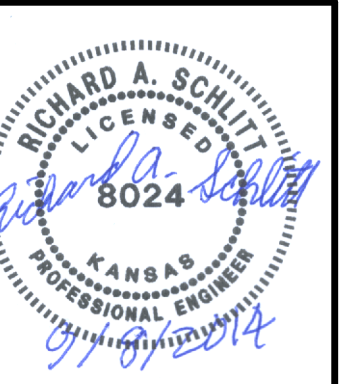


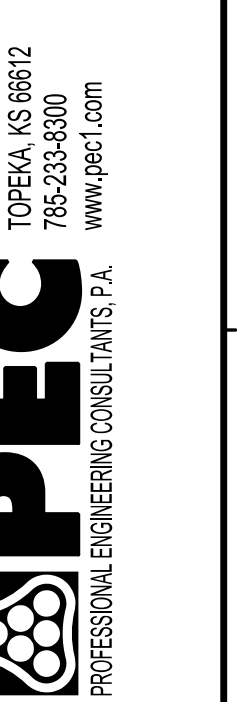
# IRVING HILL ROAD BRIDGE IMPROVEMENTS PROJECT THE UNIVERSITY OF KANSAS

PEC PROJECT #132-12G01-049

KU #Lz\_off-10402



NO.	REVISIONS DESCRIPTION	DATE



Lz\_off-10402

**Design & Construction Management**  
The University of Kansas  
St. Andrews Office Facility  
1515 St. Andrews Drive  
Lawrence, Kansas 66047  
Telephone 785-864-3431 Fax 785-864-5644

THE UNIVERSITY OF KANSAS  
**IRVING HILL ROAD  
BRIDGE IMPROVEMENTS PROJECT**  
LAWRENCE, KS 66047

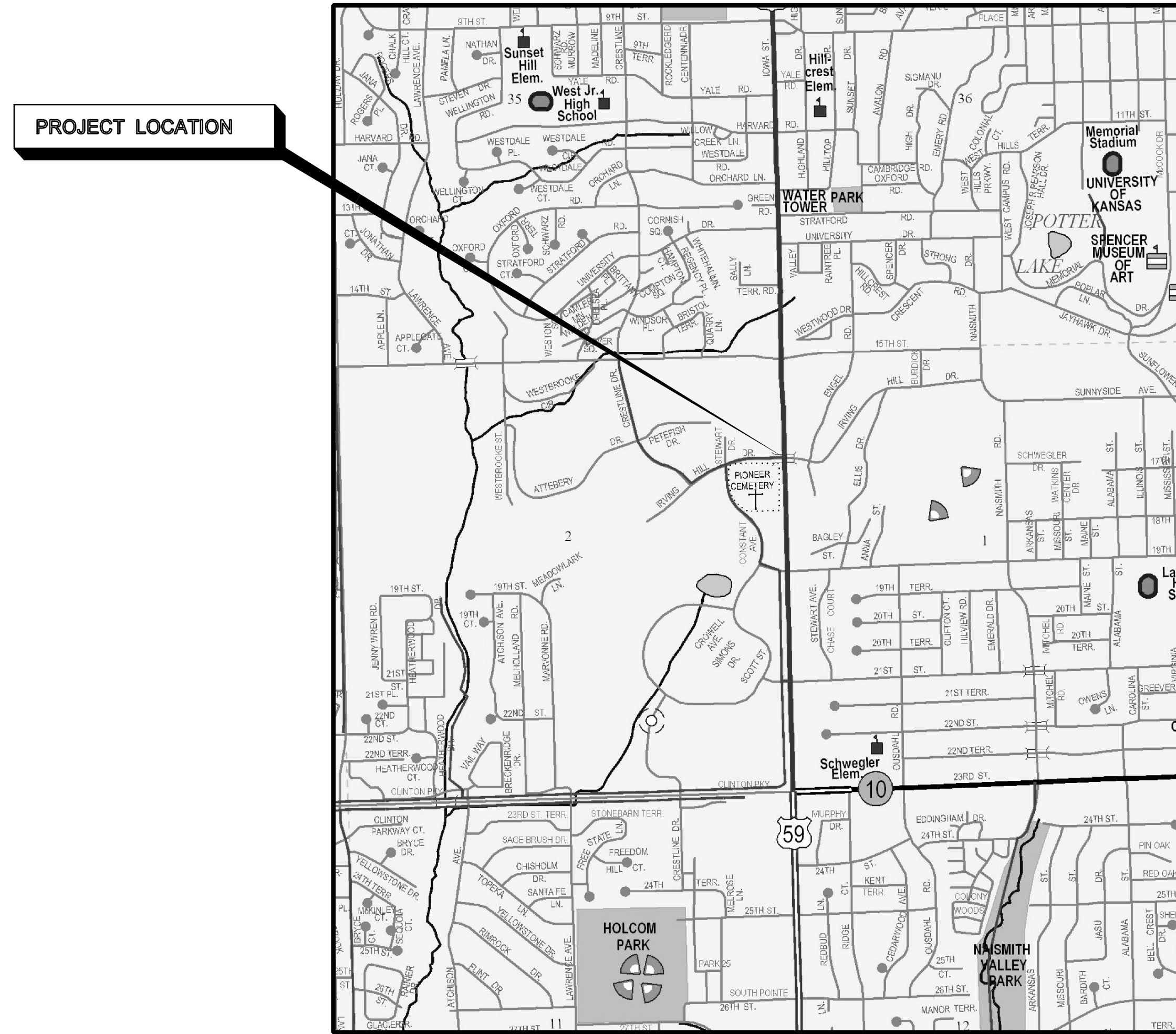
DATE: 06-11-14  
DRAWN BY: CP  
CHECKED BY: RAS  
REV:

TITLE SHEET

**C100**

ORIGINAL  
CONSTRUCTION  
DOCUMENTS

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C103	PROPOSED PLAN AND ELEVATION
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TE710	TRAFFIC CONTROL STANDARD
TE712	TRAFFIC CONTROL STANDARD
TE748	TRAFFIC CONTROL STANDARD
TE795	TRAFFIC CONTROL QUANTITIES
BR120	REINFORCING STANDARD
RD725	SIDEWALK STANDARD



LOCATION PLAN

SEPTEMBER 2014

KDOT Bridge No. 23-022



GENERAL NOTES

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

**EXISTING DIMENSION VERIFICATION:** Dimensions of the existing structure are based on old plans. Verify, by field measurement, the asbuilt dimensions of the existing structure and submit such verification in writing to the Engineer. The verification will include sketches, drawings, photographs and descriptions as needed to clearly define the asbuilt dimensions that will be incorporated in the new construction.

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

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

**PEDESTRIAN CONTROL PLAN:** Contractor to submit a pedestrian control plan to the Engineer for review prior to removal of any pedestrian barrier.

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

**REMOVAL OF EXISTING STRUCTURE:** The bid item "Removal of Existing Structure" Lump Sum, includes the removal of the concrete deck, barrier, temporary fencing, and sidewalks as shown on the plans. Concrete sawing shall be limited to a maximum depth of 1 1/2 inches. Use a Jackhammer no heavier than 15 lb. to remove concrete. Damage to the existing structural steel caused by procedures not conforming to the above recommendations shall be repaired as directed by the Engineer at the Contractor's expense (no cost to the State). Any costs incurred for testing or Engineering evaluations will be included in the Contractor's expense for repair. The Contractor shall submit a plan for protection of traffic under the bridge for approval by the Engineer. Care to be taken to protect and maintain IT cables attached to the North side of the bridge during removal and construction. All materials removed from the existing structure shall become the property of the Contractor and removed from the site.

**LEAD CONTENT TEST:** This structure does not require a lead content test (TCLP).

**FALSEWORK PLANS:** A licensed Professional Engineer shall design the falsework details. Details shall bear the seal of a licensed Professional Engineer. See the Bridge Design Manual, Section 5.1 "Review and Approval of Falsework Plans", for a listing of items to be included on the falsework plan. Submit electronic plans conforming to 105.10(b) of the Standard Specification with details in compliance with KDOT Specifications to the Field Engineer for review.

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

**FALSEWORK INSPECTION:** This project has falsework plan requirements which are considered "Category I" 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.

**FALSEWORK:** Due to IT conduit interference, needle beam falsework is to be used; cantilever type falsework will not be permitted. Leave the falsework in place for the entire unit until 15 days after the last concrete pour for the unit or longer as directed by the Engineer.

**CONCRETE:** Superstructure concrete is bid as Concrete (Grade 4.0)(AE). Bevel all exposed edges of all concrete with a 3/4 inch triangular molding, except as otherwise noted on the plans. Construction joints are optional with the Contractor, but if used, place only at locations shown, or at locations approved by the Engineer

**REINFORCING STEEL:** All reinforcing steel dimensions are to the centerline of bars unless otherwise noted. All reinforcing steel shall conform to the requirements of ASTM A615, Grade 60. Where non-coated bars come in contact with epoxy coated bars, they need not be coated.

**DRILLING AND GROUTING:** This item shall consist of grouting reinforcing steel, anchor bolts, tie bars, or dowel bars into the existing concrete, where required by the Engineer, with an epoxy grout. Follow KDOT Specifications 842 and any associated Special Provisions. Follow the manufacturer's directions for mixing, application and curing. The tools, materials, labor and incidentals necessary to complete the work shall be paid for per each by the bid item "Drilling and Grouting".

**CONCRETE PLACING SEQUENCE:** The sequence of placing concrete in the slab and curbs shall be as shown, or the Contractor may submit an alternate placing sequence for review. Submit the alternate placing sequence to the Engineer at the Preconstruction Conference. Include the proposed rate of concrete placement in C.Y./h, the plant capacity, placement direction, construction joint location, a description of the equipment used in placing the concrete, proposed admixtures, and the quantity of concrete in each placing segment. Any additional cost for the Contractor's alternate plan of placing concrete, including admixtures, shall be at the Contractor's expense and shall be considered subsidiary to the bid item, "Concrete (Grade 4.0) (AE)". Approval of the Contractor's alternate sequence is required prior to placement of concrete in the deck.

**POLYMER OVERLAY:** When the date and temperature requirements of the specifications are met, grind profile and place a polymer overlay. When the date and temperature requirements are not met, complete any required grinding and apply the polymer overlay according to the next available date(s) and temperature allowed per the current KDOT specifications.

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

**REMOVABLE BOLLARDS:** Provide, in the locations shown on the plans as follows or approved equal. A removable bollard similar to the Calpipe Security Bollards as 4 inch diameter with half dome internal locking 36 inch tall and 48 inch total length including 12 inch embedment. bollard to be painted both prime and final coat as per the rail paint requirements. Include two 2 inch wide reflective white bands spaced 3 inches apart near the dome top and repeated 6 inches from the bottom of these two bands. Padlock to be provided by KU.

**SALVAGE:** Existing aluminum rail on bridge to be salvaged and stockpiled for removal by KDOT forces. Temporary fencing to be salvaged and stockpiled for removal by University of Kansas forces.

**HORIZONTAL CONTROL:** Stations shown are taken from existing plans with perceived EWS's as reference control.

**VERTICAL ELEVATIONS:** Elevations shown are taken from existing plans with no benchmarks field located. The purpose of elevation values is to provide relative vertical differences for rail fabrication.

DESIGN DATA

**DESIGN SPECIFICATIONS:** AASHTO Specifications, 2013 Edition and latest Interim Specifications. Load and Resistance Factor Design

**UNIT STRESSES:**  
Concrete (Grade 4.0) f'c = 4 ksi  
Concrete (Grade 4.0)(AE) f'c = 4 ksi  
Reinforcing Steel (Grade 60) fy = 60 ksi

**NOTE:** In general bridge construction will comply with KDOT Design Manual Volume III - Bridge Section U.S. Customary Units and KDOT Special Provisions to the Standard Specifications, 2007 Edition.

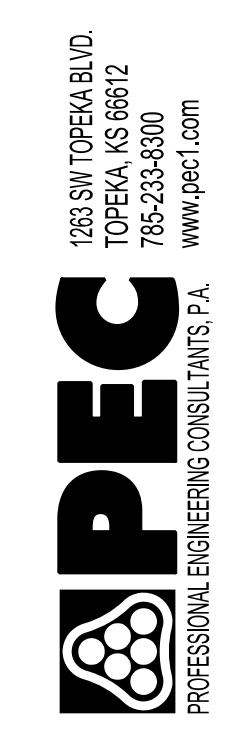
Special provisions required are as follows:  
708 Falsework and Form Construction  
736 Field Erection  
737 Controlled Demolition

This list is to be used for information only and should not be considered all inclusive.

SUMMARY OF QUANTITIES

Item	Unit	Quantity
Concrete (Grade 4.0) (AE)	CY	63.6
Reinforcing Steel (Grade 60) (Epoxy Coated)	LBS	6296
Concrete Safety Barrier (Special)	LF	318.0
Concrete Safety Barrier (Transition)	LF	104.5
Bridge Handrail (Steel) (Pedestrian)	LF	414.0
Drilling & Grouting	EA	352.0
Multi-Layer Polymer Concrete Overlay	SY	310.0
Falsework Inspection	LS	1.0
Sidewalk Construction (6") (AE)	SY	93.2
Removable Bollards	EA	4.0
Bridge Painting (Special)	LS	1.0
Removal of Existing Structures	LS	1.0
Light Pole Base	EA	2.0
Electric Conduit (1.0") (Non-Metallic)	LF	156.0
Junction Box	EA	4.0
Traffic Control	LS	1.0
Mobilization	LS	1.0

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LAWRENCE, KS 66047

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GENERAL NOTES & QUANTITIES

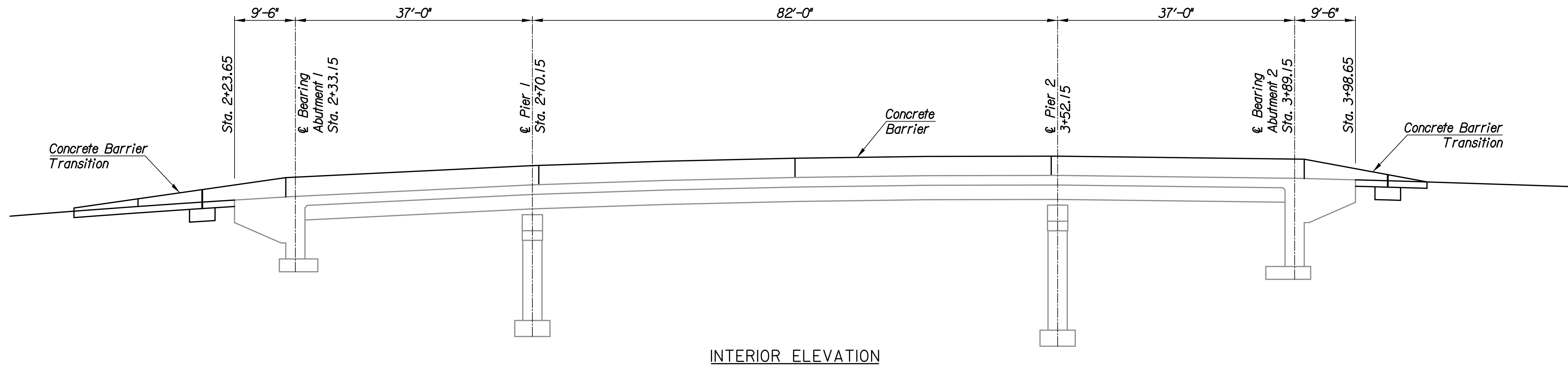
C101

ORIGINAL CONSTRUCTION DOCUMENTS

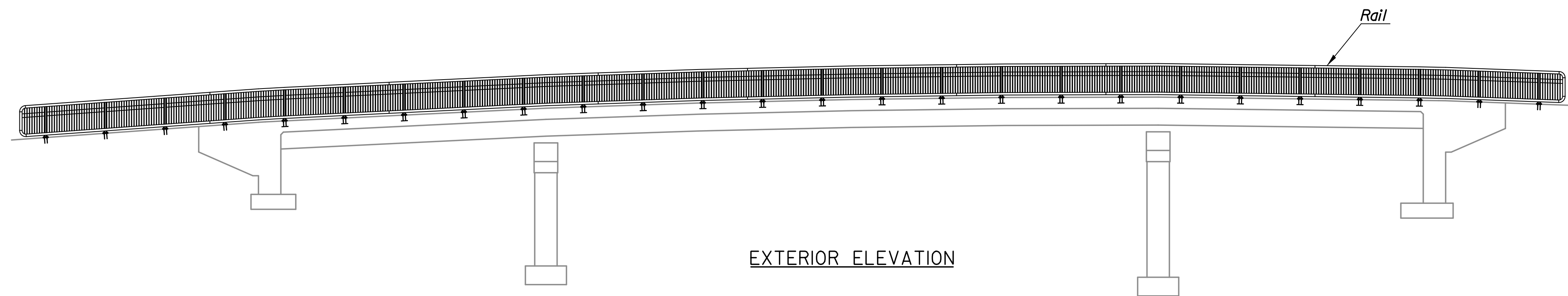
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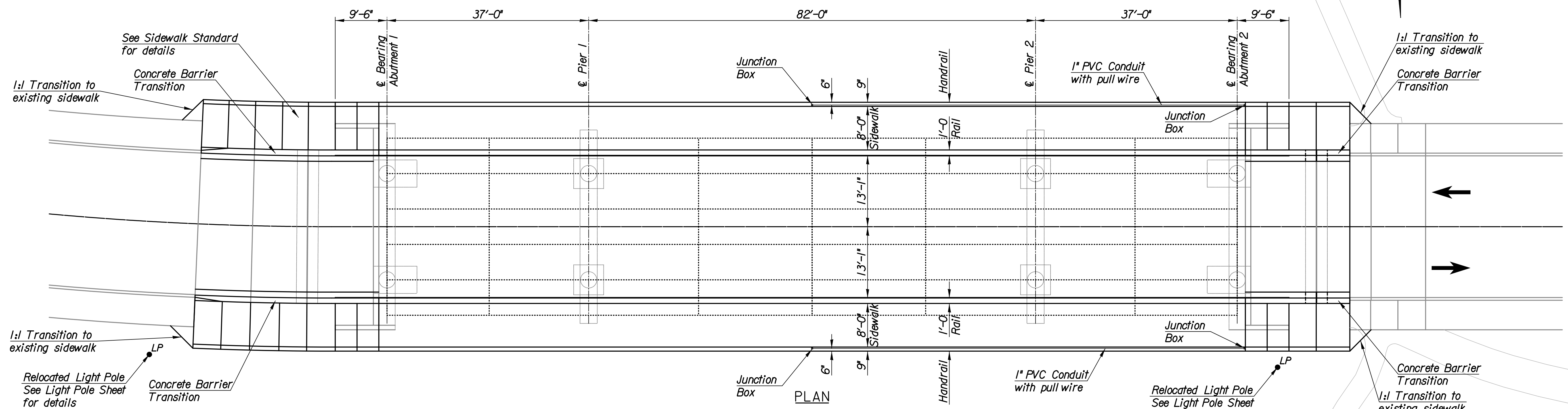




INTERIOR ELEVATION



EXTERIOR ELEVATION

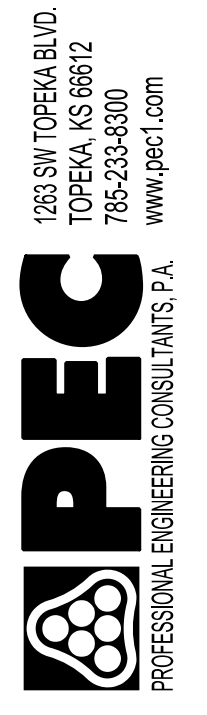


PLAN

KDOT Bridge No. 23-022

Plot: ted By: cwp Date: 9/2/2014 3:47:53 PM  
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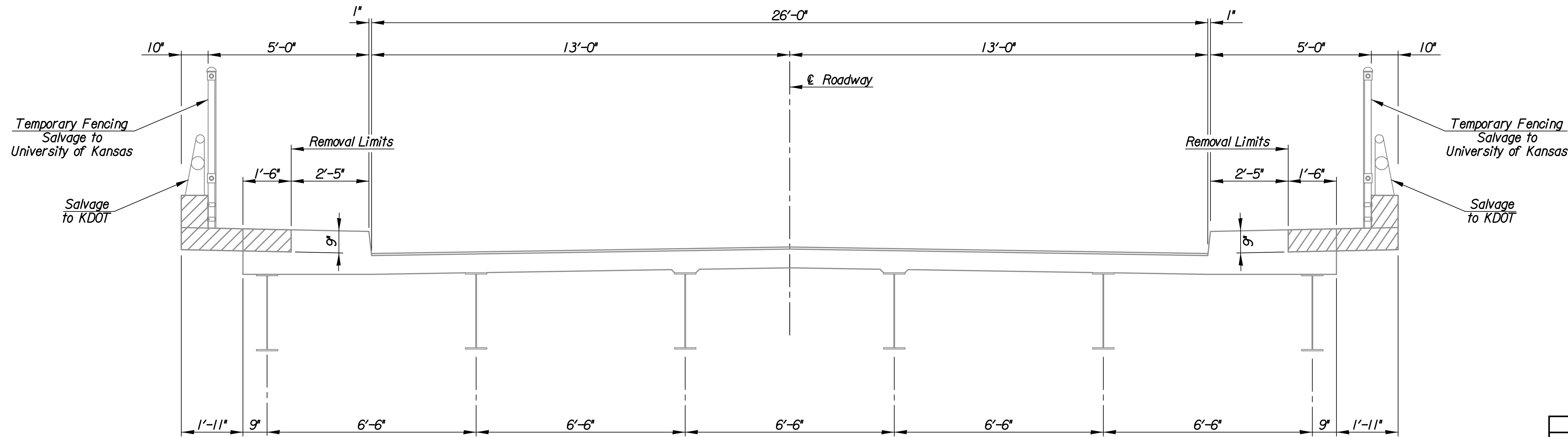
THE UNIVERSITY OF KANSAS  
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 BRIDGE IMPROVEMENTS PROJECT  
 LAWRENCE, KS 66047

DATE: 06-11-14  
 DRAWN BY: CP  
 CHECKED BY: RAS  
 REV:

PROPOSED PLAN & ELEVATION

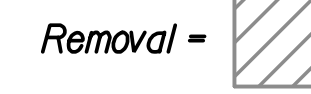
**C103**

ORIGINAL CONSTRUCTION DOCUMENTS



EXISTING TYPICAL SECTION

Removal limits extend EWS to EWS wingwalls removed to bottom of new slab

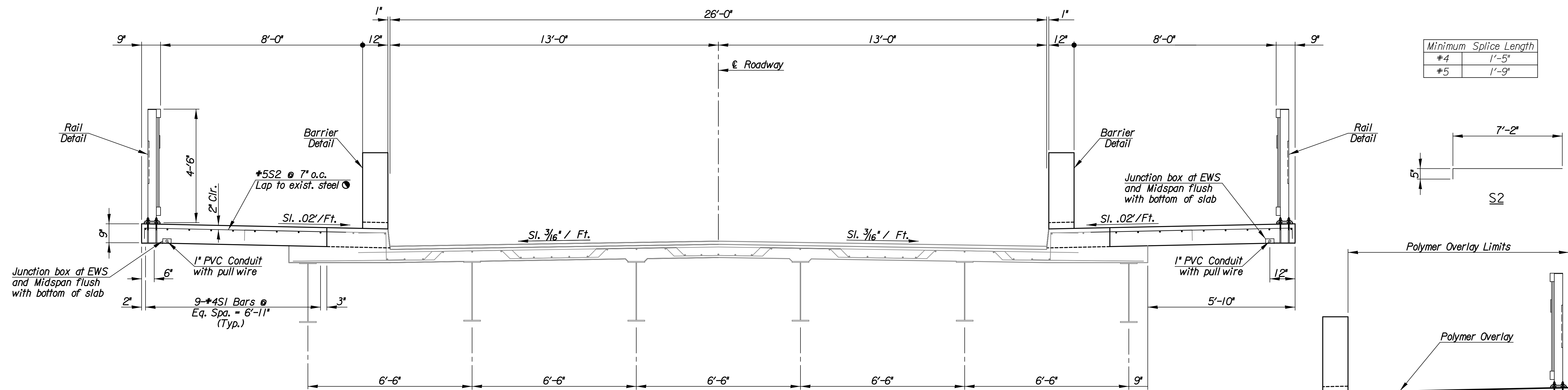


BRIDGE DECK							
BILL OF MATERIALS							
REINFORCING STEEL							
Straight Bars				Bent Bars			
Mark	No.	Size	Length	Mark	No.	Size	Length
S1	36	#4	41'-1"	S2	273	#5	7'-7"

\* SUMMARY OF QUANTITIES

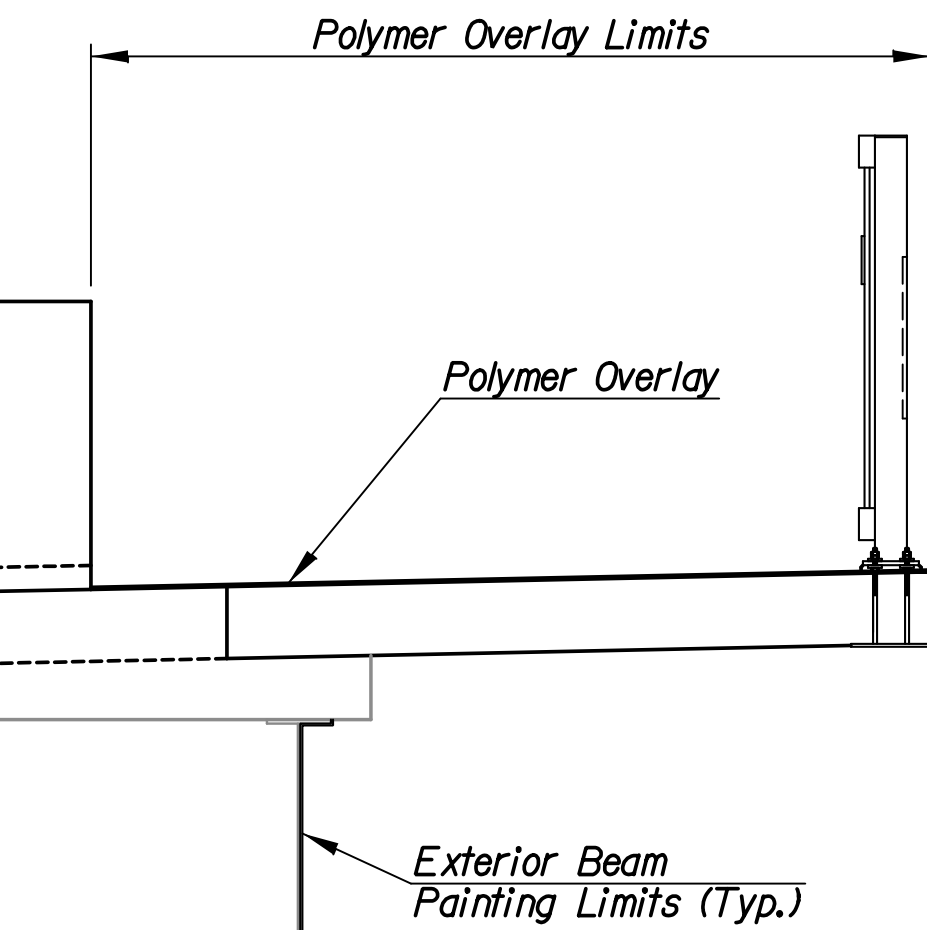
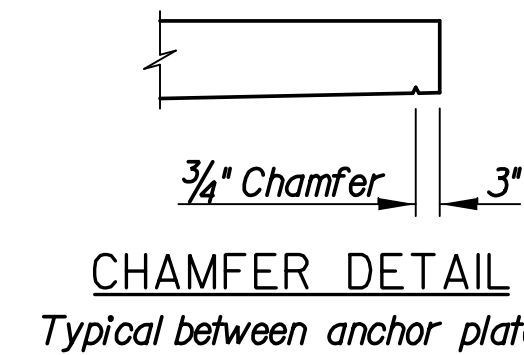
Concrete (Grade 4,0) (AE)	31.8 Cu. Yds.
Reinforcing Steel (Gr. 60)(Epoxy Coated)	3148 Lbs.

\* One side quantified, 2 required



PROPOSED TYPICAL SECTION

● Lap 1'-6" minimum. If existing bar is damaged or less than the minimum lap length remains contractor to drill and grout bars 9" minimum embed at no additional cost.



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

Plot: ted By: cwp Date: 9/10/2014 9:44:53 AM  
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NO.	DESCRIPTION	DATE

1263 SW TOPEKA BLVD.  
TOPEKA, KS 66612  
785-233-8300  
www.pcc1.com

PROFESSIONAL ENGINEERING CONSULTANTS, P.A.

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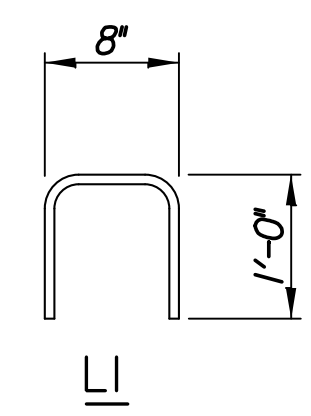
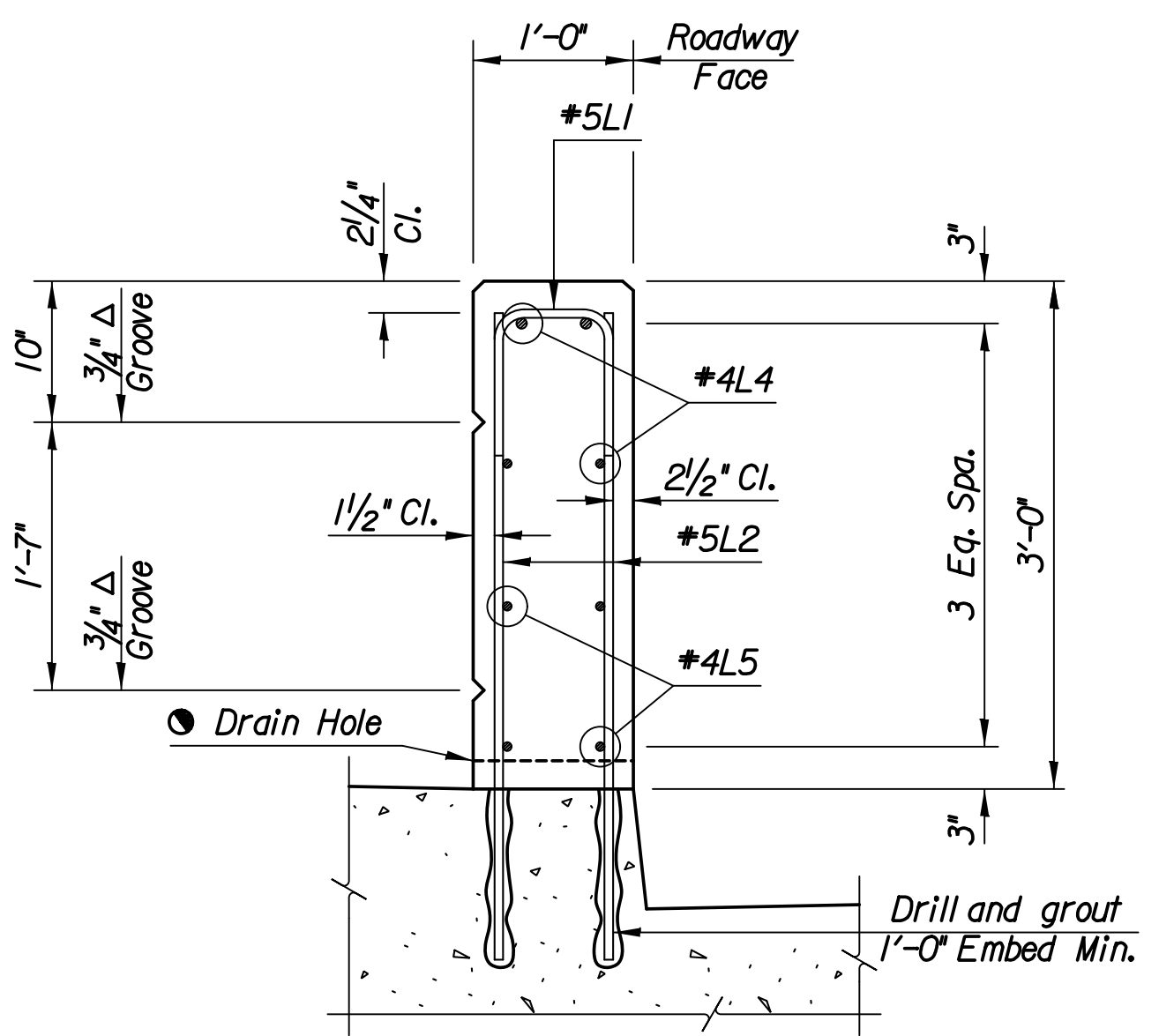
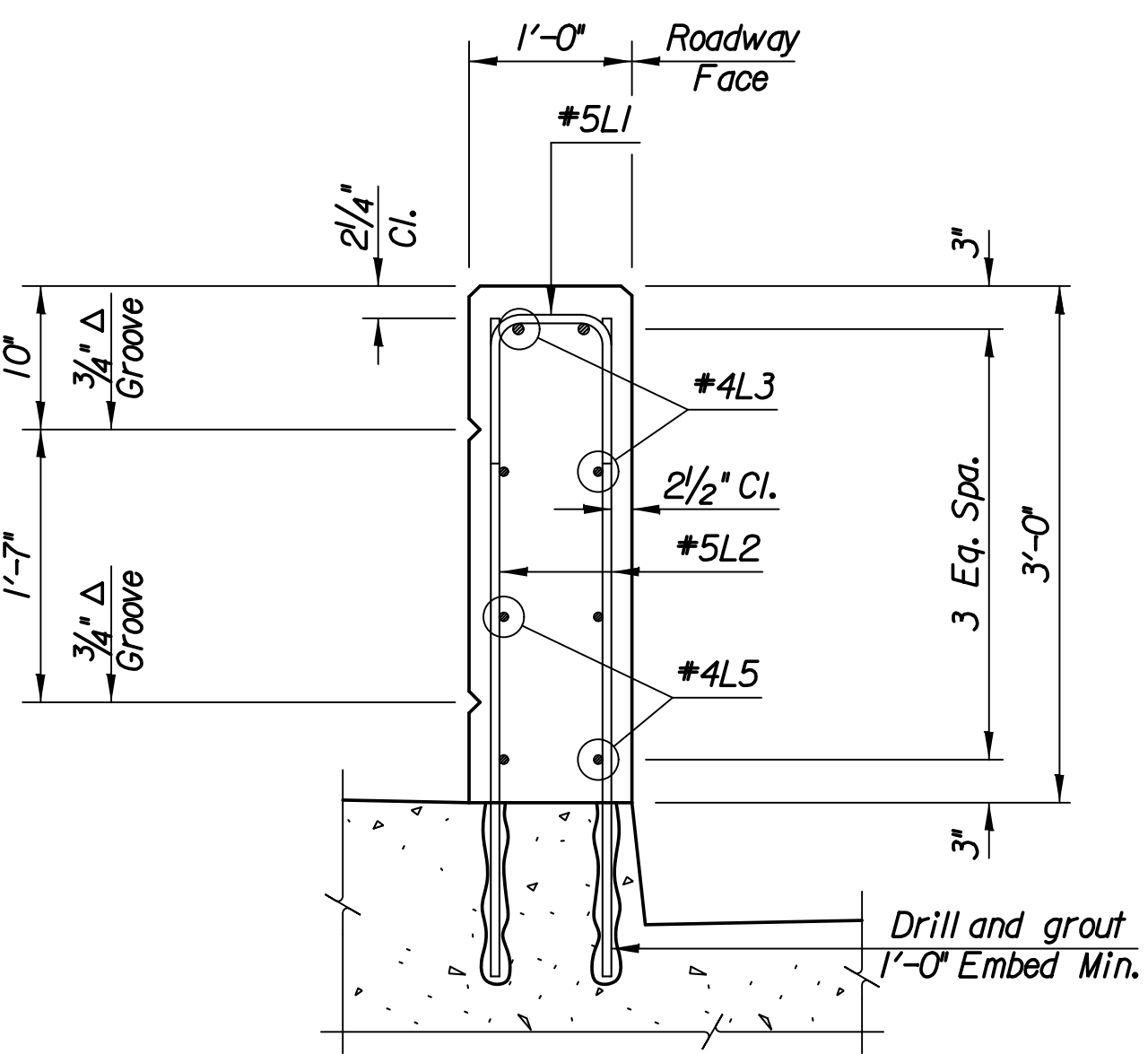
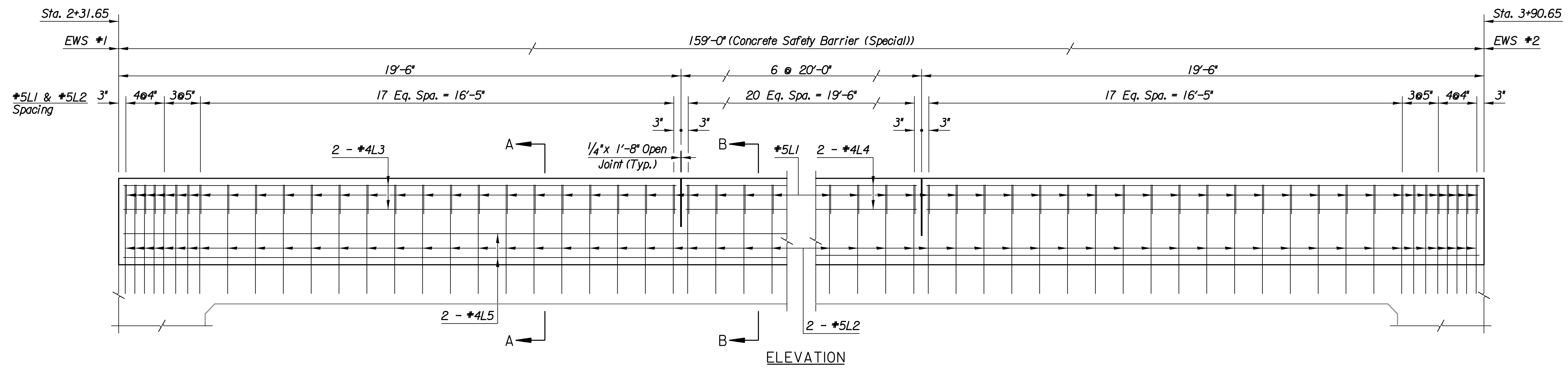
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BRIDGE IMPROVEMENTS PROJECT  
LAWRENCE, KS 66047

DATE: 06-11-14  
DRAWN BY: CP  
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BRIDGE TYPICAL SECTION

**C104**

ORIGINAL CONSTRUCTION DOCUMENTS



**GENERAL NOTES:**

The Concrete Safety Barrier shall be constructed of Concrete (Grade 4.0) (AE) and Reinforcing Steel complying to A.S.T.M. Designation A-615 Grade 60. All reinforcing steel shall be epoxy coated and all clearances shall be 1/2" unless otherwise noted.

The exposed Faces of the Barrier shall be grooved with a 3/4" Chamfer Strip at Contraction Joint locations. Where adjacent to Concrete Pavement, Contraction Joints shall match those in adjacent Pavement.

The Bid Item "Concrete Safety Barrier (Special)" shall be measured per lineal foot as per Plan. The amount of completed and accepted work, measured by lineal foot, shall be paid for at the Contract Unit Price Bid for "Concrete Safety Barrier (Special)." This price shall be considered full compensation for furnishing all material and equipment and labor necessary to complete the work.

BARRIER							
BILL OF MATERIALS							
REINFORCING STEEL							
Straight Bars				Bent Bars			
Mark	No.	Size	Length	Mark	No.	Size	Length
L2	352	#5	3'-10"	L1	176	#5	2'-8"
L3	8	#4	19'-2"				
L4	24	#4	19'-8"				
L5	12	#4	54'-0"				

\* SUMMARY OF QUANTITIES

Concrete (Grade 4.0) (AE)	17.67 Cu. Yds.
Reinforcing Steel (Gr. 60)(Epoxy Coated)	2748 Lbs.

\* For Information Only; 2 required

2"x4" voided drain hole to be placed at 10'-0" maximum spacing. Center between LI bars.

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1263 SW TOPEKA BLVD.  
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LAWRENCE, KS 66047

DATE: 06-11-14	REV: RAS
DRAWN BY: CP	CHECKED BY: RAS

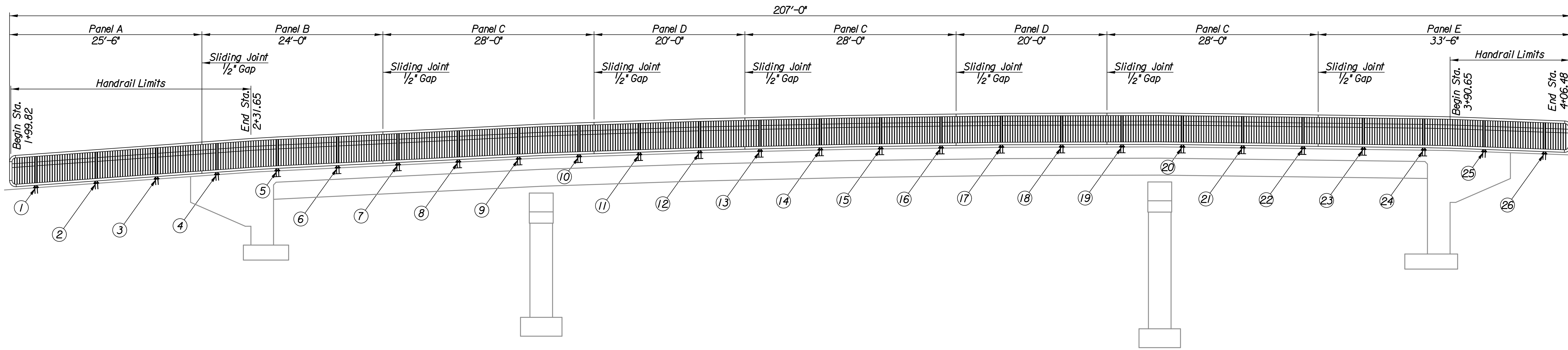
**BARRIER DETAILS**

**C105**

ORIGINAL CONSTRUCTION DOCUMENTS

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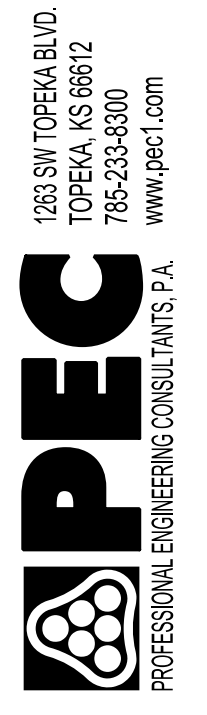
**RAIL ELEVATION**  
 Looking South  
 North opposite hand

See Sh. No. C108 for Handrail Details.

BASE PLATE LOCATIONS			
Base Plate #	Side	Station	Elevation
1	Lt. or Rt.	2+03.15	1029.89
2	Lt. or Rt.	2+11.15	1030.47
3	Lt. or Rt.	2+19.15	1031.04
4	Lt. or Rt.	2+27.15	1031.62
5	Lt. or Rt.	2+35.15	1032.15
6	Lt. or Rt.	2+43.15	1032.59
7	Lt. or Rt.	2+51.15	1032.99
8	Lt. or Rt.	2+59.15	1033.37
9	Lt. or Rt.	2+67.15	1033.71
10	Lt. or Rt.	2+75.15	1034.02
11	Lt. or Rt.	2+83.15	1034.29
12	Lt. or Rt.	2+91.15	1034.53
13	Lt. or Rt.	2+99.15	1034.74
14	Lt. or Rt.	3+07.15	1034.92
15	Lt. or Rt.	3+15.15	1035.07
16	Lt. or Rt.	3+23.15	1035.18
17	Lt. or Rt.	3+31.15	1035.26
18	Lt. or Rt.	3+39.15	1035.30
19	Lt. or Rt.	3+47.15	1035.32
20	Lt. or Rt.	3+55.15	1035.30
21	Lt. or Rt.	3+63.15	1035.24
22	Lt. or Rt.	3+71.15	1035.16
23	Lt. or Rt.	3+79.15	1035.04
24	Lt. or Rt.	3+87.15	1034.89
25	Lt. or Rt.	3+95.15	1034.65
26	Lt. or Rt.	4+03.15	1034.36

Note: Elevations are provided for installer/shop drawing and fabrication purposes.

NO.	REVISIONS DESCRIPTION	DATE



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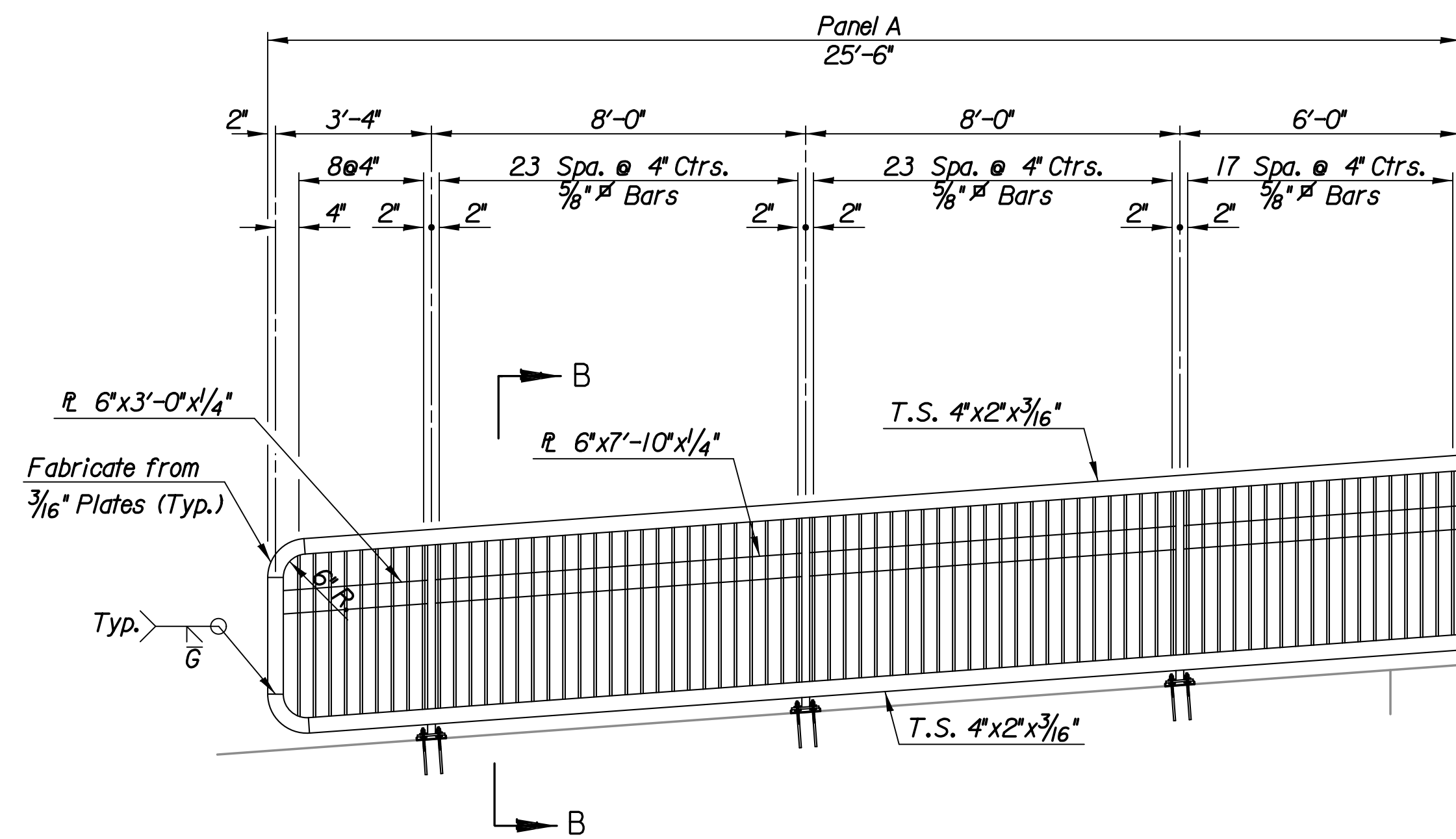
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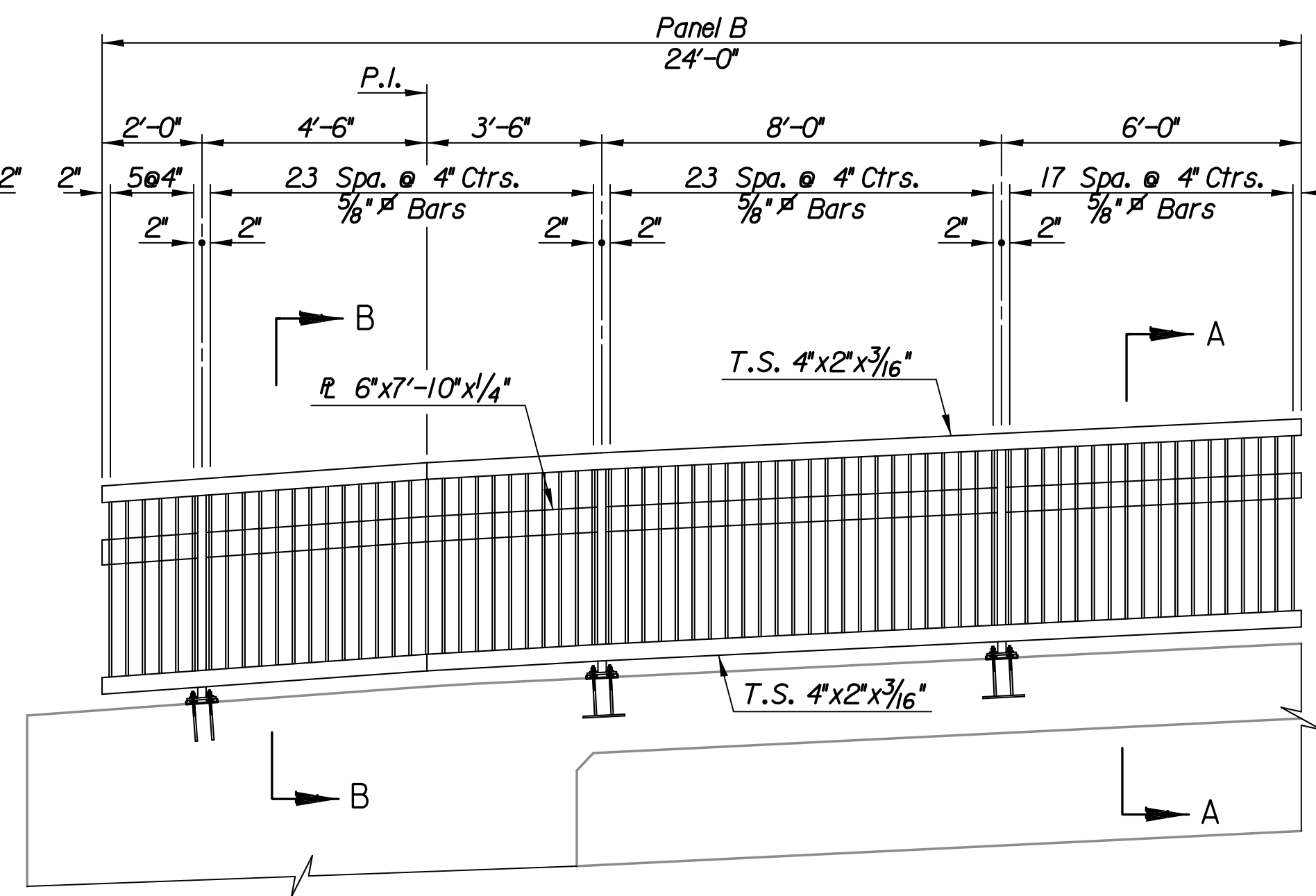
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 REV:

RAIL DETAILS  
 1 of 3

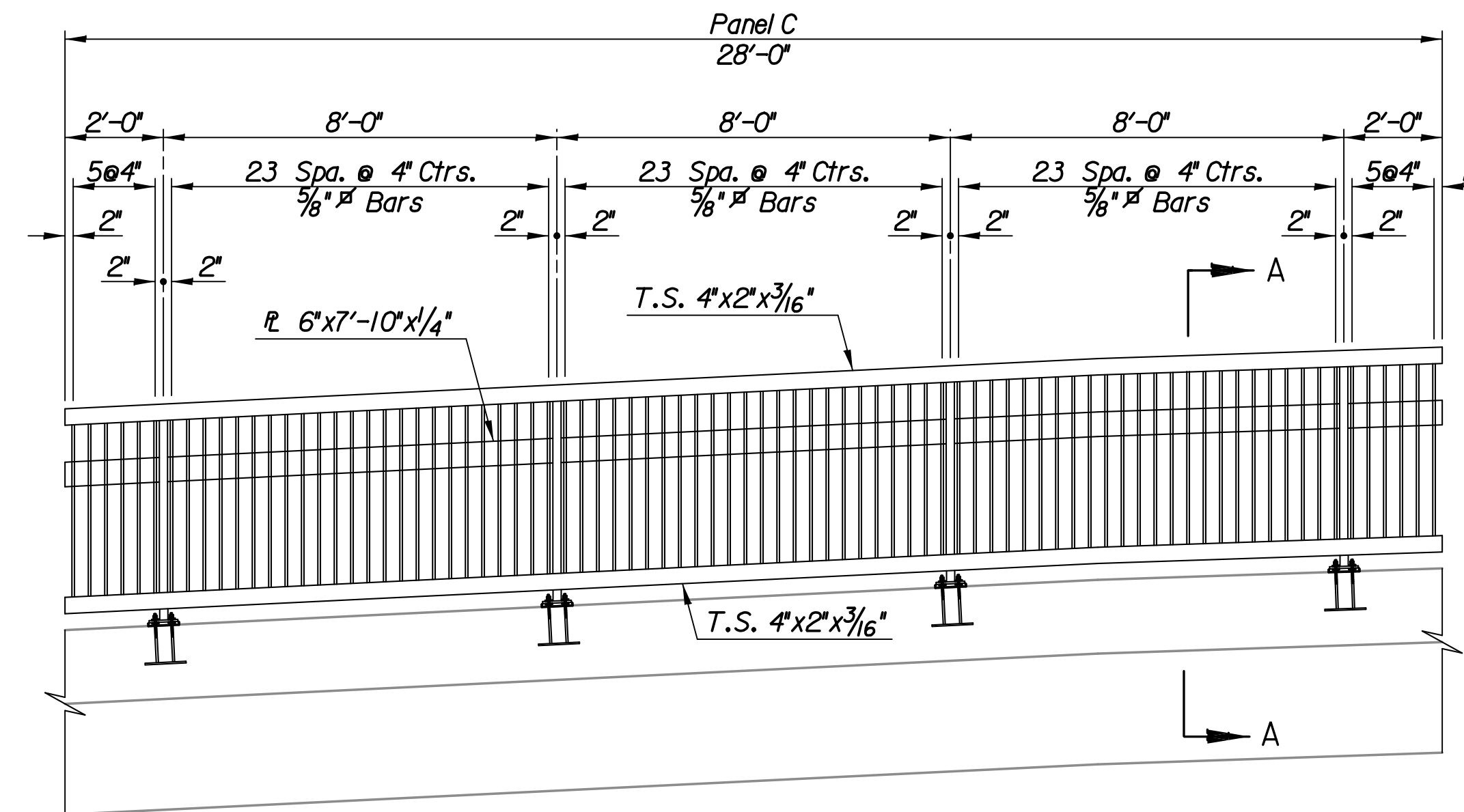
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 ORIGINAL CONSTRUCTION DOCUMENTS



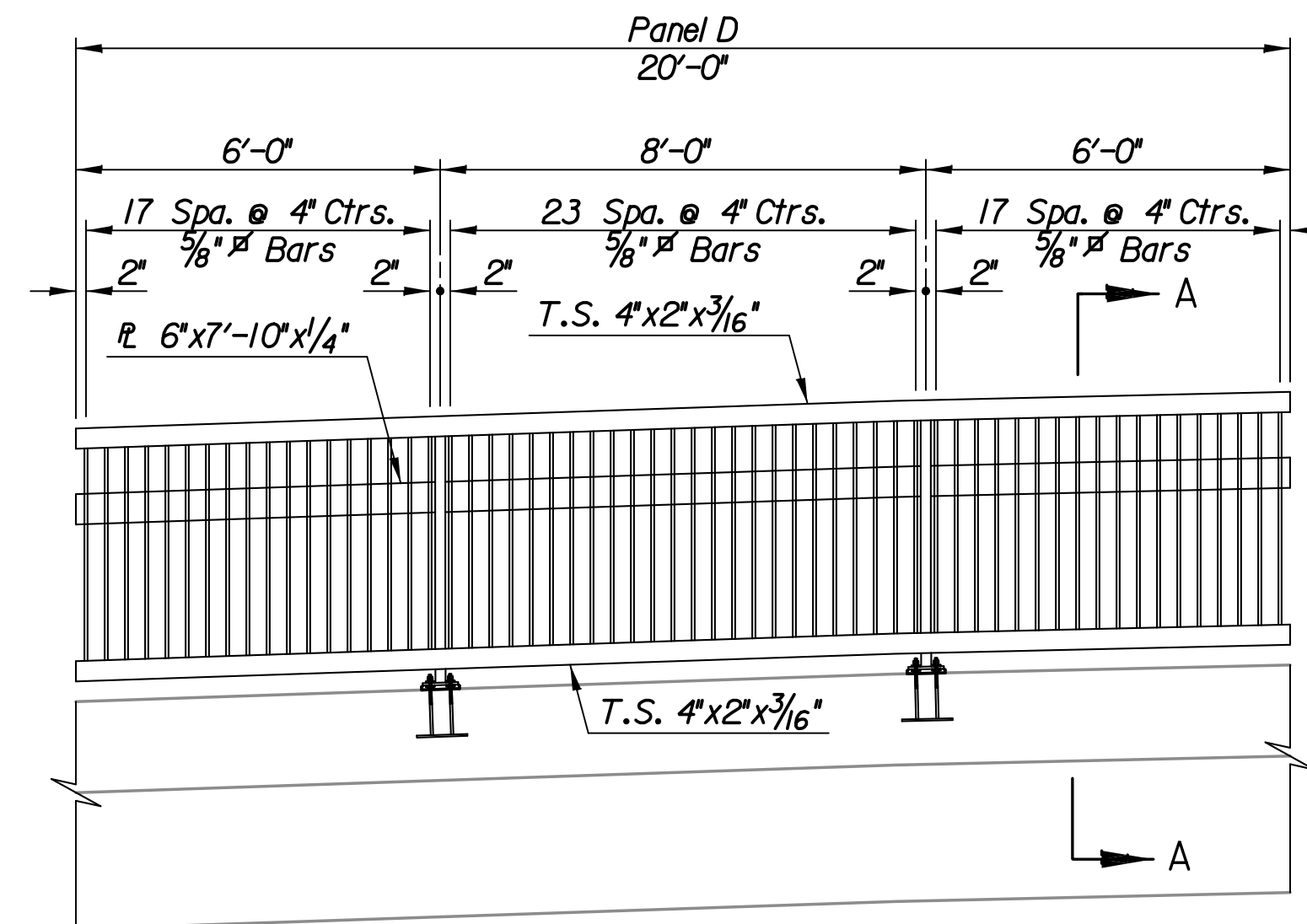
PANEL A



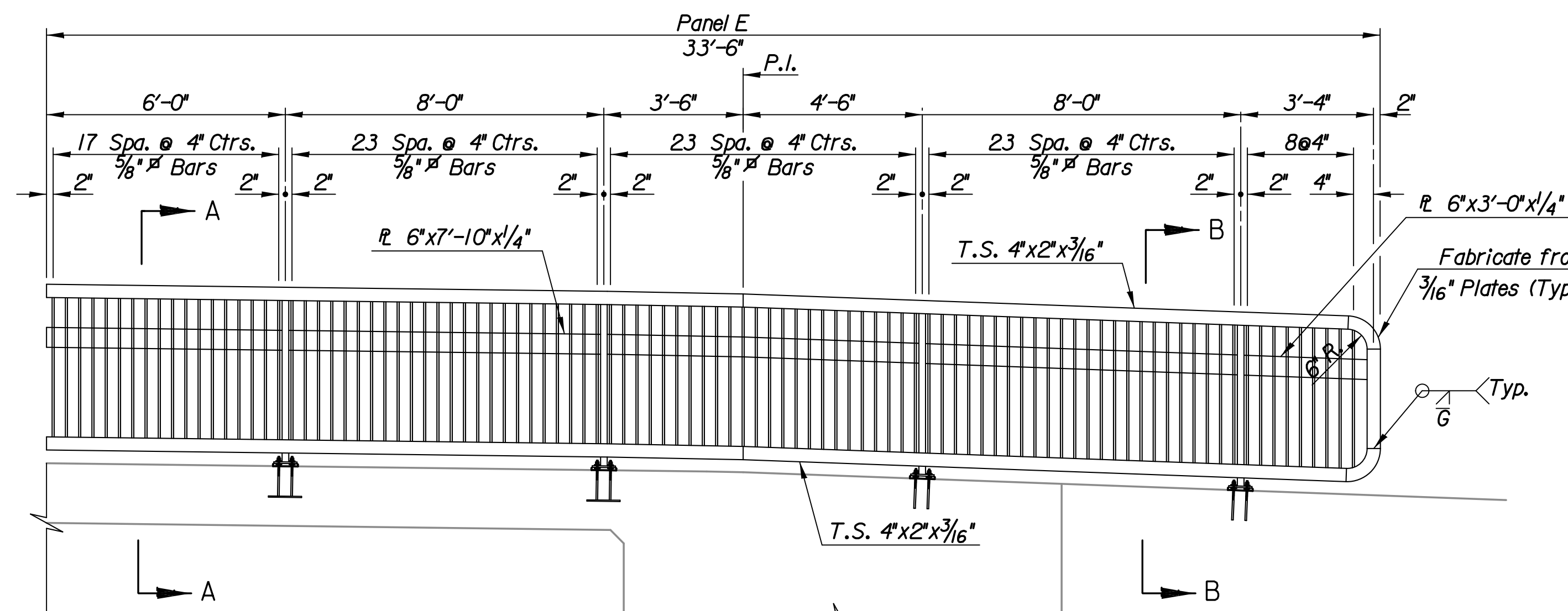
PANEL B



PANEL C

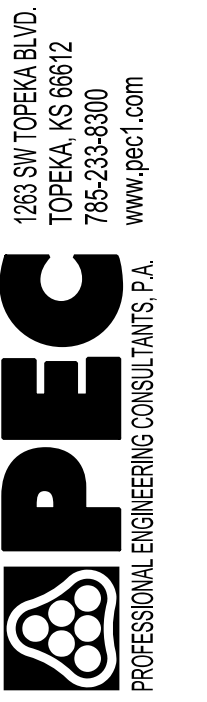


PANEL D



PANEL E

NO.	REVISIONS DESCRIPTION	DATE



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RAIL ELEVATIONS  
 2 of 3

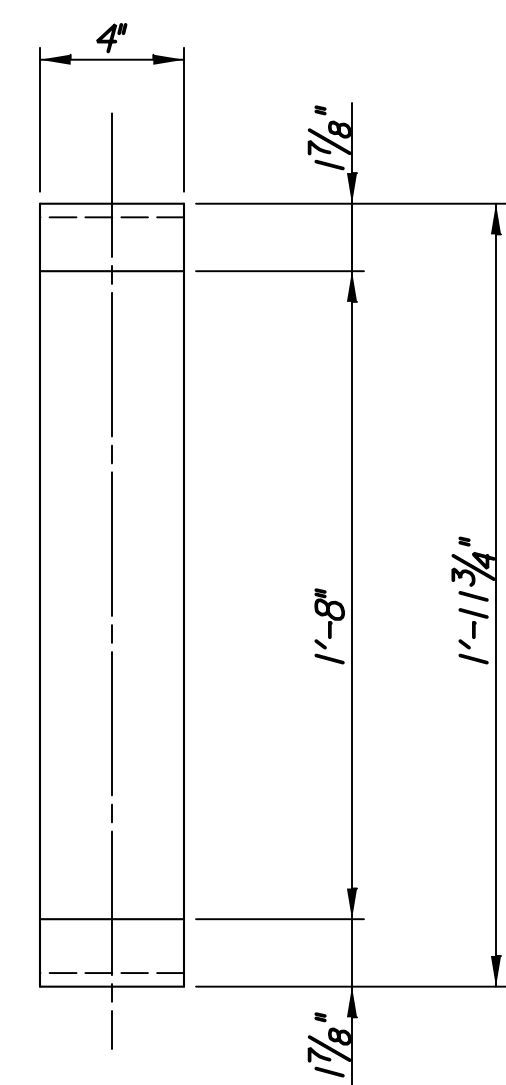
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ORIGINAL  
 CONSTRUCTION  
 DOCUMENTS

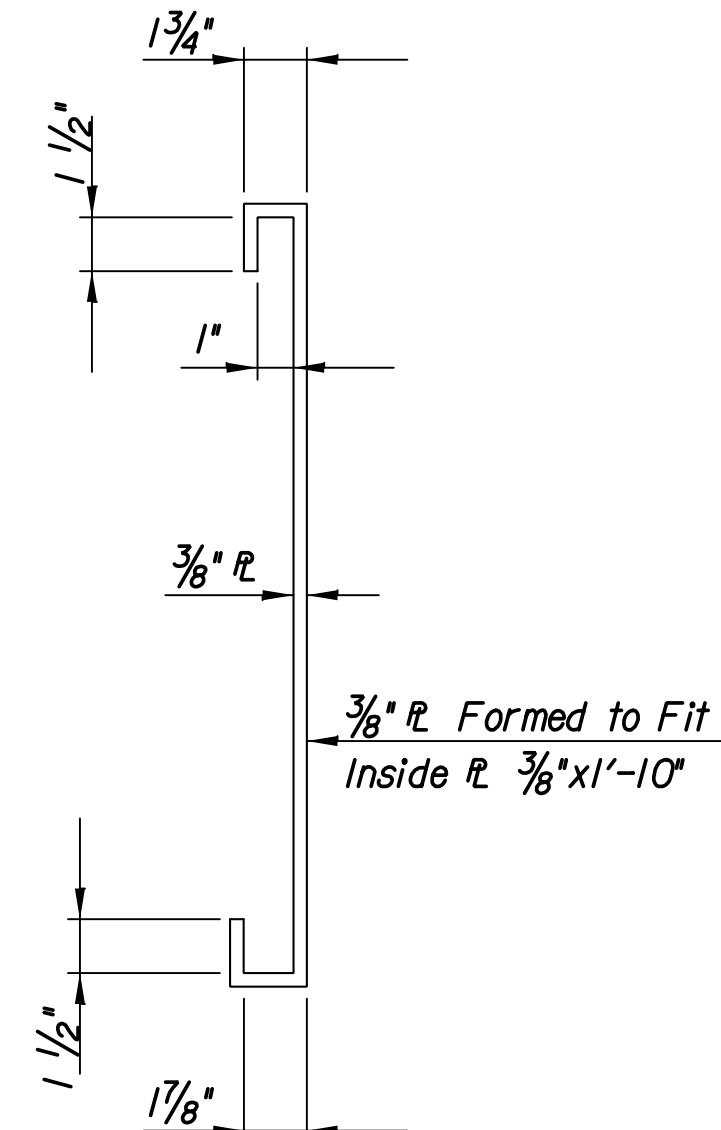
See Sh. No. C108 for Section A-A,  
 Section B-B, and Handrail Details.

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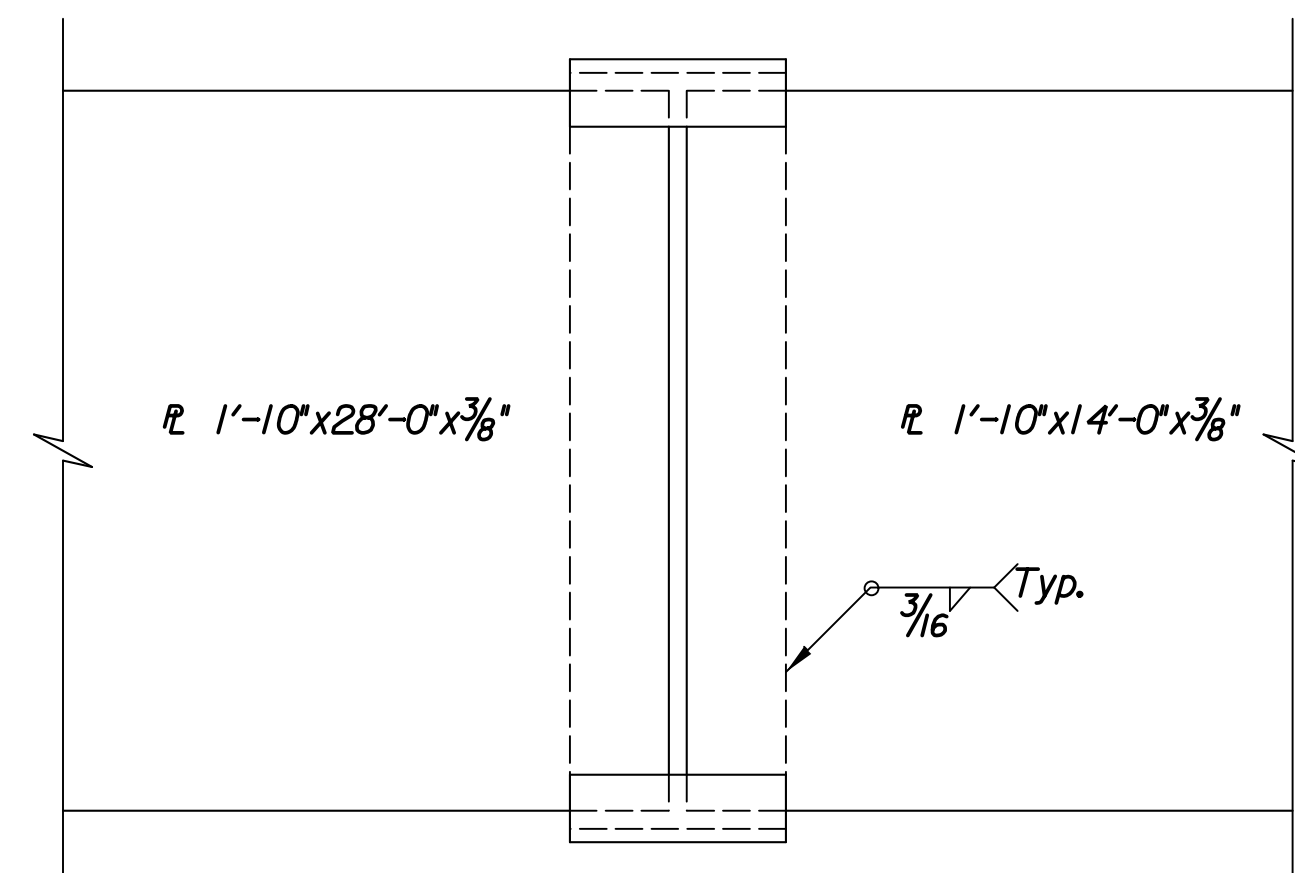




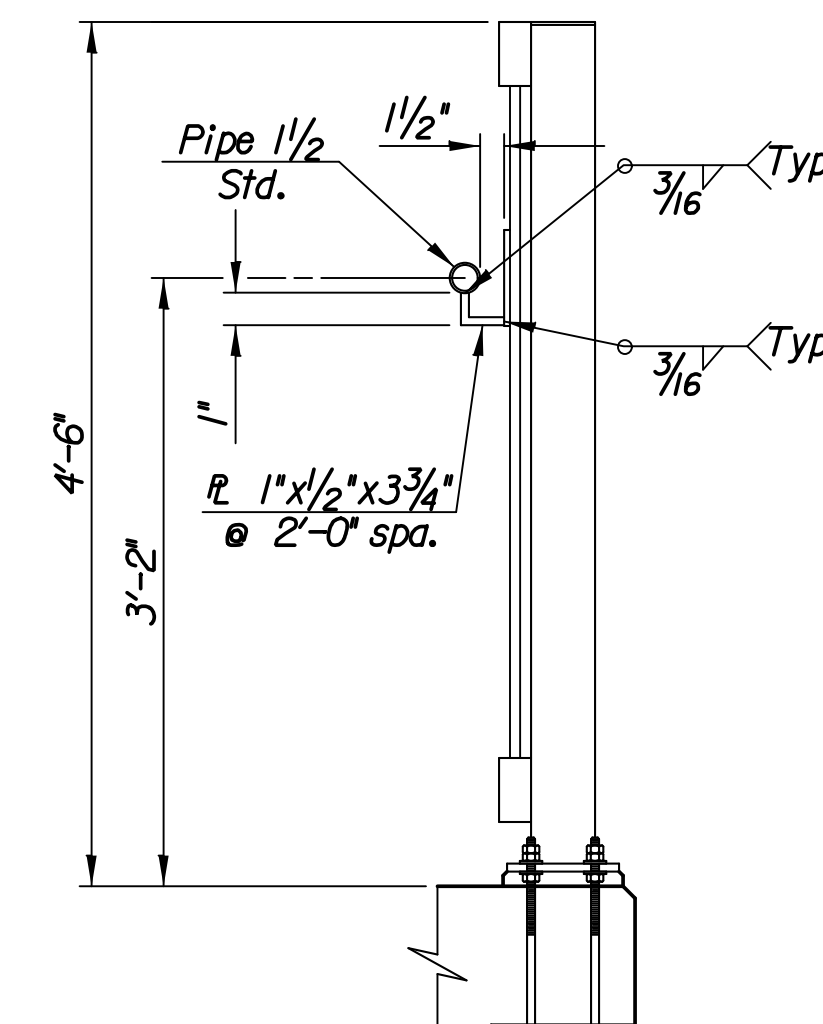
FRONT



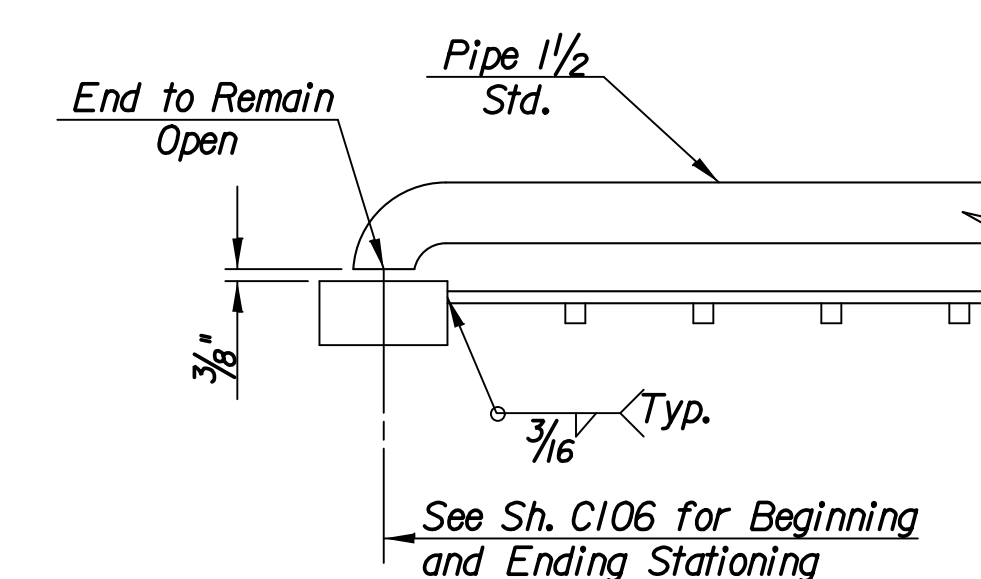
SIDE



JOINT DETAIL



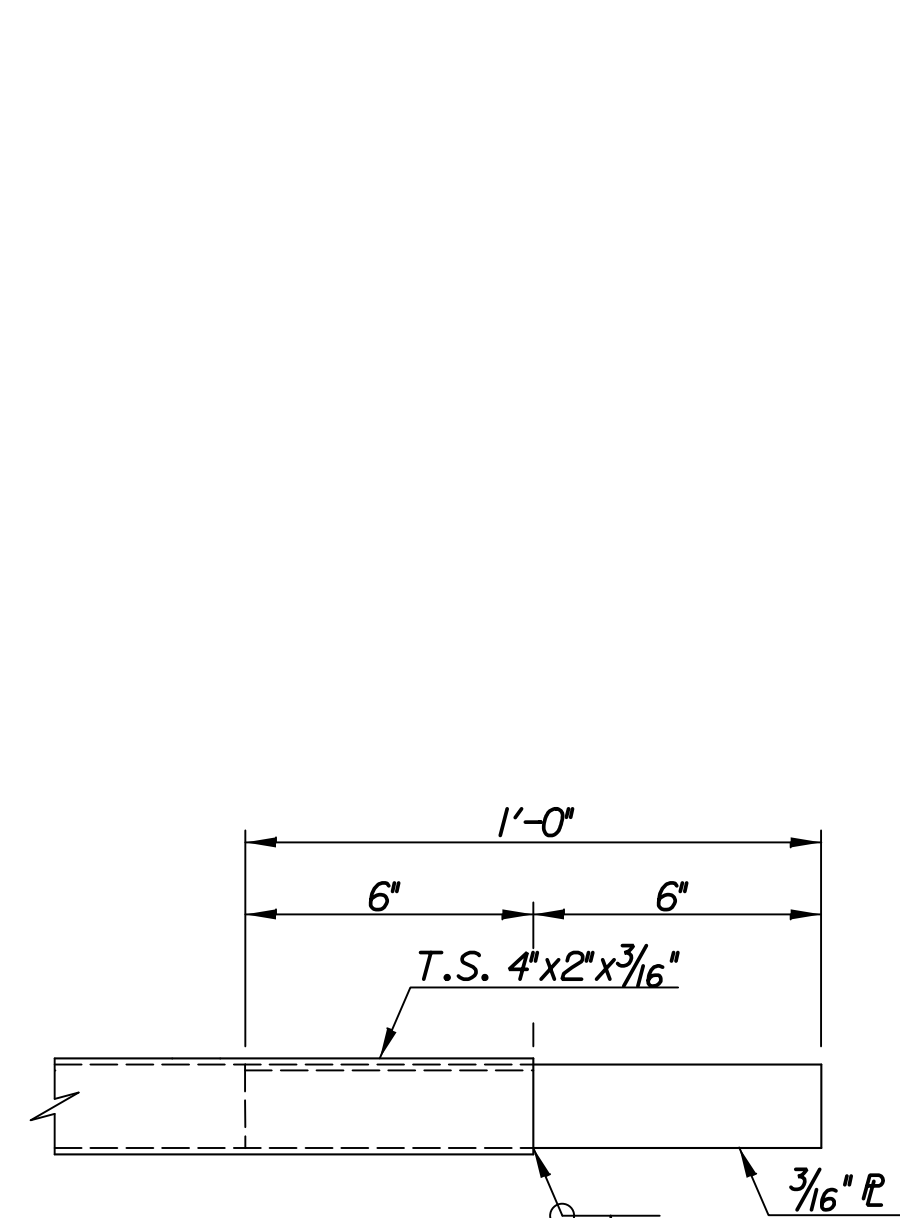
SECTION B-B



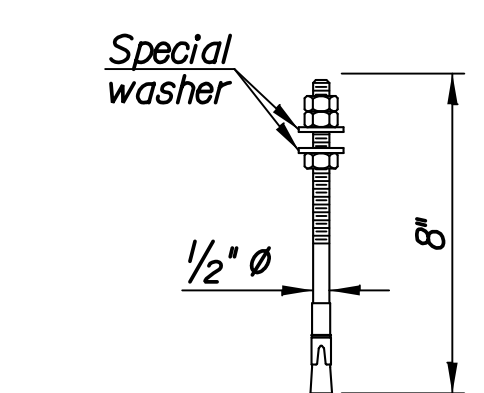
TYPICAL HANDRAIL TERMINATION

LETTER MOUNTING JOINT DETAIL

NOTE : Locations to match panel Joints as required.

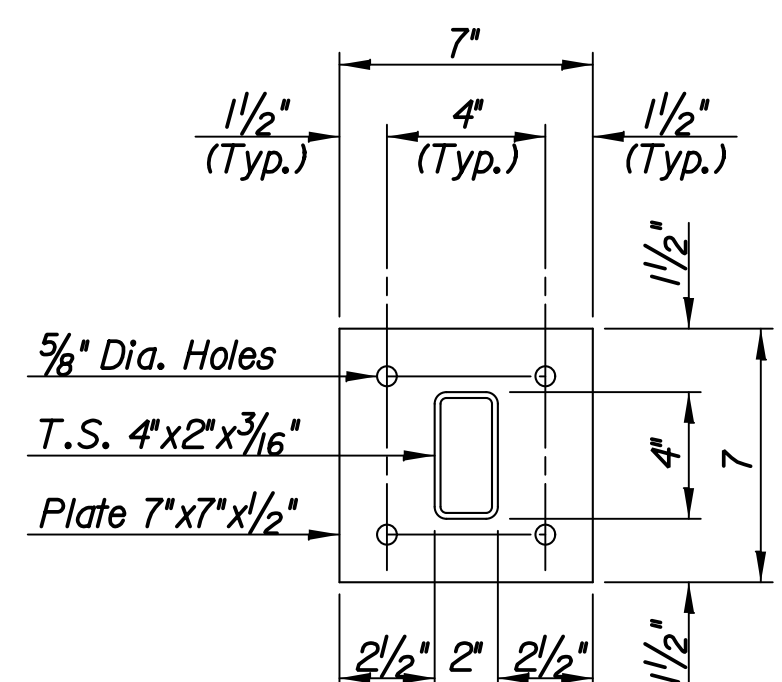


PLAN



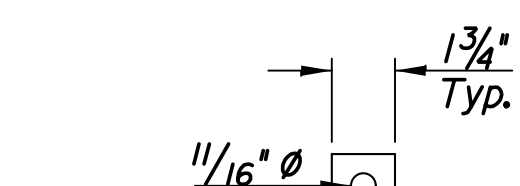
ANCHOR BOLT

For use off bridge  
Expansion Type Anchor Bolt  
Galvanized (ASTM A153)  
24 required per side



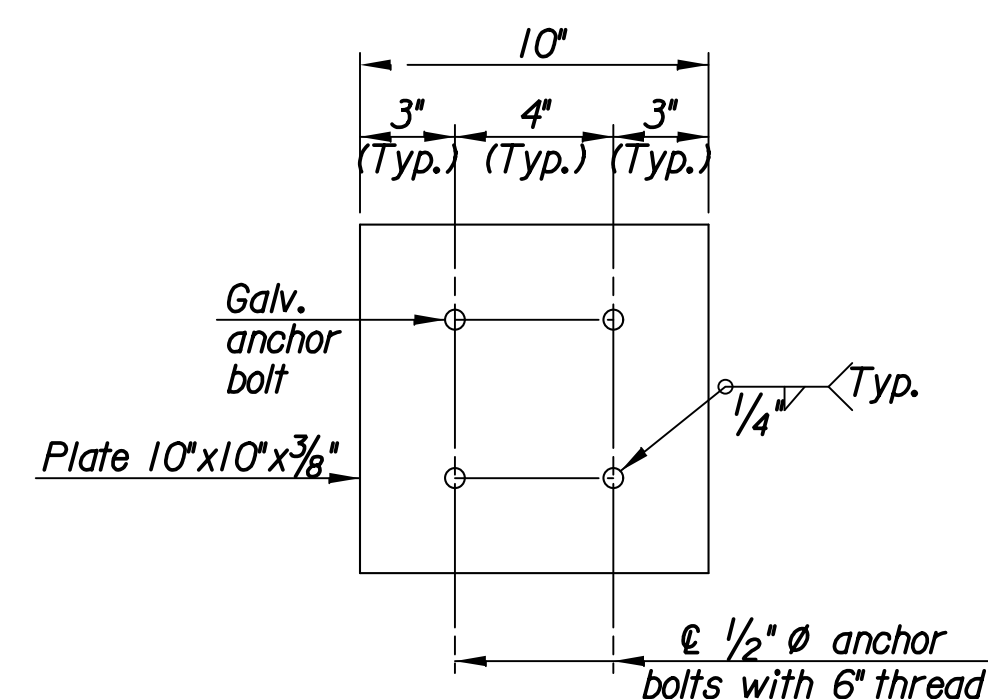
BASE PLATE

26 required per side



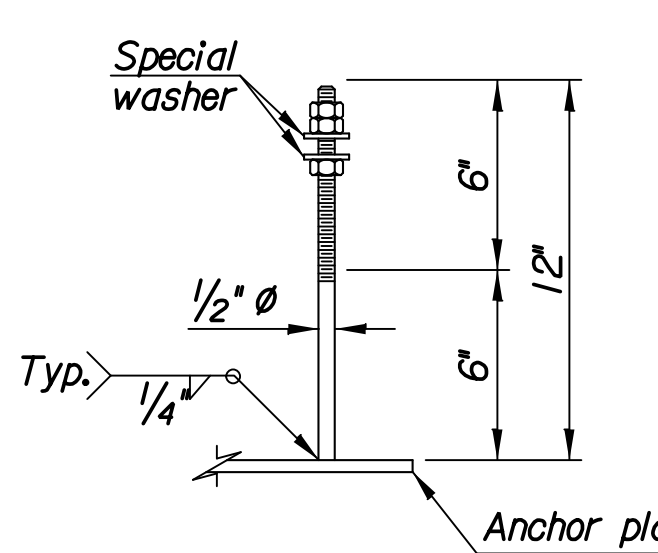
SPECIAL WASHER

5/16" x 1 3/4" x 1 3/4"



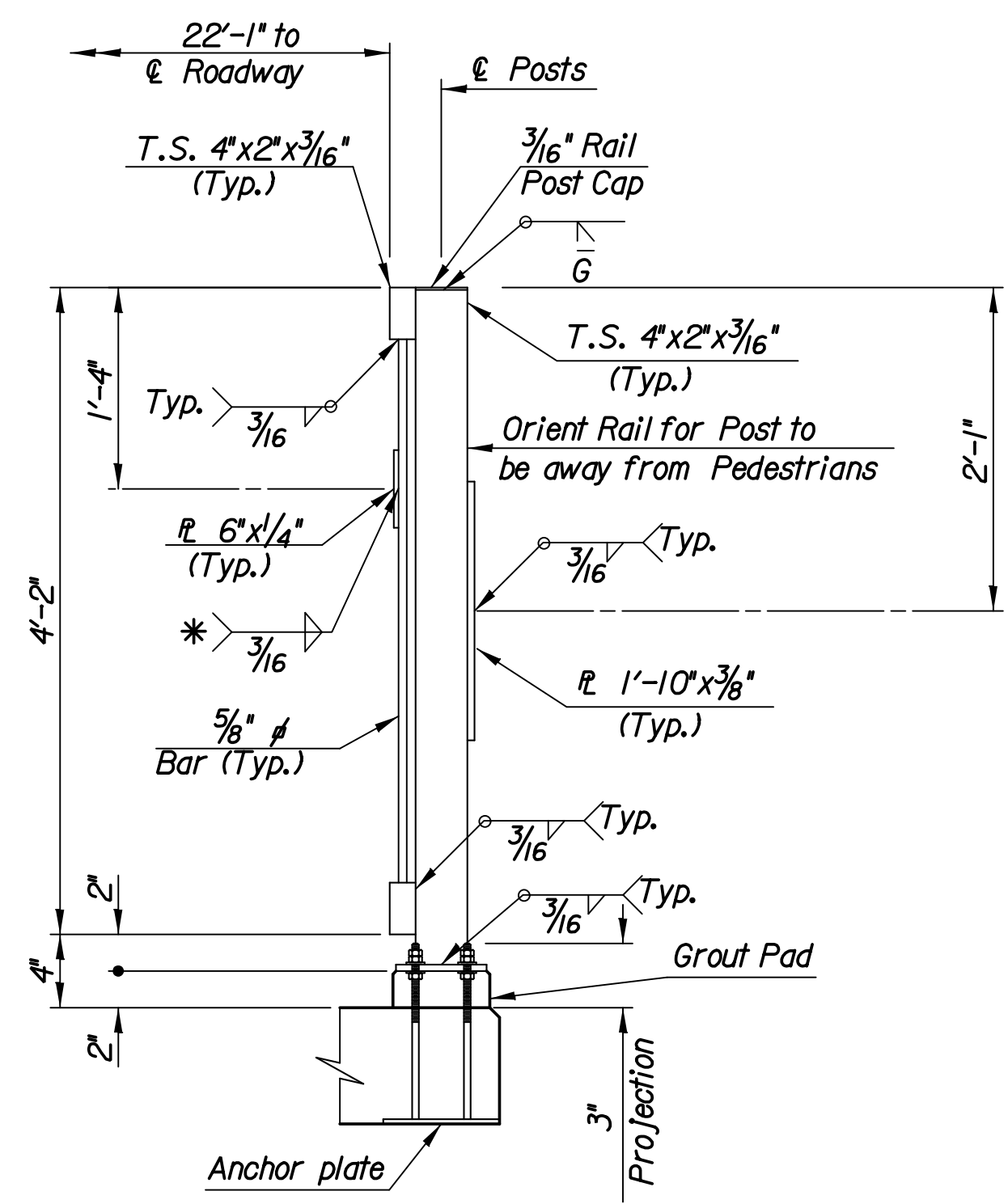
ANCHOR PLATE

20 required per side



ANCHOR BOLT ASSEMBLY

For use on bridge  
Galvanized (ASTM A153)  
after fabrication



SECTION A-A

GENERAL NOTES

The horizontal members of the Rail and Posts shall be hollow structural tubing. All structural steel tubing shall comply to A.S.T.M. designation A36 or A500 Grade B respectively. The handrail pipe shall be A.S.T.M. designation A53. All plates and bars shall comply with A.S.T.M. designation A36.

Rail shall be fabricated in lengths as shown from joint to joint and joint to end.

Post and Bars shall be set vertical using provided leveling nuts. After the rail is set fill the void between the base plate and the top of the deck or sidewalk with a non-shrink grout.

Prior to painting abrasive blast to commercial finish SSPC-SP6 to obtain a surface profile of 1-1/2 Mils. The shop and top coats applied to structural steel shall conform to an inorganic Zinc Primer with water-borne Acrylic finish coat. (The finish coat shall match KU Blue PMS 293; for more information see <http://identity.ku.edu/colors/index.shtml>) Provide a color sample to the Engineer with shop drawing submittal.

Material and construction shall conform to the structural welding code A.W.S. D1.1-01.

Shop details must be submitted and approved by the Engineer.

Slope of Handrail shall match the slope of the bridge.

All work associated with furnishing and installing Handrail shall be paid for as "Bridge Handrail (Steel)(Pedestrian)".

Plot/Red By: cwp Date: 9/2/2014 3:47:59 PM FILE: F:\2012\1260\049\Trans\Bridg\Ugn Project\1260\049-Pr.op.Brldge RailDetails.dgn

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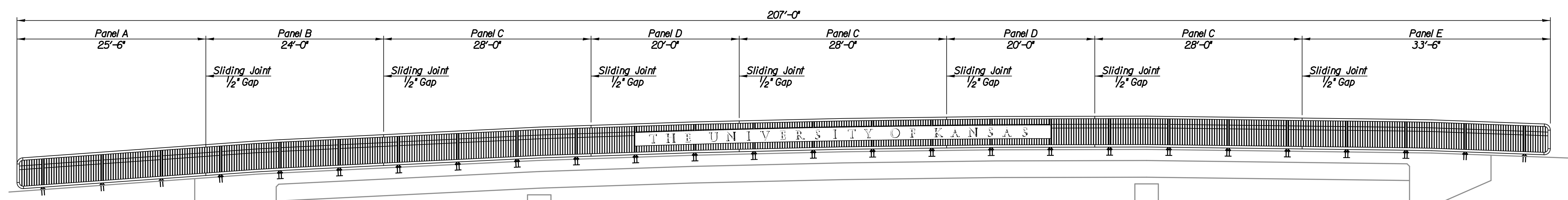
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LAWRENCE, KS 66047  
DATE: 06-11-14  
DRAWN BY: CP  
CHECKED BY: RAS  
REV:  

RAIL DETAILS  
3 of 3  
C108  
ORIGINAL  
CONSTRUCTION  
DOCUMENTS



**GENERAL NOTES**

All structural steel shall comply to A.S.T.M. designation A36. Prior to painting abrasive blast to commercial finish SSPC-SP6 to obtain a surface profile of 1-1/2 Mils. The shop and top coats applied to structural steel shall conform to an inorganic Zinc Primer with water-borne Acrylic finish coat. The finish coat for all Plates shall match KU Blue PMS 293, the finish coat for Letters shall match White \*FFFFFF; for more information see <http://identity.ku.edu/colors/index.shtml>. Provide a color sample to the Engineer with shop drawing submittal.

Material and construction shall conform to the structural welding code A.W.S. D1.1-01.

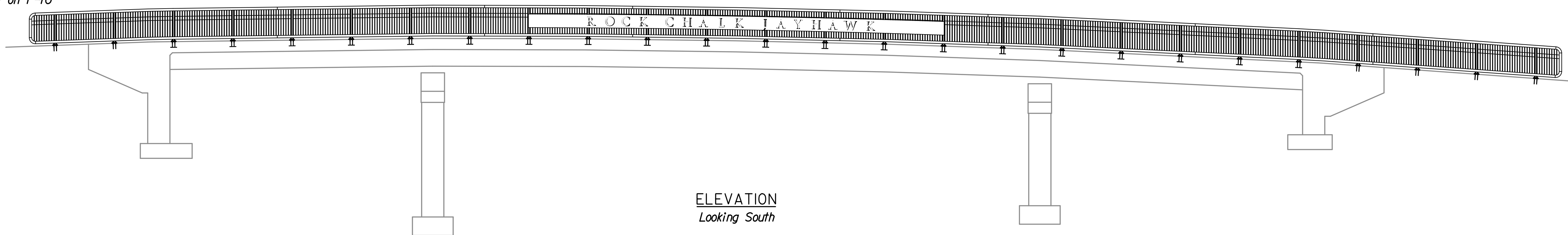
Shop details must be submitted to and approved by the Engineer.

Slope of Plates shall match the slope of the bridge.

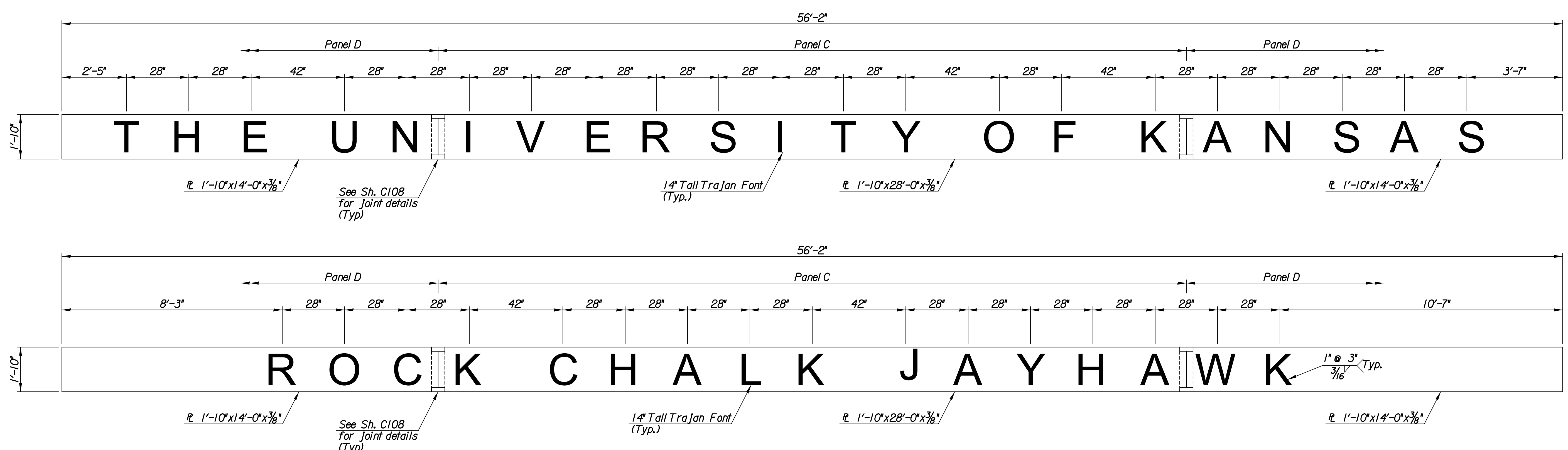
All work associated with furnishing and installing Handrail shall be paid for as "Bridge Handrail (Steel) (Pedestrian)".

Letters to be cut from ASTM designation A36 material and shall be 1" in thickness and vertically centered on 1'-10" plates.

**ELEVATION**  
Looking North



**ELEVATION**  
Looking South



Plot: 3:48:01 PM Date: 9/2/2014  
 FILE: F:\2012\1260\049\Trans\Bridges\UgN Project\1260\049-Bridge RailLettering.dgn

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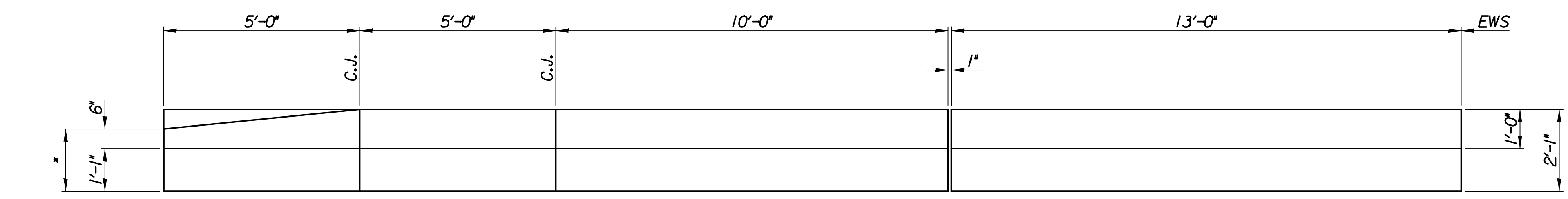
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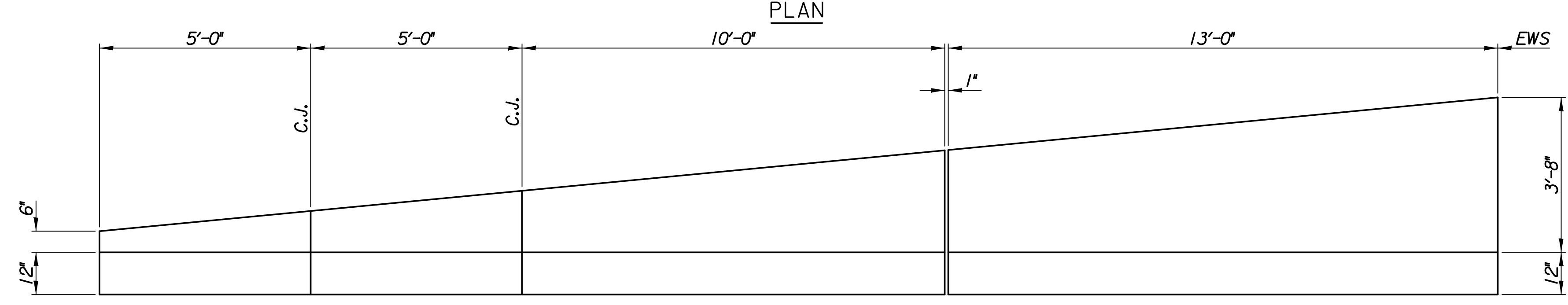
DATE: 06-11-14  
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 CHECKED BY: RAS  
 REV:

**SIGN INFORMATION**

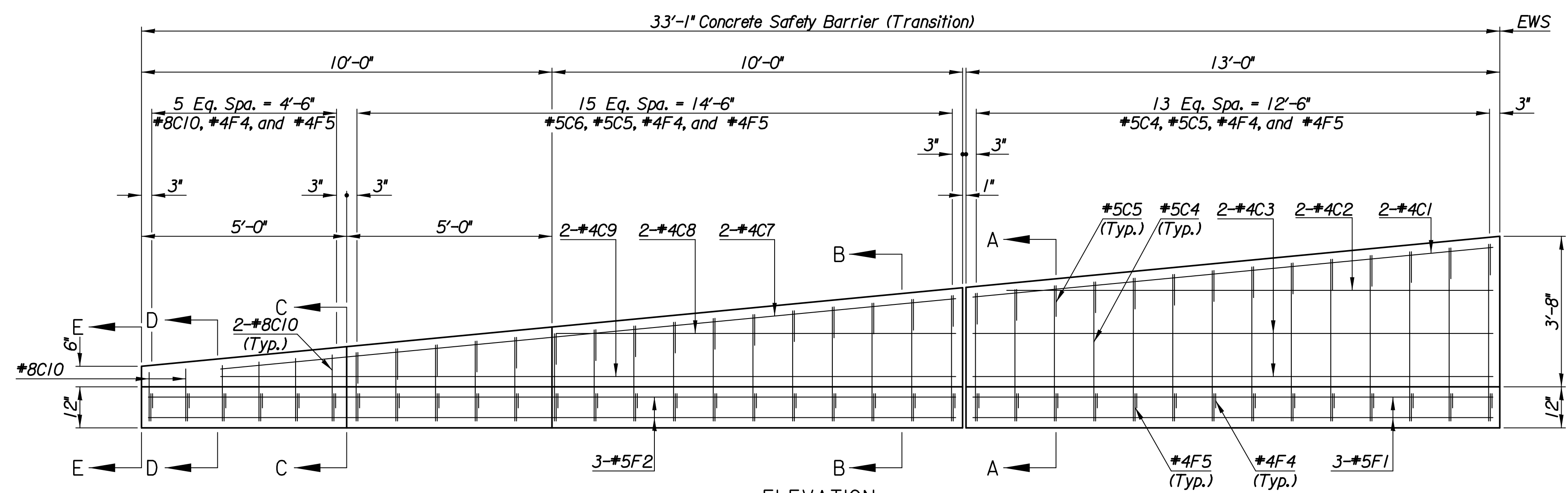
**C109**  
 ORIGINAL CONSTRUCTION DOCUMENTS



\* Adjust to match gutter



ELEVATION



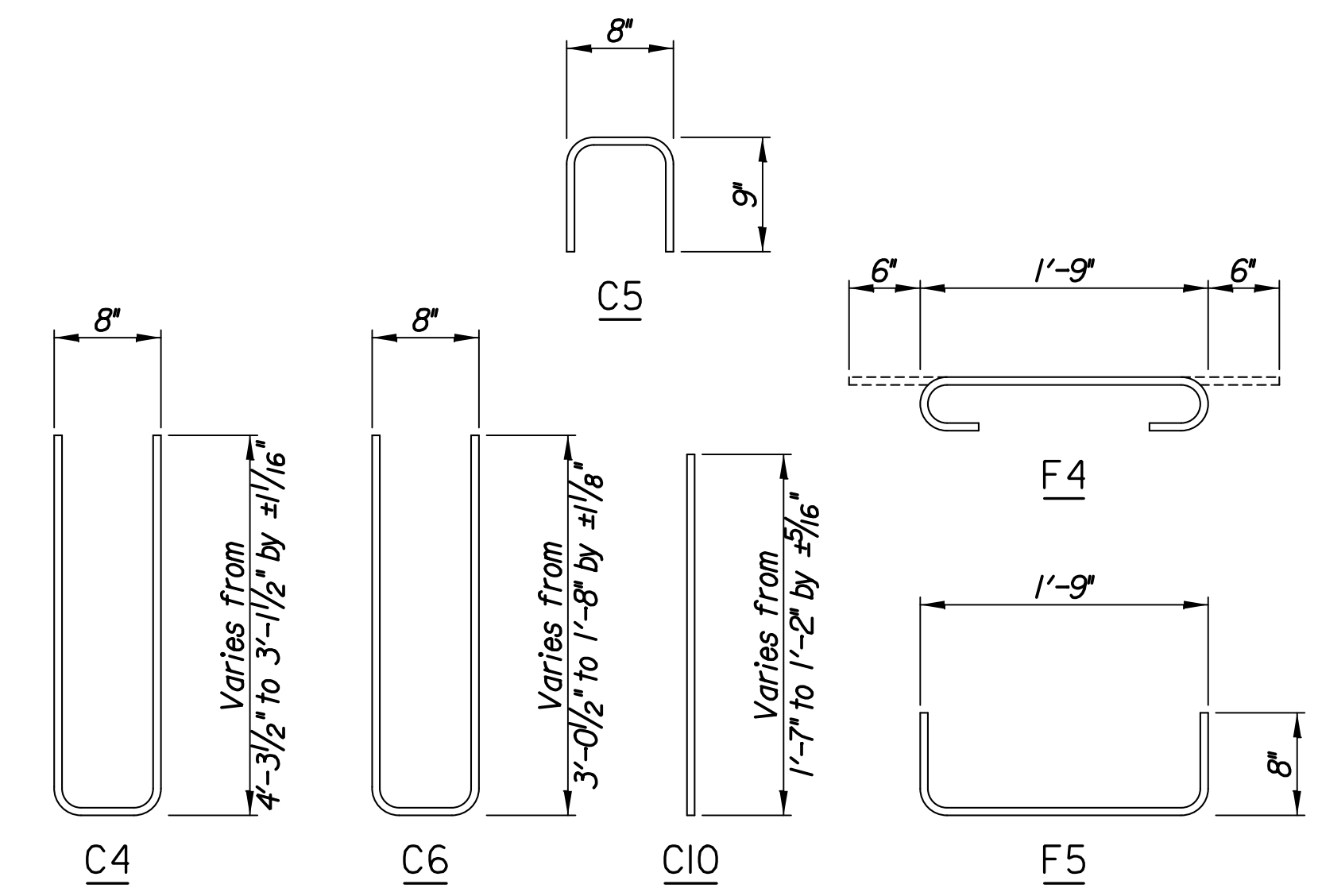
ELEVATION

EAST TRANSITION BARRIER									
BILL OF MATERIALS									
REINFORCING STEEL									
Straight Bars					Bent Bars				
Mark	No.	Size	Length	Mark	No.	Size	Length		
C1	2	#4	12'-8 1/2"	C4	14	#5	Varies		
C2	2	#4	11'-2"	C5	30	#5	2'-2"		
C3	4	#4	12'-8"	C6	16	#5	Varies		
C7	2	#4	18'-0"						
C8	2	#4	9'-9"	F4	36	#4	2'-9"		
C9	2	#4	17'-11"	F5	36	#4	3'-1"		
C10	12	#8	Varies						
F1	6	#5	12'-8"						
F2	6	#5	19'-8"						

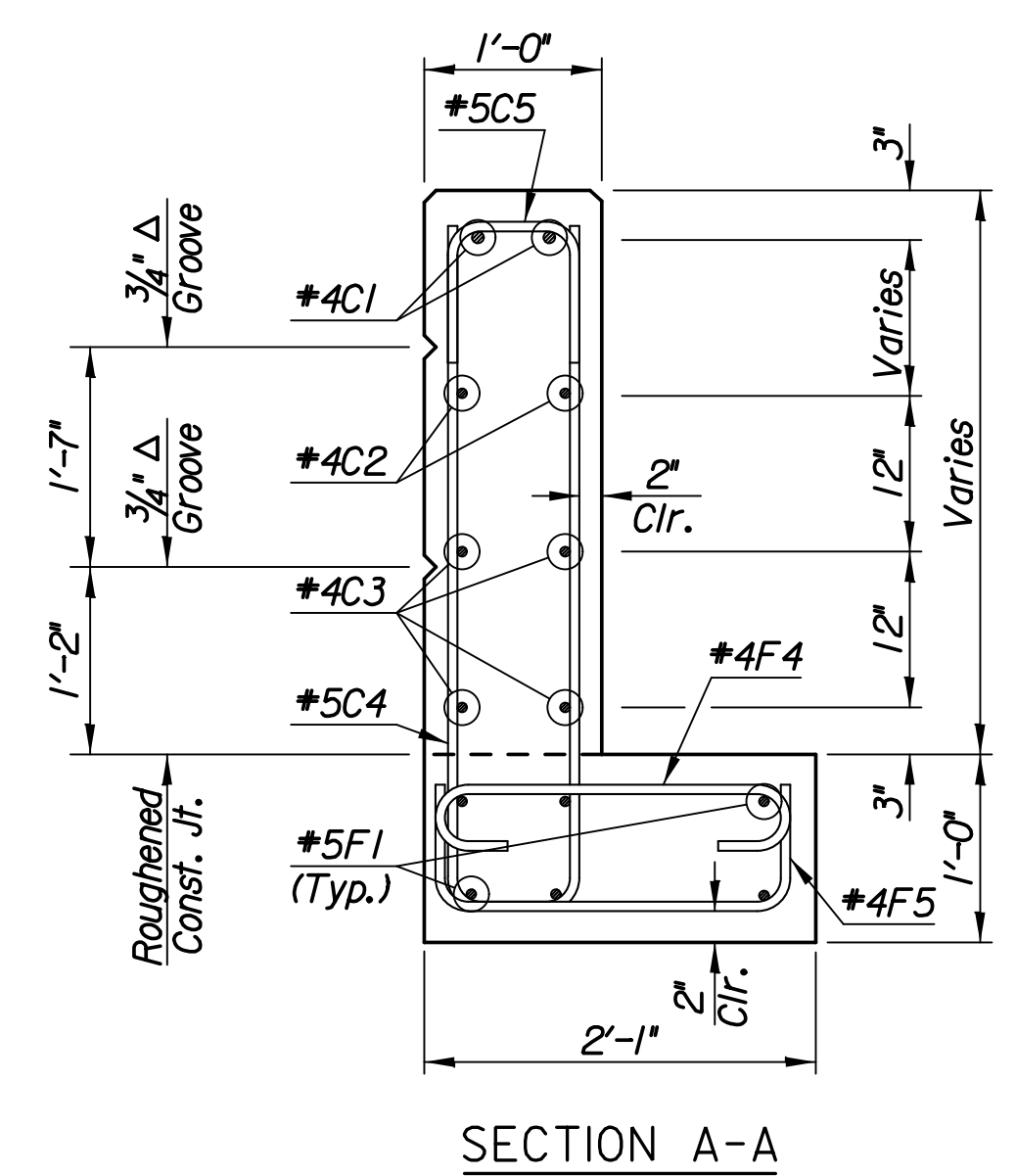
\* SUMMARY OF QUANTITIES

Concrete (Grade 4.0) (AE)	5.06 Cu. Yds.
Reinforcing Steel (Gr. 60)(Epoxy Coated)	675 Lbs.

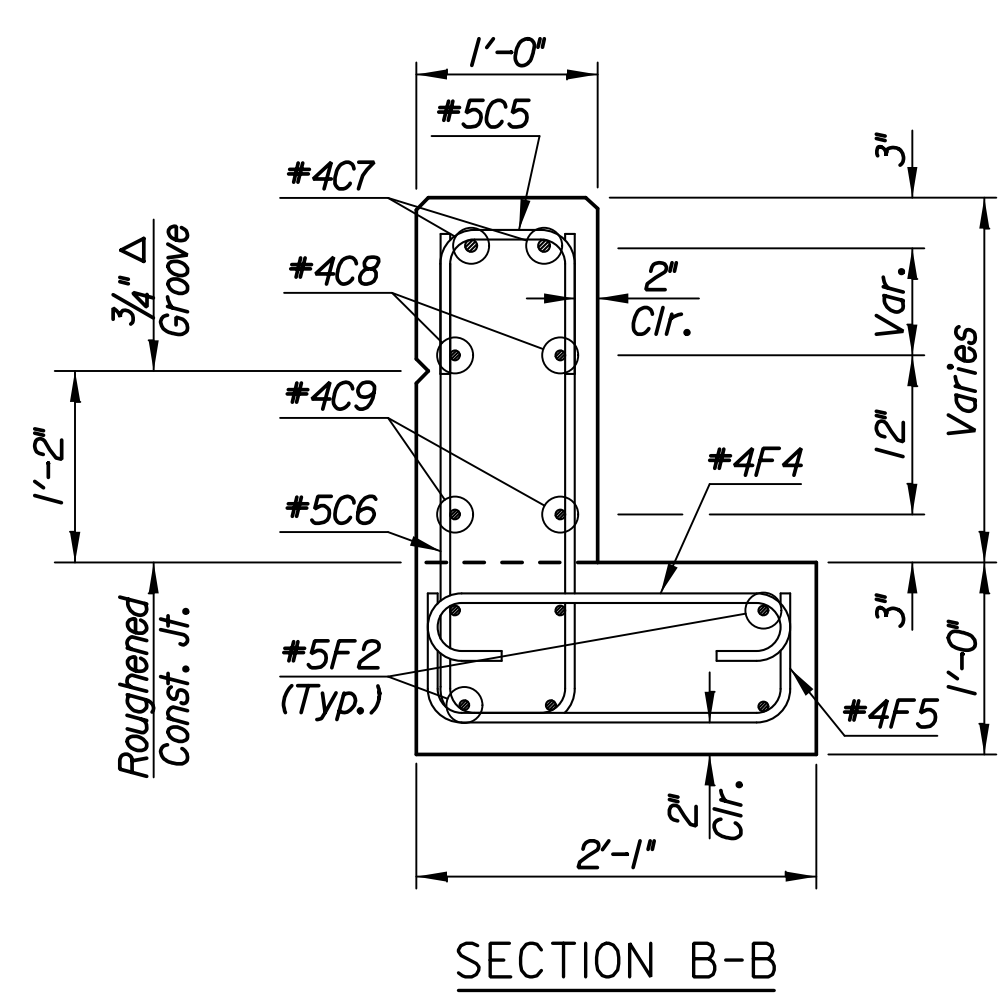
\* For Information Only; 2 required



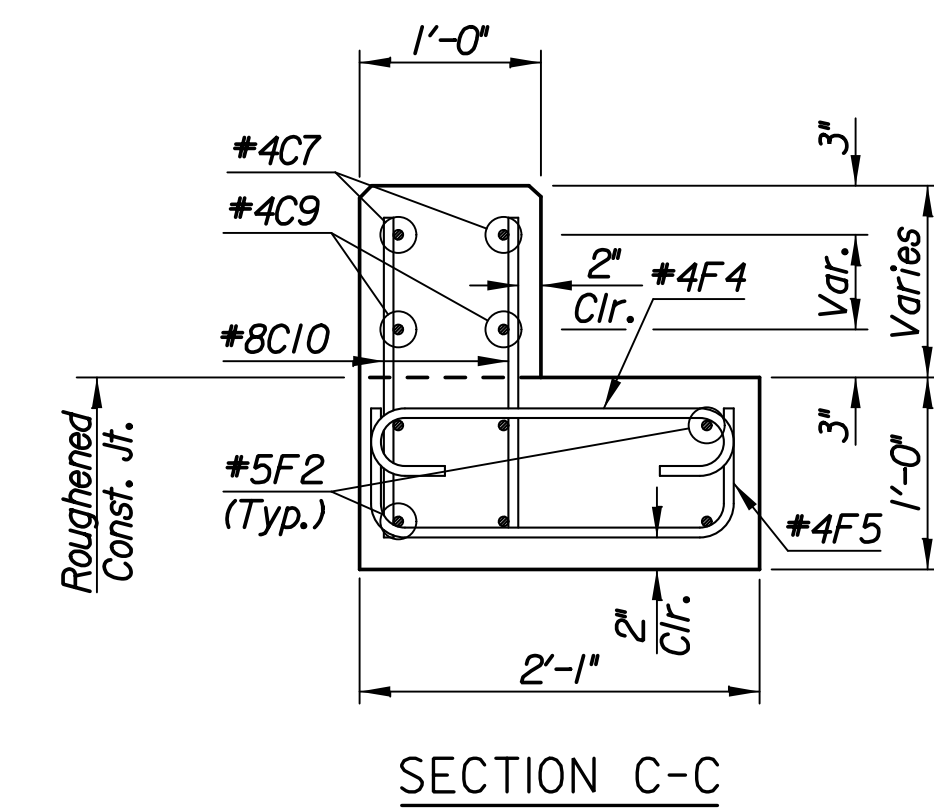
BENDING DIAGRAMS  
Dimensions are out to out of Bars



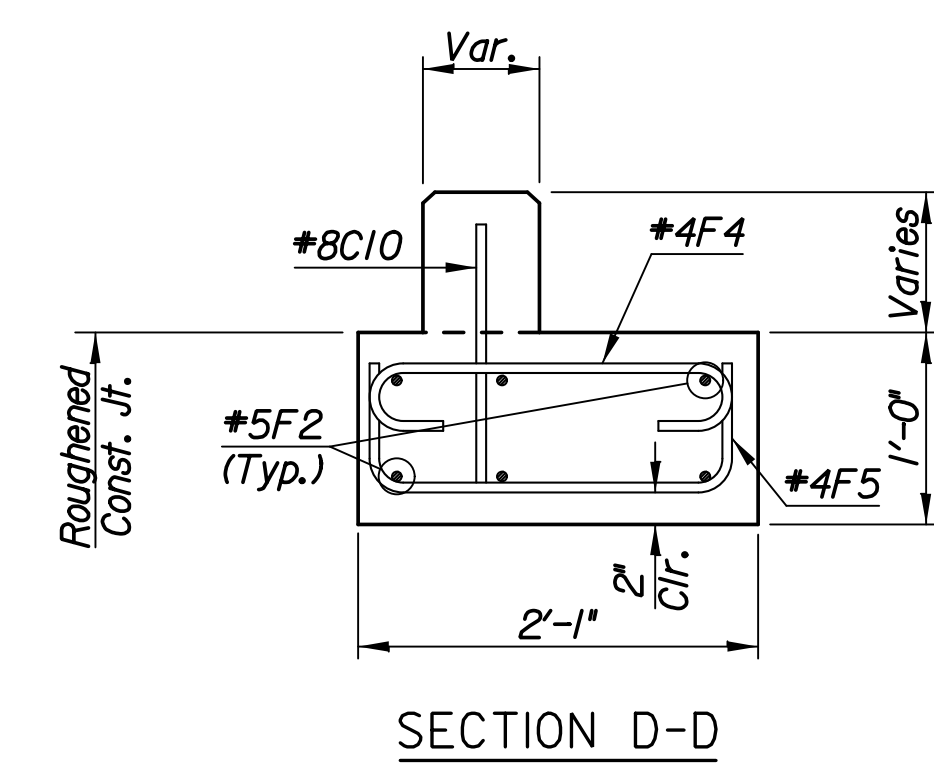
SECTION A-A



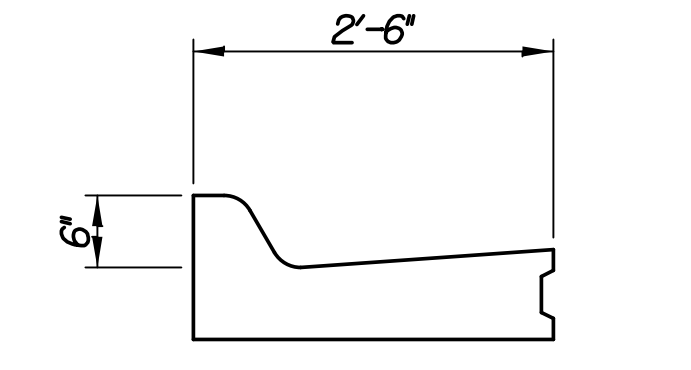
SECTION B-B



SECTION C-C



SECTION D-D



SECTION E-E  
Special E Modification required.

Note: Existing transverse approach slab reinforcing to be extended into base footing.

**GENERAL NOTES:**

The Concrete Safety Barrier shall be constructed of Concrete (Grade 4.0) (AE) and Reinforcing Steel complying to A.S.T.M. Designation A-615 Grade 60. All reinforcing steel shall be epoxy coated and all clearances shall be 1/2" unless otherwise noted.

The exposed Faces of the Barrier shall be grooved with a 3/4" Chamfer Strip at Contraction Joint locations. Where adjacent to Concrete Pavement, Contraction Joints shall match those in adjacent Pavement.

The Bid Item "Concrete Safety Barrier (Transition)" shall be measured per lined foot as per Plan. The amount of completed and accepted work, measured by lined foot, shall be paid for at the Contract Unit Price Bid for "Concrete Safety Barrier (Transition)." This price shall be considered full compensation for furnishing all material, equipment and labor necessary to complete the work.

Plot: 9/2/2014 3:48:01 PM  
 Date: 9/2/2014 3:48:01 PM  
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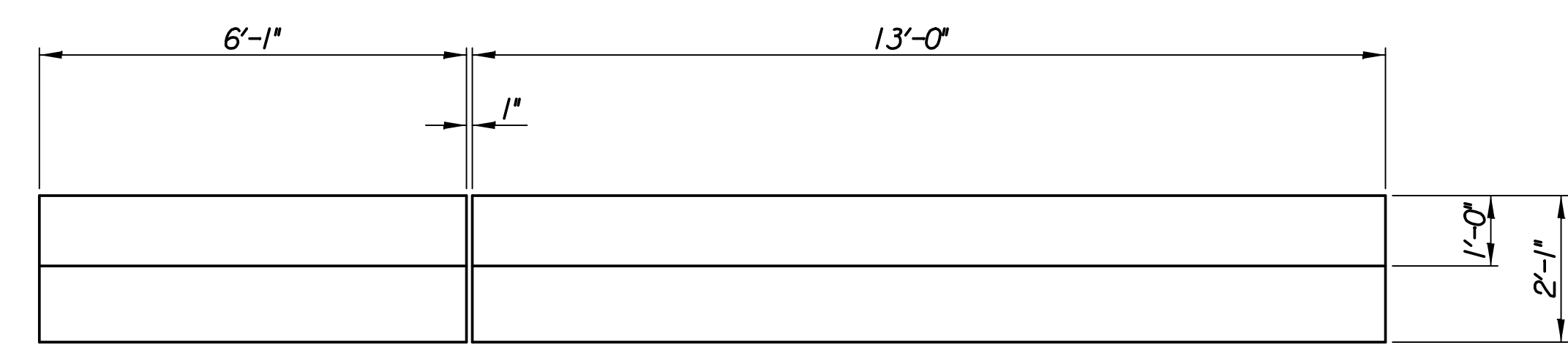
EAST TRANSITION DETAILS

**C110**

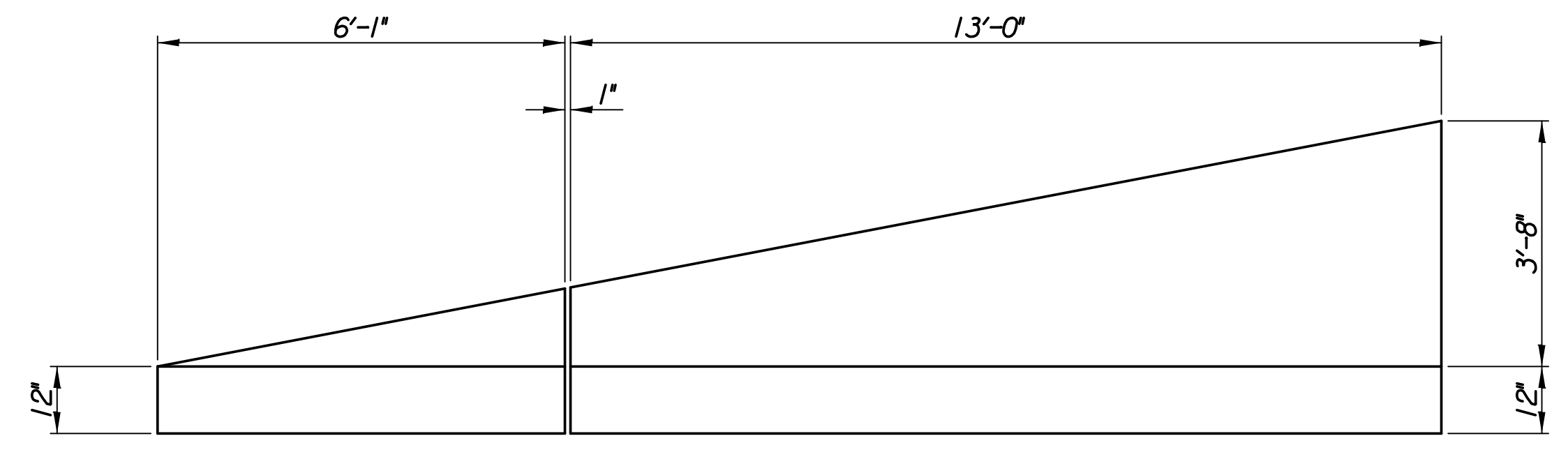
ORIGINAL CONSTRUCTION DOCUMENTS



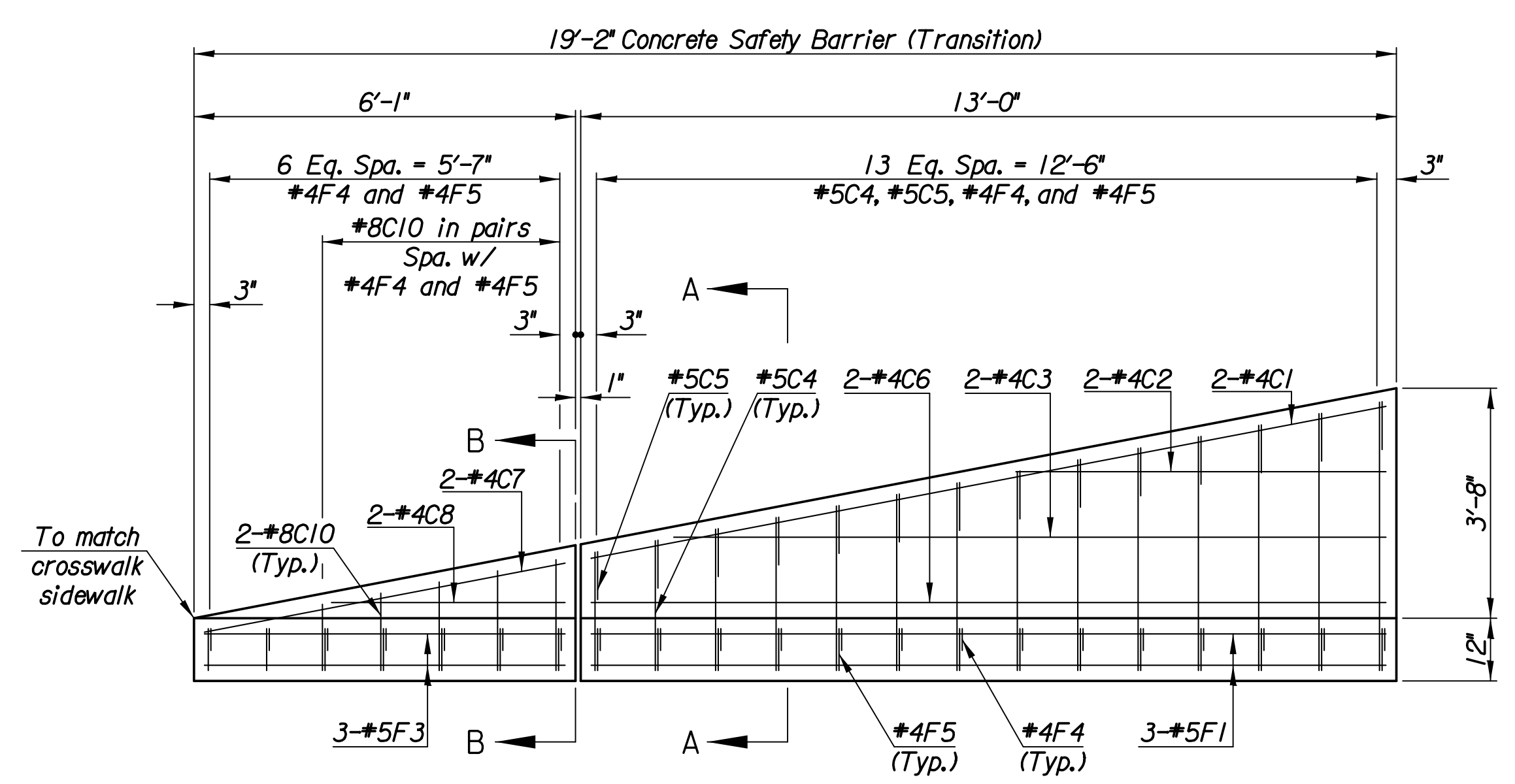
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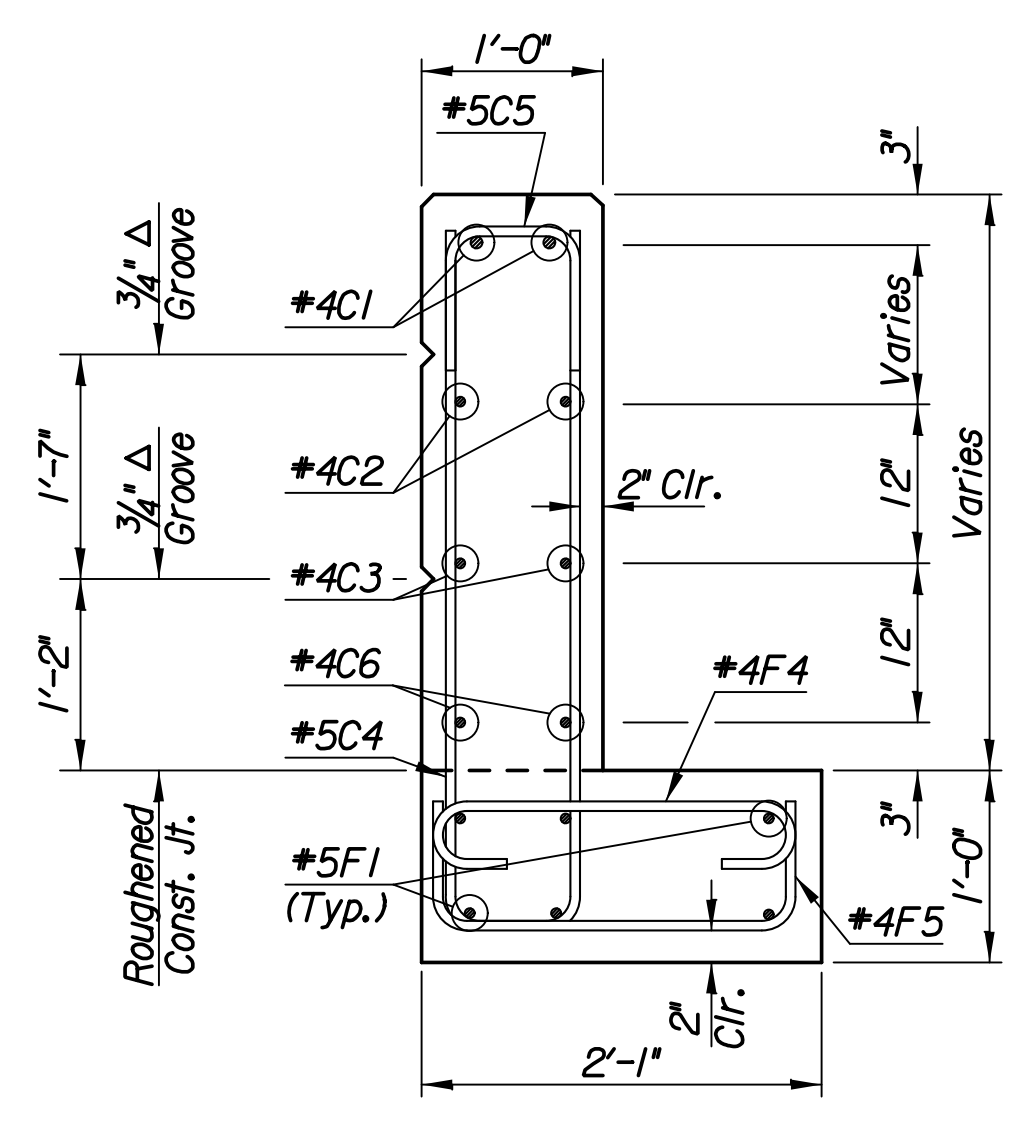
PLAN



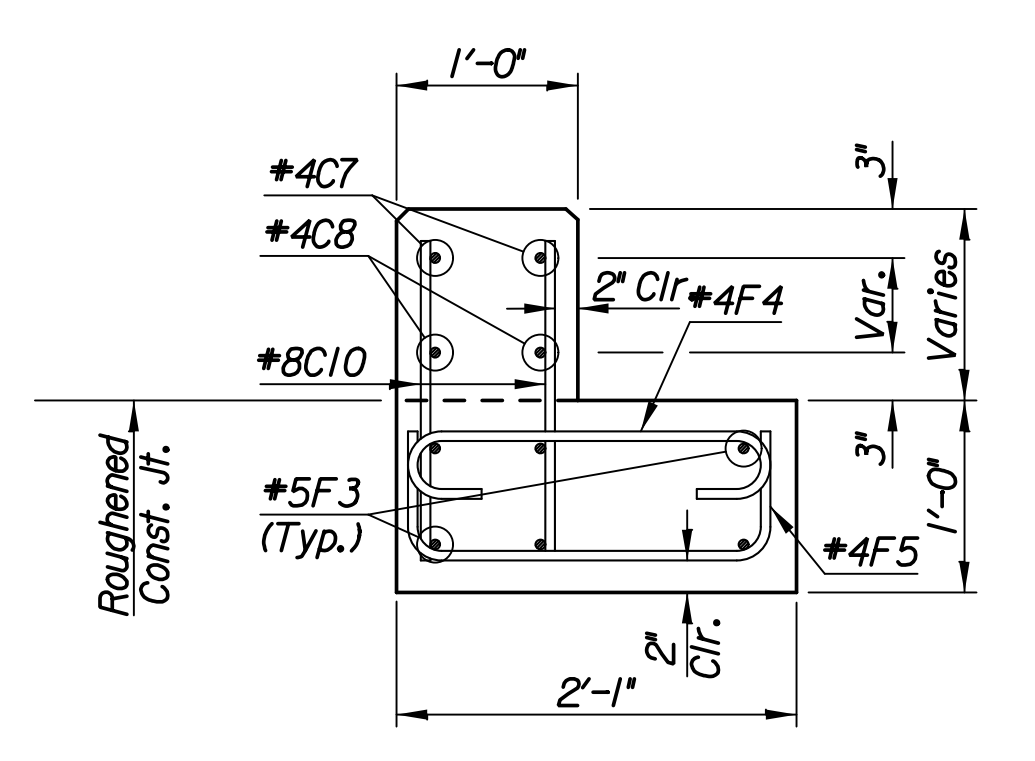
ELEVATION



ELEVATION



SECTION A-A



SECTION B-B

Note: Existing transverse approach slab reinforcing to be extended into base footing.

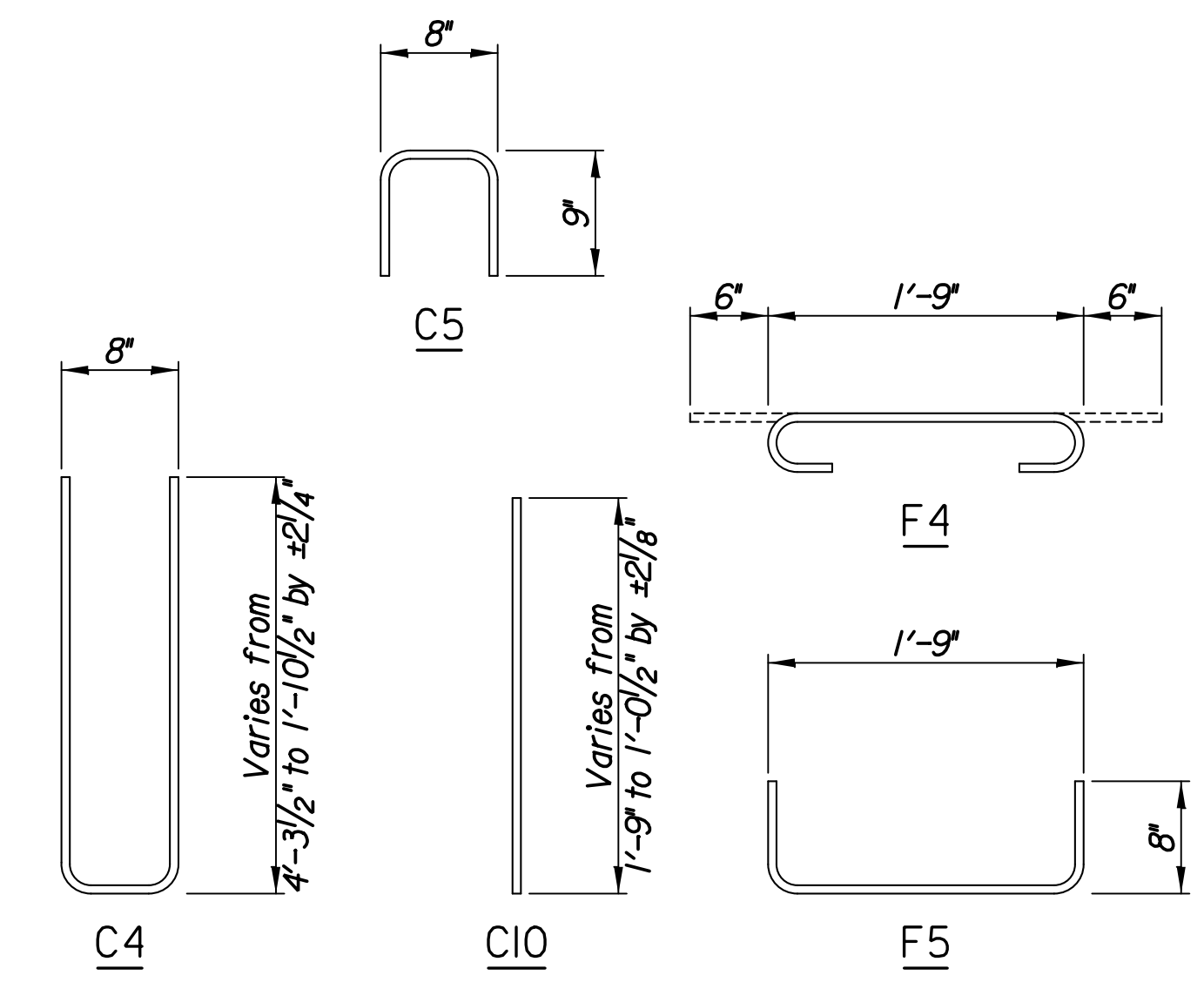
WEST TRANSITION BARRIER  
**BILL OF MATERIALS**

REINFORCING STEEL							
Straight Bars				Bent Bars			
Mark	No.	Size	Length	Mark	No.	Size	Length
C1	2	#4	12'-11"	C4	14	#5	Varies
C2	2	#4	5'-11"	C5	14	#5	2'-2"
C3	4	#4	11'-4"				
C6	2	#4	12'-8"	F4	21	#4	2'-9"
C7	2	#4	5'-10"	F5	21	#4	3'-1"
C8	2	#4	3'-9"				
C10	10	#8	Varies				
F1	6	#5	12'-8"				
F3	6	#5	5'-9"				

\* SUMMARY OF QUANTITIES

Concrete (Grade 4.0) (AE)	2.77 Cu. Yds.
Reinforcing Steel (Gr. 60)(Epoxy Coated)	382 Lbs.

\* For Information Only; 2 required



BENDING DIAGRAMS  
 Dimensions are out to out of Bars

**GENERAL NOTES:**

The Concrete Safety Barrier shall be constructed of Concrete (Grade 4.0) (AE) and Reinforcing Steel complying to A.S.T.M. Designation A-615 Grade 60. All reinforcing steel shall be epoxy coated and all clearances shall be 1/2" unless otherwise noted.

The exposed Faces of the Barrier shall be grooved with a 3/4" Chamfer Strip at Contraction Joint locations. Where adjacent to Concrete Pavement, Contraction Joints shall Match those in adjacent Pavement.

The Bid Item "Concrete Safety Barrier (Transition)" shall be measured per lineal foot as per Plan. The amount of completed and accepted work, measured by lineal foot, shall be paid for at the Contract Unit Price Bid for "Concrete Safety Barrier (Transition)". This price shall be considered full compensation for furnishing all material, equipment and labor necessary to complete the work.

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WEST TRANSITION BARRIER

**C111**

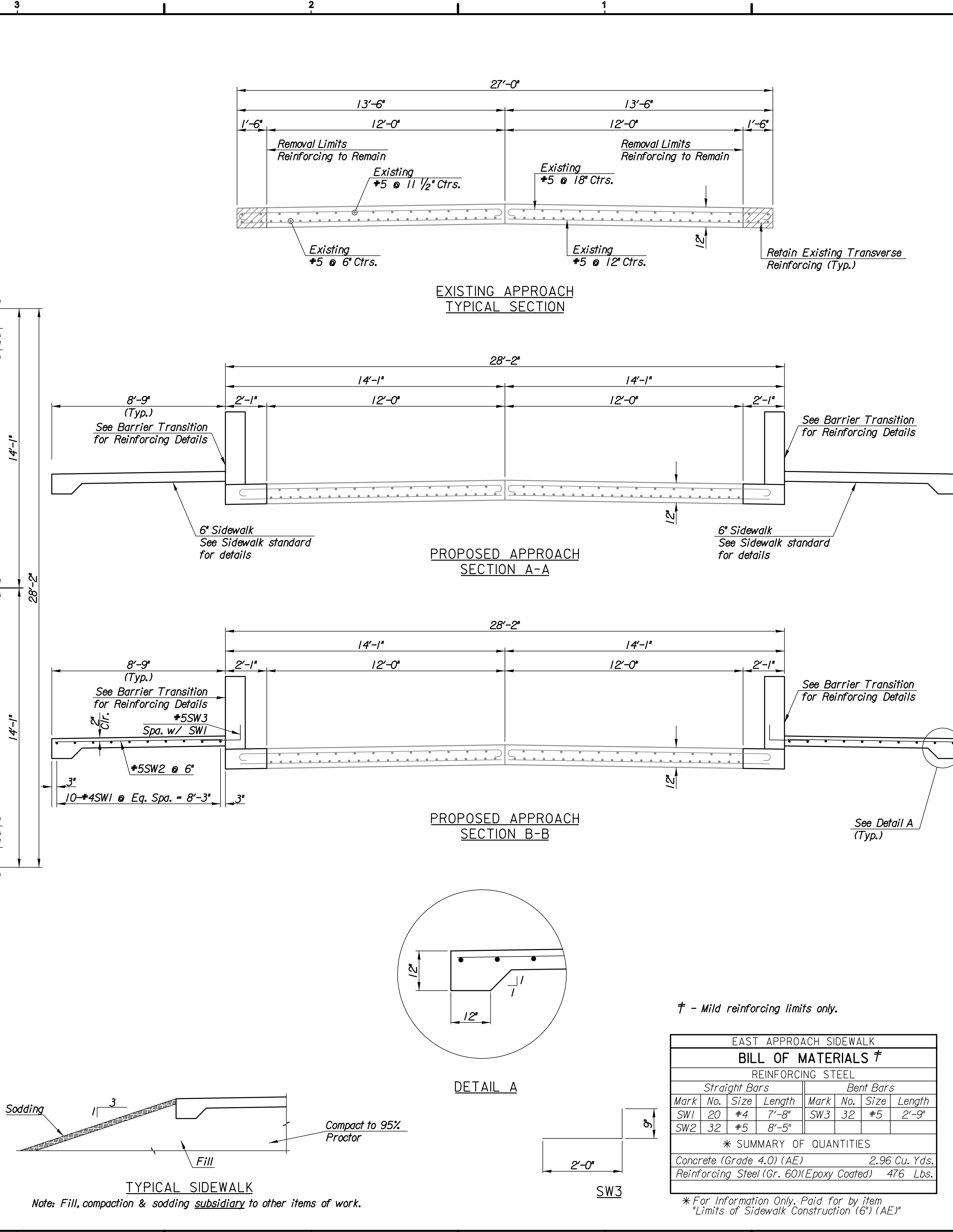
ORIGINAL CONSTRUCTION DOCUMENTS

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Plot: Fred By: cwp Date: 9/2/2014 3:48:05 PM  
 FILE: F:\2012\1260\049\Trans\Bridges\Udn Project\1260-049-Prop. Approach Slabs.dgn



# - Mild reinforcing limits only.

EAST APPROACH SIDEWALK							
BILL OF MATERIALS #							
REINFORCING STEEL							
Straight Bars			Bent Bars				
Mark	No.	Size	Length	Mark	No.	Size	Length
SW1	20	#4	7'-8"	SW3	32	#5	2'-9"
SW2	32	#5	8'-5"				
* SUMMARY OF QUANTITIES							
Concrete (Grade 4.0) (AE)				2.96 Cu. Yds.			
Reinforcing Steel (Gr. 60)(Epoxy Coated)				476 Lbs.			
* For Information Only. Paid for by item							
"Limits of Sidewalk Construction (6") (AE)"							

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**EAST APPROACH SLAB**

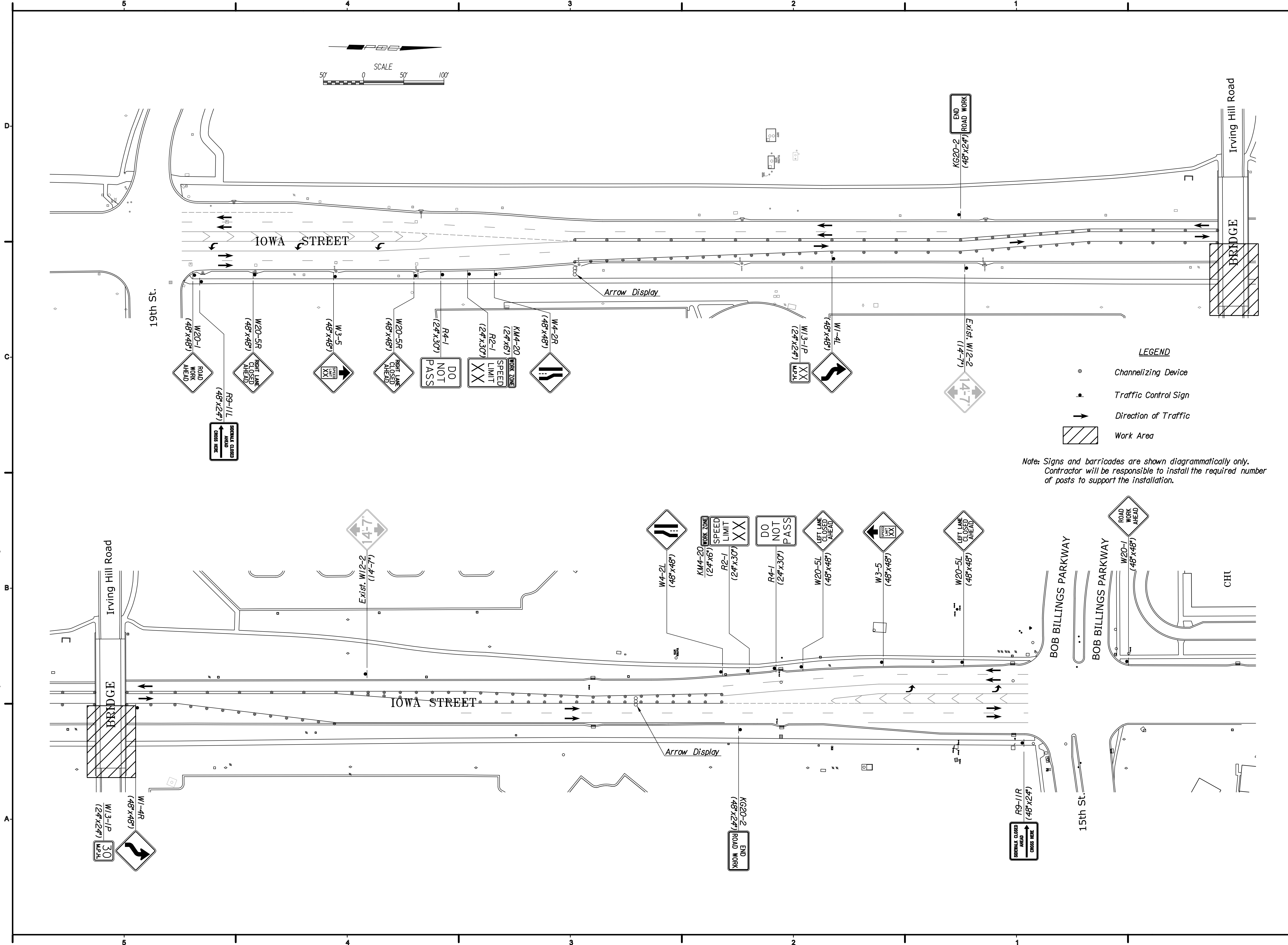
**C113**

ORIGINAL CONSTRUCTION DOCUMENTS









Note: Signs and barricades are shown diagrammatically only.  
 Contractor will be responsible to install the required number of posts to support the installation.

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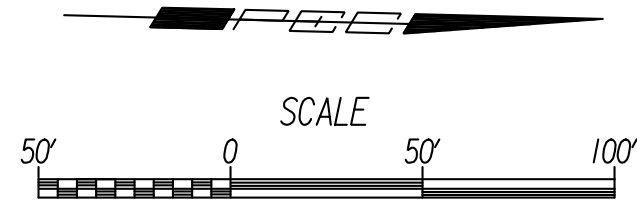
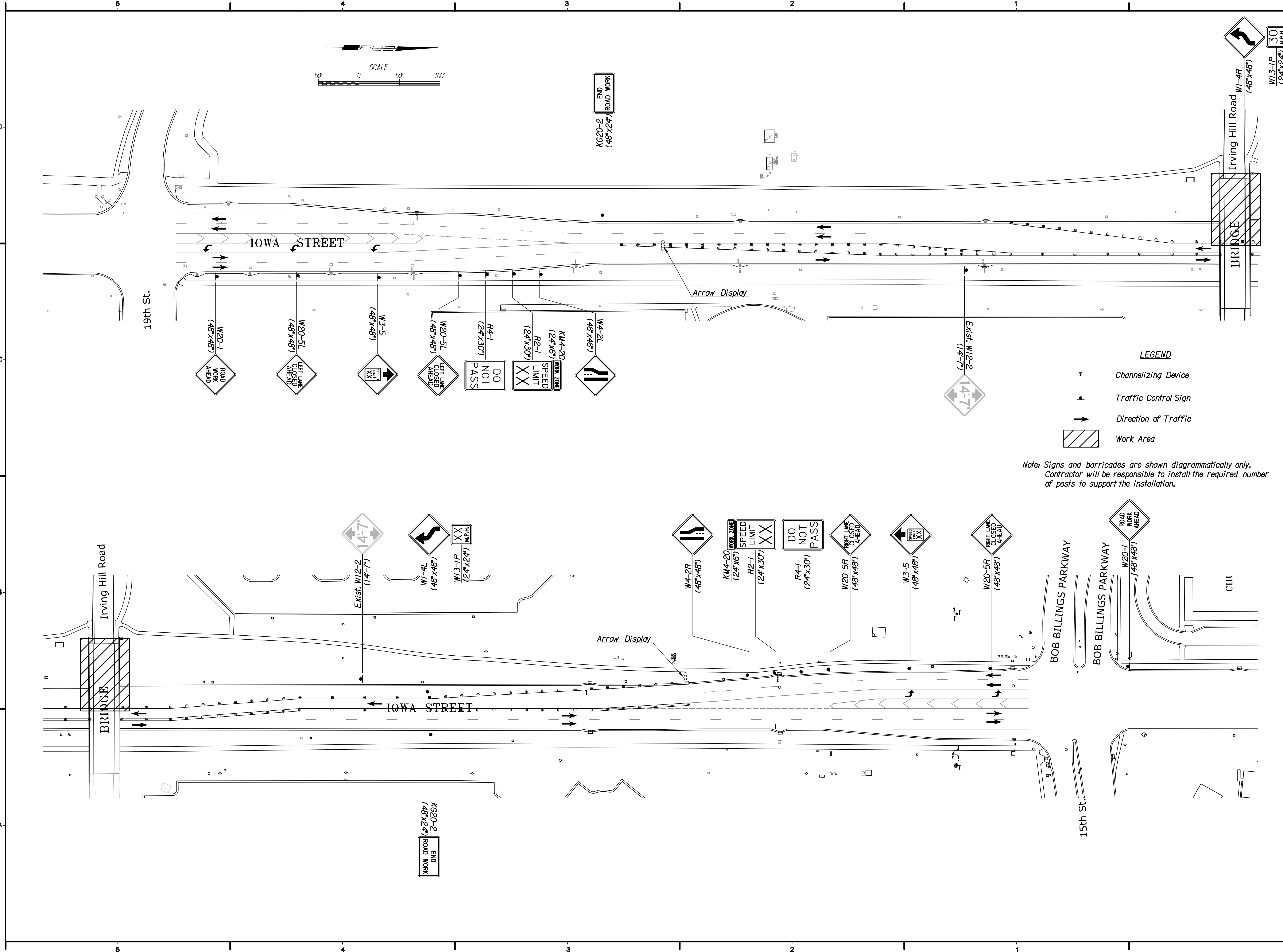
DATE: 06-11-14  
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TRAFFIC CONTROL PLAN  
 STAGE 1

**TC100**

ORIGINAL CONSTRUCTION DOCUMENTS





**LEGEND**

- Channelizing Device
- Traffic Control Sign
- Direction of Traffic
- Work Area

Note: Signs and barricades are shown diagrammatically only.  
 Contractor will be responsible to install the required number of posts to support the installation.

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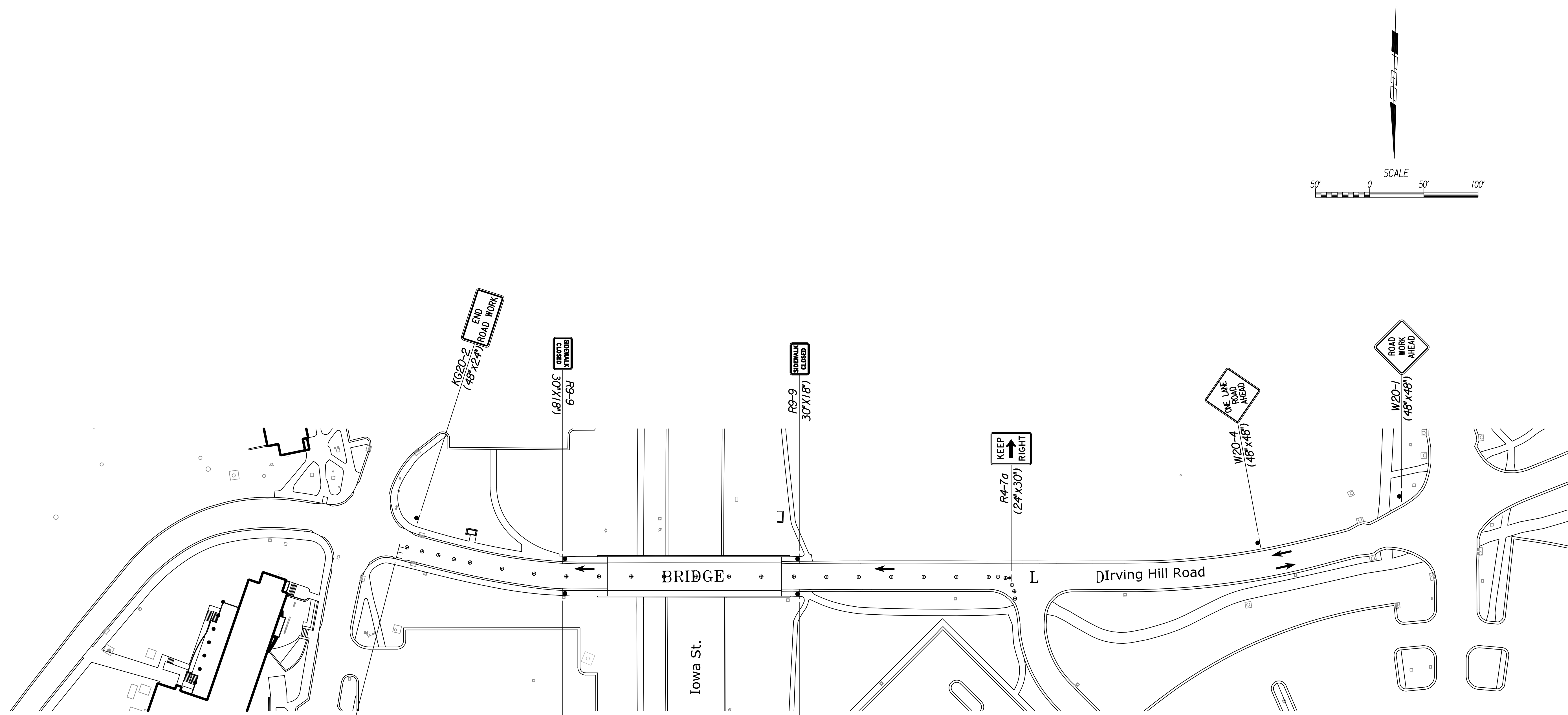
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TRAFFIC CONTROL PLAN  
 STAGE 2

**TC101**  
 ORIGINAL CONSTRUCTION DOCUMENTS



**LEGEND**

- ⊙ Channelizing Device
- Traffic Control Sign
- ➔ Direction of Traffic
- TTTT Type III Barricade(s)

Note: Signs and barricades are shown diagrammatically only.  
 Contractor will be responsible to install the required number  
 of posts to support the installation.

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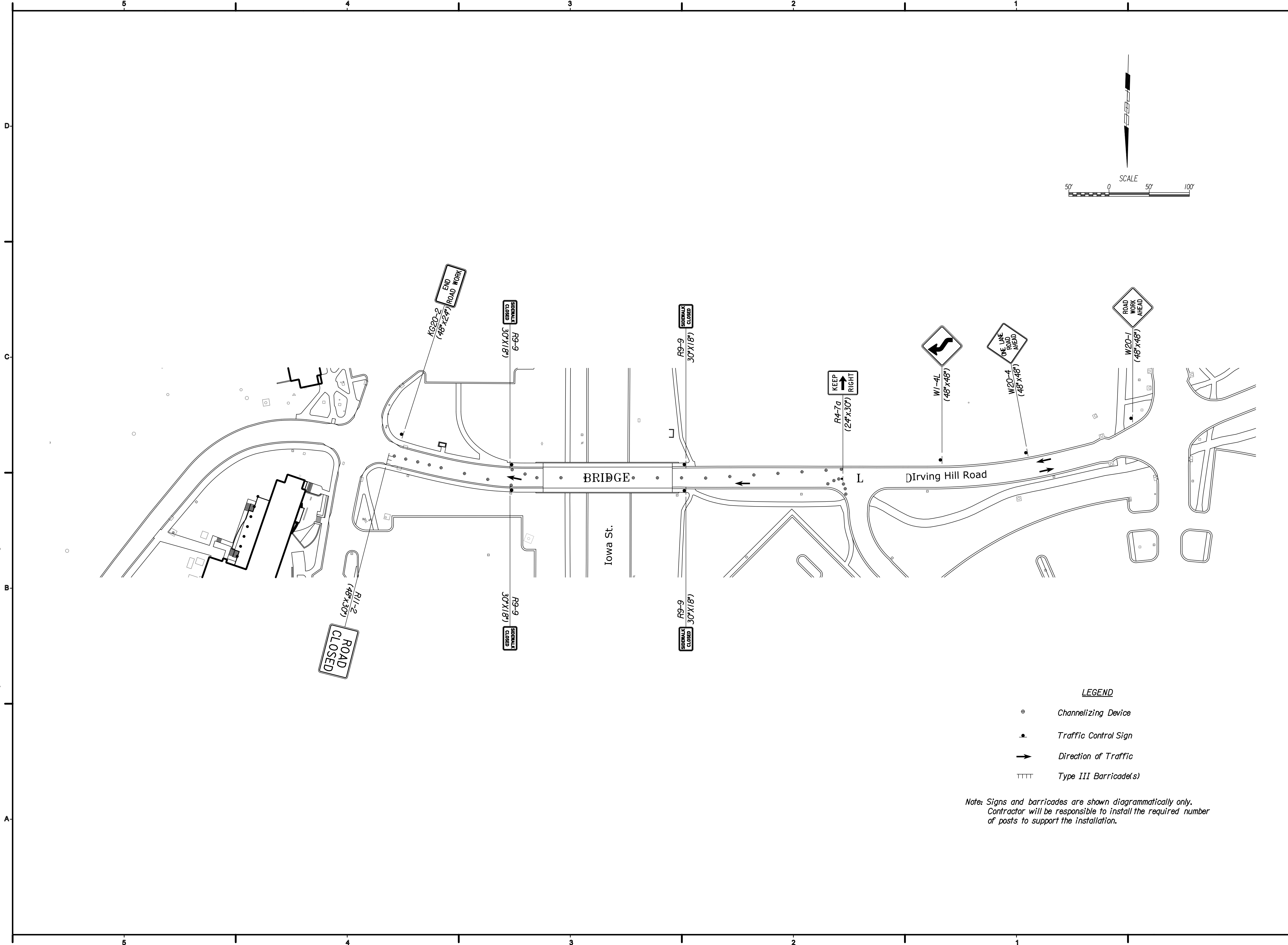
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TRAFFIC CONTROL PLAN STAGE A

**TC102**  
 ORIGINAL CONSTRUCTION DOCUMENTS



**LEGEND**

- ⊙ Channelizing Device
- Traffic Control Sign
- Direction of Traffic
- TTTT Type III Barricade(s)

Note: Signs and barricades are shown diagrammatically only.  
 Contractor will be responsible to install the required number  
 of posts to support the installation.

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TRAFFIC CONTROL  
 PLAN  
 STAGE B

**TC103**

ORIGINAL  
 CONSTRUCTION  
 DOCUMENTS

1. MUTCD COMPLIANCE:

ALL TEMPORARY TRAFFIC CONTROL DEVICES AND THEIR INSTALLATION AND MAINTENANCE SHALL COMPLY WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR STREETS AND HIGHWAYS WHICH HAS BEEN ADOPTED BY THE SECRETARY OF TRANSPORTATION. WHENEVER THE TEMPORARY TRAFFIC CONTROL STANDARDS CONFLICT WITH THE MUTCD, THE STANDARDS SHALL GOVERN.

2. 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.

3. CLEAR ZONE:

ALL CONSTRUCTION EQUIPMENT (INCLUDING VEHICLES), MATERIALS, AND DEBRIS SHALL BE STORED OUT OF THE CLEAR ZONE. WHERE THIS CANNOT BE ACHIEVED, THE CONTRACTOR SHALL PLACE APPROPRIATE SIGNS, OBJECT IDENTIFIERS, AND/OR BARRICADES AS DESIGNATED BY THE ENGINEER. TEMPORARY TRAFFIC CONTROL DEVICES NEEDED FOR THIS CONDITION SHALL BE CONSIDERED SUBSIDIARY TO OTHER BID ITEMS.

4. MINIMUM LANE WIDTHS:

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.

5. FLAGGER:

A MINIMUM OF ONE FLAGGER SHALL 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.

6. PAVEMENT MARKING:

WHEN THE WORK WILL OCCUPY A LOCATION MORE THAN THREE DAYS, ALL CONFLICTING PAVEMENT MARKINGS SHALL BE REMOVED OR MASKED AND ALL TRANSITION TAPERS, CROSSOVERS, AND EDGE LINES ALONG CHANNELIZING DEVICES SHALL BE MARKED WITH SOLID 4" WIDE PAVEMENT MARKING.

7. FIRST MODULE OF IBS:

THE FIRST MODULE OF EACH INERTIAL BARRIER SYSTEM (IBS) SHALL HAVE A MINIMUM OF 2 SQ. FT. OF FLUORESCENT ORANGE ASTM TYPE IV SHEETING FACING TRAFFIC. EITHER A VERTICAL RECTANGLE OR DIAMOND SHAPE MAY BE USED.

8. PEDESTRIAN / BICYCLE SAFETY:

WORK ZONE SIGNS SHALL NOT INHIBIT PEDESTRIAN AND BICYCLE TRAFFIC ON SIDEWALKS OR OTHER AREAS DESIGNATED FOR PEDESTRIAN OR BICYCLE USE. CONSIDERATION SHOULD BE MADE TO SEPARATE PEDESTRIAN AND 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 AND BICYCLISTS 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 AND BICYCLISTS ARE NOT CONFRONTED WITH MIDBLOCK WORK SITES THAT WILL INDUCE THEM TO ATTEMPT SKIRTING THE WORK SITE OR MAKING A MIDBLOCK CROSSING.

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.

9. CHANGED STOP CONDITIONS:

ATTACH TWO FLUORESCENT RED-ORANGE FLAGS AND A RED TYPE "B" HIGH INTENSITY WARNING LIGHT TO ANY STOP SIGN THAT CREATES A NEW STOP CONDITION OR MOVES THE STOP CONDITION TO A NEW LOCATION. LEAVE FLAGS AND LIGHTS IN PLACE FOR AT LEAST THE FIRST 30 DAYS. INSTALL W3-1 (SYMBOLIC STOP AHEAD) SIGN IN ADVANCE OF STOP SIGN IF STOP SIGN IS NOT VISIBLE FOR A MINIMUM OF DISTANCE 'A' (SEE CHART ON TE710) OR IF STOP CONDITION IS MOVED TO LESS THAN DISTANCE 'A' FROM AN EXISTING STOP AHEAD SIGN.

10. LUMP SUM BIDDING:

WHEN TRAFFIC CONTROL IS BID LUMP SUM, ADDITIONAL DEVICES WILL BE PAID FOR AS EXTRA WORK.

11. NIGHTTIME LIGHTING:

WHEN NIGHTTIME WORK IS REQUIRED, FLOODLIGHTS SHOULD BE USED TO ILLUMINATE FLAGGER STATIONS, EQUIPMENT CROSSINGS, AND OTHER AREAS WHERE EXISTING LIGHTING IS NOT ADEQUATE FOR THE WORK TO BE PERFORMED SAFELY.

IN NO CASE SHALL FLOODLIGHTS BE PERMITTED TO CREATE A DISABLING GLARE FOR THE DRIVER. THE ADEQUACY OF THE FLOODLIGHT PLACEMENT AND ELIMINATION OF POTENTIAL GLARE SHOULD BE CHECKED BY DRIVING THROUGH THE PROJECT.

12. NCHRP REPORT 350 CRASHWORTHY REQUIREMENTS:

TRAFFIC CONTROL DEVICES SHALL MEET THE EVALUATION CRITERIA IN NCHRP REPORT 350 OR IN MASH REPORT 2009 AS SUPPLEMENTED BY FHWA MEMORANDUM "IDENTIFYING ACCEPTABLE HIGHWAY SAFETY FEATURES," DATED JULY 25, 1997. AVAILABLE ON THE INTERNET AT [http://safety.fhwa.dot.gov/roadway\\_dept/policy\\_guide/road\\_hardware/policy\\_memo/](http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road_hardware/policy_memo/)

ANY DEVICE NOT ADDRESSED BY THE TE STANDARDS MAY BE APPROVED ON A CASE BY CASE BASIS BY THE ENGINEER. THE DEVICE SHALL BE ACCOMPANIED BY AND INSTALLED ACCORDING TO MASH REPORT 2009. ANY DEVICE ACCEPTED PRIOR TO THE ADOPTION OF MASH REPORT 2009 USING CRITERIA FROM NCHRP REPORT 350 MAY REMAIN IN PLACE AND CONTINUE TO BE USED. ANY TRAFFIC CONTROL DEVICE ACCEPTED USING NCHRP REPORT 350 CRITERIA IS NOT REQUIRED TO BE TESTED UNDER MASH REPORT 2009. HOWEVER, NEW TRAFFIC CONTROL DEVICES NOT PREVIOUSLY EVALUATED MUST UTILIZE MASH REPORT 2009 FOR TESTING AND EVALUATION.

THE CONTRACTOR SHALL:

1) PROVIDE TO THE ENGINEER A COPY OF THE MANUFACTURER'S SELF-CERTIFICATION THAT ANY CATEGORY 1 (i.e. - PLASTIC CONICAL DELINEATORS, TUBULAR MARKERS, DRUMS WITHOUT ATTACHMENTS) AND CATEGORY 2 (i.e. - PORTABLE SIGN STANDS (WITH SIGNS), TYPE II AND III BARRICADES, AND VERTICAL PANELS) DEVICES USED ON THE PROJECT ARE NCHRP REPORT 350 OR MASH REPORT 2009 COMPLIANT.

2) PROVIDE TO THE ENGINEER A COPY OF THE ENTIRE FHWA ACCEPTANCE LETTER (WZ-xxx) FOR ANY CATEGORY 2 DEVICE (i.e. - PORTABLE SIGN STANDS (WITH SIGNS), TYPE II AND III BARRICADES, AND VERTICAL PANELS) USED ON THE PROJECT. WORK ZONE FHWA ACCEPTANCE LETTERS (WZ-xxx) ARE AVAILABLE ON THE INTERNET AT: [http://safety.fhwa.dot.gov/roadway\\_dept/policy\\_guide/road\\_hardware/wzd/](http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road_hardware/wzd/)

3) CERTIFY THAT THE TRUCK MOUNTED ATTENUATORS (TMA'S) (WHICH ARE DEFINED AS CATEGORY 3 DEVICES BY THE FHWA MEMORANDUM) MEET CURRENT CRASHWORTHY SPECIFICATIONS AS DEFINED ABOVE AND INCLUDE A COPY OF THE ENTIRE FHWA ACCEPTANCE LETTER. ALL CATEGORY 1 & 2 DEVICES SHALL BE NCHRP REPORT 350 OR MASH REPORT 2009 COMPLIANT.

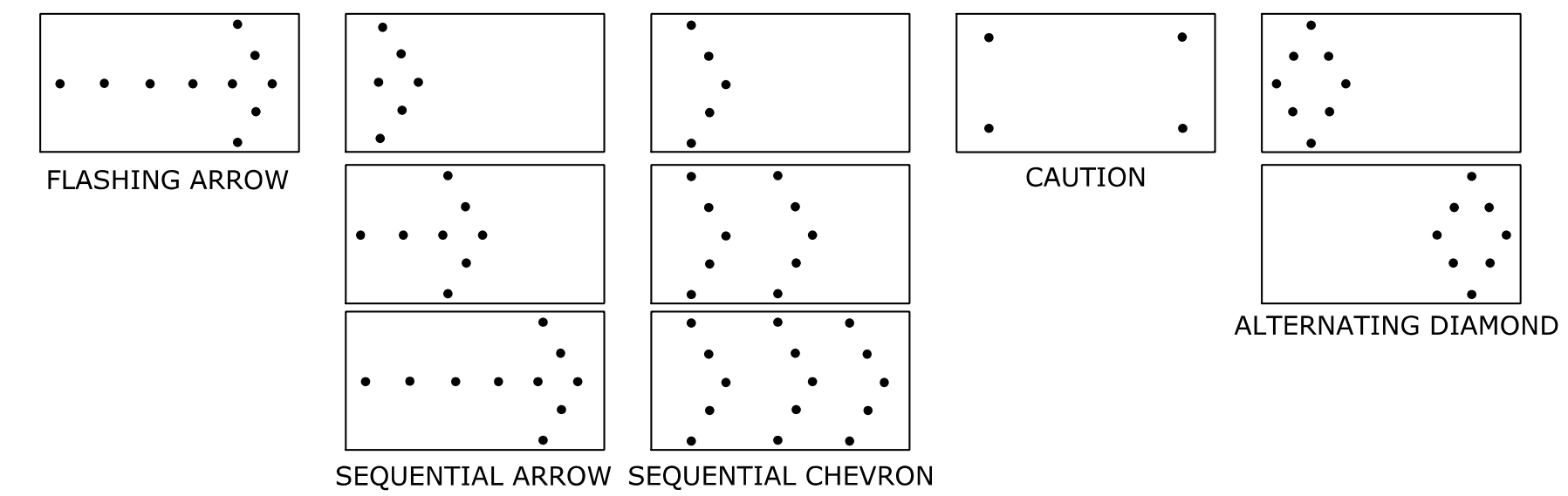
13. LEAD IN CHANNELIZING DEVICES ON CENTERLINE:

TEMPORARY RUMBLE STRIPS MAY BE USED IN LIEU OF LEAD IN CENTERLINE CHANNELIZING DEVICES WHEN THE ROADWAY IS LESS THAN OR EQUAL TO 30' (FEET) INCLUDING PAVED SHOULDERS. WHEN EXTENUATING CIRCUMSTANCES EXIST, THE AREA ENGINEER MAY ELECT TO ELIMINATE BOTH THE LEAD IN CHANNELIZERS AND THE RUMBLE STRIPS.

14. TEMPORARY RUMBLE STRIPS:

ALTERNATIVE TEMPORARY RUMBLE STRIP OPTIONS MAY BE AVAILABLE. PLEASE CONTACT THE TEMPORARY TRAFFIC CONTROL UNIT FOR MORE INFORMATION AT 785-296-0355 OR 785-296-1183.

ARROW DISPLAYS



ARROW DISPLAY ELEMENTS SHALL BE CAPABLE OF A MINIMUM 50 PERCENT DIMMING FROM THEIR FULL-RATED LAMP VOLTAGE. FULL LAMP VOLTAGE SHOULD BE USED DURING THE DAY AND DIMMED MODE SHALL BE USED AT NIGHT. FOR SHOULDER WORK, ROADSIDE WORK NEAR THE SHOULDER, BLOCKING THE SHOULDER, OR FOR TEMPORARY CLOSING ONE LANE ON A TWO-LANE, TWO-WAY ROADWAY, AN ARROW PANEL SHALL BE USED ONLY IN THE CAUTION MODE.

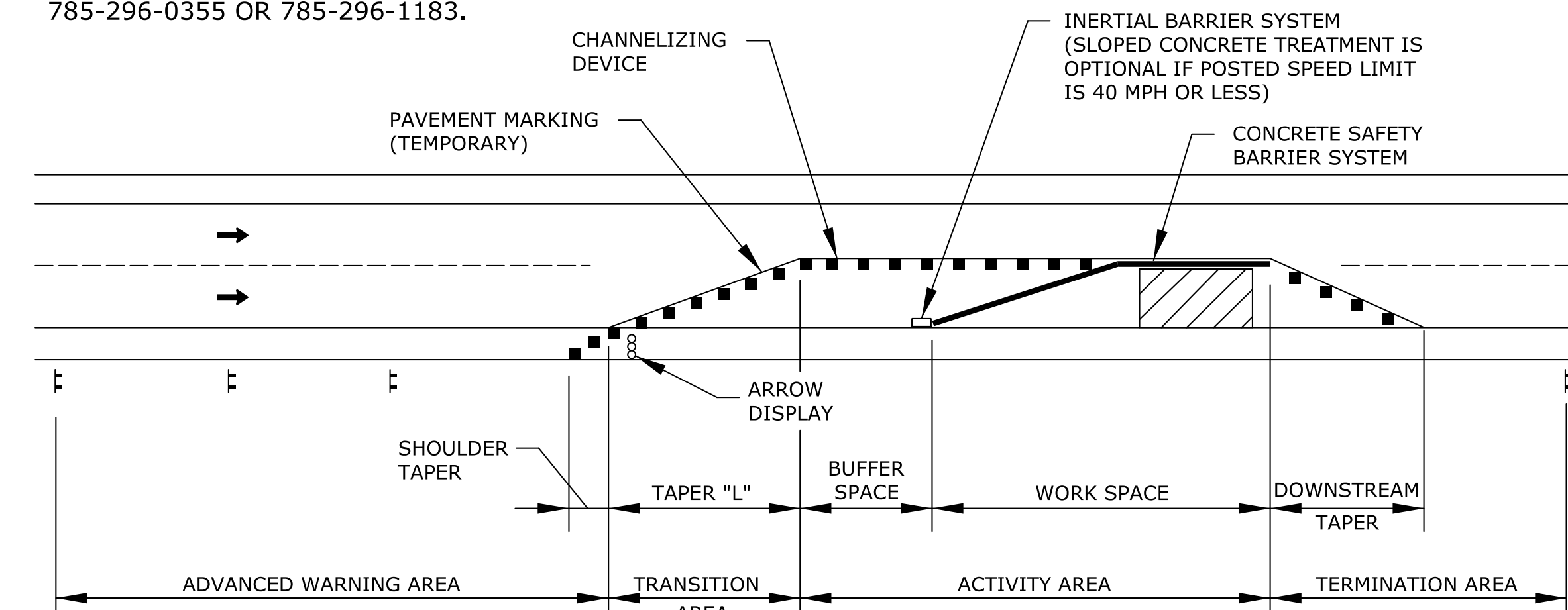
BUFFER SPACE

Table with columns for SPEED (MPH) and LENGTH (ft) ranging from 20 to 75 mph.

\* 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.



NOTE: REFER TO STD. TE702 FOR TAPER "L" FORMULA.

TYPICAL WORK ZONE COMPONENTS

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Table with columns for REVISIONS: NO., DESCRIPTION, DATE.

PEC logo and contact information: 1263 SW TOPEKA BLVD., TOPEKA, KS 66612, 785-233-8300, www.pec1.com

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Design & Construction Management, The University of Kansas, St. Andrews Office Facility, 1515 St. Andrews Drive, Lawrence, Kansas 66047, Telephone 785-864-3431 Fax 785-864-5644

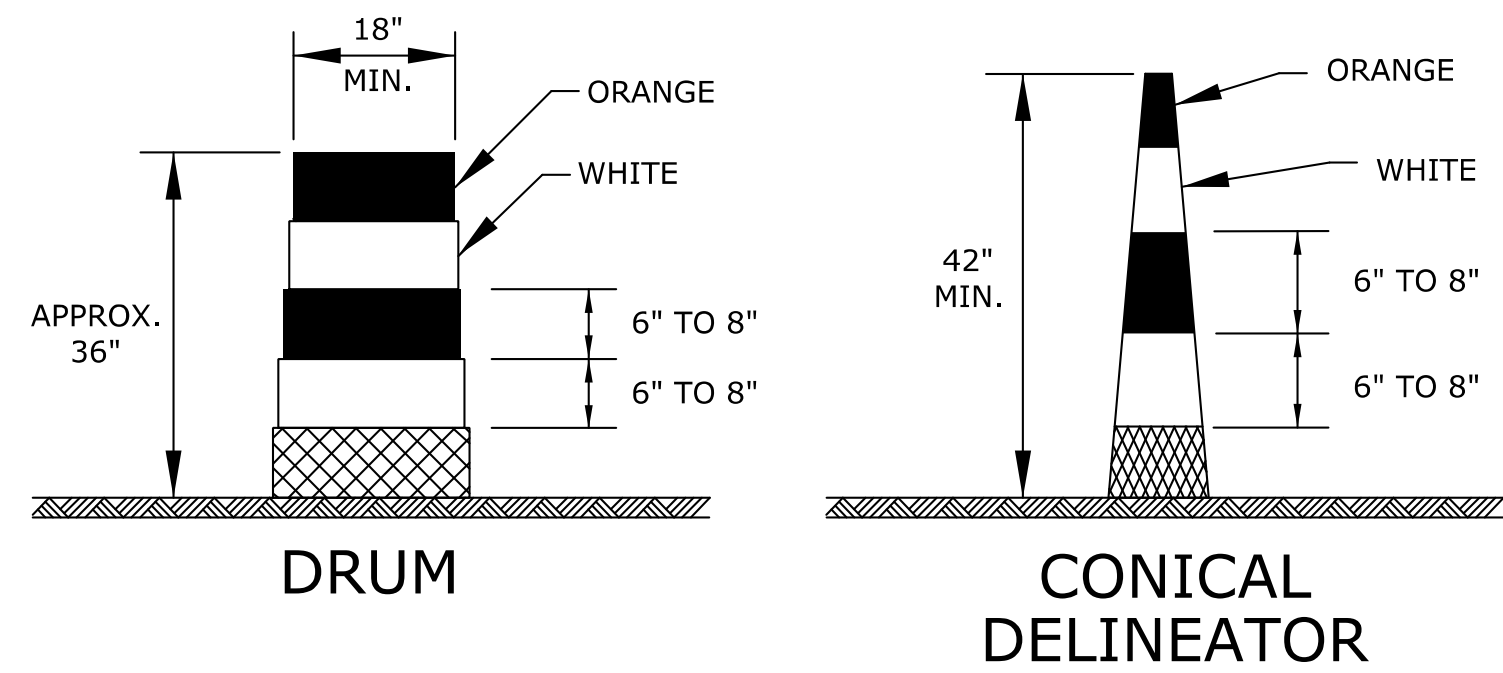
THE UNIVERSITY OF KANSAS, IRVING HILL ROAD, BRIDGE IMPROVEMENTS PROJECT, LAWRENCE, KS 66047. Includes fields for DRAWN BY, CHECKED BY, REV:.

TRAFFIC CONTROL DETAILS

TE700 ORIGINAL CONSTRUCTION DOCUMENTS

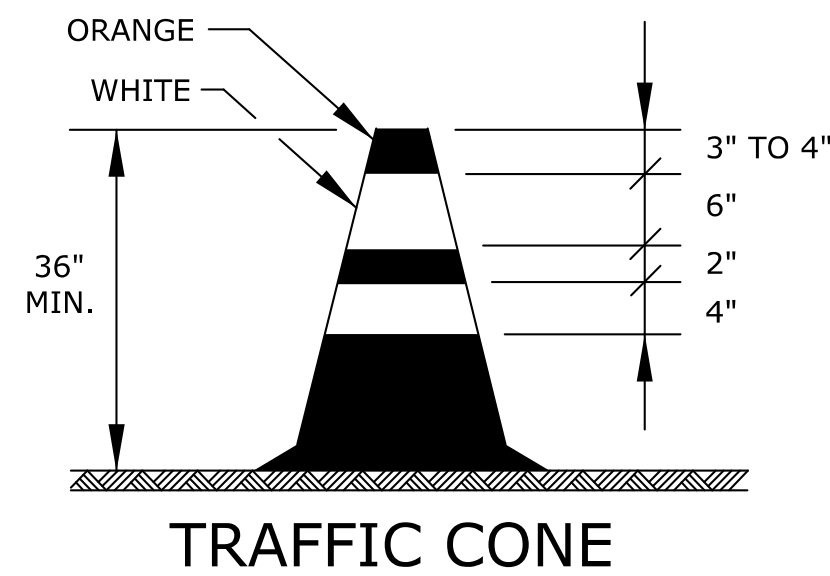
This Sheet is adapted from KDOT Standard Sheet TE700.



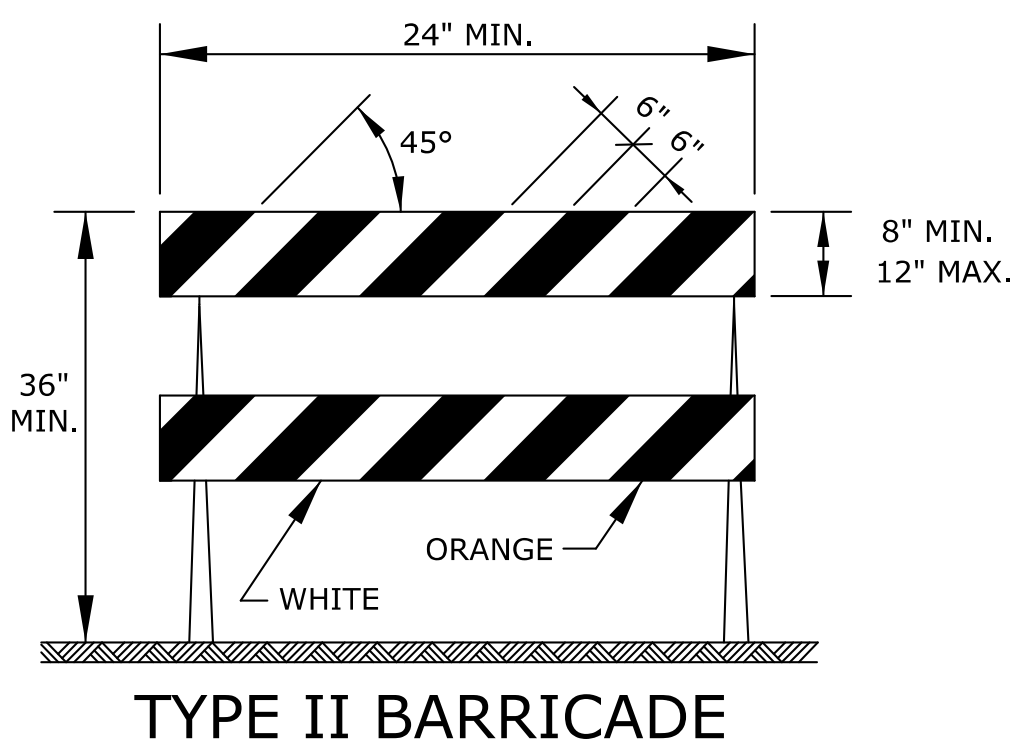


DRUMS AND CONICAL DELINEATORS SHALL HAVE AT LEAST TWO ORANGE AND TWO WHITE 6" TO 8" WIDE RETROREFLECTIVE STRIPES. ADDITIONAL STRIPES MAY BE NON-RETROREFLECTIVE. IF THERE ARE NON-RETROREFLECTIVE SPACES BETWEEN ADJACENT STRIPES, THEY SHALL BE NO MORE THAN 3" WIDE.

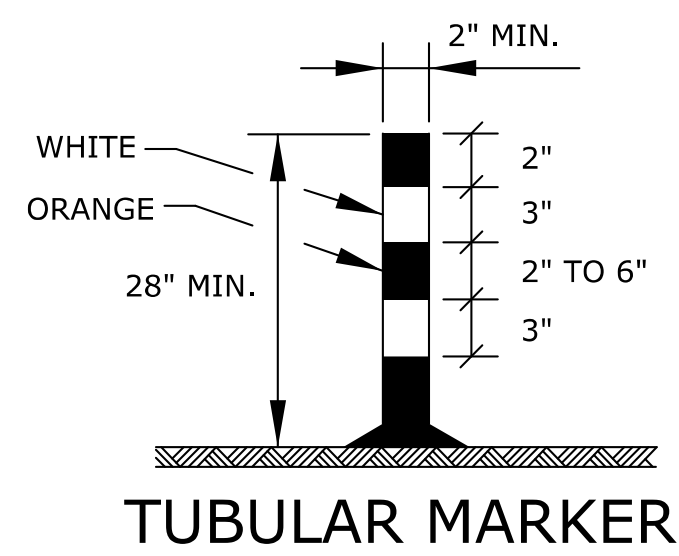
ALL RETROREFLECTIVE STRIPES ON DRUMS SHALL BE ASTM TYPE III SHEETING. THE WHITE STRIPES ON CONICAL DELINEATORS SHALL BE ASTM TYPE III SHEETING. ORANGE STRIPES ON ALL CONICAL DELINEATORS SHALL BE FLUORESCENT ORANGE ASTM TYPE IV SHEETING.



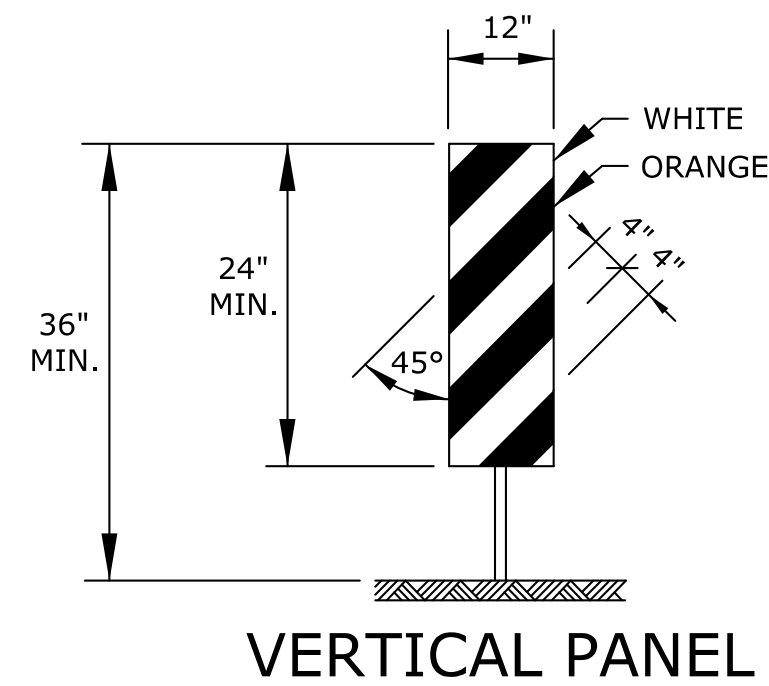
TRAFFIC CONES MAY BE USED AS CHANNELIZING DEVICES FOR DAYTIME OPERATIONS ONLY. THEY WILL NOT BE PAID FOR SEPARATELY, BUT WILL BE SUBSIDIARY TO OTHER TRAFFIC CONTROL BID ITEMS. THE ENGINEER MAY REQUIRE THAT TRAFFIC CONES BE SUPPLEMENTED BY OTHER TRAFFIC CONTROL DEVICES IN CERTAIN SITUATIONS.



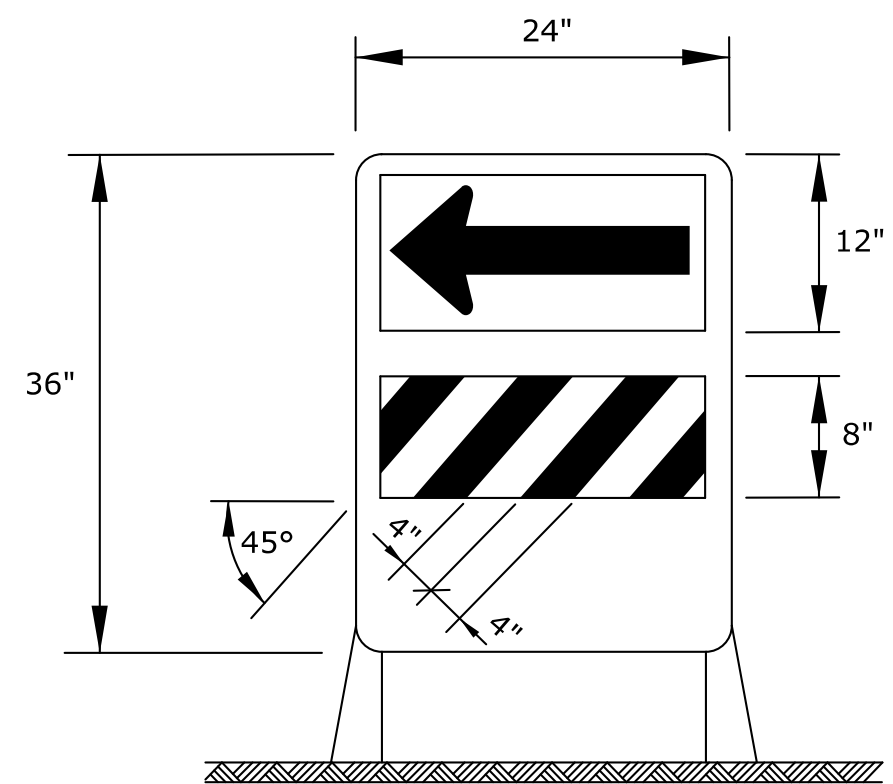
FOR RAILS LESS THAN 36" LONG, 4" WIDE STRIPES MAY BE USED. THE ENTIRE AREA OF BARRICADE RAILS, BOTH FRONT AND BACK, SHALL BE ASTM TYPE III SHEETING. THE STRIPES SHALL SLOPE DOWNWARD TO THE TRAFFIC SIDE FOR CHANNELIZATION.



THE TWO WHITE RETROREFLECTIVE STRIPES SHALL BE ASTM TYPE III SHEETING. STRIPING AS SHOWN FOR UP TO 42".



THE ENTIRE AREA OF VERTICAL PANELS, BOTH FRONT AND BACK, SHALL HAVE ASTM TYPE III SHEETING. THE STRIPES SHALL SLOPE DOWNWARD TO THE TRAFFIC SIDE FOR CHANNELIZATION.



THE ARROW PANEL SHALL BE BLACK ON FLUORESCENT ORANGE ASTM TYPE IV SHEETING. THE STRIPES SHALL BE ORANGE AND WHITE ASTM TYPE III SHEETING SLOPING 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.

THE ARROW PANEL SHOULD NOT BE VISIBLE TO OPPOSING TRAFFIC.

TAPER FORMULAS:

$$L = WS \text{ FOR SPEEDS OF 45 MPH OR MORE}$$

$$L = WS^2/60 \text{ FOR SPEEDS OF 40 MPH OR LESS}$$

WHERE: L = MINIMUM LENGTH OF TAPER IN FEET  
S = NUMERICAL VALUE OF POSTED SPEED PRIOR TO WORK STARTING IN MPH  
W = WIDTH OF OFFSET IN FEET

CHANNELIZER PLACEMENT:

(A) 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.

(B) 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.

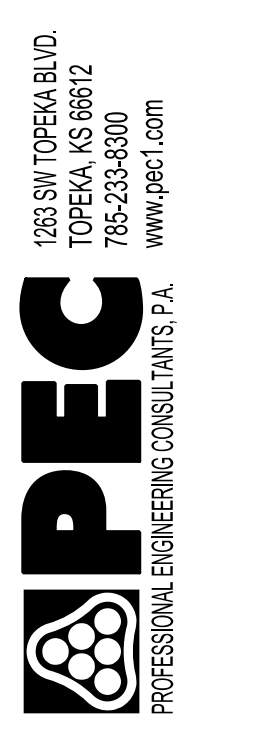
(C) CHANNELIZING DEVICES SHALL BE PLACED FOR OPTIMUM VISIBILITY, NORMALLY AT RIGHT ANGLES TO THE TRAFFIC FLOW.

(D) CHANNELIZING DEVICES PLACED ALONG SHOULDER EDGES OR IN DROPOFFS SHALL HAVE A MINIMUM OF 24" FROM THE TOP OF THE CHANNELIZING DEVICE TO THE TOP OF THE PAVEMENT.

ITEM	LOCATION									
		CROSS-OVERS	SHOOPLY DIVERSIONS	TANGENTS	TAPERS	RAMPS	HEAD TO HEAD	OBJECT IDENTIFIER	LEAD IN DEVICES	GORES
PORTABLE	DRUMS	YES	YES	YES	YES	YES	(1)	YES	YES	YES
	CONICAL DELINEATORS	YES	YES	YES	YES	YES	(1)	YES	YES	YES
	VERTICAL PANELS	(2)	(2)	(2)	(2)	(2)	(1,2)	YES	(2)	(2)
	DIRECTION INDICATOR BARRICADE	NO	NO	NO	YES	NO	NO	NO	NO	NO
FIXED	TYPE II BARRICADE	(2)	(2)	(2)	(2)	NO	NO	YES	NO	NO
	TUBULAR MARKERS	(3)	(3)	(3)	NO	(3)	YES	NO	YES	YES
	VERTICAL PANELS	(3)	(3)	(3)	(3)	(3)	(3)	YES	(2,3)	(2)

- (1) NOT ALLOWED ON CENTERLINE DELINEATION ALONG FREEWAYS OR EXPRESSWAYS.
- (2) THE STRIPES SHALL SLOPE DOWNWARD TO THE TRAFFIC SIDE FOR CHANNELIZATION.
- (3) MAY BE USED UPON THE APPROVAL OF THE ENGINEER.

NO.	REVISIONS DESCRIPTION	DATE



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THE UNIVERSITY OF KANSAS  
IRVING HILL ROAD  
BRIDGE IMPROVEMENTS PROJECT  
LAWRENCE, KS 66047

DATE: 06-11-14  
DRAWN BY: CP  
CHECKED BY: RAS  
REV:

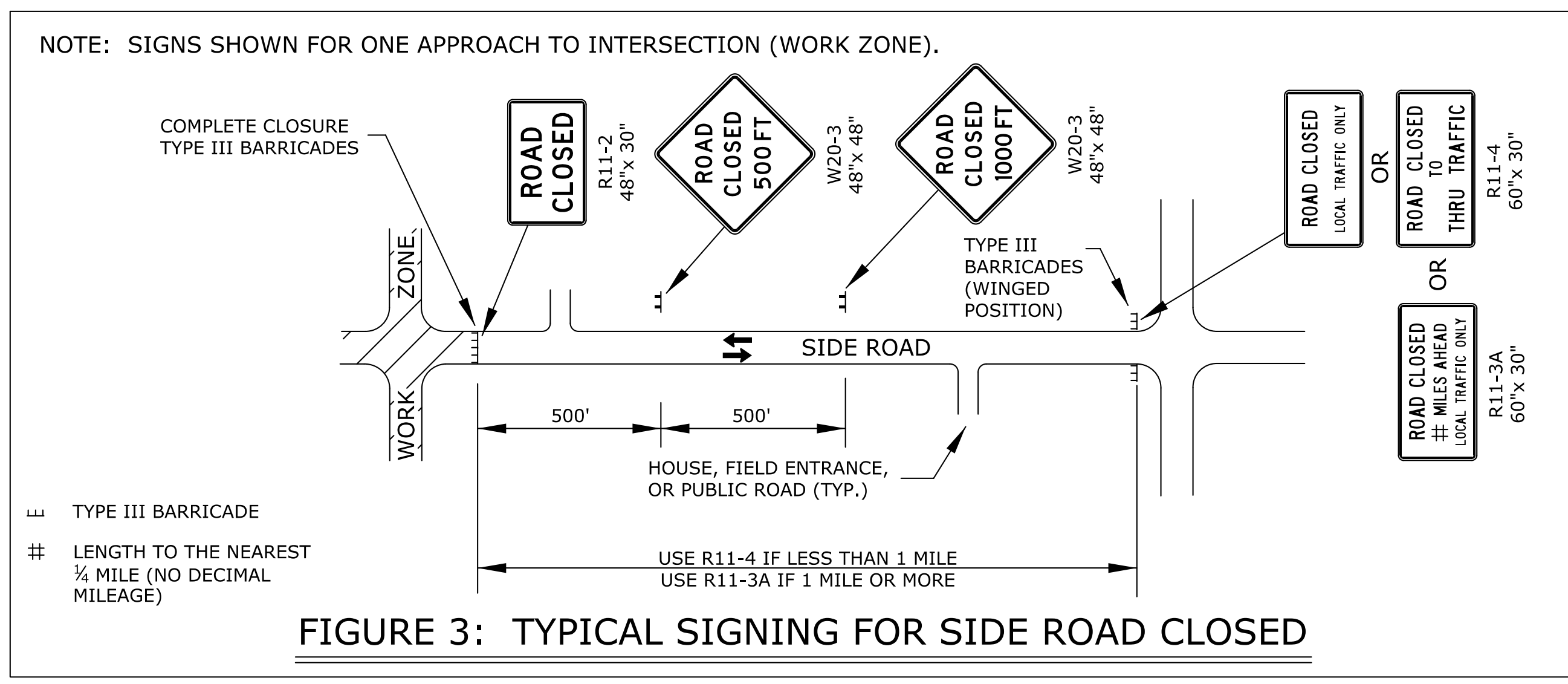
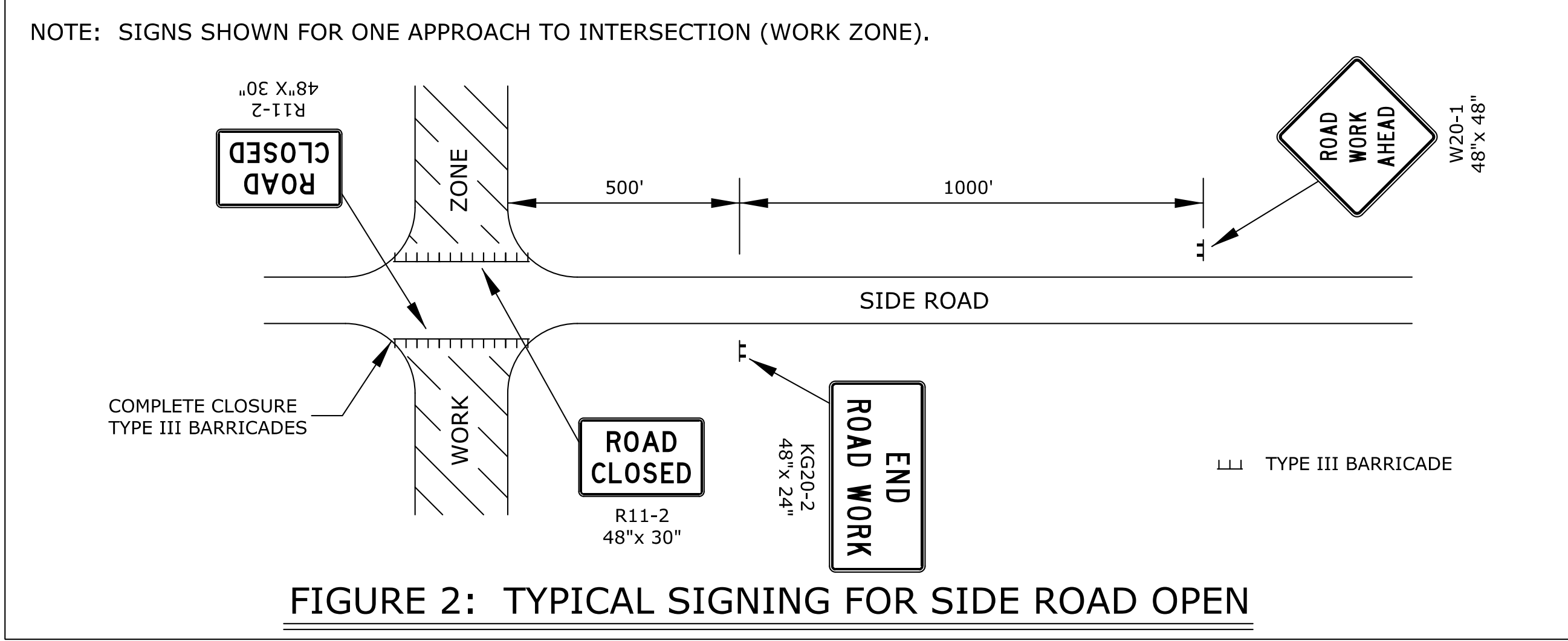
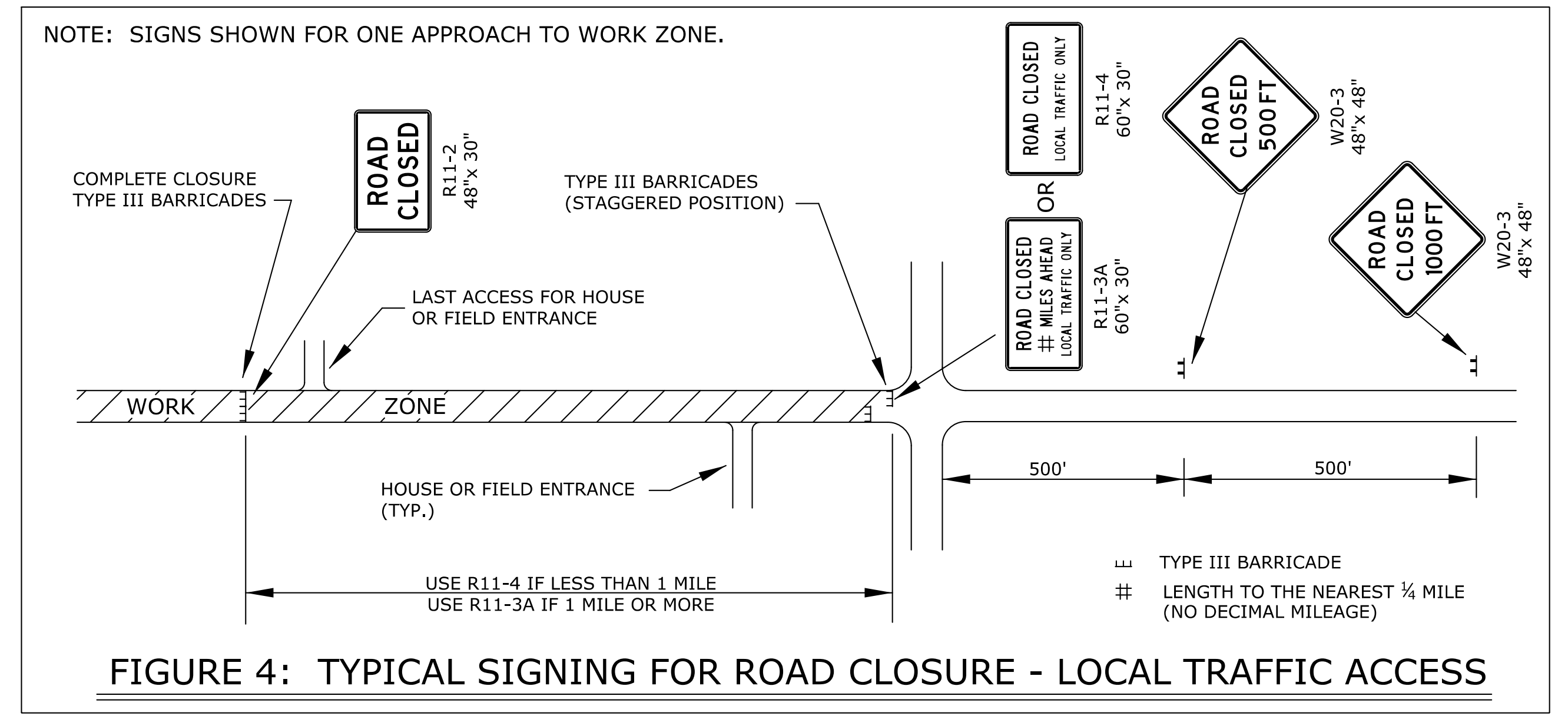
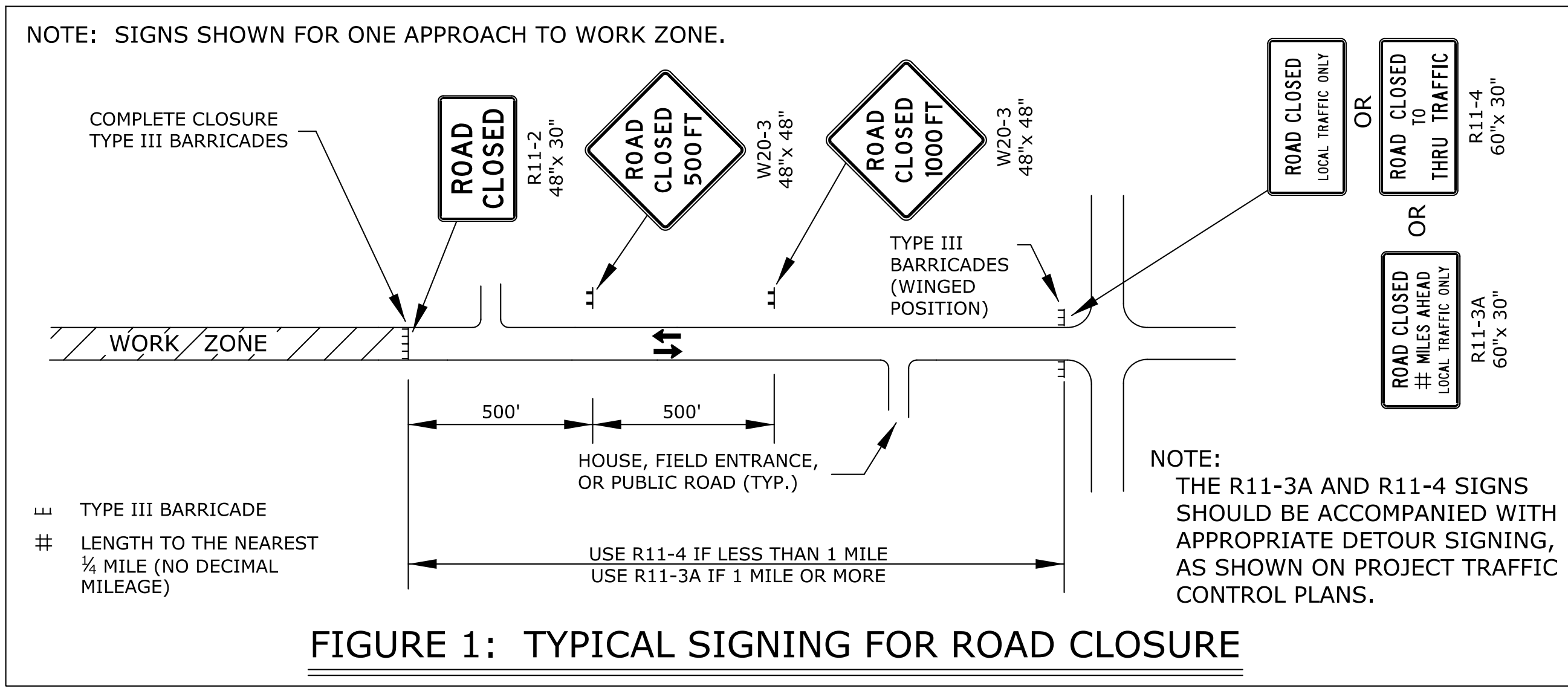
TRAFFIC CONTROL DETAILS

TE702

ORIGINAL CONSTRUCTION DOCUMENTS

This Sheet is adapted from KDOT Standard Sheet TE702.

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**NOTES:**

**1. SIGNS:**

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.

**2. BARRICADE PLACEMENT:**

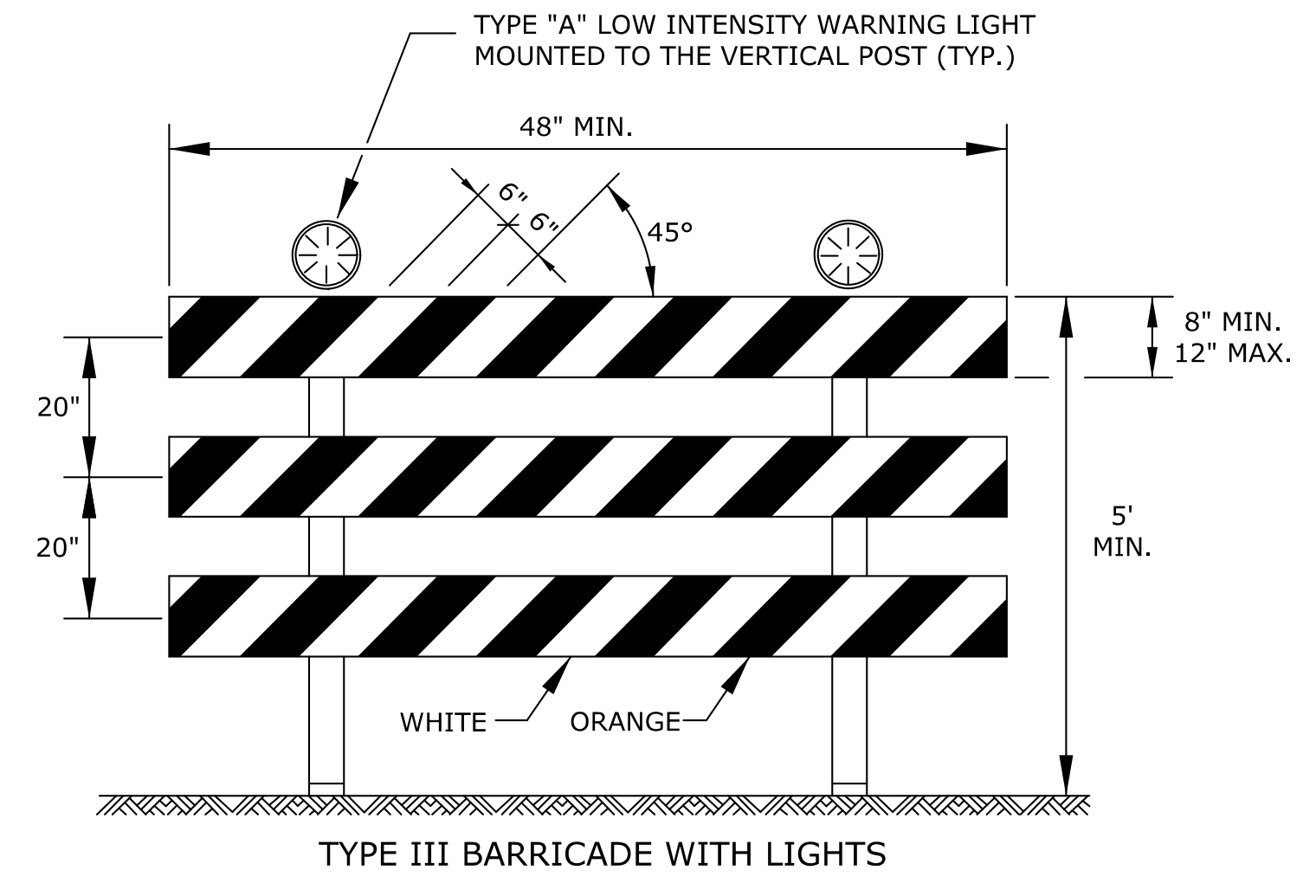
**A) COMPLETE ROAD CLOSURE**

WHEN A ROADWAY IS CLOSED, TYPE III BARRICADES SHALL BE PLACED END-TO-END TO COMPLETELY COVER THE ROADWAY AND SHOULDERS. WHEN ACCESS MUST BE ALLOWED FOR CONSTRUCTION OR OTHER OFFICIAL/GOVERNMENT VEHICLES, TYPE III BARRICADES SHALL BE LONGITUDINALLY STAGGERED FAR ENOUGH APART FROM ONE ANOTHER TO ALLOW SAFE PASSAGE OF VEHICLES AND MAINTAIN THE APPEARANCE OF A CLOSED ROADWAY. TYPE III BARRICADES SHALL BE REALIGNED AND PLACED END-TO-END TO DENY ANY ACCESS WHEN THE CONSTRUCTION ACTIVITY HAS CEASED FOR THE DAY.

**B) ROAD CLOSED - LOCAL TRAFFIC**

AS SHOWN IN FIGURE 4, WHEN LOCAL TRAFFIC MUST BE ALLOWED ACCESS INTO THE WORK ZONE, TYPE III BARRICADES SHALL BE LONGITUDINALLY STAGGERED TO MAINTAIN THE APPEARANCE OF A CLOSED ROADWAY. A SECOND LINE OF END-TO-END TYPE III BARRICADES SHALL BE PLACED JUST BEYOND THE LAST ACCESS POINT IN THE WORK ZONE, TO COMPLETELY CLOSE THE ROADWAY AS DESCRIBED IN NOTE 2-A.

AS SHOWN IN FIGURE 1 AND FIGURE 3, 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 III BARRICADES (WINGED POSITION), PLACED ON THE SHOULDERS OF ROADWAY.



THE ENTIRE AREA OF BARRICADE RAILS, BOTH FRONT AND BACK, SHALL HAVE ASTM TYPE III SHEETING.

THE STRIPES SHALL SLOPE DOWNWARD TO THE SIDE TRAFFIC IS TO PROCEED OR TOWARD THE CENTER OF THE ROADWAY AT ROAD CLOSURES.

APPROVED SIGNS MOUNTED ON TYPE III BARRICADES SHOULD NOT COVER MORE THAN 50% OF THE TOP TWO RAILS OR 33% OF THE TOTAL AREA OF THE THREE RAILS.

WHEN BARRICADES ARE PLACED END-TO-END OR STAGGERED, A TYPE "A" LOW INTENSITY WARNING LIGHT SHALL BE MOUNTED TO THE VERTICAL POST NEAR EACH OUTSIDE CORNER OF THE END BARRICADES.

NO.	REVISIONS DESCRIPTION	DATE

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**BRIDGE IMPROVEMENTS PROJECT**  
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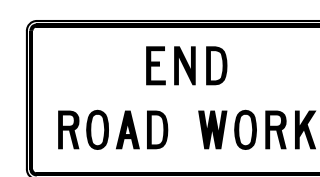
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 DRAWN BY: CP  
 DATE: 06-11-14

TRAFFIC CONTROL DETAILS

**TE704**

ORIGINAL CONSTRUCTION DOCUMENTS

### SIGN LAYOUT INFORMATION



STD. SIZE  
EXPWY/FREEWAY  
6" C  
48"x 24"

KG20-2



STD. SIZE  
EXPWY/FREEWAY  
6" C  
48"x 24"

KG20-5



STD. SIZE  
EXPWY/FREEWAY  
3" C 6" C  
24"x 6" 48"x 12"

KM4-20



MILEAGE TO BE DETERMINED BY THE ENGINEER.

W7-3a



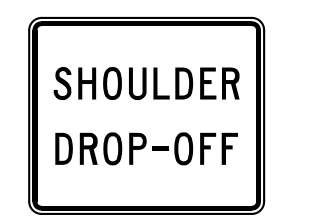
STD. SIZE  
EXPWY/FREEWAY  
8" D  
48"x 48"

W8-11



STD. SIZE  
EXPWY/FREEWAY  
48"x 48"

W8-17



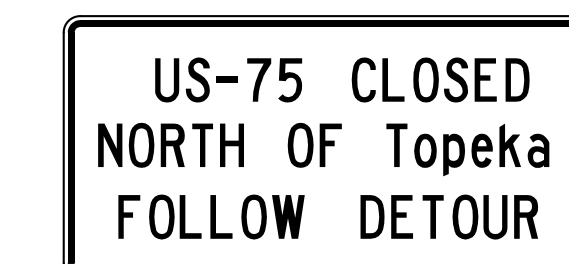
STD. SIZE  
EXPWY/FREEWAY  
30"x 24"

W8-17P  
(OPTIONAL)



STD. SIZE  
EXPWY/FREEWAY  
6" C 10" D

SP-01  
(SPECIAL SIGN)



STD. SIZE  
EXPWY/FREEWAY  
UPPERCASE: 6" C 10" D  
LOWERCASE: 4.5" C 8" D

SP-02  
(SPECIAL SIGN)

ALL CITY NAMES AND STREET NAMES ON SPECIAL SIGNS AND DESTINATION SIGNS MUST HAVE UPPER AND LOWER CASE LETTERS.

ALL SIGNS SHALL BE BLACK ON ORANGE RETROREFLECTIVE SHEETING.

### GENERAL NOTES

#### 1. MAINTENANCE:

THE CONTRACTOR SHALL MAINTAIN ALL SIGNS AND DEVICES IN AN UPRIGHT POSITION. THE CONTRACTOR SHALL CLEAN OR REPLACE ANY DAMAGED OR ILLEGIBLE SIGN OR DEVICE AS DIRECTED BY THE ENGINEER.

#### 2. EXISTING SIGNS:

IF EXISTING SIGNS THAT ARE TO REMAIN (WHETHER DENOTED ON THE PLANS OR NOT) INTERFERE WITH CONSTRUCTION WORK, THE CONTRACTOR SHALL REMOVE, STORE, AND RESET THE SIGNS. THIS SHALL BE SUBSIDIARY TO OTHER TRAFFIC CONTROL BID ITEMS. SIGNING DAMAGED BY THE CONTRACTOR SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.

#### 3. CONFLICTING SIGNS, SIGNS NOT IN USE, AND TRAFFIC SIGNALS:

SIGNS AND TRAFFIC SIGNALS THAT ARE IN CONFLICT WITH THE TRAFFIC CONTROL PLAN OR DO NOT APPLY TO THE TRAFFIC OPERATIONS SHALL BE IMMEDIATELY REMOVED, TURNED SO NOT VISIBLE TO TRAFFIC FROM ANY DIRECTION, OR COMPLETELY COVERED WITH ADEQUATE OPAQUE BREATHABLE MATERIAL. TAPE SHALL NOT BE APPLIED TO THE FACE OF THE SIGN.

#### 4. PORTABLE AND POST MOUNTED SIGNS:

TEMPORARY TRAFFIC CONTROL SIGNS THAT ARE ANTICIPATED TO REMAIN IN PLACE FOR 3 DAYS OR LESS ARE CONSIDERED "PORTABLE." PORTABLE SIGNS SHALL BE MOUNTED ON AN APPROVED SUPPORT AT A MINIMUM HEIGHT OF 12" ABOVE THE TRAVELED WAY. TRAFFIC CONTROL SIGNS IN PLACE FOR OVER 3 DAYS ARE REQUIRED TO BE MOUNTED ON APPROVED POSTS. A MINIMUM OF 42" OF THE APPROVED POST MUST BE BELOW THE GROUND SURFACE WITH ADEQUATE BACKFILL AND COMPACTION. ALL POSTS AT MINIMUM SHALL EXTEND TO THE TOP EDGE OF THE SIGN AND NO GREATER THAN 6" ABOVE THE SIGN.

WHEN THE SIGN WIDTH IS EQUAL TO OR GREATER THAN 9', THREE OR MORE WOOD POSTS MAY BE USED WITH A MINIMUM OF 4' BETWEEN THE CENTERLINE OF EACH POST. ALL SIGNS LESS THAN 9' IN WIDTH SHALL USE A MAXIMUM OF TWO WOOD POSTS.

"ROLL-UP" SIGNS MAY BE USED FOR PORTABLE WARNING SIGNS. THEY MUST BE FLUORESCENT ORANGE ASTM TYPE IV SIGNS OF OPAQUE MATERIAL. MESH SIGNS ARE NOT ALLOWED.

#### IN THE CASE OF HITTING ROCK WHEN DRIVING POSTS

- SHIFT THE SIGN LOCATION. DO NOT VIOLATE MINIMUM SIGN SPACING.
- WITH THE ENGINEER'S APPROVAL, USE ACCEPTABLE ALTERNATIVE SIGN STANDS.

#### 5. SHEETING:

ALL ORANGE SIGNS SHALL HAVE FLUORESCENT ORANGE ASTM TYPE IV SHEETING. ALL OTHER SIGNS SHALL HAVE ASTM TYPE III SHEETING OF STANDARD COLORS.

#### 6. SIGNS INVOLVING SPEEDS:

THE W3-5 (SPEED REDUCTION) SHOULD BE USED ONLY IF THE ENGINEER DETERMINES THAT A REDUCED SPEED IS REQUIRED ON THE PROJECT.

THE KM4-20 (WORK ZONE) PLAQUE SHALL BE PLACED ABOVE ALL SPEED LIMIT SIGNS, (R2-1), EXISTING AND TEMPORARY. MOUNT THE WORK ZONE PLAQUES TO THE POST. DO NOT OVERLAP THE R2-1 AND KM4-20 SIGNS.

FOR SPEEDS OF 30 MPH OR LESS, THE W1-1(TURN) OR W1-3(REVERSE TURN) SHOULD BE USED. FOR SPEEDS OF 35 MPH OR MORE, THE W1-2(CURVE) OR W1-4(REVERSE CURVE) SHOULD BE USED. THE W13-1(MPH) IS TO BE ELIMINATED IF THE ADVISORY SPEED IS WITHIN 5 MPH OF THE SPEED LIMIT.

#### 7. SIGNS CONTROLLING WORK ZONE:

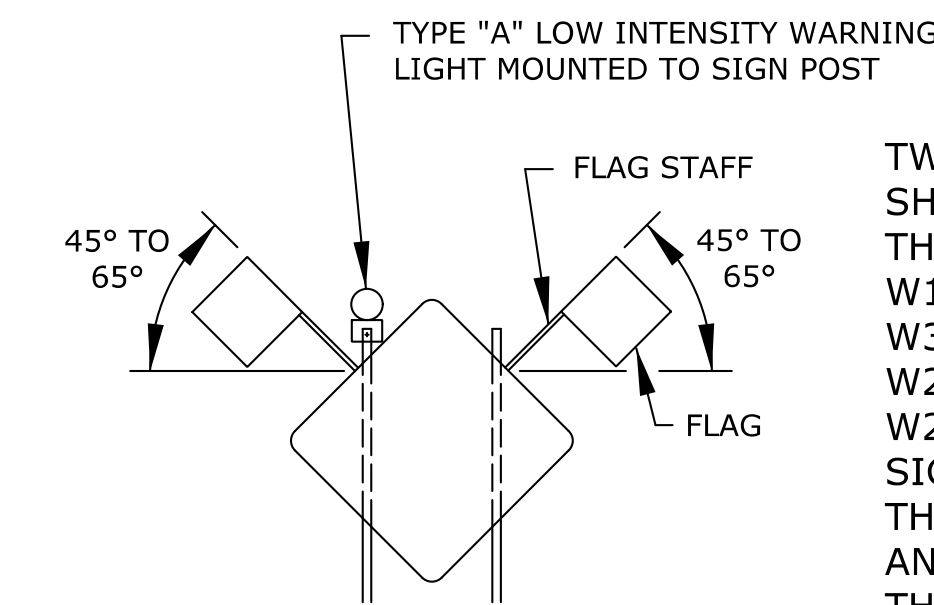
THE KG20-2(END ROAD WORK) SHOULD BE PLACED 500' FROM THE END OF THE ACTUAL WORK SPACE, NOT NECESSARILY AT THE EXTREME LIMITS OF THE PROJECT. THE KG20-2 SHOULD BE MOUNTED ON TWO POSTS. THE KG20-2 MAY BE MOUNTED ON ONE POST IF IN URBAN AREAS WHERE UTILITIES ARE A PROBLEM AND WIND LOADS ARE NOT AN ISSUE.

WHERE TWO WORK ZONES ARE LESS THAN 1 MILE APART IN RURAL AREAS OR ¼ MILE APART IN URBAN AREAS, THE KG20-2(END ROAD WORK) FOR THE FIRST WORK ZONE AND THE W20-1(ROAD WORK) FOR THE SECOND WORK ZONE SHOULD BE ELIMINATED.

#### 8. WARNING LIGHTS ON SIGNS:

A TYPE "A" LOW INTENSITY WARNING LIGHT IS AN L.E.D. BI-DIRECTIONAL FLASHING WORK ZONE WARNING LIGHT. TYPE "A" LOW INTENSITY WARNING LIGHTS SHOULD BE USED WITH ALL CONSTRUCTION ACTION WARNING SIGNS AND SHALL NOT BE USED ON SIGNS MOUNTED LESS THAN 5' HIGH ON TEMPORARY SUPPORTS. ON ALL OTHER CONSTRUCTION WARNING SIGNS, TYPE "A" LOW INTENSITY WARNING LIGHTS ARE TO BE USED AS DIRECTED BY THE ENGINEER.

TYPE "A" LOW INTENSITY WARNING LIGHTS SHALL BE MAINTAINED SO AS TO BE CAPABLE OF BEING VISIBLE ON A CLEAR NIGHT FROM A DISTANCE OF 3000 FT. IF A TYPE "A" LOW INTENSITY WARNING LIGHT HAS A SEPARATE BATTERY CASE, THE BATTERY CASE SHALL BE MOUNTED NO HIGHER THAN 12" ABOVE THE GROUND AND MOUNTED BEHIND THE SIGN POST. A TYPE "A" LOW INTENSITY WARNING LIGHT WHERE THE LENS AND BATTERY ARE ONE UNIT SHALL BE MOUNTED ON THE TEMPORARY SIGN POST NEAREST TO THE TRAVELED WAY. FLAGS SHALL NOT INTERFERE WITH THE VISIBILITY OF THE TYPE "A" LOW INTENSITY WARNING LIGHT.



TWO (2) 18" x 18" FLUORESCENT RED-ORANGE FLAGS SHALL BE ATTACHED (IN THE POSITION SHOWN) ON THE W20-2(DETOUR), W1-1(TURN), W1-2(CURVE), W1-3(REVERSE TURN), W1-4(REVERSE CURVE), W3-3(SIGNAL AHEAD), W4-2(LANE REDUCTION), W20-4(ONE LANE ROAD), W20-5(LANE CLOSED), W20-7A(FLAGGER), AND W3-4 (BE PREPARED TO STOP) SIGNS AND ANY OTHER ACTION SIGNS AS SHOWN ON THE PLANS OR DIRECTED BY THE ENGINEER. THE FLAGS AND STAFFS ARE TO BE ATTACHED IN SUCH A MANNER THAT THE SIGN WILL NOT BE OBSCURED. THE FLAGS MAY BE EITHER A CLOTH OR VINYL MATERIAL. THE FLAGS SHALL BE SUBSIDIARY TO THE CONSTRUCTION SIGN BID ITEMS.

#### MINIMUM ADVANCE WARNING SIGN SPACING (IN FEET):

	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

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.

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THE UNIVERSITY OF KANSAS  
IRVING HILL ROAD  
BRIDGE IMPROVEMENTS PROJECT  
LAWRENCE, KS 66047

DATE: 06-11-14  
DRAWN BY: CP  
CHECKED BY: RAS  
REV: RAS

TRAFFIC CONTROL  
DETAILS

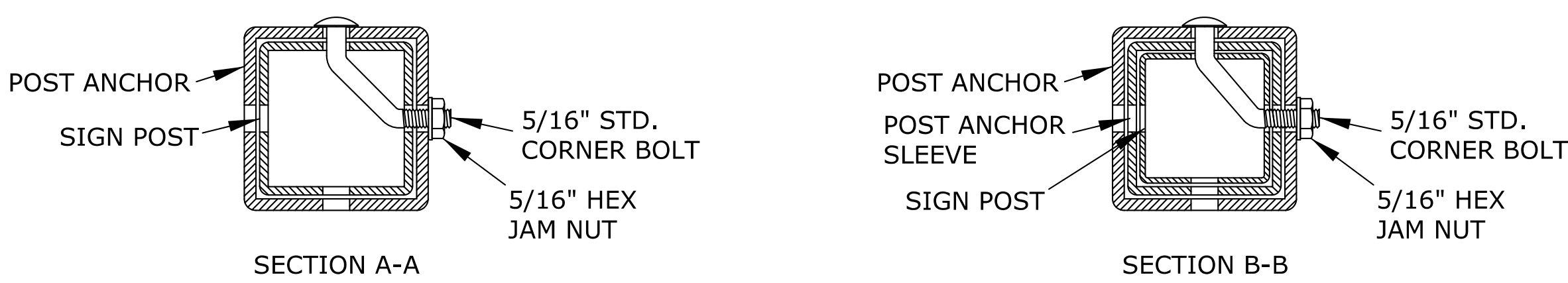
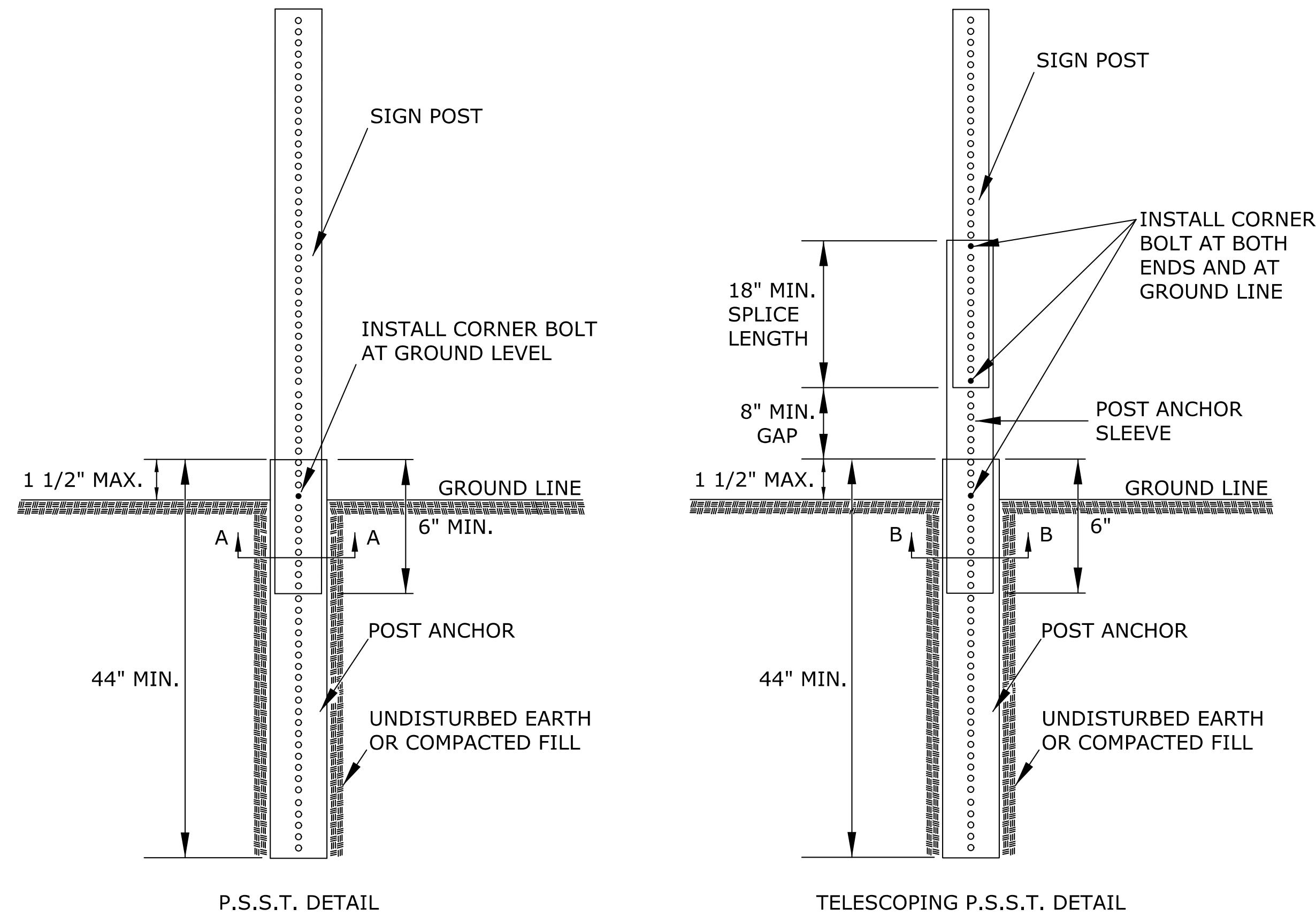
TE710

ORIGINAL  
CONSTRUCTION  
DOCUMENTS

This Sheet is adapted from KDOT Standard Sheet TE710.

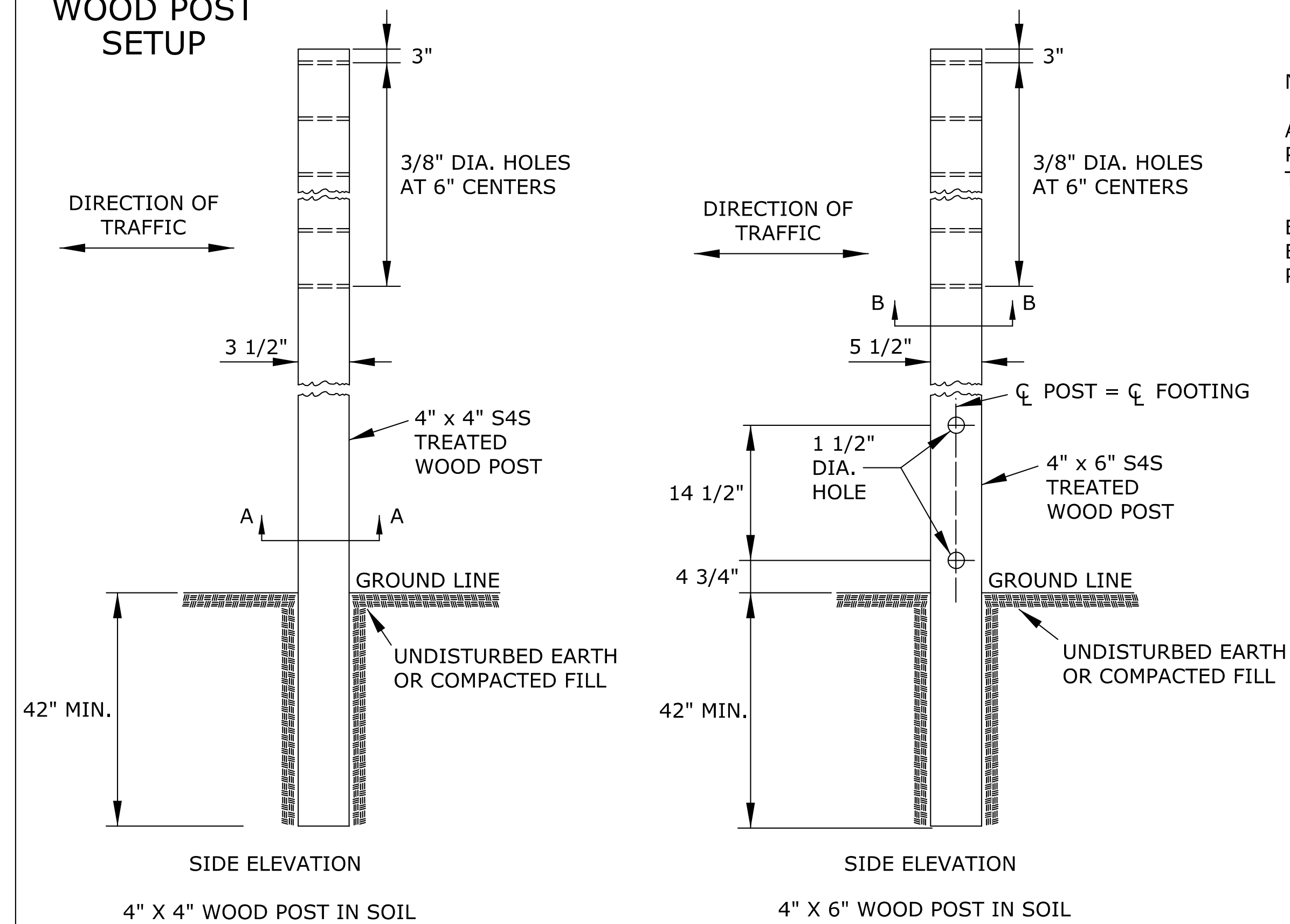


**PERFORATED SQUARE STEEL TUBE (P.S.S.T.) POST SETUP**



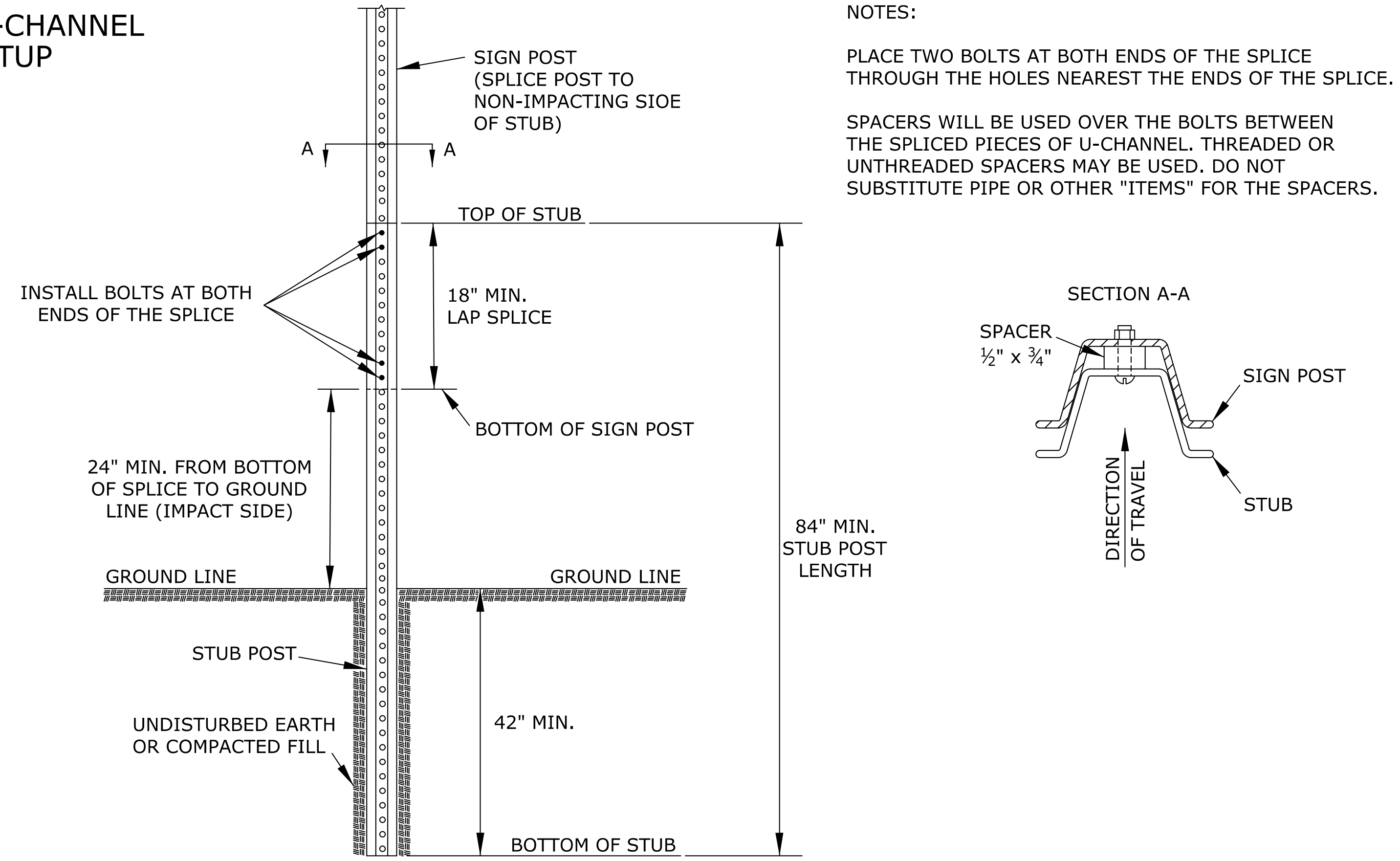
DETAILS FOR 2", 2 1/4", OR 2 1/2" SIGN POST  
PLACE BOLTS IN THE SAME CORNER ALONG EACH SIGN POST.

**WOOD POST SETUP**



NOTES:  
ALL SIGN MOUNTING HOLES IN THE WOOD POSTS SHALL BE DRILLED PRIOR TO TREATING.  
BREAKAWAY HOLES AND FIELD CUTS SHALL BE TREATED IN ACCORDANCE WITH THE PRESERVATIVE TREATMENT SPECIFICATIONS.

**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.  
SPACERS WILL BE USED OVER THE BOLTS BETWEEN THE SPLICED PIECES OF U-CHANNEL. THREADED OR UNTHREADED SPACERS MAY BE USED. DO NOT SUBSTITUTE PIPE OR OTHER "ITEMS" FOR THE SPACERS.

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TRAFFIC CONTROL DETAILS

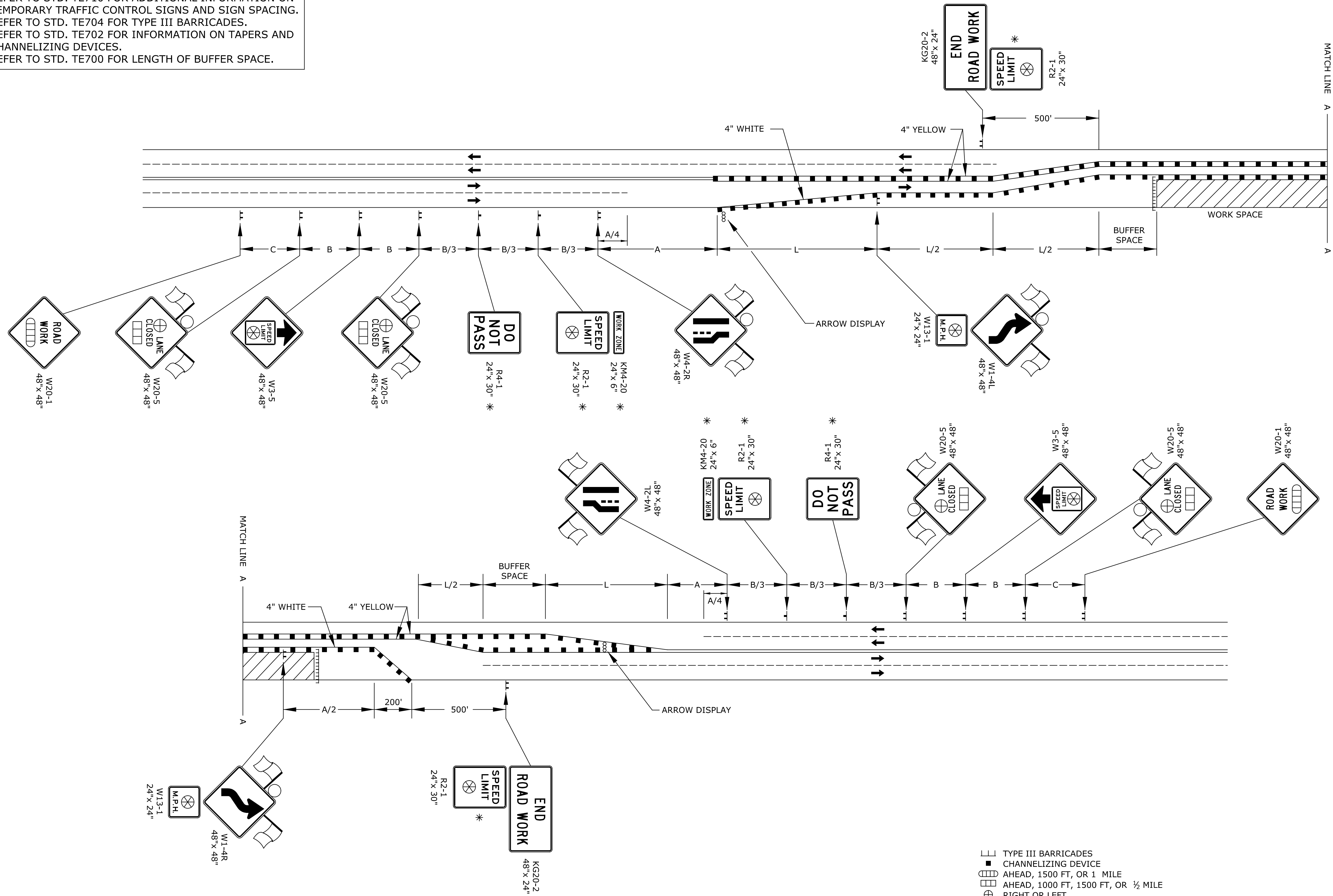
**TE712**  
ORIGINAL CONSTRUCTION DOCUMENTS

This Sheet is adapted from KDOT Standard Sheet TE712.



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REFER TO STD. TE710 FOR ADDITIONAL INFORMATION ON TEMPORARY TRAFFIC CONTROL SIGNS AND SIGN SPACING.  
 REFER TO STD. TE704 FOR TYPE III BARRICADES.  
 REFER TO STD. TE702 FOR INFORMATION ON TAPERS AND CHANNELIZING DEVICES.  
 REFER TO STD. TE700 FOR LENGTH OF BUFFER SPACE.



\* FOR SPEEDS GREATER THAN 45 MPH USE FREEWAY / EXPRESSWAY SIZE SIGNS.

- ▬ TYPE III BARRICADES
- 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

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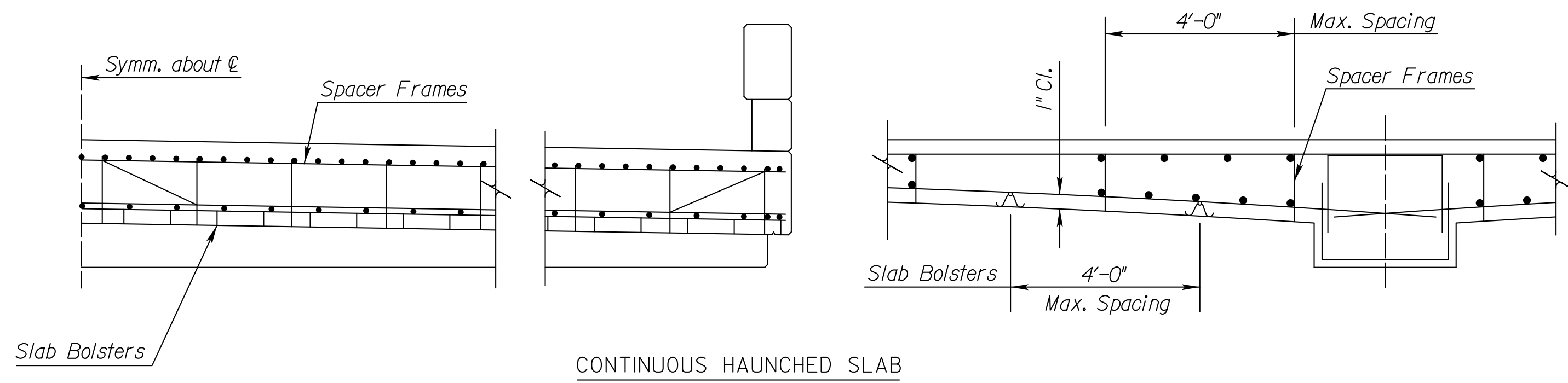
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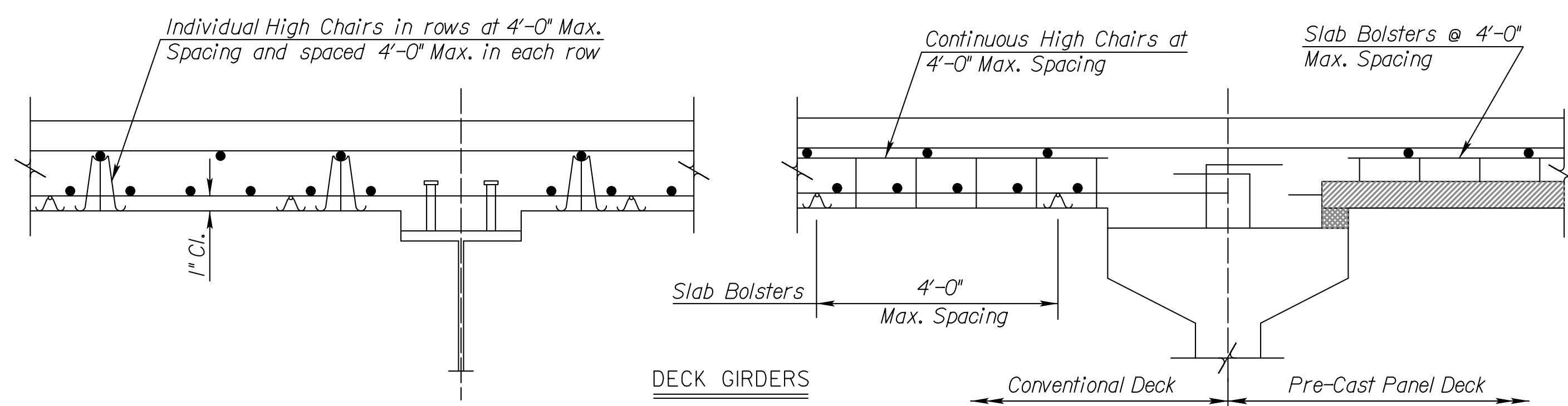
**TRAFFIC CONTROL DETAILS**  
  
**TE748**  
 ORIGINAL CONSTRUCTION DOCUMENTS

This Sheet is adapted from KDOT Standard Sheet TE748.

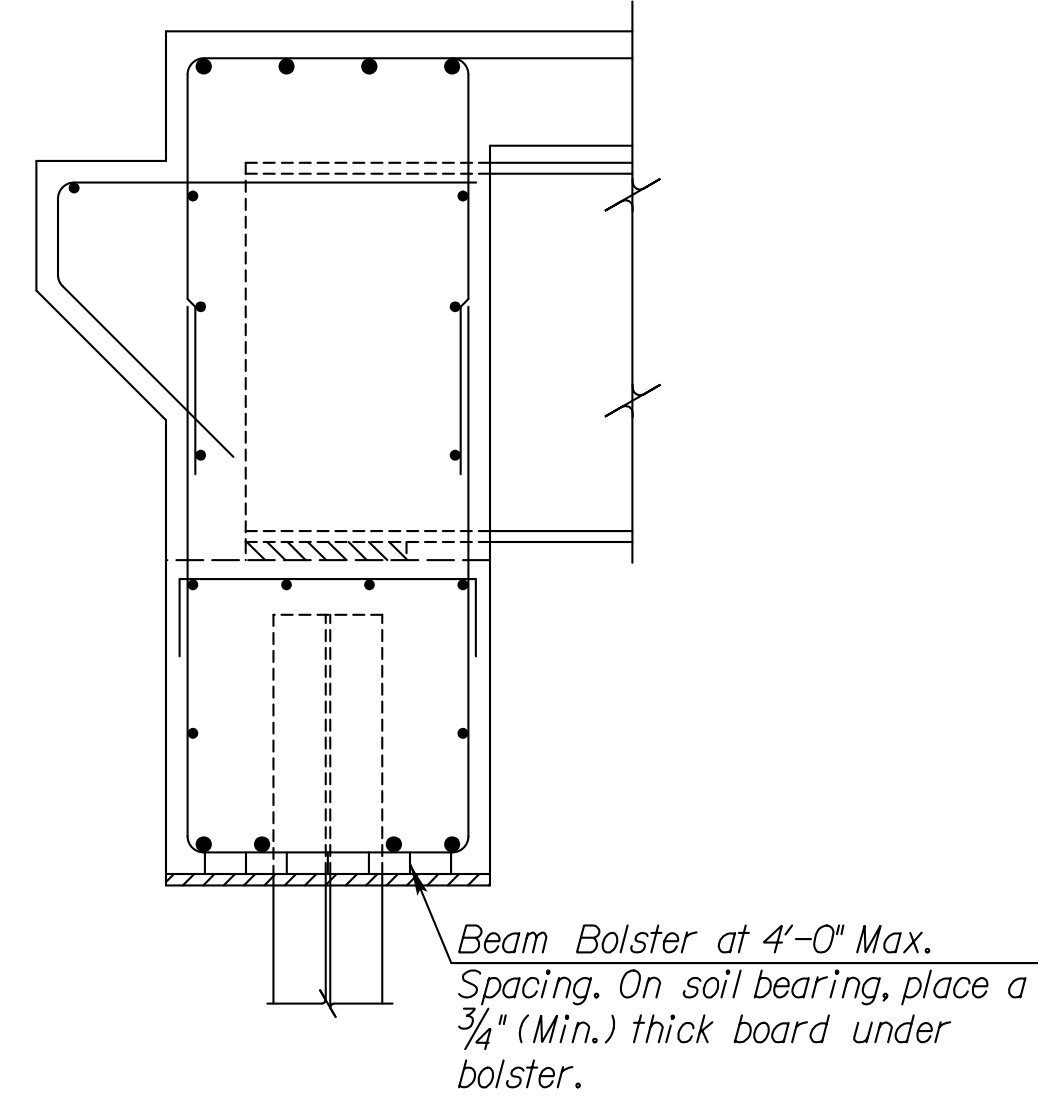




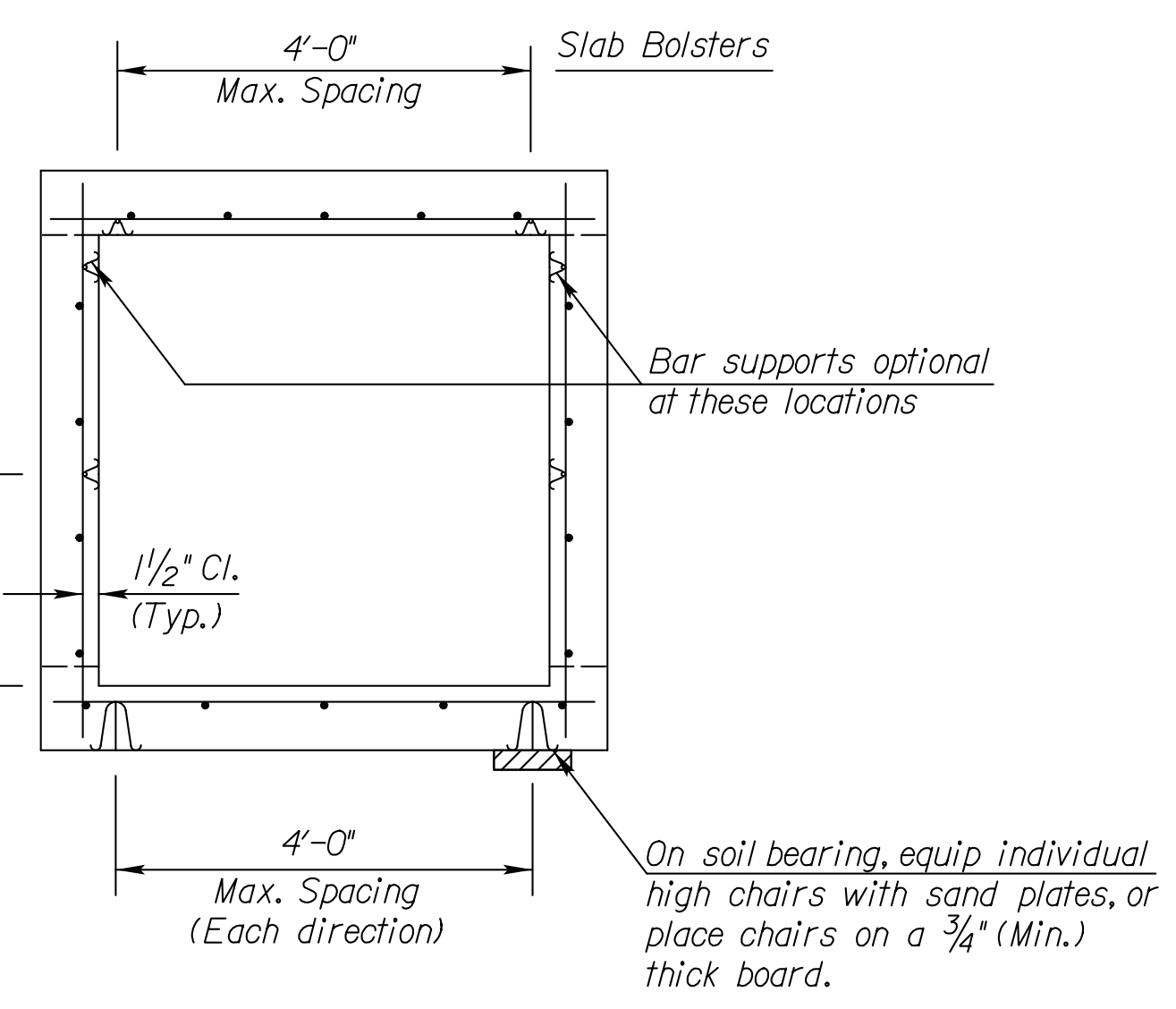
**CONTINUOUS HAUNCHED SLAB**



**DECK GIRDERS**

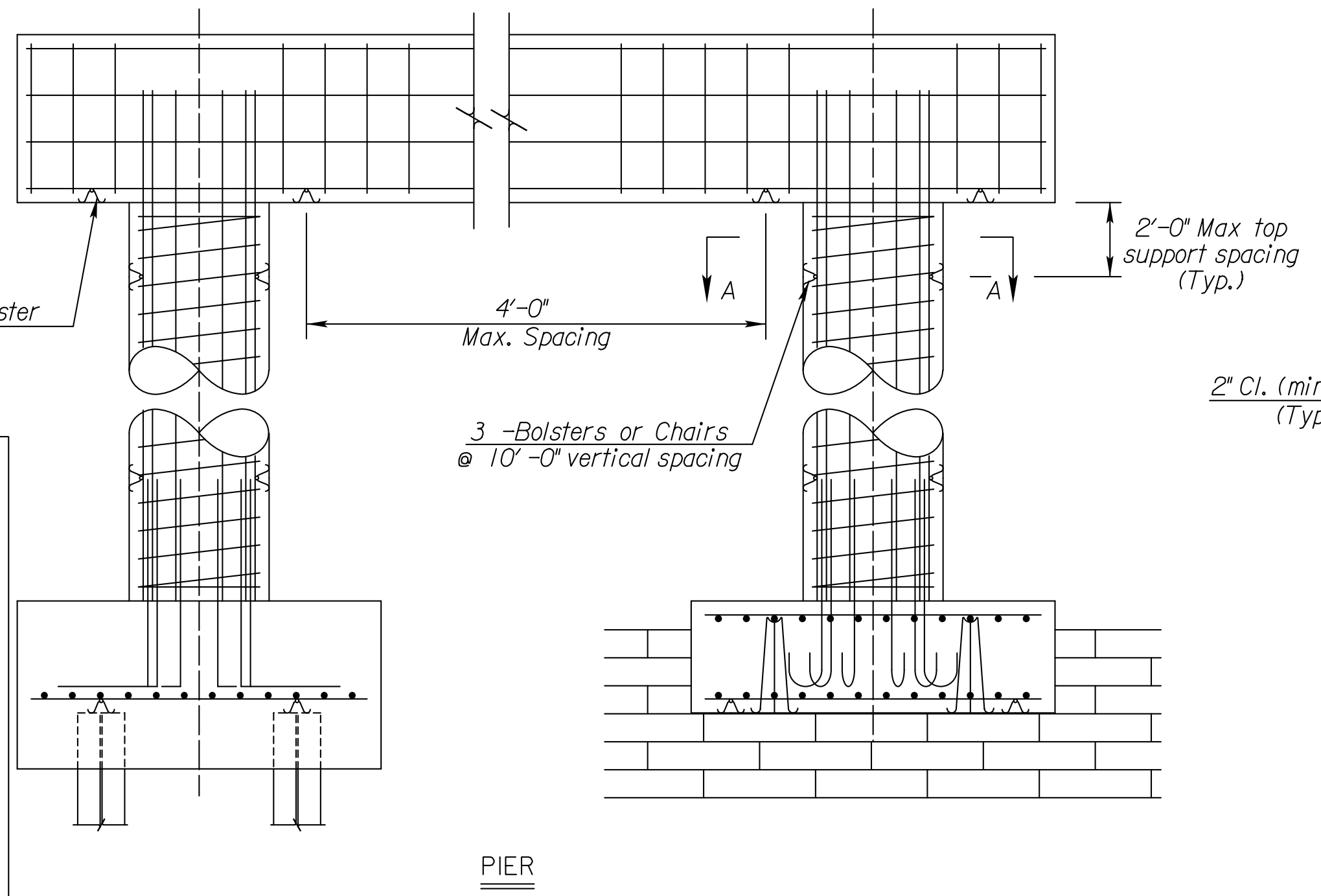


**ABUTMENT**

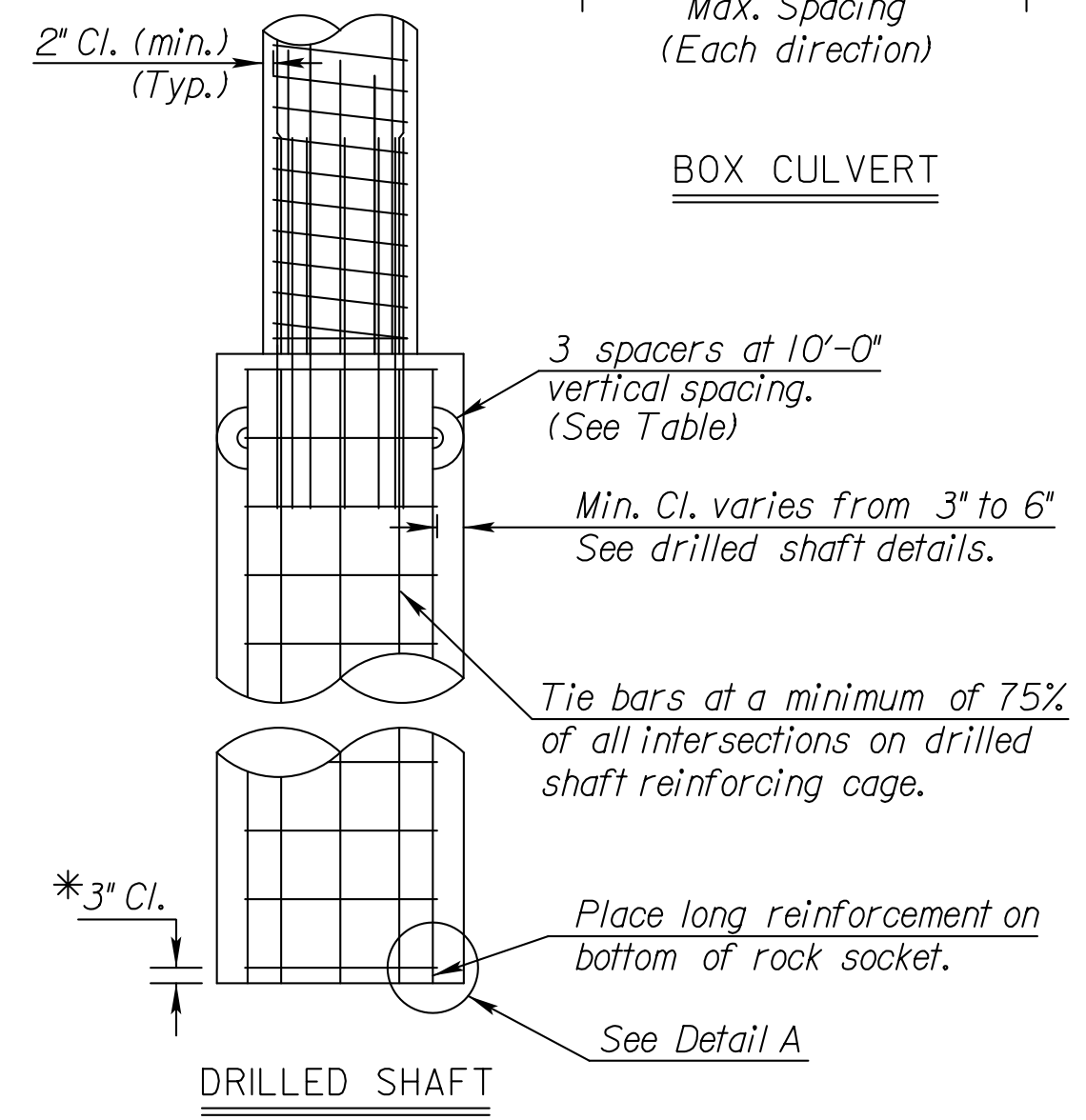


**BOX CULVERT**

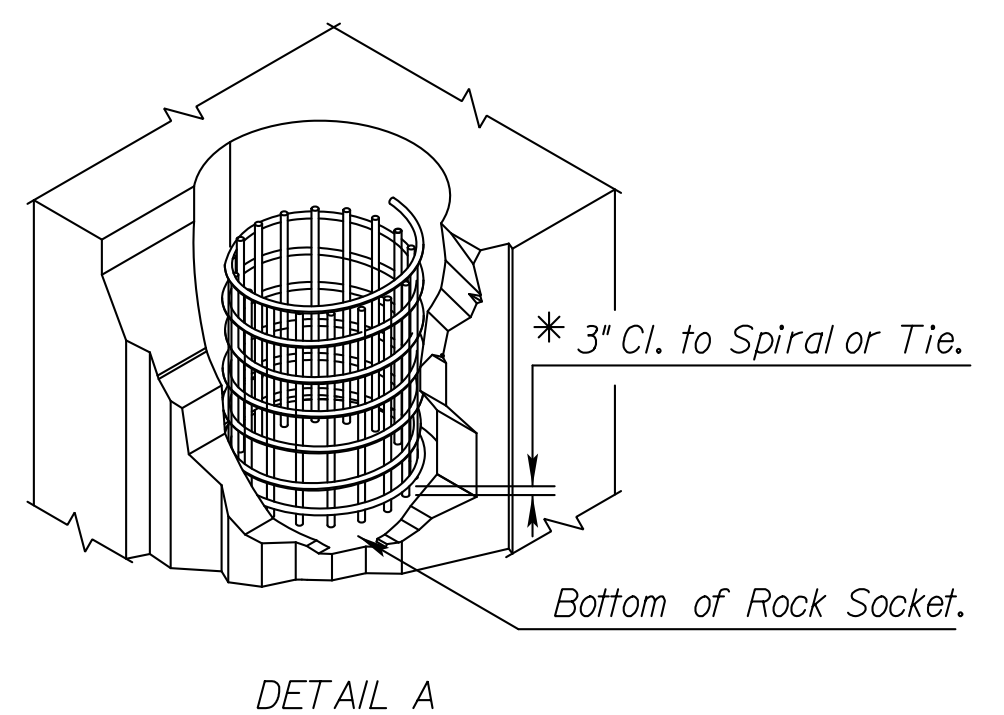
Req'd Shaft Supports		
Diameter (in.)	Circumference (in.)	No. of Spacers
18	56	3
24	75	3
30	94	4
36	113	4
42	131	5
48	150	6
54	169	6
60	188	7
66	207	7
72	226	8
78	244	9
84	263	9
90	282	10
96	301	11
102	320	11
108	339	12



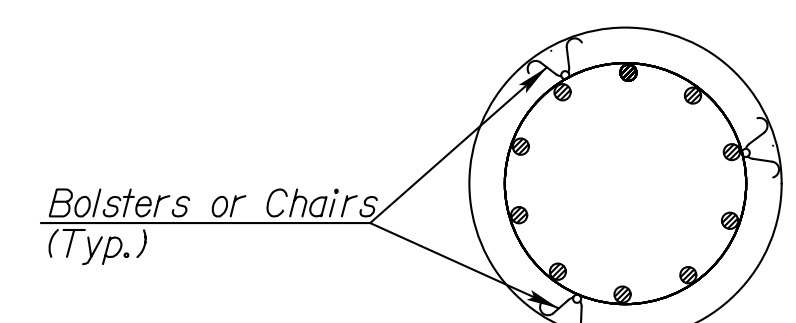
**PIER**



**DRILLED SHAFT**



**DETAIL A**



**SECTION A-A**

**TYPICAL SECTION**

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.

\* 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.

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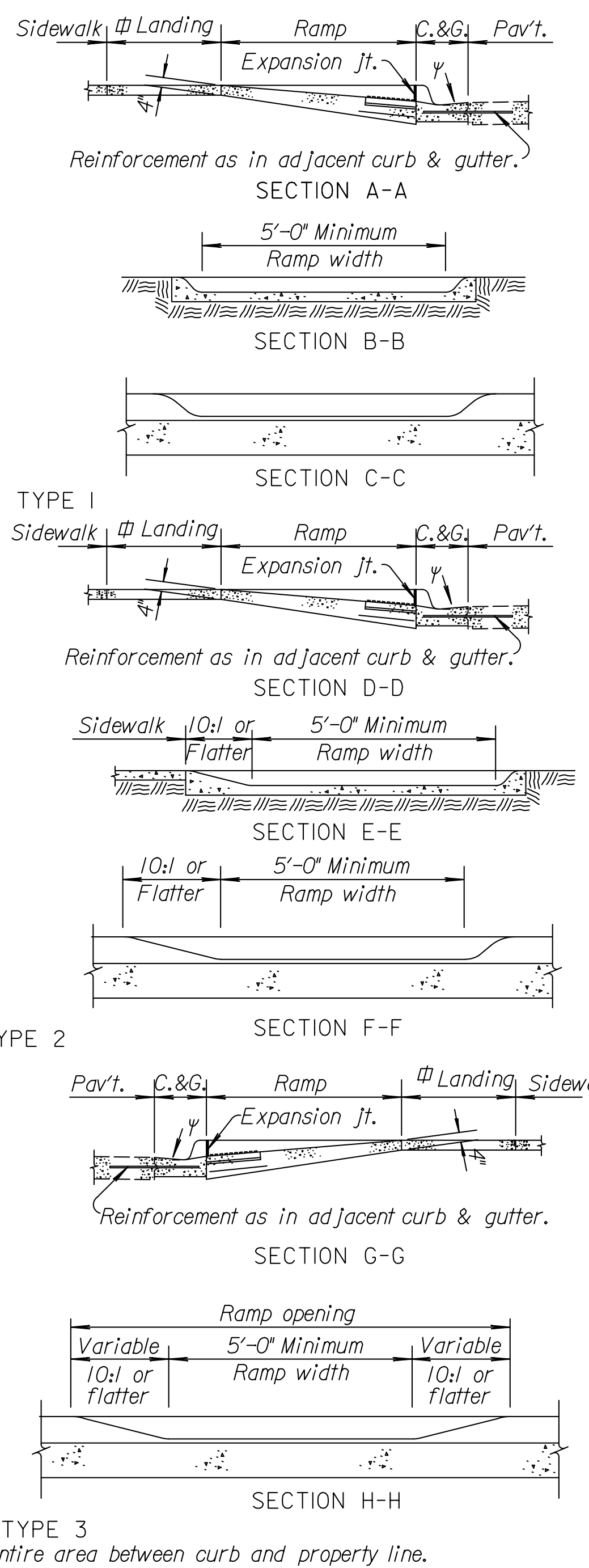
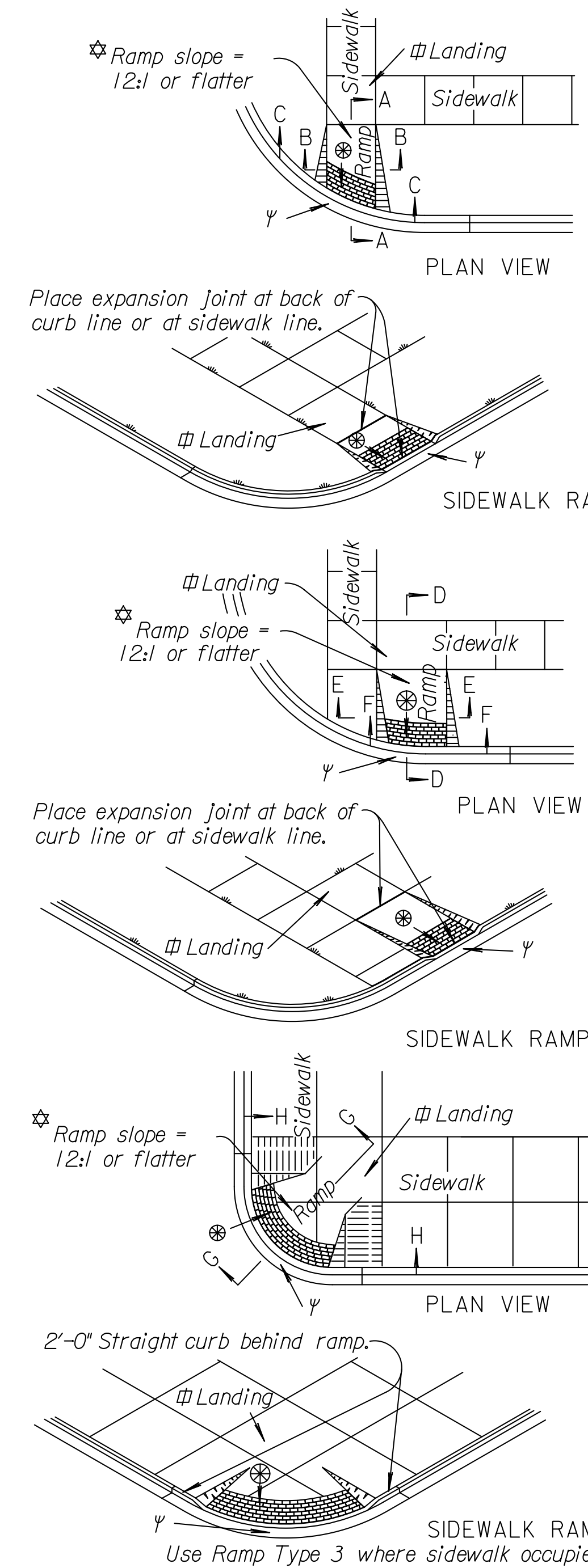
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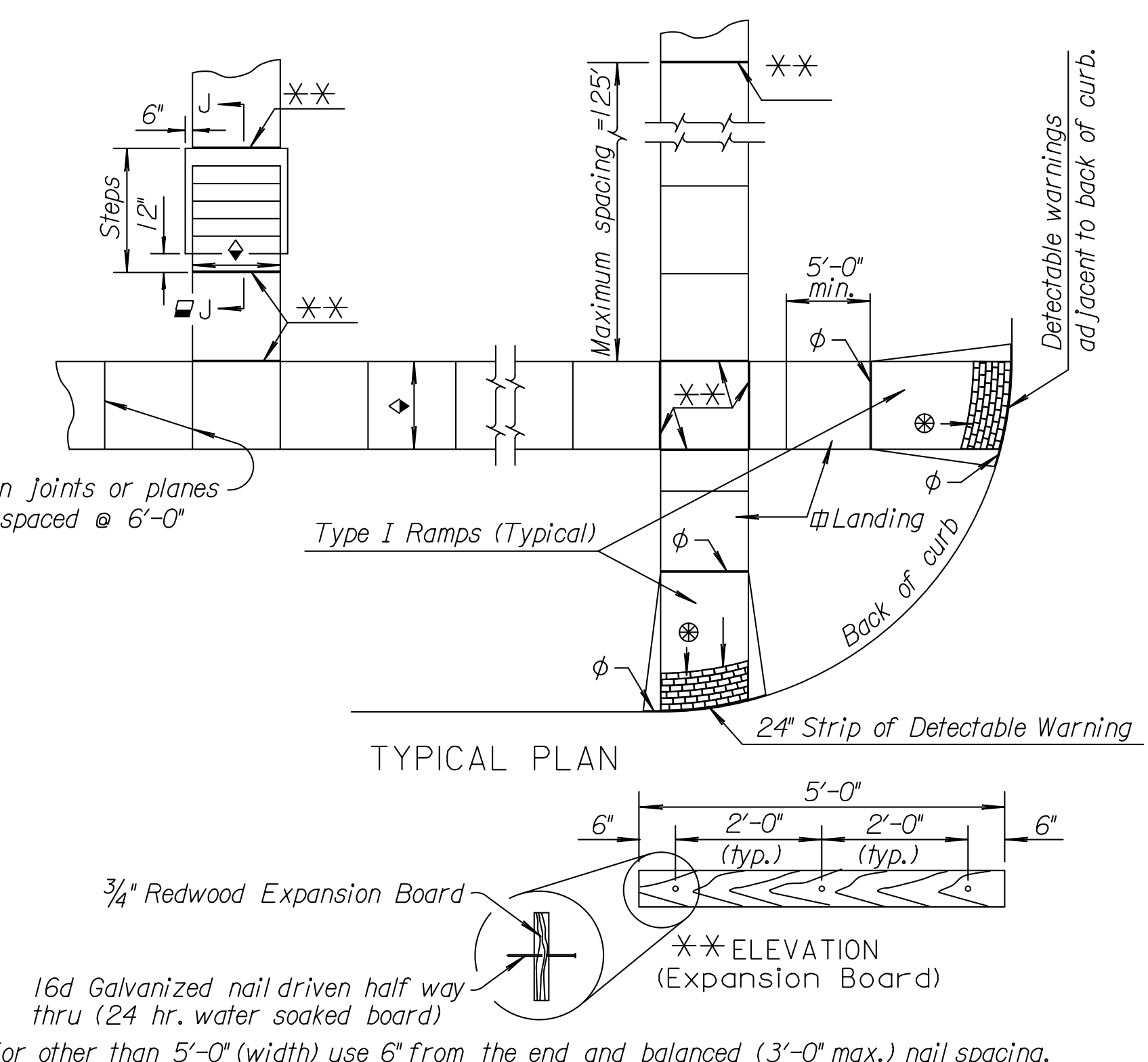
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REINFORCING STANDARD  
**BR120**  
 ORIGINAL CONSTRUCTION DOCUMENTS

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SECTION J-J see standard drawing RD725B for details of Steps and Handrail.



- Expansion Joint (3/4" Redwood board) placed at either back of curb line or at sidewalk back of curb line or at sidewalk line.
- Expansion Joint (3/4" redwood board) located as shown.
- Variable width (5'-0" min.). Entrance walk to be same width as approach walk. Use sidewalk width of 4'-0" where existing conditions prohibit use of 5'-0".
- New construction ramp slopes are 12:1 or flatter. Desirable ramp slopes for existing sites are 12:1 or flatter. Where space limitations prohibit construction of a 12:1 slope on existing sites, use the following slopes:  
 8:1 or flatter for a maximum rise of 3 inches  
 10:1 or flatter for a maximum rise of 6 inches
- Use a landing slope of 50:1 or flatter. Landings are the same width as ramp and a minimum 5'-0" in length.
- Use a counter slope of 20:1 or flatter at the base of sidewalk ramps. Refer to standard drawing RD725A for additional curb and gutter details.
- Detectable warning installation is typical and required on Sidewalk Ramps Type 1, Type 2, Type 3, median ramp crossings and other locations as shown in the plans. See standard drawing RD725A for additional details.

**GENERAL NOTES**

The details depicted here may not be appropriate for all locations. Designs shall meet this criteria on all new construction projects unless impracticable by site restrictions. For an existing sidewalk facility where the sidewalk will be replaced, sidewalk will be replaced according to this drawing to the maximum extent feasible.

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

Details shown on this sheet apply to all construction or reconstruction of streets, curbs or sidewalks. See standard specifications for additional information.

Restrict use of sidewalk ramp Type 2 to locations where it is not feasible to use Types 1 or 3.

Curb cut ramps are to be located as shown on the plans or as directed by the Engineer.

Do not place drainage structures in line with ramps except where existing drainage structures are being utilized in the new construction. Ramp locations should take precedence over the location of drainage structures.

Ramp sidewalks where the driveway curb is extended across the walk. Construct ramp with uniform grade free of sags and short grade changes.

Place 3/4" redwood expansion joints flush with the surface at a maximum spacing of 125'. Place 3/4" redwood expansion joints at sidewalk junctions, see plan details. Where sidewalk abuts a curb place 3/4" redwood board expansion joint flush with the surface.

Place 1/2" preformed (Non-extruding, Type B) joint filler where sidewalk is parallel and adjacent to a rigid surface.

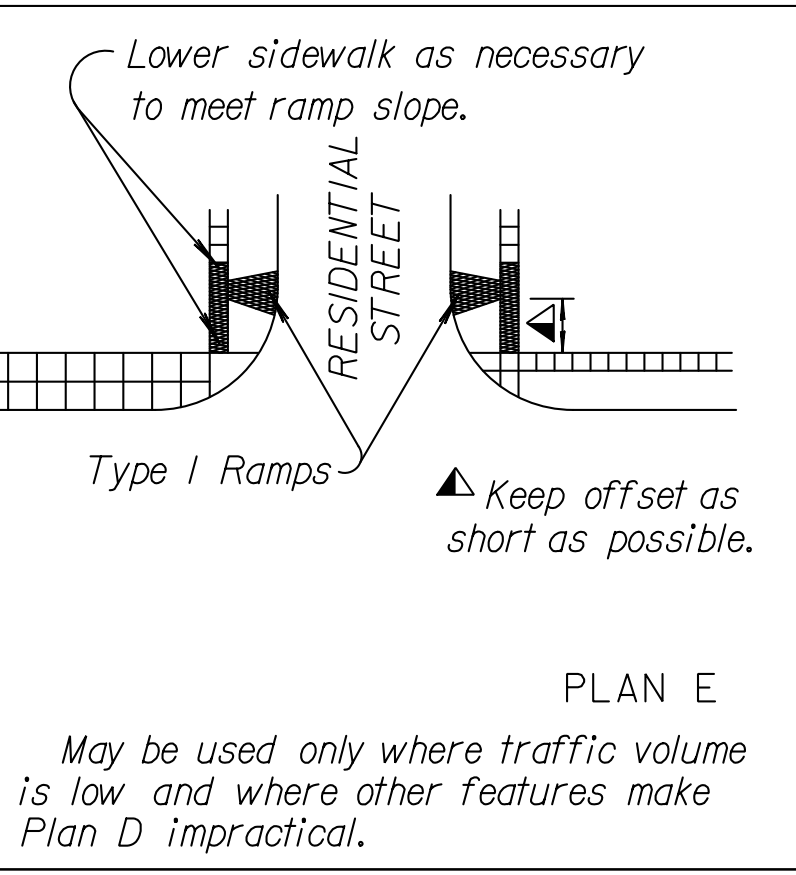
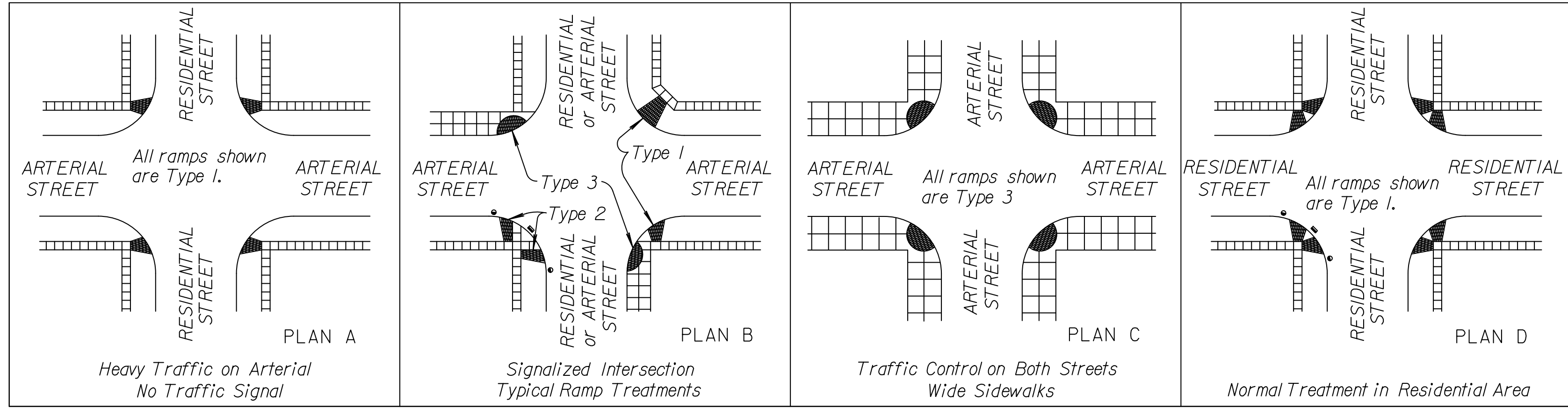
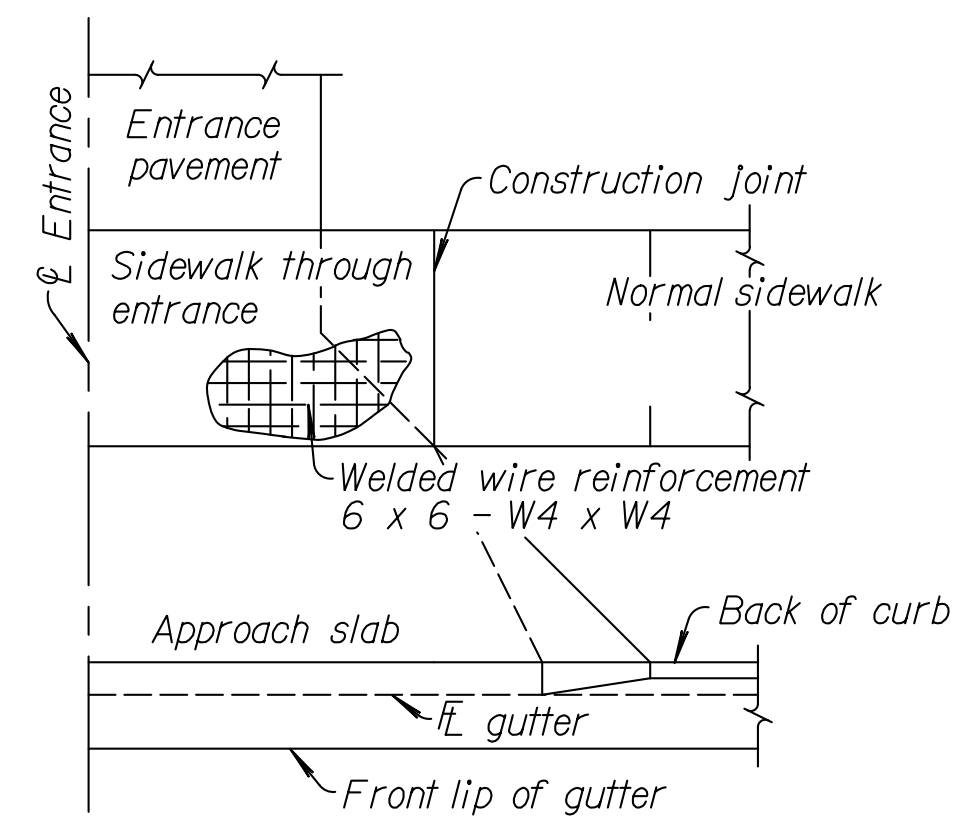
Slope sidewalk toward the street at a 50:1 or flatter. Slope or depress sidewalk where necessary to fit alleys and entrances see plans or at Engineer's direction.

Where clear width of sidewalk between top of ramp and building or other obstruction is less than 48 inches, slope the flared sides 12:1 or flatter.

Sidewalk shown to be constructed in back of an entrance shall be placed 6" thick with welded wire mesh reinforcement. Gauge and spacing of wires are the same as entrance pavement (See Reinforcement Diagram). Bid item will be "Sidewalk Construction (6") either with or without air entrainment.

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

Surface texture ramp slope with a wooden float or brushed finish.



**LEGEND**

- Sidewalk Ramp Type 1
- Sidewalk Ramp Type 2
- Sidewalk Ramp Type 3
- Preferred location of drainage inlet (Typical)
- Alternate location of drainage inlet (Typical)
- Sidewalk

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**SIDEWALK STANDARD**

**RD725**  
 ORIGINAL CONSTRUCTION DOCUMENTS