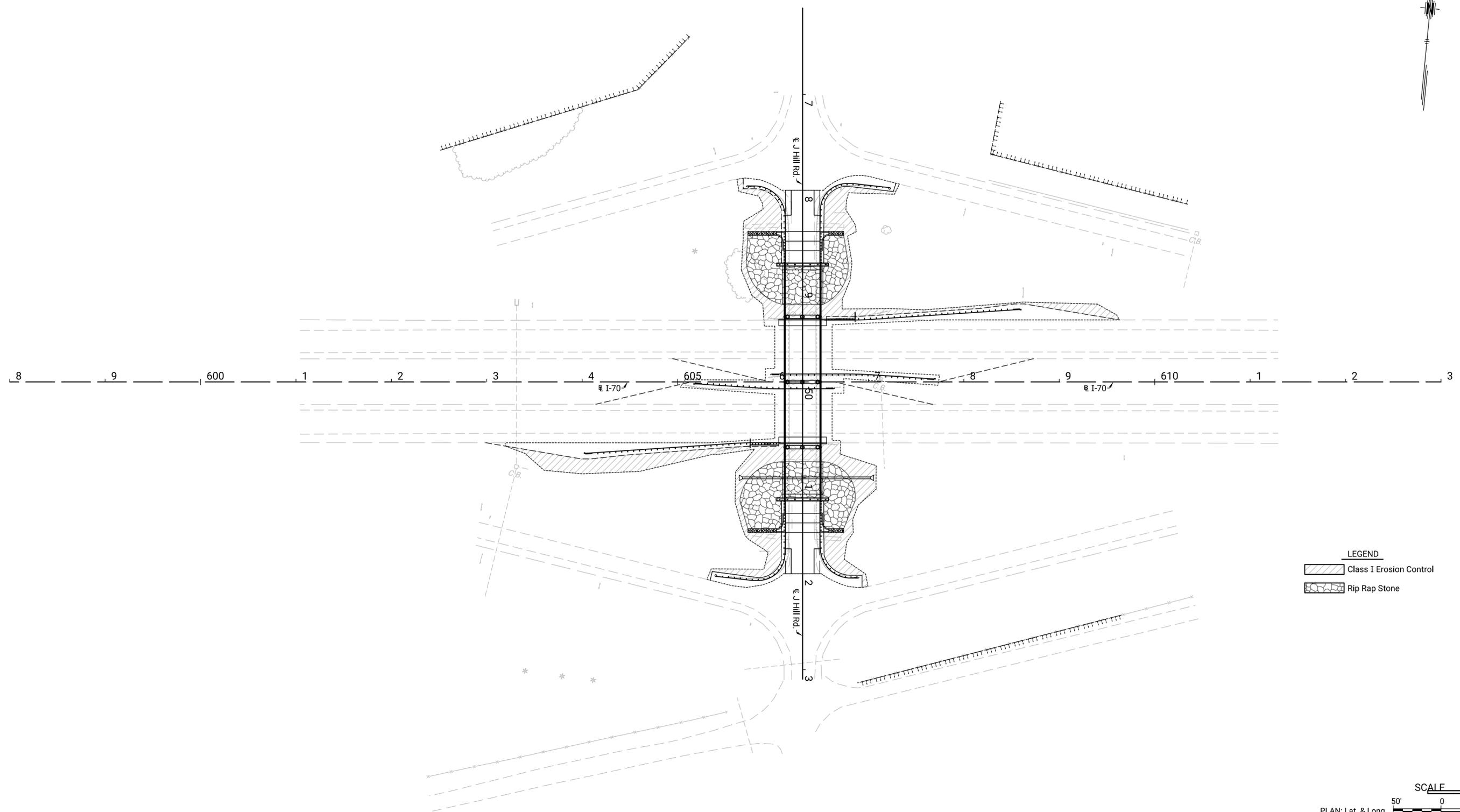
Scott H. Shields

01-26-18 | APPD.

DOT Graphics Certified 03-11-2025 Sh. No. 66



| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 68        | 148          |



**LEGEND**

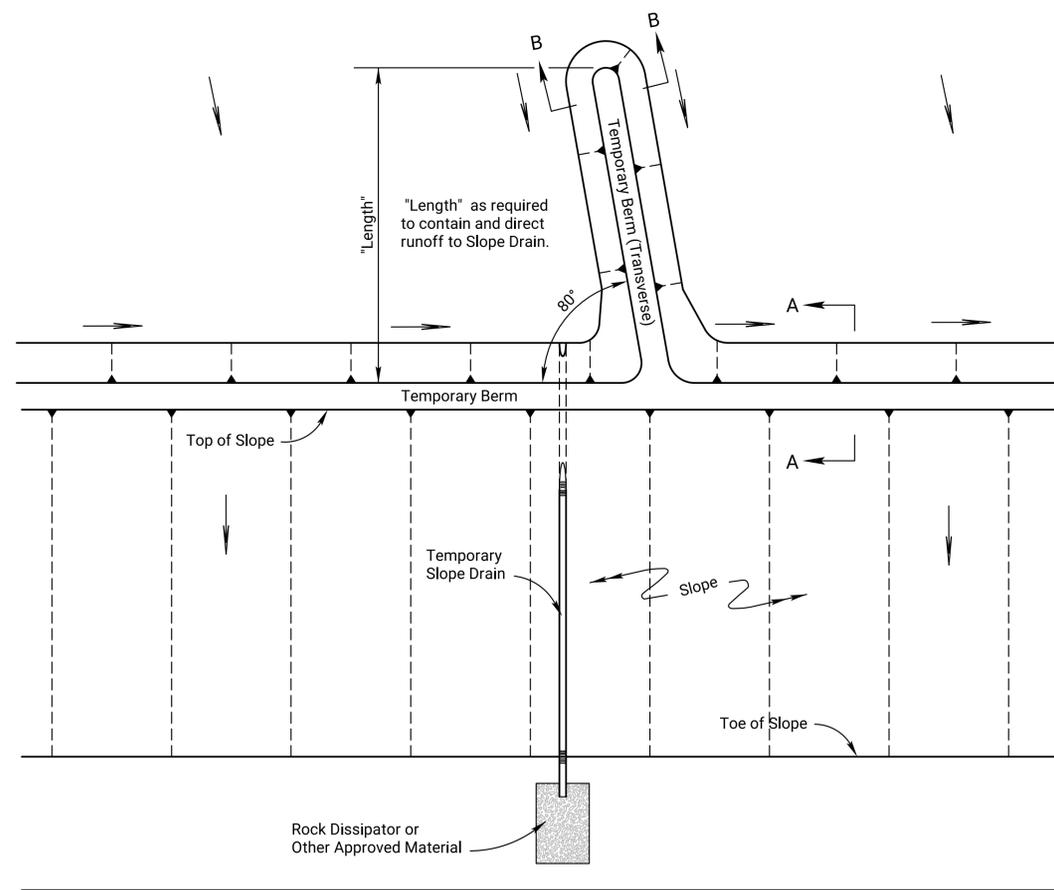
|  |                         |
|--|-------------------------|
|  | Class I Erosion Control |
|  | Rip Rap Stone           |



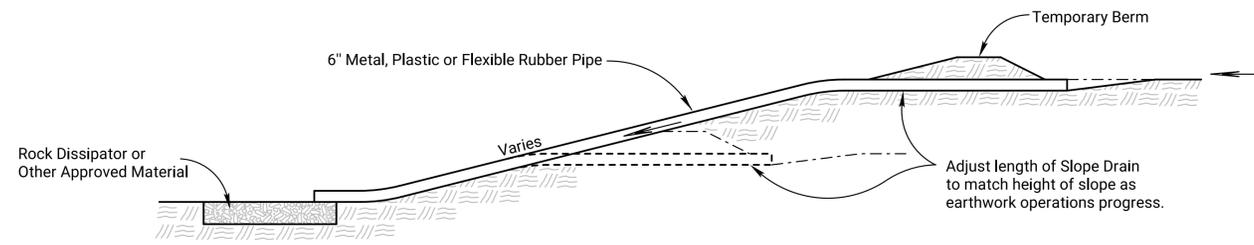
KANSAS DEPARTMENT OF TRANSPORTATION  
**EROSION CONTROL  
 PLAN**

Plotted by : Elias.Esquivel@ks.gov 13-MAR-2025 15:04  
 File : KA64830Trec-01.dgn

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 69        | 148          |

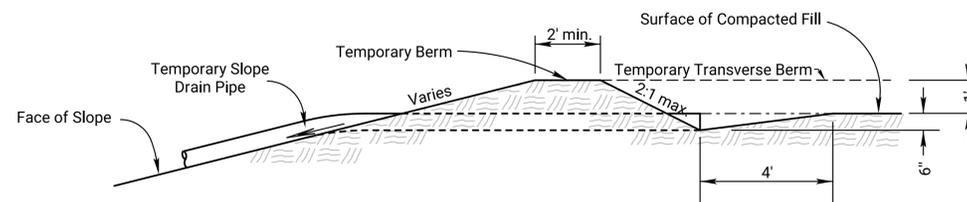


TYPICAL PLAN VIEW OF TEMPORARY BERM AND TEMPORARY SLOPE DRAIN  
NO SCALE

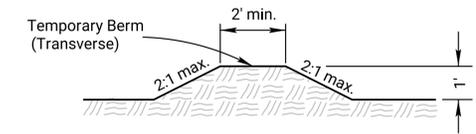


TYPICAL PROFILE OF TEMPORARY SLOPE DRAIN  
NO SCALE

- 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.

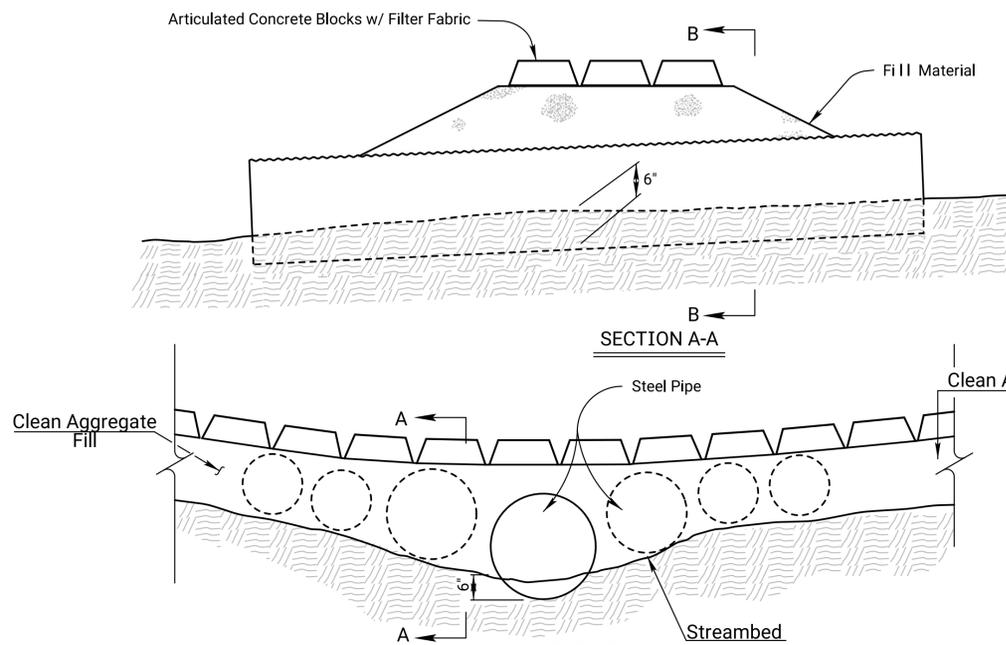


SECTION A-A  
NO SCALE



SECTION B-B  
NO SCALE

TYPICAL PROFILE OF TEMPORARY BERM  
NO SCALE

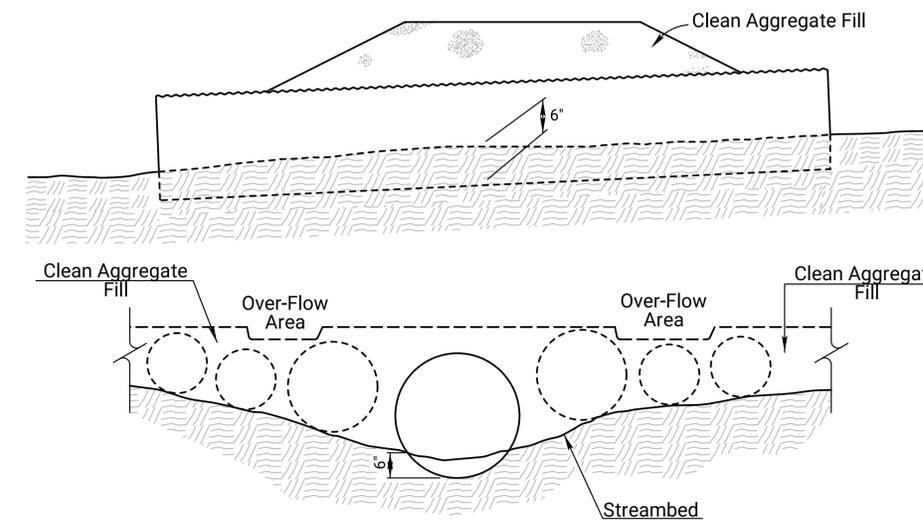


TEMPORARY STREAM CROSSING (ARTICULATED CONCRETE BLOCKS)  
NO SCALE

Pipe size may vary.  
Place 1 pipe buried 6" into stream bottom, in the lowest point of the channel to allow the passage of aquatic organisms, with additional pipes placed along the remainder of the stream channel bottom such that ordinary high water (OHW) flows designated in the Contract Documents shall flow through the pipes without overtopping the crossing.

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

See KDOT Specifications for more information.



SECTION B-B  
TEMPORARY STREAM CROSSING (AGGREGATE)  
NO SCALE

Pipe size may vary.  
Place 1 pipe buried 6" into stream bottom, in the lowest point of the channel to allow the passage of aquatic organisms, with additional pipes placed along the remainder of the stream channel bottom such that ordinary high water (OHW) flows designated in the Contract Documents shall flow through the pipes without overtopping the crossing.

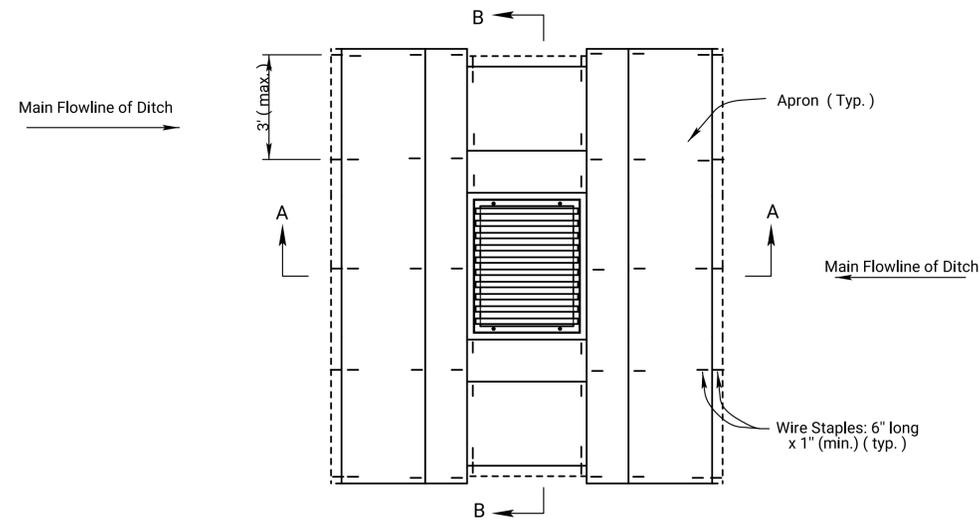
Clean aggregate fill will extend a minimum of 50' on the entrance and exit side of the crossing to prevent tracking. The aggregate shall be clean aggregate and a minimum of 6" thick and will be maintained through the use of the crossing.

See KDOT Specifications for more information.

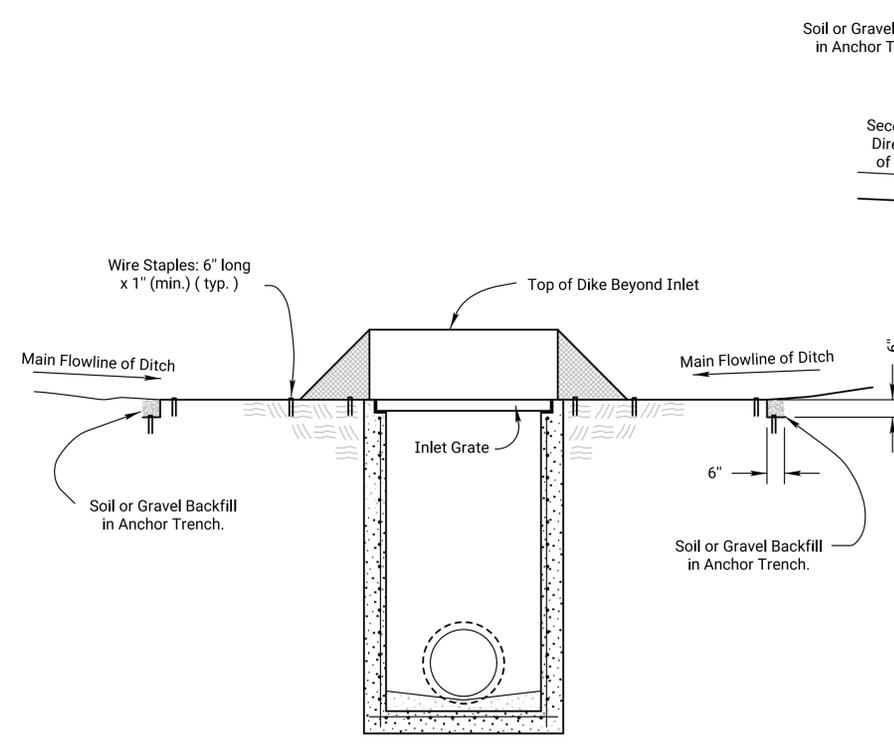
| NO. | DATE     | REVISIONS  | BY     | APPROV |
|-----|----------|--|--------|--------|
| 03  | 01-21-22 | Temp Stream Crossing - Clean Aggregate Fill Note Added | M.R.D. | M.L.   |
| 02  | 08-24-21 | Temp Stream Crossing - Clean Aggregate Fill Note Added | M.R.D. | M.L.   |
| 01  | 06-11-13 | Revised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

| KANSAS DEPARTMENT OF TRANSPORTATION                          |            |            |             |
|--|------------|------------|-------------|
| TEMPORARY EROSION AND POLLUTION CONTROL                      |            |            |             |
| TEMPORARY SLOPE DRAIN, TEMPORARY STREAM CROSSING (AGGREGATE) |            |            |             |
| LA852B   |            |            |             |
| DESIGNED   | 01-21-22   | APPD.      | Mervin Lare |
| DESIGN CK.   | DETAIL CK. | QUANTITIES | TRACED      |
| DESIGN CK.   | DETAIL CK. | QUAN. CK.  | TRACE CK.   |

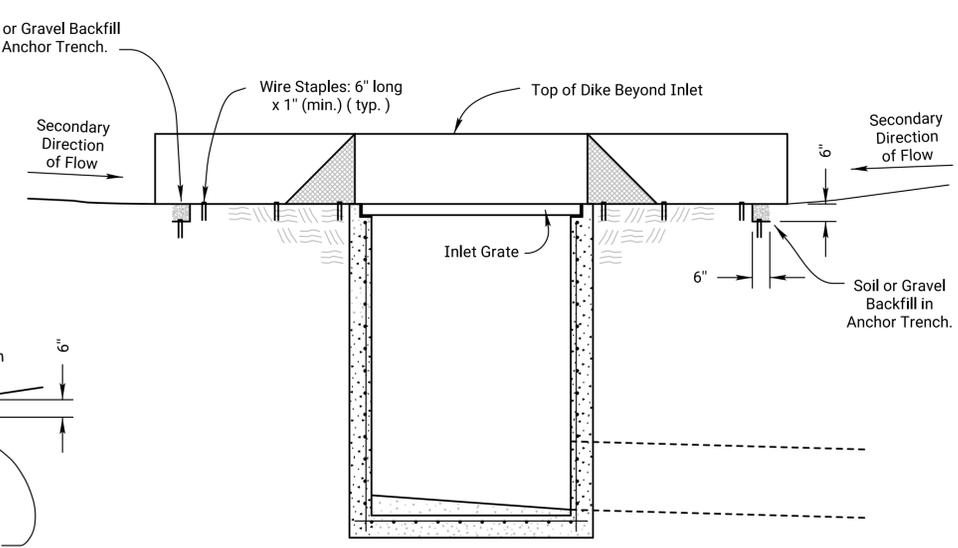
|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 70        | 148          |



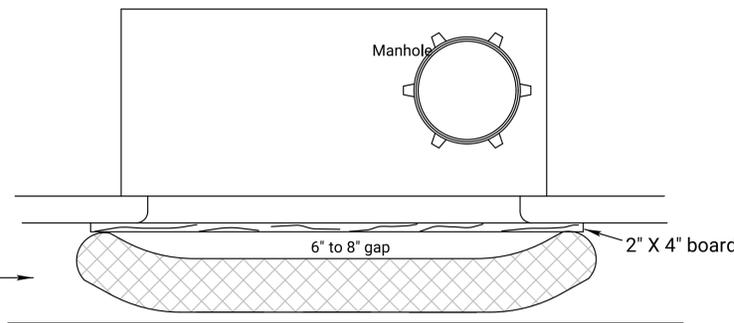
**PLAN**  
**TEMPORARY I NLET SEDI MENT BARRI ER**  
**(TRI ANGULAR SI LT DI KE METHOD)**  
**NO SCALE**



**SECTION A - A**

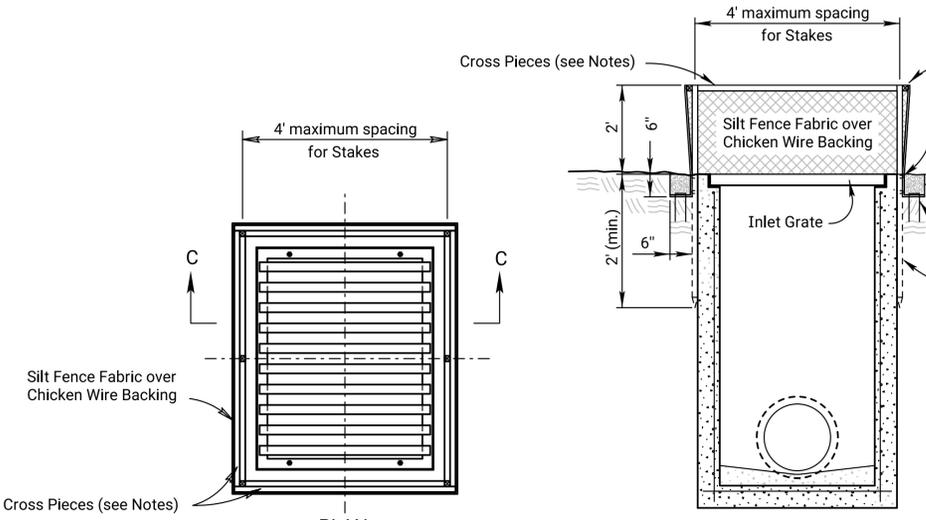


**SECTION B - B**



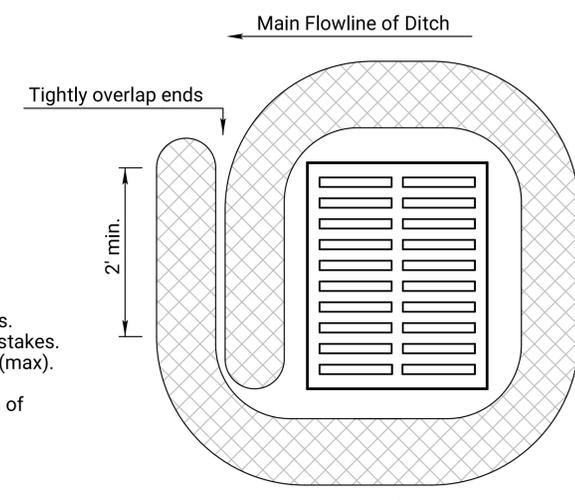
**CURB INLET PROTECTION**

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



**PLAN**  
**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 3/4" x 1 3/4";
    - b. Southern Pine (No. 2) - 2 5/8" x 2 5/8";
    - c. Steel U, T, L, or C Section - .95 lbs. per 1'-0"; or
    - d. Synthetic - same strength as wood stakes.
  2. Cross pieces shall be of same material as stakes.
  3. Attach fence fabric securely on 6" centers (max).
  4. Use of high flow material is acceptable.
  5. Refer to plan sheets to estimate the length of silt fence required.



**Drop inlet use**  
**1'-6" TO 1'-8" diameter log**  
**BIODEGRADABLE LOG/FILTER SOCK**  
**DROP INLET PROTECTION**

Note: 25% of log shall be keyed into ground during installation.  
 Stake every 4'

| Material Requirements  |  |
|--|--|
| Use 100% shredded mulch or other non-compost biodegradable material as fill for logs.  |  |
| No compost or fines.   |  |
| No hay or straw.   |  |
| Do not use material which prohibits water infiltration.  |  |
| Log Mesh:<br>Use mesh with 1/4" openings or larger. Mesh must allow water infiltration but also hold fill material in place. |  |

| NO. | DATE     | REVISIONS   | BY     | APPD   |
|-----|----------|---|--------|--------|
| 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**

|            |        |            |        |            |           |
|------------|--------|------------|--------|------------|-----------|
| DESIGNED   | R.A.   | DETAILED   | R.A.   | QUANTITIES | TRACED    |
| DESIGN CK. | S.H.S. | DETAIL CK. | S.H.S. | QUAN. CK.  | TRACE CK. |

Scott H. Shields

Plotted by : Elias Esquivel@ks.gov 13-MAR-2025 15:05  
 File : KA648301la852c.dgn

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 71        | 148          |

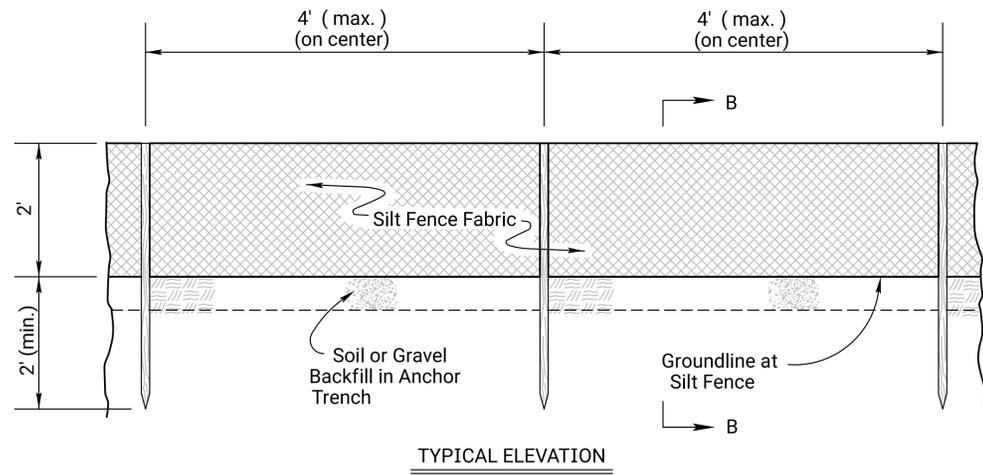
**INSTALLATION NOTES**

**SILT FENCE:**

- Stakes shall be 4' (min.) long and of one of the following materials:
  - Hardwood - 1 3/16" x 1 3/16";
  - Southern Pine (No. 2) - 2 5/8" x 2 5/8";
  - Steel U, T, L, or C Section - .95 lbs. per 1'-0"; or
  - Synthetic - same strength as wood stakes.
- Attach fence fabric with 3 zip ties within the top 8" of the fence. Alternate attachment methods may be approved by the Engineer on a performance basis.
- Use of high flow material is acceptable.
- Refer to plan sheets to estimate the length of silt fence required.

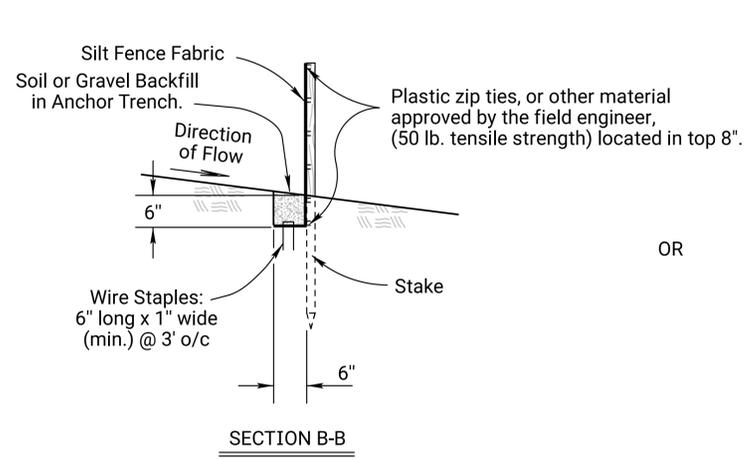
**BIODEGRADABLE LOG OR FILTER SOCK**

- Place biodegradable logs or filter sock tightly together minimum overlap of 18".
- Wood stakes shall be 2" x 2" (nom.).
- Refer to plan sheets to estimate length of biodegradable log and filter sock required.
- Each log or sock (except compost filter socks) should be keyed into the ground at a minimum of 25% of its height. Compost filter socks should be placed on smooth prepared ground with no gaps between the sock and soil.
- Length of stakes should be 2 times the height of the log at a minimum with minimum ground embedment equal to the height of the log / sock.

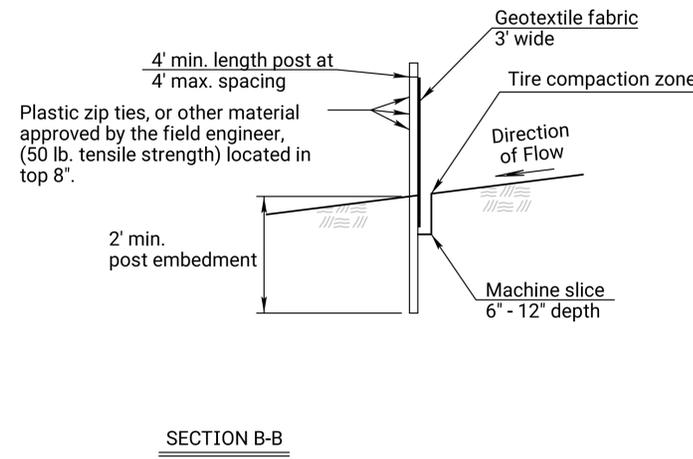


**TYPICAL ELEVATION**

**SILT FENCE BARRIER**  
NO SCALE



**SECTION B-B**



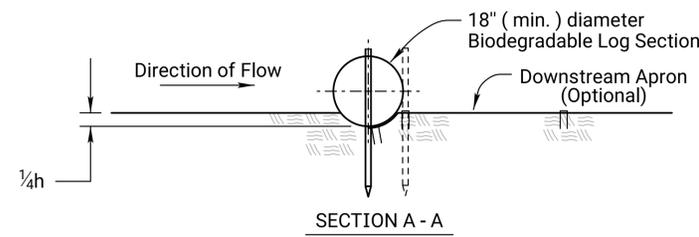
**SECTION B-B**

**Biodegradable Log or Filter Sock Slope Interruptions**

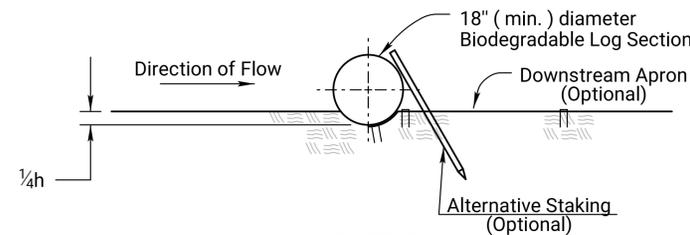
|                |        | PRODUCT                                |  |  |
|----------------|--------|--|--|--|
|                |        | 9" Sediment Log or 8" Filter Sock (ft) | 12" Sediment Log or 12" Filter Sock (ft) | 20" Sediment Log or 18" Filter Sock (ft) |
| Slope Gradient | ≤4H:1V | 40   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

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

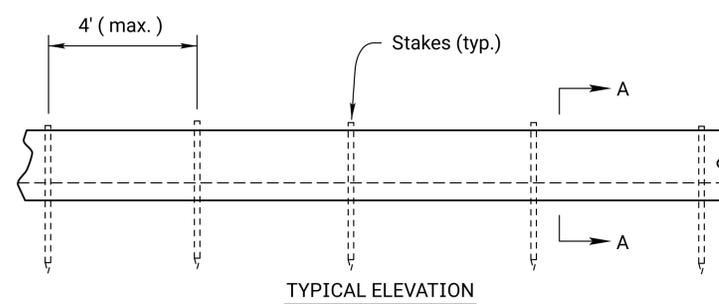
Deviations should be approved by the Field Engineer.



**SECTION A - A**



**ALT. DETAIL**  
OPTIONAL



**TYPICAL ELEVATION**

**BIODEGRADABLE LOG SLOPE INTERRUPTIONS**  
OR Filter Sock

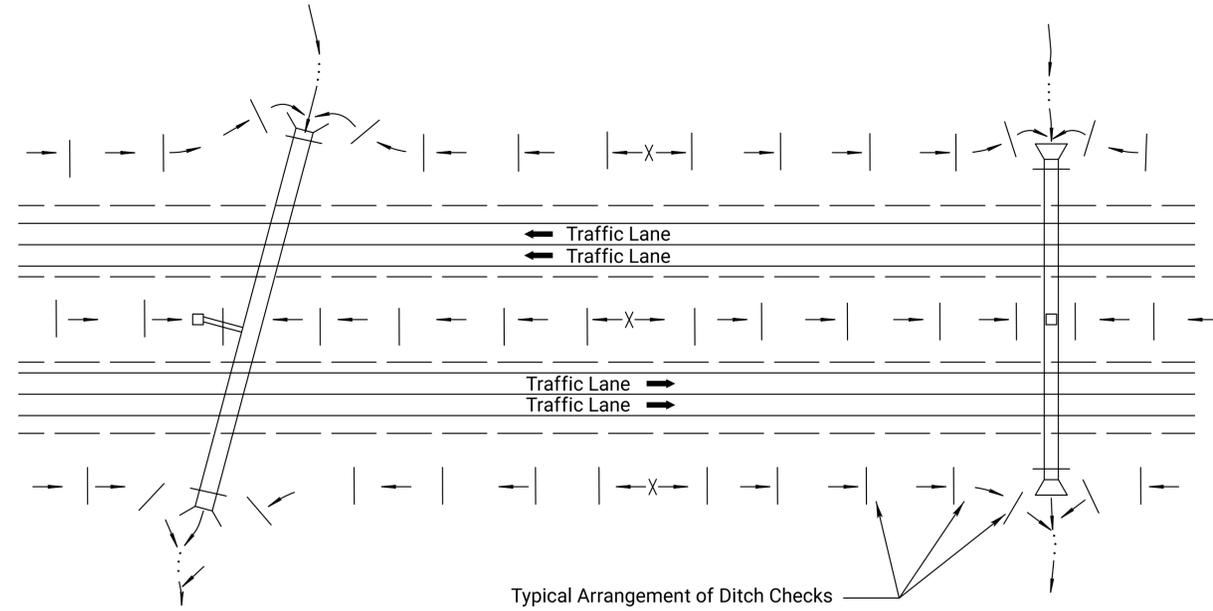
**GENERAL NOTES**

- Slope interruptions shall be placed along contour lines, with a short section turned upgrade at each end of the barrier.
- The maximum length of the slope interruptions shall not exceed 250 feet, and the barrier ends need to be staggered.
- 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.
- 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.

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

|   |        |            |           |                  |
|---|--------|------------|-----------|------------------|
| KANSAS DEPARTMENT OF TRANSPORTATION   |        |            |           |                  |
| <b>TEMPORARY EROSION AND POLLUTION CONTROL SLOPE INTERRUPTIONS BIODEGRADABLE LOG / SILT FENCE</b> |        |            |           |                  |
| <b>LA852D</b>   |        |            |           |                  |
| DESIGNED  | S.H.S. | 09-14-16   | APPD.     | Scott H. Shields |
| DESIGN CK.  | S.H.S. | DETAIL CK. | QUAN. CK. | TRACED           |

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 72        | 148          |



TYPICAL DITCH CHECK LAYOUT PLAN  
NO SCALE

| 20" BIOLOG CHECK SPACING |                         |
|--------------------------|-------------------------|
| DITCH @ SLOPE (%)        | SPACING INTERVAL (FEET) |
| 1.0                      | 125                     |
| 2.0                      | 60                      |
| 3.0                      | 40                      |
| 4.0                      | 30                      |
| 5.0                      | 25                      |

NOTE: Use this spacing for all except Rock Ditch Checks.

| 18" FILTER SOCK CHECK SPACING |                         |
|-------------------------------|-------------------------|
| DITCH @ SLOPE (%)             | SPACING INTERVAL (FEET) |
| 1.0                           | 110                     |
| 2.0                           | 55                      |
| 3.0                           | 35                      |
| 4.0                           | 25                      |
| 5.0                           | 20                      |

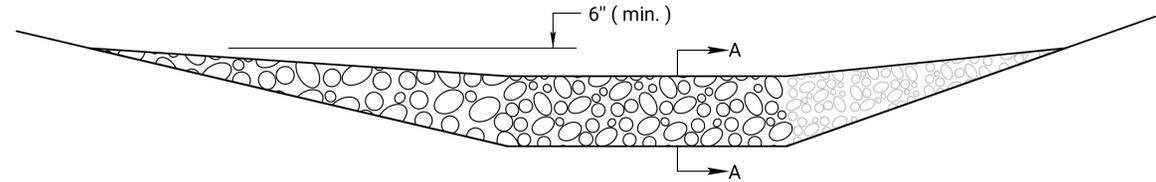
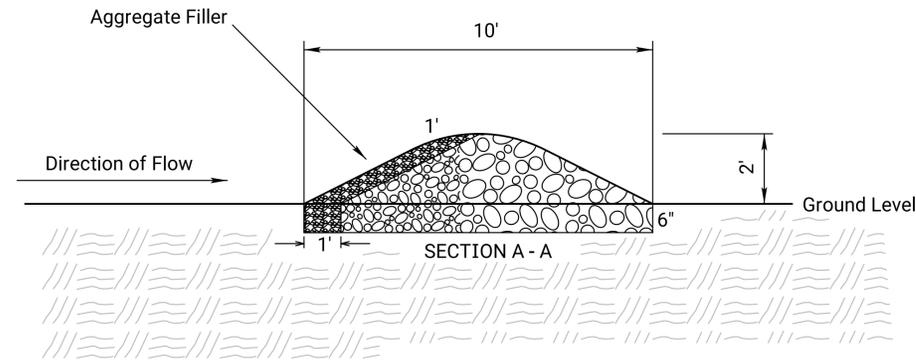
NOTE: Use this spacing for all except Rock Ditch Checks.

GENERAL NOTES

- 1) The choice of ditch check methods is at the option of the Contractor.
- 2) Use only rock checks in situations where the ditch slope is 6 percent or greater.
- 2) Ditch checks damaged by Contractor's negligence, including improper maintenance or lack of maintenance, shall be repaired by Contractor at no extra cost to KDOT.

Plotted by : Elias Esquivel@ks.gov 13-MAR-2025 15:05  
File : KA648301a852e.dgn

| 03  | 08-10-16 | Revised Standard | R.A.A. | S.H.S.           |
|---|----------|------------------|--------|------------------|
| 02  | 06-28-16 | Revised Standard | R.A.A. | S.H.S.           |
| 01  | 06-01-13 | Revised Standard | M.R.M. | S.H.S.           |
| NO.   | DATE     | REVISIONS        | BY     | APPD             |
| KANSAS DEPARTMENT OF TRANSPORTATION                         |          |                  |        |                  |
| <b>TEMPORARY EROSION AND POLLUTION CONTROL DITCH CHECKS</b> |          |                  |        |                  |
| LA852E  |          |                  |        |                  |
| FHWA APPROVAL   |          | 09-14-16         | APPD.  | Scott H. Shields |
| DESIGNED  | S.H.S.   | DETAILED         | R.A.A. | QUANTITIES       |
| DESIGN CK.  | S.H.S.   | DETAIL CK.       | S.H.S. | QUAN. CK.        |
| TRACED  |          | R.A.A.           |        | R.A.A.           |
| TRACE CK.   |          | S.H.S.           |        | S.H.S.           |



TYPICAL ELEVATION

**ROCK DITCH CHECK**

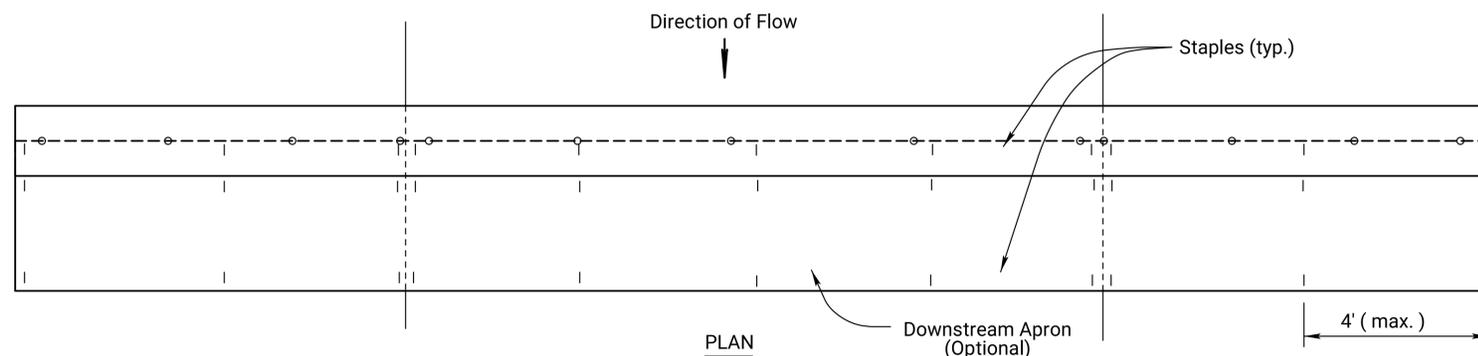
NO SCALE

| 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**

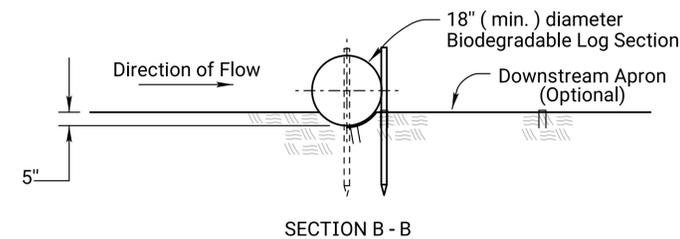
1. Rock shall be clean aggregate, D50-6" and aggregate filler.
2. Place rock in such manner that water will flow over, not around ditch check.
3. Do not use rock ditch checks in clear zone.
4. Excavation: The ditch area shall be reshaped to fill any eroded areas. Prior to placement of the rock, the ditch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

Downstream Apron (Optional)

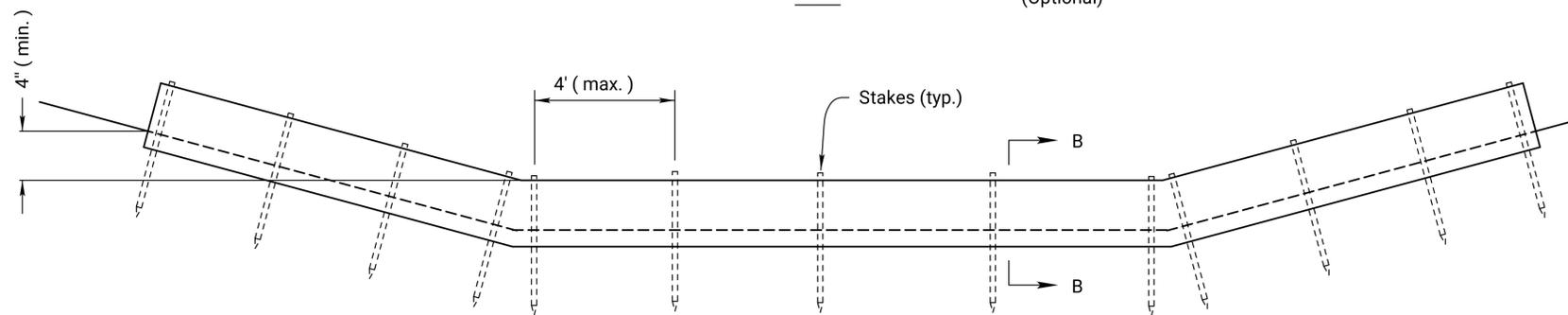
4' (max.)



SECTION B-B

18" (min.) diameter Biodegradable Log Section  
Downstream Apron (Optional)

5"



TYPICAL ELEVATION

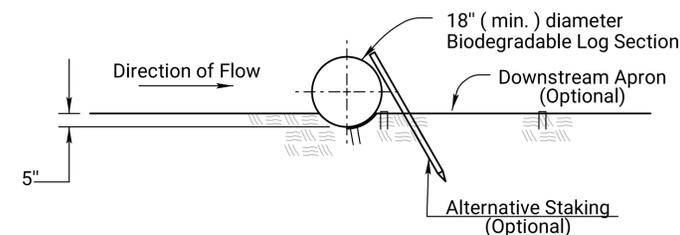
Stakes (typ.)

4' (max.)

4" (min.)

B

B



ALT. DETAIL OPTIONAL

18" (min.) diameter Biodegradable Log Section  
Downstream Apron (Optional)  
Alternative Staking (Optional)

5"

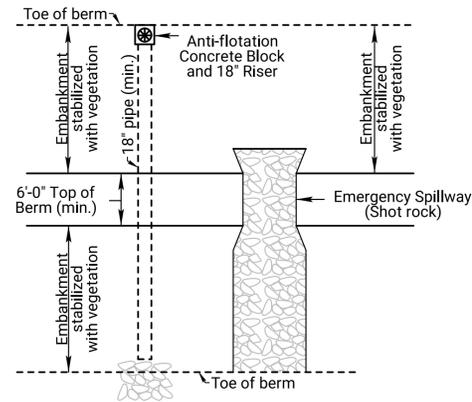
**BIODEGRADABLE LOG DITCH CHECK NOTES**

1. Use as many biodegradable log sections as necessary to ensure water does not flow around end of ditch check.
2. Overlap sections a minimum of 18".
3. Stakes shall be wood or steel according to Section 2114 of the Standard Specifications. Length of stakes shall be a minimum of 2 x the diameter of the log.
4. Use Erosion Control (Class 1) (Type C) as the downstream apron when required.
5. A downstream apron is required when directed by the Engineer. Apron material will be paid at the contract unit price.
6. Each log or sock (except compost filter socks) should be keyed into the ground at a minimum of 25% of its height. Compost filter socks should be placed on smooth prepared ground with no gaps between the sock and soil.

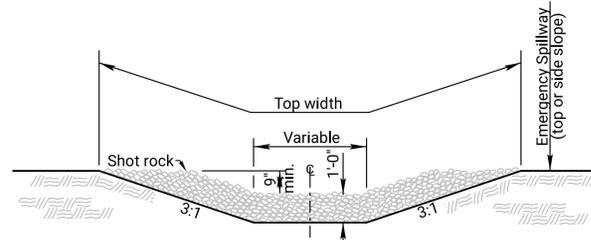
| NO. | DATE     | REVISIONS        | BY     | APPD   |
|-----|----------|------------------|--------|--------|
| 03  | 11-19-20 | Revised Standard | M.R.D. | M.L.   |
| 02  | 08-10-16 | Revised Standard | R.A.A. | S.H.S. |
| 01  | 10-21-15 | Revised Standard | R.A.A. | S.H.S. |

| KANSAS DEPARTMENT OF TRANSPORTATION     |      |            |      |            |           |
|---|------|------------|------|------------|-----------|
| TEMPORARY EROSION AND POLLUTION CONTROL |      |            |      |            |           |
| ROCK DITCH CHECKS                       |      |            |      |            |           |
| BIODEGRADABLE LOG DITCH CHECKS          |      |            |      |            |           |
| LA852G                                  |      |            |      |            |           |
| FHWA APPROVAL                           |      | 11-19-20   |      | APPD       |           |
| DESIGNED                                | M.L. | DETAILED   | D.K. | QUANTITIES | TRACED    |
| DESIGN CK.                              | M.L. | DETAIL CK. | M.L. | QUAN. CK.  | TRACE CK. |
| Mervin Lare                             |      |            |      |            |           |

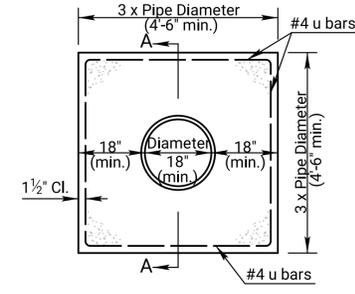
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 74        | 148          |



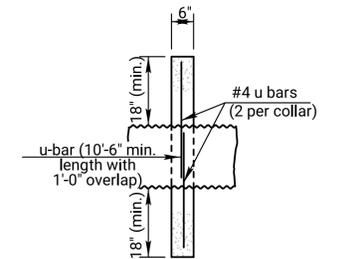
**SEDIMENT STORAGE BASIN (PLAN)**



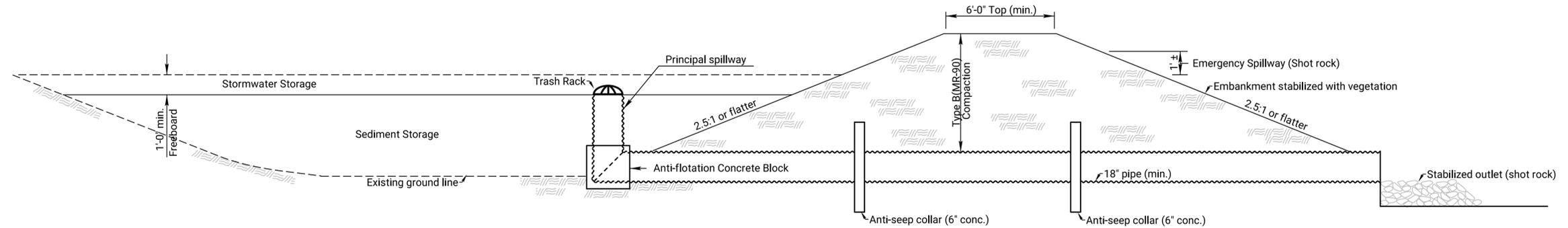
**CROSS SECTION (EMERGENCY SPILLWAY)**



**CONCRETE ANTI-SEEP COLLAR**



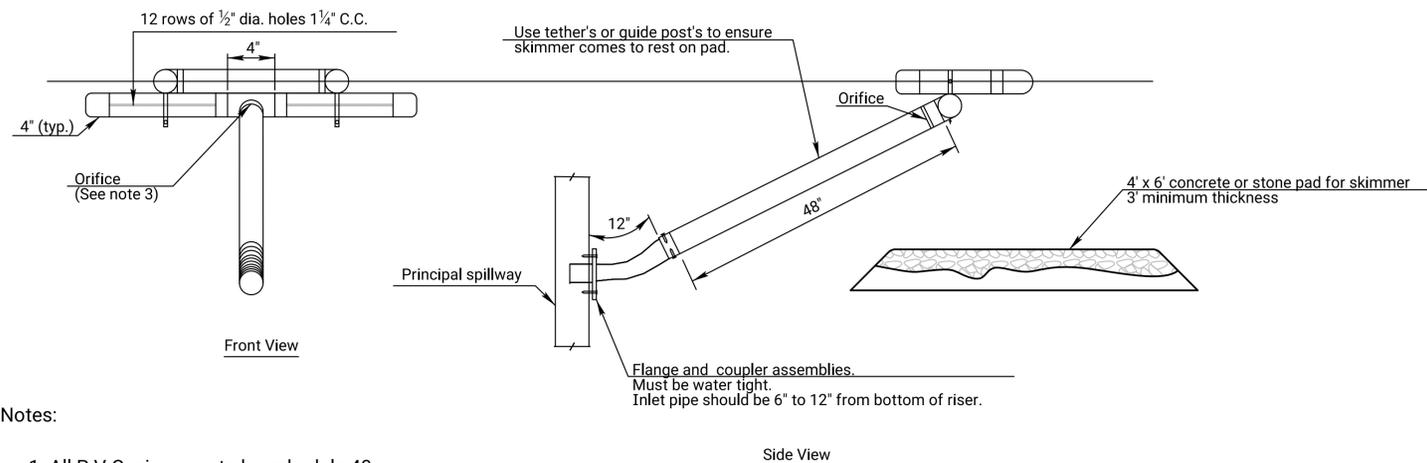
**SECTION A-A**



**SEDIMENT STORAGE BASIN (ELEVATION)**

**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 regardless the size of the drainage area.



**Notes:**

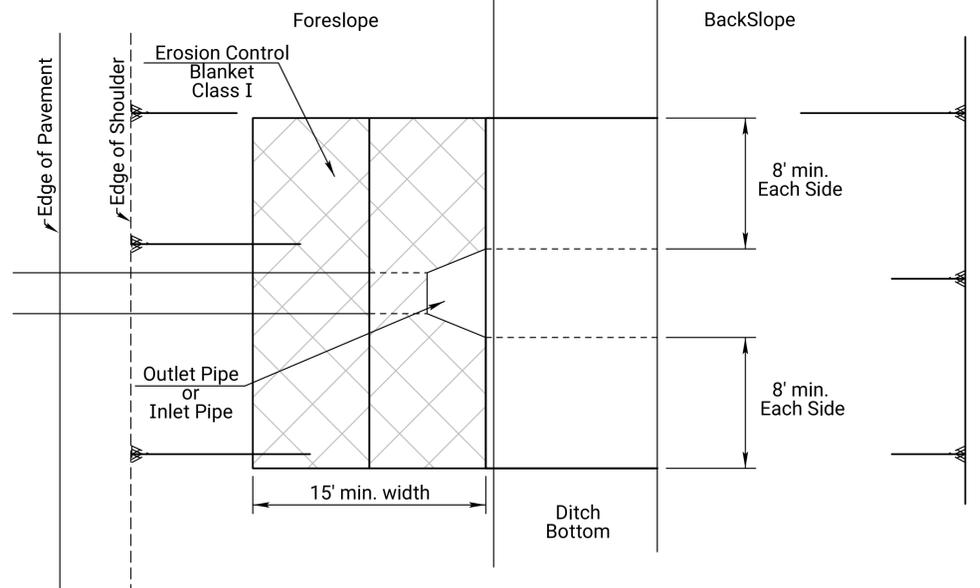
1. All P.V.C. pipes are to be schedule 40.
2. HDPE flexible drain pipes is to be attached to the pond outlet structure with water-tight connections.
3. The orifice shall be sized of to provide drawdown time to 2 to 5 days and approved by the engineer.
4. Other skimmer designs maybe used that dewateres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

**SKIMMER DEWATERING DEVICE**

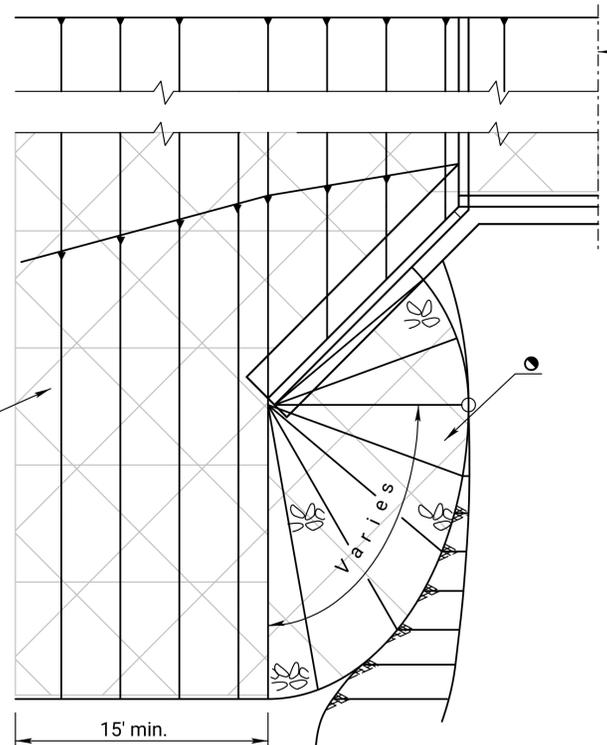
| SEDIMENT STORAGE BASIN LOCATIONS |      |                           |
|----------------------------------|------|---------------------------|
| STATION TO STATION               | SIDE | REQUIRED STORAGE CAPACITY |
|                                  |      |                           |
|                                  |      |                           |
|                                  |      |                           |
|                                  |      |                           |
|                                  |      |                           |
|                                  |      |                           |
|                                  |      |                           |
|                                  |      |                           |
|                                  |      |                           |
|                                  |      |                           |

| 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.    |
| NO.   | DATE     | REVISIONS                       | BY     | APPD      |
| KANSAS DEPARTMENT OF TRANSPORTATION                                   |          |                                 |        |           |
| <b>TEMPORARY EROSION AND POLLUTION CONTROL SEDIMENT STORAGE BASIN</b> |          |                                 |        |           |
| LA852H  |          |                                 |        |           |
| DESIGNED  | B.B.     | QUANTITIES                      | TRACED | B.B.      |
| DESIGN CK.  | S.H.S.   | DETAIL CK.                      | S.H.S. | QUAN. CK. |
| DOT Graphics Certified 06-20-2022 Sh. No. 74                          |          |                                 |        |           |

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 75        | 148          |



PARTIAL PLAN PIPE

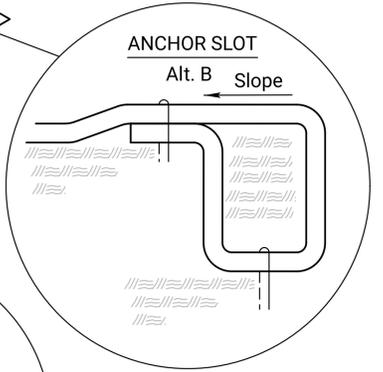
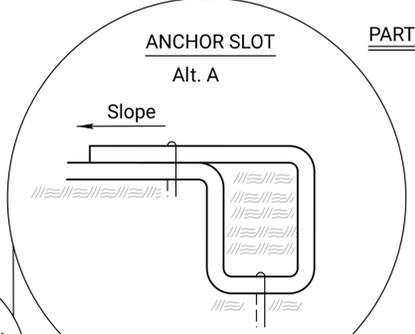
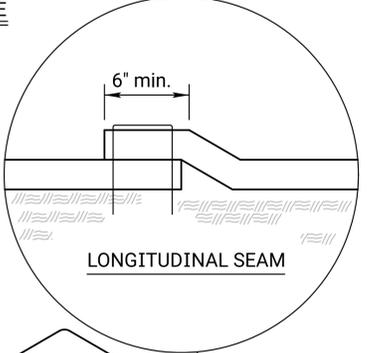
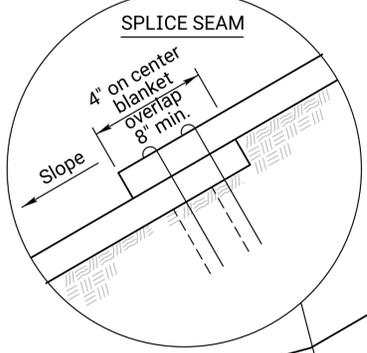


PARTIAL PLAN BOX CULVERT

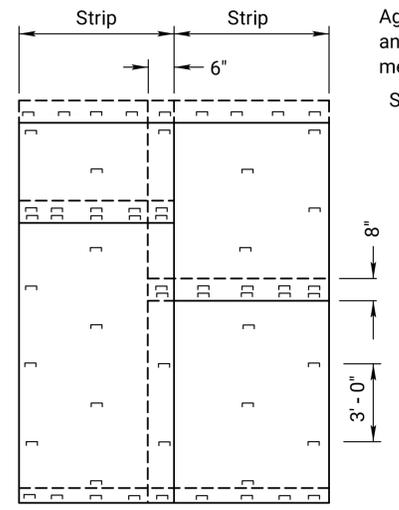
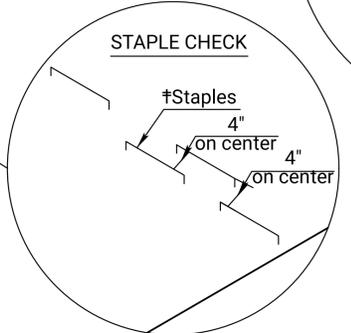
**INSTALLATION DETAILS FOR EROSION CONTROL CLASS 1**

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.

- 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.
- LONGITUDINAL SEAMS:** The edges of the blanket should overlap each other a minimum of 6 inches, with anchors catching the edges of both blankets.
- SPLICE SEAM:** When splices are necessary, overlap end a minimum of 8 inches in direction of water flow. Stagger splice seams.
- 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.
- TYPICAL ANCHORS:** Anchor design shall be as recommended by the manufacturer.
- STAPLE CHECK:** Establish Staples in 2 rows 4" on center apart. Staple Checks - shall be 30' apart.

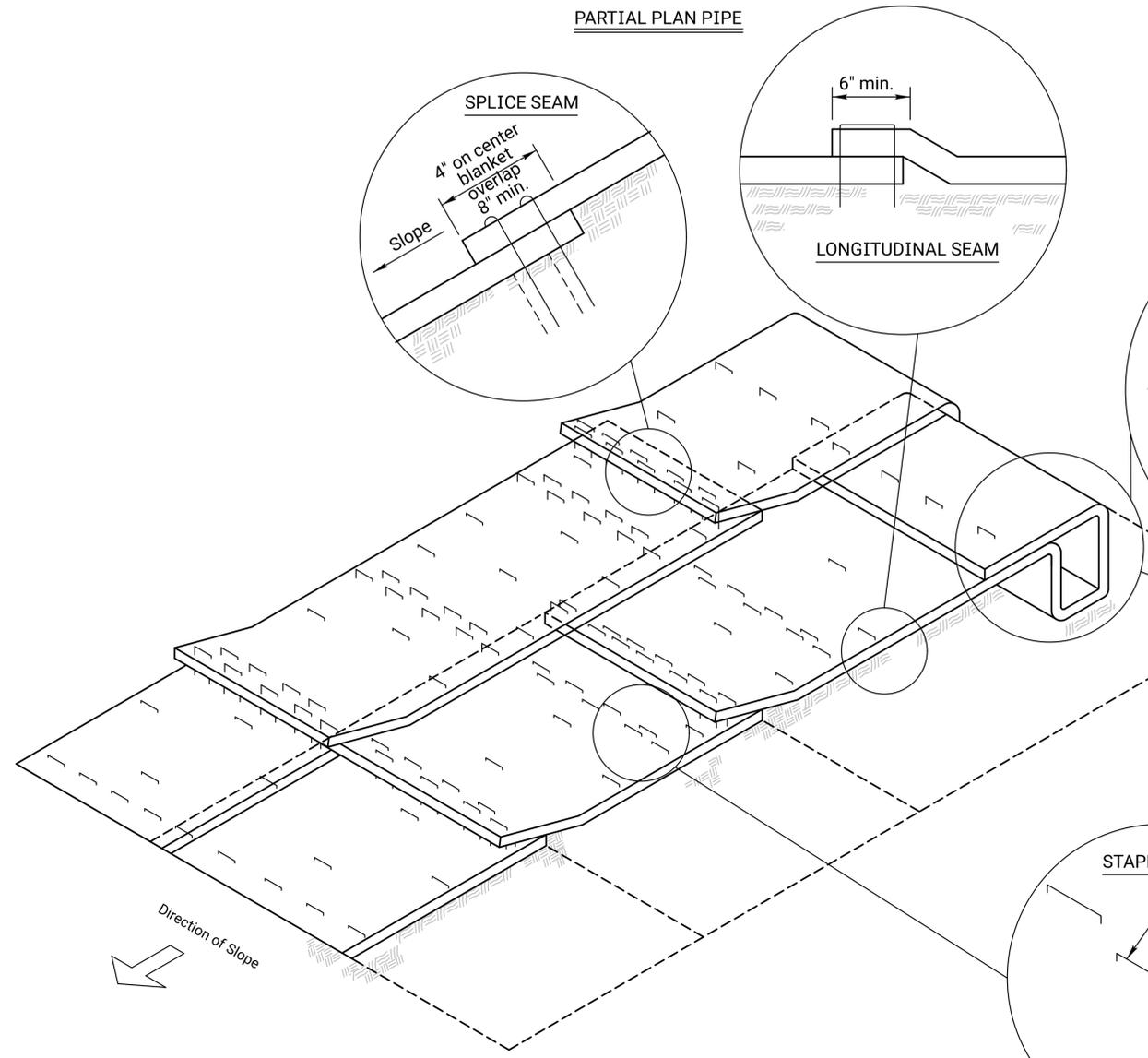


● Erosion Control Class I may be omitted if the area is immediately covered by permanent slope protection (where directed by the plans).



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     | APPD   |
|-----|----------|------------------|--------|--------|
| 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

|            |        |            |        |            |           |        |
|------------|--------|------------|--------|------------|-----------|--------|
| DESIGNED   | R.A.A. | DETAIL CD. | R.A.A. | QUANTITIES | TRACED    | R.A.A. |
| DESIGN CK. |        | DETAIL CK. |        | QUAN. CK.  | TRACE CK. | R.A.A. |

Scott H. Shields

Plotted by : Elias Esquivel@ks.gov 13-MAR-2025 15:05  
File : KA648301la855.dgn

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 76        | 148          |

### GRASS & WILDFLOWER SEEDING SEASONS

| COOL SEASON GRASSES                                      | WARM SEASON GRASSES & WILDFLOWERS |
|--|-----------------------------------|
| February 15 thru April 20<br>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.

### 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<sub>2</sub>O<sub>5</sub>, K<sub>2</sub>O 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:

1 3/4 - 2 1/4 Tons per Acre = 1 1/2" 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.

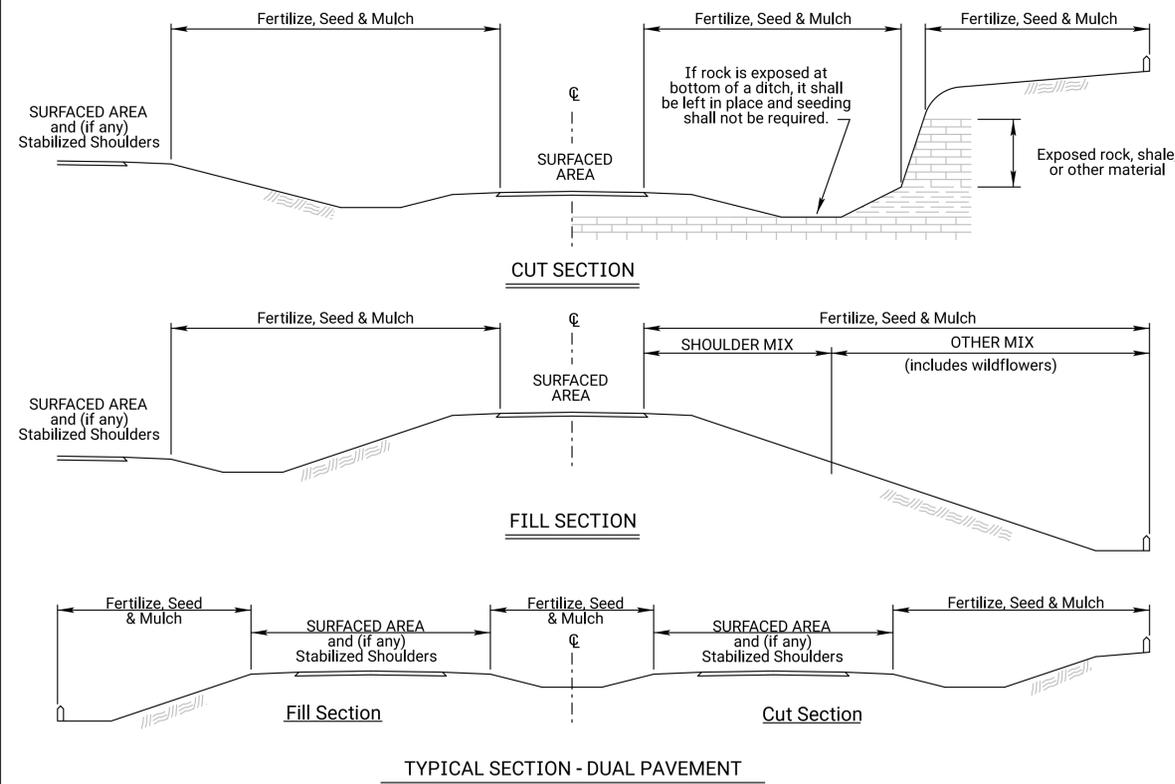
Other vegetative mulches are acceptable only with the Engineer's concurrence.

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.

### SODDING SEASONS

| COOL SEASON GRASSES                                   | WARM SEASON GRASSES     |
|---|-------------------------|
| March 1 thru April 15<br>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.



### SUMMARY OF SEEDING QUANTITIES

| P.L.S. RATE/ACRE |       | ACRES |       | BID ITEM   | QUANTITY | UNIT     |
|------------------|-------|-------|-------|------------|----------|----------|
| SHLDR            | OTHER | SHLDR | OTHER |            |          |          |
|                  |       |       |       | Seeding    | Lump Sum | Lump Sum |
|                  |       |       |       | Mulching * |          |          |

### 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 1/8" - 1/4". 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.

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.

| 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. |
| NO.  | DATE       | REVISIONS                                | BY          | APPD   |
| KANSAS DEPARTMENT OF TRANSPORTATION                        |            |  |             |        |
| <b>PERMANENT SEEDING<br/>SUMMARY OF SEEDING QUANTITIES</b> |            |  |             |        |
| LA850  |            |  |             |        |
| DESIGNED   | 05-06-19   | APPD.                                    | Mervin Lare |        |
| DESIGN CK.   | DETAIL CK. | QUANTITIES                               | TRACED      |        |
|  |            | QUAN.CK.                                 | TRACE CK.   |        |

| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 77        | 148          |

## 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

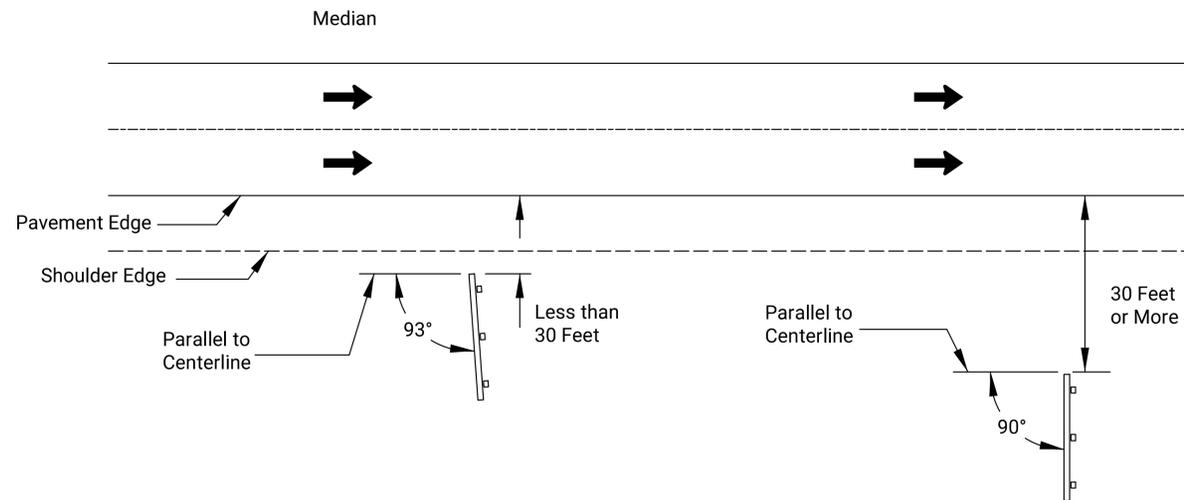
SIGNING INDEX, SYMBOLS, & GENERAL NOTES  
 POST SPACING & SIGN ANGLE DETAILS  
 HEIGHT & LATERAL DISTANCE FOR ERECTION  
 POSITIONING, DESIGN, & MOUNTING OF DELINEATORS  
 POSITIONING, DESIGN, & MOUNTING FOR OBJECT MARKERS (TYPE 2 & 3)  
 POSITIONING FOR CHEVRON (W1-8) SIGNS  
 PLAN SHEETS (INSTALLATIONS)  
 PLAN SHEETS (REMOVALS)  
 QUANTITIES SHEETS (INSTALLATIONS)  
 QUANTITIES SHEET (DELINEATORS & OBJECT MARKERS)  
 SUMMARY SHEET (INSTALLATIONS & REMOVALS)  
 SUMMARY SHEET (REMOVAL & RESET)  
 RECAPITULATION SHEET  
 STANDARD STRUCTURAL SIGN SUPPORTS (WOOD & STEEL POSTS)  
 MOUNTING OF SIGNS ON WOOD POSTS  
 MOUNTING OF FLAT SHEET SIGNS ON STEEL I-BEAM POSTS  
 MOUNTING OF REINFORCED PANEL SIGNS ON I-BEAM POSTS  
 DETAILS FOR FLAT SHEET SIGN BLANKS  
 DETAILS FOR PROCESSED SIGNS  
 DETAILS FOR REINFORCED PANELS  
 DETAILS FOR GUIDE SIGN LEGEND  
 DETAILS FOR GUIDE SIGNS  
 DETAILED SIGN SPECIFICATIONS

Plotted by : ghuarter 14-MAR-2025 12:29  
File : te402.dgn

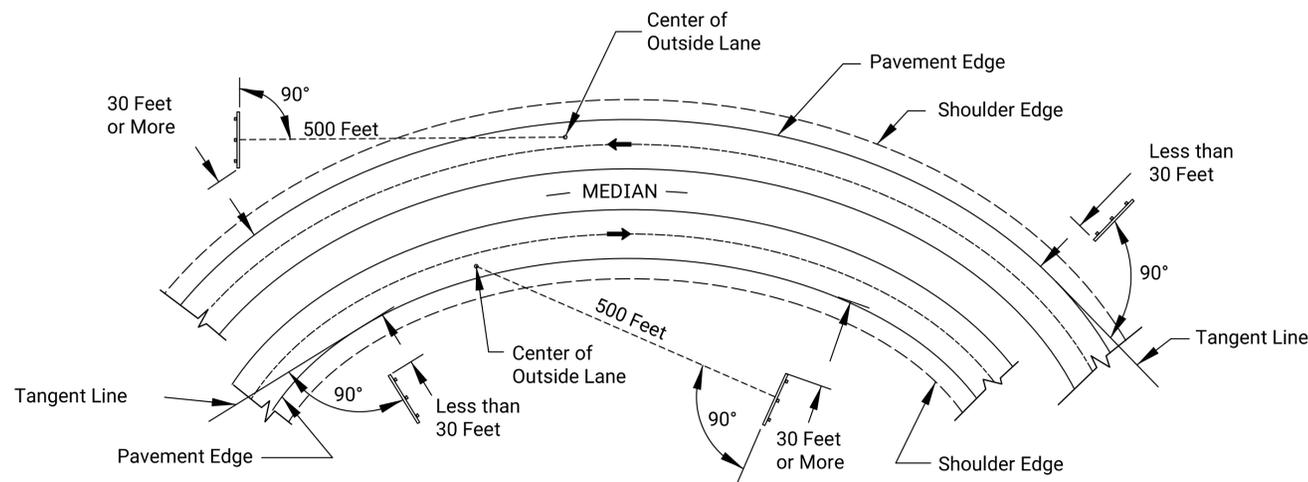
| NO. | DATE     | REVISIONS                                | BY     | APPD   |
|-----|----------|--|--------|--------|
| 02  | 10-01-19 | Changed symbol, notes, & Index           | D.D.G. | E.W.N. |
| 01  | 07-23-10 | Changed General Notes and Spec Book Date | D.D.G. | D.B.   |

|   |        |            |                         |            |
|---|--------|------------|-------------------------|------------|
| KANSAS DEPARTMENT OF TRANSPORTATION                       |        |            |                         |            |
| <b>SIGNING SYMBOL KEY<br/>GENERAL NOTES<br/>AND INDEX</b> |        |            |                         |            |
| TE402   |        |            | 07-01-03                |            |
| FHWA APPROVAL   |        |            |                         |            |
| DESIGNED  | D.D.G. | DETAILED   | W.S.B.                  | QUANTITIES |
| DESIGN CK.  | S.A.B. | DETAIL CK. | D.D.G.                  | QUAN. CK.  |
|   |        |            | APPD. Steven A. Buckley |            |
|   |        |            | TRACED                  |            |
|   |        |            | TRACE CK.               |            |



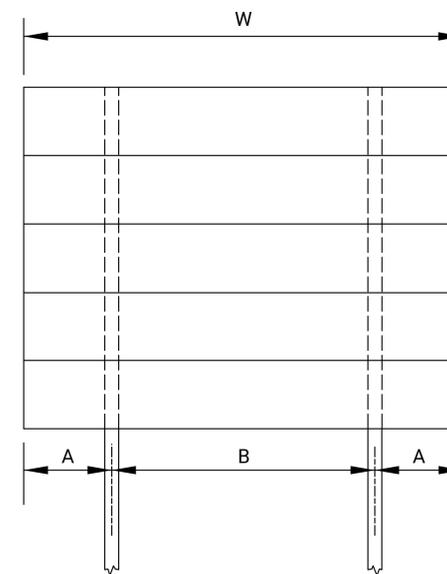
ANGLE OF SIGNS ERECTED ON STRAIGHT ROADWAY



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.



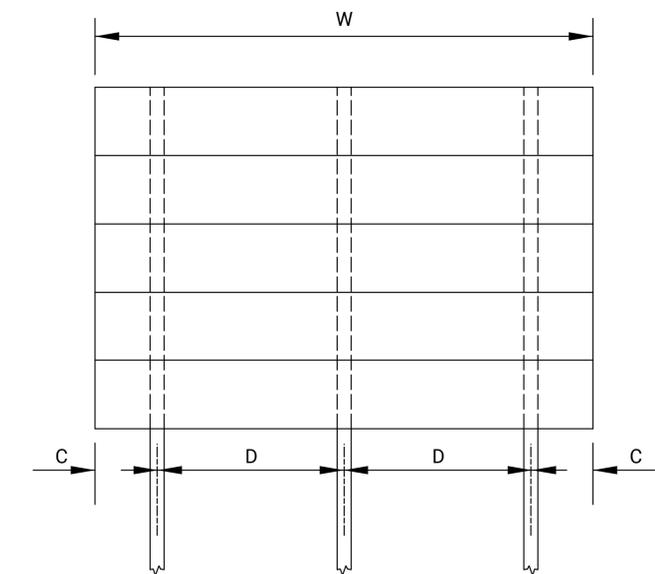
**TWO POST SPACING**

| Wood Post |                        |    |
|-----------|------------------------|----|
| A         | B                      | W  |
| 6" (Min.) | $\frac{3}{5} W$ (Min.) | NA |

| Steel Beam Post<br>(Width less than or equal to 13'-0") |    |               |
|---|----|---------------|
| A   | B  | W             |
| 12" (Min.)  | 8' | 10'-0" (Min.) |

| Steel Beam Post<br>(Width greater than 13'-0") |           |               |
|--|-----------|---------------|
| A  | B         | W             |
| 32" (Min.)                                     | 8' (Min.) | 13'-6" (Min.) |

Spacing Pattern: A+B+A  
W= Sign Width  
A=  $\frac{1}{5} W$   
B=  $\frac{3}{5} W$



**THREE POST SPACING**

| Wood Post |           |              |
|-----------|-----------|--------------|
| C         | D         | W            |
| 6" (Min.) | 4' (Min.) | 9'-0" (Min.) |

| Steel Beam Post<br>(Width less than or equal to 21'-0") |    |               |
|---|----|---------------|
| C   | D  | W             |
| 12" (Min.)  | 8' | 18'-0" (Min.) |

| Steel Beam Post<br>(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=  $\frac{1}{5} W$   
D=  $\frac{3}{5} W$

NOTE: All spacing dimensions are measured to the centerline of the posts.

**POST SPACING FOR REINFORCED PANEL SIGNS**

Plotted by : ghuerter 14-MAR-2025 12:29  
File : te404.dgn

| NO. | DATE     | REVISIONS                                 | BY     | APPD   |
|-----|----------|---|--------|--------|
| 01  | 10-01-19 | Changed the post spacing tables and notes | D.D.G. | E.W.N. |

KANSAS DEPARTMENT OF TRANSPORTATION

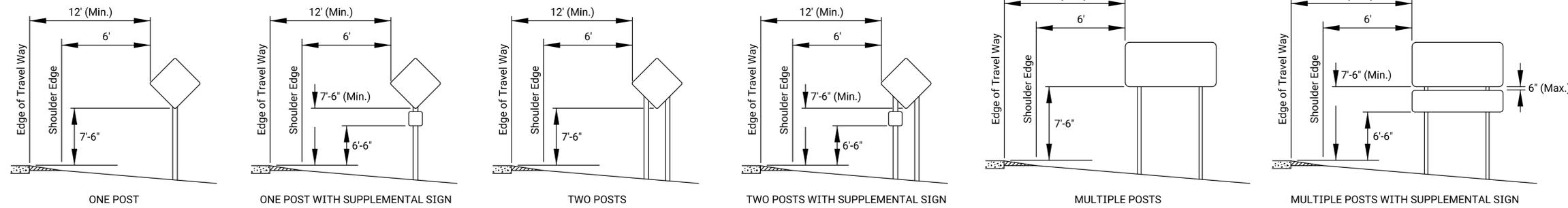
**POST SPACING FOR REINFORCED PANEL SIGNS AND ANGLE OF SIGNS**

TE404 07-01-03

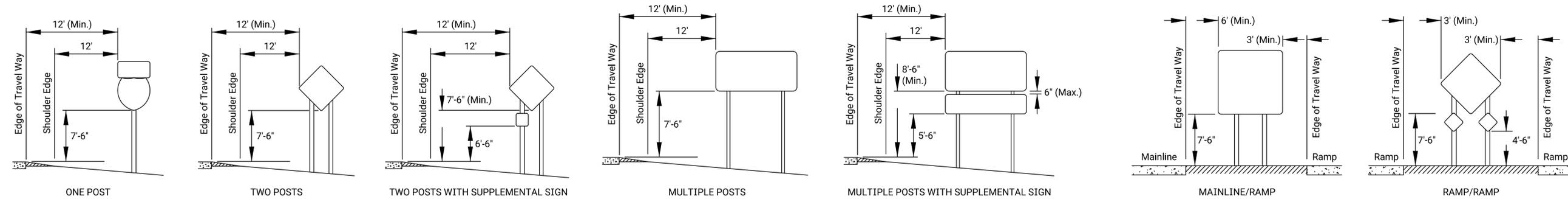
|            |        |            |        |            |           |
|------------|--------|------------|--------|------------|-----------|
| DESIGNED   | D.D.G. | DETAILED   | W.S.B. | QUANTITIES | TRACED    |
| DESIGN CK. | S.A.B. | DETAIL CK. | D.D.G. | QUAN. CK.  | TRACE CK. |

Steven A. Buckley

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 79        | 148          |

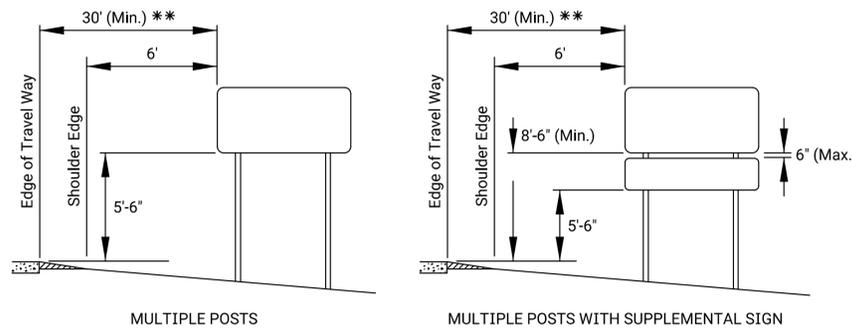


### RAMPS AND EXPRESSWAY INTERSECTIONS



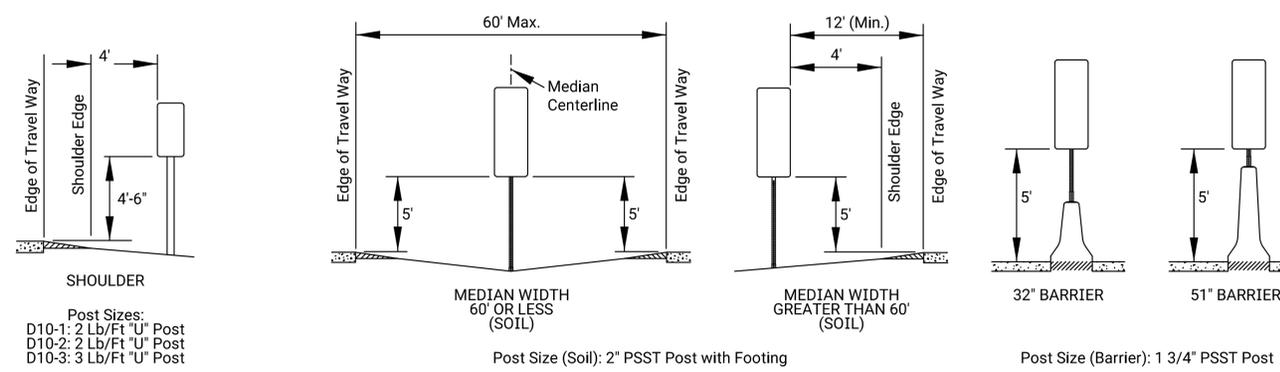
### MAINLINE - SHOULDER MOUNT

### HIGHWAY GORES



\*\* 60' Max.

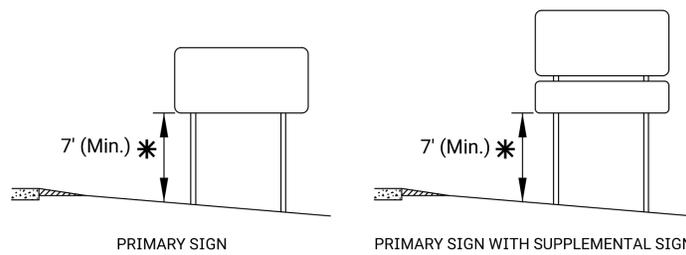
### MAINLINE - OFFSET MOUNT



### MILE POSTS

### INTERMEDIATE REFERENCE MARKERS

### ADOPT A HIGHWAY



\*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'

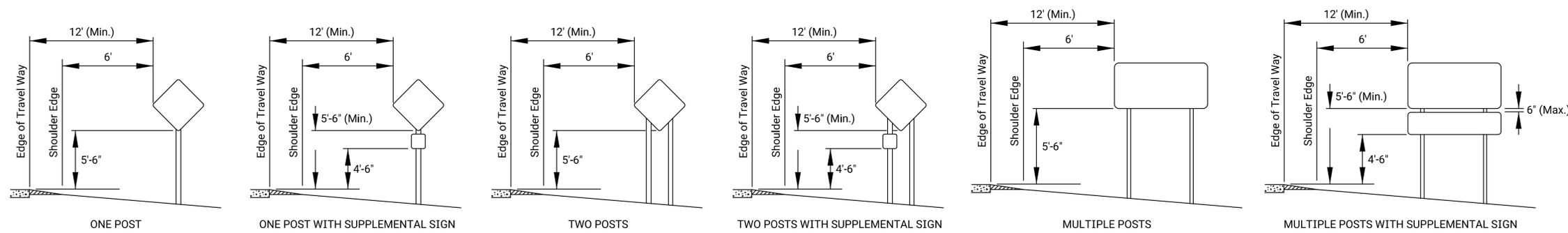
If any sign with a distance or mileage is longitudinally adjusted, the distance or mileage shall be checked and modified as needed.

The minimum spacing between signs are:

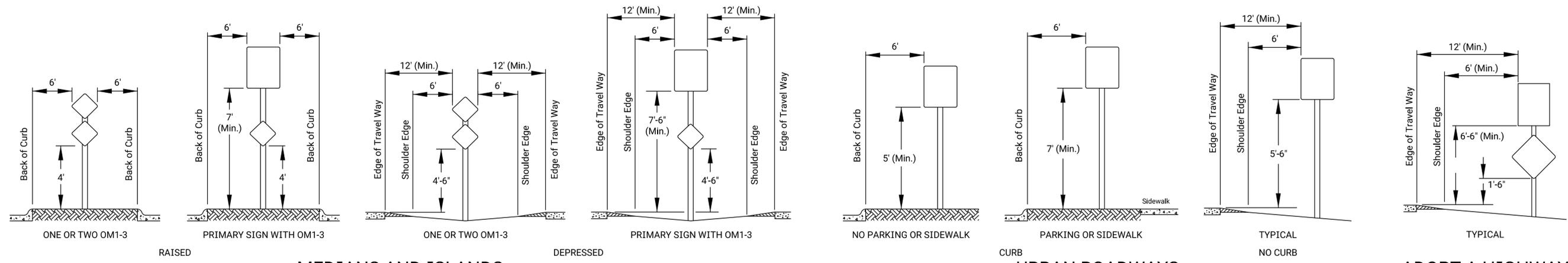
- Mainline guide sign to mainline guide sign: 800'
- Mainline guide sign to regulatory, warning, route marker sign: 400'
- Ramp sign to ramp sign: 100'

| NO.  | DATE | REVISIONS | BY | APPD           |
|--|------|-----------|----|----------------|
| KANSAS DEPARTMENT OF TRANSPORTATION                                      |      |           |    |                |
| <b>MOUNTING HEIGHT &amp; LATERAL OFFSET FOR FREEWAYS AND EXPRESSWAYS</b> |      |           |    |                |
| TE406  |      |           |    | 10-01-19       |
| DESIGNED   |      | D.D.G.    |    | APPD.          |
| E.W.N.   |      | E.W.N.    |    | Eric W. Nichol |
| DETAIL CK.   |      | QUAN CK.  |    | TRACED         |
| E.W.N.   |      | E.W.N.    |    | TRACE CK.      |

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 80        | 148          |



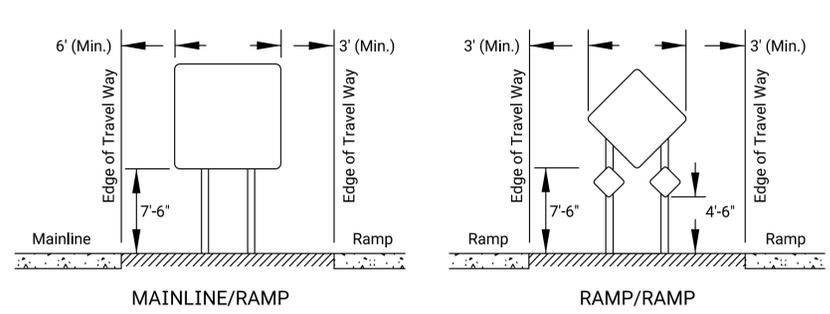
### CONVENTIONAL HIGHWAY AND SIDE ROADS



### MEDIANS AND ISLANDS

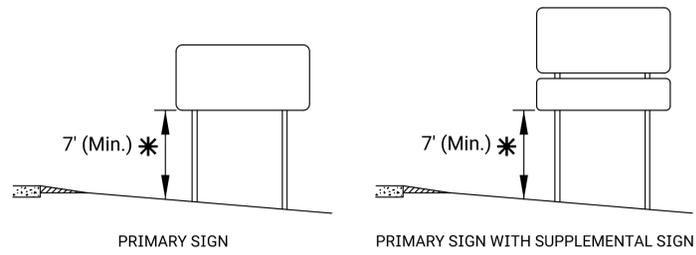
### URBAN ROADWAYS

### ADOPT A HIGHWAY



### HIGHWAY GORES

### REFERENCE MARKERS



### GROUND CLEARANCE FOR STEEL BEAM POSTS

\*NOTE: Measured from the nearest point between the sign and the groundline.

### 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.

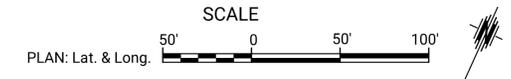
The gore sign shall be installed in the paved gore area. The edges of the gore sign shall not extend beyond the shoulder edge. The minimum distance from the centerline of the posts to the back of the paved gore area is 2'.

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'.

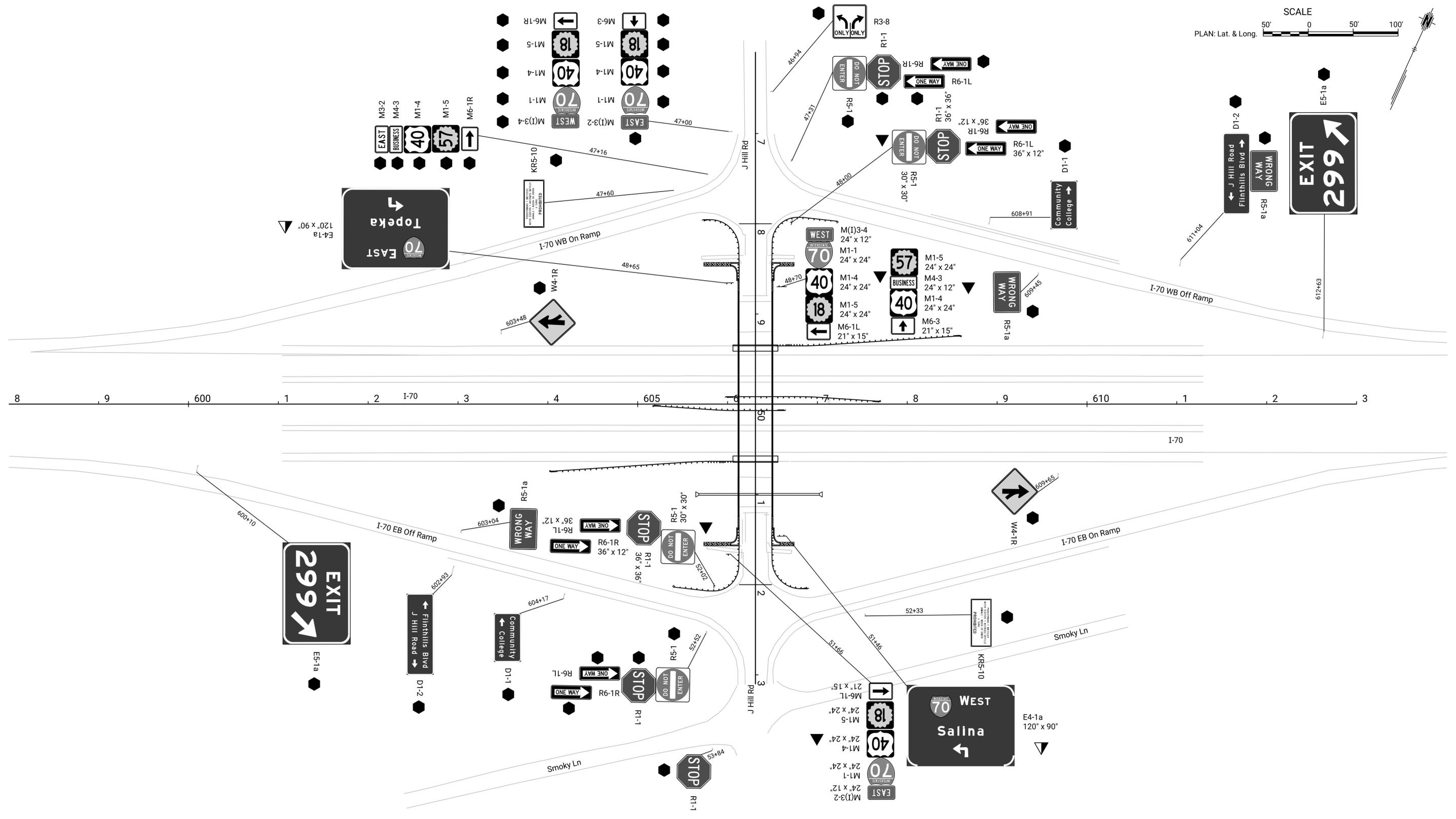
| NO.  | DATE   | REVISIONS  | BY     | APPD           |
|--|--------|------------|--------|----------------|
| KANSAS DEPARTMENT OF TRANSPORTATION  |        |            |        |                |
| <b>MOUNTING HEIGHT &amp; LATERAL OFFSET FOR CONVENTIONAL HIGHWAYS, SIDE ROADS, MEDIANS, ISLANDS, GORES, AND URBAN ROADWAYS</b> |        |            |        |                |
| TE407  |        |            |        |                |
| 10-01-19   |        |            |        |                |
| FHWA APPROVAL  |        | 10-01-19   |        | APPD.          |
| DESIGNED   | D.D.G. | DETAILED   | D.D.G. | QUANTITIES     |
| DESIGN CK.   | E.W.N. | DETAIL CK. | E.W.N. | QUAN. CK.      |
|  |        |            |        | Eric W. Nichol |
|  |        |            |        | TRACED         |
|  |        |            |        | TRACE CK.      |

| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 81        | 148          |



| DATE | BY |
|------|----|
|      |    |
|      |    |

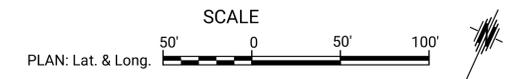
|                    |
|--------------------|
| REFERENCES NOTED   |
| REFERENCES CHECKED |



Plotted by : ghuarter 14-MAR-2025 12:30  
File : KA648301pp1-11.dgn

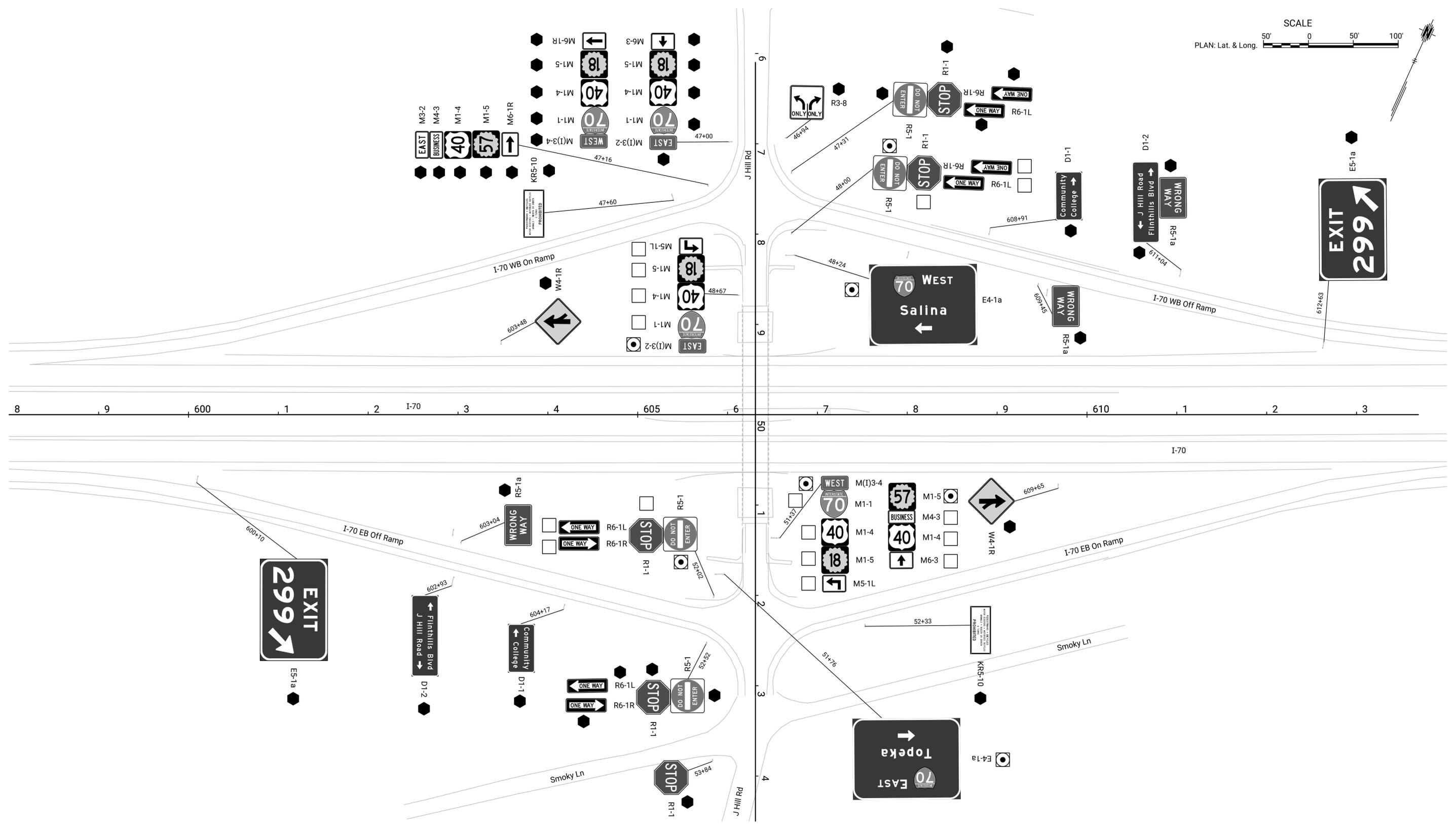
KANSAS DEPARTMENT OF TRANSPORTATION  
SIGNING PLAN  
J HILL RD

| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 82        | 148          |



| DATE | BY |
|------|----|
|      |    |
|      |    |
|      |    |

|                    |
|--------------------|
| REFERENCES NOTED   |
| REFERENCES CHECKED |



Plotted by : ghuarter 14-MAR-2025 12:30  
File : KA648301prmm-01.dgn

KANSAS DEPARTMENT OF TRANSPORTATION  
SIGNING REMOVAL PLAN  
J HILL RD



### SUMMARY OF QUANTITIES

| SIGNS            |        |             |
|------------------|--------|-------------|
| TYPE             | NUMBER | SQUARE FEET |
| FLAT SHEET       | 22     | 87.1        |
| REINFORCED PANEL | 2      | 150         |
| 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  |  | X |
|                                  | OM3-R  |  |   |
|                                  | OM3-C  |  |   |
| TYPE 3 ("U" POST) (BACK TO BACK) |        |  |   |

| POSTS AND ALUMINUM BEAMS |                 |                       |                   |                      |          |          |                            |                  |           |                  |                                     |                  |        |    |        |        |
|--------------------------|-----------------|-----------------------|-------------------|----------------------|----------|----------|----------------------------|------------------|-----------|------------------|-------------------------------------|------------------|--------|----|--------|--------|
|                          | 4" x 6" POST    |                       |                   | 312.25 ALUMINUM BEAM | "U" POST |          | GALVANIZED STEEL BEAM POST |                  |           |                  | PERFORATED SQUARE STEEL TUBE (PSST) |                  |        |    |        |        |
|                          | WOOD            |                       | STEEL             |                      | 2 LBS/FT | 3 LBS/FT | W6x9                       |                  | W10x12    |                  | W10x22                              |                  | 1-3/4" | 2" | 2-1/4" | 2-1/2" |
|                          | FLAT SHEET SIGN | REINFORCED PANEL SIGN | STRUCTURAL TUBING |                      |          |          | A36 STEEL                  | A572 STEEL (ALT) | A36 STEEL | A572 STEEL (ALT) | A36 STEEL                           | A572 STEEL (ALT) |        |    |        |        |
| NUMBER                   | 5               |                       |                   |                      |          |          | 4                          | 4                |           |                  |                                     |                  |        |    |        |        |
| FEET                     | 70              |                       |                   |                      |          |          | 80                         | 80               |           |                  |                                     |                  |        |    |        |        |

| POST FOOTINGS AND BRACKETS |                         |           |     |                  |     |                         |        |    |        |         |        |    |  |  |  |
|----------------------------|-------------------------|-----------|-----|------------------|-----|-------------------------|--------|----|--------|---------|--------|----|--|--|--|
|                            | CONCRETE FOOTING (DIA.) |           |     |                  |     | PERFORATED SQUARE STEEL |        |    |        |         |        |    |  |  |  |
|                            | WOOD                    | A36 STEEL |     | A572 STEEL (ALT) |     | TUBE FOOTING            |        |    |        | BRACKET |        |    |  |  |  |
|                            |                         | 18"       | 24" | 30"              | 24" | 30"                     | 1-3/4" | 2" | 2-1/4" | 2-1/2"  | 1-3/4" | 2" |  |  |  |
| NUMBER                     | 5                       | 4         |     | 4                |     |                         |        |    |        |         |        |    |  |  |  |
| FEET                       | 15                      | 24        |     | 24               |     |                         |        |    |        |         |        |    |  |  |  |

| NUMBER & LENGTHS OF POSTS & ALUMINUM BEAMS (INFORMATION ONLY) |                 |                       |                   |          |                      |          |           |                            |           |                  |           |                  |                                     |    |        |        |
|---|-----------------|-----------------------|-------------------|----------|----------------------|----------|-----------|----------------------------|-----------|------------------|-----------|------------------|-------------------------------------|----|--------|--------|
| LENGTH OF POST OR BEAM  | 4" x 6" POST    |                       |                   |          | 312.25 ALUMINUM BEAM | "U" POST |           | GALVANIZED STEEL BEAM POST |           |                  |           |                  | PERFORATED SQUARE STEEL TUBE (PSST) |    |        |        |
|   | WOOD            |                       | STEEL             | 2 LBS/FT |                      | 3 LBS/FT | W6x9      |                            | W10x12    |                  | W10x22    |                  | 1-3/4"                              | 2" | 2-1/4" | 2-1/2" |
|   | FLAT SHEET SIGN | REINFORCED PANEL SIGN | STRUCTURAL TUBING |          |                      |          | A36 STEEL | A572 STEEL (ALT)           | A36 STEEL | A572 STEEL (ALT) | A36 STEEL | A572 STEEL (ALT) |                                     |    |        |        |
| 2.1' - 4'   |                 |                       |                   |          |                      |          |           |                            |           |                  |           |                  |                                     |    |        |        |
| 4.1' - 6'   |                 |                       |                   |          |                      |          |           |                            |           |                  |           |                  |                                     |    |        |        |
| 6.1' - 8'   |                 |                       |                   |          |                      |          |           |                            |           |                  |           |                  |                                     |    |        |        |
| 8.1' - 10'  |                 |                       |                   |          |                      |          |           |                            |           |                  |           |                  |                                     |    |        |        |
| 10.1' - 12'   |                 |                       |                   |          |                      |          |           |                            |           |                  |           |                  |                                     |    |        |        |
| 12.1' - 14'   | 5               |                       |                   |          |                      |          |           |                            |           |                  |           |                  |                                     |    |        |        |
| 14.1' - 16'   |                 |                       |                   |          |                      |          |           |                            |           |                  |           |                  |                                     |    |        |        |
| 16.1' - 18'   |                 |                       |                   |          |                      |          |           |                            |           |                  |           |                  |                                     |    |        |        |
| 18.1' - 20'   |                 |                       |                   |          |                      |          |           | 4                          | 4         |                  |           |                  |                                     |    |        |        |
| 20.1' - 22'   |                 |                       |                   |          |                      |          |           |                            |           |                  |           |                  |                                     |    |        |        |
| 22.1' - 24'   |                 |                       |                   |          |                      |          |           |                            |           |                  |           |                  |                                     |    |        |        |
| 24.1' - 26'   |                 |                       |                   |          |                      |          |           |                            |           |                  |           |                  |                                     |    |        |        |
| 26.1' - 28'   |                 |                       |                   |          |                      |          |           |                            |           |                  |           |                  |                                     |    |        |        |
| 28.1' - 30'   |                 |                       |                   |          |                      |          |           |                            |           |                  |           |                  |                                     |    |        |        |
| 30.1' - 32'   |                 |                       |                   |          |                      |          |           |                            |           |                  |           |                  |                                     |    |        |        |

| BASE PLATES AND STUB POSTS |           |                  |           |                  |           |                  |
|----------------------------|-----------|------------------|-----------|------------------|-----------|------------------|
|                            | W6x9      |                  | W10x12    |                  | W10x22    |                  |
|                            | A36 STEEL | A572 STEEL (ALT) | A36 STEEL | A572 STEEL (ALT) | A36 STEEL | A572 STEEL (ALT) |
| BREAKAWAY BASES            |           |                  |           |                  |           |                  |
| BASE PLATE (TOP)           | 4         | 4                |           |                  |           |                  |
| STUB POST WITH BASE PLATE  | 4         | 4                |           |                  |           |                  |
| NON-BREAKAWAY BASES        |           |                  |           |                  |           |                  |
| BASE PLATE                 |           |                  |           |                  |           |                  |

| REMOVALS        |        |
|-----------------|--------|
| TYPE            | NUMBER |
| SIGNS           | 24     |
| POSTS           | 9      |
| FOOTINGS        | 9      |
| SIGN STRUCTURES |        |

| SIGN STRUCTURES                  |     |          |                  |       |
|----------------------------------|-----|----------|------------------|-------|
| TYPE                             | NEW | MODIFIED | REMOVE AND RESET | RESET |
| OVERHEAD STRUCTURE               |     |          |                  |       |
| CANTILEVER STRUCTURE             |     |          |                  |       |
| BUTTERFLY STRUCTURE              |     |          |                  |       |
| BRIDGE MOUNT ATTACHMENT          |     |          |                  |       |
| MAST ARM SIGN SUPPORT            |     |          |                  |       |
| SINGLE TAPERED TUBE SIGN SUPPORT |     |          |                  |       |

|     |          |                |        |        |
|-----|----------|----------------|--------|--------|
| 02  | 10-01-19 | Revised Tables | D.D.G. | E.W.N. |
| 01  | 07-23-10 | Revised Tables | D.D.G. | D.B.   |
| NO. | DATE     | REVISIONS      | BY     | APPD   |

KANSAS DEPARTMENT OF TRANSPORTATION

### SUMMARY OF QUANTITIES FOR INSTALLATIONS AND REMOVALS

TE439 07-01-03

|               |          |            |                   |
|---------------|----------|------------|-------------------|
| FHWA APPROVAL | 10-01-19 | APPD.      | 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.         |



|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 86        | 148          |

**GENERAL NOTES**

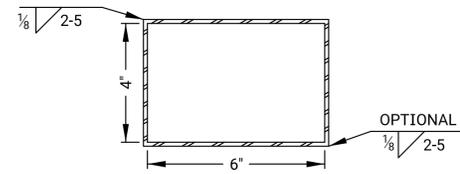
The post sleeve shall be formed from 10 gauge sheet steel to meet the requirements of ASTM A653 and zinc coated to meet the requirements of coating designation A123. If galvanized sheet steel is used, no other galvanization is required. It is permissible to close the bottom of the sleeve with a metal 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.

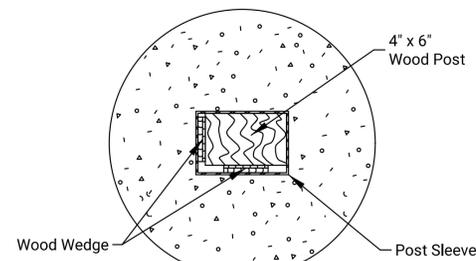
Prior to sealing the opening between the wood post and the top of the concrete footing, secure the post by placing 3" wide by 2" long wood wedges into the opening on two adjacent sides of the post. The wedges are to be flush with up to a maximum of 3/8" sticking up above the top of the footing.

Commercial grade concrete may be substituted for sign support footings.

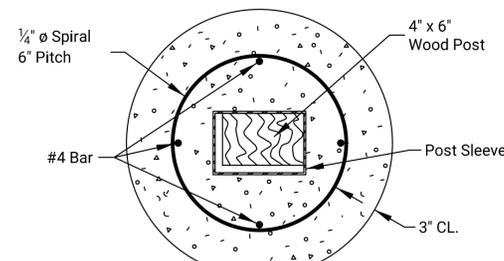


NOTE: Dimensions are to inside of post sleeve.

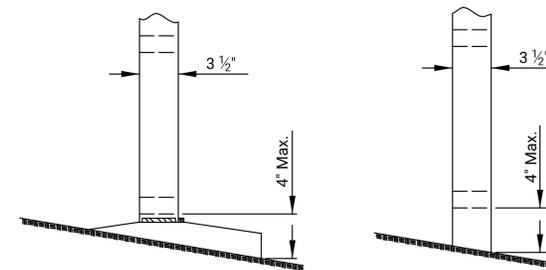
**POST SLEEVE**



**SECTION A-A**



**SECTION B-B**

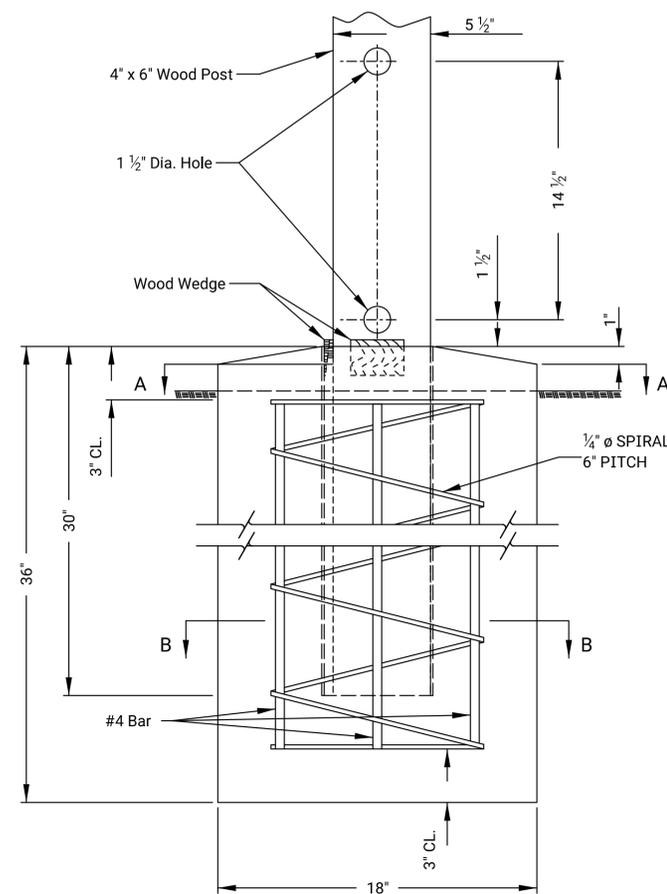


**FRONT ELEVATION  
CONCRETE FOOTING**

**FRONT ELEVATION  
SOIL**

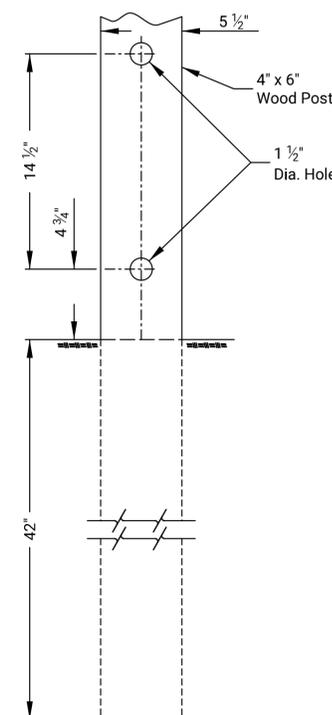
**NOTE TO THE ENGINEER:**  
The intent of the "AASHTO Roadside Design Guide" and these plans is to have a 4" or less projection above the finished ground line after impact.

**BREAKAWAY CLEARANCE**



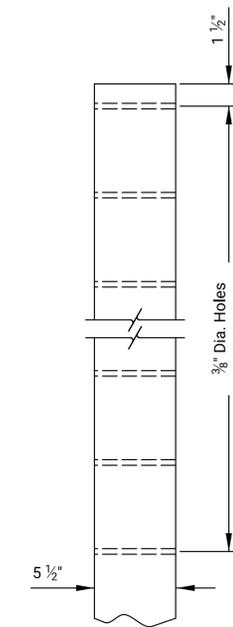
**SIDE ELEVATION**

**WOOD POST IN CONCRETE FOOTING**



**SIDE ELEVATION**

**WOOD POST IN SOIL**



**SIGN POST**

**SIGN MOUNTING HOLES**

All dimensions in inches unless otherwise noted.

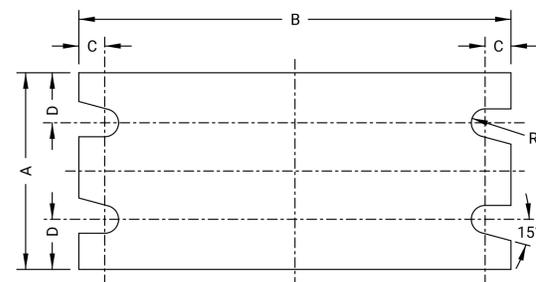
| NO. | DATE     | REVISIONS               | BY     | APPD   |
|-----|----------|-------------------------|--------|--------|
| 01  | 10-01-19 | Change details and note | D.D.G. | E.W.N. |

KANSAS DEPARTMENT OF TRANSPORTATION

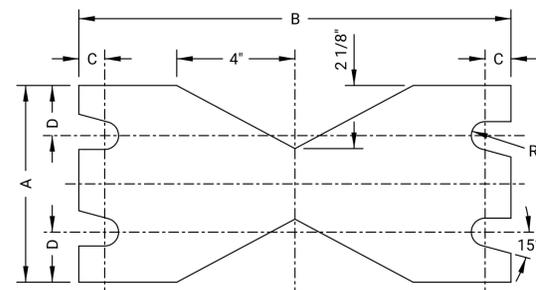
**DETAILS FOR WOOD POSTS**

TE460 07-01-03

|            |        |            |        |            |           |
|------------|--------|------------|--------|------------|-----------|
| DESIGNED   | D.D.G. | DETAILED   | A.A.D. | QUANTITIES | TRACED    |
| DESIGN CK. | S.A.B. | DETAIL CK. | D.D.G. | QUAN. CK.  | TRACE CK. |

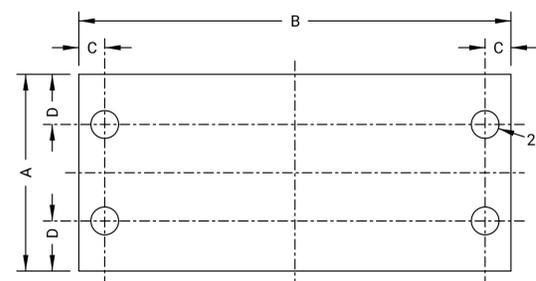


W6 X 9 and W10 X 12 POSTS

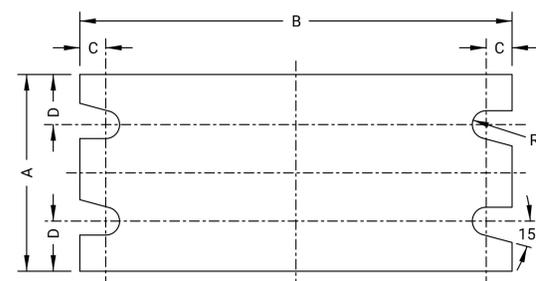


W10 X 22 POSTS

SIGN POST BASE PLATE



BOLT RETAINER PLATE

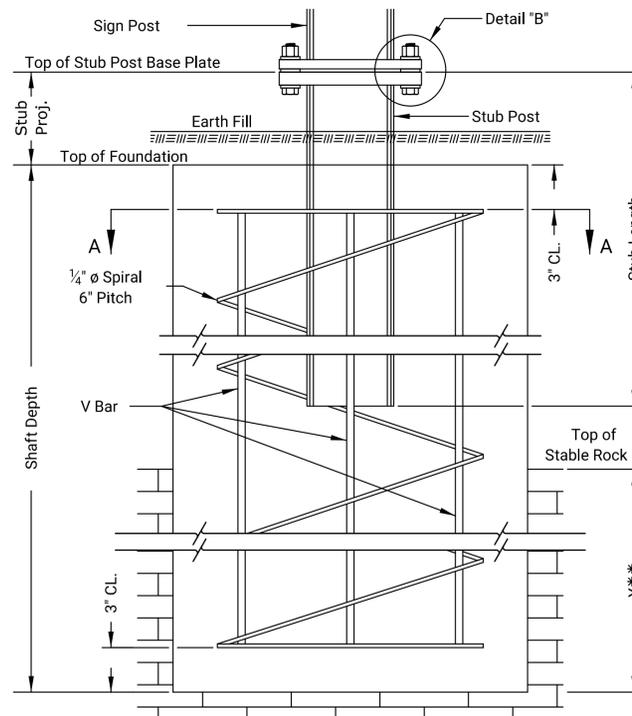


STUB POST BASE PLATE

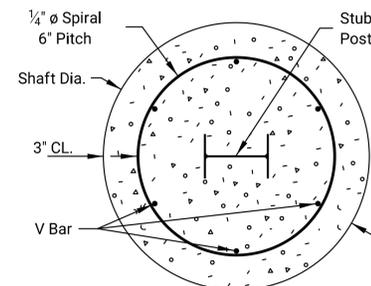
NOTE:  
The plates shown are for right shoulder or gore installations. The plate slot bevels are to be reversed for left shoulder installations. The sign post and stub post are to be centered on base plates.

| BASE CONNECTION DATA TABLE |               |                   |      |        |      |        |         |      |         |         |
|----------------------------|---------------|-------------------|------|--------|------|--------|---------|------|---------|---------|
| POST SIZE                  | BOLT SIZE     | TORQUE (IN. LBS.) | WS   | T1     | T2   | A      | B       | C    | D       | R       |
| W6 X 9                     | 5/8" X 3"     | 345               | 1/4" | 7/8"   | 5/8" | 4 5/8" | 9 5/8"  | 3/4" | 1 1/16" | 1 1/2"  |
| W10 X 12                   | 5/8" X 3 1/4" | 345               | 1/4" | 1"     | 3/4" | 4 5/8" | 13 5/8" | 3/4" | 1 1/16" | 1 1/2"  |
| W10 X 22                   | 7/8" X 4"     | 640               | 3/8" | 1 3/8" | 1"   | 6 5/8" | 14 5/8" | 7/8" | 1 1/16" | 1 5/32" |

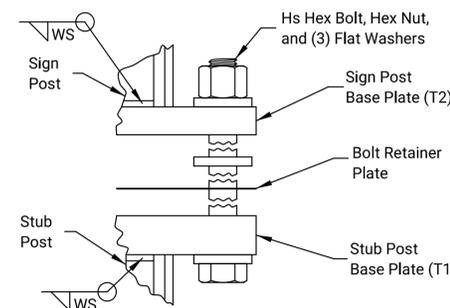
T1: Stub Post Base Plate Thickness  
T2: Sign Post Base Plate Thickness



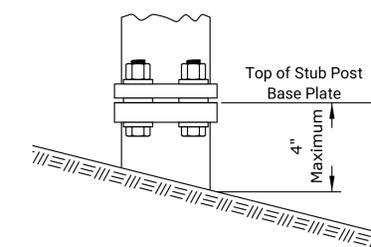
SIDE ELEVATION



SECTION A-A



DETAIL "B"



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.

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

- 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.
- 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.
- 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.
- Burr threads at junction with nut using a center punch to prevent nut loosening.

All dimensions are in inches, unless otherwise noted.

| FOUNDATION DATA TABLE |             |            |            |             |          |       |           |            |
|-----------------------|-------------|------------|------------|-------------|----------|-------|-----------|------------|
| POST SIZE             | STUB LENGTH | STUB PROJ. | SHAFT DIA. | SHAFT DEPTH |          |       | V BAR NO. | V BAR SIZE |
|                       |             |            |            | A36         | A572 ALT | Y**   |           |            |
| W6 X 9                | 2'-6"       | 6 1/4"     | 2'-0"      | 6'-0"       | 6'-0"    | 3'-6" | 6         | #4         |
| W10 X 12              | 2'-9"       | 6 1/4"     | 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.

| KANSAS DEPARTMENT OF TRANSPORTATION                 |        |            |          |                         |           |
|---|--------|------------|----------|-------------------------|-----------|
| DETAILS FOR STEEL BEAM BREAKAWAY POSTS SHEET 1 OF 2 |        |            |          |                         |           |
| TE463   |        | 10-01-19   |          | APPD. Steven A. Buckley |           |
| DESIGNED  | D.D.G. | DATE       | 10-01-19 | QUANTITIES              | TRACED    |
| DESIGN CK.  | S.A.B. | DETAIL CK. | D.D.G.   | QUAN. CK.               | TRACE CK. |

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 88        | 148          |

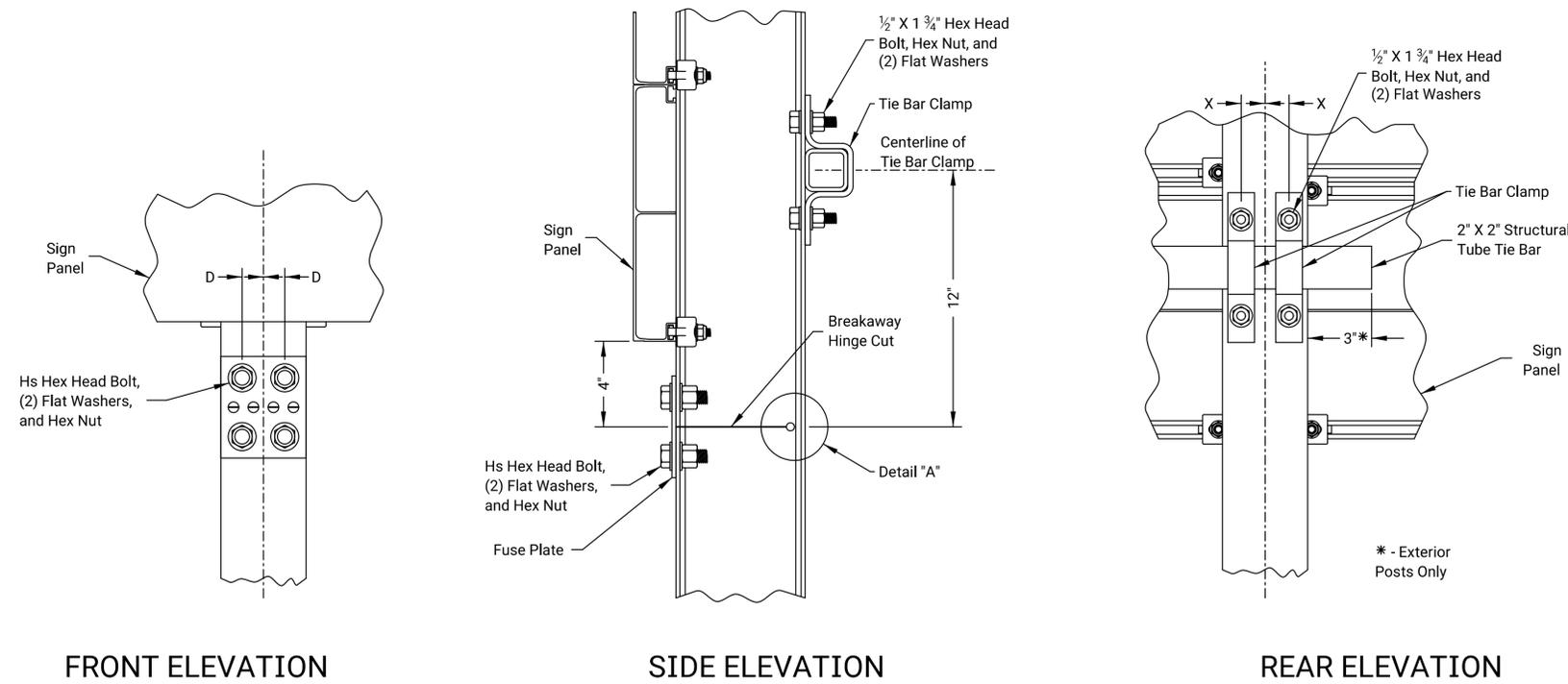
GENERAL NOTES

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 accordance 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.

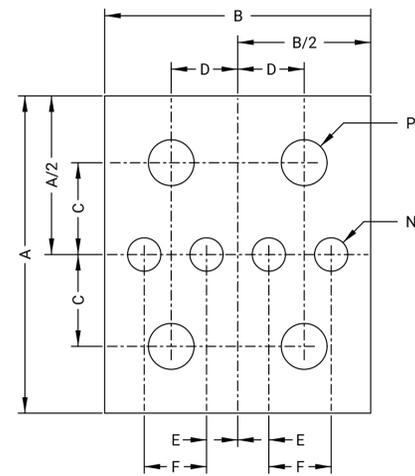


FRONT ELEVATION

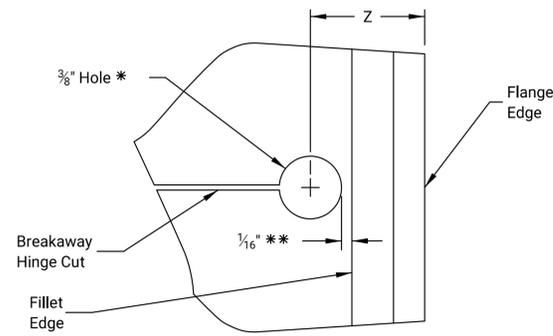
SIDE ELEVATION

REAR ELEVATION

BREAKAWAY HINGE AND STRUCTURAL TUBE TIE BAR INSTALLATION



FUSE PLATE



DETAIL "A"

\* - Hole To Be Drilled Prior To Cutting Web  
 \*\* - Edge Of Hole To Fillet

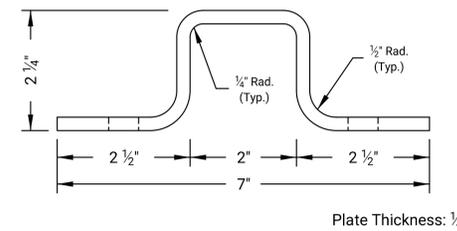
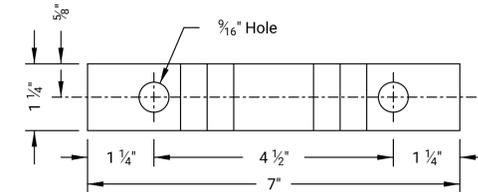


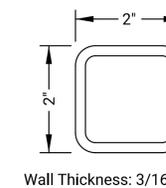
Plate Thickness: 1/4"

TIE BAR CLAMP



\* - Minimum Length:  
 W6x9: 8'-10"  
 W10x12: 8'-10"  
 W10x22: 8'-11 3/4"

STRUCTURAL TUBE TIE BAR

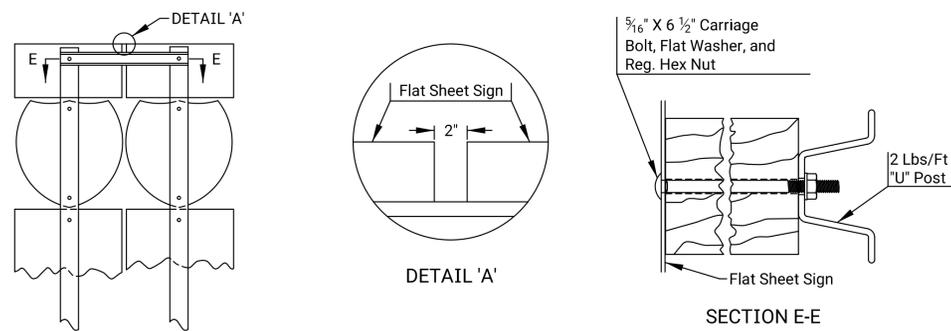


Wall Thickness: 3/16"

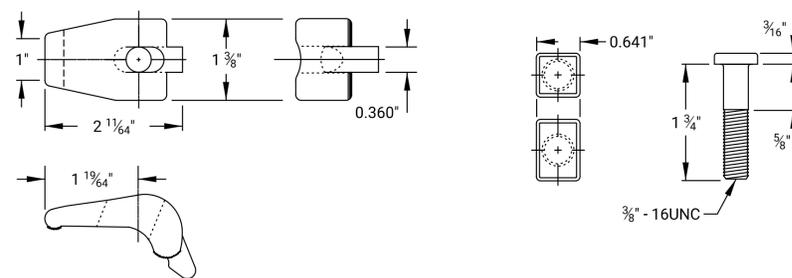
All dimensions are in inches, unless otherwise noted.

|                                     |        |            |   |                   |           |
|-------------------------------------|--------|------------|---|-------------------|-----------|
| 01                                  |        | 10-01-19   | Removed S3x5.7 posts and revised notes. | D.D.G.            | E.W.N.    |
| NO.                                 | DATE   | DESIGNED   | REVISIONS                               | BY                | APPD      |
| KANSAS DEPARTMENT OF TRANSPORTATION |        |            |   |                   |           |
| TE464                               |        |            | 07-01-03                                |                   |           |
| FHWA APPROVAL                       |        | 10-01-19   | APPD.                                   | 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. |

DETAILS FOR  
 STEEL BEAM BREAKAWAY POSTS  
 SHEET 2 OF 2



ROUTE MARKER ASSEMBLIES ATTACHMENT



ALUMINUM POST CLIP AND POST CLIP BOLT

NOTES:  
The top of the post shall not extend above the top of the sign.

When signs are mounted back to back, the signs shall be mounted at their prescribed height. In general installations, the bottom holes of the signs should be aligned. In order to prevent having to drill holes in the signs or posts, the sign on the back should be raised and positioned such that the holes are aligned. When a sign is mounted on the back of the R1-1 (Stop) sign, that sign is to be centered vertically on the R1-1 sign. When a sign is mounted on the back of the R1-2 (Yield) sign, the top holes of the signs should be aligned.

The primary sign and supplemental sign are to be mounted at their prescribed height, but under no circumstances shall the signs overlap each other. If the primary sign cannot be mounted without overlapping, then it shall be raised above the supplemental sign.

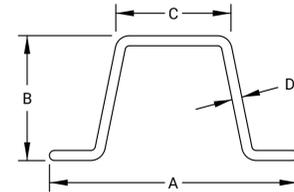
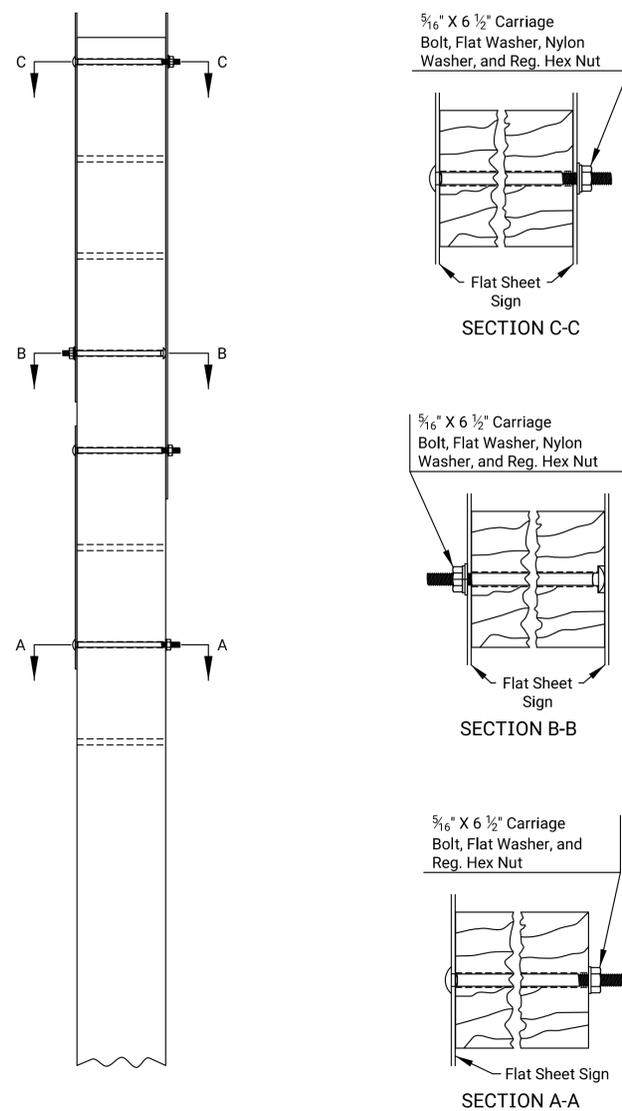
Any additional mounting holes, either through the sign or post, shall be drilled by the contractor. All holes drilled in the post shall be treated with a preservative. All holes drilled in the sign shall be free of any defects and the sheeting around the hole shall not be damaged.

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)'.

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)'.

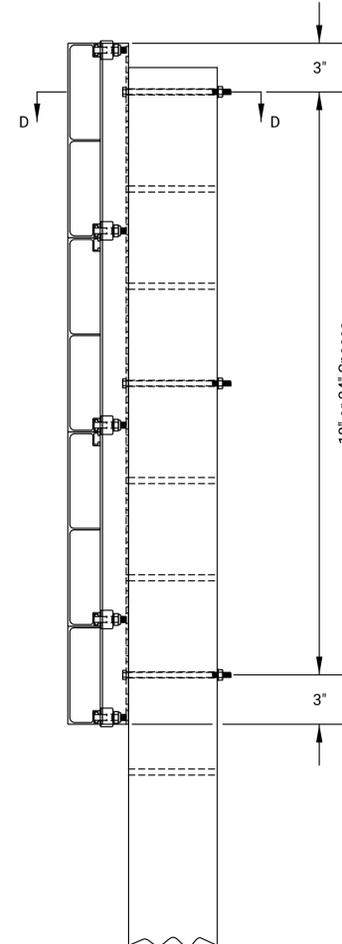
The aluminum post clip bolt may have a rectangular head if the smaller dimension is equal to the square head dimension.



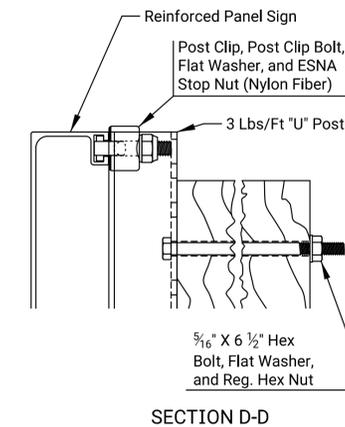
| DIM. | 2 LBS/FT | 3 LBS/FT |
|------|----------|----------|
| A    | 3 1/8"   | 3 1/2"   |
| B    | 1 17/32" | 1 3/4"   |
| C    | 1 1/4"   | 1 5/8"   |
| D    | 1/8"     | 9/64"    |

(DIMENSIONS ARE NOMINAL)

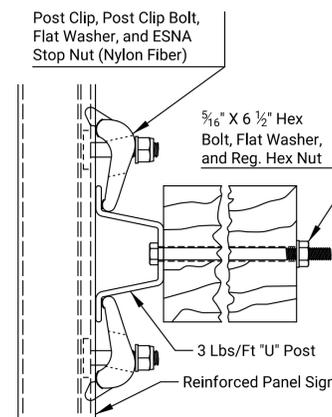
"U" POST



TYPICAL MOUNTING OF REINFORCED PANEL SIGNS



SECTION D-D

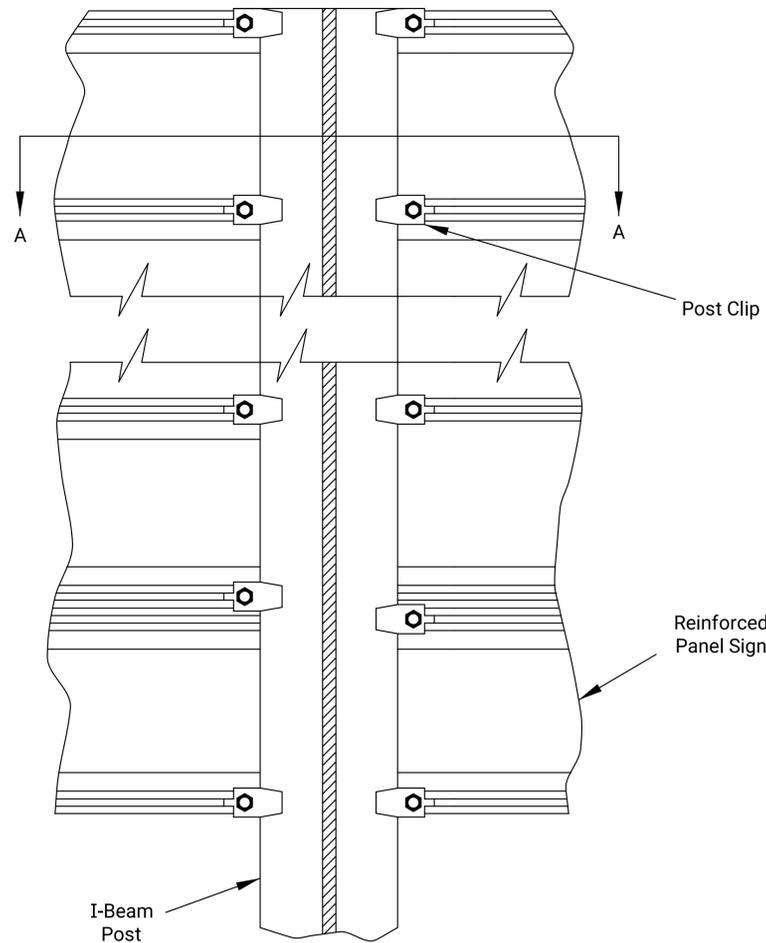


TOP VIEW

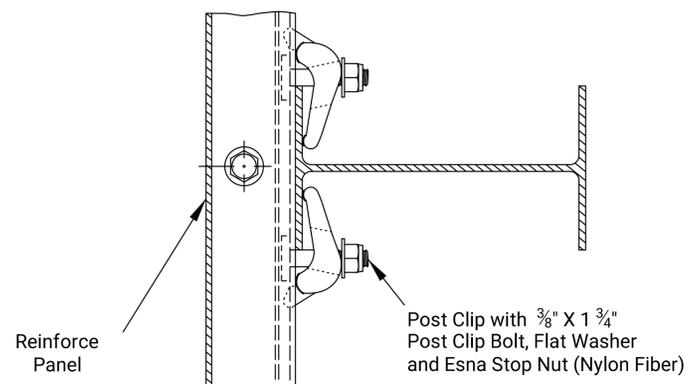
All dimensions are in inches

| NO.  | DATE     | REVISIONS                  | BY     | APPD              |
|--|----------|----------------------------|--------|-------------------|
| 01   | 10-01-19 | Revised drawings and notes | D.D.G. | E.W.N.            |
| KANSAS DEPARTMENT OF TRANSPORTATION  |          |                            |        |                   |
| <b>DETAILS FOR MOUNTING SIGNS ON WOOD POST FLAT SHEET AND REINFORCED PANEL</b> |          |                            |        |                   |
| TE481  |          |                            |        | 07-01-03          |
| FHWA APPROVAL  |          |                            |        |                   |
| DESIGNED   | D.D.G.   | DETAILED                   | A.A.D. | QUANTITIES        |
| DESIGN CK.   | S.A.B.   | DETAIL CK.                 | D.D.G. | QUAN. CK.         |
|  |          |                            |        | STEVEN A. BUCKLEY |
|  |          |                            |        | TRACED            |
|  |          |                            |        | TRACE CK.         |

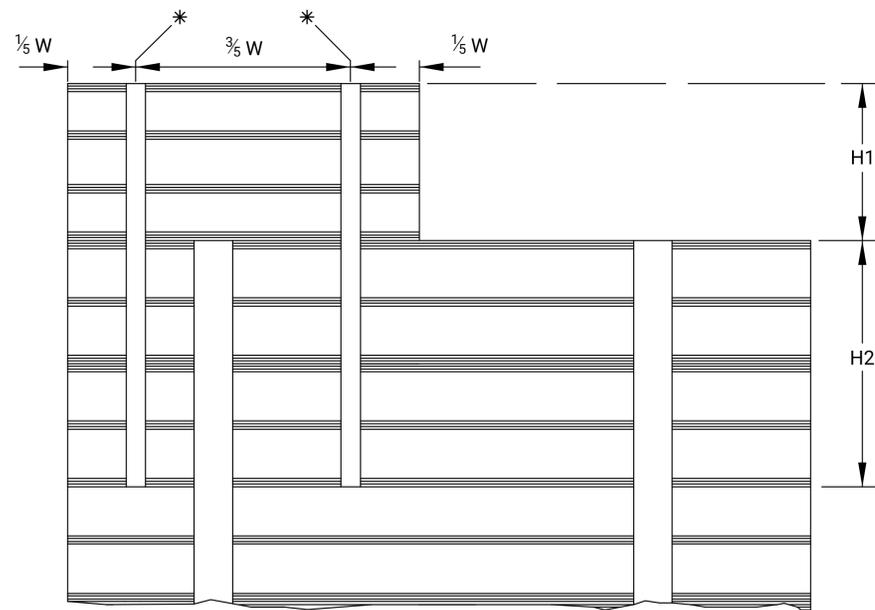
|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 90        | 148          |



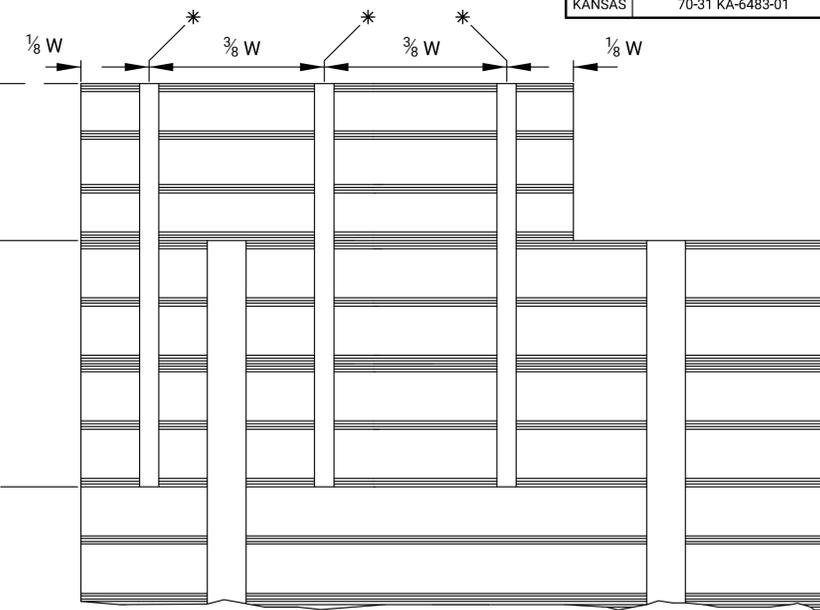
MOUNTING OF REINFORCED PANELS TO I-BEAM POST



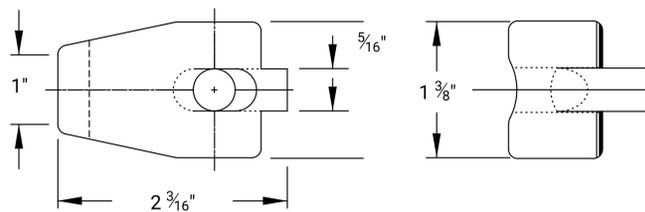
SECTION A-A



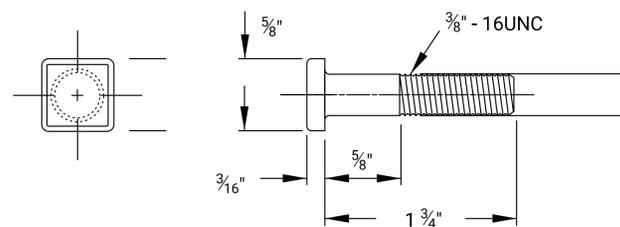
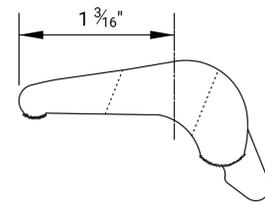
E1-5 MOUNTING FROM RIGHT EXIT (2 I-BEAMS)



E1-5 MOUNTING FROM RIGHT EXIT (3 I-BEAMS)



POST CLIP ALUMINUM



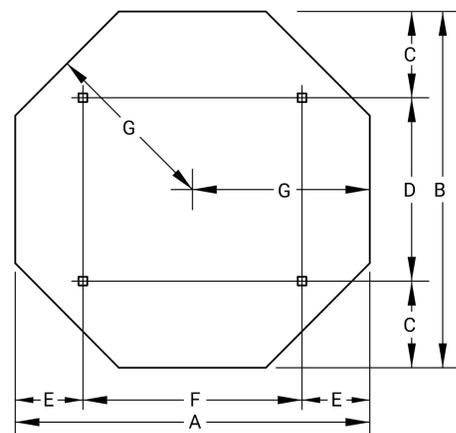
POST CLIP BOLT ALUMINUM

NOTES:

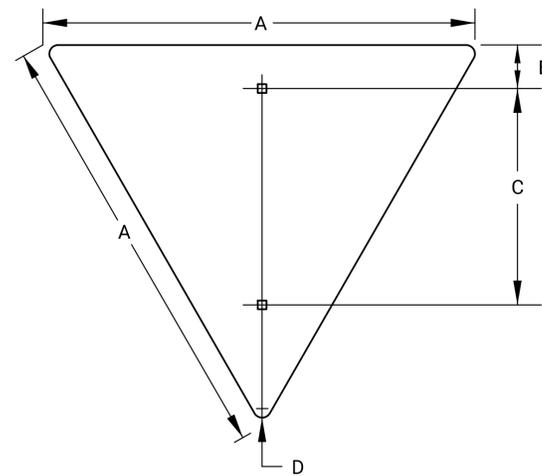
- \* - Centerline of aluminum I-beam
- H1 - height of added sign (E1-5)
- H2 - H1 + 12" or to the bottom of the next stiffener
- The E1-5 sign shall be positioned above the guide sign according to the direction of the exit:
  - Right exit - right edge of sign
  - Left exit - left edge of sign
  - Two 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.

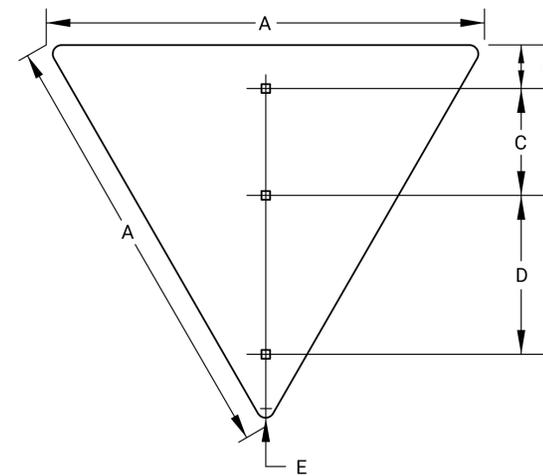
| NO.  | DATE   | REVISIONS  | BY     | APPD.             |
|--|--------|------------|--------|-------------------|
| KANSAS DEPARTMENT OF TRANSPORTATION                              |        |            |        |                   |
| <b>DETAILS FOR MOUNTING REINFORCED PANEL SIGN ON I-BEAM POST</b> |        |            |        |                   |
| TE490  |        | 07-01-03   |        |                   |
| DESIGNED   | D.D.G. | DETAILED   | B.A.H. | QUANTITIES        |
| DESIGN CK.   | S.A.B. | DETAIL CK. | D.D.G. | QUAN. CK.         |
| APPD.  |        |            |        | Steven A. Buckley |



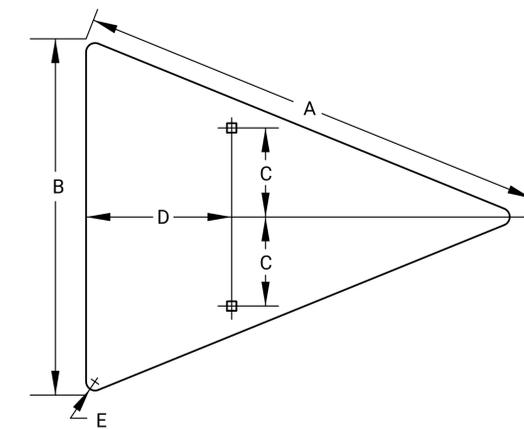
| SIGN SIZE | A  | B  | C  | D  | E | F  | G  | T     | AREA  |
|-----------|----|----|----|----|---|----|----|-------|-------|
| 48 X 48   | 48 | 48 | 12 | 24 | 9 | 30 | 24 | 0.100 | 13.25 |



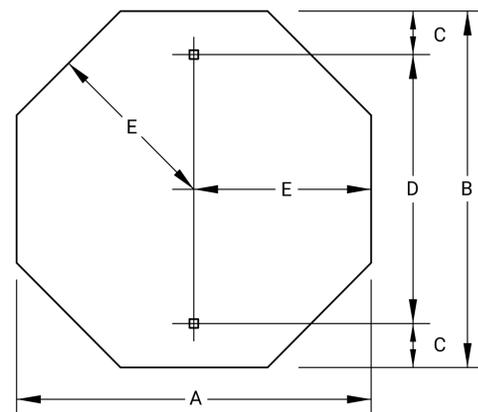
| SIGN SIZE | A  | B | C  | D | T     | AREA |
|-----------|----|---|----|---|-------|------|
| 36 X 36   | 36 | 3 | 18 | 2 | 0.080 | 3.90 |



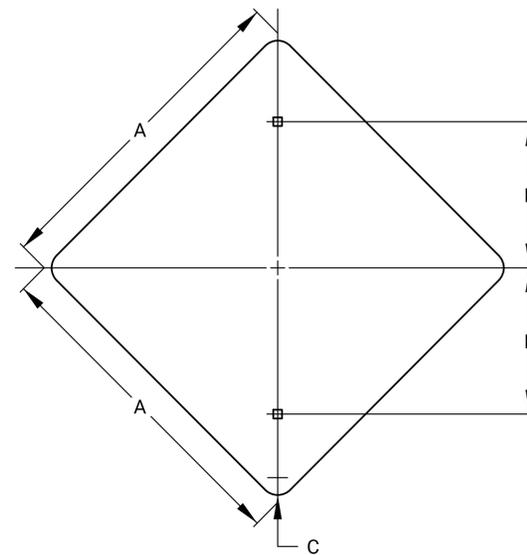
| SIGN SIZE | A  | B | C  | D  | E | T     | AREA  |
|-----------|----|---|----|----|---|-------|-------|
| 48 X 48   | 48 | 3 | 12 | 18 | 3 | 0.080 | 6.93  |
| 60 X 60   | 60 | 3 | 18 | 18 | 4 | 0.100 | 10.83 |



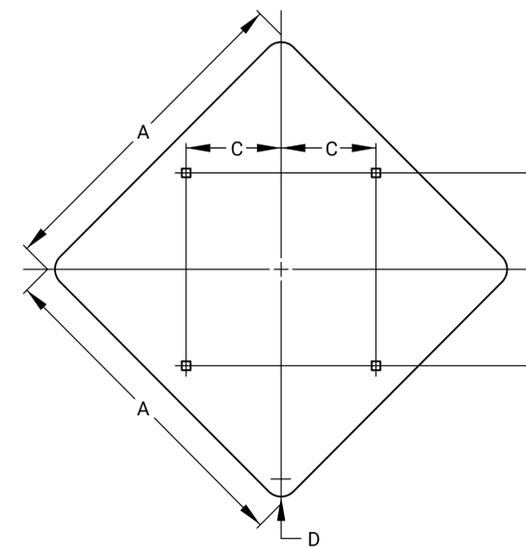
| SIGN SIZE | A  | B  | C | D      | E     | T     | AREA |
|-----------|----|----|---|--------|-------|-------|------|
| 48 X 36   | 48 | 36 | 9 | 14 3/4 | 2 1/4 | 0.125 | 5.56 |



| SIGN SIZE | A  | B  | C | D  | E  | T     | AREA |
|-----------|----|----|---|----|----|-------|------|
| 30 X 30   | 30 | 30 | 3 | 24 | 15 | 0.080 | 5.18 |
| 36 X 36   | 36 | 36 | 6 | 24 | 18 | 0.080 | 7.46 |



| SIGN SIZE | A  | B  | C     | T     | AREA |
|-----------|----|----|-------|-------|------|
| 18 X 18   | 18 | 6  | 1 1/2 | 0.080 | 2.25 |
| 24 X 24   | 24 | 12 | 1 1/2 | 0.080 | 4.00 |
| 30 X 30   | 30 | 12 | 1 7/8 | 0.080 | 6.25 |
| 36 X 36   | 36 | 18 | 2 1/4 | 0.080 | 9.00 |

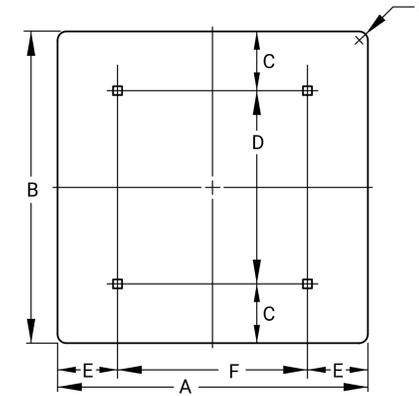
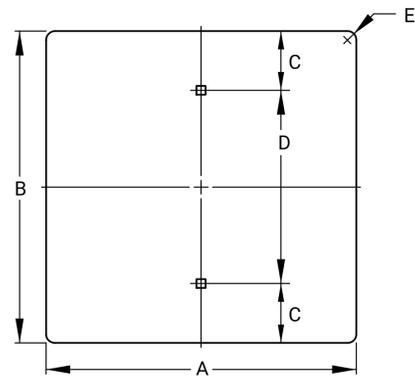


| SIGN SIZE | A  | B  | C  | D | T     | AREA  |
|-----------|----|----|----|---|-------|-------|
| 48 X 48   | 48 | 12 | 15 | 3 | 0.100 | 16.00 |

NOTE:  
All holes are 3/8" square unless otherwise noted.  
The dimension "t" is the thickness of the aluminum blank.  
① Center hole is required.

All dimensions are in inches.

| KANSAS DEPARTMENT OF TRANSPORTATION     |        |            |          |            |                   |
|---|--------|------------|----------|------------|-------------------|
| SIGN BLANK DETAILS FOR FLAT SHEET SIGNS |        |            |          |            |                   |
| TE503                                   |        |            | 07-01-03 |            |                   |
| DESIGNED                                | D.D.G. | DATE       | 10-01-19 | APP'D.     | Steven A. Buckley |
| DETAILER                                | D.D.G. | DATE       | 10-01-19 | QUANTITIES | TRACED            |
| DESIGN CK.                              | S.A.B. | DETAIL CK. | D.D.G.   | QUAN. CK.  | TRACE CK.         |



|   | SIGN SIZE | A  | B  | C     | D  | E     | T     | AREA  |
|---|-----------|----|----|-------|----|-------|-------|-------|
| ① | 3 X 8     | 3  | 8  | 1     | 6  | 3/8   | 0.040 | 0.17  |
| ① | 6 X 12    | 6  | 12 | 3     | 6  | 3/8   | 0.063 | 0.50  |
|   | 12 X 6    | 12 | 6  | 1 1/2 | 3  | 3/4   | 0.063 | 0.50  |
|   | 12 X 9    | 12 | 9  | 1 1/2 | 6  | 1 1/2 | 0.063 | 0.75  |
|   | 12 X 18   | 12 | 18 | 3     | 12 | 1 1/2 | 0.063 | 1.50  |
|   | 12 X 24   | 12 | 24 | 3     | 18 | 1 1/2 | 0.080 | 2.00  |
|   | 12 X 36   | 12 | 36 | 6     | 24 | 1 1/2 | 0.080 | 3.00  |
|   | 12 X 48   | 12 | 48 | 6     | 36 | 1 1/2 | 0.080 | 4.00  |
|   | 18 X 6    | 18 | 6  | 1 1/2 | 3  | 1 1/2 | 0.063 | 0.75  |
|   | 18 X 18   | 18 | 18 | 3     | 12 | 1 1/2 | 0.063 | 2.25  |
|   | 18 X 30   | 18 | 24 | 3     | 24 | 1 1/2 | 0.080 | 3.75  |
|   | 18 X 36   | 18 | 24 | 6     | 24 | 1 1/2 | 0.080 | 4.50  |
|   | 18 X 42   | 18 | 24 | 6     | 30 | 1 1/2 | 0.080 | 5.25  |
|   | 18 X 48   | 18 | 24 | 6     | 36 | 1 1/2 | 0.080 | 6.00  |
|   | 21 X 15   | 21 | 15 | 1 1/2 | 12 | 1 1/2 | 0.080 | 2.19  |
|   | 24 X 6    | 24 | 6  | 1 1/2 | 3  | 1 1/2 | 0.080 | 1.00  |
|   | 24 X 12   | 24 | 12 | 3     | 6  | 1 1/2 | 0.080 | 2.00  |
|   | 24 X 18   | 24 | 18 | 3     | 12 | 1 1/2 | 0.080 | 3.00  |
|   | 24 X 24   | 24 | 24 | 3     | 18 | 1 1/2 | 0.080 | 4.00  |
|   | 24 X 30   | 24 | 30 | 3     | 24 | 1 1/2 | 0.080 | 5.00  |
|   | 24 X 36   | 24 | 36 | 6     | 24 | 1 1/2 | 0.080 | 6.00  |
|   | 30 X 12   | 30 | 12 | 3     | 6  | 1 7/8 | 0.080 | 2.50  |
|   | 30 X 15   | 30 | 15 | 1 1/2 | 12 | 1 7/8 | 0.080 | 3.13  |
|   | 30 X 18   | 30 | 18 | 3     | 12 | 1 7/8 | 0.080 | 3.75  |
|   | 30 X 21   | 30 | 21 | 1 1/2 | 18 | 1 1/2 | 0.080 | 4.38  |
|   | 30 X 24   | 30 | 24 | 3     | 18 | 1 7/8 | 0.080 | 5.00  |
|   | 30 X 30   | 30 | 30 | 3     | 24 | 1 7/8 | 0.080 | 6.25  |
|   | 30 X 36   | 30 | 36 | 6     | 24 | 1 7/8 | 0.080 | 7.50  |
|   | 36 X 12   | 36 | 12 | 3     | 6  | 1 1/2 | 0.080 | 3.00  |
|   | 36 X 18   | 36 | 18 | 3     | 12 | 1 1/2 | 0.080 | 4.50  |
|   | 36 X 24   | 36 | 24 | 3     | 18 | 1 1/2 | 0.080 | 6.00  |
|   | 36 X 30   | 36 | 30 | 3     | 24 | 2 1/4 | 0.080 | 7.50  |
|   | 36 X 36   | 36 | 36 | 6     | 24 | 2 1/4 | 0.080 | 9.00  |
| ③ | 45 X 36   | 45 | 36 | 3     | 30 | 2 1/4 | 0.100 | 11.25 |

|   | SIGN SIZE | A  | B  | C  | D  | E  | F  | G     | T     | AREA  |
|---|-----------|----|----|----|----|----|----|-------|-------|-------|
|   | 36 X 12   | 36 | 12 | 3  | 6  | 3  | 30 | 1 1/2 | 0.080 | 3.00  |
|   | 36 X 30   | 36 | 30 | 3  | 24 | 3  | 30 | 2 1/4 | 0.080 | 7.50  |
|   | 36 X 48   | 36 | 48 | 9  | 30 | 6  | 24 | 0     | 0.100 | 12.00 |
|   | 36 X 60   | 36 | 60 | 12 | 36 | 6  | 24 | 0     | 0.100 | 15.00 |
| ② | 36 X 72   | 36 | 72 | 6  | 60 | 6  | 24 | 0     | 0.100 | 18.00 |
|   | 42 X 12   | 48 | 12 | 3  | 6  | 6  | 30 | 1 1/2 | 0.080 | 3.50  |
|   | 42 X 18   | 48 | 18 | 3  | 12 | 6  | 30 | 1 1/2 | 0.080 | 5.25  |
|   | 42 X 24   | 48 | 24 | 6  | 12 | 6  | 30 | 1 7/8 | 0.080 | 7.00  |
|   | 42 X 36   | 48 | 36 | 6  | 24 | 6  | 30 | 0     | 0.100 | 10.50 |
|   | 48 X 12   | 48 | 12 | 3  | 6  | 9  | 30 | 1 1/2 | 0.080 | 4.00  |
|   | 48 X 18   | 48 | 18 | 3  | 12 | 9  | 30 | 1 1/2 | 0.080 | 6.00  |
|   | 48 X 24   | 48 | 24 | 6  | 12 | 9  | 30 | 1 7/8 | 0.080 | 8.00  |
|   | 48 X 30   | 48 | 30 | 6  | 18 | 9  | 30 | 0     | 0.100 | 10.00 |
|   | 48 X 36   | 48 | 36 | 6  | 24 | 9  | 30 | 0     | 0.100 | 12.00 |
|   | 48 X 42   | 48 | 42 | 6  | 30 | 9  | 30 | 0     | 0.100 | 14.00 |
|   | 48 X 48   | 48 | 48 | 9  | 30 | 9  | 30 | 0     | 0.100 | 16.00 |
|   | 48 X 60   | 48 | 60 | 12 | 36 | 9  | 30 | 0     | 0.100 | 20.00 |
| ② | 48 X 72   | 48 | 72 | 6  | 60 | 9  | 30 | 0     | 0.100 | 24.00 |
| ② | 48 X 96   | 48 | 96 | 12 | 72 | 9  | 30 | 0     | 0.100 | 32.00 |
|   | 60 X 12   | 60 | 12 | 3  | 6  | 12 | 36 | 0     | 0.100 | 5.00  |

|  | SIGN SIZE | A  | B  | C | D  | E  | F  | G | T     | AREA  |
|--|-----------|----|----|---|----|----|----|---|-------|-------|
|  | 60 X 18   | 60 | 18 | 3 | 12 | 12 | 36 | 0 | 0.100 | 7.50  |
|  | 60 X 24   | 60 | 24 | 6 | 12 | 12 | 36 | 0 | 0.100 | 10.00 |
|  | 60 X 30   | 60 | 30 | 6 | 18 | 12 | 36 | 0 | 0.100 | 12.50 |
|  | 60 X 36   | 60 | 36 | 6 | 24 | 12 | 36 | 0 | 0.100 | 15.00 |
|  | 60 X 42   | 60 | 42 | 6 | 30 | 12 | 36 | 0 | 0.100 | 17.50 |
|  | 60 X 48   | 60 | 48 | 9 | 30 | 12 | 36 | 0 | 0.100 | 20.00 |
|  | 72 X 12   | 72 | 12 | 3 | 6  | 15 | 42 | 0 | 0.100 | 6.00  |
|  | 72 X 18   | 72 | 18 | 3 | 12 | 15 | 42 | 0 | 0.100 | 9.00  |
|  | 72 X 24   | 72 | 24 | 6 | 12 | 15 | 42 | 0 | 0.100 | 12.00 |
|  | 72 X 30   | 72 | 30 | 6 | 18 | 15 | 42 | 0 | 0.100 | 15.00 |
|  | 72 X 36   | 72 | 36 | 6 | 24 | 15 | 42 | 0 | 0.100 | 18.00 |
|  | 72 X 42   | 72 | 42 | 6 | 30 | 15 | 42 | 0 | 0.100 | 21.00 |
|  | 72 X 48   | 72 | 48 | 9 | 30 | 15 | 42 | 0 | 0.100 | 24.00 |
|  | 84 X 12   | 84 | 18 | 3 | 6  | 18 | 48 | 0 | 0.100 | 7.00  |
|  | 84 X 18   | 84 | 18 | 3 | 12 | 18 | 48 | 0 | 0.100 | 10.50 |
|  | 84 X 24   | 84 | 24 | 6 | 12 | 18 | 48 | 0 | 0.100 | 14.00 |
|  | 84 X 30   | 84 | 30 | 6 | 18 | 18 | 48 | 0 | 0.100 | 17.50 |
|  | 84 X 36   | 84 | 36 | 6 | 24 | 18 | 48 | 0 | 0.100 | 21.00 |
|  | 84 X 42   | 84 | 42 | 6 | 30 | 18 | 48 | 0 | 0.100 | 24.50 |
|  | 84 X 48   | 84 | 48 | 9 | 30 | 18 | 48 | 0 | 0.100 | 28.00 |

NOTE:  
All holes are 3/8" square, unless otherwise noted.

The dimension "T" is the thickness of the aluminum blank.

- ① Holes shall be 5/16" diameter.
- ② Dimension "D" requires a center hole.
- ③ Additional hole 12" below top hole.

All dimensions are in inches.

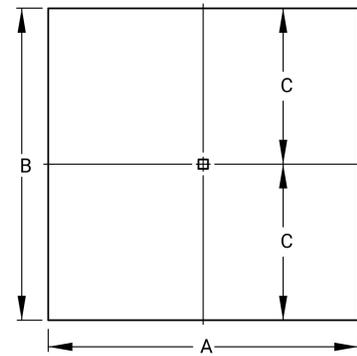
| NO. | DATE     | REVISIONS                                 | BY     | APPD.  |
|-----|----------|---|--------|--------|
| 01  | 10-01-19 | Updated sign blank details and dimensions | D.D.G. | E.W.N. |

KANSAS DEPARTMENT OF TRANSPORTATION

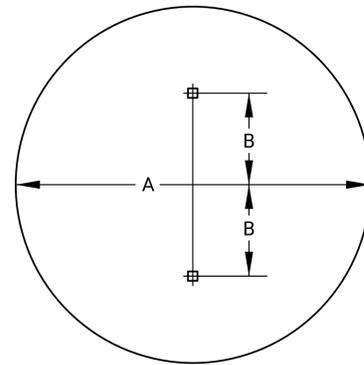
**SIGN BLANK DETAILS FOR  
FLAT SHEET SIGNS**

TE506 07-01-03

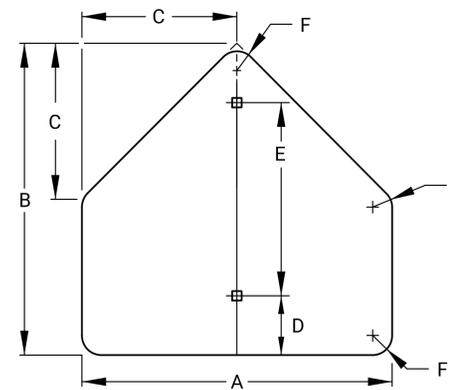
|            |        |            |          |            |                   |
|------------|--------|------------|----------|------------|-------------------|
| DESIGNED   | D.D.G. | DATE       | 10-01-19 | APPD.      | Steven A. Buckley |
| DESIGN CK. | S.A.B. | DETAIL CK. | D.D.G.   | QUANTITIES | TRACED            |
|            |        |            |          | QUAN. CK.  | TRACE CK.         |



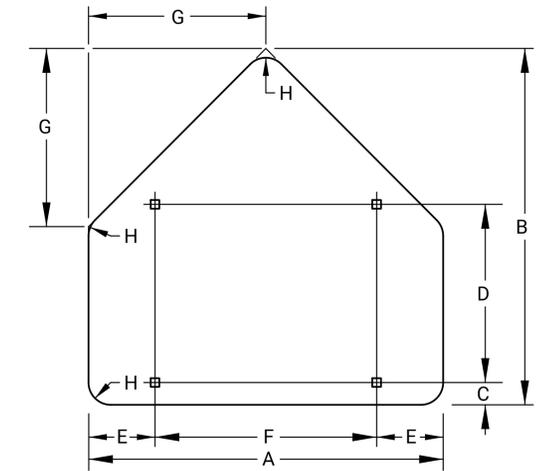
| SIGN SIZE | A | B | C | T     | AREA |
|-----------|---|---|---|-------|------|
| 6 X 6     | 6 | 6 | 3 | 0.063 | 0.25 |



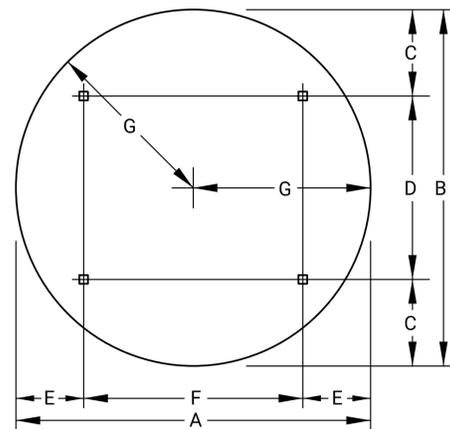
| SIGN SIZE | A  | B  | T     | AREA |
|-----------|----|----|-------|------|
| 36 DIA    | 36 | 12 | 0.080 | 7.07 |



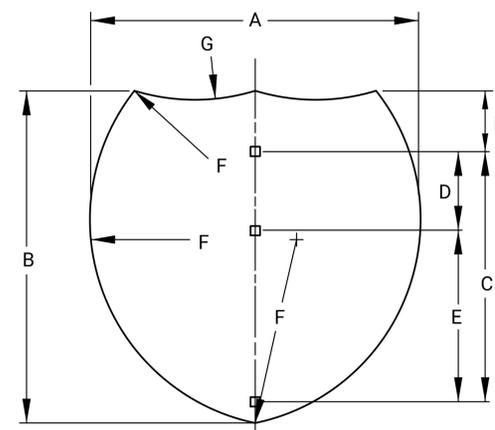
| SIGN SIZE | A  | B  | C  | D | E  | F     | T     | AREA |
|-----------|----|----|----|---|----|-------|-------|------|
| 30 X 30   | 30 | 30 | 15 | 3 | 24 | 1 7/8 | 0.080 | 4.69 |
| 36 X 36   | 36 | 36 | 18 | 6 | 24 | 2 1/4 | 0.080 | 6.75 |



| SIGN SIZE | A  | B  | C | D  | E | F  | G  | H | T     | AREA  |
|-----------|----|----|---|----|---|----|----|---|-------|-------|
| 48 X 48   | 48 | 48 | 3 | 24 | 9 | 30 | 24 | 3 | 0.100 | 12.00 |



| SIGN SIZE | A  | B  | C  | D  | E | F  | G  | T     | AREA  |
|-----------|----|----|----|----|---|----|----|-------|-------|
| 48 X 48   | 48 | 48 | 12 | 24 | 9 | 30 | 24 | 0.100 | 12.57 |



INDEPENDENT USE

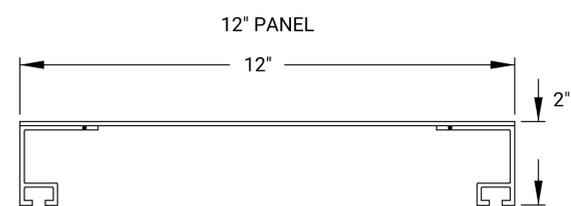
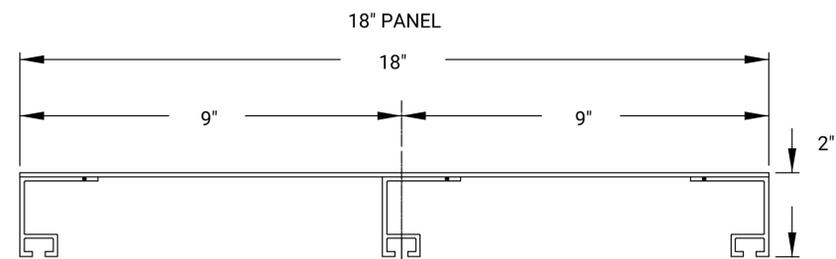
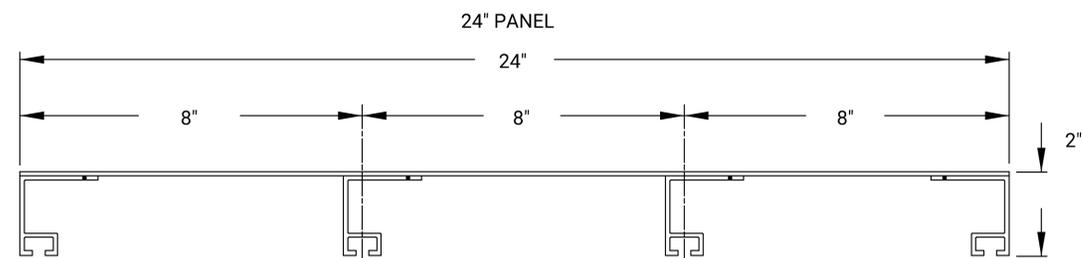
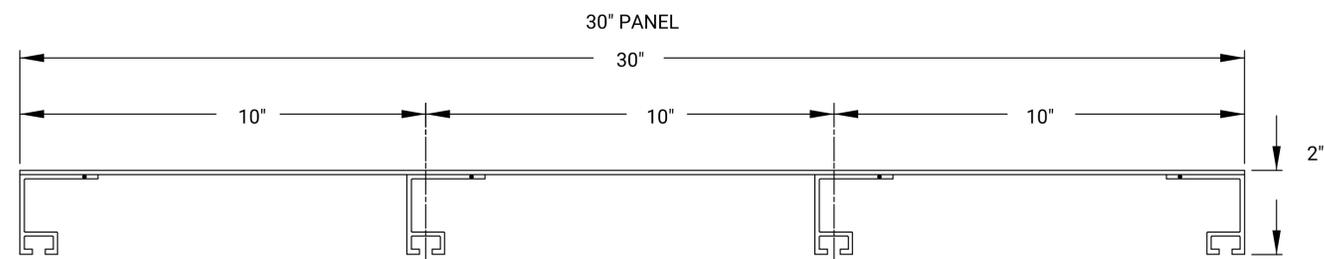
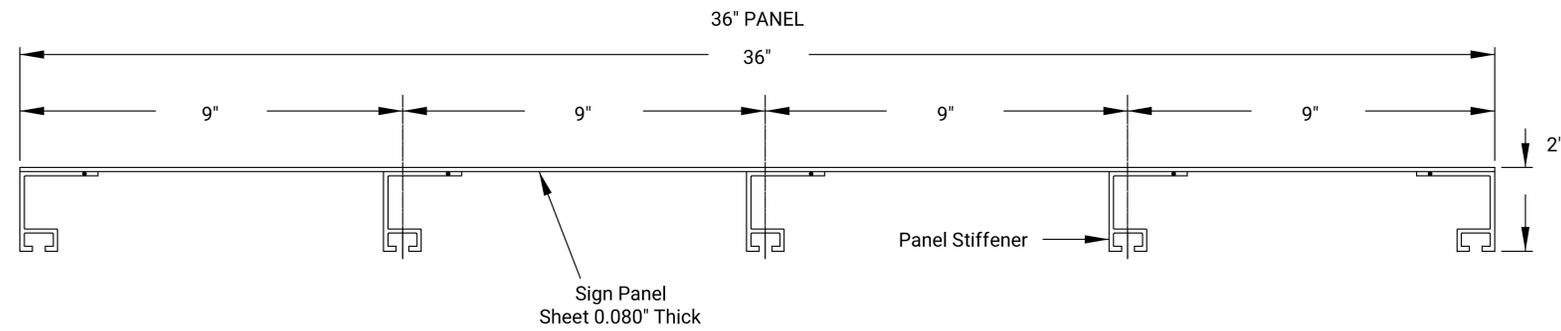
| DIMENSIONS |    |    |    |    |    |        |        |   |       |      |
|------------|----|----|----|----|----|--------|--------|---|-------|------|
| SIZE       | A  | B  | C  | D  | E  | F      | G      | H | T     | AREA |
| 24 X 24    | 24 | 24 | 18 | -  | -  | 15     | 15     | 3 | 0.080 | 3.20 |
| 36 X 36    | 36 | 36 | 30 | 12 | 18 | 22 1/2 | 22 1/2 | 3 | 0.080 | 7.20 |
| 30 X 24    | 30 | 24 | 18 | -  | -  | 17     | 24     | 3 | 0.080 | 3.99 |
| 45 X 36    | 45 | 36 | 30 | 12 | 18 | 25 1/2 | 36     | 3 | 0.100 | 8.99 |

NOTE:  
All holes are 3/8" square, unless otherwise noted.  
Dimension "T" is the thickness of the aluminum blank.

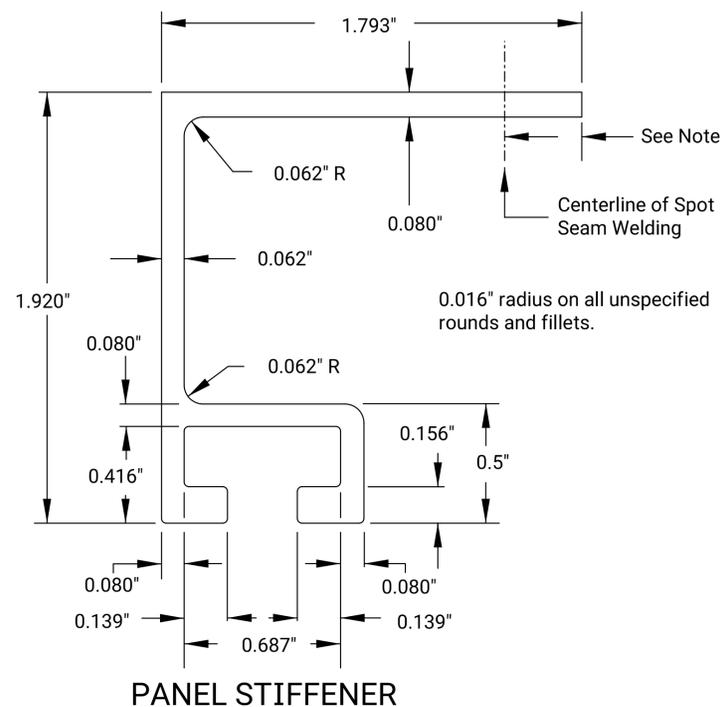
All dimensions are in inches.

| KANSAS DEPARTMENT OF TRANSPORTATION                        |          |   |  |  |  |  |  |  |        |        |  |
|--|----------|---|--|--|--|--|--|--|--------|--------|--|
| SIGN BLANK DETAILS FOR FLAT SHEET SIGNS                    |          |   |  |  |  |  |  |  |        |        |  |
| TE509  |          |   |  |  |  |  |  |  |        |        |  |
| 07-01-03   |          |   |  |  |  |  |  |  |        |        |  |
| FHWA APPROVAL  |          |   |  |  |  |  |  |  |        |        |  |
| DESIGNED D.D.G.   DETAILED A.A.D.   QUANTITIES TRACED      |          |   |  |  |  |  |  |  |        |        |  |
| DESIGN CK. S.A.B.   DETAIL CK. D.D.G.   QUAN.CK. TRACE CK. |          |   |  |  |  |  |  |  |        |        |  |
| 01   | 10-01-19 | Updated sign blank details and dimensions |  |  |  |  |  |  | D.D.G. | E.W.N. |  |
| NO.  | DATE     | REVISIONS                                 |  |  |  |  |  |  | BY     | APPD   |  |

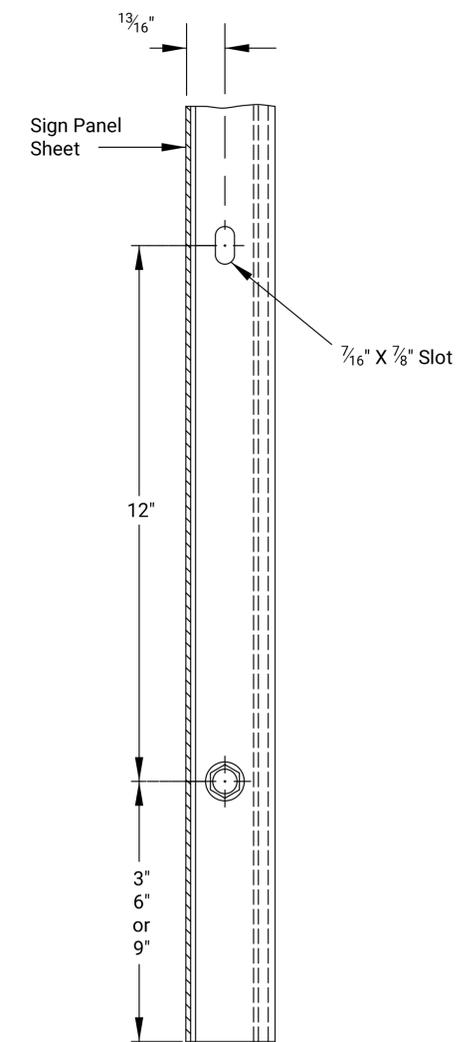
|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 94        | 148          |



STRUCTURAL SIGN PANEL WIDTHS



PANEL STIFFENER



PANEL CONNECTOR SLOTS

Aluminum  $\frac{3}{8}$ " X  $\frac{3}{4}$ "  
Hex Bolt, 2 Flat  
Washers and Hex Nut.

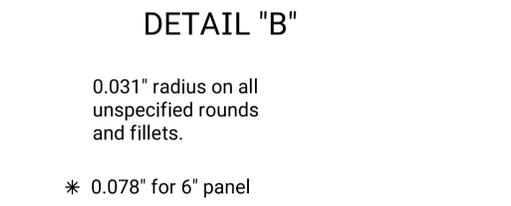
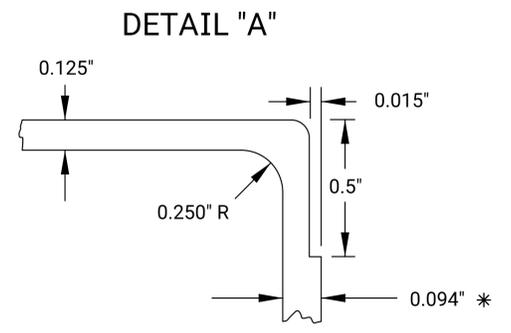
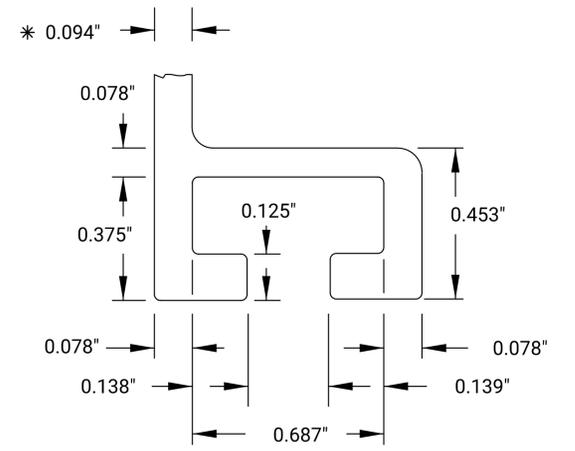
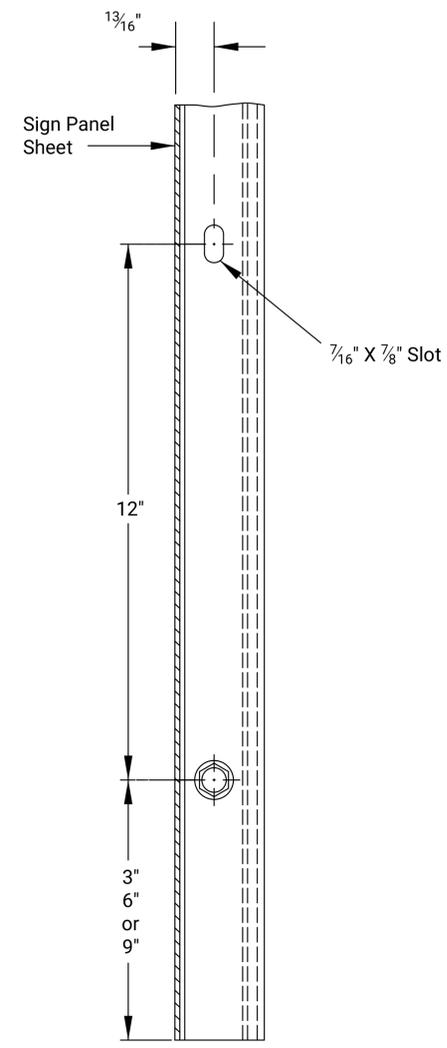
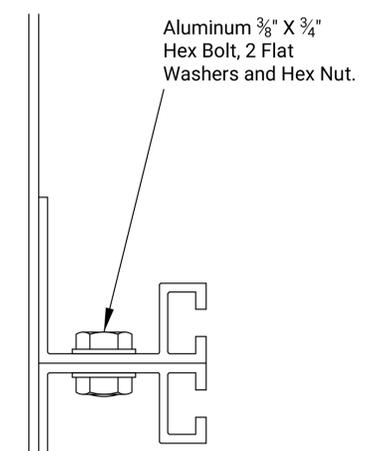
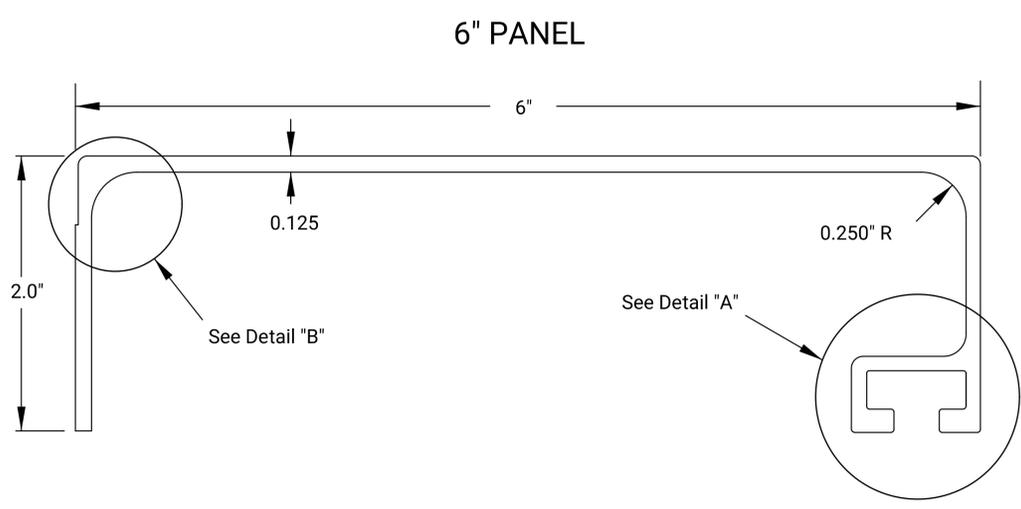
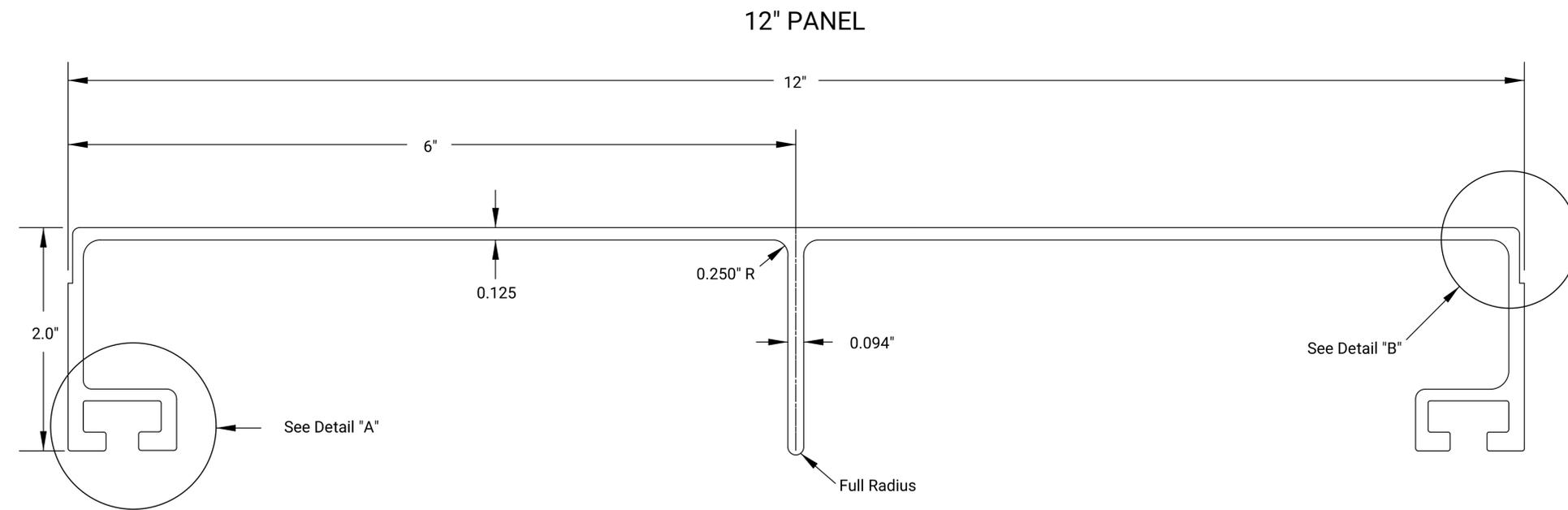
PANEL CONNECTIONS

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  $\frac{1}{2}$ " from the edge of the stiffener.

All dimensions are in inches.

| NO.  | DATE | REVISIONS  | BY | APPD.             |
|--|------|------------|----|-------------------|
| KANSAS DEPARTMENT OF TRANSPORTATION                        |      |            |    |                   |
| <b>REINFORCED PANEL DETAILS<br/>EXTRUSHEET FABRICATION</b> |      |            |    |                   |
| TE551  |      | 07-01-03   |    |                   |
| DESIGNED   |      | 07-22-03   |    | APPD.             |
| D.D.G.   |      | B.A.H.     |    | STEVEN A. BUCKLEY |
| DETAILD  |      | QUANTITIES |    | TRACED            |
| S.A.B.   |      | D.D.G.     |    | TRACE CK.         |
| DETAIL CK.   |      | QUAN. CK.  |    |                   |

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 95        | 148          |



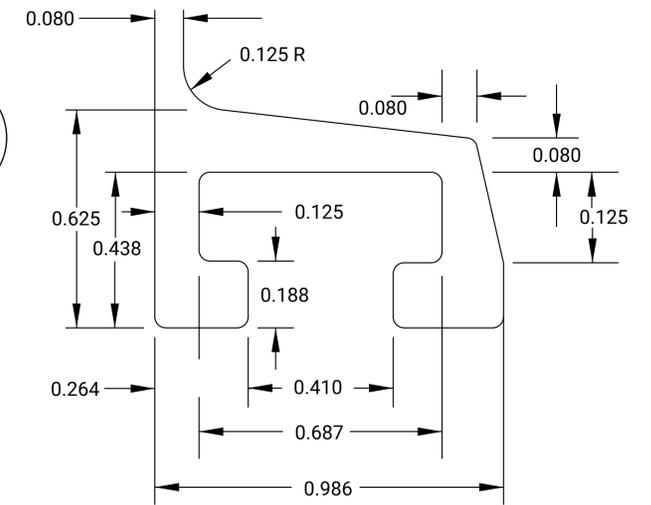
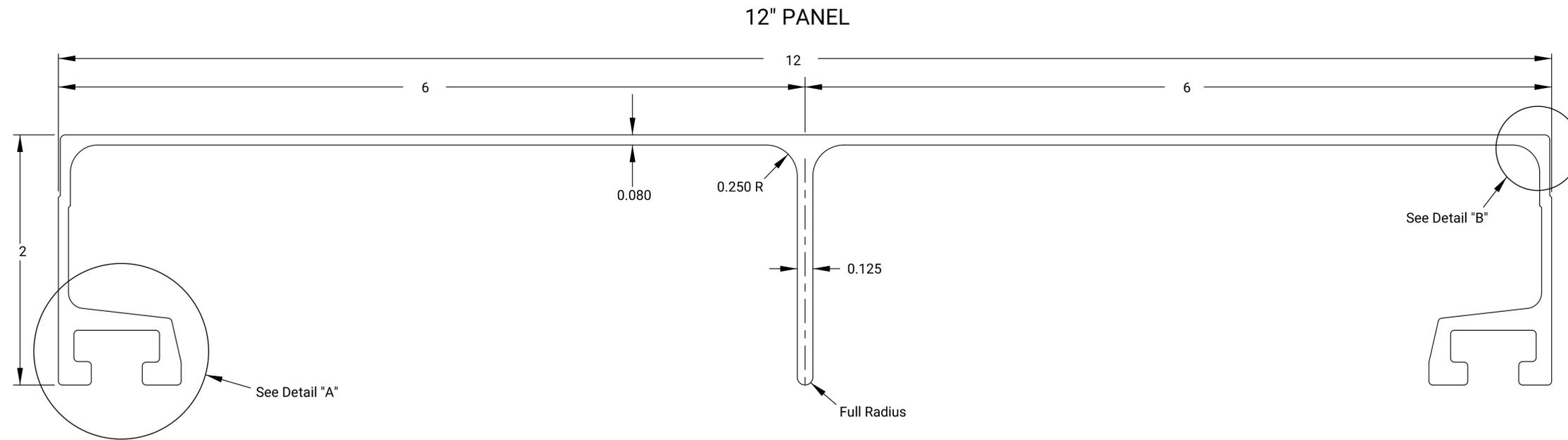
NOTE:  
For extruded panel signs with an overall height in intervals of 6", use the 6" panel at the top or bottom of the sign. All other panels are to be the 12" panel.

All dimensions are in inches.

| NO.                                 | DATE   | REVISIONS      | BY     | APPD       |
|-------------------------------------|--------|----------------|--------|------------|
| KANSAS DEPARTMENT OF TRANSPORTATION |        |                |        |            |
| <b>REINFORCED PANEL DETAILS</b>     |        |                |        |            |
| <b>EXTRUDED FABRICATION 0.125"</b>  |        |                |        |            |
| <b>1 OF 2</b>                       |        |                |        |            |
| TE554                               |        | 07-01-03       |        |            |
| FHWA APPROVAL                       |        | 07-22-03 APPD. |        |            |
| DESIGNED                            | D.D.G. | DETAILED       | B.A.H. | QUANTITIES |
| DESIGN CK.                          | S.A.B. | DETAIL CK.     | D.D.G. | QUAN. CK.  |
|                                     |        | TRACED         |        | TRACED     |
|                                     |        | TRACE CK.      |        | TRACE CK.  |

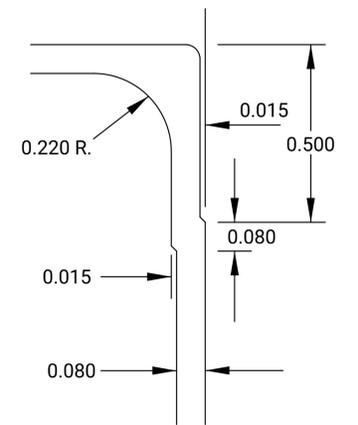
Plotted by: ghuerter  
File: te554.dgn  
14-MAR-2025 12:32

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 96        | 148          |

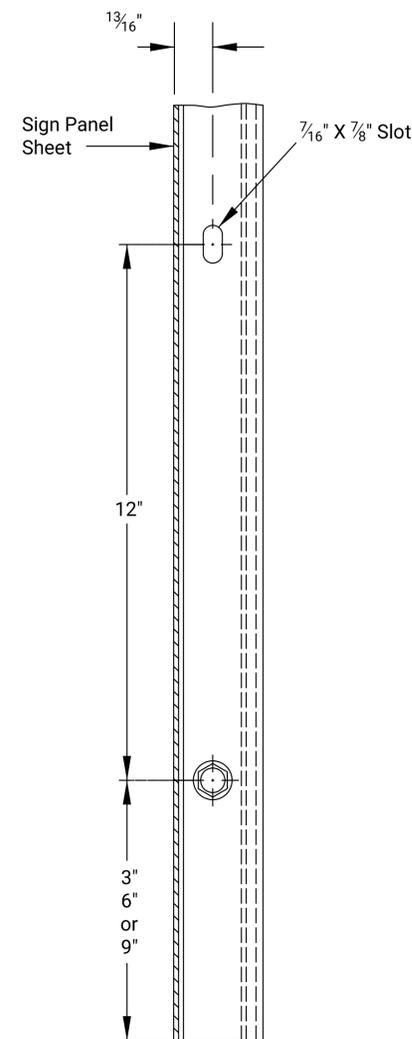


NOTE:  
.016" radius on all unspecified rounds and fillets.

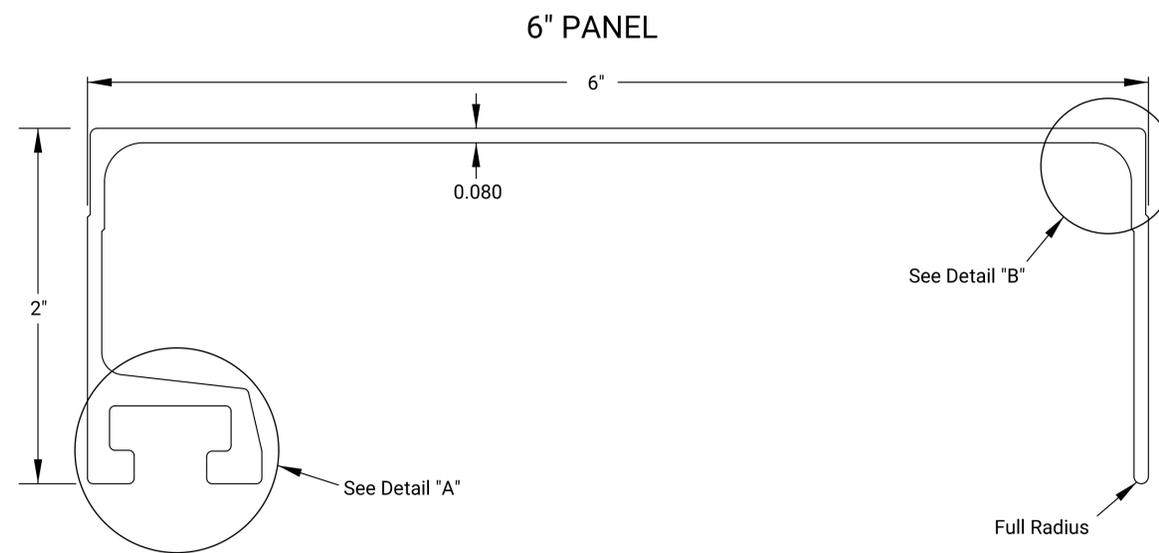
DETAIL "A"



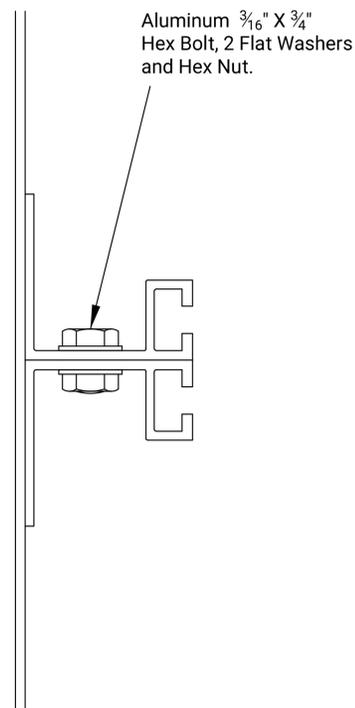
DETAIL "B"



PANEL CONNECTOR SLOTS



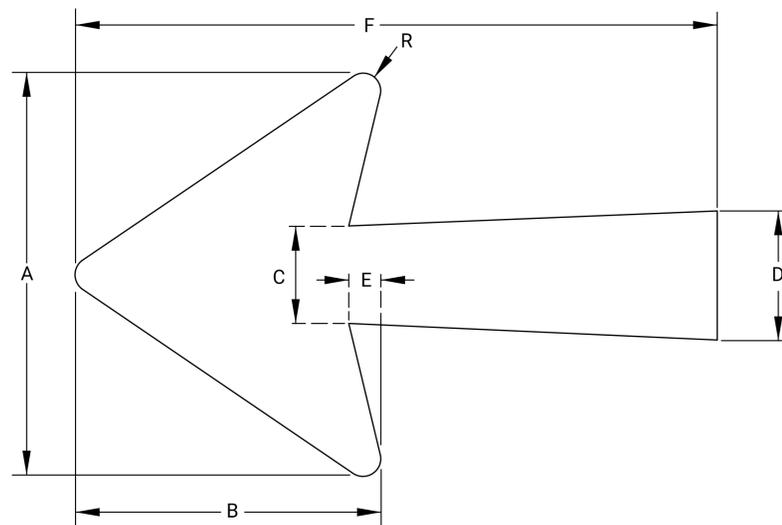
For extruded panel signs with an overall height in intervals of 6", use the 6" panel at the top or bottom of the sign. All other panels are to be the 12" panel.



PANEL CONNECTIONS

All dimensions in inches

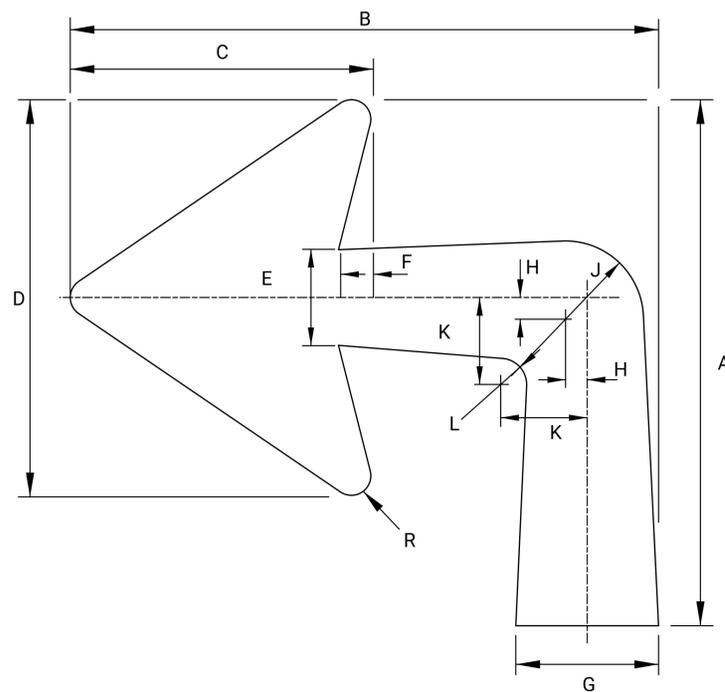
| NO.                                 | DATE   | REVISIONS  | BY     | APPD                    |           |
|-------------------------------------|--------|------------|--------|-------------------------|-----------|
| KANSAS DEPARTMENT OF TRANSPORTATION |        |            |        |                         |           |
| <b>REINFORCED PANEL DETAILS</b>     |        |            |        |                         |           |
| <b>EXTRUDED FABRICATION .080"</b>   |        |            |        |                         |           |
| <b>2 OF 2</b>                       |        |            |        |                         |           |
| TE555                               |        | 07-01-03   |        |                         |           |
| FHWA APPROVAL                       |        | 07-22-03   |        | APPD. 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. |



Arrow Dimensions (Inches)

|             | A                | B                 | C               | D               | E                | F                | R                |
|-------------|------------------|-------------------|-----------------|-----------------|------------------|------------------|------------------|
| 10.67" U.C. | 15 $\frac{1}{8}$ | 11 $\frac{1}{16}$ | 3 $\frac{3}{4}$ | 5               | 1 $\frac{1}{16}$ | 24 $\frac{1}{4}$ | 1 $\frac{3}{16}$ |
| 13.33" U.C. | 18 $\frac{1}{4}$ | 14                | 4 $\frac{1}{2}$ | 6               | 1 $\frac{1}{2}$  | 29 $\frac{1}{4}$ | $\frac{3}{4}$    |
| 16" U.C.    | 22 $\frac{1}{4}$ | 17                | 5 $\frac{3}{8}$ | 7 $\frac{1}{8}$ | 1 $\frac{3}{4}$  | 35 $\frac{5}{8}$ | 1                |

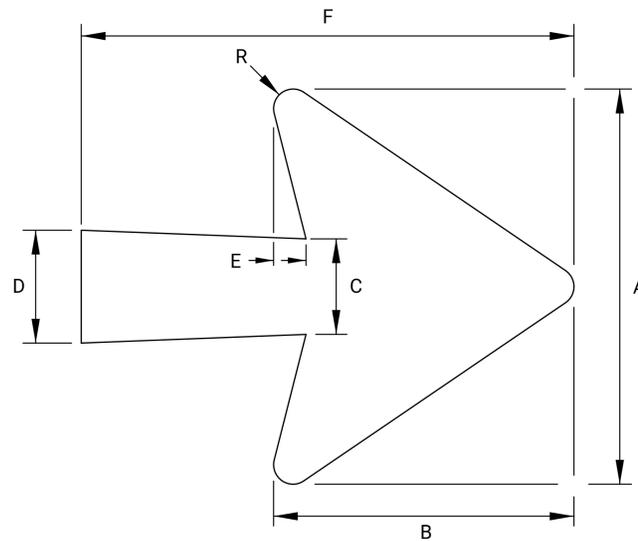
TYPE "A" ARROW



Arrow Dimensions (Inches)

|             | A                | B                | C                 | D                | E               | F                | G               | H             | J               | K               | L               | R                |
|-------------|------------------|------------------|-------------------|------------------|-----------------|------------------|-----------------|---------------|-----------------|-----------------|-----------------|------------------|
| 10.67" U.C. | 15 $\frac{1}{8}$ | 17               | 8 $\frac{11}{16}$ | 11 $\frac{3}{8}$ | 2 $\frac{3}{4}$ | 1 $\frac{1}{16}$ | 4 $\frac{1}{8}$ | $\frac{5}{8}$ | 2 $\frac{1}{4}$ | 2 $\frac{1}{2}$ | $\frac{3}{4}$   | $\frac{9}{16}$   |
| 13.33" U.C. | 18 $\frac{1}{4}$ | 20 $\frac{1}{2}$ | 10 $\frac{7}{8}$  | 14 $\frac{1}{4}$ | 3 $\frac{1}{2}$ | 1 $\frac{3}{16}$ | 5 $\frac{1}{8}$ | $\frac{5}{8}$ | 2 $\frac{3}{4}$ | 2 $\frac{7}{8}$ | 1               | 1 $\frac{1}{16}$ |
| 16" U.C.    | 22 $\frac{1}{4}$ | 25               | 13                | 17               | 4 $\frac{1}{8}$ | 1 $\frac{1}{16}$ | 6 $\frac{1}{8}$ | $\frac{3}{4}$ | 3 $\frac{1}{4}$ | 3 $\frac{7}{8}$ | 1 $\frac{1}{4}$ | $\frac{7}{8}$    |

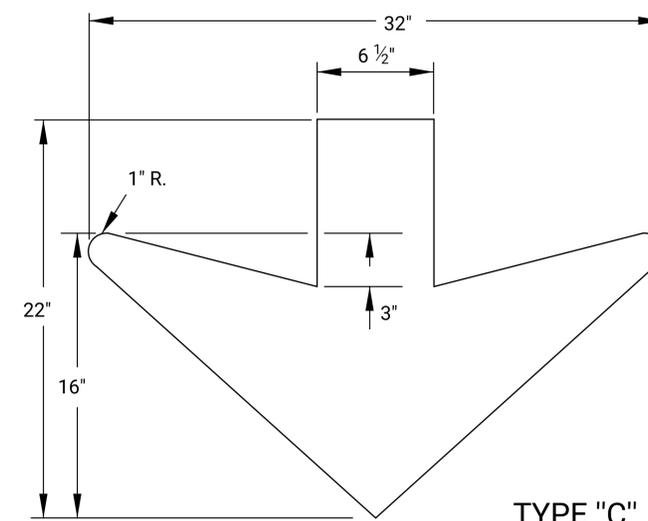
ADVANCE TURN (90°)



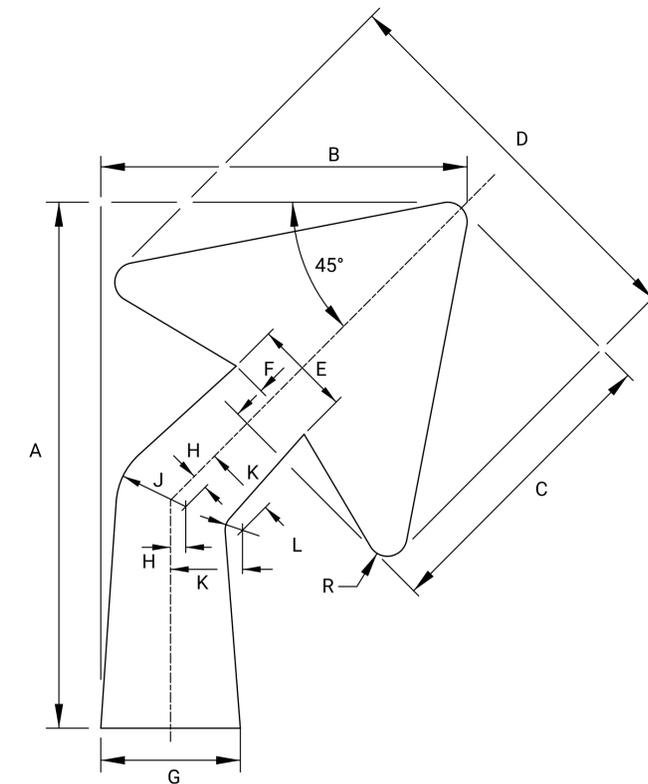
Arrow Dimensions (Inches)

|             | A                | B                 | C               | D               | E                | F                | R              |
|-------------|------------------|-------------------|-----------------|-----------------|------------------|------------------|----------------|
| 10.67" U.C. | 11 $\frac{3}{8}$ | 8 $\frac{11}{16}$ | 2 $\frac{3}{4}$ | 3 $\frac{1}{4}$ | 1 $\frac{5}{16}$ | 14 $\frac{1}{4}$ | $\frac{9}{16}$ |

TYPE "B" ARROW



TYPE "C"



Arrow Dimensions (Inches)

|             | A                | B                | C                 | D                | E               | F                | G               | H              | J               | K                | L             | R                 |
|-------------|------------------|------------------|-------------------|------------------|-----------------|------------------|-----------------|----------------|-----------------|------------------|---------------|-------------------|
| 10.67" U.C. | 15 $\frac{1}{8}$ | 10 $\frac{3}{4}$ | 8 $\frac{11}{16}$ | 11 $\frac{3}{8}$ | 2 $\frac{3}{4}$ | 1 $\frac{5}{16}$ | 4               | $\frac{7}{16}$ | 2               | 2 $\frac{1}{16}$ | $\frac{1}{2}$ | $\frac{9}{16}$    |
| 13.33" U.C. | 18 $\frac{1}{4}$ | 13               | 10 $\frac{7}{8}$  | 14 $\frac{1}{4}$ | 3 $\frac{1}{2}$ | 1 $\frac{3}{16}$ | 4 $\frac{1}{2}$ | $\frac{9}{16}$ | 2 $\frac{1}{2}$ | 2 $\frac{9}{16}$ | $\frac{5}{8}$ | 1 $\frac{11}{16}$ |
| 16" U.C.    | 22 $\frac{1}{4}$ | 15 $\frac{5}{8}$ | 13                | 17               | 4 $\frac{1}{8}$ | 1 $\frac{1}{16}$ | 5 $\frac{1}{4}$ | $\frac{5}{8}$  | 3               | 3 $\frac{1}{8}$  | $\frac{3}{4}$ | $\frac{7}{8}$     |

ADVANCE TURN (45°)

All dimensions are in inches.

NOTE:

Use Type 'A' arrows on interstate and expressway with interchanges. Use Type 'B' arrows on the mainline of expressways with at-grade intersections. See Standard Plan Sheet TE590 for detailed specifications.

| NO. | DATE | REVISIONS | BY | APPD. |
|-----|------|-----------|----|-------|
|     |      |           |    |       |

KANSAS DEPARTMENT OF TRANSPORTATION

**GUIDE SIGN  
LEGEND DETAILS  
ARROWS**

|                   |                          |
|-------------------|--------------------------|
| TE560             | 07-01-03                 |
| DESIGNED: D.D.G.  | APPD.: Steven A. Buckley |
| Detailed: W.S.B.  | TRACED                   |
| DESIGN CK: S.A.B. | TRACE CK.                |

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 98        | 148          |

|                    |    |      |
|--------------------|----|------|
| REFERENCES NOTED   | BY | DATE |
| REFERENCES CHECKED |    |      |



E4-1a/EXPRESSWAY/INTERCHANGE/STANDARD/1 DESTINATION;  
 12.0" Radius, 2.0" Border, White on Green;  
 "WEST", E Mod; "Salina", E Mod; 90 Deg Advance Turn Arrow 17.0" X 15.1";  
 Table of distances between letter and object lefts

|      |      |      |     |     |      |
|------|------|------|-----|-----|------|
| ●    | W    | E    | S   | T   |      |
| 27.0 | 32.0 | 12.4 | 7.6 | 8.0 | 6.0  |
|      |      |      |     |     |      |
| S    | a    | i    | i   | n   | a    |
| 34.6 | 11.0 | 10.8 | 6.1 | 6.1 | 10.1 |
|      |      |      |     |     |      |
| ←    |      |      |     |     |      |
| 51.5 | 17.0 | 51.5 |     |     |      |



E4-1a/EXPRESSWAY/INTERCHANGE/STANDARD/1 DESTINATION;  
 12.0" Radius, 2.0" Border, White on Green;  
 "EAST", E Mod; "Topeka", E Mod; 90 Deg Advance Turn Arrow 17.0" X 15.1";  
 Table of distances between letter and object lefts

|      |      |      |     |      |     |
|------|------|------|-----|------|-----|
| ●    | E    | A    | S   | T    |     |
| 27.9 | 32.0 | 8.6  | 9.7 | 8.0  | 5.9 |
|      |      |      |     |      |     |
| T    | o    | p    | e   | k    | a   |
| 32.4 | 9.9  | 10.3 | 9.1 | 10.1 | 9.1 |
|      |      |      |     |      |     |
| ←    |      |      |     |      |     |
| 51.5 | 17.0 | 51.5 |     |      |     |

| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 99        | 148          |

DETAILED SPECIFICATIONS FOR FLAT SHEET SIGNS AND OVERLAY PANELS

All new flat sheet sign blanks shall be of the fabrication and thickness shown on the flat sheet blank detail sheets, unless other details are shown in the plans.

Flat sheet blanks shall be used for signs that are less than or equal to 7'-0" in length and/or less than or equal to 4'-0" in height, unless other details are shown in the plans. Flat sheet blanks shall also be used for signs that are 4'-0" in length and less than or equal to 8'-0" in height, unless other details are shown in the plans.

The design details for signs (color, letter height, and letter series) shall be as shown in the FHWA Standard Highway Signs and Markings book (2004 edition and supplements), unless other details are shown in the plans.

All sign faces shall be covered with Type IV high intensity retroreflective sheeting, unless otherwise noted in the plans.

The sheeting used for the direct applied legend and borders shall be Type IV high intensity retroreflective sheeting, unless otherwise noted in the plans.

The school warning signs, the "SCHOOL" portion of the S5-1 sign, S4-3p plaque, and any supplemental plaques used with these warning signs shall have a fluorescent yellow-green background, unless otherwise noted in the plans.

The type of adhesive used for retroreflective sheeting or lettering film shall be heat activated or pressure sensitive.

DETAILED SPECIFICATIONS FOR REINFORCED PANEL SIGNS

All new reinforced sign panels shall be of the fabrication and thickness shown on the reinforced panel detail sheets. If extrusheet fabricated sign panels are used, they shall be of the length, width and in the position shown. If extrusheet fabricated panel dimensions are not shown, a line of legend should be placed entirely on one panel. If extruded fabricated sign panels are used, either 1'-0" or 6" panels shall be used. The 6" panels shall be used only at the top or bottom of signs.

Reinforced panels shall be used for signs that are greater than 7'-0" in length or greater than 4'-0" in height, unless other details are shown in the plans.

All sign faces shall be covered with Type IV high intensity retroreflective sheeting, unless otherwise noted in the plans.

The sheeting used for the direct applied legend and borders shall be Type IV high intensity retroreflective sheeting, unless otherwise noted in the plans.

The type of adhesive used for retroreflective sheeting or lettering film shall be heat activated or pressure sensitive.

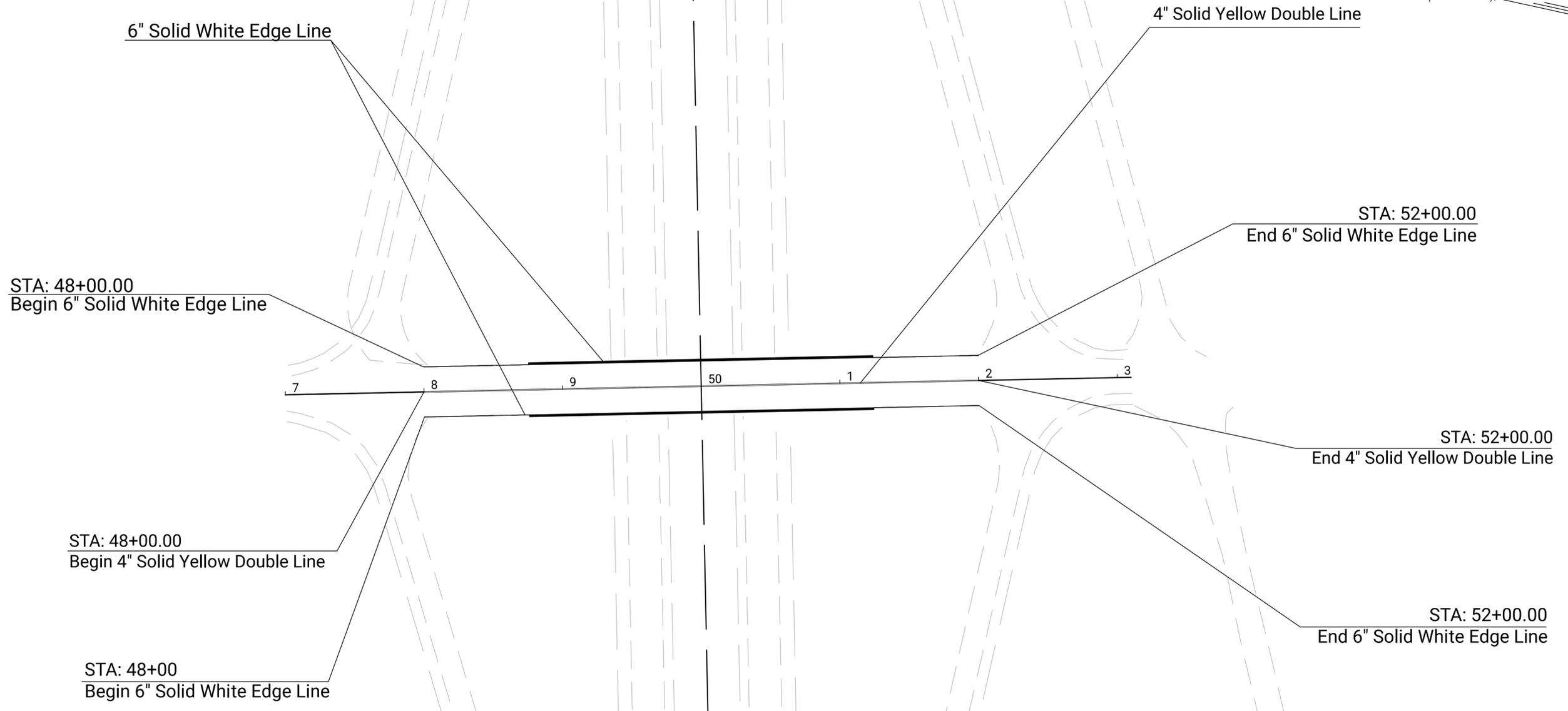
Letters and numbers on reinforced panel signs are modified Series "E" unless otherwise shown.

Spacing table dimensions are in inches.

Plotted by : ghuerter 14-MAR-2025 12:33  
File : te590.dgn

| 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.       |
| NO.   | DATE     | REVISIONS                       | BY                      | APPD       |
| KANSAS DEPARTMENT OF TRANSPORTATION   |          |                                 |                         |            |
| <b>DETAILS SPECIFICATIONS<br/>FOR REINFORCED SIGN PANELS<br/>AND FLAT SHEET SIGNS</b> |          |                                 |                         |            |
| TE590   |          |                                 | 07-01-03                |            |
| FHWA APPROVAL   |          | 10-01-19                        | APPD. Steven A. Buckley |            |
| DESIGNED  | D.D.G.   | DETAILED                        | K.D.S.                  | QUANTITIES |
| DESIGN CK.  | S.A.B.   | DETAIL CK.                      | D.D.G.                  | QUAN. CK.  |
|   |          |                                 | TRACED                  |            |
|   |          |                                 | TRACE CK.               |            |

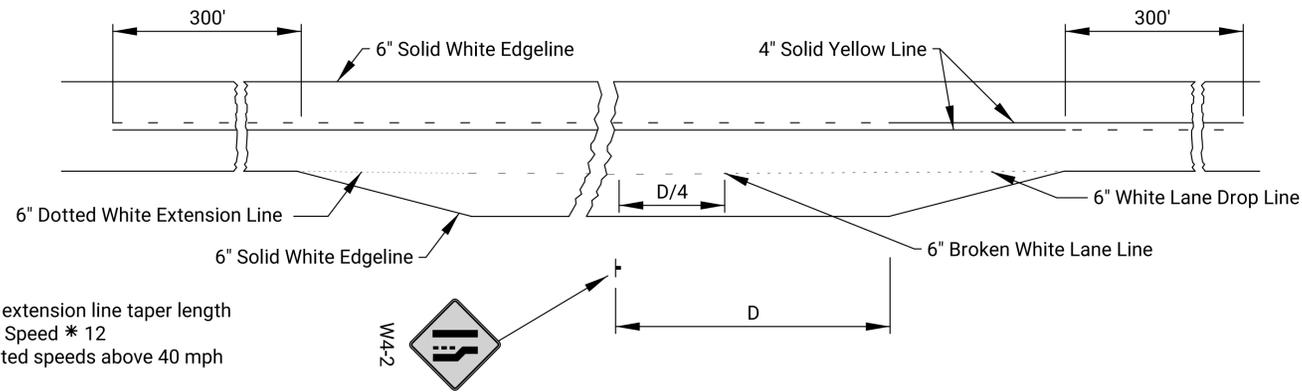
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 100       | 148          |



Plotted by: Michael.Freeland@ks.gov 27-SEP-2024 15:11  
 File: KA-6483-01.mpl-01.dgn Traffic

|   |          |            |            |
|---|----------|------------|------------|
| KANSAS DEPARTMENT OF TRANSPORTATION     |          |            |            |
| PAVEMENT MARKING<br>BRIDGE #16/ J. HILL |          |            |            |
| STA: 48+00 - STA: 52+00                 |          |            |            |
| APP'D                                   | DESIGNED | DETAILED   | DESIGN CK. |
|   |          |            |            |
| KDOT Graphics Certified                 |          | 09-12-2024 |            |

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 101       | 148          |

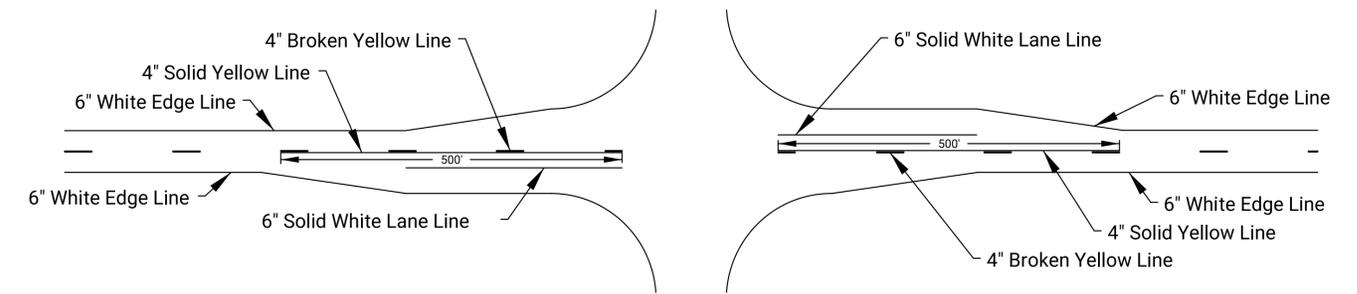


NOTE:  
Dotted extension line taper length  
Posted Speed \* 12  
for posted speeds above 40 mph

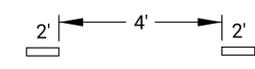
TYPICAL MARKING FOR AUXILIARY PASSING LANE

NOTE:  
All pavement markings shall be broken at  
cross roads.

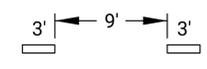
For highway junctions the no passing  
zone will extend 1000' from intersection.



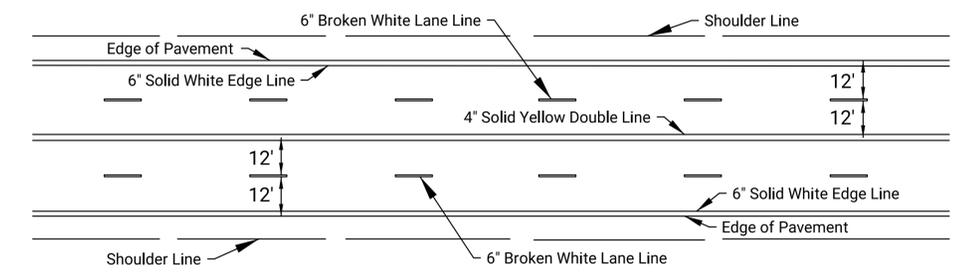
TYPICAL ROAD JUNCTION MARKINGS WITH BYPASS LANES



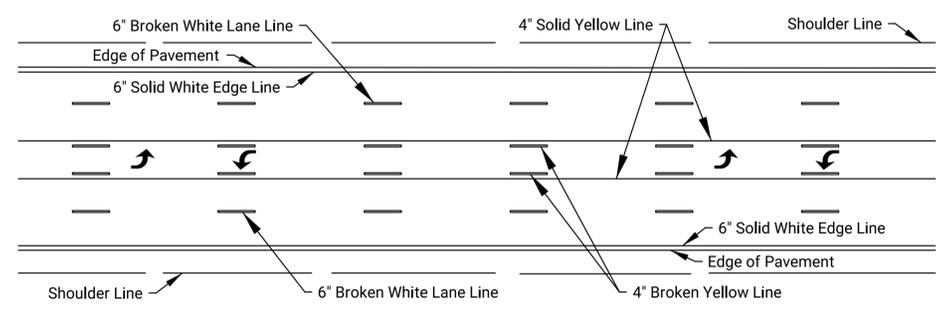
TYPICAL SPACING  
FOR DOTTED EXTENSION  
LINES, UNLESS OTHERWISE  
NOTED ON PLANS.



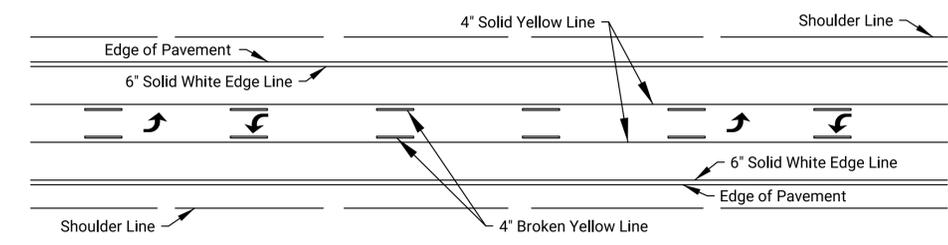
TYPICAL SPACING  
FOR LANE DROP,  
UNLESS OTHERWISE  
NOTED ON PLANS.



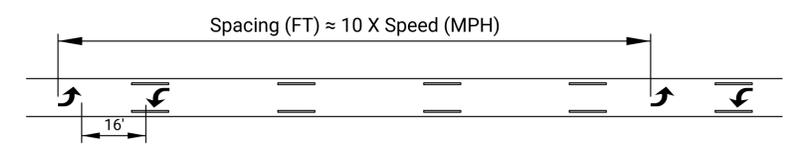
TYPICAL MARKINGS FOR FOUR LANE ROADWAY



TWO-WAY LEFT TURN DETAIL FOR FIVE LANE ROADWAY

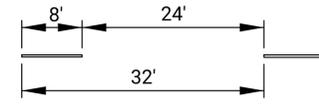


TWO-WAY LEFT TURN DETAIL FOR THREE LANE ROADWAY

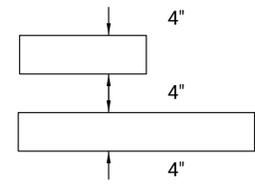


TWO-WAY LEFT TURN ARROW SPACING DETAIL

NOTE:  
If arrows are used space the arrows as shown in  
the spacing detail.



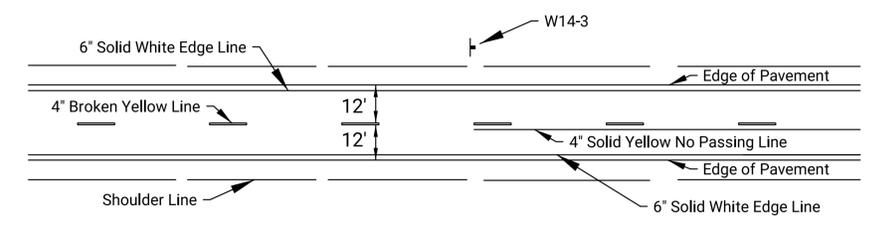
TYPICAL SPACING  
FOR BROKEN LINES,  
UNLESS OTHERWISE  
NOTED ON PLANS



TYPICAL SPACING FOR  
NO PASSING LINES,  
UNLESS OTHERWISE  
NOTED ON PLANS

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.



TYPICAL TWO LANE MARKINGS

Plotted by : Michael.Freeland@ks.gov 27-SEP-2024 15:10  
File : te308.dgn

| NO. | DATE     | REVISIONS                                  | BY     | APPD   |
|-----|----------|--|--------|--------|
| 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

|            |        |            |        |                |
|------------|--------|------------|--------|----------------|
| DESIGNED   | J.F.F. | 05-25-12   | APPD.  | Brian D. Gower |
| DESIGN CK. | B.D.G. | DETAIL CK. | B.D.G. | QUAN. CK.      |

KDOT Graphics Certified 07-19-2022 Sh. No. 101

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 102       | 148          |

### 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 |  |
|--------------------------|--------------------------|--------------------------|---------------------------|---------------------------------|--------------------------------|--------------------------------|--------------------------|--------------------------------|--------------------------|--------------------------------|-------------------------------|------------------------------|---------------------------------------|--|---------------------------|---------------------------|-----------------------------|----------------------|-----------------------|---------------------------|--------------------------------|--|
| BRIDGE #16 / J. HILL RD. |                          | 800                      |                           |                                 |                                |                                |                          |                                |                          |                                |                               |                              |                                       |  |                           |                           | 400                         |                      |                       |                           |                                |  |
| TOTALS                   |                          | 800                      |                           |                                 |                                |                                |                          |                                |                          |                                |                               |                              |                                       |  |                           |                           | 800                         |                      |                       |                           |                                |  |

### RECAPITULATION OF QUANTITIES

| ITEMS  | TOTAL | UNITS |
|--|-------|-------|
| PAVEMENT MARKING (MULTI-COMPONENT)(WHITE)(4')              |       | FT    |
| PAVEMENT MARKING (MULTI-COMPONENT)(WHITE)(6')              | 800   | FT    |
| PAVEMENT MARKING (MULTI-COMPONENT)(WHITE)(8')              |       | FT    |
| PAVEMENT MARKING (MULTI-COMPONENT)(WHITE)(12')             |       | FT    |
| PAVEMENT MARKING (MULTI-COMPONENT)(YELLOW)(4')             | 800   | FT    |
| PAVEMENT MARKING (MULTI-COMPONENT)(YELLOW)(6')             |       | FT    |
| PAVEMENT MARKING (MULTI-COMPONENT)(YELLOW)(12')            |       | FT    |
| PAVEMENT MARKING (THERMOPLASTIC)(WHITE)(4')                |       | FT    |
| PAVEMENT MARKING (THERMOPLASTIC)(WHITE)(6')                |       | FT    |
| PAVEMENT MARKING (THERMOPLASTIC)(WHITE)(8')                |       | FT    |
| PAVEMENT MARKING (THERMOPLASTIC)(WHITE)(12')               |       | FT    |
| PAVEMENT MARKING (THERMOPLASTIC)(YELLOW)(4')               |       | FT    |
| PAVEMENT MARKING (THERMOPLASTIC)(YELLOW)(6')               |       | FT    |
| PAVEMENT MARKING (THERMOPLASTIC)(YELLOW)(12')              |       | FT    |
| PAVEMENT MARKING (EPOXY)(WHITE)(4')                        |       | FT    |
| PAVEMENT MARKING (EPOXY)(WHITE)(6')                        |       | FT    |
| PAVEMENT MARKING (EPOXY)(WHITE)(8')                        |       | FT    |
| PAVEMENT MARKING (EPOXY)(WHITE)(12')                       |       | FT    |
| PAVEMENT MARKING (EPOXY)(YELLOW)(4')                       |       | FT    |
| PAVEMENT MARKING (EPOXY)(YELLOW)(6')                       |       | FT    |
| PAVEMENT MARKING (EPOXY)(YELLOW)(12')                      |       | FT    |
| PAVEMENT MARKING (INTERSECTION GRADE)(WHITE)(12')          |       | FT    |
| PAVEMENT MARKING (INTERSECTION GRADE)(WHITE)(24')          |       | FT    |
| PAVEMENT MARKING (INTERSECTION GRADE)(YELLOW)(12')         |       | FT    |
| PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(WHITE)( )     |       | EACH  |
| PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(WHITE)( )     |       | EACH  |
| PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(WHITE)( )     |       | EACH  |
| PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(WHITE)( )     |       | EACH  |
| PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(WHITE)( )     |       | EACH  |
| PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(WHITE)( )     |       | EACH  |
| PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(US-SHIELD)( ) |       | EACH  |
| PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(K-SHIELD)( )  |       | EACH  |
| PAVEMENT MARKING SYMBOL (INTERSECTION GRADE)(I-SHIELD)( )  |       | EACH  |
| PAVEMENT MARKING (PATTERNED COLD PLASTIC)(WHITE)(6')       |       | FT    |
| PAVEMENT MARKING (PATTERNED COLD PLASTIC)(WHITE)(8')       |       | FT    |
| PAVEMENT MARKING (PATTERNED COLD PLASTIC)(WHITE)(12')      |       | FT    |
| PAVEMENT MARKING REMOVAL                                   |       | FT    |

### SUMMARY OF WORD & SYMBOL MARKINGS

| LOCATION | ↔ | ↖ | ↑ | ↗ | ↙ | ♿ | STOP | ONLY | X-ING | SCHOOL | 70 | 400 | 18 | ↪ | ↩ | ↪ | ↩ | ↗ |  | ≡ | ≠ |  |  |
|----------|---|---|---|---|---|---|------|------|-------|--------|----|-----|----|---|---|---|---|---|--|---|---|--|--|
| TOTALS   |   |   |   |   |   |   |      |      |       |        |    |     |    |   |   |   |   |   |  |   |   |  |  |

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.

| 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.         |
| NO.  | DATE     | REVISIONS                              | BY     | APPD           |
| KANSAS DEPARTMENT OF TRANSPORTATION                              |          |  |        |                |
| <b>SUMMARY AND RECAPITULATION OF PAVEMENT MARKING QUANTITIES</b> |          |  |        |                |
| TE311  |          |  |        |                |
| FHWA APPROVAL  |          | 05-25-12                               | APPD   | Brian D. Gower |
| DESIGNED   | J.F.F.   | DETAILED                               | J.F.F. | QUANTITIES     |
| DESIGN CK.   | B.D.G.   | DETAIL CK.                             | B.D.G. | QUAN. CK.      |
| DESIGNED   |          | QUANTITIES                             |        | TRACED         |
| DESIGN CK.   |          | QUAN. CK.                              |        | TRACE CK.      |

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 103       | 148          |

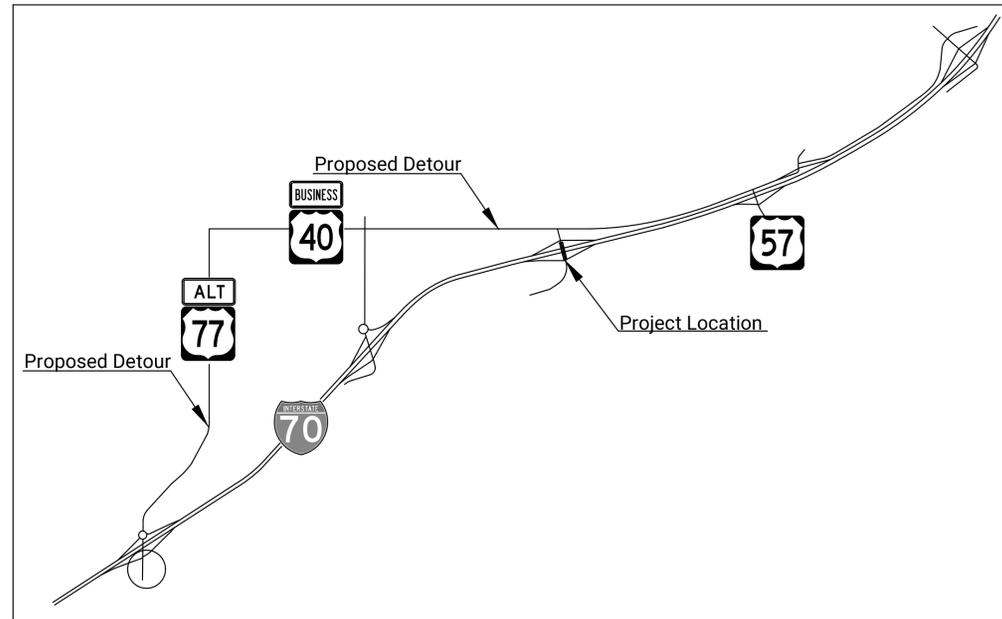
Guide to designer: Use this sheet when subgrading in rock or shale is not required. See Soils and Geology Reports for additional plan notes.

| CONSTRUCTION SEQUENCE |       |  |  |   |
|-----------------------|-------|--|--|---|
| PHASE                 | STAGE | MAJOR CONSTRUCTION FEATURES  | HANDLING OF TRAFFIC  | REMARKS   |
| 1                     | A     | Remove Bridge No. 70-31-298.98 (016)                                     | -Westbound I-70 traffic will remain on I-70 head to head condition, as part of project KA-6062-01, until J Hill Road interchange. For Phase 1A nighttime closure, Westbound I-70 traffic will use the J Hill Road interchange ramps. No access to J Hill Road will be allowed.<br>-Eastbound I-70 Traffic will be detoured onto Business US-40 and Cannon View Road to access the Marshall Drive/Henry Drive interchange (Exit 301).<br>-Northbound J Hill Road will have access to eastbound I-70. J Hill Road interchange will be closed to through traffic. | One night closure of I-70 from 7pm to 7am or as directed by engineer. |
|                       | B     | Remove Bridge Piers Below Grade. Construct proposed piers and guardrail. | -Eastbound and Westbound I-70 will be head to head traffic as part of the pavement repair project (KA-6062-01). Concrete barriers will be used along the median and the outside shoulder to protect workers. J Hill Road will be closed to through traffic.  |   |
| 2                     | A     | Install J Hill Rd. Bridge Girders  | -Westbound I-70 traffic will remain on I-70 head to head condition, as part of project KA-6062-01, until J Hill Road interchange. For Phase 1A nighttime closure, Westbound I-70 traffic will use the J Hill Road interchange ramps. No access to J Hill Road will be allowed.<br>-Eastbound I-70 Traffic will be detoured onto Business US-40 and Cannon View Road to access the Marshall Drive/Henry Drive interchange (Exit 301).<br>-Northbound J Hill Road will have access to eastbound I-70. J Hill Road interchange will be closed to through traffic. | One night closure of I-70 from 7pm to 7am or as directed by engineer. |
|                       | B     | Construct Proposed J Hill Rd. Bridge from Sta. 48+00 to Sta. 52+00.      | -Eastbound and Westbound I-70 will be head to head traffic as part of the pavement repair project (KA-6062-01). Concrete barriers will be used along the median and the outside shoulder to protect workers. J Hill Road will be closed to through traffic.  |   |

Plotted by : Elias.Esquivel@ks.gov 14-MAR-2025 17:51  
File : KA64830Trcs-01.dgn

KDOT Graphics Certified

| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 104       | 148          |



NOTE: Circle on map denotes location of detour.

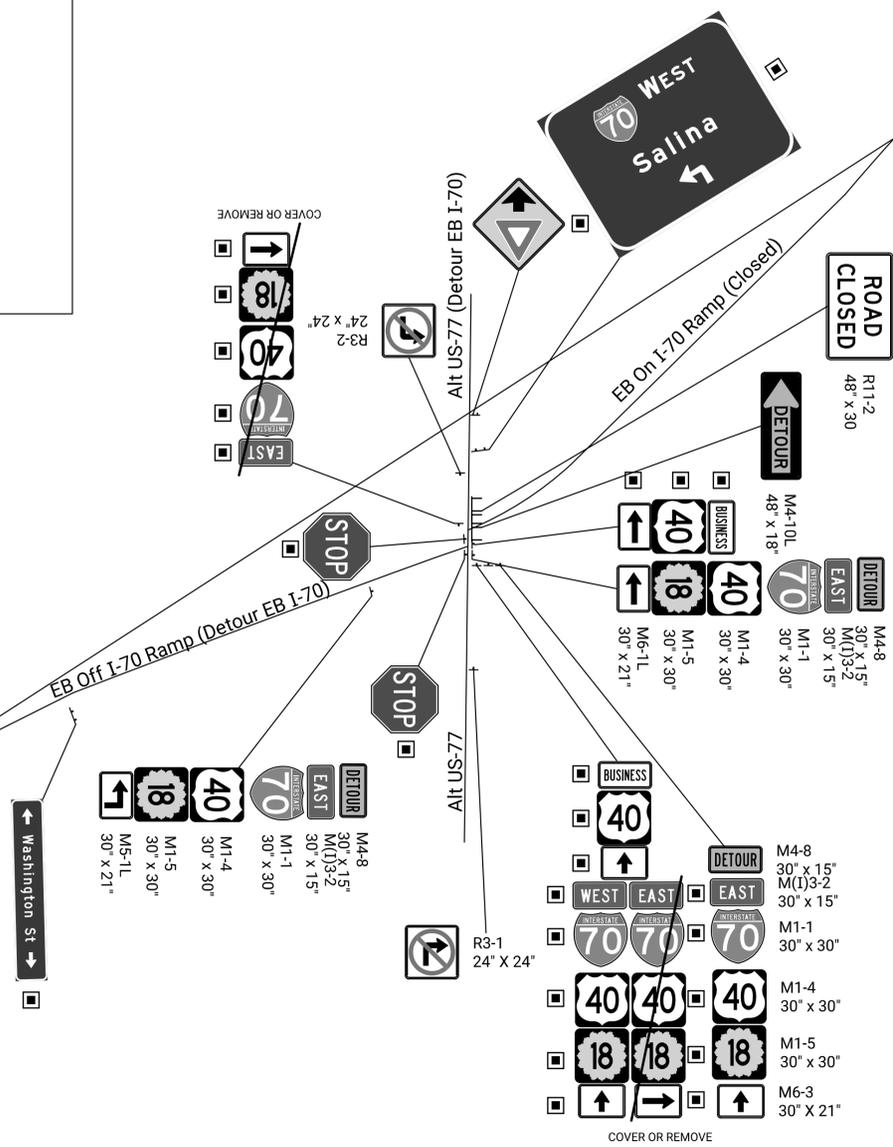
All conflicting route markers along detour route shall be covered or removed.

Existing signs not shown at these junctions shall remain in place unless otherwise directed by the engineer.

Erect detour confirming assemblies in conjunction with existing 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.



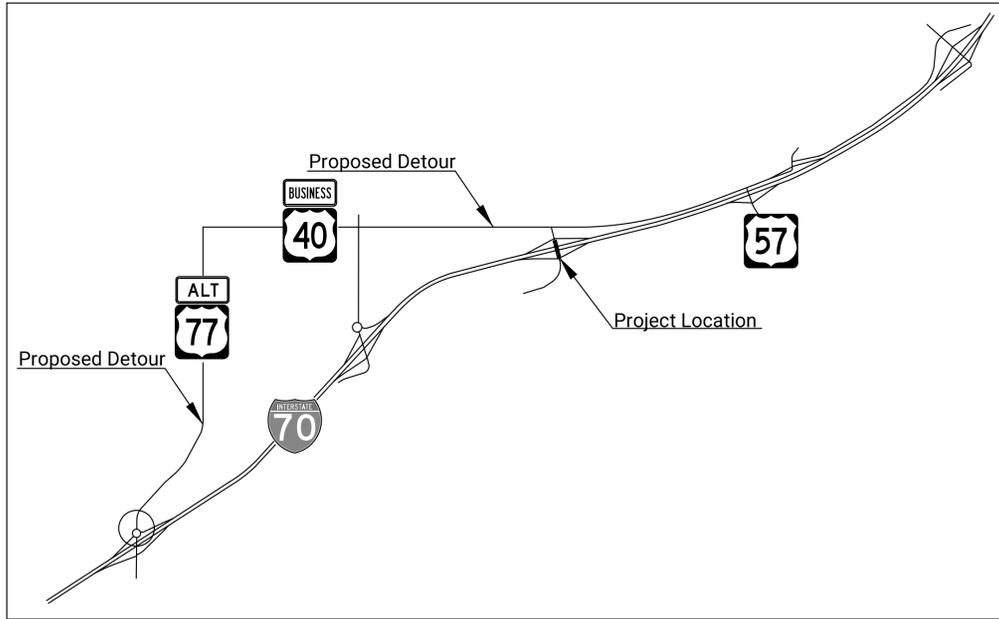
NOT TO SCALE

- Existing
- ⏏ Type III Barricade
- Portable Changeable Message Sign (PCMS)

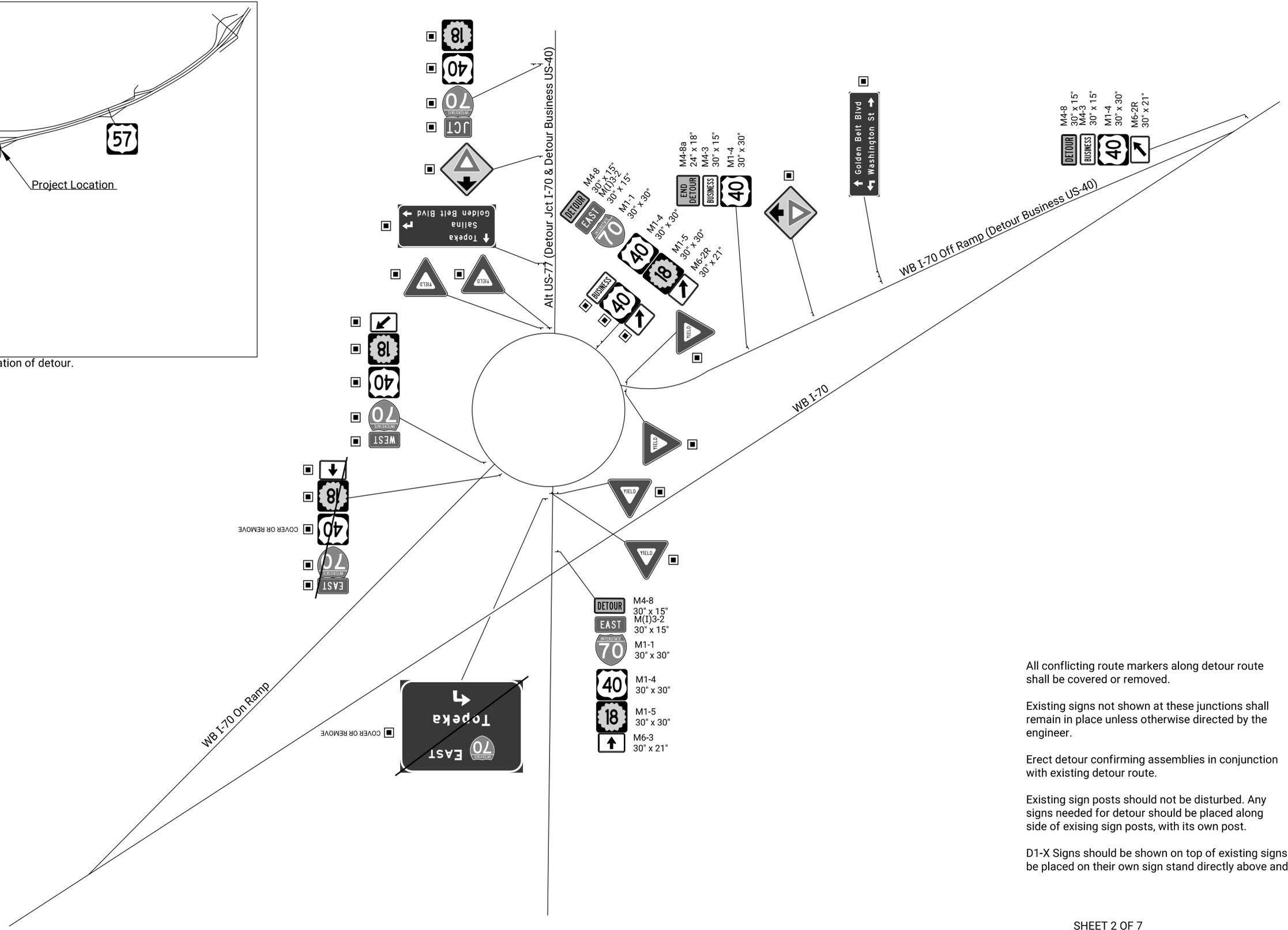
SHEET 1 OF 7

KANSAS DEPARTMENT OF TRANSPORTATION  
 PHASE 1A & 2A DETOUR PLAN  
 ALT US-77 & EB I-70 RAMPS

| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 105       | 148          |



NOTE: Circle on map denotes location of detour.



Plotted by : ghuertler 14-MAR-2025 14:08  
File : KA648301cddt-04.dgn

NOT TO SCALE

- Existing
- ▬ Type III Barricade
- Portable Changeable Message Sign (PCMS)

All conflicting route markers along detour route shall be covered or removed.

Existing signs not shown at these junctions shall remain in place unless otherwise directed by the engineer.

Erect detour confirming assemblies in conjunction with existing 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.

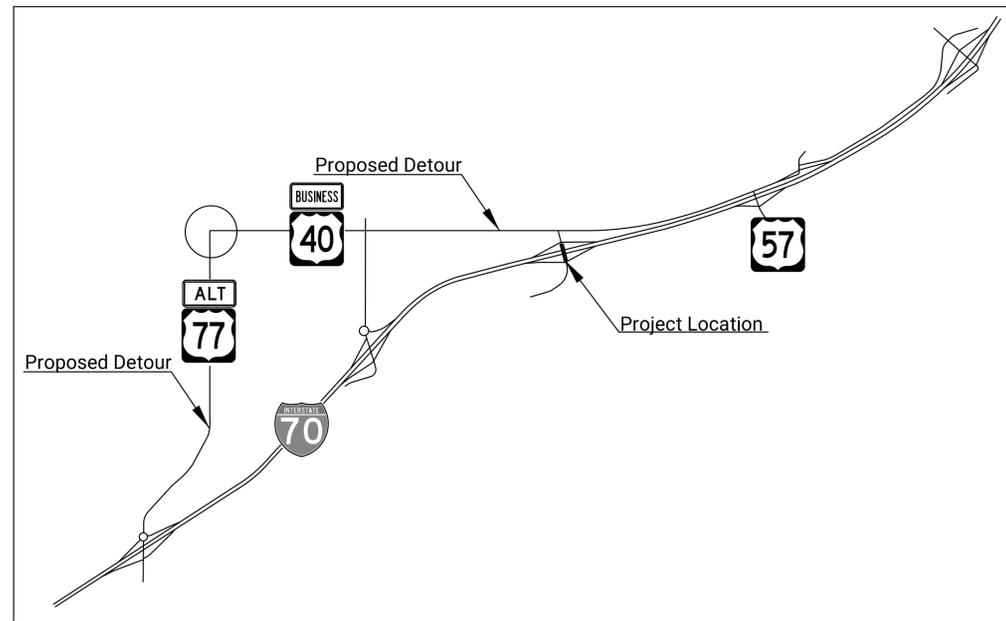
SHEET 2 OF 7

KANSAS DEPARTMENT OF TRANSPORTATION

PHASE 1A & 2A DETOUR PLAN

ALT US-77 & WB I-70 RAMPS

| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 106       | 148          |



NOTE: Circle on map denotes location of detour.

All conflicting route markers along detour route shall be covered or removed.

Existing signs not shown at these junctions shall remain in place unless otherwise directed by the engineer.

Erect detour confirming assemblies in conjunction with existing 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.

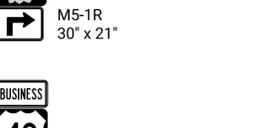
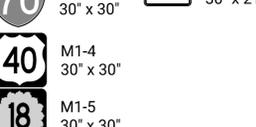
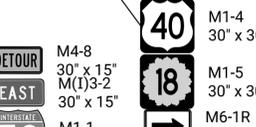
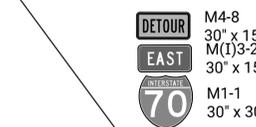
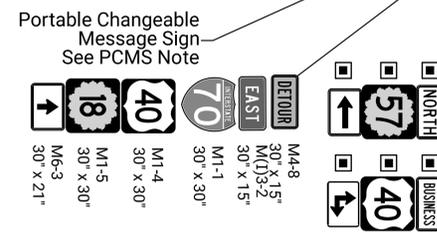
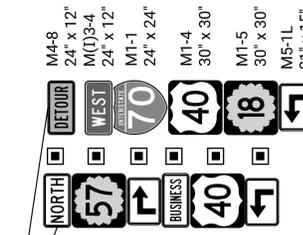
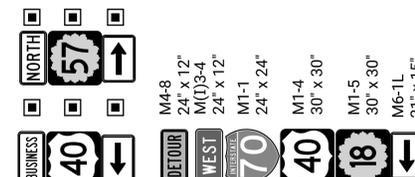
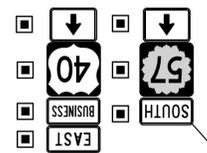
D1-X Signs should be shown on top of existing signs but, be placed on their own sign stand directly above and behind.



6th St

N Washington St

6th St/Business US-40 (Detour Jct I-70)



PCMS Note:  
Contractor shall install portable changeable message sign (PCMS) for eastbound 6th St/Business US-40 Traffic at the Washington St intersection to notify drivers about J Hill Rd closure.

SCREEN 1  
EB I-70  
CLOSED

SCREEN 2  
FOLLOW  
DETOUR

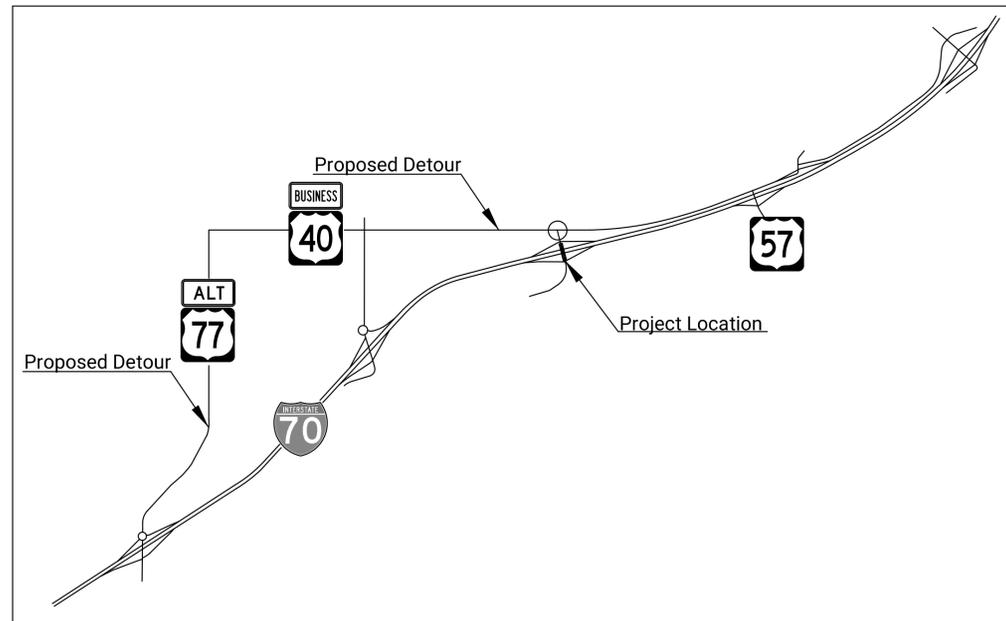
NOT TO SCALE

- Existing
- Type III Barricade
- Portable Changeable Message Sign (PCMS)

SHEET 3 OF 7

KANSAS DEPARTMENT OF TRANSPORTATION  
PHASE 1A & 2A DETOUR PLAN  
6TH ST & N WASHINGTON ST

| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 107       | 148          |



NOTE: Circle on map denotes location of detour.

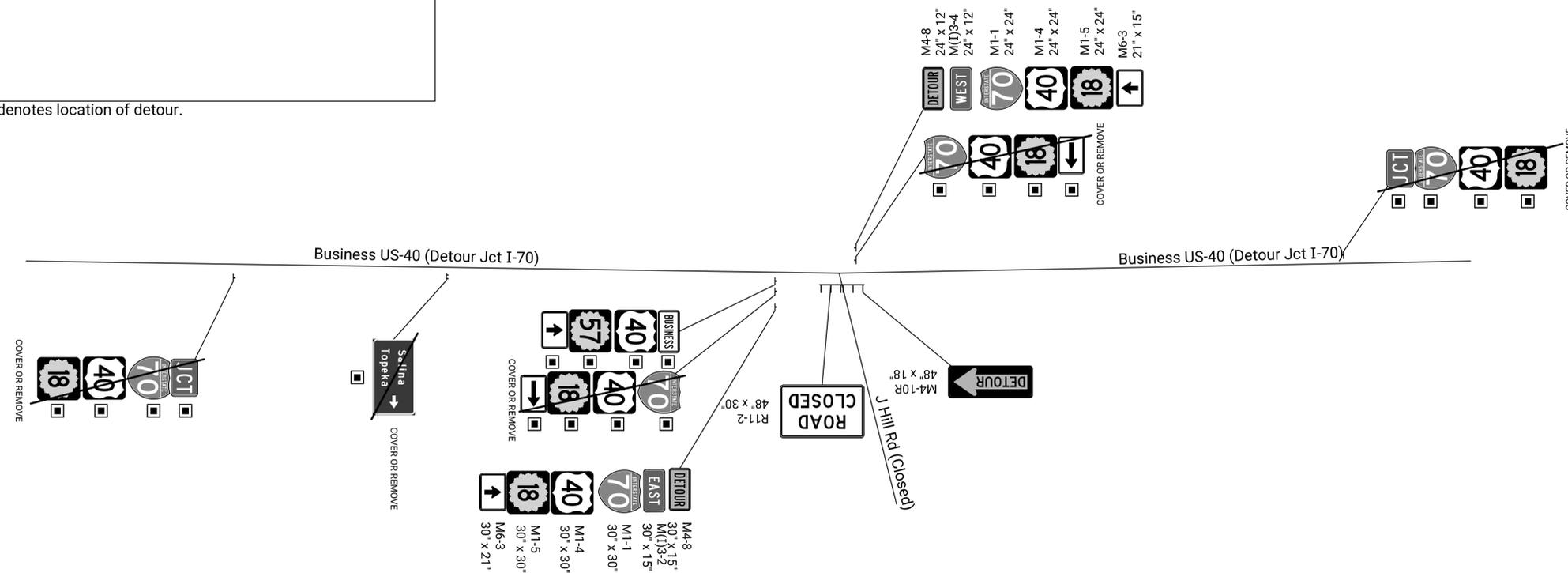
All conflicting route markers along detour route shall be covered or removed.

Existing signs not shown at these junctions shall remain in place unless otherwise directed by the engineer.

Erect detour confirming assemblies in conjunction with existing 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.



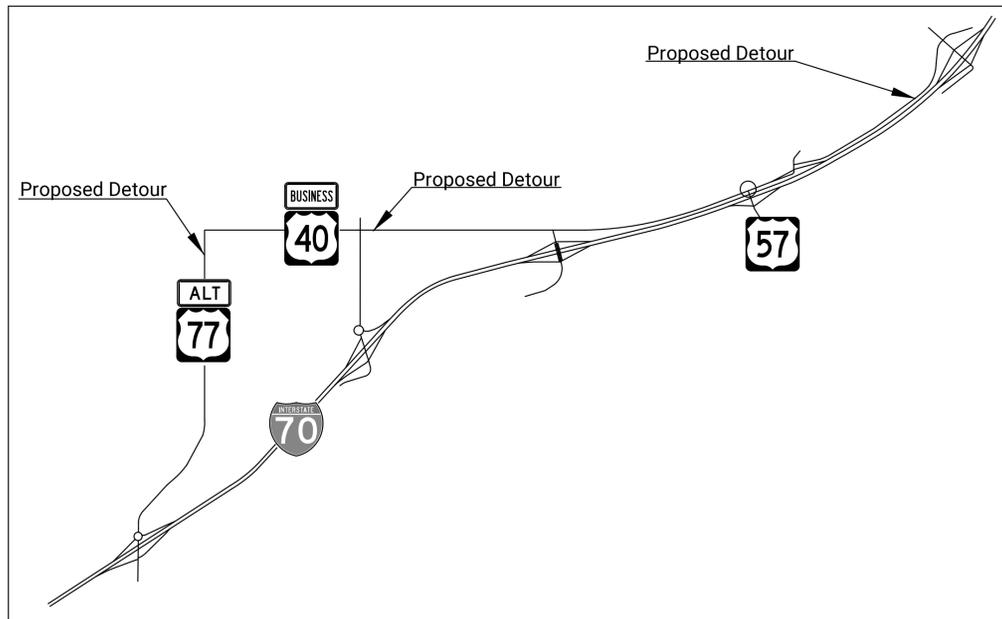
NOT TO SCALE

- Existing
- ⏏ Type III Barricade
- Portable Changeable Message Sign (PCMS)

SHEET 4 OF 7

KANSAS DEPARTMENT OF TRANSPORTATION  
 PHASE 1A & 2A DETOUR PLAN  
 BUSINESS US-40 & J HILL PLAN

| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 108       | 148          |



NOTE: Circle on map denotes location of detour.

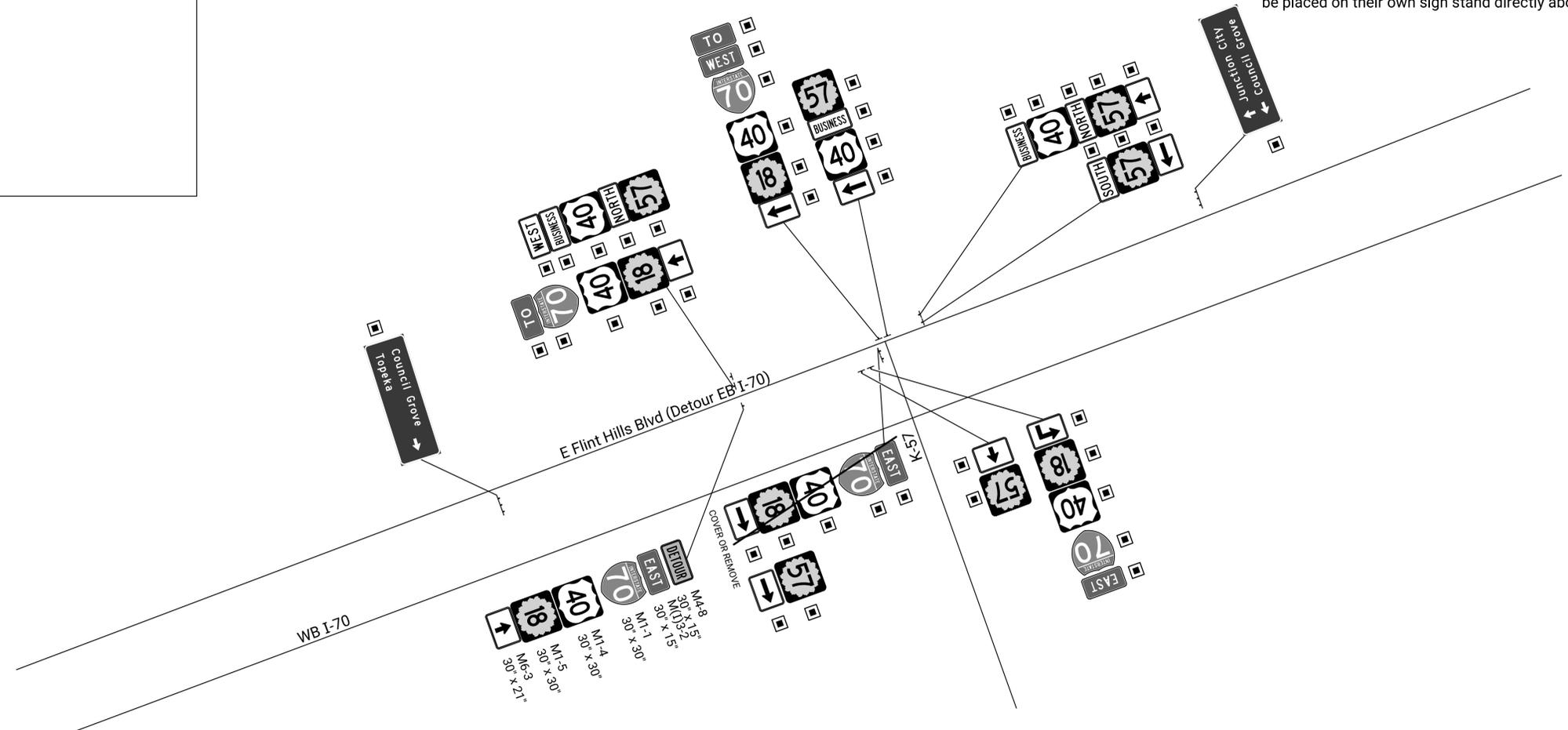
All conflicting route markers along detour route shall be covered or removed.

Existing signs not shown at these junctions shall remain in place unless otherwise directed by the engineer.

Erect detour confirming assemblies in conjunction with existing 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

- Existing
- ⏏ Type III Barricade
- Portable Changeable Message Sign (PCMS)

Plotted by : ghuarter 14-MAR-2025 14:09  
File : KA648301cdt-07.dgn

SHEET 5 OF 7

KANSAS DEPARTMENT OF TRANSPORTATION  
PHASE 1A & 2A DETOUR PLAN  
E FLINT HILLS BLVD & K-57

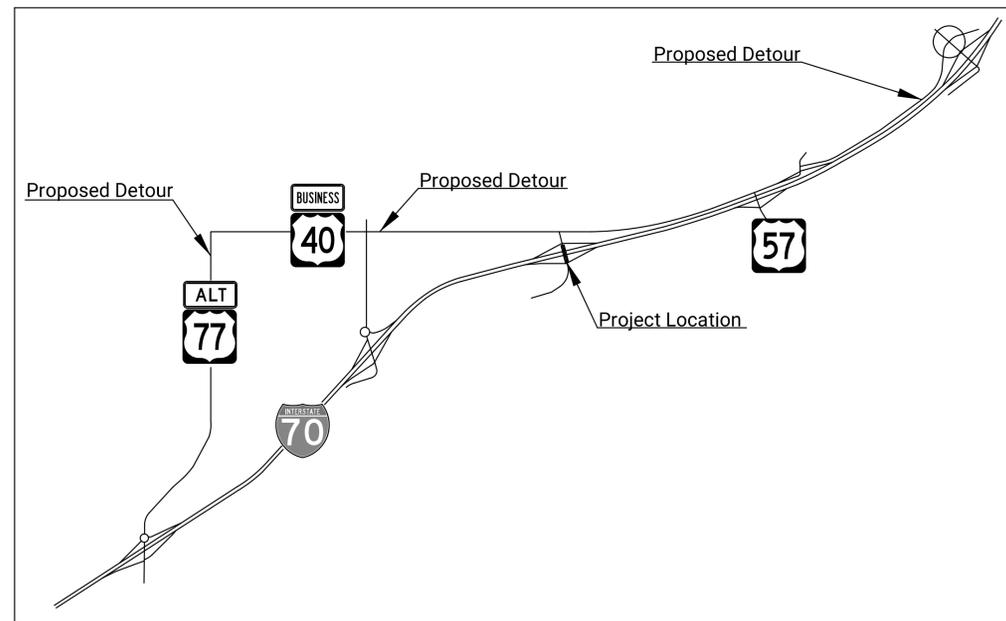
CADconform Certify This File

Sh. No. 108

CADconform Certify This File



| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 110       | 148          |



NOTE: Circle on map denotes location of detour.

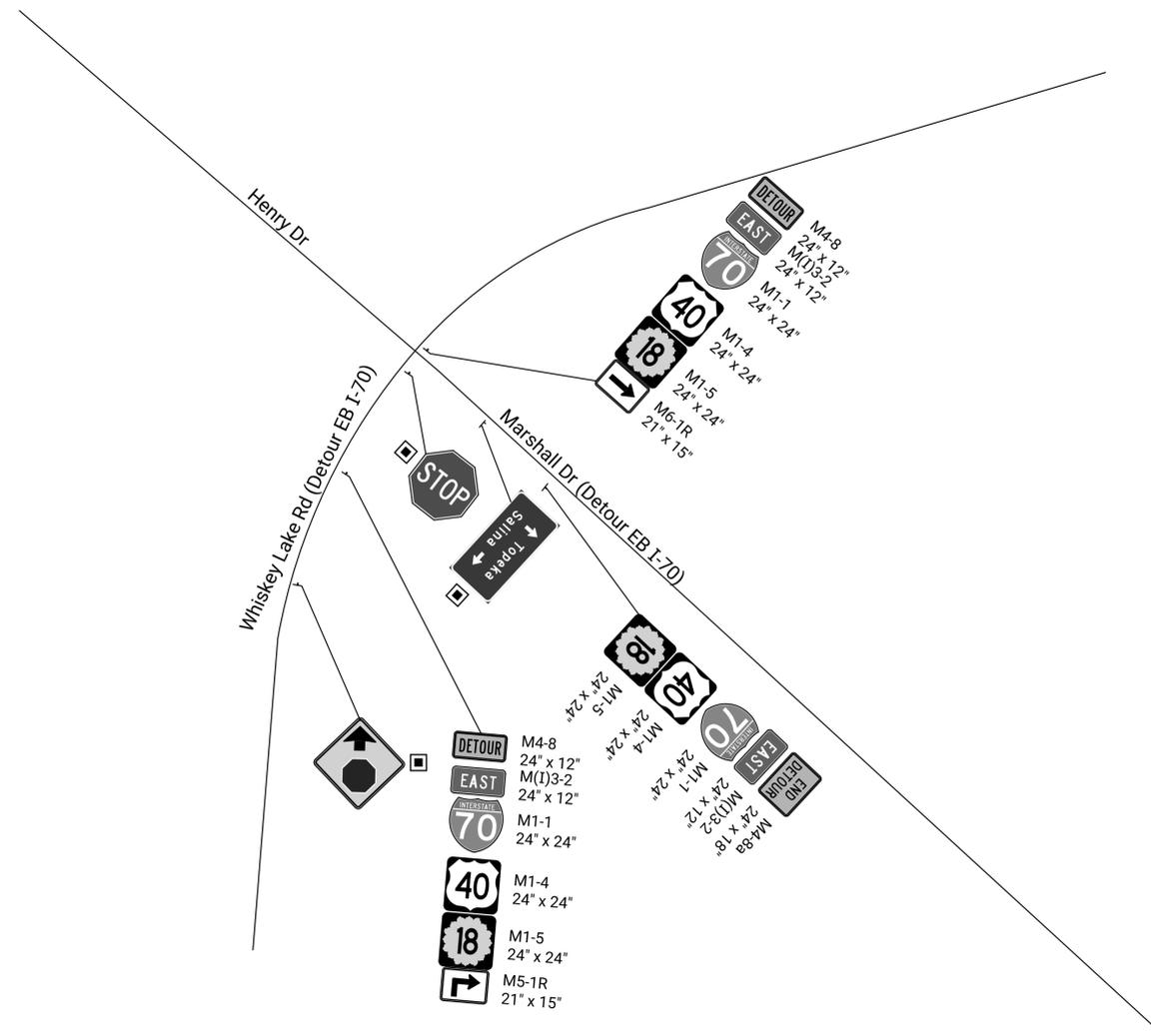
All conflicting route markers along detour route shall be covered or removed.

Existing signs not shown at these junctions shall remain in place unless otherwise directed by the engineer.

Erect detour confirming assemblies in conjunction with existing 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

- Existing
- ▬ Type III Barricade
- Portable Changeable Message Sign (PCMS)

SHEET 7 OF 7

KANSAS DEPARTMENT OF TRANSPORTATION  
 PHASE 1A & 2A DETOUR PLAN  
 MARSHALL DR & WHISKEY LAKE RD

| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 111       | 148          |

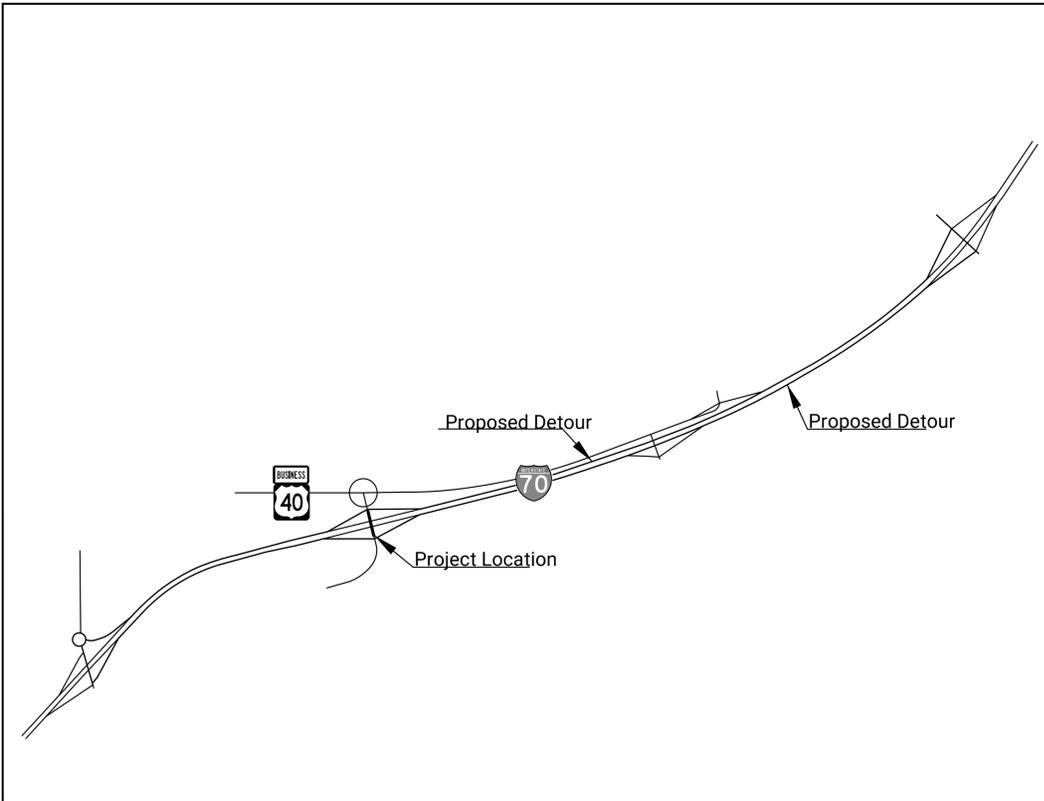
All conflicting route markers along detour route shall be covered or removed.

Existing signs not shown at these junctions shall remain in place unless otherwise directed by the engineer.

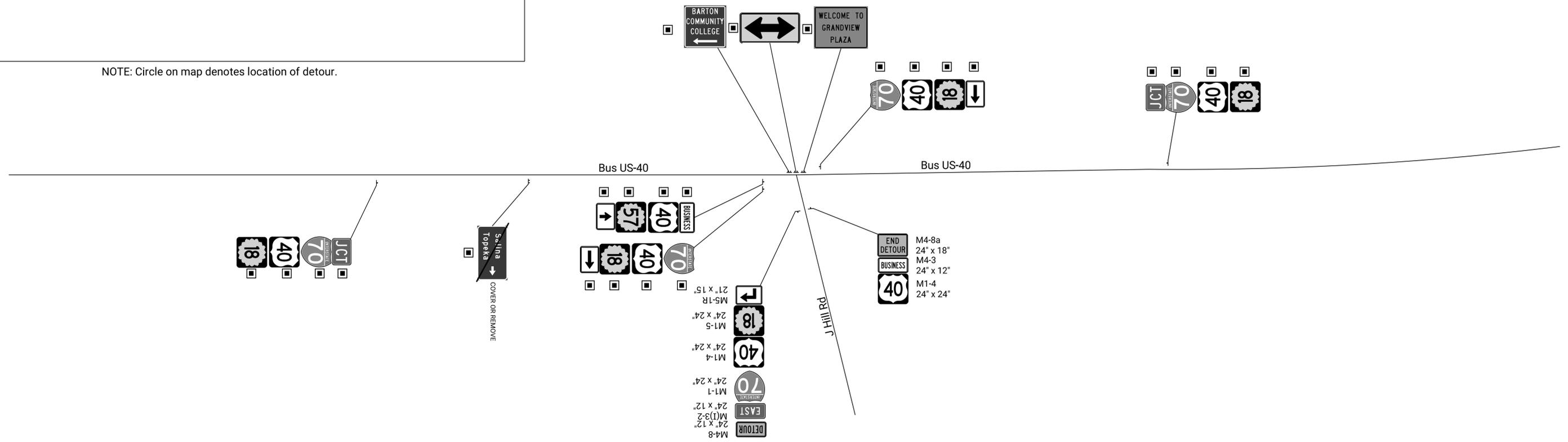
Erect detour confirming assemblies in conjunction with existing detour route.

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.



NOTE: Circle on map denotes location of detour.



NOT TO SCALE

- Existing
- ⏏ Type III Barricade

Plotted by : ghuarter 14-MAR-2025 14:09  
File : KA648301cdt-10.dgn

SHEET 1 OF 7

KANSAS DEPARTMENT OF TRANSPORTATION  
PHASE 1B & 2B DETOUR PLAN  
BUSINESS US-40 & J HILL RD

| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 112       | 148          |

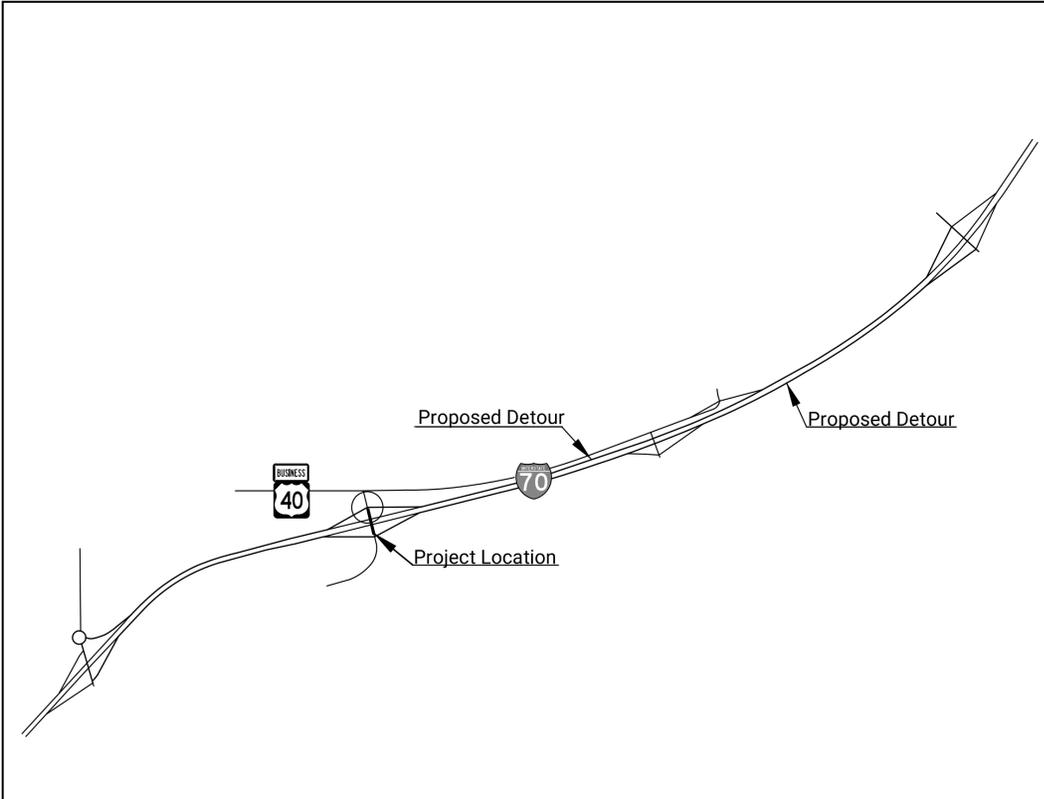
All conflicting route markers along detour route shall be covered or removed.

Existing signs not shown at these junctions shall remain in place unless otherwise directed by the engineer.

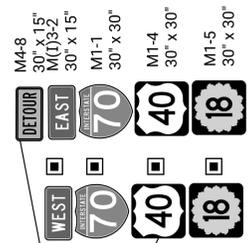
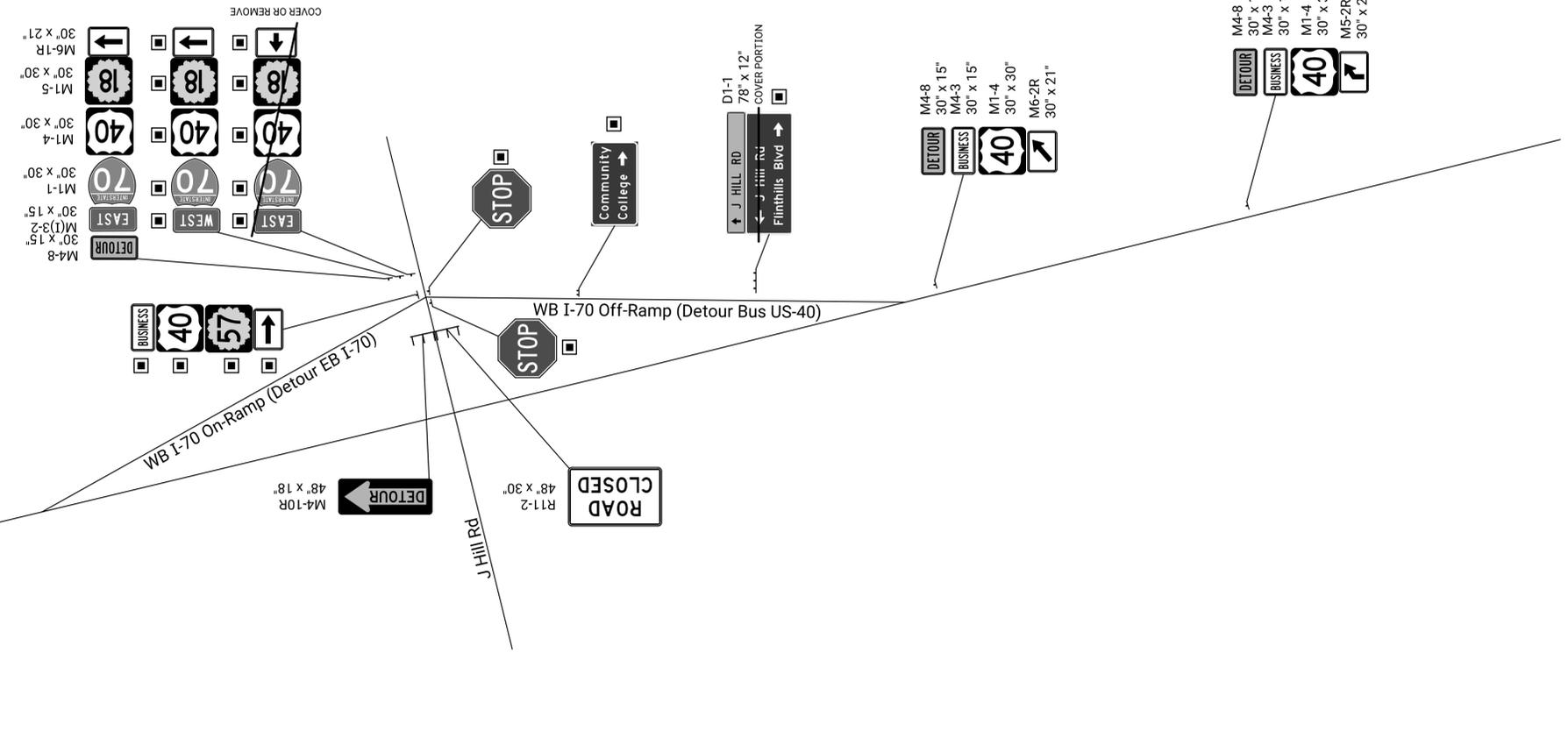
Erect detour confirming assemblies in conjunction with existing detour route.

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.



NOTE: Circle on map denotes location of detour.



NOT TO SCALE

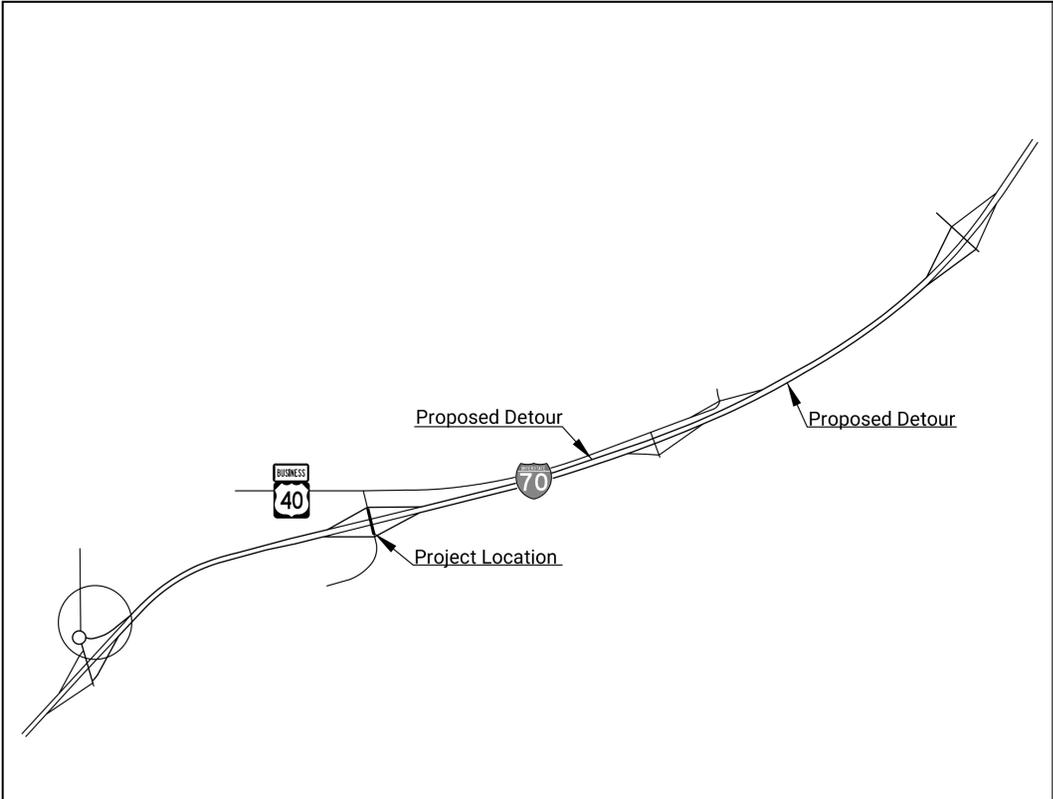
- Existing
- ⊥ Type III Barricade

Plotted by : ghuarter 14-MAR-2025 14:09  
File : KA648301cddt-11.dgn

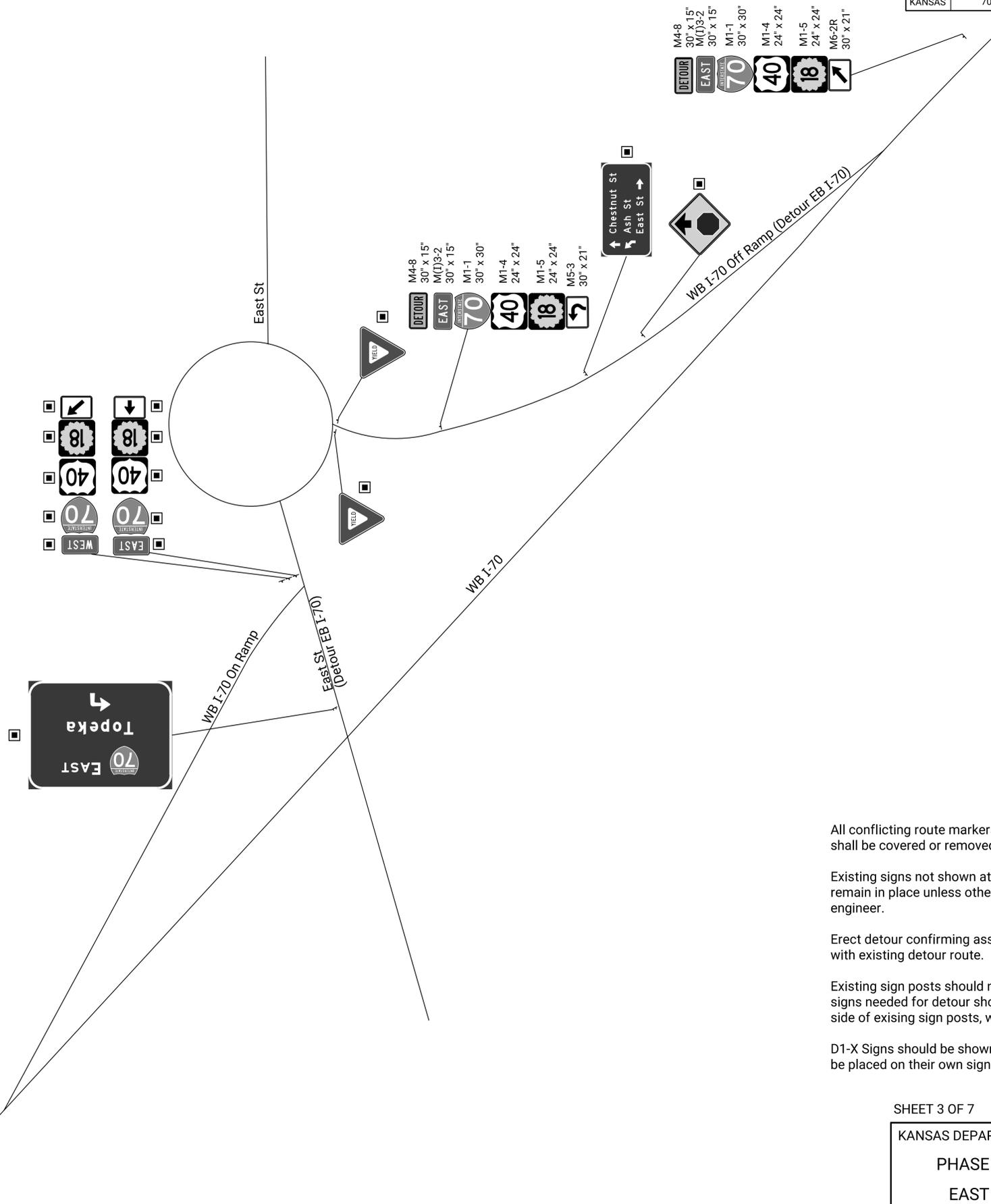
SHEET 2 OF 7

KANSAS DEPARTMENT OF TRANSPORTATION  
PHASE 1B & 2B DETOUR PLAN  
J HILL RD & WB I-70 RAMPS

| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 113       | 148          |



NOTE: Circle on map denotes location of detour.



All conflicting route markers along detour route shall be covered or removed.

Existing signs not shown at these junctions shall remain in place unless otherwise directed by the engineer.

Erect detour confirming assemblies in conjunction with existing 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.

SHEET 3 OF 7  
 KANSAS DEPARTMENT OF TRANSPORTATION  
 PHASE 1B & 2B DETOUR PLAN  
 EAST ST & WB I-70 RAMPS

Plotted by : ghuarter 14-MAR-2025 14:10  
 File : KA64830Tcdt-12.dgn

NOT TO SCALE  
 Existing  
 Type III Barricade

| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 114       | 148          |

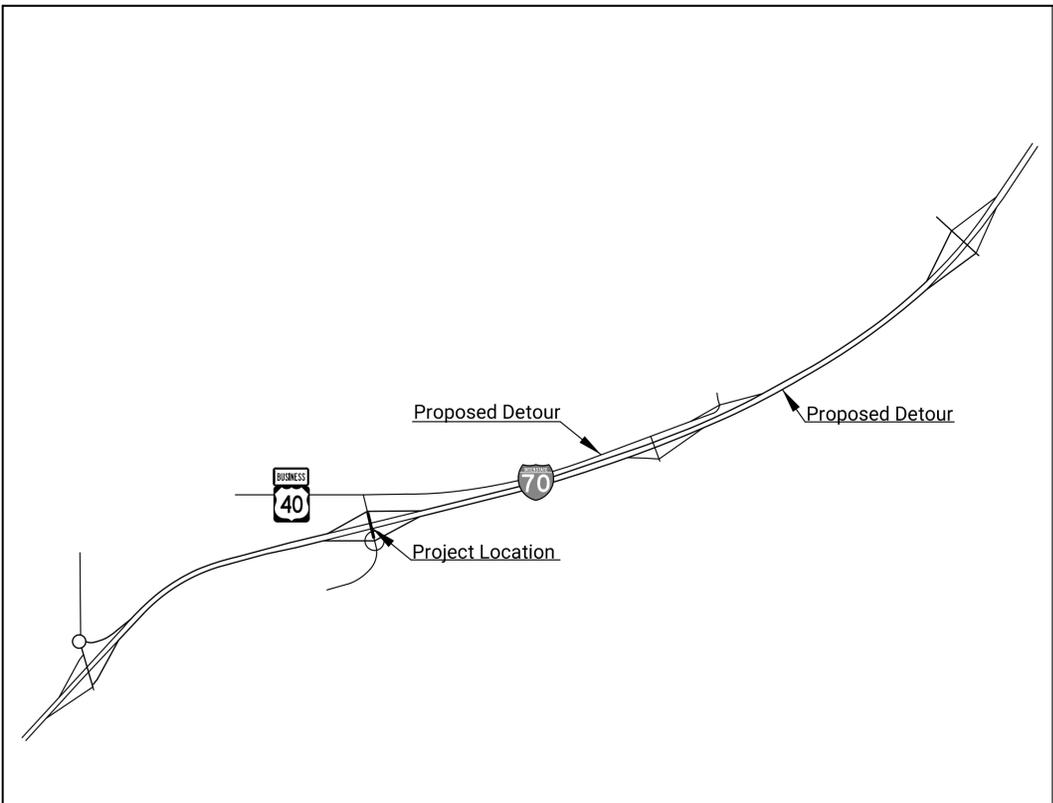
All conflicting route markers along detour route shall be covered or removed.

Existing signs not shown at these junctions shall remain in place unless otherwise directed by the engineer.

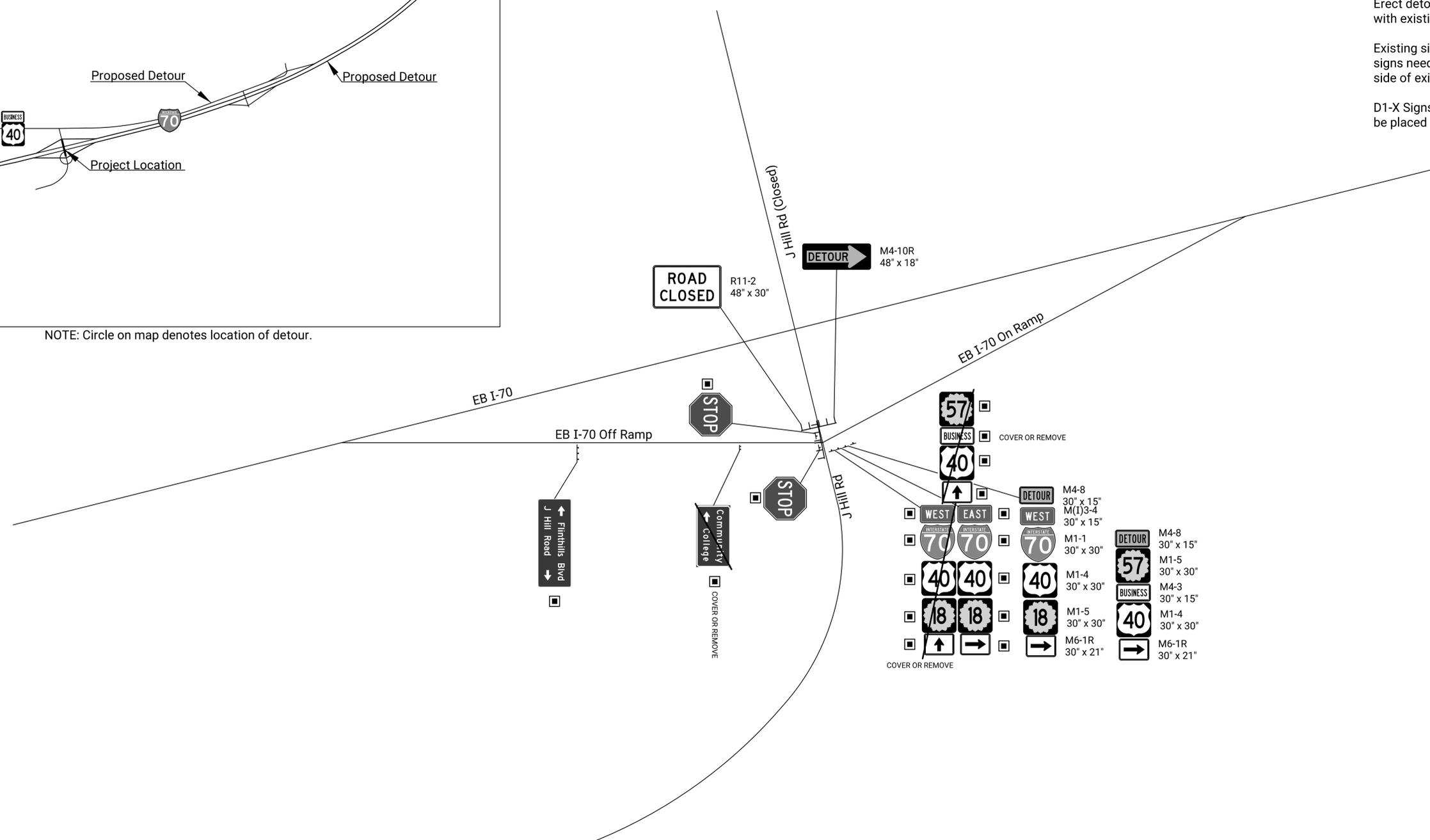
Erect detour confirming assemblies in conjunction with existing detour route.

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.



NOTE: Circle on map denotes location of detour.



NOT TO SCALE

■ Existing

⊥ Type III Barricade

Plotted by : ghuarter 14-MAR-2025 14:10  
File : KA648301cdd-13.dgn

SHEET 4 OF 7

KANSAS DEPARTMENT OF TRANSPORTATION

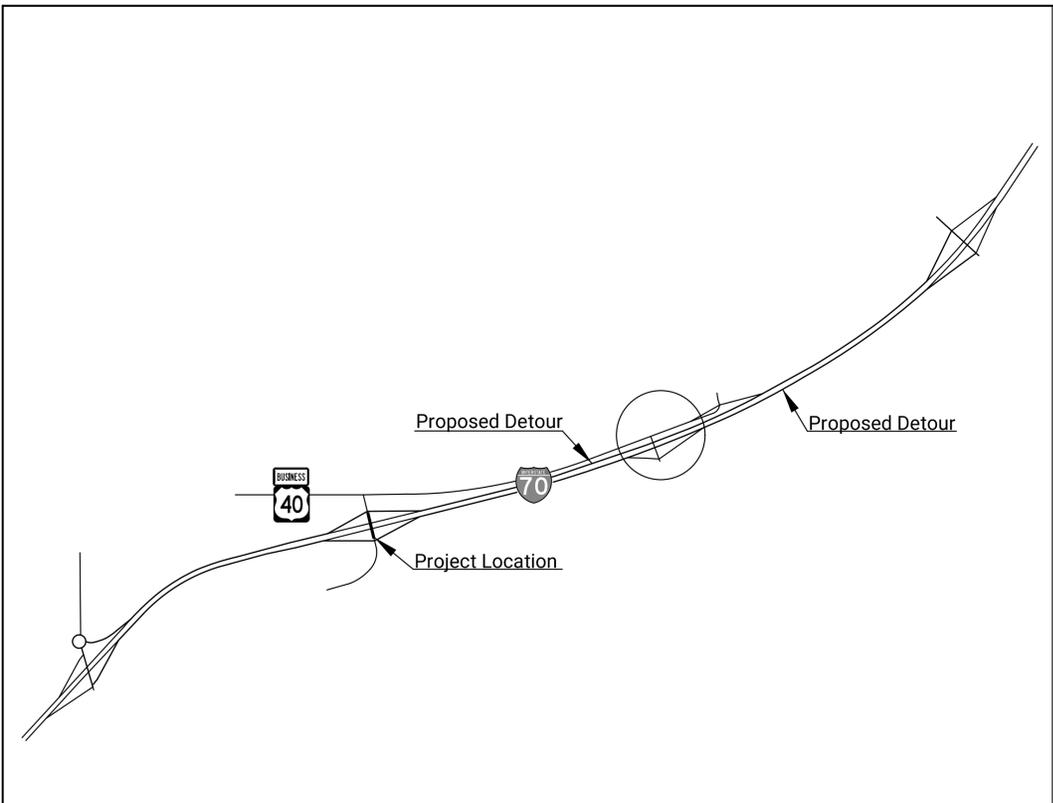
PHASE 1B & 2B DETOUR PLAN

J HILL RD & EB I-70 RAMPS

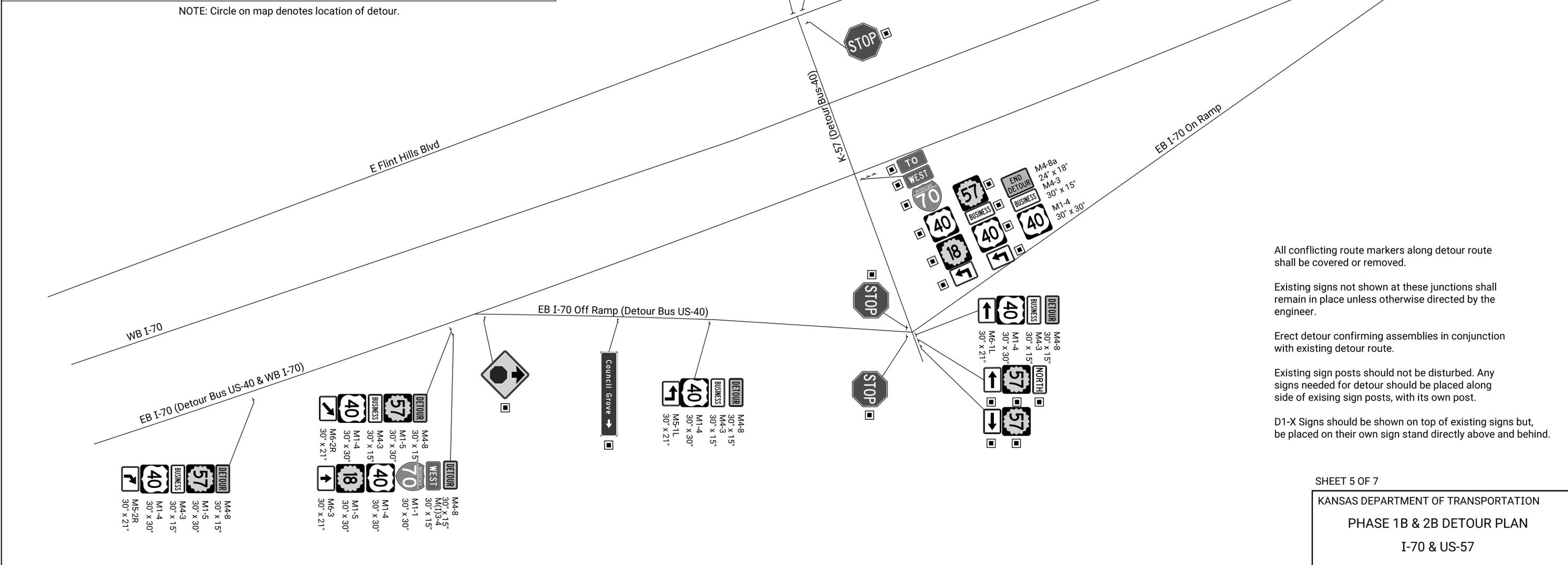
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 115       | 148          |



NOT TO SCALE  
 ■ Existing  
 □ Type III Barricade



NOTE: Circle on map denotes location of detour.



All conflicting route markers along detour route shall be covered or removed.

Existing signs not shown at these junctions shall remain in place unless otherwise directed by the engineer.

Erect detour confirming assemblies in conjunction with existing 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.

SHEET 5 OF 7  
 KANSAS DEPARTMENT OF TRANSPORTATION  
 PHASE 1B & 2B DETOUR PLAN  
 I-70 & US-57

Plotted by : ghuarter 14-MAR-2025 14:10  
 File : KA648301cdt-14.dgn



| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 117       | 148          |

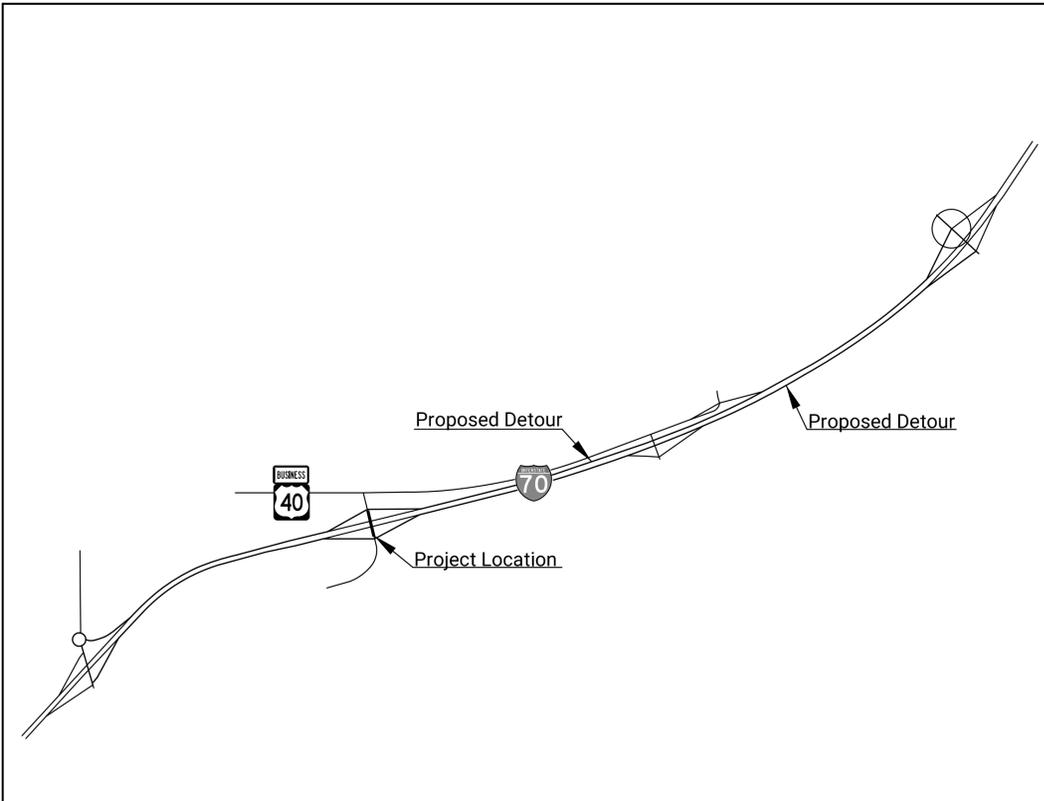
All conflicting route markers along detour route shall be covered or removed.

Existing signs not shown at these junctions shall remain in place unless otherwise directed by the engineer.

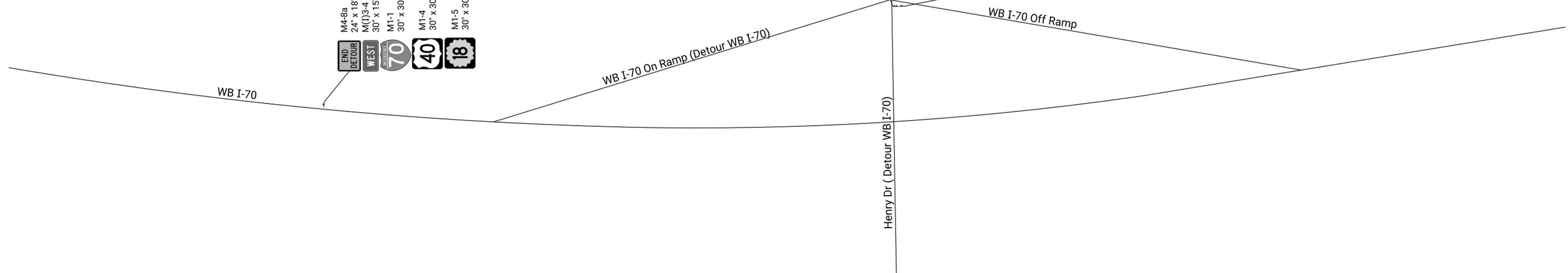
Erect detour confirming assemblies in conjunction with existing detour route.

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.



NOTE: Circle on map denotes location of detour.



NOT TO SCALE

- Existing
- ⊥ Type III Barricade

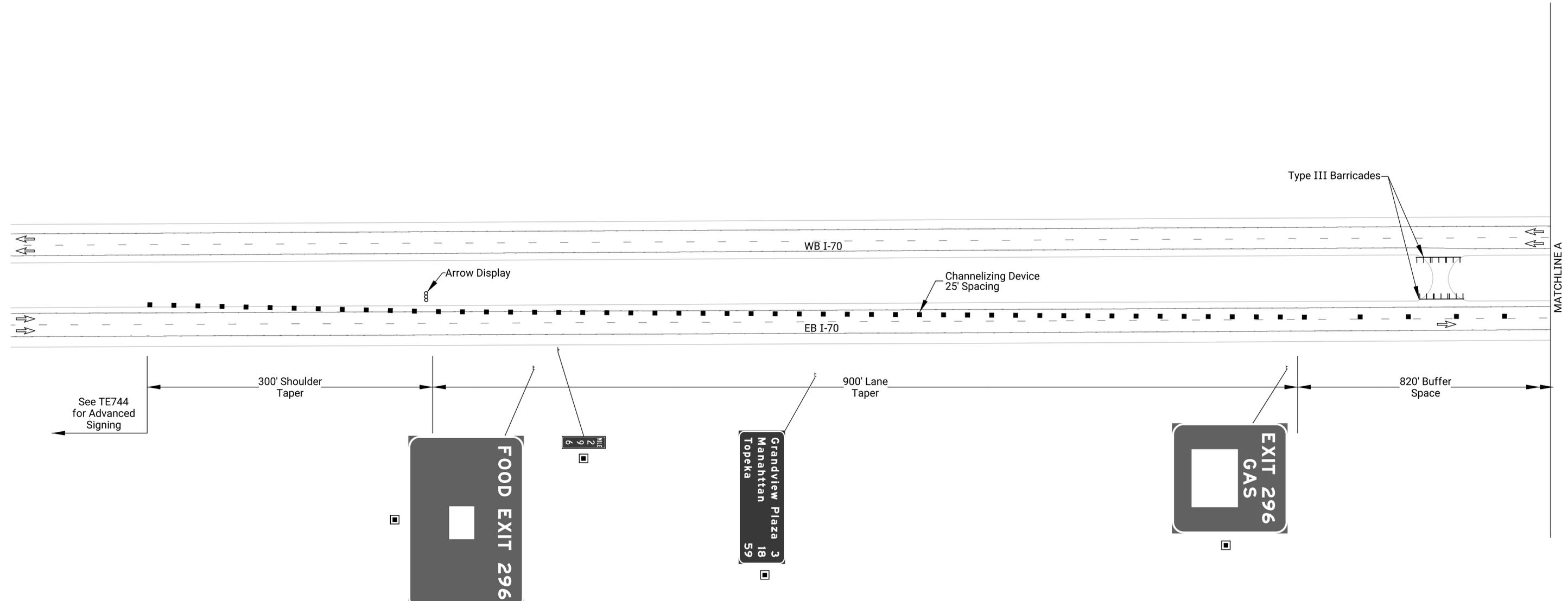
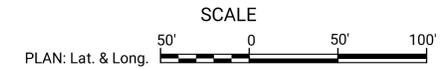
SHEET 7 OF 7

KANSAS DEPARTMENT OF TRANSPORTATION  
 PHASE 1B & 2B DETOUR PLAN  
 HENRY DR & WB I-70 RAMPS

| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 118       | 148          |

**TRAFFIC CONTROL PHASE 1A & 2A NOTES:**

1. Contractor shall install temporary traffic control devices prior to removal of pavement or construction per KDOT Standards and specifications unless specified on plans. Contractor shall cover existing traffic signs that conflict with the traffic control plan.
2. Contractor shall initiate project communication plan at a minimum of two weeks prior to I-70 closure.
3. Access to J Hill Rd shall be closed to I-70 motorists.
4. EB I-70 traffic must exit at Washington St interchange and follow detour provided.



**TRAFFIC CONTROL LEGEND**

- |  |                       |  |  |
|--|-----------------------|--|--|
|  | Workzone              |  | Type "A" Low Intensity Warning Light                             |
|  | Existing Sign         |  | Speed to be Determined by the Engineer                           |
|  | Channelizing Device   |  | Red Type "B" High Intensity Warning Light                        |
|  | Type III Barricade(s) |  | Sign Post  |
|  | Lane Use Arrow        |  | Tubular Marker and Raised Pavement Markers (Type II) (By Others) |

KANSAS DEPARTMENT OF TRANSPORTATION  
**TRAFFIC CONTROL PLAN**  
 PHASE 1A & 2A

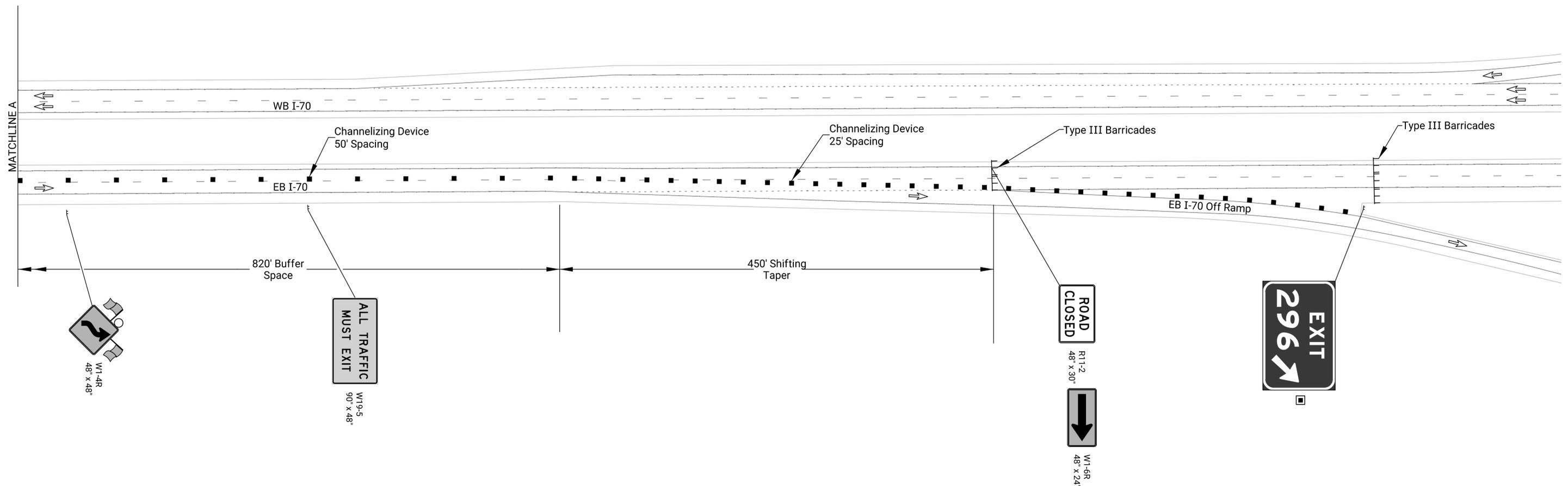
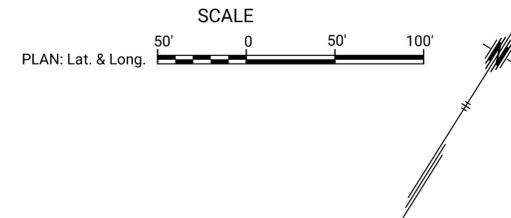
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 119       | 148          |

**TRAFFIC CONTROL PHASE 1A NOTES:**

- Contractor shall install temporary traffic control devices prior to removal of pavement or construction per KDOT Standards and specifications unless specified on plans. Contractor shall cover existing traffic signs that conflict with the traffic control plan.
- Contractor shall initiate project communication plan at a minimum of two weeks prior to I-70 closure.
- Access to J Hill Rd shall be closed to I-70 motorists.
- EB I-70 traffic must exit at Washington St interchange and follow detour provided.

**TRAFFIC CONTROL LEGEND**

- |   |                       |   |  |
|---|-----------------------|---|--|
|  | Workzone              |  | Type "A" Low Intensity Warning Light                             |
|  | Existing Sign         |  | Speed to be Determined by the Engineer                           |
|  | Channelizing Device   |  | Red Type "B" High Intensity Warning Light                        |
|  | Type III Barricade(s) |  | Sign Post  |
|  | Lane Use Arrow        |  | Tubular Marker and Raised Pavement Markers (Type II) (By Others) |



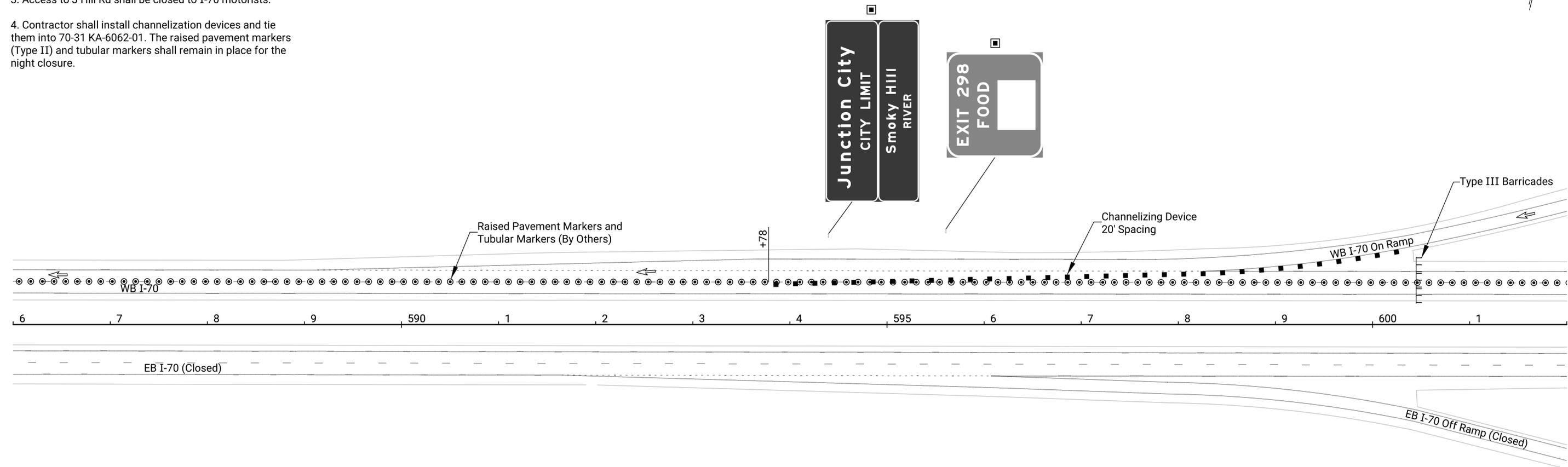
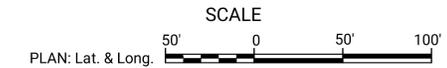
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 120       | 148          |

**TRAFFIC CONTROL PHASE 1A & 2A NOTES:**

- Contractor shall install temporary traffic control devices prior to removal of pavement or construction per KDOT Standards and specifications unless specified on plans. Contractor shall cover existing traffic signs that conflict with the traffic control plan.
- Contractor shall initiate project communication plan at a minimum of two weeks prior to I-70 closure.
- Access to J Hill Rd shall be closed to I-70 motorists.
- Contractor shall install channelization devices and tie them into 70-31 KA-6062-01. The raised pavement markers (Type II) and tubular markers shall remain in place for the night closure.

**TRAFFIC CONTROL LEGEND**

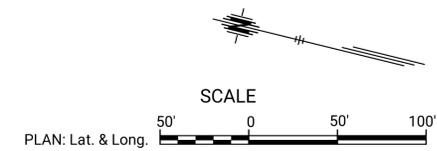
- |   |                       |   |  |
|---|-----------------------|---|--|
|  | Workzone              |  | Type "A" Low Intensity Warning Light                             |
|  | Existing Sign         |  | Speed to be Determined by the Engineer                           |
|  | Channelizing Device   |  | Red Type "B" High Intensity Warning Light                        |
|  | Type III Barricade(s) |  | Sign Post  |
|  | Lane Use Arrow        |  | Tubular Marker and Raised Pavement Markers (Type II) (By Others) |



Plotted by : ghuarter 14-MAR-2025 14:11  
File : KA648301cpl-03.dgn

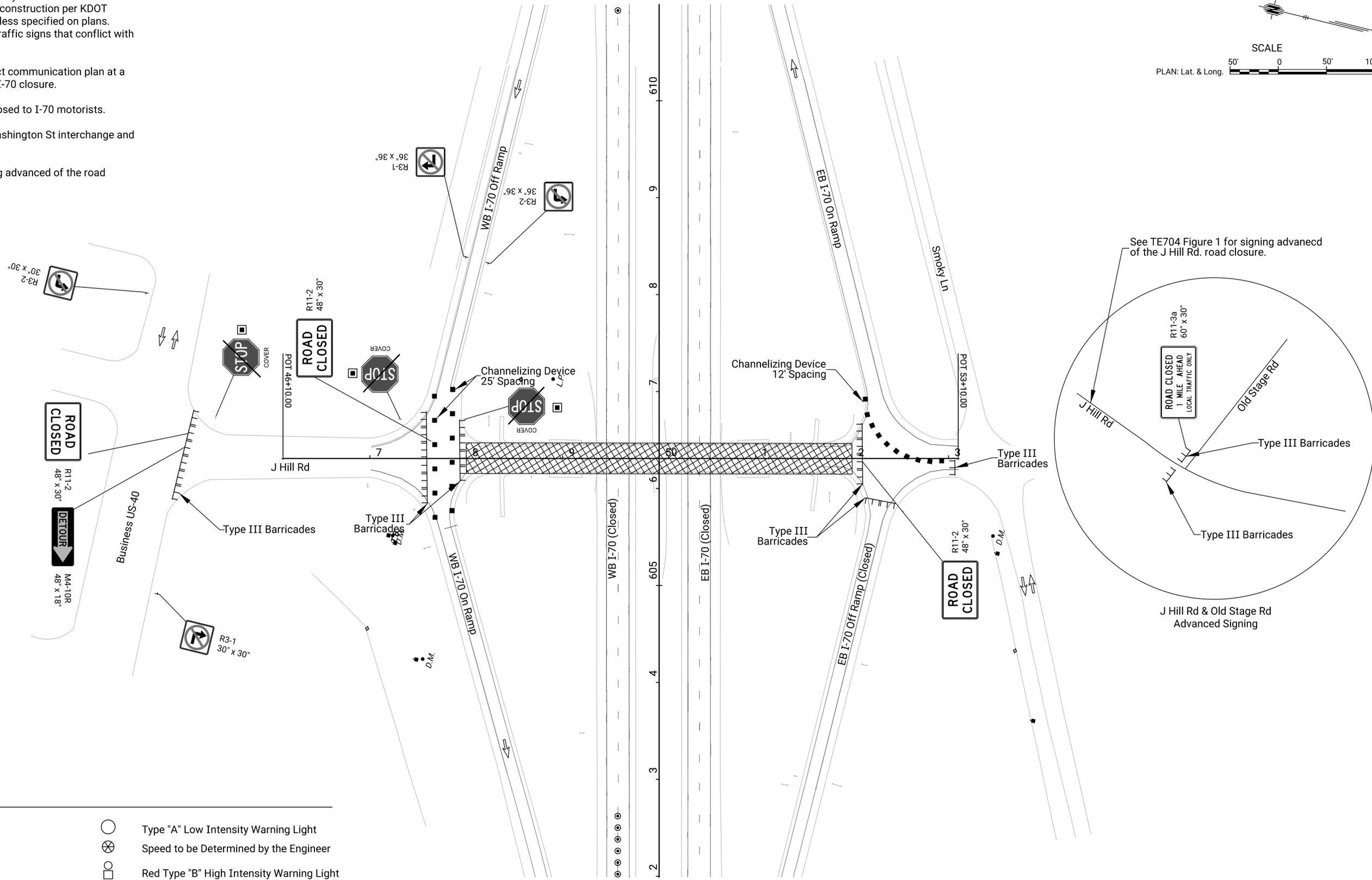
KANSAS DEPARTMENT OF TRANSPORTATION  
TRAFFIC CONTROL PLAN  
PHASE 1A & 2A

| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 121       | 148          |



**TRAFFIC CONTROL PHASE 1A & 2A NOTES:**

1. Contractor shall install temporary traffic control devices prior to removal of pavement or construction per KDOT Standards and specifications unless specified on plans. Contractor shall cover existing traffic signs that conflict with the traffic control plan.
2. Contractor shall initiate project communication plan at a minimum of two weeks prior to I-70 closure.
3. Access to J Hill Rd shall be closed to I-70 motorists.
4. EB I-70 traffic must exit at Washington St interchange and follow detour provided.
5. See TE704 Figure 1 for signing advanced of the road closure on J Hill Rd.



**TRAFFIC CONTROL LEGEND**

- |  |                       |  |  |
|--|-----------------------|--|--|
|  | Workzone              |  | Type "A" Low Intensity Warning Light                             |
|  | Existing Sign         |  | Speed to be Determined by the Engineer                           |
|  | Channelizing Device   |  | Red Type "B" High Intensity Warning Light                        |
|  | Type III Barricade(s) |  | Sign Post  |
|  | Lane Use Arrow        |  | Tubular Marker and Raised Pavement Markers (Type II) (By Others) |

KANSAS DEPARTMENT OF TRANSPORTATION  
**TRAFFIC CONTROL PLAN**  
 PHASE 1A & 2A

Plotted by : ghuarter 14-MAR-2025 14:12  
 File : KA648301cpl-04.dgn

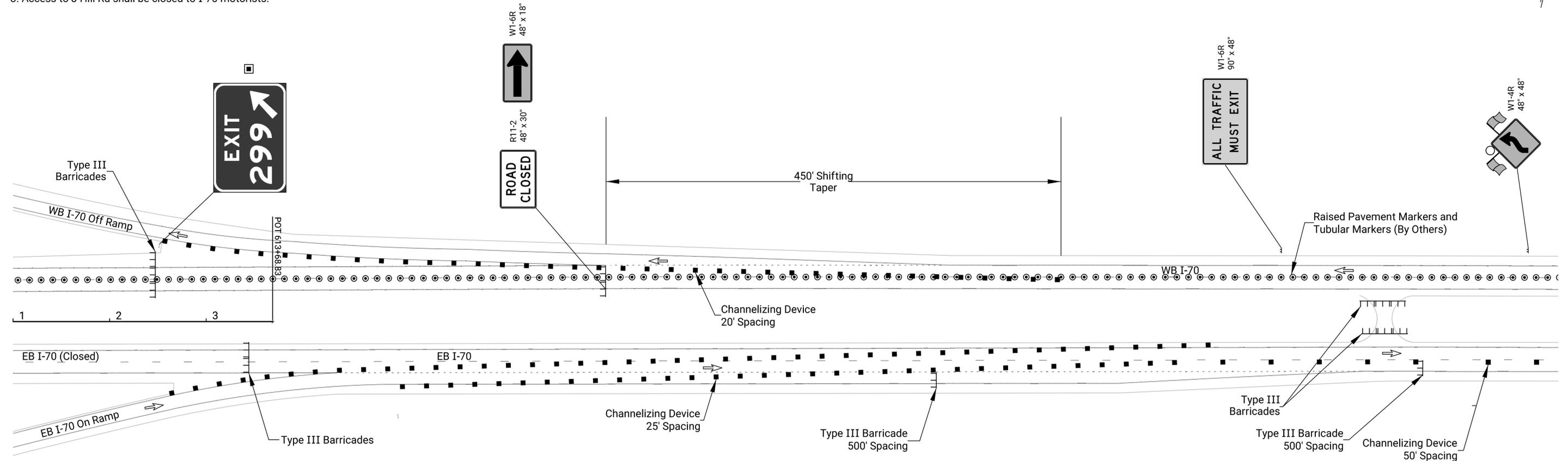
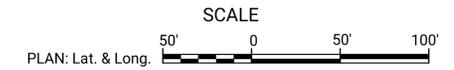
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 122       | 148          |

**TRAFFIC CONTROL PHASE 1A & 2A NOTES:**

1. Contractor shall install temporary traffic control devices prior to removal of pavement or construction per KDOT Standards and specifications unless specified on plans. Contractor shall cover existing traffic signs that conflict with the traffic control plan.
2. Contractor shall initiate project communication plan at a minimum of two weeks prior to I-70 closure.
3. Access to J Hill Rd shall be closed to I-70 motorists.
4. EB I-70 open to traffic using EB I-70 On Ramp at J Hill Rd. Traffic to be shifted to one lane immediately and shall use next crossover available from 70-31 KA 6062-01. Install Type III Barricades every 500 feet in the right lane.
5. Contractor shall install channelization devices and tie them into 70-31 KA-6062-01. The raised pavement markers (Type II) and tubular markers shall remain in place for the night closure.

**TRAFFIC CONTROL LEGEND**

-  Workzone
-  Existing Sign
-  Channelizing Device
-  Type III Barricade(s)
-  Lane Use Arrow
-  Type "A" Low Intensity Warning Light
-  Speed to be Determined by the Engineer
-  Red Type "B" High Intensity Warning Light
-  Sign Post
-  Tubular Marker and Raised Pavement Markers (Type II) (By Others)



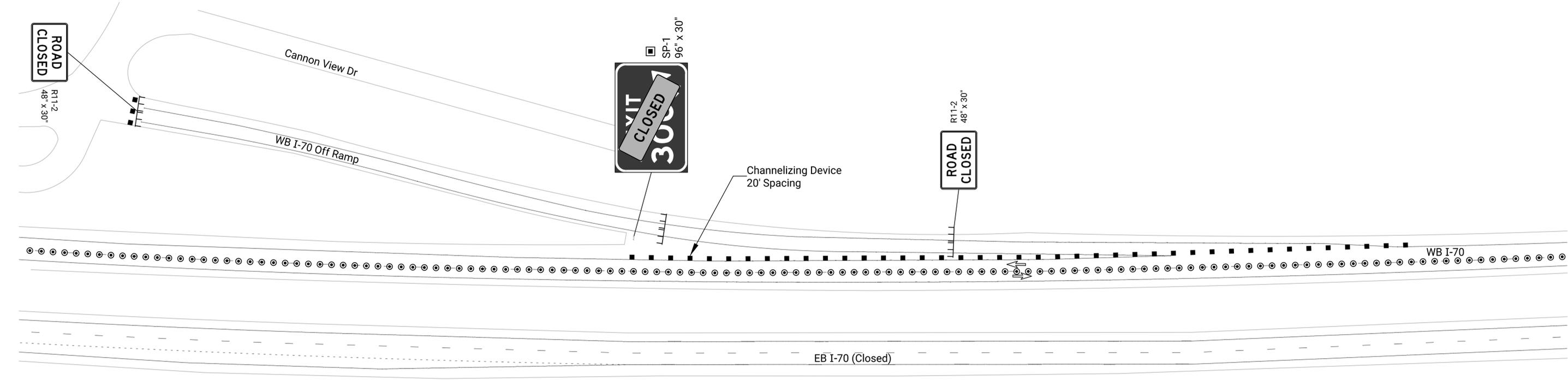
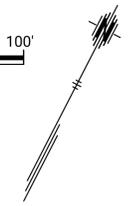
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 123       | 148          |

**TRAFFIC CONTROL PHASE 1A & 2A NOTES:**

- Contractor shall install temporary traffic control devices prior to removal of pavement or construction per KDOT Standards and specifications unless specified on plans. Contractor shall cover existing traffic signs that conflict with the traffic control plan.
- Contractor shall initiate project communication plan at a minimum of two weeks prior to J Hill Rd closure.
- Access to J Hill Rd shall be closed to I-70 motorists.
- EB I-70 open to traffic using EB I-70 On Ramp at J Hill Rd. Traffic to be shifted to one lane immediately and shall use next crossover available from 70-31 KA 6062-01. Install Type III barricades every 500 feet in the right lane.

**TRAFFIC CONTROL LEGEND**

- |   |                       |   |  |
|---|-----------------------|---|--|
|  | Workzone              |  | Type "A" Low Intensity Warning Light                             |
|  | Existing Sign         |  | Speed to be Determined by the Engineer                           |
|  | Channelizing Device   |  | Red Type "B" High Intensity Warning Light                        |
|  | Type III Barricade(s) |  | Sign Post  |
|  | Lane Use Arrow        |  | Tubular Marker and Raised Pavement Markers (Type II) (By Others) |



Plotted by : ghuarter 14-MAR-2025 14:12  
 File : KA648301cpl-09.dgn

KANSAS DEPARTMENT OF TRANSPORTATION  
 TRAFFIC CONTROL PLAN  
 PHASE 1A & 2A

| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 124       | 148          |

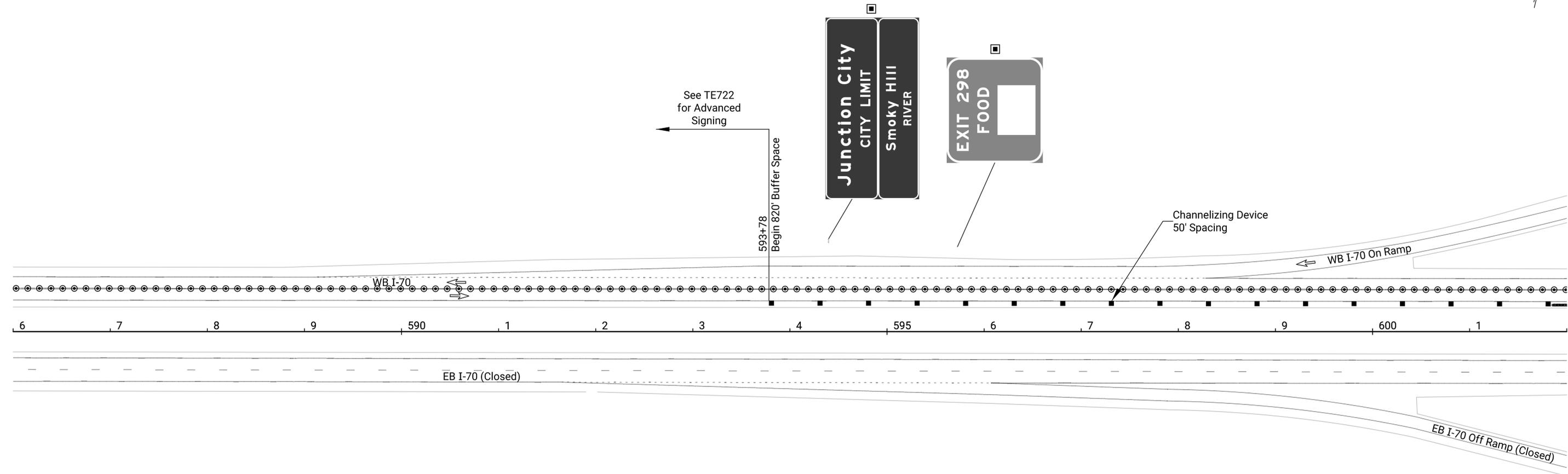
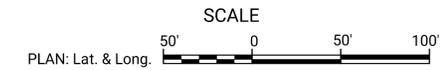
**TRAFFIC CONTROL PHASE 1B NOTES:**

1. Contractor shall install temporary traffic control devices prior to removal of pavement or construction per KDOT Standards and specifications unless specified on plans. Contractor shall cover existing traffic signs that conflict with the traffic control plan.

2. Contractor shall initiate project communication plan at a minimum of two weeks prior to J Hill Rd closure.

**TRAFFIC CONTROL LEGEND**

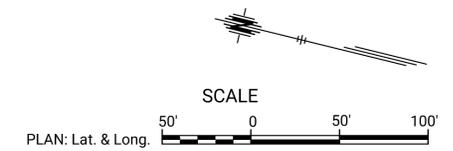
-  Workzone
-  Existing Sign
-  Channelizing Device
-  Type III Barricade(s)
-  Lane Use Arrow
-  Type "A" Low Intensity Warning Light
-  Speed to be Determined by the Engineer
-  Red Type "B" High Intensity Warning Light
-  Sign Post
-  Tubular Marker and Raised Pavement Markers (Type II) (By Others)



Plotted by : ghuarter 14-MAR-2025 14:12  
 File : KA648301cpl-06.dgn

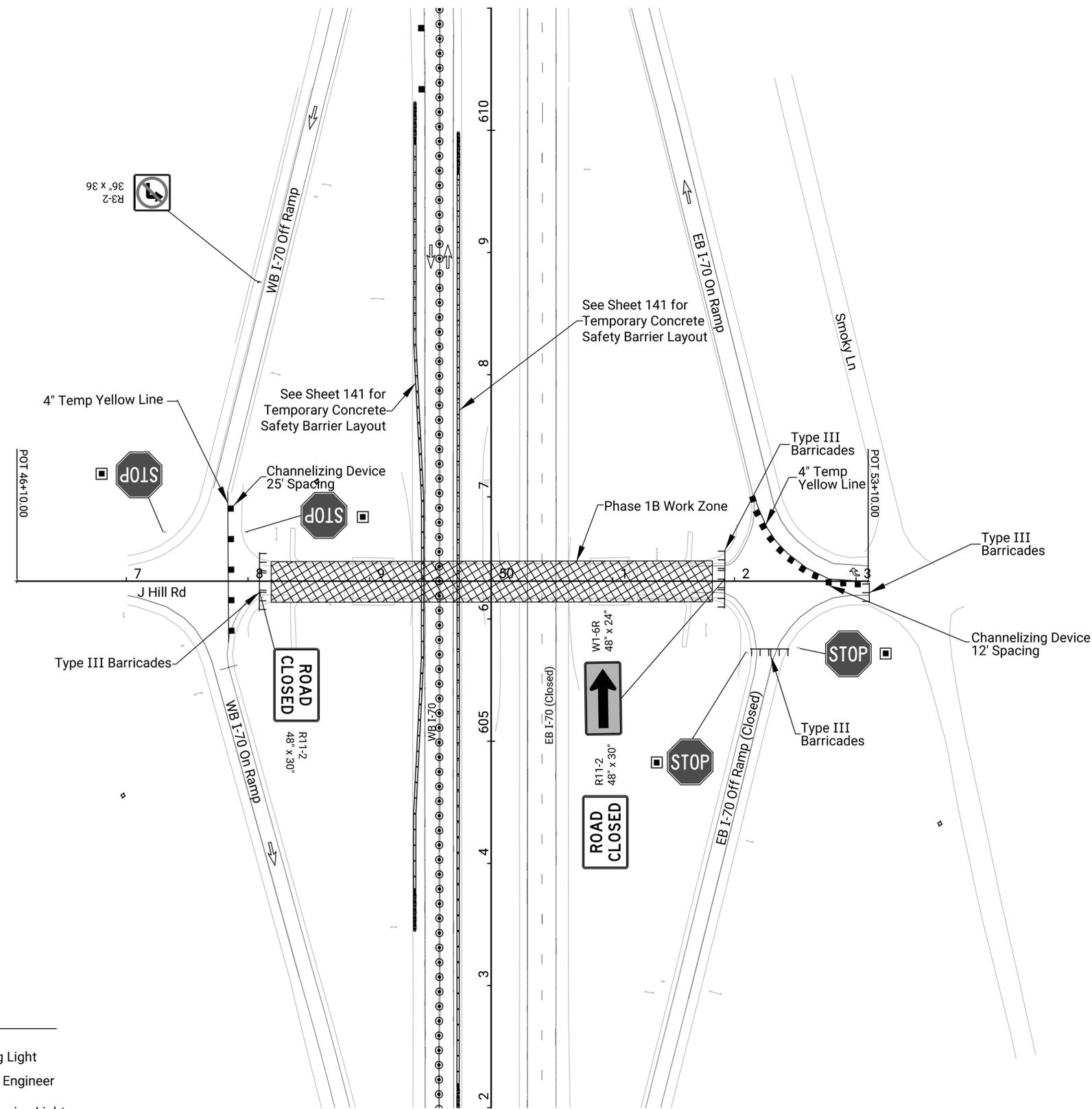
KANSAS DEPARTMENT OF TRANSPORTATION  
 TRAFFIC CONTROL PLAN  
 PHASE 1B & 2B

| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 125       | 148          |



**TRAFFIC CONTROL PHASE 1B & 2B NOTES:**

1. Contractor shall install temporary traffic control devices prior to removal of pavement or construction per KDOT Standards and specifications unless specified on plans. Contractor shall cover existing traffic signs that conflict with the traffic control plan.
2. Contractor shall initiate project communication plan at a minimum of two weeks prior to J Hill Rd closure.
3. Upon completion of EB I-70 Off Ramp, reinstall R1-1 with Work Zone Red Type B High Intensity Light and flags.



**TRAFFIC CONTROL LEGEND**

- |  |                       |  |  |
|--|-----------------------|--|--|
|  | Workzone              |  | Type "A" Low Intensity Warning Light                             |
|  | Existing Sign         |  | Speed to be Determined by the Engineer                           |
|  | Channelizing Device   |  | Red Type "B" High Intensity Warning Light                        |
|  | Type III Barricade(s) |  | Sign Post  |
|  | Lane Use Arrow        |  | Tubular Marker and Raised Pavement Markers (Type II) (By Others) |

Plotted by : ghuarter 14-MAR-2025 14:12  
File : KA648301cpl-07.dgn

KANSAS DEPARTMENT OF TRANSPORTATION  
**TRAFFIC CONTROL PLAN**  
PHASE 1B & 2B

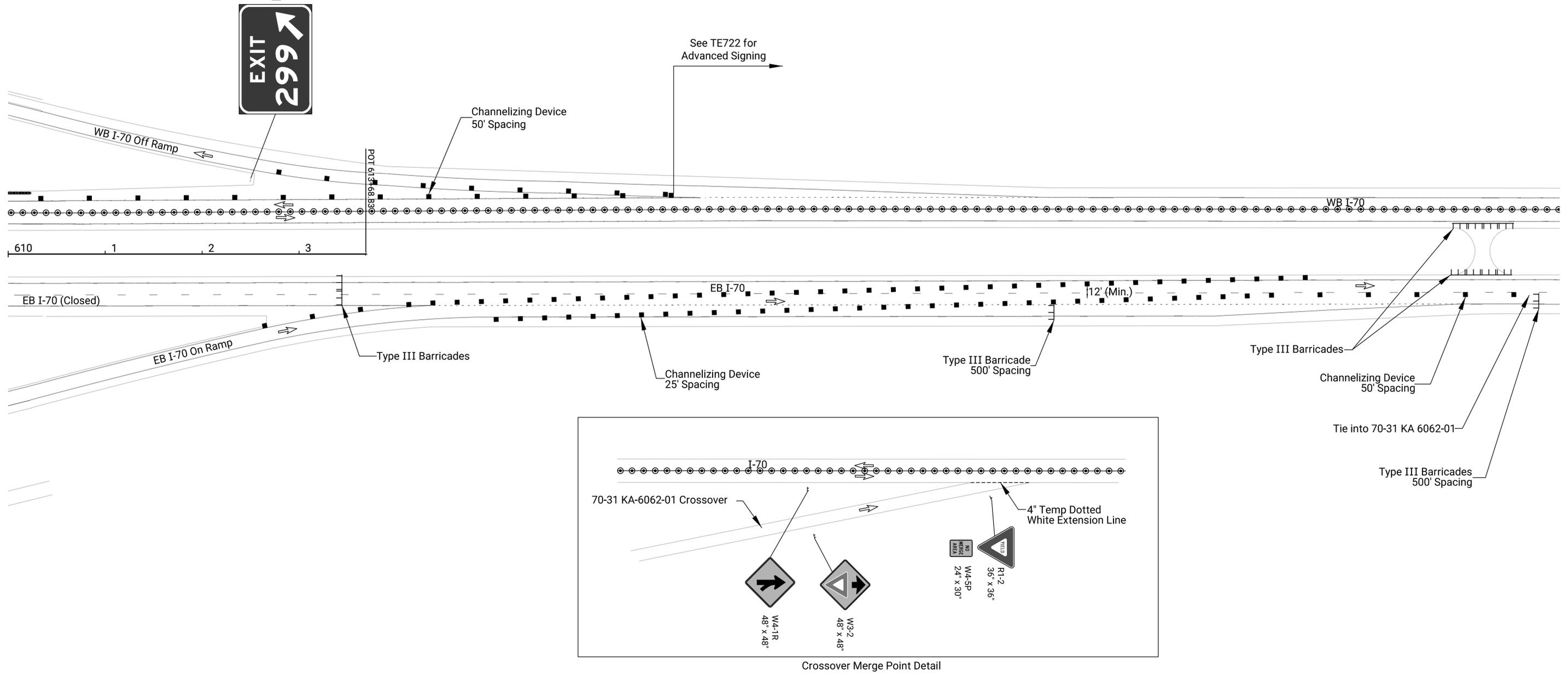
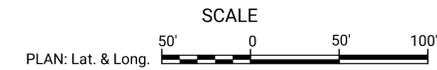
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 126       | 148          |

**TRAFFIC CONTROL PHASE 1B & 2B NOTES:**

- Contractor shall install temporary traffic control devices prior to removal of pavement or construction per KDOT Standards and specifications unless specified on plans. Contractor shall cover existing traffic signs that conflict with the traffic control plan.
- Contractor shall initiate project communication plan at a minimum of two weeks prior to J Hill Rd closure.
- Access to J Hill Rd shall be closed to I-70 motorists.
- EB I-70 open to traffic using EB I-70 On Ramp at J Hill Rd. Traffic to be shifted to one lane immediately and shall use next crossover available from 70-31 KA 6062-01. Install Type III barricades every 500 feet in the right lane.

**TRAFFIC CONTROL LEGEND**

- |   |                       |   |  |
|---|-----------------------|---|--|
|  | Workzone              |  | Type "A" Low Intensity Warning Light                             |
|  | Existing Sign         |  | Speed to be Determined by the Engineer                           |
|  | Channelizing Device   |  | Red Type "B" High Intensity Warning Light                        |
|  | Type III Barricade(s) |  | Sign Post  |
|  | Lane Use Arrow        |  | Tubular Marker and Raised Pavement Markers (Type II) (By Others) |



|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 127       | 148          |

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

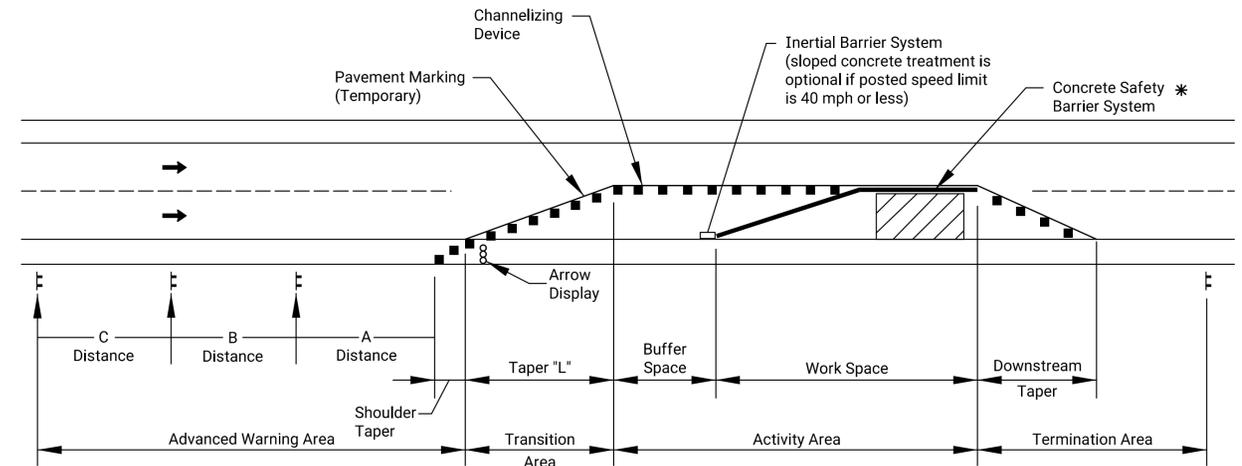
2) Minimum Lane Width: Lane widths shall be a minimum of 11' (measured between centerlines of pavement markings) or as shown on the plans, or as directed by the engineer. A lane width less than 11' may require restricted roadway width signing.

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

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

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

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



### TYPICAL WORK ZONE COMPONENTS

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

Minimum advance warning sign spacing (in feet):

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

\* Posted speed prior to work starting  
 The minimum spacing between signs shall be no less than 100', unless directed by the engineer.  
 The spacing between any signs may be increased beyond the minimum values in the table above as approved by the engineer in order to maximize visibility.

Taper Formulas:

$L = WS$  for speeds of 45 MPH or more

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

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

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

Channelizer Placement:

- (1) The spacing between devices in transition area (taper) should not exceed a distance in feet equal to 1/2 the posted speed limit in mph prior to work starting.
- (2) The spacing between devices in the advanced warning area and the activity area should not exceed a distance in feet equal to two times the posted speed limit in mph prior to work starting.
- (3) Channelizing devices shall be placed for optimum visibility, normally at right angles to the traffic flow.
- (4) Place directional indicator barricades in series to direct traffic onto the new path. The arrow sign should not be visible to opposing traffic.
- (5) Alternating diagonal orange and white striping must slope downward in the direction traffic is expected to pass.

Buffer Space

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

\* Posted speed prior to work starting

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

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

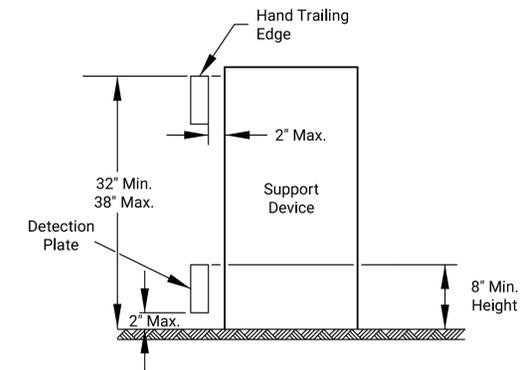
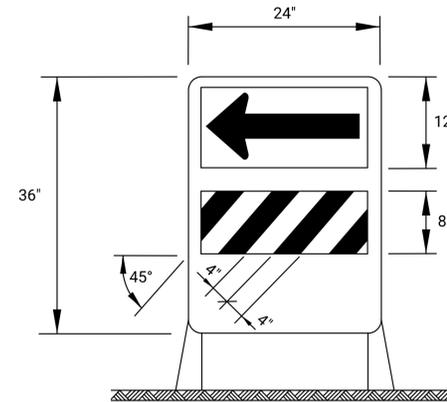
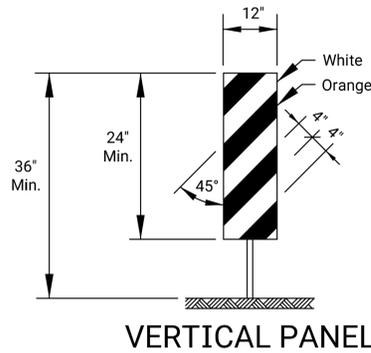
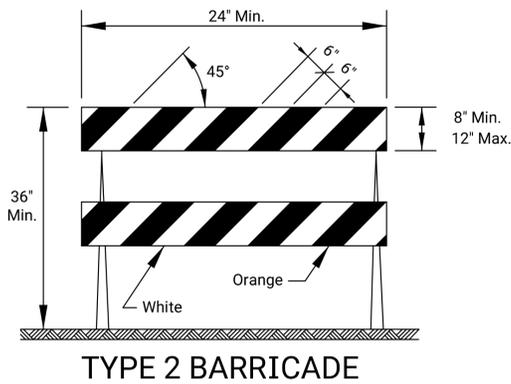
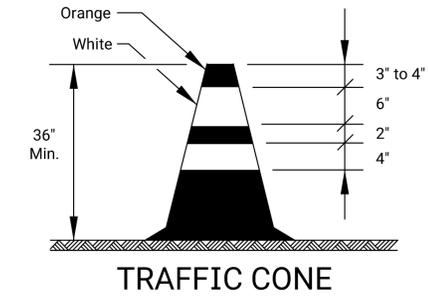
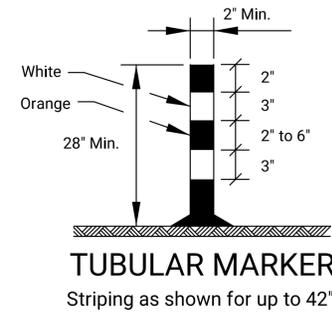
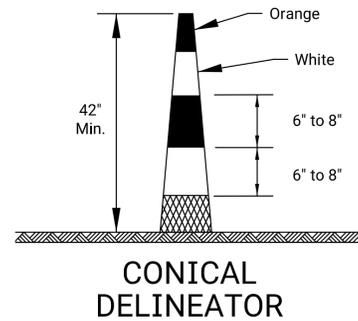
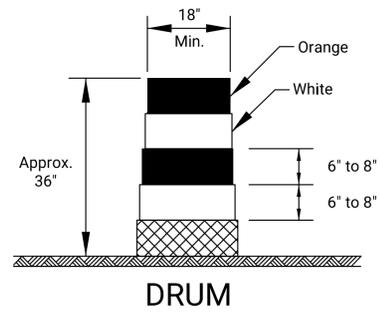
| NO. | DATE     | REVISIONS                     | BY     | APPD   |
|-----|----------|-------------------------------|--------|--------|
| 02  | 03-13-18 | W8-15p usage changed to Shall | R.W.B. | E.K.G. |
| 01  | 08-18-15 | Channelizer spacing info      | R.W.B. | K.E.   |

KANSAS DEPARTMENT OF TRANSPORTATION

### TRAFFIC CONTROL GENERAL NOTES

TE700

| DESIGNED   | B.A.H. | DETAILED   | R.W.B. | QUANTITIES | TRACED    |
|------------|--------|------------|--------|------------|-----------|
| DESIGN CK. |        | DETAIL CK. |        | QUAN. CK.  | TRACE CK. |



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

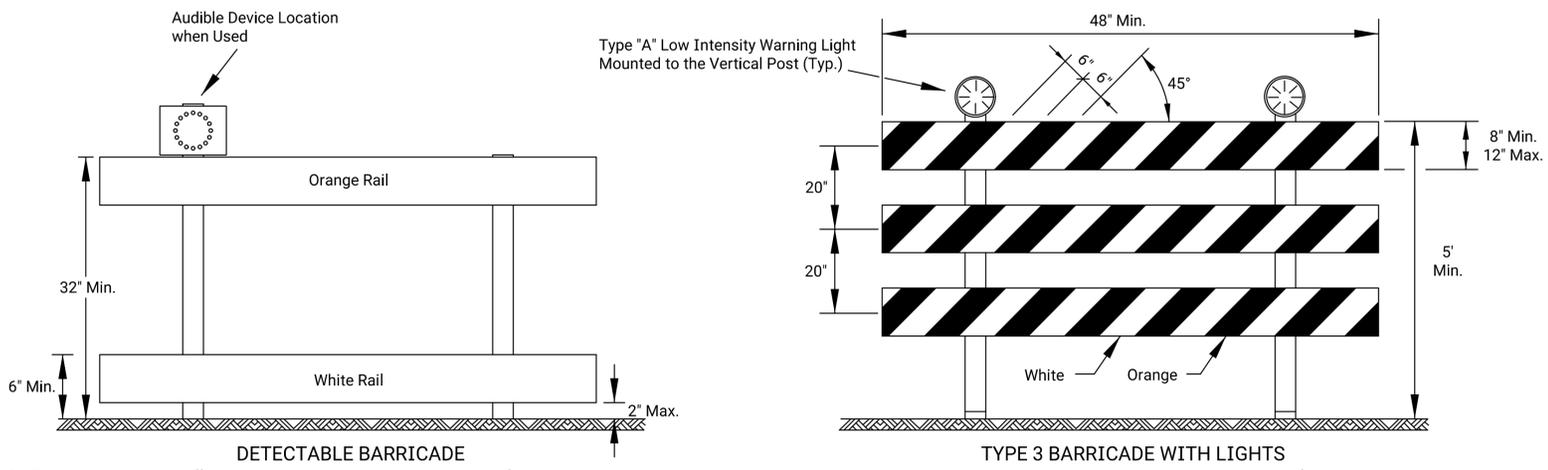
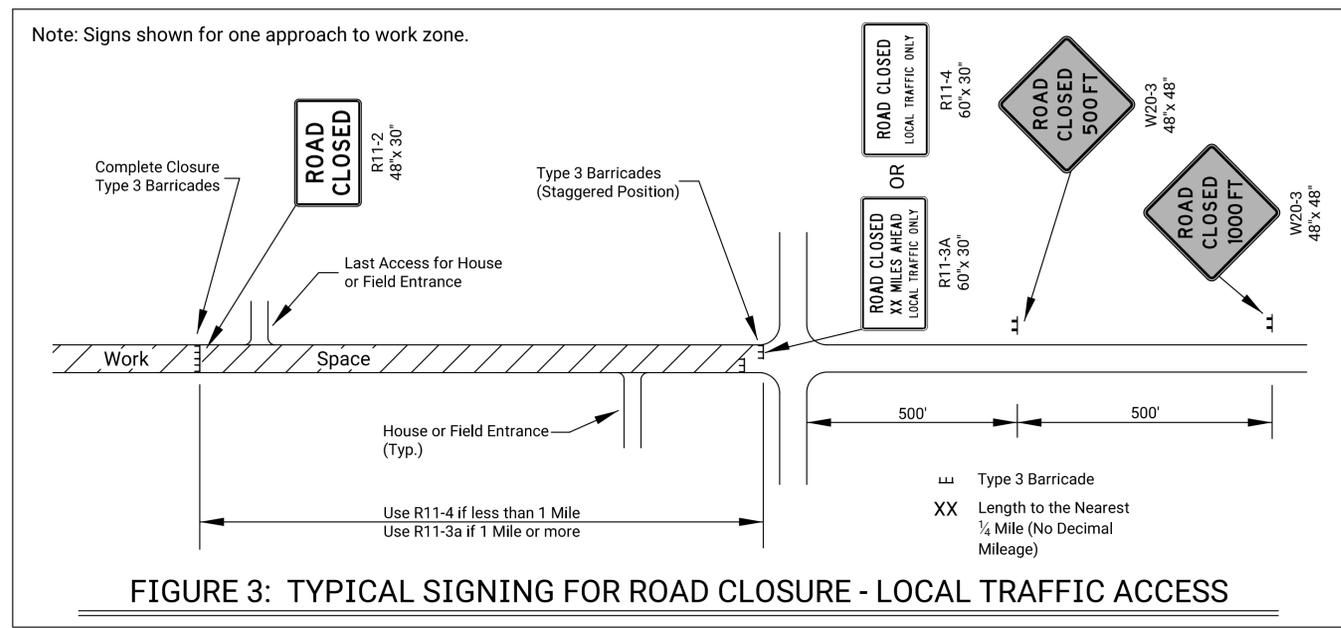
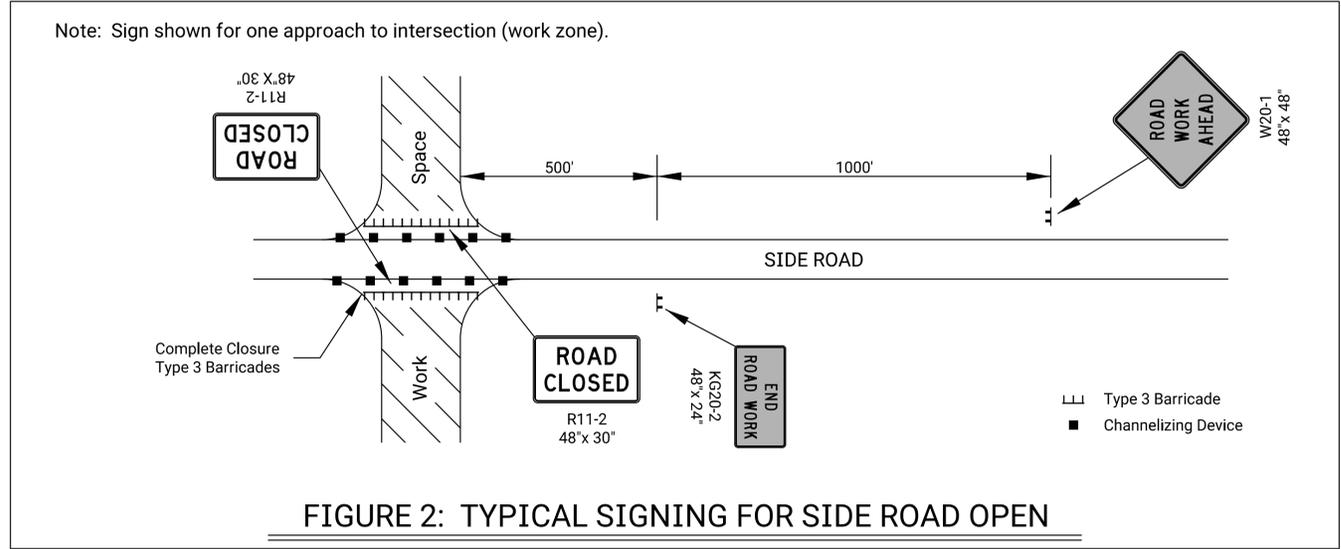
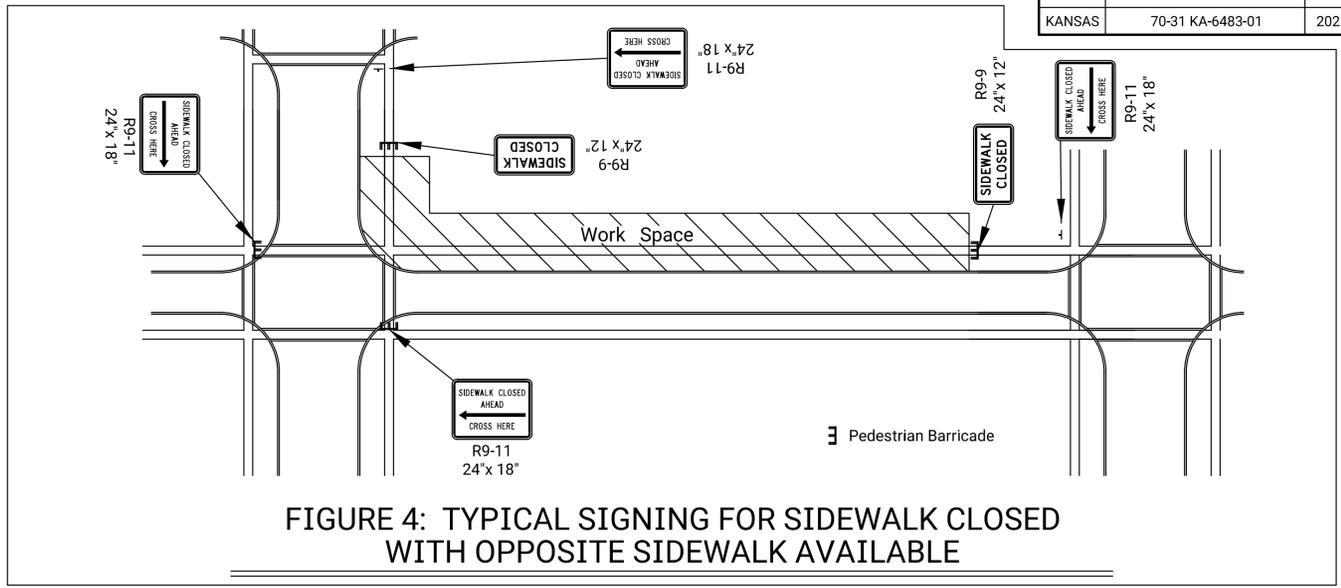
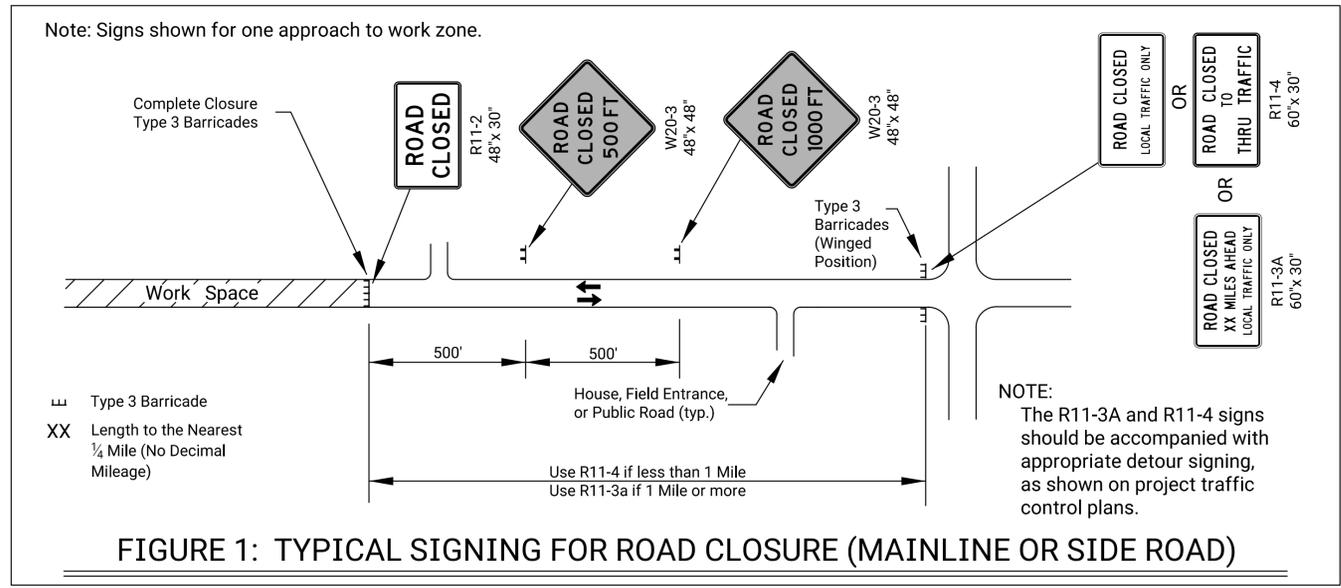
The stripes shall slope downward to the traffic side for channelization.

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.

- Support device shall not project beyond the detection plate into the pathway.
- Hand trailing edges and detection plates are optional for continuous walls.
- Interconnect pedestrian channelizers to prevent displacement and to provide continuous guidance through or around work.
- Alternate pathways shall be firm, stable, and slip resistant.
- 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.
- Use alternating orange/white on interconnected devices.

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

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



- 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.

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

**ROAD CLOSED GENERAL NOTES**

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

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

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

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

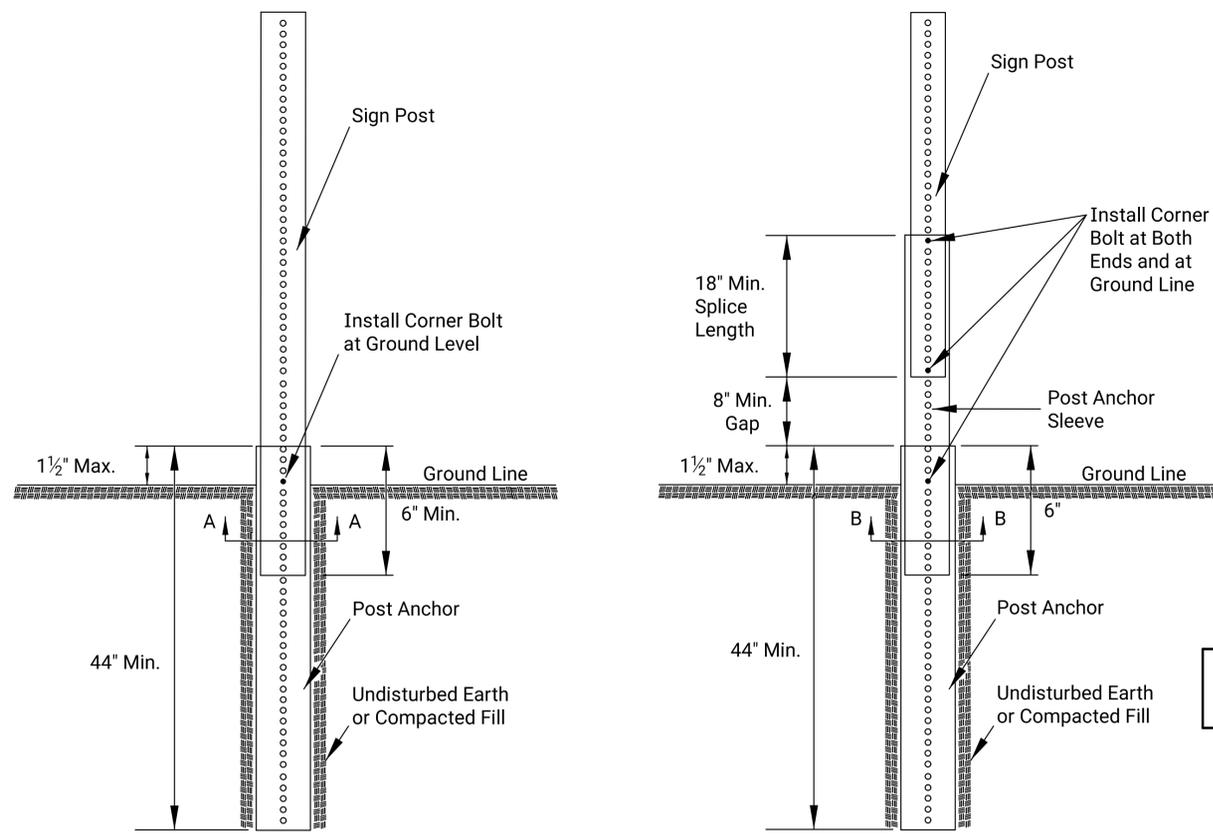
The words "BRIDGE OUT" (or BRIDGE CLOSED) may be substituted for the words "ROAD CLOSED" on the R11-3a or R11-4 sign where applicable.

| NO.                                 | DATE   | REVISIONS  | BY         | APPD              |
|-------------------------------------|--------|------------|------------|-------------------|
| KANSAS DEPARTMENT OF TRANSPORTATION |        |            |            |                   |
| <b>TRAFFIC CONTROL CLOSURES</b>     |        |            |            |                   |
| TE704                               |        |            |            |                   |
| DESIGNED                            | B.A.H. | 06-01-15   | APPD.      | Kristina Erickson |
| DETAIL                              | CK.    | DETAIL CK. | QUANTITIES | TRACED            |
| DESIGN CK.                          |        |            | QUAN. CK.  | TRACE CK.         |



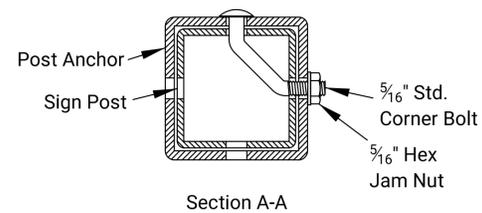
|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 131       | 148          |

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

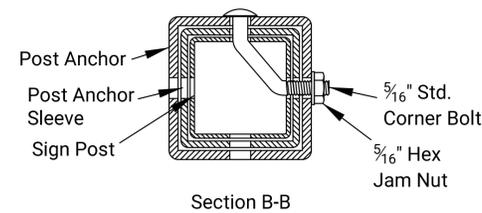


P.S.S.T. Detail

Telescoping P.S.S.T. Detail



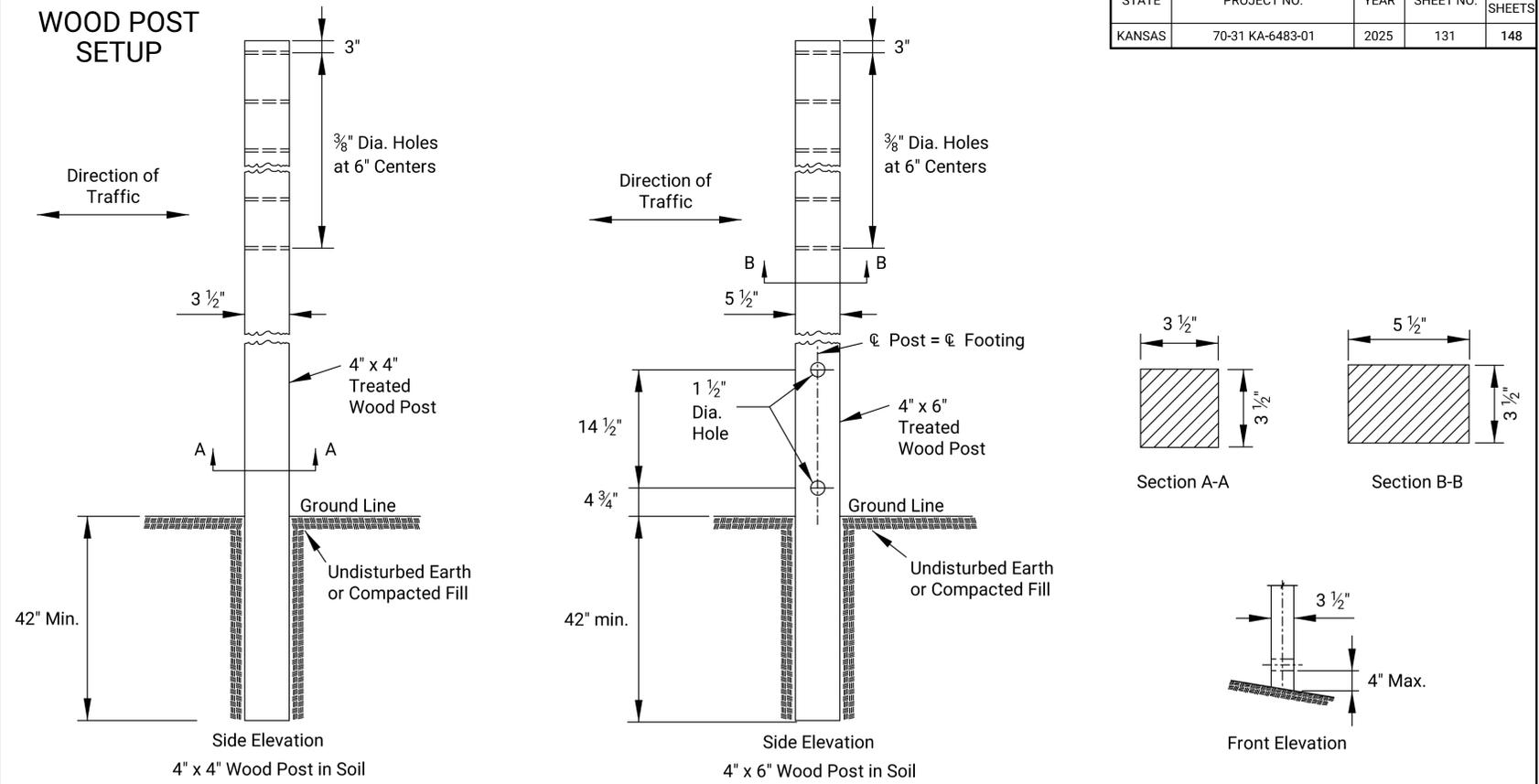
Section A-A



Section B-B

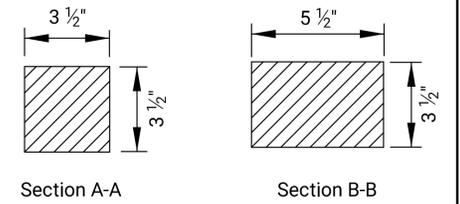
Details for 2", 2 1/4", or 2 1/2" sign posts  
Place bolts in the same corner along each sign post.

### WOOD POST SETUP



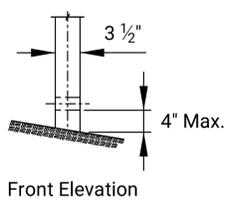
Side Elevation  
4" x 4" Wood Post in Soil

Side Elevation  
4" x 6" Wood Post in Soil



Section A-A

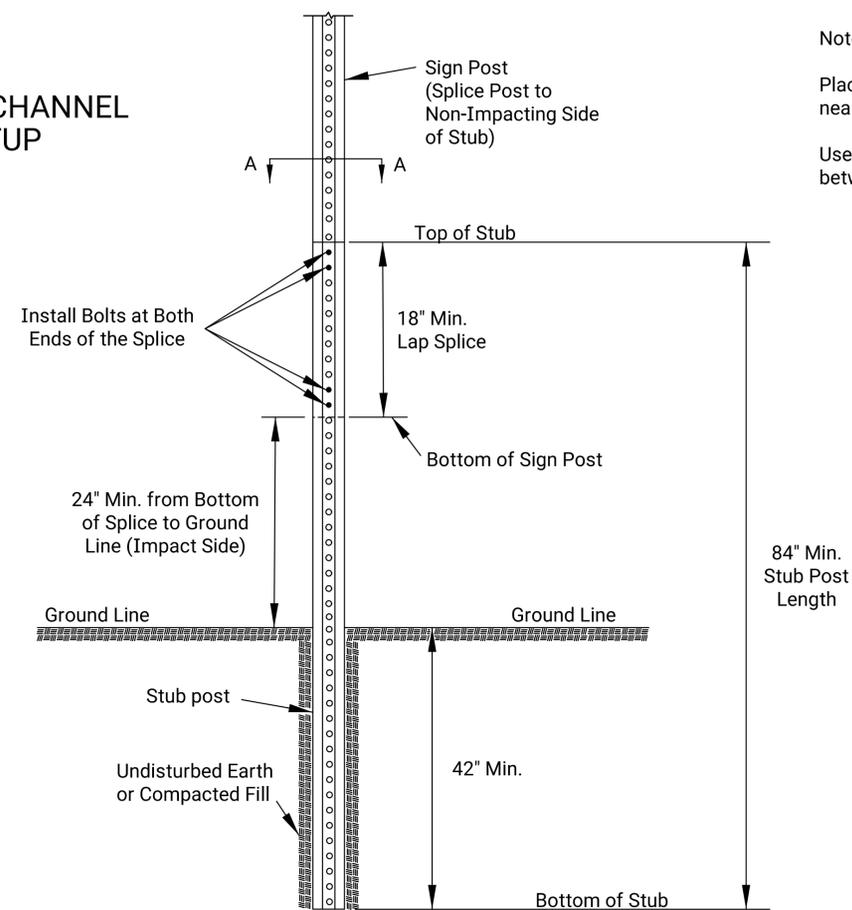
Section B-B



Front Elevation

See TE710 for Additional Details and Requirements

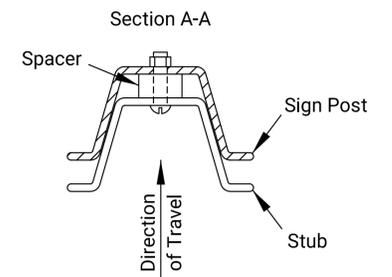
### 3 LB/F U-CHANNEL SETUP



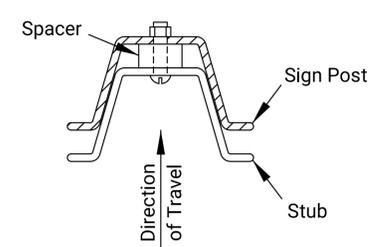
Notes:

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

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



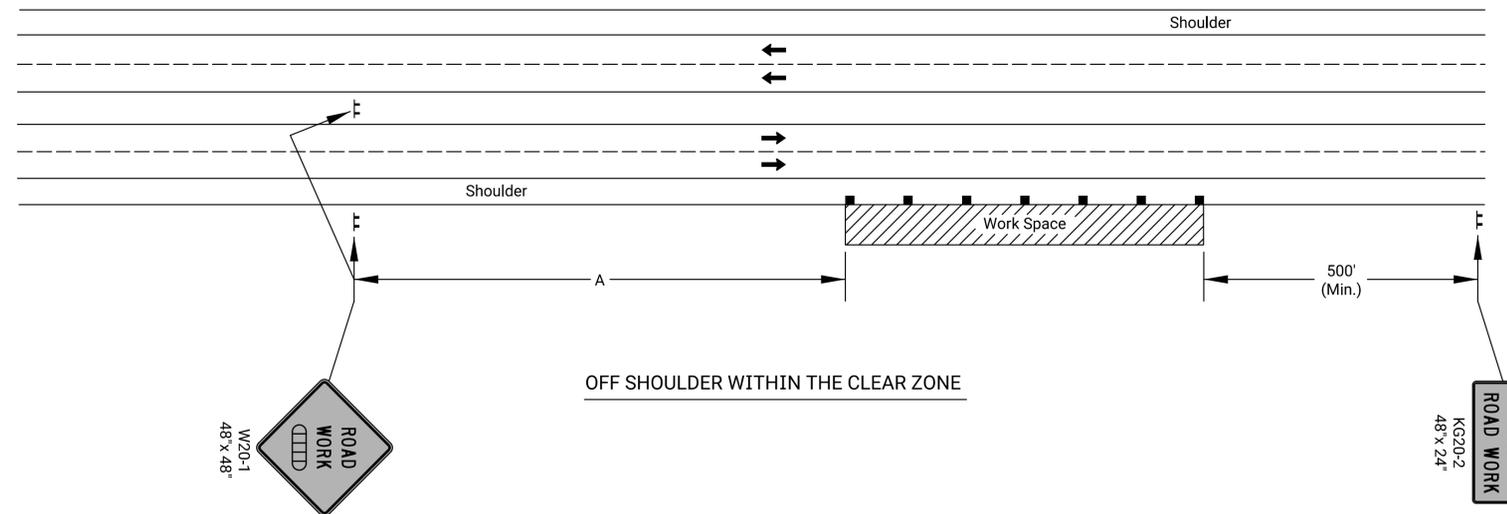
Section A-A



Direction of Travel

| NO.                                 | DATE       | REVISIONS | BY         | APPD              |
|-------------------------------------|------------|-----------|------------|-------------------|
| KANSAS DEPARTMENT OF TRANSPORTATION |            |           |            |                   |
| <b>TRAFFIC CONTROL SIGN POSTS</b>   |            |           |            |                   |
| TE712                               |            |           |            |                   |
| DESIGNED                            | B.A.H.     | APPD.     | 06-01-15   | Kristina Erickson |
| DESIGN CK.                          | DETAIL CK. | R.W.B.    | QUANTITIES | TRACED            |
|                                     |            |           | QUAN.CK.   | TRACE CK.         |

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 132       | 148          |

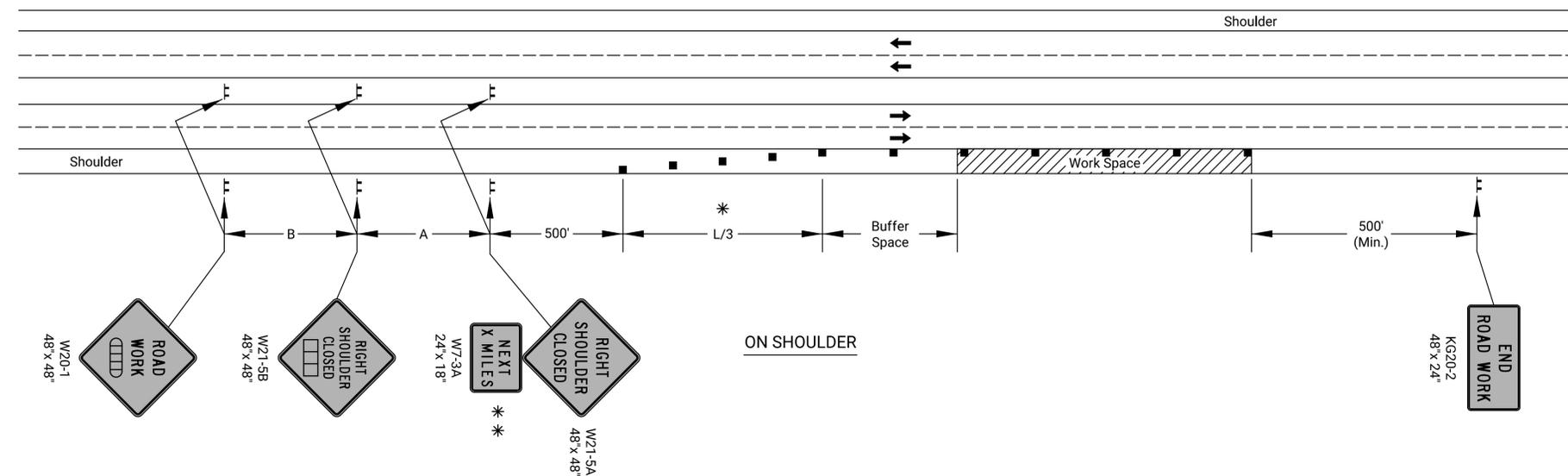


Notes:

For work in the median, install signs and channelizing devices for each direction of traffic according to the applicable typical drawing.

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 a high-intensity rotating, flashing, oscillating, or strobe light is used.



- \* Omit taper if paved shoulder is less than 8' wide.
- \*\* Eliminate W7-3a if shoulder is closed for less than 2 miles.

- X Length to the Nearest Whole Mile
- Channelizing Device
- ▭ Ahead, 1500 ft, or 1 Mile
- ▭ Ahead, 1000 ft, 1500 ft or 1/2 Mile

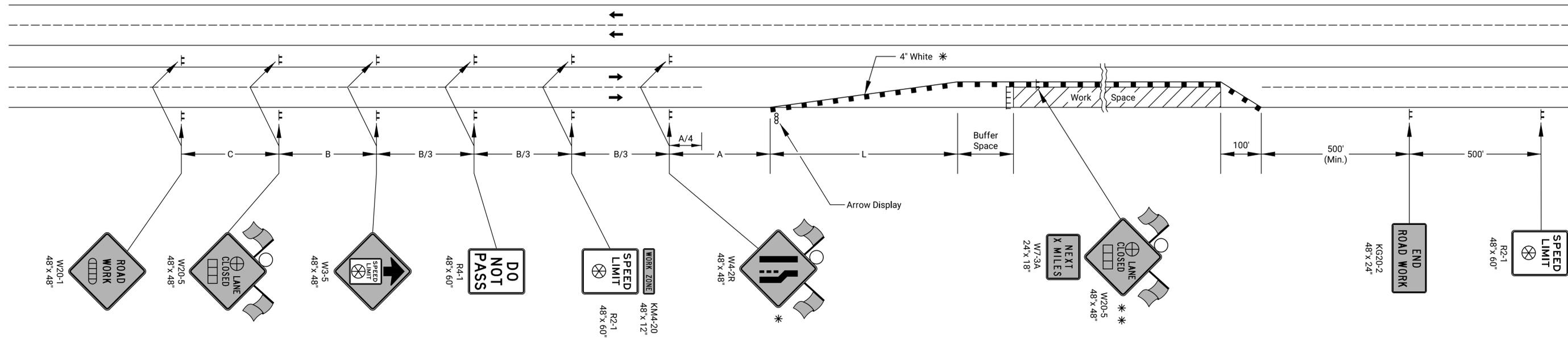
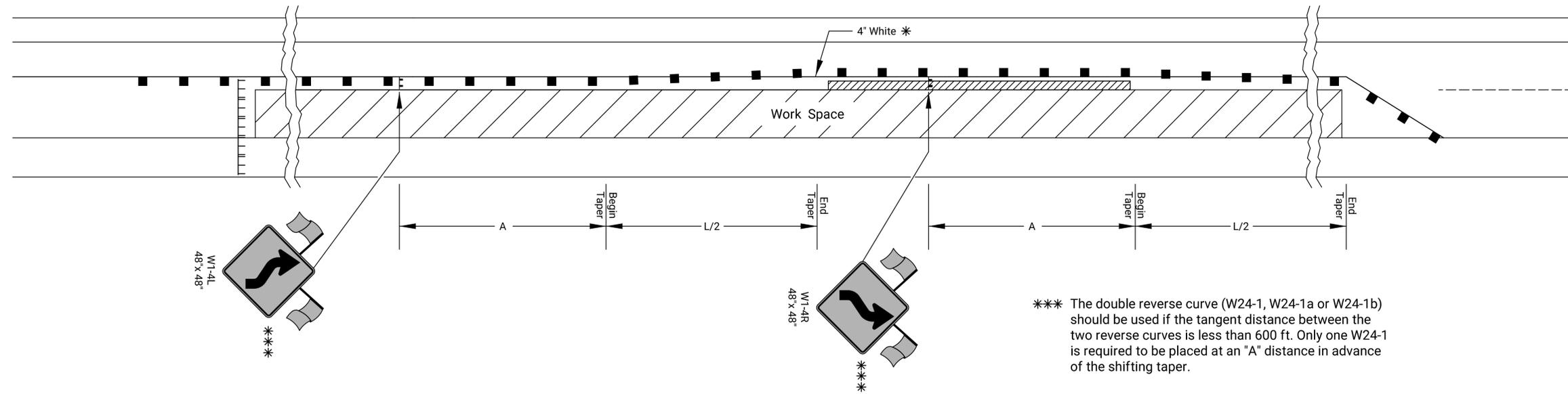
Plotted by : ghuarter 14-MAR-2025 14:14  
File : te722.dgn

| KANSAS DEPARTMENT OF TRANSPORTATION                 |            |           |        |                   |
|---|------------|-----------|--------|-------------------|
| NO.   | DATE       | REVISIONS | BY     | APPD              |
| TRAFFIC CONTROL<br>SHOULDER WORK<br>DIVIDED ROADWAY |            |           |        |                   |
| TE722   |            |           |        |                   |
| FHWA APPROVAL                                       |            | 06-01-15  | APPD.  | Kristina Ericksen |
| DESIGNED  | L.E.R.     | DETAILED  | R.W.B. | QUANTITIES        |
| DESIGN CK.  | DETAIL CK. | QUAN. CK. | TRACED | TRACE CK.         |

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 133       | 148          |

## 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.



- ▤ Type 3 Barricades
- X Length to the Nearest Whole Mile
- Channelizing Device
- ▤▤▤ Ahead, 1500 ft, or 1 mile
- ▤▤▤ Ahead, 1000 ft, 1500 ft, or 1/2 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.

Left-side signs shall be omitted for a four-lane undivided highway.

One flagger should be stationed within each multi-lane roadway activity area where work is in a closed lane adjacent to traffic and not separated by a concrete safety barrier system.

Plotted by : ghuarter 14-MAR-2025 14:14  
File : te744.dgn

| KANSAS DEPARTMENT OF TRANSPORTATION              |            |                               |        |              |
|--|------------|-------------------------------|--------|--------------|
| TRAFFIC CONTROL<br>LANE CLOSURE ON MULTILANE HWY |            |                               |        |              |
| TE744  |            |                               |        |              |
| DESIGNED   | B.A.H.     | DATE                          | APPD.  | Eric Koehler |
| 01   | 03-13-18   | W24-1 usage changed to Should | R.W.B. | E.G.K.       |
| NO.  | DATE       | REVISIONS                     | BY     | APPD.        |
|  |            |                               |        |              |
| DESIGN CK.                                       | DETAIL CK. | QUAN. CK.                     | TRACED | TRACE CK.    |

### SUMMARY OF TRAFFIC CONTROL DEVICES (EACH)

| Work Zone Sign (Special) |                     |                     |
|--------------------------|---------------------|---------------------|
| Sign No.                 | 16.25 Sq.Ft. & Less | 16.26 Sq.Ft. & Over |
| SP-1                     | 1                   |                     |
|                          |                     |                     |
|                          |                     |                     |
|                          |                     |                     |
|                          |                     |                     |
|                          |                     |                     |
|                          |                     |                     |
|                          |                     |                     |



SP-6;  
3.0" Radius, 1.0" Border, Black on Orange;  
"CLOSED", D 2K;  
Table of distances between letter and object lefts

|      |      |     |      |      |     |     |      |
|------|------|-----|------|------|-----|-----|------|
|      | C    | L   | O    | S    | E   | D   |      |
| 19.0 | 10.8 | 9.0 | 10.3 | 10.2 | 9.5 | 8.2 | 19.0 |

### SUMMARY OF TRAFFIC CONTROL DEVICES (EACH PER DAY)

\* Quantity most used on the project at any one time

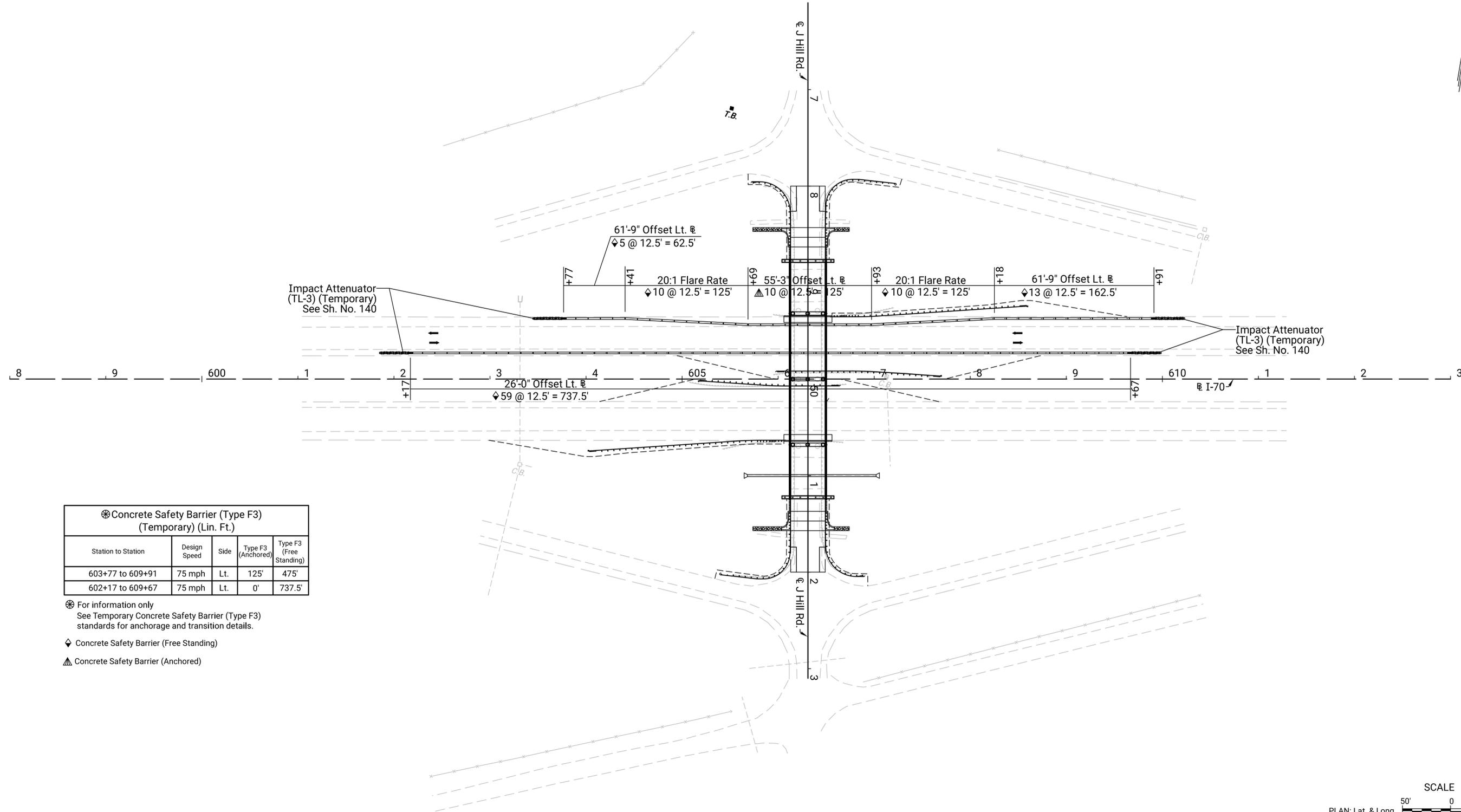
| Sign No. | Work Zone Signs * |            |              |
|----------|-------------------|------------|--------------|
|          | 0-9.25            | 9.26-16.25 | 16.26 & Over |
| W20-7    |                   | 2          |              |
| M4-8     | 19                |            |              |
| M(I)3-2  | 15                |            |              |
| M1-1     | 18                |            |              |
| M1-4     | 22                |            |              |
| M1-5     | 18                |            |              |
| M5-1L    | 2                 |            |              |
| M6-3     | 7                 |            |              |
| M6-1L    | 3                 |            |              |
| R11-2    |                   | 6          |              |
| M4-10L   | 1                 |            |              |
| R3-1     | 5                 |            |              |
| R3-2     | 3                 |            |              |
| M4-3     | 9                 |            |              |
| M4-8a    | 3                 |            |              |
| M6-2R    | 4                 |            |              |
| M(I)3-4  | 8                 |            |              |
| M5-1R    | 2                 |            |              |
| M6-1R    | 3                 |            |              |
| M4-10R   | 2                 |            |              |
| D1-1     | 1                 |            |              |
| M5-3     | 1                 |            |              |
| M5-2R    | 3                 |            |              |
| W19-5    | 1                 |            |              |
| W1-6R    | 1                 |            |              |
| R11-3a   |                   | 1          |              |
| W20-1    |                   | 2          |              |
| W20-5    |                   | 2          |              |
| W3-5     |                   | 2          |              |
| R4-1     |                   |            | 2            |
| W4-2L    |                   | 2          |              |
| W21-5B   |                   | 2          |              |
| W21-5A   |                   | 2          |              |
| W1-4R    |                   | 1          |              |
| W20-3    |                   | 2          |              |
| R2-1     |                   |            | 2            |
| KM4-20   | 2                 |            |              |
| KI-104A  |                   | 2          |              |
| KI-105A  |                   | 2          |              |

| Barricades *       |            | Channelizing Devices * |          |            |
|--------------------|------------|------------------------|----------|------------|
| Type 3 (4' to 12') | Pedestrian | Fixed                  | Portable | Pedestrian |
| 67                 |            |                        | 321      |            |

| Lighted Devices *                                     |    |
|---|----|
| Work Zone Warning Light (Type "A" Low Intensity)      | 61 |
| Work Zone Warning Light (Red Type "B" High Intensity) | 1  |
| Arrow Display   | 2  |
| Portable Changeable Message Sign                      | 1  |

| Recapitulation of Quantities                              |          |              |
|---|----------|--------------|
| Item  | Quantity | Unit         |
| Work Zone Signs (0 to 9.25 Sq.Ft.)                        | 26,780   | Each Per Day |
| Work Zone Signs (9.26 to 16.25 Sq.Ft.)                    | 4900     | Each Per Day |
| Work Zone Signs (16.26 Sq.Ft. & Over)                     | 700      | Each Per Day |
| Work Zone Barricades (Type 3 - 4' to 12')                 | 11,730   | Each Per Day |
| Work Zone Barricades (Pedestrian)                         |          | Each Per Day |
| Channelizer (Fixed)                                       |          | Each Per Day |
| Channelizer (Portable)                                    | 56,180   | Each Per Day |
| Channelizer (Pedestrian)                                  |          | Each Per Day |
| Work Zone Warning Light (Type "A" Low Intensity)          | 10,680   | Each Per Day |
| Work Zone Warning Light (Red Type "B" High Intensity)     | 180      | Each Per Day |
| Arrow Display   | 350      | Each Per Day |
| Portable Changeable Message Sign                          | 180      | Each Per Day |
| Pavement Marking (Temporary)                              |          |              |
| 4" Solid (Type I)   | 2.5      | Sta./Line    |
| 4" Solid (Type II)  |          | Sta./Line    |
| 4" Broken (8.0') (Type I)                                 |          | Sta./Line    |
| 4" Broken (8.0') (Type II)                                |          | Sta./Line    |
| 4" Broken (3.0') (Type I)                                 |          | Sta./Line    |
| 4" Broken (3.0') (Type II)                                |          | Sta./Line    |
| 4" Dotted Extension (Type I)                              | 0.2      | Sta./Line    |
| 4" Dotted Extension (Type II)                             |          | Sta./Line    |
| Solid (Line Masking Tape)                                 |          | Sta./Line    |
| Broken (Line Masking Tape)                                |          | Sta./Line    |
| Symbol (Type I)   |          | Each         |
| Symbol (Type II)  |          | Each         |
| Flexible Raised Pavement Marker (4" Broken (8.0'))        |          | Sta./Line    |
| Flexible Raised Pavement Marker (4" Broken (3.0'))        |          | Sta./Line    |
| Pavement Marking Removal                                  | 200      | Lin. Ft.     |
| Work Zone Sign (Special) (16.25 Sq. Ft. & Less)           | 1        | Each         |
| Work Zone Sign (Special) (16.26 Sq. Ft. & More)           |          | Each         |
| Rigid Raised Pavement Marker (Type I)                     |          | Each         |
| Rigid Raised Pavement Marker (Type II)                    |          | Each         |
| Traffic Signal Installation (Temporary)                   |          | Lump Sum     |
| Traffic Control (Initial Set Up)                          | Lump Sum | Lump Sum     |
| Traffic Control   |          | Lump Sum     |
| Flagger (Set Price)                                       | 1        | Hour         |
| Smart Work Zone System Deployment (Construction Entrance) | 2        | Each         |
| Smart Work Zone (Construction Entrance)                   | 180      | Each Per Day |
| Traffic Control Inspection                                | 180      | Each Per Day |

● - The quantity is estimated and will be over/underrun based on contractor means/methods.

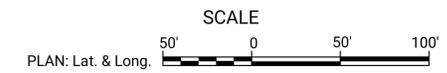


| Concrete Safety Barrier (Type F3) (Temporary) (Lin. Ft.) |              |      |                    |                         |
|--|--------------|------|--------------------|-------------------------|
| Station to Station                                       | Design Speed | Side | Type F3 (Anchored) | Type F3 (Free Standing) |
| 603+77 to 609+91   | 75 mph       | Lt.  | 125'               | 475'                    |
| 602+17 to 609+67   | 75 mph       | Lt.  | 0'                 | 737.5'                  |

For information only  
See Temporary Concrete Safety Barrier (Type F3) standards for anchorage and transition details.

Concrete Safety Barrier (Free Standing)

Concrete Safety Barrier (Anchored)



KANSAS DEPARTMENT OF TRANSPORTATION  
TEMPORARY CONCRETE  
SAFETY BARRIER LAYOUT  
PHASE 1B & 2A

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".

Plotted by : Elias.Esquivel@ks.gov 13-MAR-2025 15:06  
File : KA64830Trss052.dgn

| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 136       | 148          |

| 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 |
| Phase 1B & 2A:                      |                            |      |                               |           |                    |                        |      |          |
| I-70                                | 602+17 to 609+67           | Lt.  |                               | 737.5'    |                    |                        | LF   |          |
| I-70                                | 603+77 to 604+41           | Lt.  |                               | 62.5'     |                    |                        | LF   |          |
| I-70                                | 604+41 to 605+69           | Lt.  | 20:1                          | 125'      |                    |                        | LF   |          |
| I-70                                | 605+69 to 606+93           | Lt.  |                               | 125'      |                    |                        | LF   |          |
| I-70                                | 606+93 to 608+18           | Lt.  | 20:1                          | 125'      |                    |                        | LF   |          |
| I-70                                | 608+18 to 609+91           | Lt.  |                               | 162.5'    |                    |                        | LF   |          |
| TOTAL                               |                            |      |                               | 1,337.5'  |                    |                        |      |          |

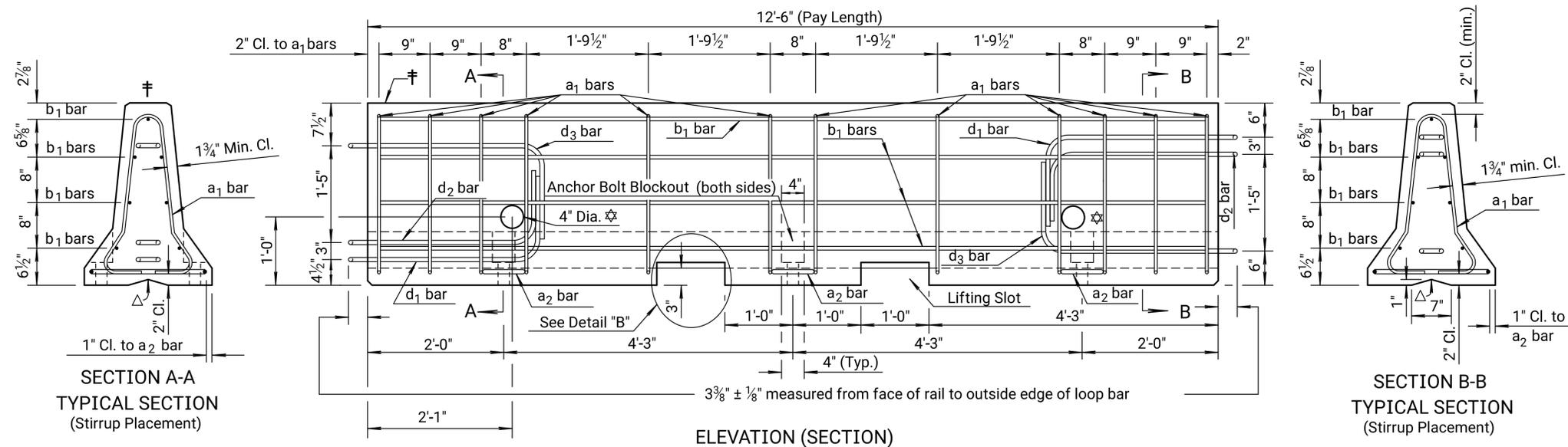
⊙ The quantity reported does not include the 3 5/8" gap between 12'-6" sections of barrier. The 3 5/8" gap will not be included in the pay length for Concrete Safety Barrier (Type F3) (Temporary). See the Summary of Quantities on Sheet No. 64 for Recap of Temporary Concrete Safety Barrier and End Treatments.

| 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              |

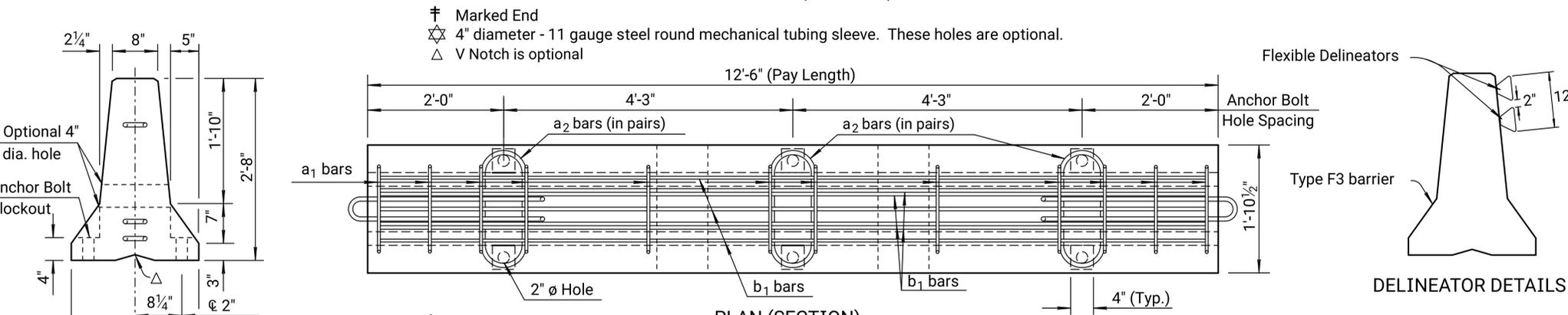
Note: The flare rates listed here apply only to temporary concrete safety barrier installations. See temporary concrete safety barrier layouts included in the plans for variations. Typical alternate flare rates may be used as approved by the Engineer.

|   |            |                 |           |                       |        |
|---|------------|-----------------|-----------|-----------------------|--------|
|   |            |                 |           |                       |        |
| 01  | 02-11-15   | Initial Release |           | K.E.K.                | S.W.K. |
| NO.   | DATE       | REVISIONS       |           | BY                    | APPD   |
| KANSAS DEPARTMENT OF TRANSPORTATION   |            |                 |           |                       |        |
| <b>SUMMARY OF QUANTITIES<br/>TEMPORARY CONCRETE SAFETY<br/>BARRIER AND END TREATMENTS</b> |            |                 |           |                       |        |
| <b>RD052</b>  |            |                 |           |                       |        |
| FHWA APPROVAL   |            | 09-16-15        |           | APPD. James O. Brewer |        |
| DESIGNED  | DETAILED   | QUANTITIES      | TRACED    |                       |        |
| DESIGN CK.  | DETAIL CK. | QUAN. CK.       | TRACE CK. |                       |        |

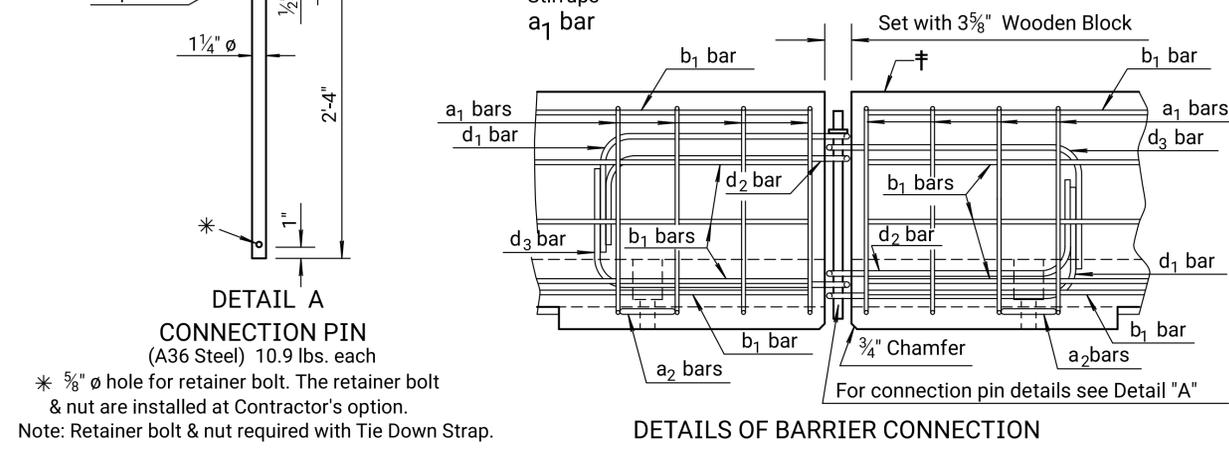
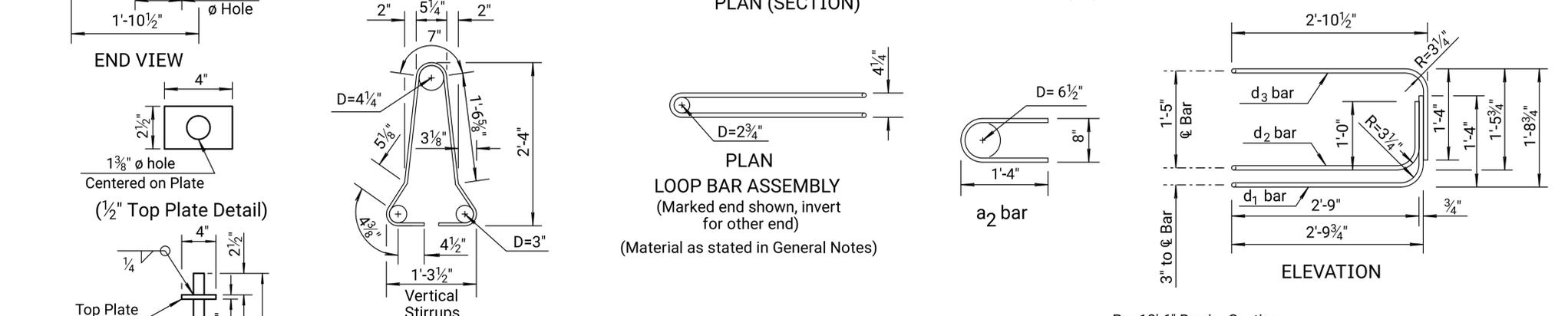
KDOT Graphics Certified



**GENERAL NOTES:**  
**MATERIAL:** Use ASTM A615, Grade 60 reinforcing bars, except for the loop bars (d<sub>1</sub>, d<sub>2</sub> and d<sub>3</sub>). The loop bars (d<sub>1</sub>, d<sub>2</sub> and d<sub>3</sub>) shall be 3/4" 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 1/8" 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)



**DELINEATOR DETAILS**  
 Flexible Delineators  
 Type F3 barrier  
 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 1/2" 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".



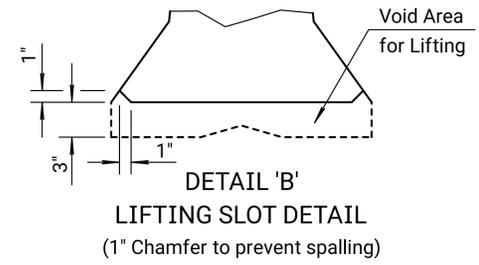
Per 12'-6" Barrier Section

| REINFORCING A615 Gr. 60 |          |       |             |            |             |
|-------------------------|----------|-------|-------------|------------|-------------|
| Bar                     | Bar Size | Shape | No. of Bars | Length Ft. | Weight Lbs. |
| a <sub>1</sub>          | #4       | U     | 12          | 6'-0"      | 48.1        |
| a <sub>2</sub>          | #6       | C     | 6           | 2'-11"     | 26.3        |
| b <sub>1</sub>          | #5       | —     | 7           | 12'-2"     | 88.8        |

| LOOP ASSEMBLY  |    |   |   |       |      |
|----------------|----|---|---|-------|------|
| d <sub>1</sub> | #6 | U | 2 | 8'-5" | 25.3 |
| d <sub>2</sub> | #6 | U | 2 | 7'-7" | 22.8 |
| d <sub>3</sub> | #6 | U | 2 | 8'-6" | 25.5 |

Concrete Quantity = 1.3 C.Y.  
 (Dimensions are out to out of bars unless otherwise noted.)



\* 5/8" ø hole for retainer bolt. The retainer bolt & nut are installed at Contractor's option.  
 Note: Retainer bolt & nut required with Tie Down Strap.

NOTE: At no time shall the barriers be lifted, moved, etc. by use of the loop bars: d<sub>1</sub>, d<sub>2</sub> or d<sub>3</sub>.

|     |          |                        |        |        |
|-----|----------|------------------------|--------|--------|
| 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. |
| NO. | DATE     | REVISIONS              | BY     | APPD   |

KANSAS DEPARTMENT OF TRANSPORTATION

**TEMPORARY CONCRETE SAFETY BARRIER TYPE F3**

RD622

|            |            |            |           |
|------------|------------|------------|-----------|
| DESIGNED   | DETAILD    | QUANTITIES | TRACED    |
| DESIGN CK. | DETAIL CK. | QUAN. CK.  | TRACE CK. |

Scott W. King

KDOT Graphics Certified 05-12-2022 Sh. No. 137

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 accommodate for expansion during construction.

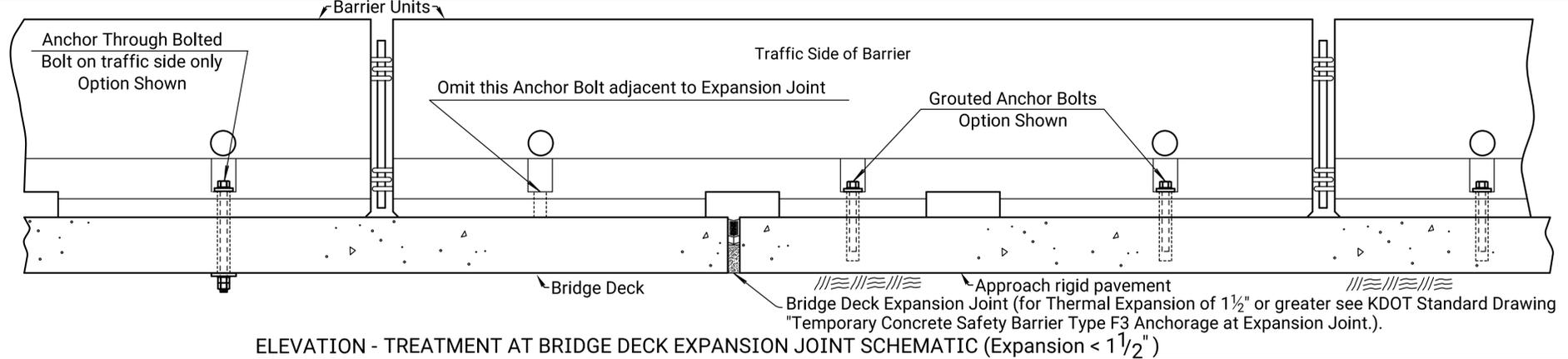
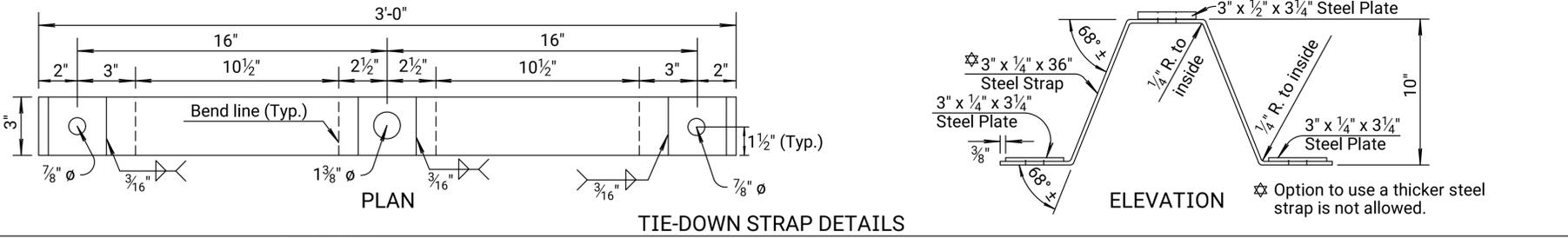
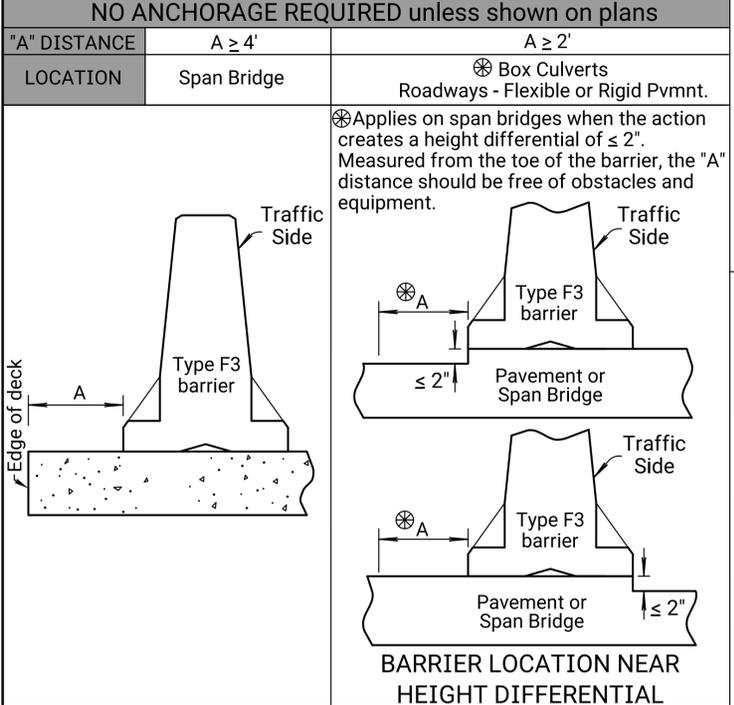
Plotted by : Elias.Esquivel@ks.gov 13-MAR-2025 15:01  
File : KA648301rsg622b.dgn

**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.

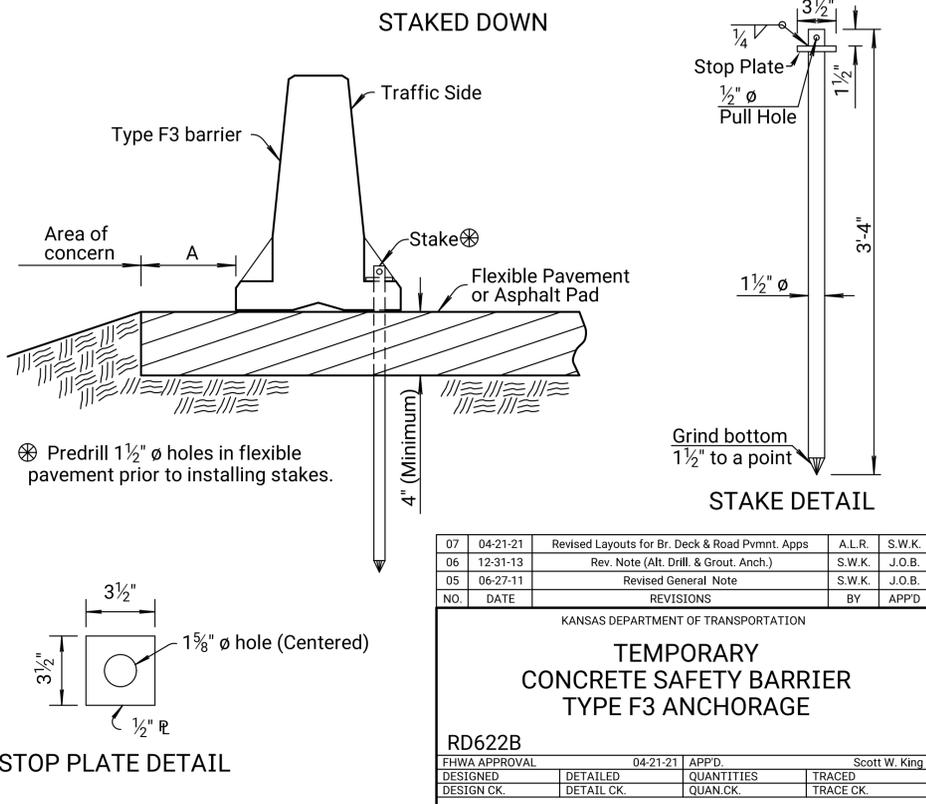
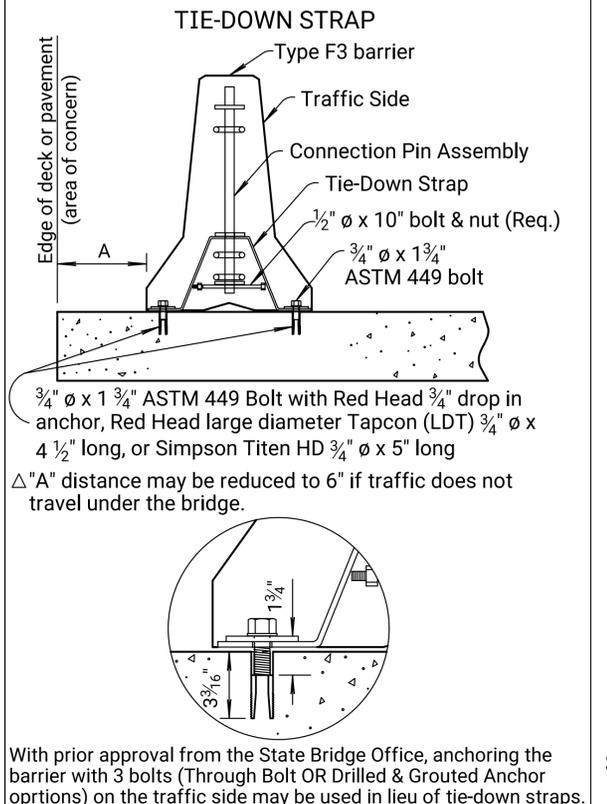
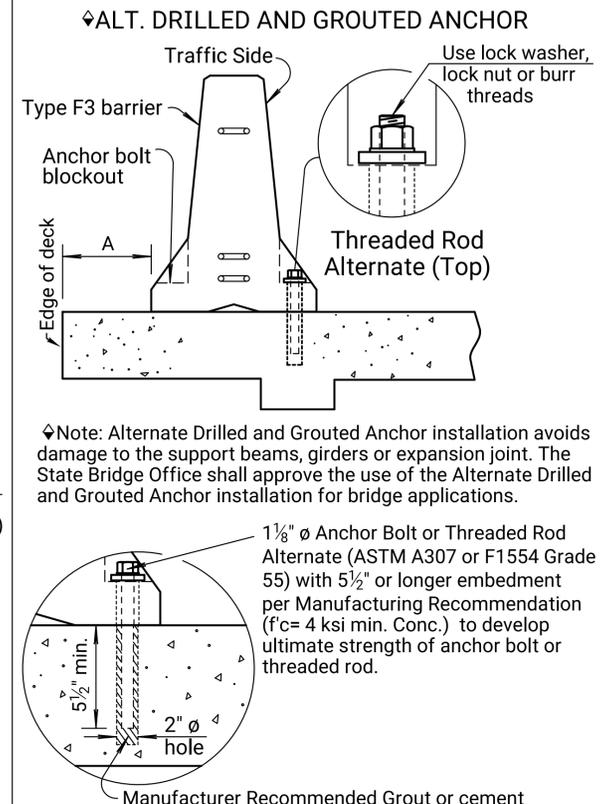
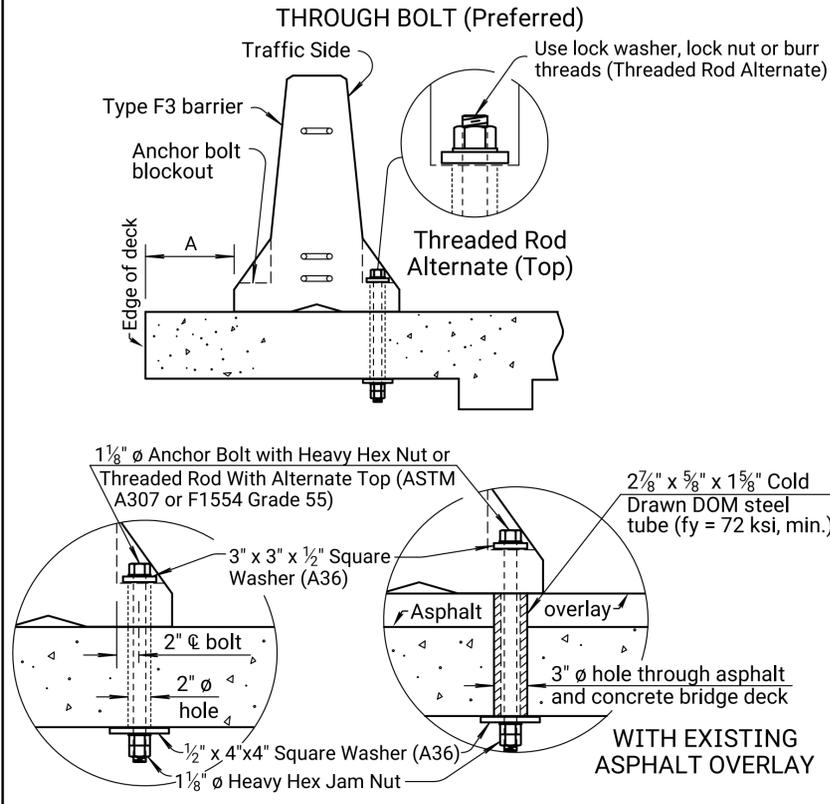
**ANCHORAGE:** Use galvanized grouted anchor bolts, through anchor bolts, nuts & washers that meet standard specifications. Install 3 anchor bolts or asphalt pins per barrier on the traffic side except on transition barrier as shown.  
**BARRIER REMOVAL:** Completely remove all anchor systems. Remove 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.

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
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| 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'  | Δ 2' ≤ A < 4'  | 6" ≤ A < 2'  |
| LOCATION     | Span Bridge                                 | Span Bridge<br>Box Culverts<br>Roadways - RIGID Pavement | Span Bridge<br>Box Culverts<br>Roadways - RIGID Pavement | Box Culverts (ceiling below stake depth)<br>Roadways - FLEXIBLE Pavement |



|     |          |   |        |        |
|-----|----------|---|--------|--------|
| 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. |
| NO. | DATE     | REVISIONS                                       | BY     | APPD   |

KANSAS DEPARTMENT OF TRANSPORTATION

**TEMPORARY CONCRETE SAFETY BARRIER TYPE F3 ANCHORAGE**

RD622B

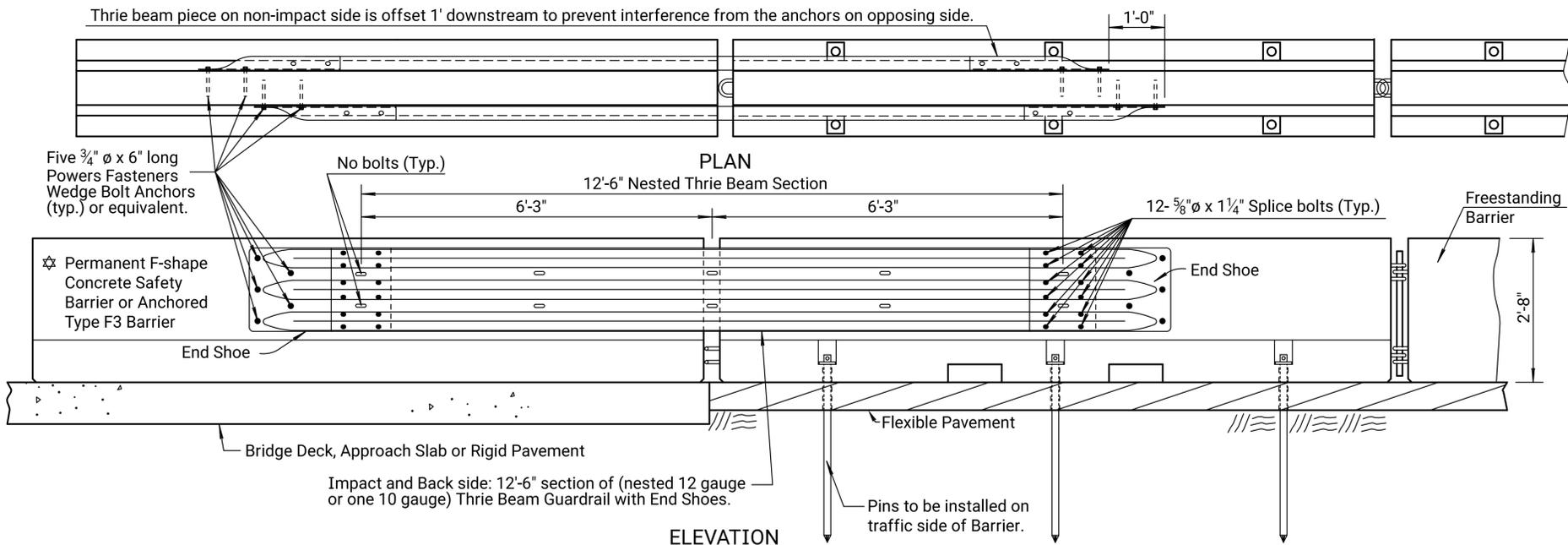
|            |            |            |               |
|------------|------------|------------|---------------|
| DESIGNED   | 04-21-21   | APPD.      | Scott W. King |
| DESIGN CK. | DETAIL CK. | QUANTITIES | TRACED        |
|            |            | QUAN. CK.  | TRACE CK.     |

KDOT Graphics Certified 05-13-2022 Sh. No. 138

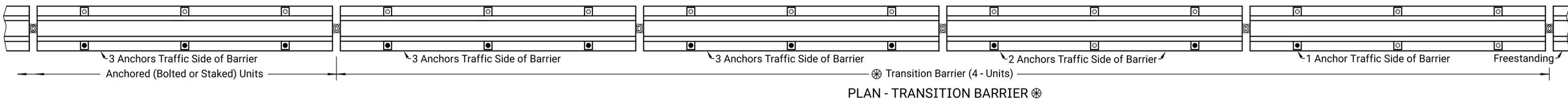
\* Note to Designer: The minimum length for Freestanding Temporary Concrete Safety Barrier (TCSB) installations is 11 sections @ 12.5' = 137.5'. In a Freestanding TCSB installation, if both ends are anchored, fewer than 11 sections of Freestanding TCSB may be used. The 5 sections of Freestanding TCSB 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 : Elias.Esquivel@ks.gov  
 File : KA648301r622d.dgn  
 13-MAR-2025 15:03

Thrie beam piece on non-impact side is offset 1' downstream to prevent interference from the anchors on opposing side.

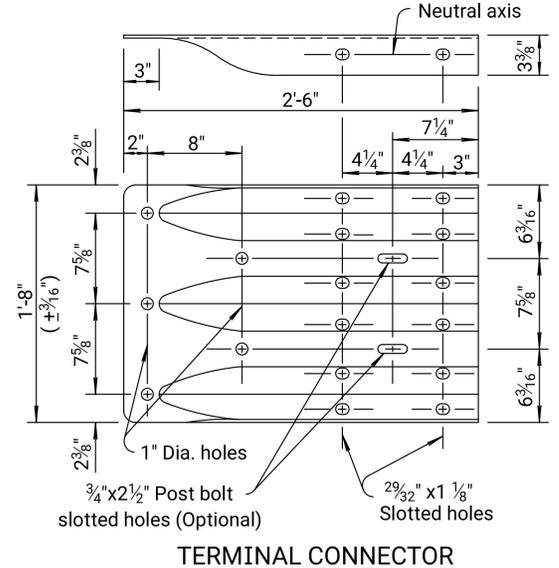


☆ GUARDRAIL CONNECTION-ANCHORED/RIGID BARRIER TO FREESTANDING BARRIER

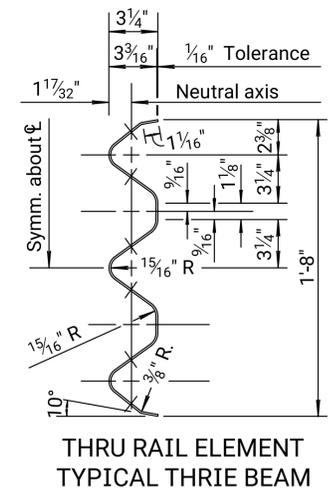


PLAN - TRANSITION BARRIER

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.

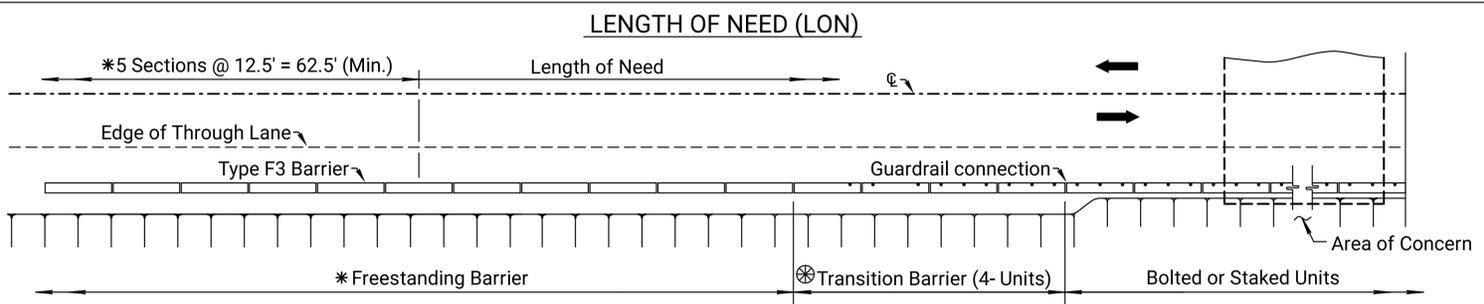


TERMINAL CONNECTOR

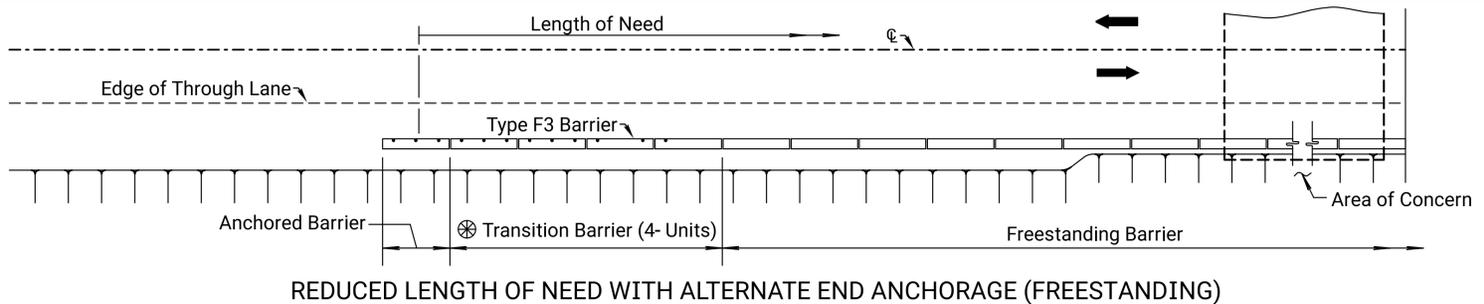


THRU RAIL ELEMENT TYPICAL THRIE BEAM

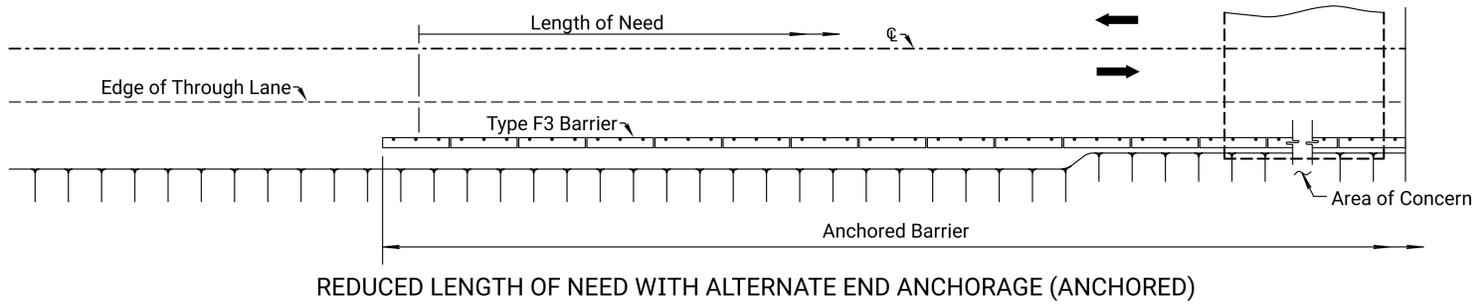
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 139       | 148          |



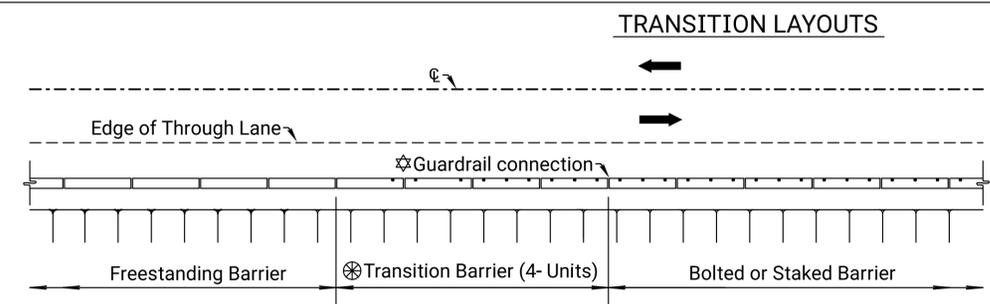
LENGTH OF NEED WITH FREESTANDING TYPE F-3 CONCRETE BARRIER ENDING



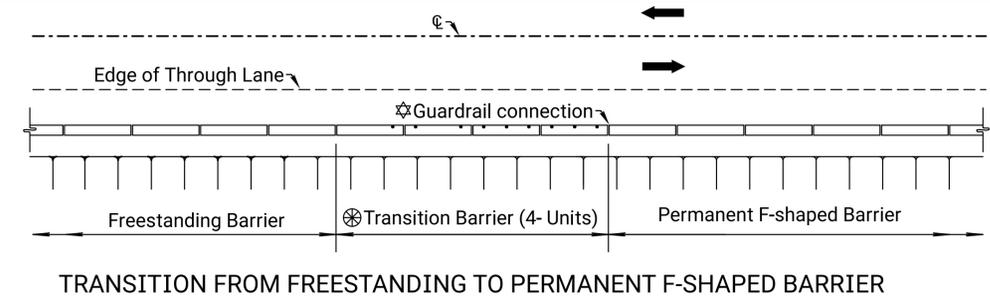
REDUCED LENGTH OF NEED WITH ALTERNATE END ANCHORAGE (FREESTANDING)



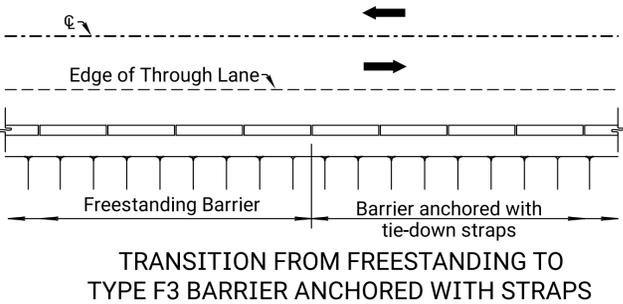
REDUCED LENGTH OF NEED WITH ALTERNATE END ANCHORAGE (ANCHORED)



TRANSITION FROM FREESTANDING TO AN ANCHORED (BOLTED OR STAKED) TYPE F-3 BARRIER



TRANSITION FROM FREESTANDING TO PERMANENT F-SHAPED BARRIER



TRANSITION FROM FREESTANDING TO TYPE F3 BARRIER ANCHORED WITH STRAPS

| 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 |

| TRANSITION "From/To"   | ☆   | ⊗   |
|--|-----|-----|
| Transition from a Freestanding Barrier to a Permanent F-Shape Barrier. | YES | YES |

| 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 |

| NO. | DATE     | REVISIONS                             | BY     | APPD   |
|-----|----------|---------------------------------------|--------|--------|
| 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**

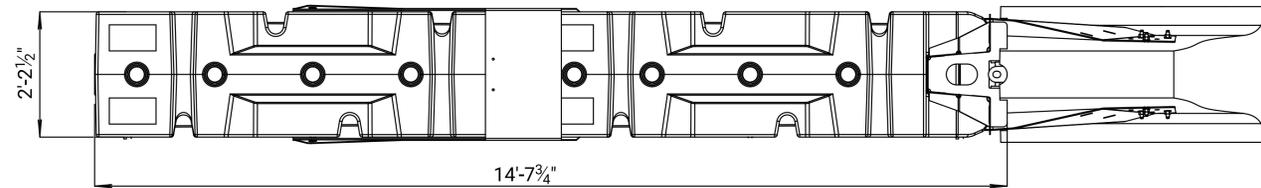
RD622D

|            |            |           |            |        |
|------------|------------|-----------|------------|--------|
| DESIGNED   | 08-07-19   | APPD.     | QUANTITIES | TRACED |
| DESIGN CK. | DETAIL CK. | QUAN. CK. | TRACE CK.  |        |

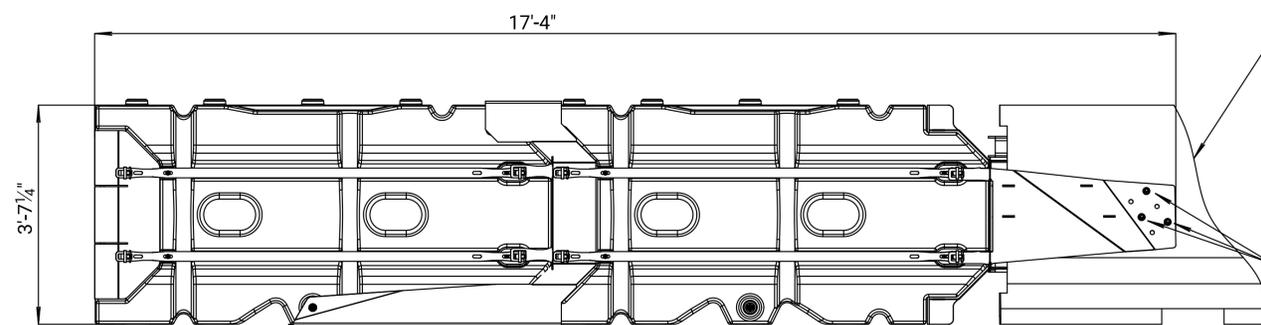
KDOT Graphics Certified 05-13-2022 Sh. No. 139

KDOT Graphics Certified

|        |                  |      |           |              |
|--------|------------------|------|-----------|--------------|
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
| KANSAS | 70-31 KA-6483-01 | 2025 | 140       | 148          |

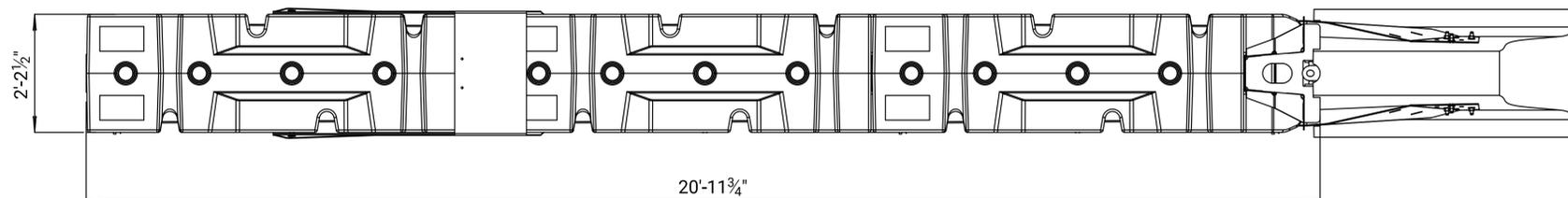


PLAN (TL2 ≤ 45 mph)

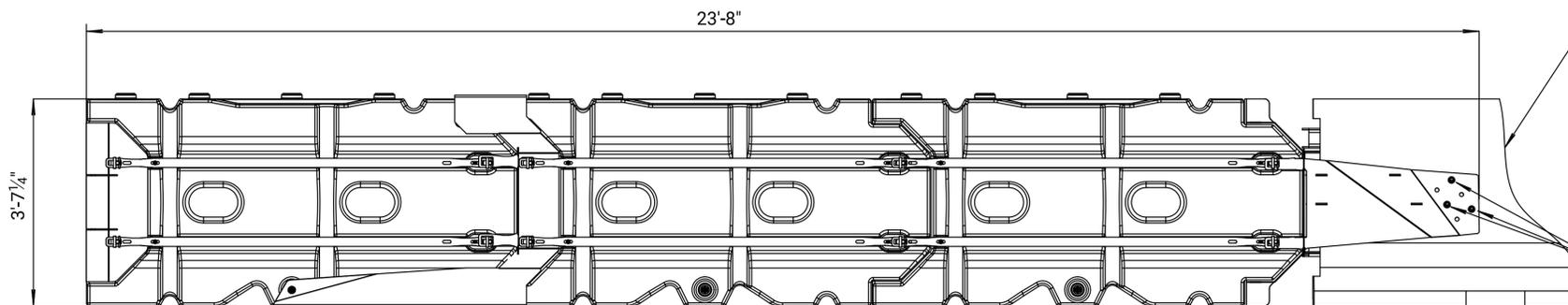


ELEVATION (TL2 ≤ 45 mph)

BARRIER SHOWN FOR REFERENCE



PLAN (TL3 > 45 mph)



ELEVATION (TL3 > 45 mph)

BARRIER SHOWN FOR REFERENCE

GENERAL NOTES

Details shown on this sheet for ABSORB-M are for Information Only and may not be an exact detail of ABSORB-M. See the Manufacturer's Installation Manual furnished to the Engineer for details of components and installation for the ABSORB-M.

ABSORB-M is an anchorless system designed to perform on a variety of foundations including concrete, asphalt, and any other surfaces capable of bearing the weight of the system with a maximum cross-slope of 8.0%. Contact the manufacturer for slopes greater than 8.0%.

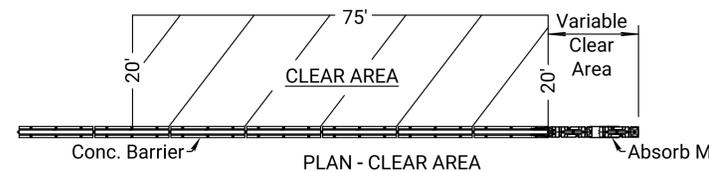
The installation area should be flattened and free from large debris. The ABSORB-M system should be approximately parallel with the barrier or  $\phi$  of merging barriers. Maintain a clear area 20' parallel from the back of barrier for a distance of 75' behind ABSORB-M Terminal Assembly free of stockpiled material, equipment, temporary signs or obstructions regardless of crash worthiness. Do not install Absorb-M Impact Attenuator in Narrow Medians, on Elevated Structures or where Clear Area can't be achieved.

The front element of the ABSORB-M system should be left empty, while the remaining system is to be filled with water. Installation in Kansas requires an anti-freeze solution to prevent the water from freezing. See the Manufacturer's Installation Manual for acceptable anti-freeze solutions.

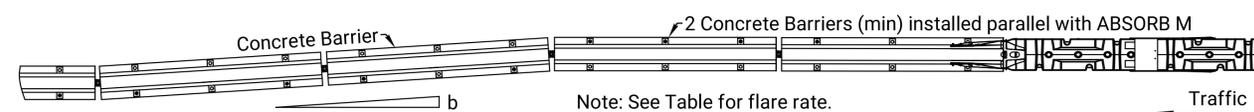
The unit shown on this sheet abuts a barrier up to 24" wide. The ABSORB-M TL2 & TL3 can be connected to permanent or temporary safety shape, constant slope, and other shapes of barriers up to 42" height. Refer to the Manufacturer's Installation Manual for these connections.  $\Psi$  Anchorage holes must be drilled to depth as per the Manufacturer's Installation Manual and cleared of debris to achieve proper anchorage.

For system relocation information, see Manufacturer's Installation Manual.

All work and material required for installation of this attenuator shall be paid under the bid item "Impact Attenuator (Temporary)(TL-2 or TL-3)".



PLAN - CLEAR AREA



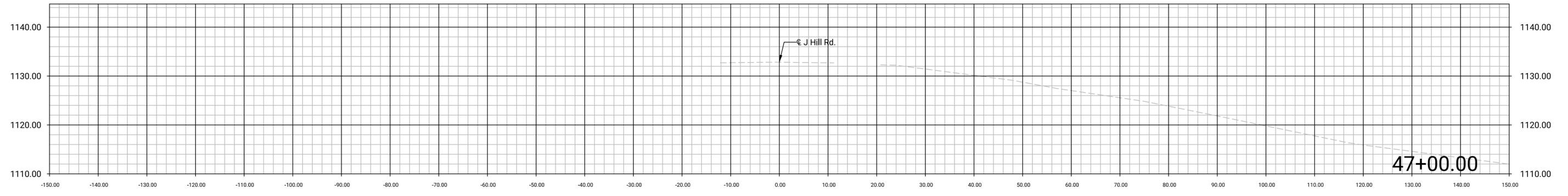
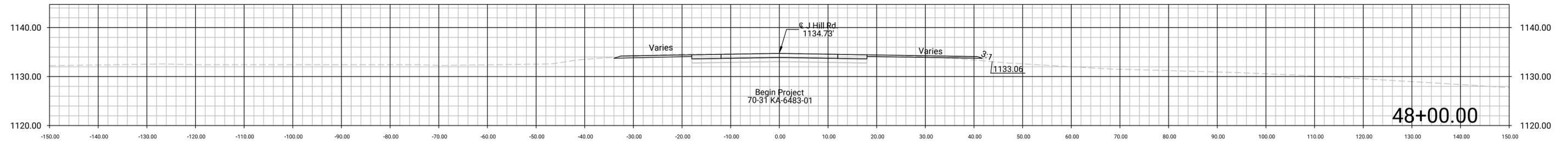
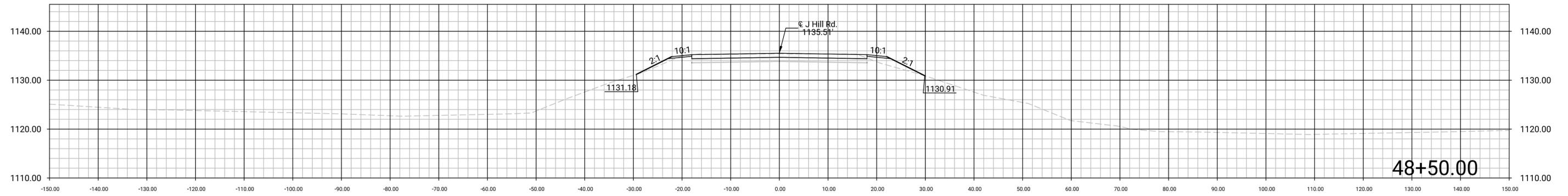
Note: See Table for flare rate.

PLAN - FLARED LAYOUT OPTION

| 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              |

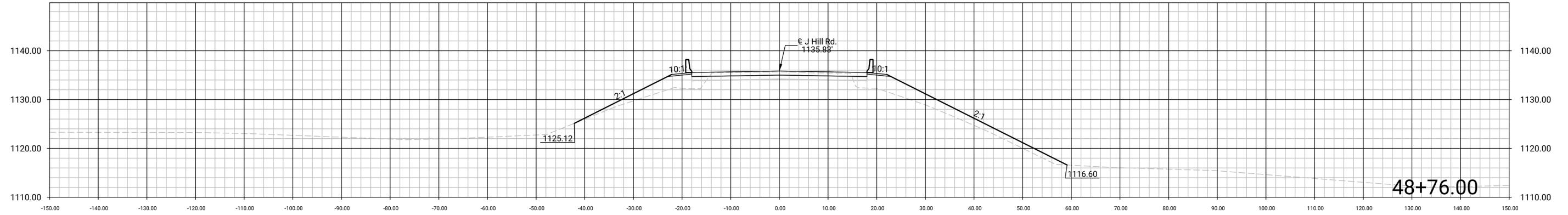
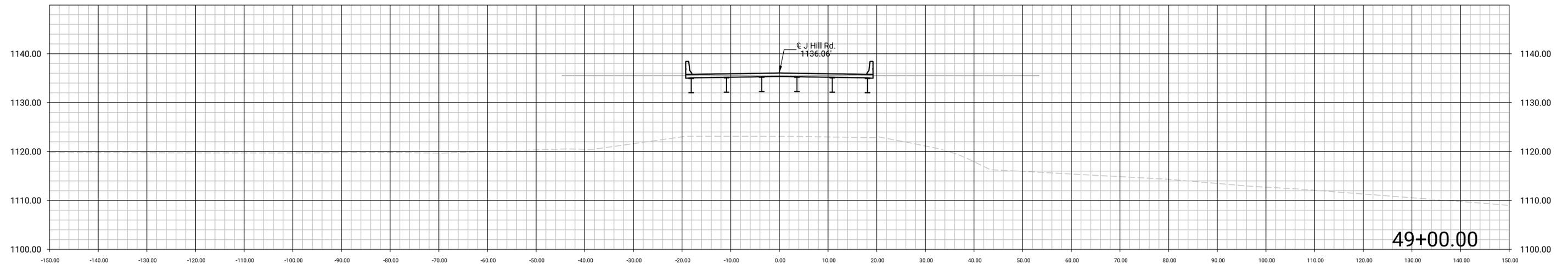
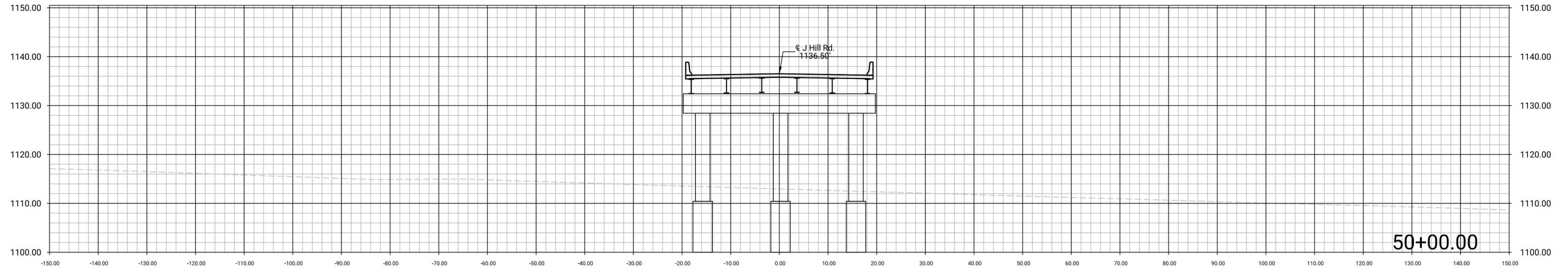
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|---|------------|-----------------|---------------|--------|
| 01  | 04-15-22   | Initial Release | A.L.R.        | S.W.K. |
| NO.   | DATE       | REVISIONS       | BY            | APPD   |
| KANSAS DEPARTMENT OF TRANSPORTATION             |            |                 |               |        |
| <b>TEMPORARY IMPACT ATTENUATOR<br/>ABSORB-M</b> |            |                 |               |        |
| RD621A  |            | Scott W. King   |               |        |
| DESIGNED  | 04-21-22   | APPD.           | Scott W. King |        |
| DESIGN CK.                                      | DETAIL CK. | QUANTITIES      | TRACED        |        |
|   |            | QUAN. CK.       | TRACE CK.     |        |

| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 141       | 148          |



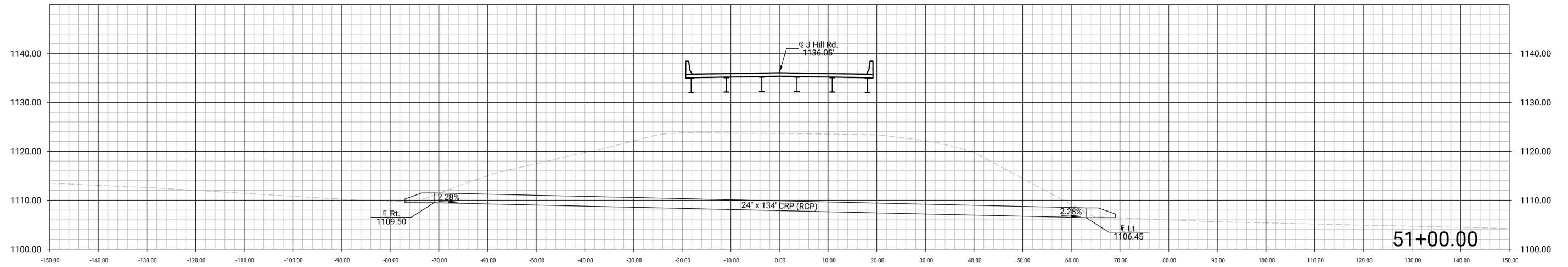
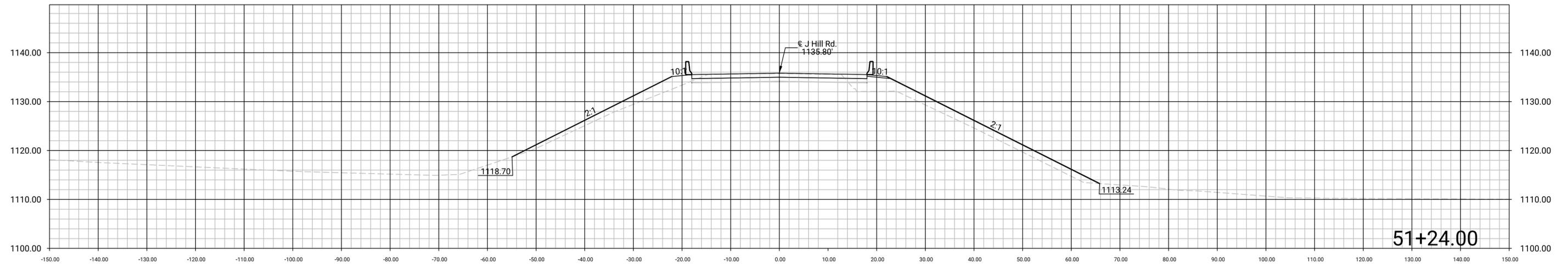
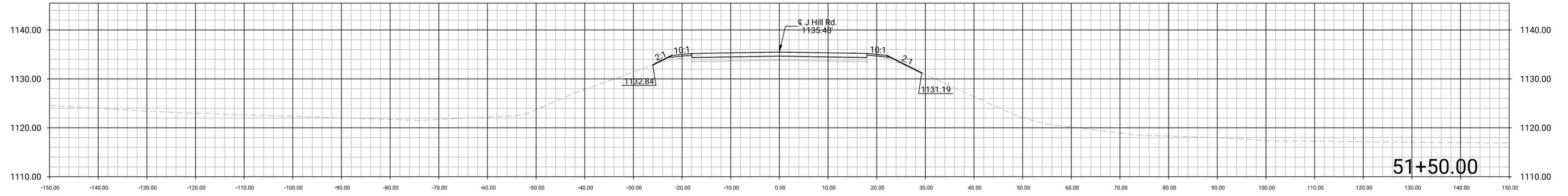
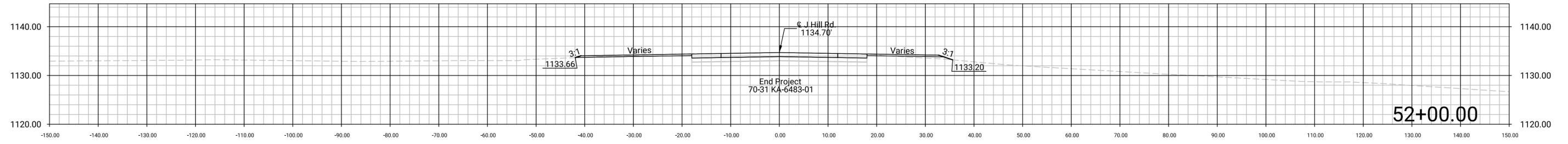
**J HILL RD**  
**Sta. 47+00 to Sta. 48+50**  
 SCALE 1:10

| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 142       | 148          |



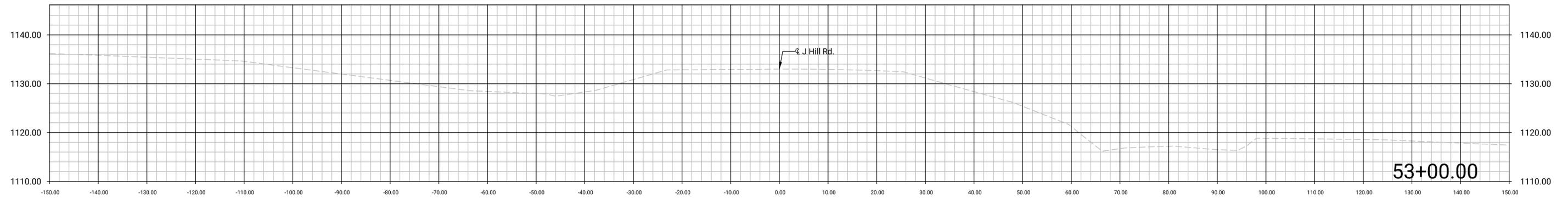
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| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 143       | 148          |



**J HILL RD**  
**Sta. 51+00 to Sta. 52+00**  
 SCALE 1:10

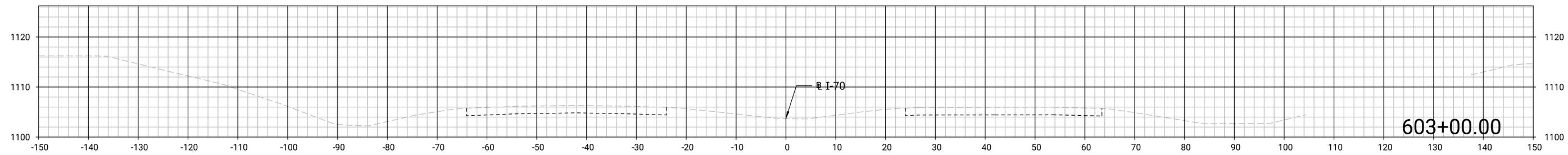
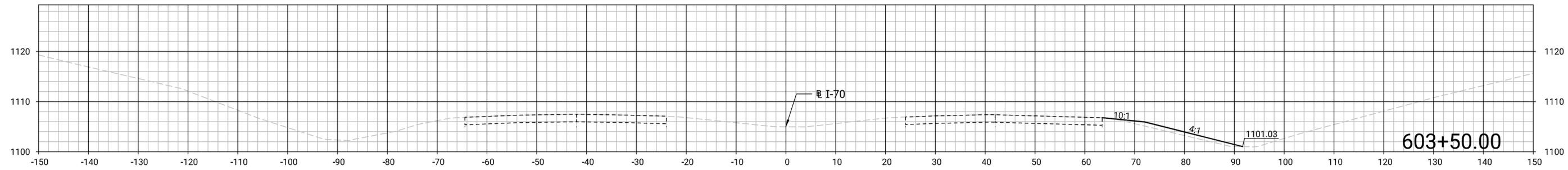
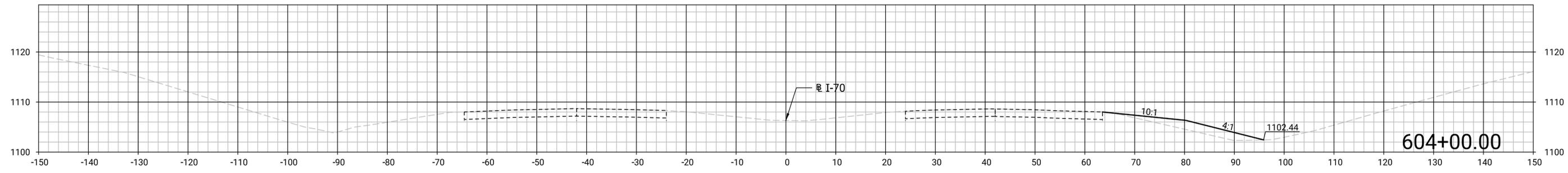
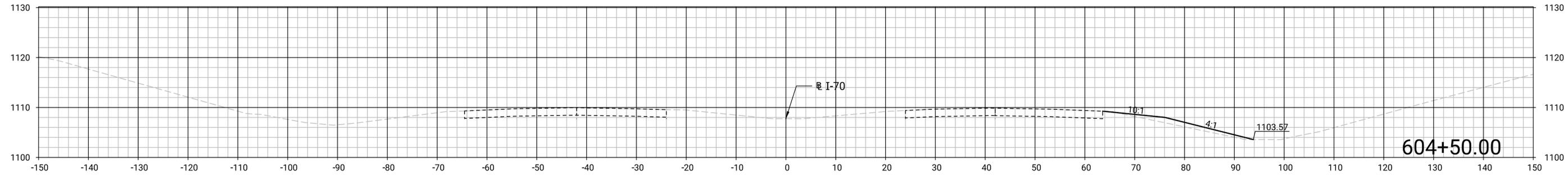
| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 144       | 148          |



**J HILL RD**  
**Sta. 52+50 to Sta. 53+00**  
 SCALE 1:10

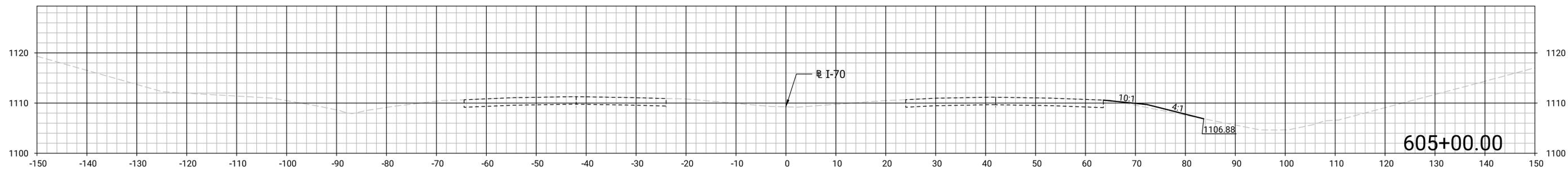
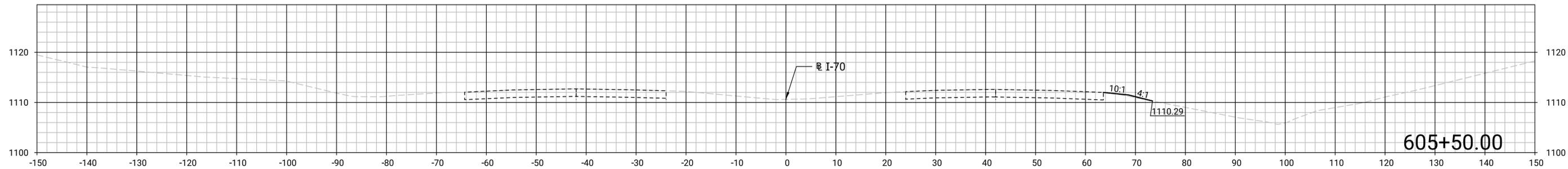
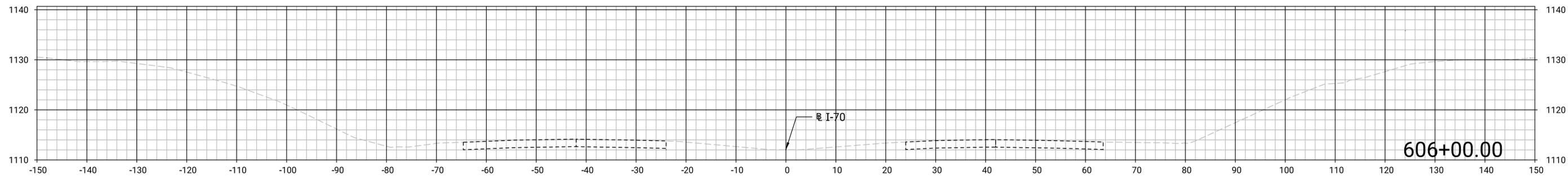
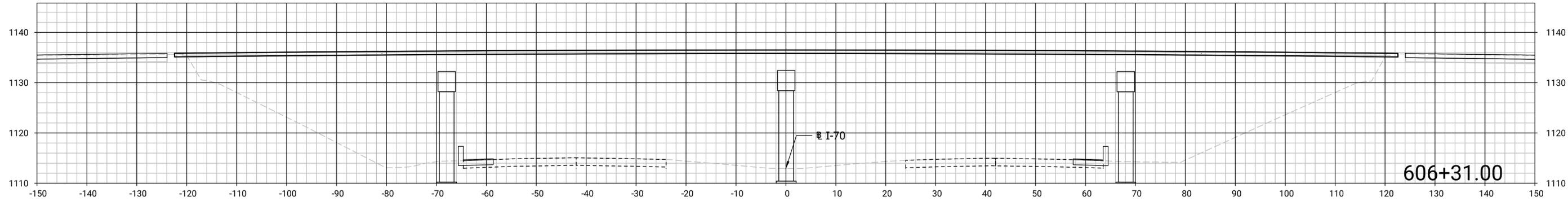
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| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 145       | 148          |



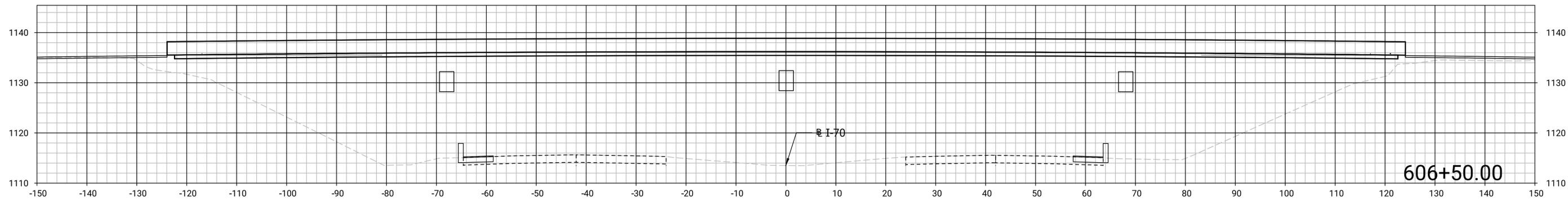
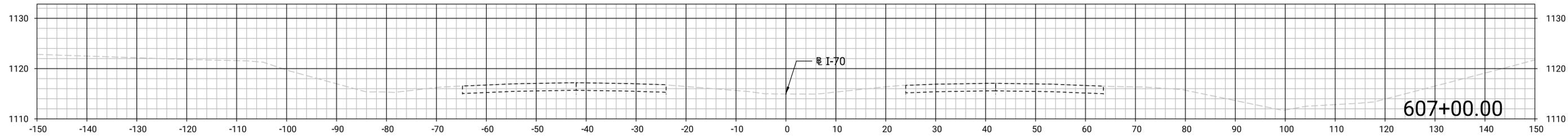
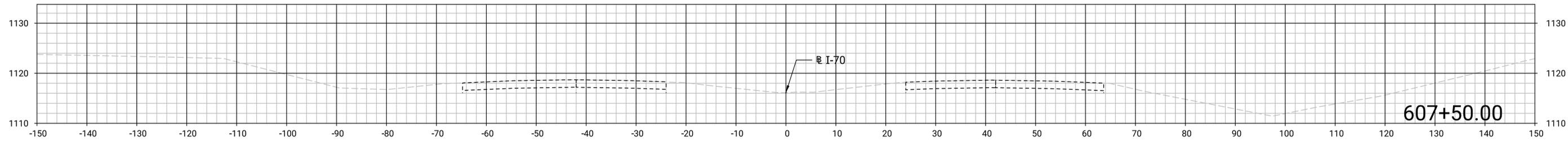
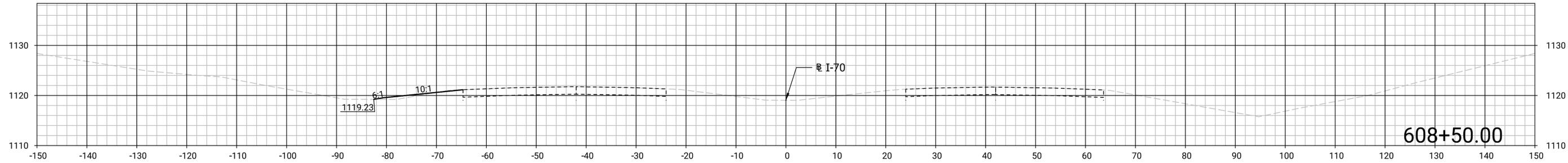
I-70  
 Sta. 603+00 to Sta. 604+50  
 SCALE 1:10

| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 146       | 148          |



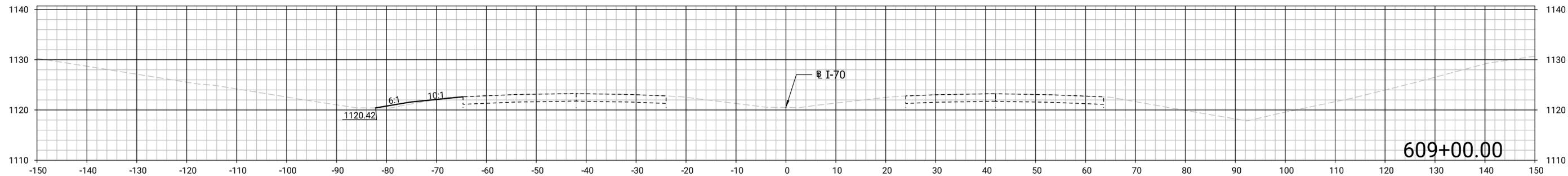
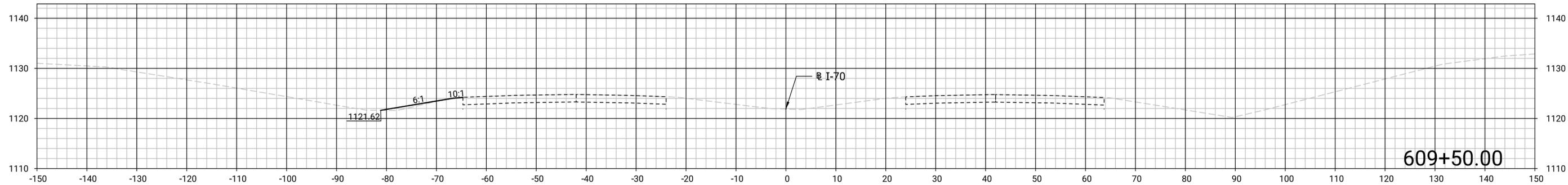
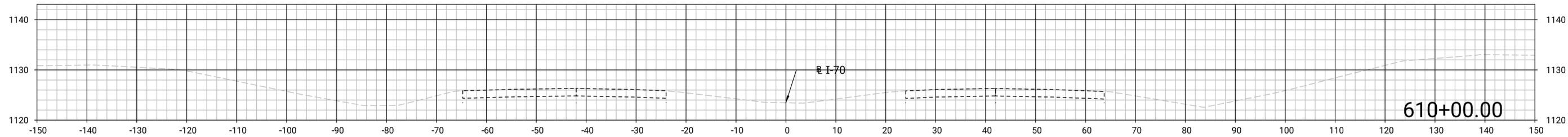
**I-70**  
**Sta. 605+00 to Sta. 606+31**  
 SCALE 1:10

| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 147       | 148          |



**I-70**  
**Sta. 606+50 to Sta. 608+50**  
 SCALE 1:10

| STATE  | PROJECT NO.      | YEAR | SHEET NO. | TOTAL SHEETS |
|--------|------------------|------|-----------|--------------|
| KANSAS | 70-31 KA-6483-01 | 2025 | 148       | 148          |



I-70  
 Sta. 609+00 to Sta. 610+00  
 SCALE 1:10