

STATE OF SOUTH DAKOTA  
DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED  
**PROJECT NH 0050(123)390**  
**SD HIGHWAY 50 EBL**  
**YANKTON COUNTY**

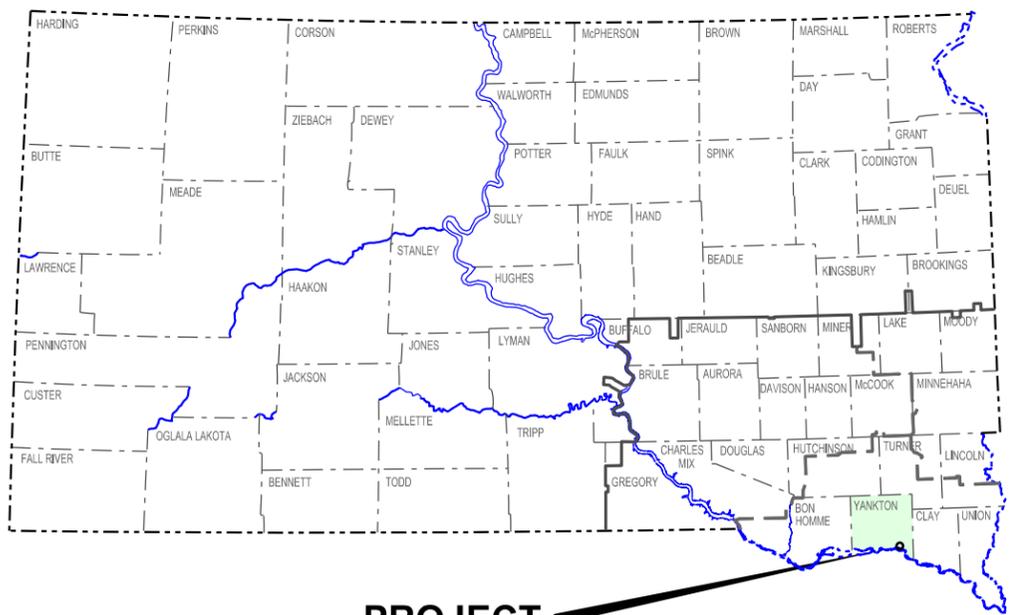
APPROACH SLAB, APPROACH PCC PAVEMENT & GUARDRAIL

PCN 05HE

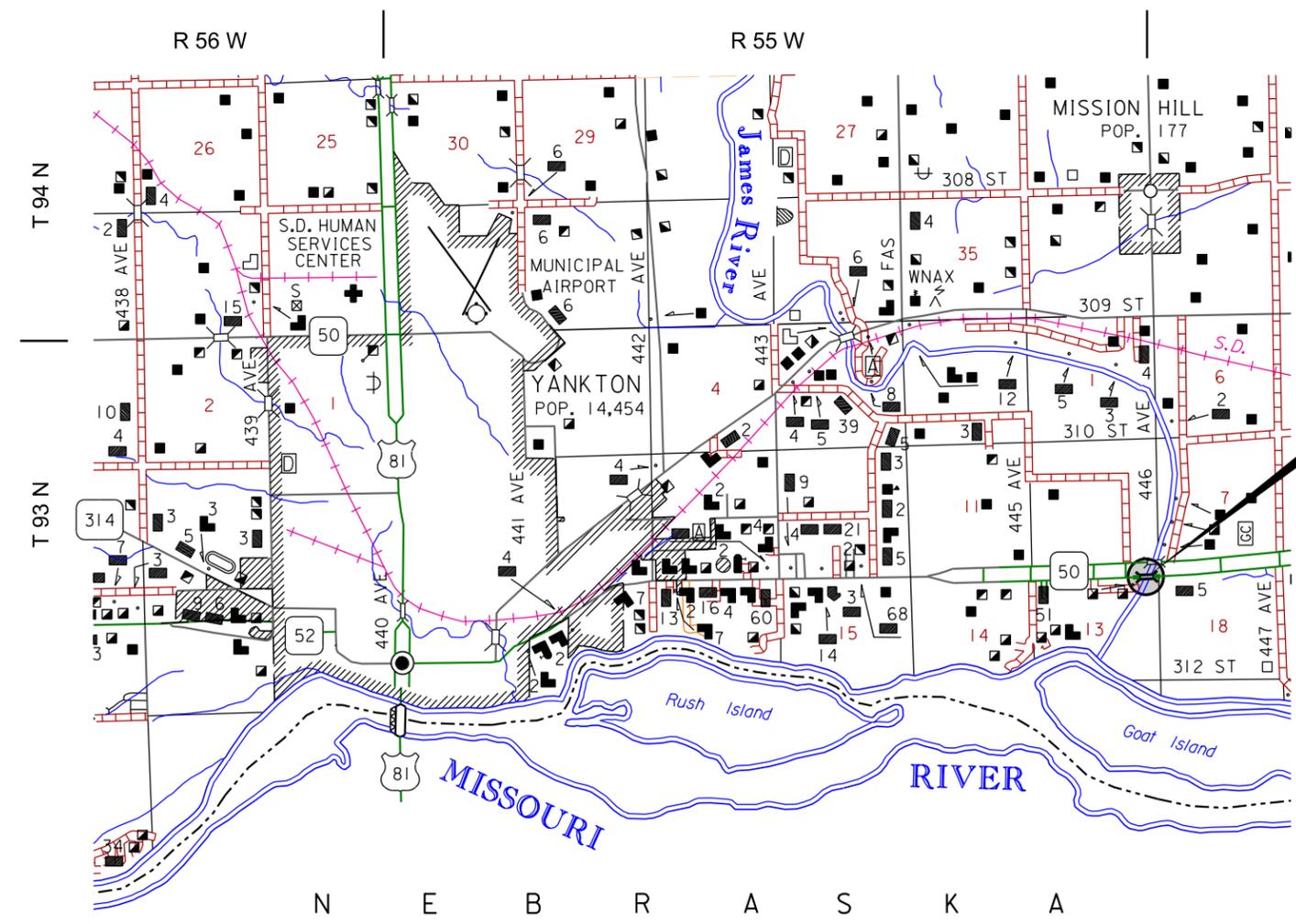
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PLOT SCALE - 1"=7000'



PROJECT



**STR. NO. 68-180-200**  
Cont. Comp. Girder Bridge  
326'-1 9/16"=0.062 Mile  
MRM 390.05 EBL

**STORM WATER PERMIT**  
(None required)

**DESIGN DESIGNATION**

ADT(2014)	2,492
ADT(2034)	3,384
DHV	443
D	52%
T DHV	8.5%
T ADT	18.8%
V	70 MPH

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# ESTIMATE OF QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT <b>NH 0050(123)390</b>	SHEET <b>2</b>	TOTAL SHEETS <b>56</b>
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Rev 12/11/2015 GAW

## NH 0050(123)390 – PCN 05HE

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
110E0400	Remove Drop Inlet	2	Each
110E0500	Remove Pipe Culvert	46	Ft
110E1100	Remove Concrete Pavement	272.0	SqYd
110E6000	Remove 3 Cable Guardrail for Reset	25	Ft
110E6200	Remove Double Thrie Beam Guardrail for Reset	25.0	Ft
110E6230	Remove W Beam Guardrail for Reset	50.0	Ft
110E6240	Remove W Beam to Thrie Beam Guardrail Transition for Reset	2	Each
110E7700	Remove Drop Inlet Frame and Grate Assembly for Reset	2	Each
120E0010	Unclassified Excavation	85	CuYd
120E0600	Contractor Furnished Borrow Excavation	170	CuYd
260E3010	Gravel Surfacing	84.0	Ton
380E0070	9" Nonreinforced PCC Pavement	419.0	SqYd
380E6000	Dowel Bar	156	Each
380E6110	Insert Steel Bar in PCC Pavement	35	Each
450E0122	18" RCP Class 2, Furnish	38	Ft
450E0130	18" RCP, Install	38	Ft
450E4759	18" CMP 16 Gauge, Furnish	10	Ft
450E4760	18" CMP, Install	10	Ft
450E5010	18" CMP Elbow, Furnish	2	Each
450E5011	18" CMP Elbow, Install	2	Each
629E0100	3 Cable Guardrail	295	Ft
629E0200	Reset 3 Cable Guardrail	25	Ft
629E0300	3 Cable Guardrail Slip Base Anchor Assembly	1	Each
629E0400	3 Cable Guardrail Anchor Assembly	1	Each
630E0110	Straight Double Class A Thrie Beam Guardrail with Wood Posts	25.0	Ft
630E1010	Straight Class A W Beam Guardrail with Wood Posts	87.5	Ft
630E2000	W Beam to Thrie Beam Guardrail Transition	2	Each
630E2020	W Beam Guardrail Tangent End Terminal	1	Each
630E2030	W Beam Guardrail Breakaway Cable Terminal	1	Each
630E2110	Beam Guardrail Post and Block	24	Each
630E5130	Reset Double Thrie Beam Rail	25.0	Ft
630E5160	Reset W Beam Rail	50.0	Ft
630E5200	Reset W Beam to Thrie Beam Transition Rail	2	Each
632E2220	Guardrail Delineator	11	Each
632E2520	Type 2 Object Marker	1	Each
634E0010	Flagging	80.0	Hour
634E0110	Traffic Control Signs	234	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0280	Type 3 Barricade, 8' Single Sided	1	Each
634E0420	Type C Advance Warning Arrow Board	1	Each
634E0640	Temporary Pavement Marking	4,100	Ft
670E3000	1.5' x 3' Type D Drop Inlet	2	Each

## NH 0050(123)390 – PCN 05HE (CONTINUED)

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
670E5400	Precast Drop Inlet Collar	2	Each
670E7000	Reset Drop Inlet Frame and Grate Assembly	2	Each
734E0010	Erosion Control	Lump Sum	LS

## Structure 68-180-200

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E0010	Remove Concrete Bridge Approach Slab	163.1	SqYd
410E2600	Membrane Sealant Expansion Joint	125.6	Ft
430E0300	Granular Bridge End Backfill	13.0	CuYd
460E0070	Class A45 Concrete, Bridge Repair	1.1	CuYd
460E0150	Concrete Approach Slab for Bridge	107.6	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	33.8	SqYd
460E0300	Breakout Structural Concrete	1.2	CuYd
480E0200	Epoxy Coated Reinforcing Steel	130	Lb
480E0504	No. 4 Rebar Splice	16	Each
480E0505	No. 5 Rebar Splice	27	Each
480E0506	No. 6 Rebar Splice	25	Each
480E5000	Galvanic Anode	20	Each

### **SPECIFICATIONS**

Standard Specifications for Roads and Bridges, 2015 Edition and Required Provisions, Supplemental Specifications and Special Provisions as included in the Proposal.

# ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0050(123)390	3	56

## ENVIRONMENTAL COMMITMENTS

An Environmental Commitment is a measure that SDDOT commits to implement in order to avoid, minimize, and/or mitigate a real or potential environmental impact. Environmental commitments to various agencies and the public have been made to secure approval of this project. An agency mentioned below with permitting authority can influence a project if perceived environmental impacts have not been adequately addressed. Unless otherwise designated, the Contractor's primary contact regarding matters associated with these commitments will be the Project Engineer. These environmental commitments are not subject to change without prior written approval from the SDDOT Environmental Office. The environmental commitments associated with this project are as follows:

### COMMITMENT B: FEDERALLY THREATENED, ENDANGERED, AND PROTECTED SPECIES

#### COMMITMENT B2: WHOOPING CRANE

The Whooping Crane is a spring and fall migratory bird in South Dakota that is about 5 feet tall and typically stops on wetlands, rivers, and agricultural lands along their migration route. An adult Whooping Crane is white with a red crown and a long, dark, pointed bill. Immature Whooping Cranes are cinnamon brown. While in flight, their long necks are kept straight and their long dark legs trail behind. Adult Whooping Cranes' black wing tips are visible during flight.

#### Action Taken/Required:

Harassment or other measures to cause the Whooping Crane to leave the site is a violation of the Endangered Species Act. If a Whooping Crane is sighted roosting in the vicinity of the project, borrow pit, or staging site associated with the project, cease construction activities in the affected area until the Whooping Crane departs and contact the Project Engineer. The Project Engineer will contact the Environmental Office so that the sighting can be reported to USFWS.

#### COMMITMENT B4: BALD EAGLE

Bald eagles are known to occur in this area.

#### Action Taken/Required:

If a nest is observed within one mile of the project site, notify the Project Engineer immediately so that he/she can consult with the Environmental Office for an appropriate course of action.

#### COMMITMENT E: STORM WATER

Construction activities constitute less than 1 acre of disturbance.

#### Action Taken/Required:

At a minimum and regardless of project size, appropriate erosion and sediment control measures must be installed to control the discharge of pollutants from the construction site.

## COMMITMENT H: WASTE DISPOSAL SITE

The Contractor shall furnish a site(s) for the disposal of construction and/or demolition debris generated by this project.

#### Action Taken/Required:

Construction and/or demolition debris may not be disposed of within the State ROW.

The waste disposal site(s) shall be managed and reclaimed in accordance with the following from the General Permit for Highway, Road, and Railway Construction/Demolition Debris Disposal Under the South Dakota Waste Management Program issued by the Department of Environment and Natural Resources.

The waste disposal site(s) shall not be located in a wetland, within 200 feet of surface water, or in an area that adversely affects wildlife, recreation, aesthetic value of an area, or any threatened or endangered species, as approved by the Project Engineer.

If the waste disposal site(s) is located such that it is within view of any ROW, the following additional requirements shall apply:

1. Construction and/or demolition debris consisting of concrete, asphalt concrete, or other similar materials shall be buried in a trench completely separate from wood debris. The final cover over the construction and/or demolition debris shall consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the State ROW shall be seeded in accordance with Natural Resources Conservation Service recommendations. The seeding recommendations may be obtained through the appropriate County NRCS Office. The Contractor shall control the access to waste disposal sites not within the State ROW through the use of fences, gates, and placement of a sign or signs at the entrance to the site stating "No Dumping Allowed".
2. Concrete and asphalt concrete debris may be stockpiled within view of the ROW for a period of time not to exceed the duration of the project. Prior to project completion, the waste shall be removed from view of the ROW or buried and the waste disposal site reclaimed as noted above.

The above requirements will not apply to waste disposal sites that are covered by an individual solid waste permit as specified in SDCL 34A-6-58, SDCL 34A-6-1.13, and ARSD 74:27:10:06.

Failure to comply with the requirements stated above may result in civil penalties in accordance with South Dakota Solid Waste Law, SDCL 34A-6-1.31.

All costs associated with furnishing waste disposal site(s), disposing of waste, maintaining control of access (fence, gates, and signs), and reclamation of the waste disposal site(s) shall be incidental to the various contract items.

## COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES

The SDDOT has obtained concurrence with the State Historical Preservation Office (SHPO or THPO) for all work included within the project limits and all designated option borrow sites provided within the plans.

#### Action Taken/Required:

All earth disturbing activities not designated within the plans require review of cultural resources impacts. This work includes, but is not limited to: staging areas, borrow sites, waste disposal sites, and all material processing sites.

The Contractor shall arrange and pay for a cultural resource survey and/or records search. The Contractor has the option to contact the state Archaeological Research Center (ARC) at 605-394-1936 or another qualified archaeologist, to obtain either a records search or a cultural resources survey. A record search might be sufficient for review; however, a cultural resources survey may need to be conducted by a qualified archaeologist.

The Contractor shall provide ARC with the following: a topographical map or aerial view on which the site is clearly outlined, site dimensions, project number, and PCN. If applicable, provide evidence that the site has been previously disturbed by farming, mining, or construction activities with a landowner statement that artifacts have not been found on the site.

The Contractor shall submit the records search or cultural resources survey report and if the location of the site is within the current geographical or historic boundaries of any South Dakota reservation to SDDOT Environmental Engineer, 700 East Broadway Avenue, Pierre, SD 57501-2586 (605-773-3180). SDDOT will submit the information to the appropriate SHPO/THPO. Allow **30 Days** from the date this information is submitted to the Environmental Engineer for SHPO/THPO review.

If evidence for cultural resources is uncovered during project construction activities, then such activities shall cease and the Project Engineer shall be immediately notified. The Project Engineer will contact the SDDOT Environmental Engineer in order to determine an appropriate course of action.

SHPO/THPO review does not relieve the Contractor of the responsibility for obtaining any additional permits and clearances for staging areas, borrow sites, waste disposal sites, or material processing sites that affect wetlands, threatened and endangered species, or waterways. The Contractor shall provide the required permits and clearances to the Project Engineer at the preconstruction meeting.

**TABLE FOR REMOVAL AND INSTALLATION OF GUARDRAIL AND RELATED ITEMS**

LOCATION	REMOVE 3 CABLE GUARDRAIL FOR RESET	REMOVE DOUBLE THRIE BEAM GUARDRAIL FOR RESET (CLASS A)	REMOVE W BEAM GUARDRAIL FOR RESET (CLASS A)	REMOVE W BEAM TO THRIE BEAM GUARDRAIL TRANSITION FOR RESET	CONTRACTOR FURNISHED BORROW EXCAVATION	GRAVEL SURFACING	3 CABLE GUARDRAIL	RESET 3 CABLE GUARDRAIL	3 CABLE GUARDRAIL SLIP BASE ANCHOR ASSEMBLY	3 CABLE GUARDRAIL ANCHOR ASSEMBLY	STRAIGHT DOUBLE CLASS A THRIE BEAM GUARDRAIL WITH WOOD POSTS	STRAIGHT CLASS A W BEAM GUARDRAIL WITH WOOD POSTS	W BEAM TO THRIE BEAM GUARDRAIL TRANSITION	W BEAM GUARDRAIL TANGENT END TERMINAL	W BEAM GUARDRAIL BREAKAWAY CABLE TERMINAL	W BEAM GUARDRAIL POST AND BLOCK	THRIE BEAM GUARDRAIL POST AND BLOCK	RESET DOUBLE THRIE BEAM RAIL (CLASS A)	RESET W BEAM RAIL (CLASS A)	RESET W BEAM TO THRIE BEAM RAIL	
	Ft	Ft	Ft	Each	CuYd	Ton	Ft	Ft	Each	Each	Ft	Ft	Each	Each	Each	Each	Each	Each	Ft	Ft	Each
<b>BRIDGE CORNER</b>																					
<b>STR.NO. 68-180-200</b>																					
<b>MRM 390.05 EBL</b>																					
Northwest Corner	25	12.5	25	1	-	-	-	25	-	-	-	-	-	-	-	3	9	12.5	25	1	
Southwest Corner	-	12.5	25	1	-	-	-	-	-	-	-	-	-	-	-	3	9	12.5	25	1	
Northeast Corner	-	-	-	-	125	57*	295	-	1	1	12.5	62.5	1	-	1	-	-	-	-	-	
Southeast Corner	-	-	-	-	45	27*	-	-	-	-	12.5	25	1	1	-	-	-	-	-	-	
<b>TOTALS:</b>	<b>25</b>	<b>25</b>	<b>50</b>	<b>2</b>	<b>170</b>	<b>84</b>	<b>295</b>	<b>25</b>	<b>1</b>	<b>1</b>	<b>25</b>	<b>87.5</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>6</b>	<b>18</b>	<b>25</b>	<b>50</b>	<b>2</b>	

\*Tonnage shown above for Gravel Surfacing is based on a compacted depth of 6 inches.

**TABLE OF GUARDRAIL DELINEATORS & OBJECT MARKERS**

LOCATION	TYPE 2 OBJECT MARKER BACK TO BACK	TYPE 2 OBJECT MARKER	GUARDRAIL TERMINAL END OBJECT MARKER (ADHESIVE)	GUARDRAIL DELINEATOR			
				BEAM		CABLE	
				Yellow	White	Yellow	White
<b>BRIDGE CORNER</b>	<b>LANE-SHOULDER</b>	(M) #	(M) #	(E) #	(B) #	(C) #	
<b>STR.NO. 68-180-200</b>							
<b>MRM 390.05 EBL</b>							
Northeast Corner	EBL Median		1	1	2	5	
Southeast Corner	EBL Outside			1	4		
<b>TOTALS</b>			<b>1</b>	<b>2</b>	<b>2</b>	<b>5</b>	<b>-</b>
				<b>11</b>			

# - For KEY, Refer to Standard Plate 632.40 - Sheet 1 of 4.

N.A.B.I. = Not A Bid Item - Cost is incidental to the contract unit prices for the various items.

### UTILITIES

The Contractor shall contact the involved utility companies through South Dakota One Call (1-800-781-7474) prior to starting work. It shall be the responsibility of the Contractor to coordinate work with the utility owners to avoid damage to existing facilities.

Utilities are not planned to be affected on this project. If utilities are identified near the improvement area, the Contractor shall contact the Project Engineer to determine modifications that will be necessary to avoid utility impacts.

### EXISTING NRC PAVEMENT

The existing pavement is 9" x 26' Nonreinforced PCC Pavement.

Existing contraction joints are spaced at approximately 15'. Longitudinal joints are reinforced with No. 5 x 30" deformed tie bars spaced 48" center to center. Transverse joints are reinforced with 1¼" x 18" plain round dowel bars spaced 12" center to center.

The aggregate in the existing NRC Pavement is quartzite.

### RESTORATION OF GRAVEL CUSHION

An inspection of the gravel cushion subgrade shall be made after removing concrete from each pavement replacement area. Areas of excess moisture shall be dried to the satisfaction of the Engineer. Loose material shall be removed. Each replacement area shall be leveled and compacted to the satisfaction of the Engineer.

If additional gravel cushion material is required, the Contractor shall furnish, place and compact gravel cushion to the satisfaction of the Engineer at no additional cost to the State.

Cost for this work shall be incidental to the contract unit price per square yard for 9" Nonreinforced PCC Pavement.

### GRAVEL CUSHION

If quarried ledge rock is used in the Gravel Cushion, a maximum blend of 40% quarried ledge rock will be allowed.

### 9" NONREINFORCED PCC PAVEMENT

The aggregate may require screening as determined by the Engineer.

Fine aggregate shall conform to Section 800.2.D Alkali Silica Reactivity (ASR) Requirements of the Specifications.

The concrete mix shall be A45 according to section 460.

In lieu of an automatic subgrader operating from a preset line, a motor grader or other suitable equipment may be used to trim the gravel cushion to final grade prior to placement of concrete. There will be no direct payment for trimming of the gravel cushion for PCC pavement. The trimming will be considered incidental to the related items required for PCC Pavement.

Automatic dowel bar inserters will not be allowed on this project.

A construction joint will be sawed whenever new concrete pavement is placed adjacent to existing concrete pavement.

### 9" NONREINFORCED PCC PAVEMENT (CONTINUED)

The transverse contraction joints shall be perpendicular to the centerline as detailed in the standard plates 380.01 and 380.08. In multilane areas the transverse contraction joints shall be perpendicular to the centerline and be in a straight line across the width of the pavement. In special situations the Engineer may pre-approve transverse contraction joints that do not meet these requirements. All nonconforming transverse contraction joints that are not pre-approved shall be removed at the Contractor's expense. Any method of placement that cannot produce these requirements shall not be allowed to continue.

In addition to traditional field inspection of reinforcement, a Ground Penetrating Radar (GPR) unit may be used to verify reinforcement locations in the hardened concrete. The GPR may be used anytime prior to the Acceptance of Field Work being issued. All costs related to corrective measures, including but not limited to concrete removal or cutting of reinforcement, price deducts, and delays to the project schedule shall be the responsibility of the Contractor.

The surface of the mainline paving shall be longitudinally tined. All other areas shall be tined as directed by the Engineer. The surface of the mainline paving shall be tined to within 2 or 3 feet of the face of the curb. A self-propelled mechanical tiner will not be required.

### TIE BARS AND LONGITUDINAL JOINTS

The use of automatic tie bar inserters will only be allowed on the vertical edge of longitudinal construction joints. The use of automatic tie bar inserters will not be allowed on sawed longitudinal joints.

Tie bars shall be held in the specified position parallel to the slab surface and perpendicular to the centerline by a supporting device. Tie bars or tie bar baskets shall be securely staked to the roadbed and shall hold the bar at the correct spacing, alignment, and elevation.

Tie bars will not require supports if inserted into the side of the pavement during slip form paving of the longitudinal construction joint operation. Failure to acquire the correct tie bar locations or position in the construction joint shall require the bars to be corrected and a change made to the operation which may include drilling and epoxy bars or other methods as approved by the engineer.

The final position of each tie bar shall be within the following tolerances:

- Vertical Placement:  $\pm T/6$  for any part of the tie bar (T = slab thickness)
- Transverse Placement (side shift):  $\pm 3$  inches when measured perpendicular to the longitudinal joint line

If the tie bar does not meet the requirements and tolerances specified, corrective action shall be performed at the Contractor's expense to the satisfaction of the engineer.

### STEEL BAR INSERTION

Locations and quantities of concrete replacement are subject to change in the field at the discretion of the Engineer. The Contractor will be responsible for ordering the actual quantity of steel bars necessary to complete the work.

The Contractor shall insert the steel bars (1¼" x 18" epoxy coated plain round dowel bars and No. 9 x 18" epoxy coated deformed tie bars for transverse joints and No. 5 x 24" epoxy coated deformed tie bars for longitudinal joints) into drilled holes in the existing concrete pavement. An epoxy resin adhesive must be used to anchor the steel bar in the drilled hole.

Plain round dowel bars shall be cut to the specified length by sawing and shall be free from burring or other deformations. Shearing will not be permitted.

Steel bars shall be inserted in the transverse joint on 18" centers. The first steel bar in the transverse joint shall be placed 9" from the edge of the slab closest to centerline. Steel bars shall be inserted in the longitudinal joint on 30" centers and shall be a minimum of 15" from either transverse joint. A typical one-lane patch 12' wide and 6' long will require 18 steel bars (8 in each transverse joint and 2 in the longitudinal joint). It will be necessary to laterally adjust the location of some of the inserted steel bars when the dimensions above interfere with existing steel bar locations.

A rigid frame or mechanical device will be required to guide the drill to ensure proper horizontal and vertical alignment of the steel bars in the drilled holes.

The epoxy used to hold the steel bars in the drilled holes shall start to gel before placing fresh concrete as per manufacturer's recommendations.

Cost for the epoxy resin adhesive, steel bars, drilling of holes, inserting the steel bars into the drilled holes and all other items incidental to the insertion of the steel bars shall be included in the contract unit price per each for Insert Steel Bar in PCC Pavement.

**SAW AND SEAL JOINTS**

All longitudinal and transverse joints at concrete replacement areas shall be sawed and sealed.

Joints shall not be sealed unless they are thoroughly clean and dry. Cleaning shall be accomplished by sand blasting and other tools as necessary. Just prior to sealing, each joint shall be blown out using a jet of compressed air to remove all traces of dust.

Longitudinal and Transverse joints may be sealed with either Hot Poured Elastic Joint Sealer or Low Modulus Silicone Sealant.

Acceptance of the Low Modulus Silicone Sealant and Hot Poured Elastic Joint Sealer will be based on visual inspection by the Engineer.

Cost for sawing and sealing of the longitudinal construction joint and transverse joints shall be incidental to the contract unit price per square yard for 9" Nonreinforced PCC Pavement.

**DROP INLET REMOVAL AND INSTALLATION**

Existing drop inlets at structures shown in the table below shall be removed. The existing cast iron frames and grates shall be salvaged for reset.

The void left after the removal of the drop inlets shall be backfilled to the satisfaction of the Engineer. Cost for performing such work shall be incidental to the contract unit prices for the various items.

Existing frames or grates which are broken or cracked through carelessness of the Contractor's forces shall be replaced with new frames and/or grates at the Contractor's expense.

Type D Drop Inlets shall be installed at the locations detailed in these plans.

The salvaged cast iron frames and grates shall be reset on new drop inlet collars. The elevations of the frame and grate shall be flush with the top of the finished concrete approach slab.

Payment for resetting the cast iron frame and grate will be at the contract unit price per each for Reset Drop Inlet Frame and Grate Assembly. Payment for the drop inlet collar will be at the contract unit price per each for Precast Drop Inlet Collar.

Payment for drop inlets will be at the contract unit price per each for 1.5' x 3' Type D Drop Inlet. Depth from top of wall to top of floor is 3'-6". The following quantities for drop inlets are estimated for informational purposes:

STR.NO. LOCATION	REMOVE DROP INLET	CLASS M6 CONCRETE	REINF. STEEL	CONC. COLLAR
	EACH	CuYd	LBS	EACH
<b>68-180-200</b>				
NW Bridge Corner	1	0.9	105	1
SW Bridge Corner	1	0.9	105	1

**PERMANENT SEEDING AND MULCHING**

The areas to be seeded and mulched include all disturbed areas within the right-of-way resulting from the work required by this contract.

Type C Permanent Seed Mixture shall consist of the following:

Grass Species	Variety	Pure Live Seed (PLS) (Pounds/Acre)
Western Wheatgrass	Arriba, Flintlock, Rodan, Rosana	16
Canada Wildrye	Mandan	2
Total:		18

The areas to be seeded and mulched are estimated at 0.3 acre.

Cost for seeding and mulching shall be incidental to the contract lump sum price for Erosion Control.

**MYCORRHIZAL INOCULUM**

Mycorrhizal inoculum shall consist of mycorrhizal fungi spores and mycorrhizal fungi-infected root fragments in a solid carrier. The carrier may include organic materials, calcinated clay, or other materials consistent with application and good plant growth. The supplier shall provide certification of the fungal species claimed and the live propagule count. The inoculum shall include the following fungal species:

- Glomus intraradices* 25%
- Glomus aggregatu* 25%
- Glomus mosseae* 25%
- Glomus etunicatum* 25%

All seed shall be inoculated by the seed supplier with a minimum of 100,000 live propagules of mycorrhizal fungi per acre. All costs of inoculating the seed shall be incidental to the contract lump sum price for Erosion Control.

The mycorrhizal inoculum shall be as shown below or an approved equal:

<u>Product</u>	<u>Manufacturer</u>
MycApply	Mycorrhizal Applications, Inc. Grants Pass, OR Phone: 1-866-476-7800 <a href="http://www.mycorrhizae.com/">http://www.mycorrhizae.com/</a>

### MAINTENANCE OF TRAFFIC

Unless otherwise stated in these plans, no work will be allowed during hours of darkness.

Removing, relocating, covering, salvaging and resetting of existing traffic control devices, including delineation, shall be the responsibility of the Contractor. Cost for this work shall be incidental to the contract unit prices for the various items unless otherwise specified in the plans. Any delineators and signs damaged or lost shall be replaced by the Contractor at no cost to the State.

Indiscriminate driving and parking of vehicles within the right-of-way will not be permitted. Any damage to the vegetation, surfacing, embankment, delineators and existing signs resulting from such indiscriminate use shall be repaired and/or restored by the Contractor, at no expense to the State, and to the satisfaction of the Engineer.

The Contractor shall provide sign post installation crashworthiness details at the preconstruction meeting for all steel post breakaway sign support assemblies.

Construction signing that remains in the same location for more than 3 days shall be mounted on fixed location, ground mounted, breakaway supports.

The W3-5 SPEED LIMIT 45 AHEAD and R2-1 SPEED LIMIT 45 speed reduction signs shall only be displayed when workers are present. The signs shall be removed or covered when work is not occurring.

A minimum 16 ft travel lane width shall be maintained at all times.

### PAVEMENT MARKING

Raised pavement markers shall be used in the lane tapers and temporary pavement markings. Raised pavement markers shall be attached to the roadway surface with a flexible non-permanent bituminous adhesive, or with another adhesive as approved by the Engineer, capable of being removed from the roadway surface.

The Contractor shall use equipment that is not damaging to the roadway surface when removing the raised pavement markers, as approved by the Engineer.

Cost for temporary raised pavement markers shall be included in the contract unit price per foot for Temporary Pavement Marking. Cost for removal of raised pavement markers shall be incidental to the contract unit price per mile for Temporary Pavement Marking.

The State will provide permanent pavement marking upon project completion. The Contractor shall notify the State a minimum 2 weeks prior to project completion to allow the State time to schedule the work.

### ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

SIGN CODE	SIGN DESCRIPTION	EXPRESSWAY / INTERSTATE			
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R2-1	SPEED LIMIT 45	2	36" x 48"	12	24
R2-1	SPEED LIMIT 55	2	36" x 48"	12	24
R2-1	SPEED LIMIT 70	1	36" x 48"	12	12
R2-6aP	FINES DOUBLE (plaque)	1	36" x 24"	6	6
W3-5	SPEED REDUCTION AHEAD (45 MPH)	1	48" x 48"	16	16
W3-5	SPEED REDUCTION AHEAD (55 MPH)	2	48" x 48"	16	32
W4-2	LEFT or RIGHT LANE ENDS (symbol)	2	48" x 48"	16	32
W20-1	ROAD WORK AHEAD	2	48" x 48"	16	32
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	16	32
W20-7	FLAGGER (symbol)	1	48" x 48"	16	16
G20-2	END ROAD WORK	1	48" x 24"	8	8
<b>EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS SQFT</b>					<b>234</b>

#### TYPE 3 BARRICADES

ITEM DESCRIPTION	QUANTITY
Type 3 Barricade, 8' Single Sided	1 Each

#### ARROW BOARDS

ITEM DESCRIPTION	QUANTITY
Type C Arrow Board	1 Each

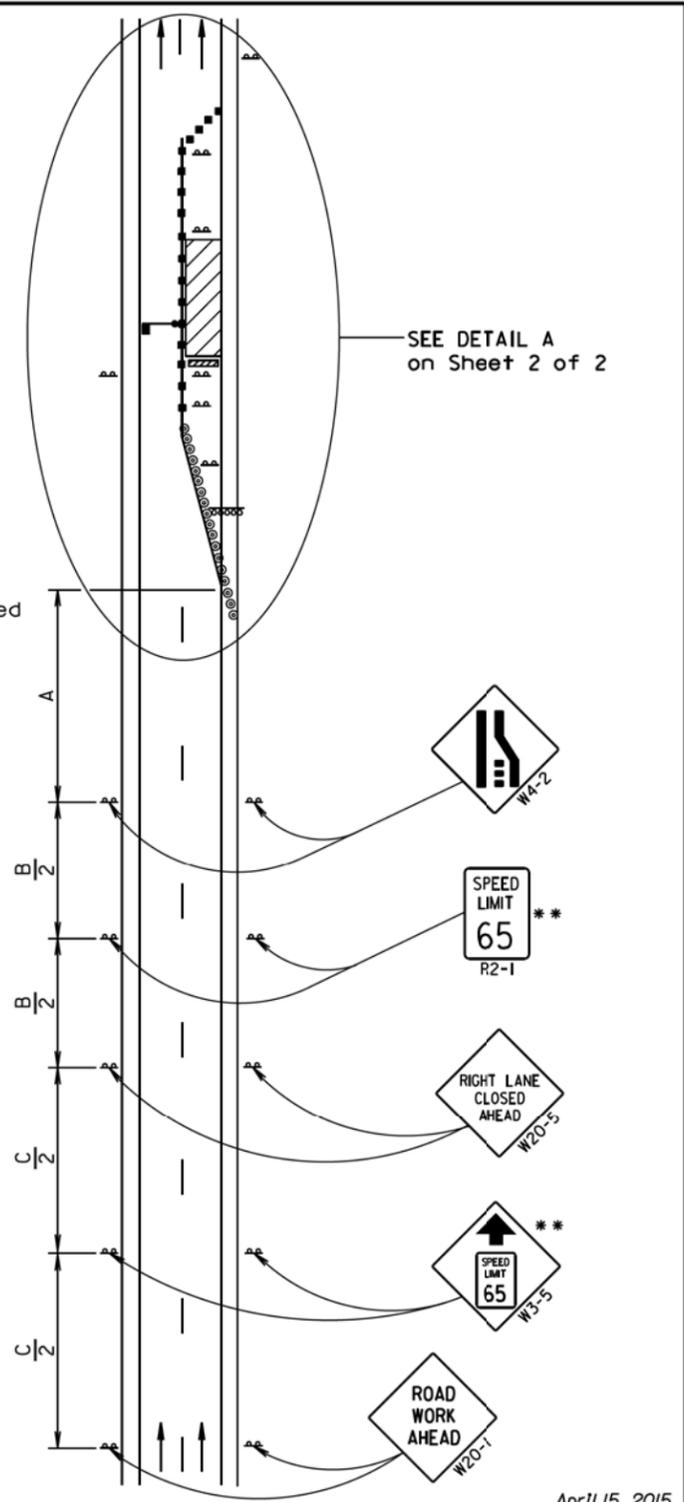
Plotting Date: mmm-ddd-yyy

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet)		
	(A)	(B)	(C)
0 - 30	200		
35 - 40	350		
45 - 50	500		
55	750		
60 - 65	1000		
	(A)	(B)	(C)
70 - 80	1000	1500	2640

- \*\* Speed appropriate for location.
- Reflectorized Drum
- Channelizing Device

ROAD WORK AHEAD sign is only required in advance of the first lane closure.

High speed is defined as having a posted speed limit greater than 45 mph.



April 15, 2015

<b>S D D O T</b>	<b>WORK ZONE SPEED REDUCTION FOR INTERSTATE AND HIGH SPEED MULTI-LANE HIGHWAYS</b>	PLATE NUMBER <b>634.63</b>
	<i>Published Date: 3rd Qtr. 2015</i>	Sheet 1 of 2

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet) (G)	Taper Length (Feet) (L)
0 - 30	25	180
35 - 40	25	320
45 - 50	50 *	600
55	50 *	660
60 - 65	50 *	780
70 - 80	50 *	960

- \* Spacing is 40' for 42" cones.
- \*\* Speed appropriate for location.
- \*\*\* Use speed limit designated for the condition when workers are present in the work space. Signs shall be covered or removed when workers are not present.

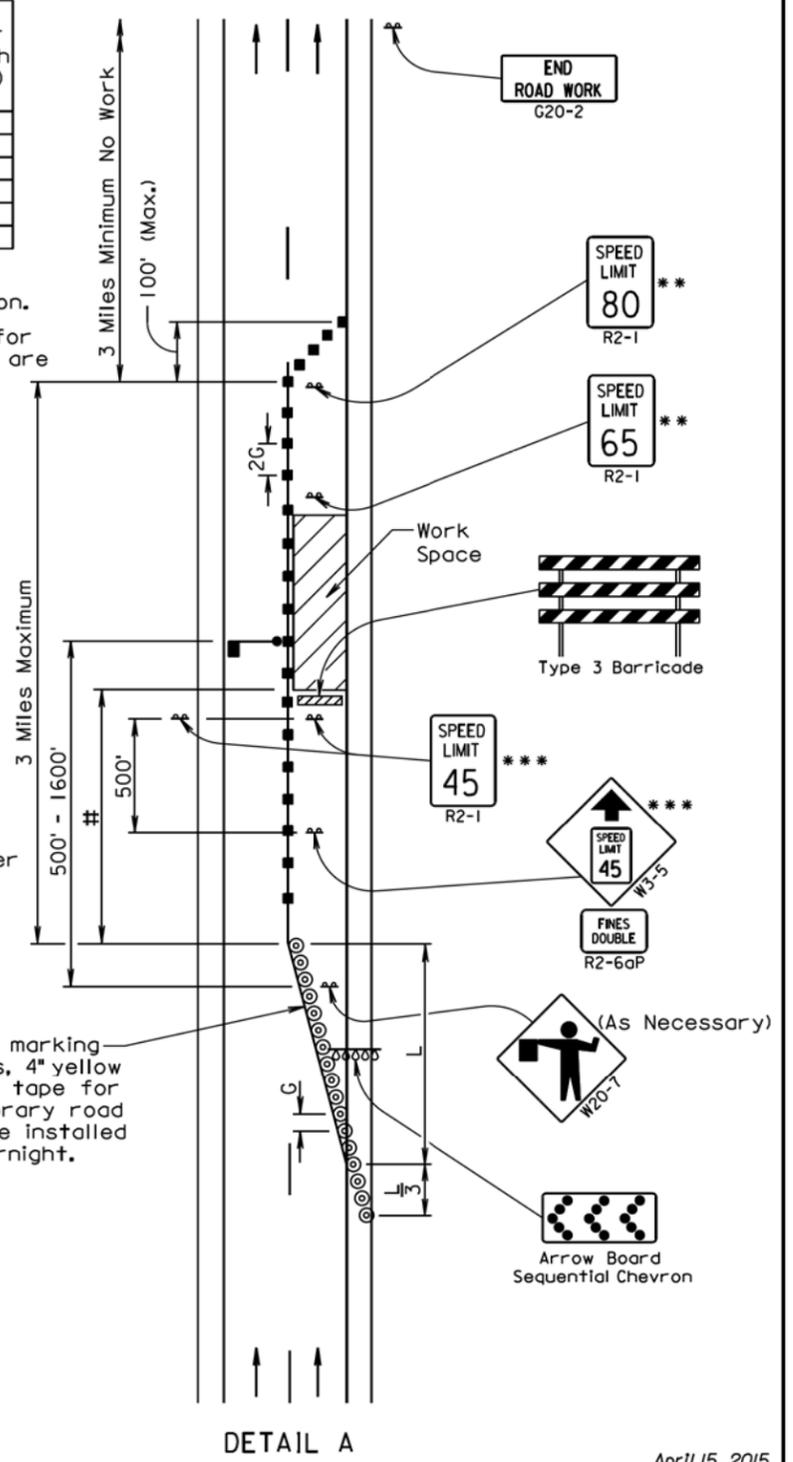
- Flagger (As Necessary)
- Reflectorized Drum
- Channelizing Device
- # The Work Space shall be a minimum of 500' from the end of the taper.

The FLAGGER sign shall be used whenever there is a Flagger present.

The channelizing devices shall be 42" cones or drums.

42" cones may be used in place of the drums shown in the taper if setup will not be used during night time hours.

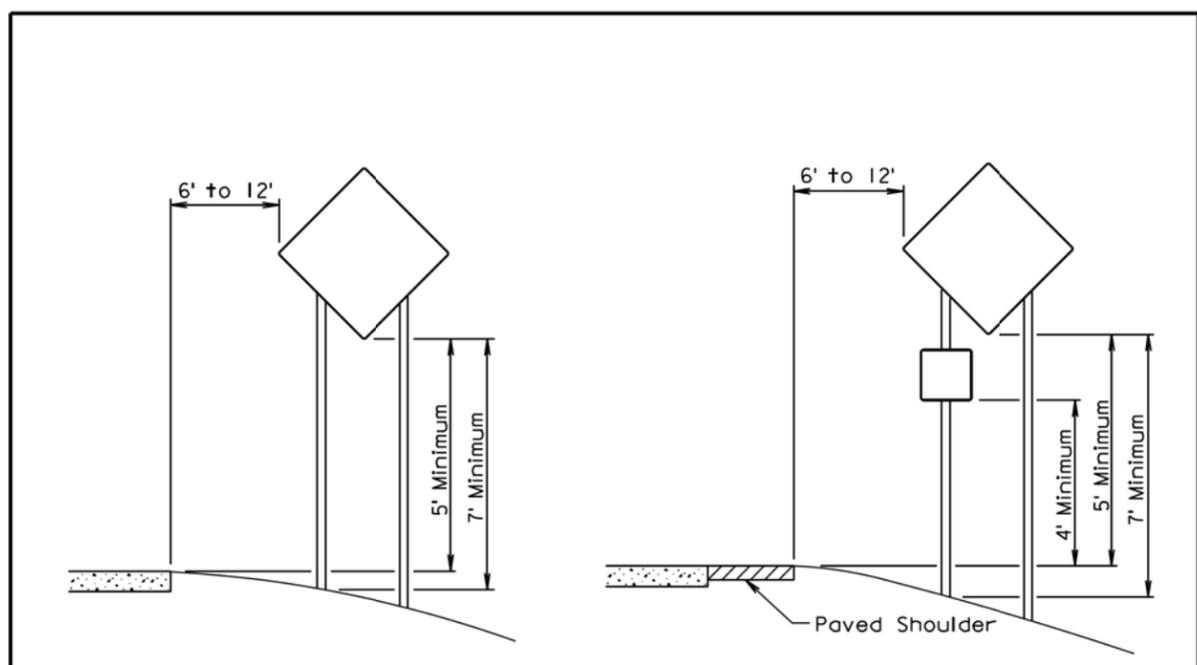
4" white temporary pavement marking tape for right lane closures, 4" yellow temporary pavement marking tape for left lane closures, or temporary road markers at 5' spacing shall be installed when the lane is closed overnight.



April 15, 2015

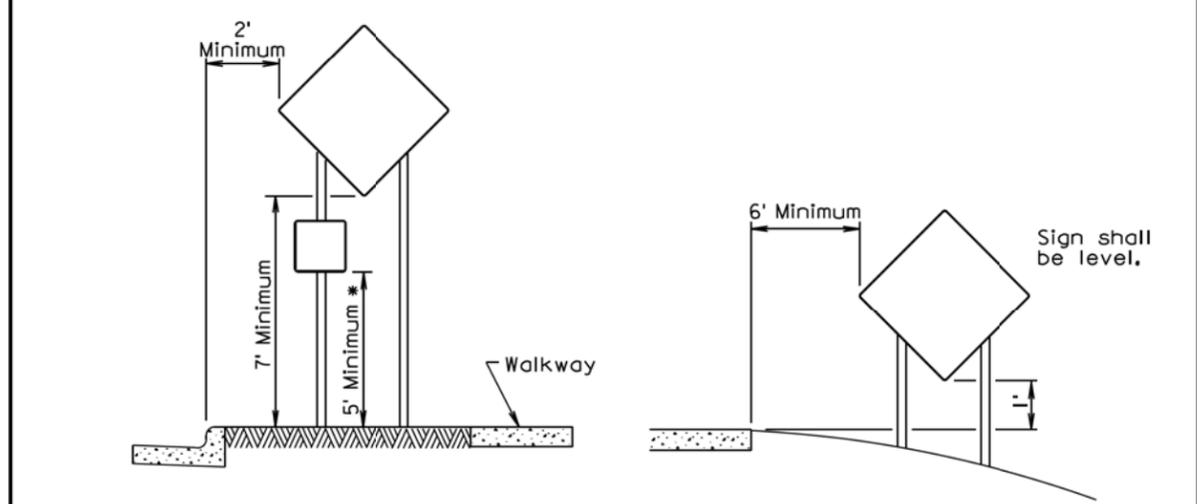
<b>S D D O T</b>	<b>WORK ZONE SPEED REDUCTION FOR INTERSTATE AND HIGH SPEED MULTI-LANE HIGHWAYS</b>	PLATE NUMBER <b>634.63</b>
	<i>Published Date: 3rd Qtr. 2015</i>	Sheet 2 of 2

Plot Scale - \$\$\$scale\$\$\$  
Plotted From - \$\$\$username\$\$\$



RURAL DISTRICT

RURAL DISTRICT WITH SUPPLEMENTAL PLATE



URBAN DISTRICT

RURAL DISTRICT 3 DAY MAXIMUM

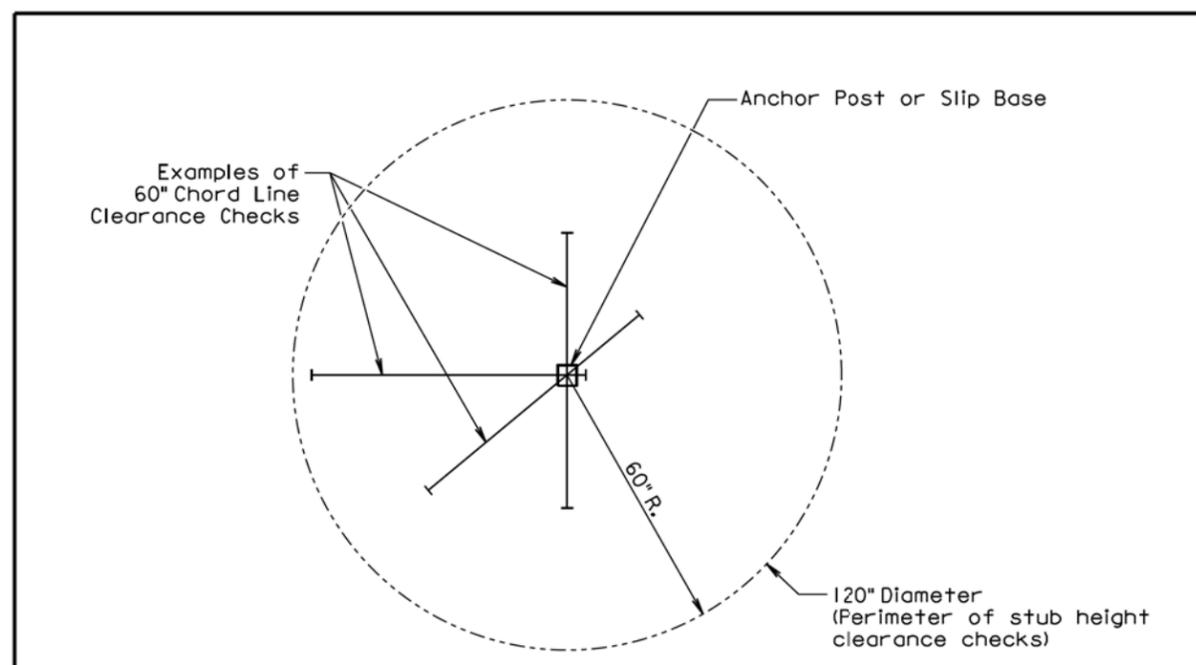
\* If the bottom of supplemental plate is mounted lower than 7 feet above a pedestrian walkway, the supplemental plate should not project more than 4" into the pedestrian facility.

(Not applicable to regulatory signs)

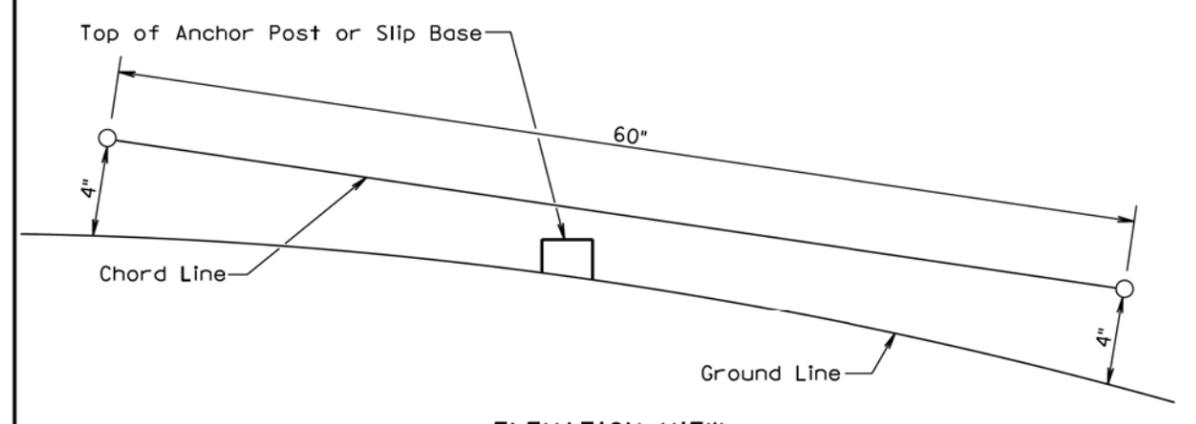
September 22, 2014

<b>S D D O T</b>	<b>CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)</b>	PLATE NUMBER <b>634.85</b>
		Sheet 1 of 1

Published Date: 3rd Qtr. 2015



PLAN VIEW  
(Examples of stub height clearance checks)



ELEVATION VIEW

**GENERAL NOTES:**

The top of anchor posts and slip bases SHALL NOT extend above a 60" chord line within a 120" diameter circle around the post with ends 4" above the ground.

At locations where there is curb and gutter adjacent to the breakaway sign support, the stub height shall be a maximum of 4" above the ground line at the localized area adjacent to the breakaway support stub.

The 4" stub height clearance is not necessary for U-channel lap splices where the support is designed to yield (bend) at the base.

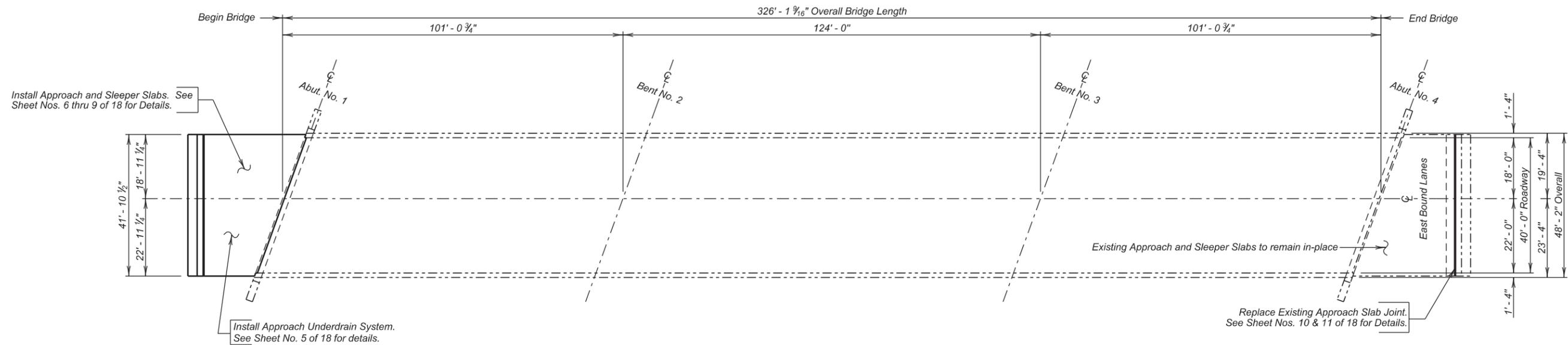
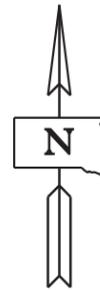
July 1, 2005

<b>S D D O T</b>	<b>BREAKAWAY SUPPORT STUB CLEARANCE</b>	PLATE NUMBER <b>634.99</b>
		Sheet 1 of 1

Published Date: 3rd Qtr. 2015

File - \$\$\$filename\$\$\$

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0050(123)390	10	56



**PLAN**

**INDEX OF BRIDGE SHEETS**

- Sheet No. 1 - Layout for Upgrading
- Sheet No. 2 - Estimate of Structure Quantities and Notes
- Sheet No. 3 - Notes (Continued)
- Sheet No. 4 - Notes (Continued)
- Sheet No. 5 - Approach Slab Underdrain Details
- Sheet No. 6 - Approach Slab Layout at Abutment No. 1
- Sheet No. 7 - Approach Slab Details at Abutment No. 1
- Sheet No. 8 - Approach Slab Details at Abutment No. 1 (Continued)
- Sheet No. 9 - Approach Slab Joint Details at Abutment No. 1
- Sheet No. 10 - Details of Approach Slab Joint Replacement Adjacent to Abutment No. 4
- Sheet No. 11 - Membrane Sealant Expansion Joint at Abutment No. 4
- Sheet Nos. 12 - 18 - Original Construction Plans

**LAYOUT FOR UPGRADING**

FOR  
**326' - 1 9/16" CONTINUOUS COMP. GIRDER BRIDGE**  
 40' - 0" ROADWAY  
 OVER JAMES RIVER  
 STR. NO. 68-180-200  
 PCN 05HE

25° SKEW L.H.F.  
 SEC. 12/13-T93N-R55W  
 P 0050(123)390

YANKTON COUNTY  
 S. D. DEPT. OF TRANSPORTATION

JUNE 2015

DESIGNED BY NP YANK05HE	CK. DES. BY EJA 05HERA01	DRAFTED BY NP	<i>Kevin N. Coeden</i> BRIDGE ENGINEER
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## ESTIMATE OF STRUCTURE QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
110E0010	Remove Concrete Bridge Approach Slab	163.1	SqYd
410E2600	Membrane Sealant Expansion Joint	125.6	Ft
430E0300	Granular Bridge End Backfill	13.0	CuYd
460E0070	Class A45 Concrete, Bridge Repair	1.1	CuYd
460E0150	Concrete Approach Slab for Bridge	107.6	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	33.8	SqYd
460E0300	Breakout Structural Concrete	1.2	CuYd
480E0200	Epoxy Coated Reinforcing Steel	130	Lb
480E0504	No. 4 Rebar Splice	16	Each
480E0505	No. 5 Rebar Splice	27	Each
480E0506	No. 6 Rebar Splice	25	Each
480E5000	Galvanic Anode	20	Each

### SPECIFICATIONS

- Design Specifications: AASHTO Standard Specifications for Highway Bridges 17th Edition using Working Stress Design.
- Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, 2015 Edition and Required Provisions, Supplemental Specifications and Special Provisions as included in the Proposal.

### DETAILS AND DIMENSIONS OF EXISTING BRIDGE

All details and dimensions of the existing bridge, contained in these plans, are based on the original construction plans and shop plans and are provided as information only. It is the Contractor's responsibility to inspect and verify the actual field conditions and any necessary as-built dimensions affecting the satisfactory completion of the work required for this project.

### SCOPE OF BRIDGE WORK & SEQUENCE OF OPERATIONS

All work on this structure shall be accomplished with the traffic control shown in the plans. Alternate sequence of operations may be submitted by the Contractor for approval by the Engineer a minimum of two weeks prior to the pre-construction meeting.

- Breakout and remove the existing double approach and sleeper slabs at Abutment No. 1 for the first phase of construction.
- Breakout and remove the existing strip seal joint at Abutment No. 4 for the first phase of construction.
- Install the bridge end backfill, sleeper slabs, and approach slabs at Abutment No. 1 for the first phase of construction.
- Install the membrane sealant joint at Abutment No. 4 for the first phase of construction.
- Switch traffic and repeat steps 1 thru 4 for the second phase of construction.

### GENERAL CONSTRUCTION - BRIDGE

- All mild reinforcing steel shall conform to ASTM A615, Grade 60.
- All exposed concrete corners and edges shall be chamfered 3/4" unless noted otherwise in the plans. Match existing chamfer if the existing chamfer differs.
- Use 2" clear cover on all reinforcing steel except as shown otherwise.
- Request for construction joints or resteel splices at points other than those shown, must be submitted to the Engineer for prior approval. If additional splices are approved, no payment will be allowed for the added quantity of reinforcing steel.
- Surfaces of fresh concrete at construction joints shall be rough floated sufficiently to consolidate the surface. All construction joints shall be cleaned of surface laitance, curing compounds and other foreign materials prior to placing fresh concrete against the joint.
- The type of vibratory screed shall be approved by the Engineer.

### DESIGN MIX OF CONCRETE

- Class A45 Concrete shall be used for the bid items Concrete Approach Slab for Bridge and Concrete Approach Sleeper Slab for Bridge.
- The Type of cement, concrete strength requirements, aggregate requirements, slump and air requirements for the contract items Concrete Approach Sleeper Slab for Bridge and Concrete Approach Slab for Bridge shall conform to the requirements of Section 460 of the Construction Specification.

### REMOVAL OF CONCRETE BRIDGE APPROACH SLAB ADJACENT TO ABUTMENT NO. 1

- The existing concrete approach and sleeper slabs adjacent to the structure shall be completely removed by the Contractor.
- The crushed concrete and reinforcing steel from the removal shall be disposed of by the Contractor at an approved site as described in the Environmental Commitment notes in this set of plans.
- All labor, tools, equipment and any incidentals necessary for removal and disposal of the existing approach and sleeper slabs shall be incidental to the contract unit price per square yard for "Remove Concrete Bridge Approach Slab".

### MODIFY EXISTING BRIDGE END BACKFILL ADJACENT TO ABUTMENT NO. 1

- This work consists of bringing the existing bridge end backfill material up to the required elevation and repairing any damage to the in-place bridge end backfill material as approved by the Engineer.

- Granular bridge end backfill shall conform to Section 882 of the Construction Specification. Granular material shall be placed and compacted using a smooth face vibratory roller or vibratory plate compactor according to Section 430.3B of the Construction Specification.
- The Reinforcement Fabric (MSE) shall conform to section 831 of the Construction Specification.
- The polyethylene sheeting shall be a minimum thickness of 6 mils and shall be sufficiently durable such that it will not puncture or tear when installed as intended.
- The existing polyethylene sheeting under the existing approach slab and sleeper slab shall be removed and disposed of in accordance with the Environmental Commitments.
- The surfaces on which the drainage fabric is to be placed shall be smooth and free of obstructions. The drainage fabric may be oriented in any direction.
- Any equipment used to install the granular bridge end backfill over the drainage fabric shall be operated in such a manner that the drainage fabric is not damaged. To avoid damage to the drainage fabric, the equipment used to place, spread, and compact material over the drainage fabric shall be limited to handheld equipment.
- Any drainage fabric that is torn or punctured shall be repaired or replaced by the Contractor at no additional cost to the Department. The repair shall consist of a patch of the same type of drainage fabric being placed over the ruptured area such that it overlaps the damaged area a minimum of 3 feet measured from any damaged edge.
- Seams shall be constructed by overlapping the fabric a minimum of 2 feet. All seams shall be inspected by the Engineer and any deficient seams repaired by the Contractor prior to placement of the bridge end backfill material.
- The granular bridge end backfill shall be compacted to a minimum of 97 percent of maximum dry density as determined by SD 104 (AASHTO T99). The moisture content of the backfill material prior to and during compaction shall be adequate to provide satisfactory results. Maximum dry density and optimum moisture shall be determined by SD 104 (AASHTO T99).

**ESTIMATE OF STRUCTURE QUANTITIES AND NOTES**  
FOR  
326' - 1 <sup>9</sup>/<sub>16</sub>" CONT. COMP. GIRDER BRIDGE

STR. NO. 68-180-200

JUNE 2015

(2) OF (18)

DESIGNED BY NP YANK05HE	CK. DES. BY EJA 05HERA02	DRAFTED BY NP	<i>Kevin N. Boeden</i> BRIDGE ENGINEER
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STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0050(123)390	12	56

**MODIFY EXISTING BRIDGE END BACKFILL ADJACENT TO ABUTMENT NO. 1 (CONTINUED)**

11. The quantity specified in the plans for granular bridge end backfill was estimated from a survey and field measurements taken in the Spring of 2015. Actual amount installed may vary slightly due to changes in the field condition and the limitations of the field survey. Regardless of these limitations, the plan shown quantity will be the basis of payment. Field measurement for Granular Bridge End Backfill will not be made. Payment will be full compensation for all labor, equipment, materials, water, and all other items incidental to furnishing and installing the drainage fabric, the polyethylene sheeting and for furnishing and installing, including any hauling or stockpiling, of the granular bridge end backfill material.

**APPROACH SLAB ADJACENT TO ABUTMENT NO. 1**

- Excavation for placement of new approach slab and sleeper slab shall be done with minimal disturbance to the underlying material.
- The top of approach slab elevations shall be established during construction and shall be subject to the approval of the Engineer. Care shall be taken to provide a smooth transition from the bridge deck elevations to the new pavement elevations established in the field so as to prevent any dips or bumps in the areas of the bridge ends or ends of the new approach slabs. The maximum rate of grade transition through the approach slab shall be 1/8 inch per 10 feet.
- Sleeper slab riser shall be cast with or later than the Approach Slab. Care shall be taken to ensure the correct grade is maintained across the joint.
- The use of a vibratory screed will be required during placement of Class A45 Concrete for the approach slabs. Concrete placement in front of the screed shall be kept parallel to the screed.
- The concrete in the approach slab shall be tined parallel with the skew of the bridge.
- The new approach slab and sleeper slab shall have a surface finish as stipulated in Section 460.3.L.4 of the Construction Specifications.
- The Concrete Approach Slab Adjacent to Bridge shall be cured in accordance with Section 460.3 M of the Construction Specifications. The minimum 7 day cure time requirement shall be waived. The approach slabs shall be cured until a minimum compressive strength of 4,000 psi is reached.
- Concrete Approach Sleeper Slab for Bridge will be paid for at the contract unit price per square yard. This payment shall be full compensation for all excavation, furnishing, hauling, and placing all materials including concrete, concrete anchors, and reinforcing steel; for disposal of all excavated material and surplus materials; and for labor, tools, equipment and any incidentals necessary to complete this item of work.

9. Concrete Approach Slab for Bridge will be paid for at the contract unit price per square yard. This payment shall be full compensation for all excavation, furnishing, hauling and placing all materials including concrete, asphalt paint or 4 mil polyethylene sheeting, elastic joint sealer and reinforcing steel; for disposal of all excavated material and surplus materials and for labor, tools, equipment and any incidentals necessary to complete this item of work.

**CONCRETE BREAKOUT**

- The existing approach slab adjacent to abutment no. 4 shall be broken out to the limits shown on the plans. Breakout limits shall be defined with a 3/4" deep sawcut (unless specified otherwise in these plans), where practical, as approved by the Engineer. Reinforcing steel that is exposed and is scheduled for use in the new construction shall be cleaned and straightened to the satisfaction of the Engineer. Care shall be taken not to damage the existing reinforcing steel that is to be reused in the new construction during concrete breakout. Any reinforcing steel that is damaged during concrete breakout shall be replaced or repaired, as approved by the Engineer, by the Contractor at no cost to the Department.
- All broken out concrete, discarded reinforcing bars and expansion devices shall be disposed of by the Contractor. Any disposal of discarded material shall be in accordance with the Environmental Commitments.
- The contract unit price per cubic yard for "Breakout Structural Concrete" shall include breaking out concrete, cleaning, straightening existing reinforcing steel, removal of the existing strip seal device, and disposal of all broken out material.
- The existing reinforcing steel in the approach slab is epoxy coated. Reinforcing steel that is exposed and is scheduled for use in the new construction shall be cleaned of all adhering concrete and rust (if present) with a wire brush and straightened to the satisfaction of the Engineer. Any reinforcing steel that is damaged during concrete breakout shall be replaced or repaired, as approved by the Engineer, by the Contractor at no cost to the Department. After all concrete removal and rebar straightening, the Contractor shall visually inspect the epoxy coating on the salvaged reinforcing steel with the Engineer and repair all areas of damaged epoxy coating as approved by the Engineer. The damaged coating areas shall be repaired with a touch up coating material supplied by an epoxy coating manufacturer who supplies coating material for new epoxy coated reinforcing steel. This coating shall be inert in concrete and compatible with the existing coating on the reinforcing steel. The coating shall be allowed to cure for 24 hours or as per the manufacturer's recommendations, whichever is more stringent, before concrete can be placed. These bars shall be clean and free from all surface contaminants before coating. The cost of cleaning and placing the epoxy touch up coating to the existing reinforcing steel shall be incidental to the various bid items.

**MECHANICAL REBAR SPLICES**

Mechanical splice devices will be required for the transverse approach slab and sleeper slab reinforcing steel. The mechanical rebar splices shall be in accordance with Section 480 of the Construction Specifications.

**MEMBRANE SEALANT EXPANSION JOINT**

- The Membrane Sealant shall be on the approved product list for Membrane Sealant Expansion Joints.
- The manufacturer shall supply the membrane sealant in packaging that precompresses the membrane sealant. The precompressed dimension shall be as recommended by the sealant manufacturer, however, in no case shall the precompressed dimension exceed 75% of the joint opening width. The foam sealant shall be slowly self expanding to permit workers ample time to install the membrane sealant before the membrane sealant exceeds the joint opening width.
- The membrane sealant shall provide a water tight seal throughout a joint movement range of +25% (minimum) from the specified joint dimension.
- The membrane sealant shall be supplied in pieces a minimum of 5 feet in length. The foam sealant shall be ultra-violet and ozone resistant.
- The bonding adhesive used to attach the membrane sealant to the adjacent concrete shall be approved by the membrane sealant manufacturer.
- Adhesive used to join adjacent pieces of the membrane sealant shall be recommended by the manufacturer.
- If styrofoam filler material is used in construction, it shall be closed cell and water-tight as approved by the Engineer.
- The minimum ambient air temperature at the time of joint installation and adhesive curing shall be 40°F.
- A technical representative of the membrane sealant manufacturer shall be present at the jobsite during installation. The technical representative shall be knowledgeable in the correct procedures for the preparation and installation of the joint material to ensure the Contractor installs the joint to the manufacturers' recommendations.

**NOTES (CONTINUED)**

FOR  
326' - 1 9/16" CONT. COMP. GIRDER BRIDGE

STR. NO. 68-180-200

JUNE 2015

3 OF 18

DESIGNED BY NP YANK05HE	CK. DES. BY EJA 05HERA03	DRAFTED BY NP	<i>Kevin N. Boeden</i> BRIDGE ENGINEER
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STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0050(123)390	13	56

**MEMBRANE SEALANT EXPANSION JOINT (CONTINUED)**

10. Surfaces that will be in contact with the membrane sealant shall be thoroughly cleaned by abrasive blasting to remove all laitance and contaminants (such as oil, curing compounds, etc.) from the surface. At a minimum, two passes of abrasive blasting with the nozzle held at an angle to within 1 to 2 inches of the surface will be required. Cleaning of the surfaces with solvents, wire brushing, or grinding shall not be permitted.
11. After abrasive blasting, but immediately prior to membrane joint installation, the entire joint contact surface shall be air blasted. The air compressor used for joint cleaning shall be equipped with trap devices capable of providing moisture-free and oil-free air at a recommended pressure of 90 psi. To obtain complete bonding with the adhesive, the adjacent surfaces must be dry and clean. The contact surfaces for the joint shall be visually inspected by the Engineer immediately prior to joint installation to verify the surface is dry and clean.
12. Individual spliced sections shall be installed as per the manufacturers' recommendations. The membrant joint sealant manufacturer shall submit a detailed installation procedure to the Engineer at least 5 days prior to joint installation for his review.
13. Traffic shall not be allowed on the joint until the bonding adhesive has had time to cure, as recommended by the manufacturer.
14. Use plywood or other material to protect concrete adjacent to the joint from spalling before any equipment is moved across the joint. Any spall areas will be repaired at the Contractor's expense by breaking out and replacing adjacent concrete, as approved by the Engineer.
15. The Membrane Sealant Expansion Joint will be measured in feet to the nearest one-tenth foot, complete in place. Measurement will be made of the overall horizontal length. The Membrane Sealant Expansion joint will be paid for at the contract unit price per foot complete in place. Payment for this item shall be full compensation for furnishing all the required materials in place, including labor, equipment and incidentals necessary to complete the work in accordance with the plans and the foregoing specifications.

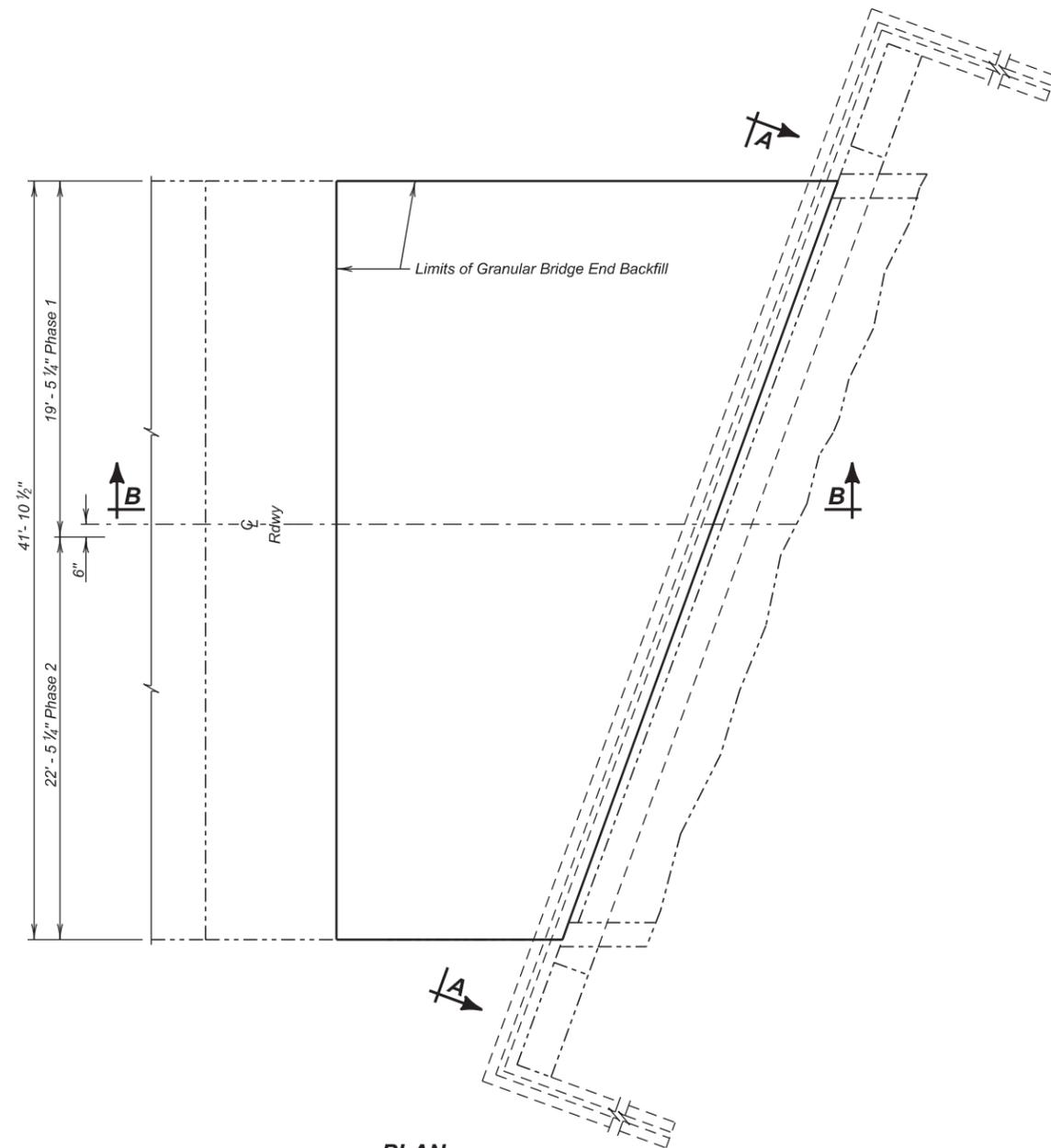
- b. Sentinel Silver  
Euclid Chemical Company  
19218 Redwood Road  
Cleveland, OH 44110  
Phone: (800) 321-7628  
Website: [www.euclidchemical.com](http://www.euclidchemical.com)
- c. Sika Galvashield XP+  
Sika Corporation US  
201 Polito Avenue  
Lyndhurst, NJ 07071  
Phone: (800) 933-7452  
Website: <http://usa.sika.com>
3. The anodes shall be placed in accordance with manufacturer's recommendations and as approved by the Engineer. The anodes have not been shown on the drawings. The Contractor shall provide shop drawings of the galvanic anode installation including locations of the individual anodes to the Office of Bridge Design.
4. The anodes shall be placed with a minimum 3/4" cover and shall be set in Embedding Mortar per the manufacturer's recommendations. The anodes shall be fully encased in the concrete repair material. Where adequate cover does not exist, a concrete pocket shall be chipped out behind the anode to provide sufficient cover. The Contractor may need to chip around the reinforcing bar locally at the anode installation to make the electrical connection. The reinforcing steel at the connection location shall be cleaned per the manufacturer's recommendations to provide sufficient electrical connection and mechanical bond.
5. The electrical continuity of the electrical connections and reinforcing steel shall be confirmed per the manufacturer's recommendations.
6. The Contractor shall provide manufacturer's product literature and installation instructions to the Engineer 10 days prior to installation.
7. All costs associated with placing anodes including labor, equipment, materials and incidentals shall be included in the contract unit price per each for "Galvanic Anode".

**GALVANIC ANODE**

1. The Contractor shall furnish and place Galvanic anodes in the concrete repair areas specified in this plan set.
2. The galvanic anodes shall be supplied as one of the following:
  - a. Galvashield XP2  
Vector Corrosion Technologies  
13312 N 56<sup>th</sup> St, Suite 102  
Tampa, FL 33617  
Phone: (813) 830-7566  
Website: [www.vector-corrosion.com](http://www.vector-corrosion.com)

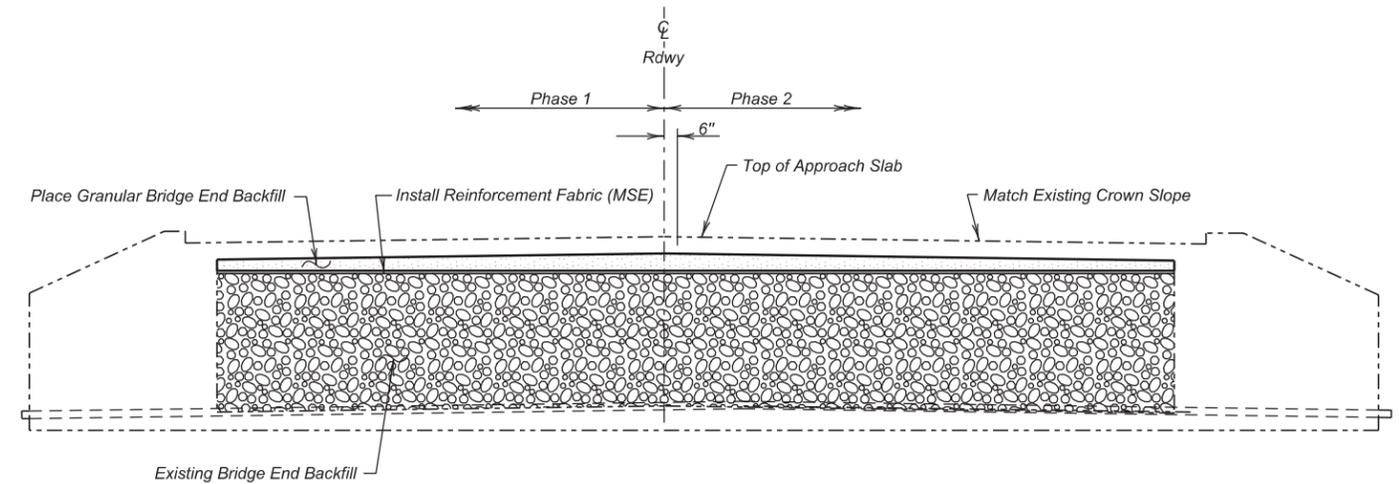
**NOTES (CONTINUED)**  
FOR  
326' - 1<sup>9</sup>/<sub>16</sub>" CONT. COMP. GIRDER BRIDGE  
STR. NO. 68-180-200  
JUNE 2015

DESIGNED BY NP YANK05HE	CK. DES. BY EJA 05HERA04	DRAFTED BY NP <i>Kevin N. Boeden</i> BRIDGE ENGINEER
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**PLAN**

(Bridge End Backfill shown adjacent to Abut. No. 1.)



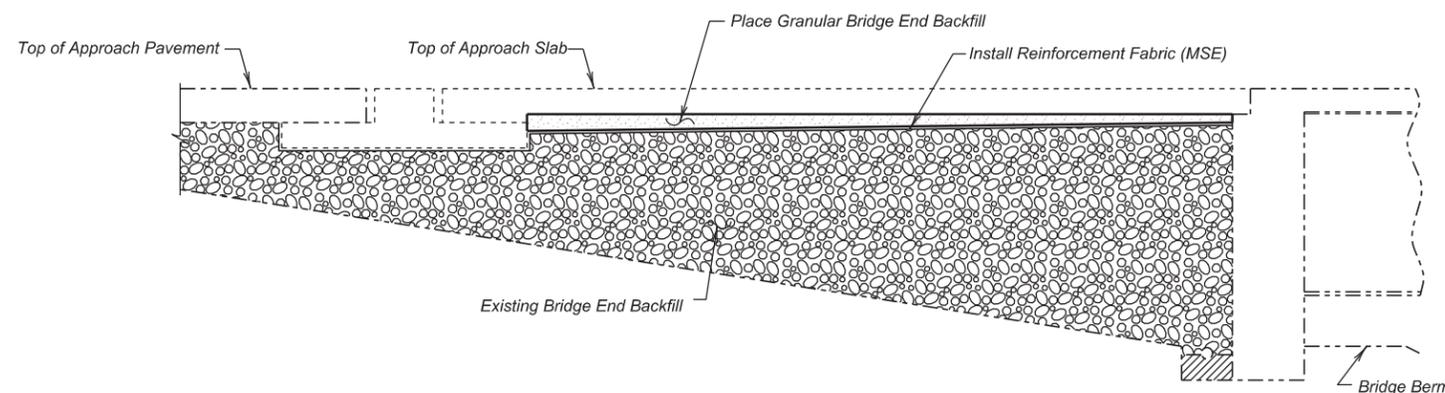
**SEC. A - A**

**ESTIMATED QUANTITIES**

ITEM	UNIT	QUANTITY	
		Phase 1	Phase 2
Granular Bridge End Backfill	CuYd	7.2	5.8

Item 1 and is an approximate quantity contained in the above bid item and is for information only.

	PHASE 1	PHASE 2
1. Reinforcement Fabric (MSE)	70.8 Sq. Yd.	62.8 Sq. Yd.



**SEC. B - B**

(at  $\bar{C}$  Roadway)

**APPROACH SLAB UNDERDRAIN DETAILS ADJACENT TO ABUT. NO. 1**

FOR

326' - 1 9/16" CONTINUOUS COMP. GIRDER BRIDGE

40' - 0" ROADWAY

OVER JAMES RIVER

STR. NO. 68-180-200

25° SKEW L.H.F.

SEC. 12/13-T93N-R55W

P 0050(123)390

YANKTON COUNTY

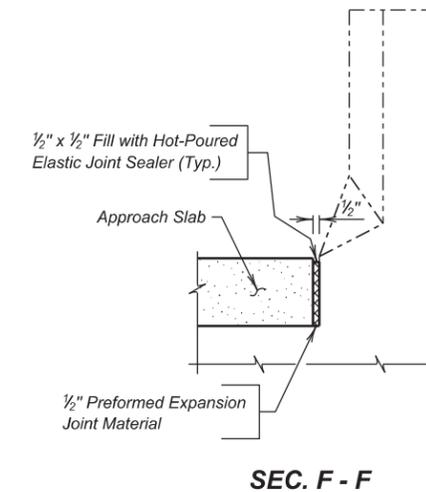
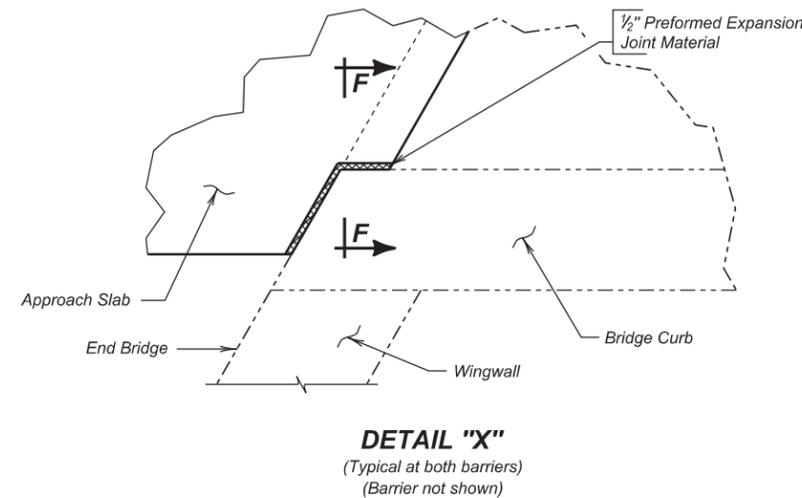
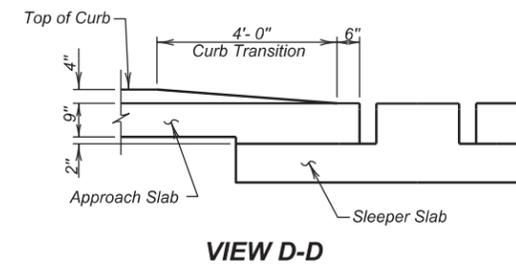
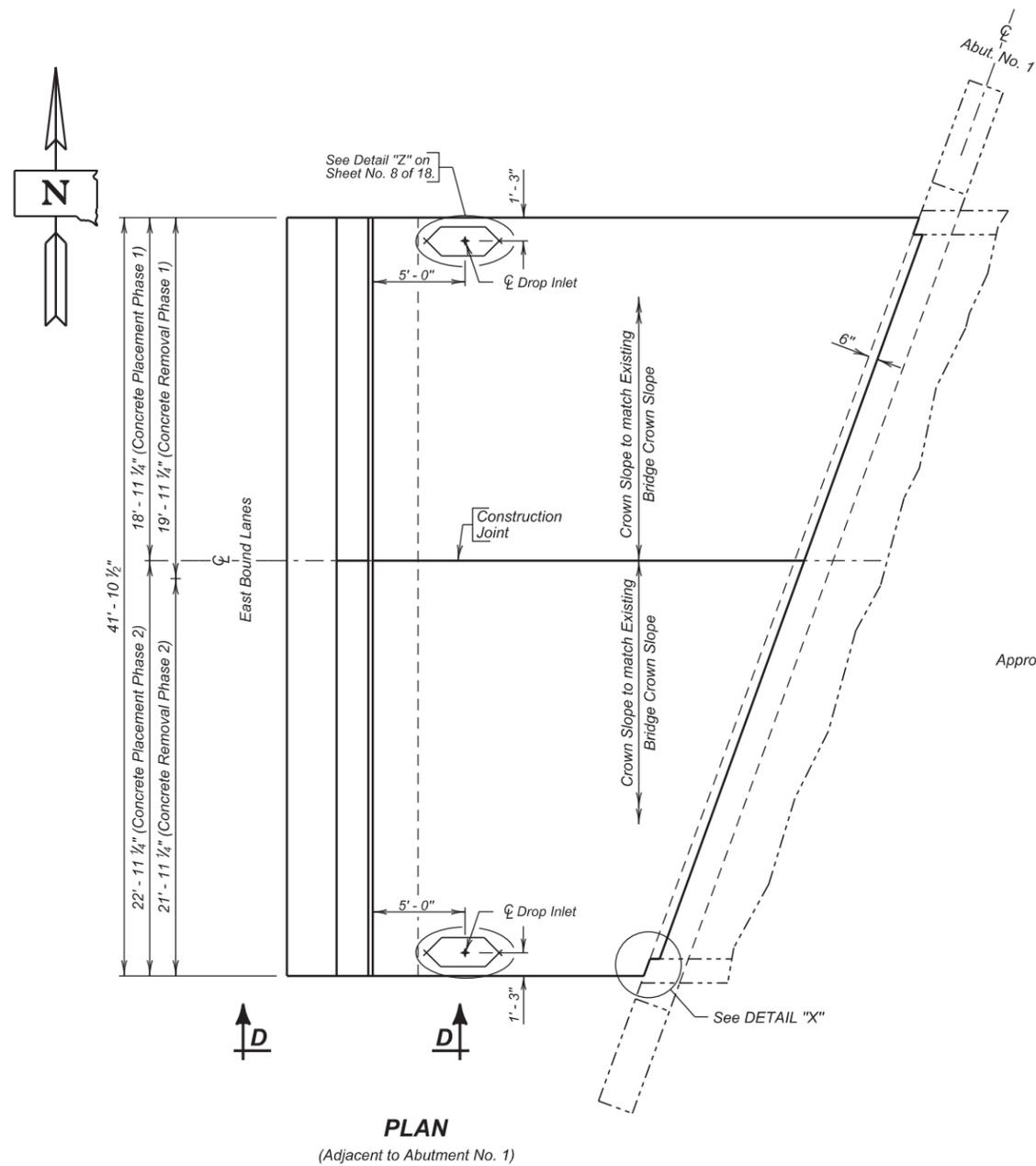
S. D. DEPT. OF TRANSPORTATION

JUNE 2015

5 OF 18

DESIGNED BY NP YANK05HE	CK. DES. BY EJA 05HERA05	DRAFTED BY NP	Kevin N. Goeden BRIDGE ENGINEER
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STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0050(123)390	15	56



**APPROACH SLAB LAYOUT AT ABUTMENT NO. 1**

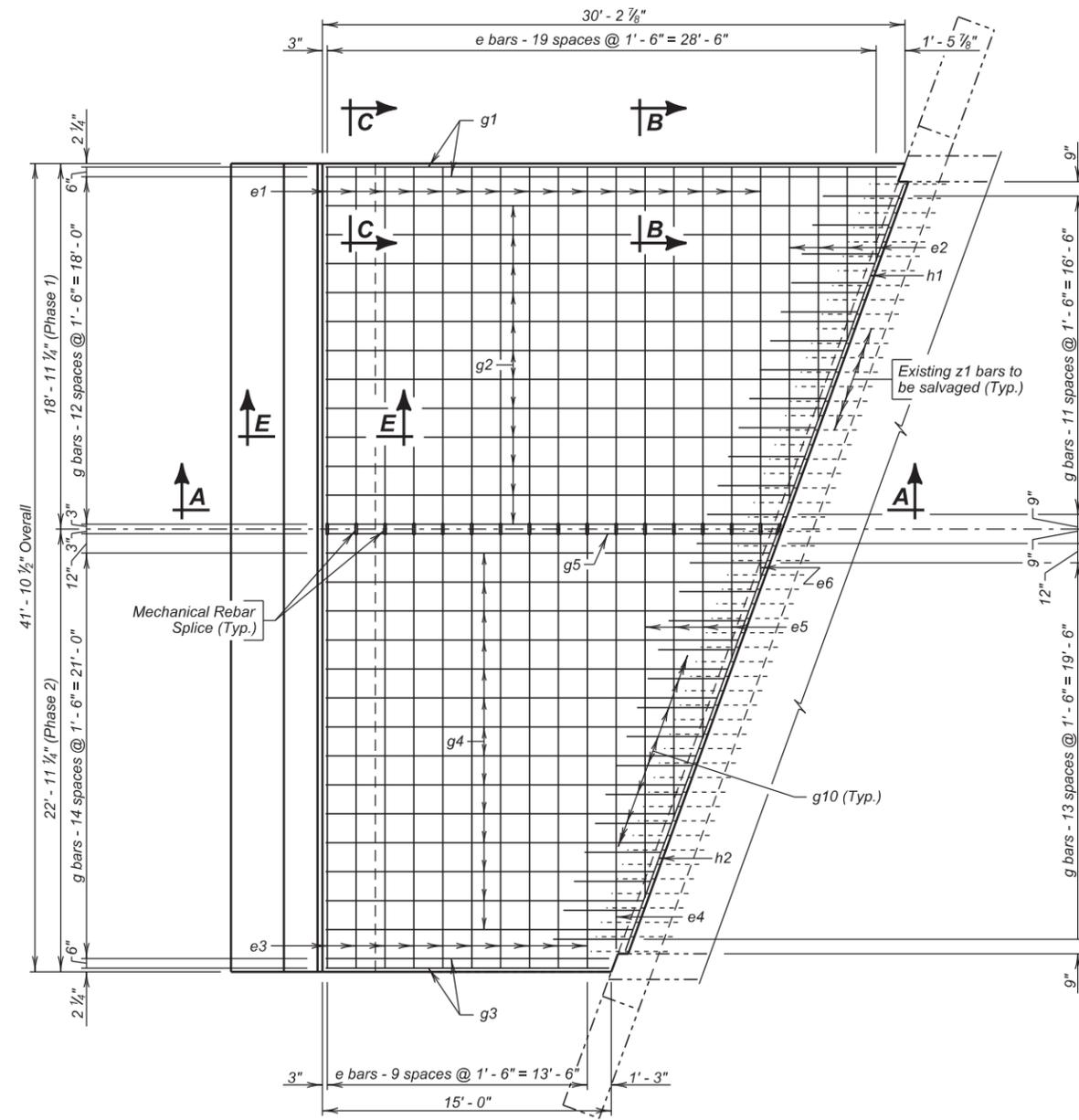
FOR

**326' - 1 9/16" CONTINUOUS COMP. GIRDER BRIDGE**  
 40' - 0" ROADWAY  
 OVER JAMES RIVER  
 STR. NO. 68-180-200

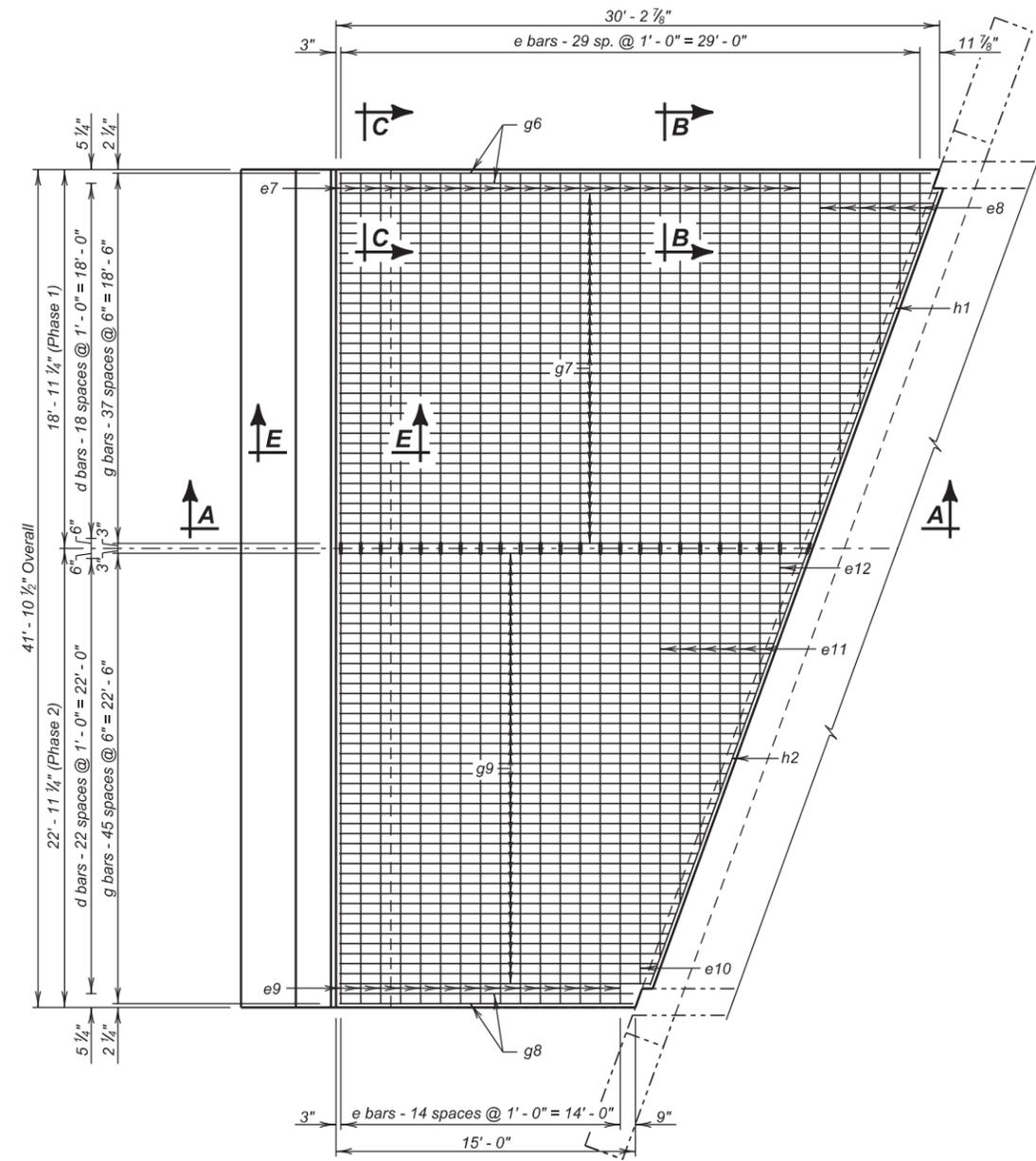
25° SKEW L.H.F.  
 SEC. 12/13-T93N-R55W  
 P 0050(123)390

YANKTON COUNTY  
 S. D. DEPT. OF TRANSPORTATION  
 JUNE 2015

DESIGNED BY NP YANK05HE	CK. DES. BY EJA 05HERA06	DRAFTED BY NP	<i>Kevin N. Goeden</i> BRIDGE ENGINEER
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**PLAN**  
(Top Steel Shown)



**PLAN**  
(Bottom Steel Shown)

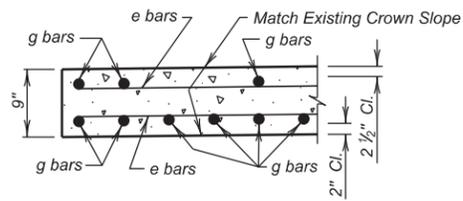
**APPROACH SLAB DETAILS AT ABUTMENT NO. 1**

FOR  
**326' - 1 9/16" CONTINUOUS COMP. GIRDER BRIDGE**  
 40' - 0" ROADWAY  
 OVER JAMES RIVER  
 STR. NO. 68-180-200

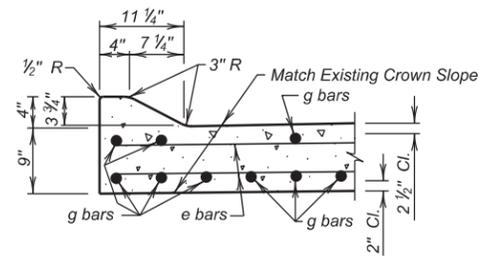
25° SKEW L.H.F.  
 SEC. 12/13-T93N-R55W  
 P 0050(123)390

YANKTON COUNTY  
 S. D. DEPT. OF TRANSPORTATION

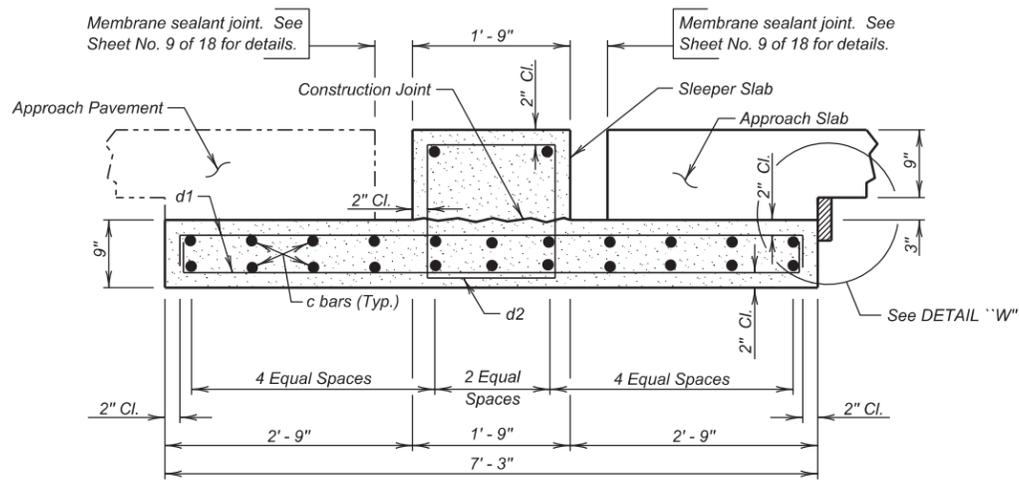
JUNE 2015



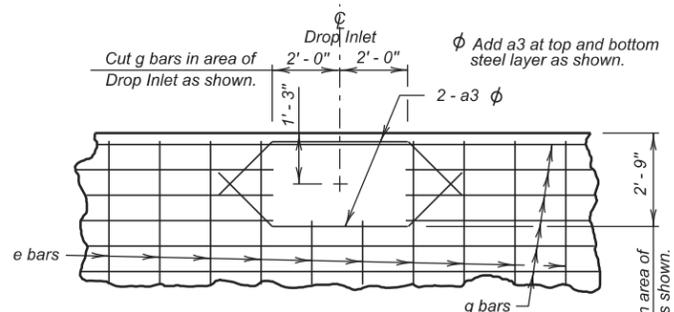
**SEC. C - C**



**SEC. B - B**

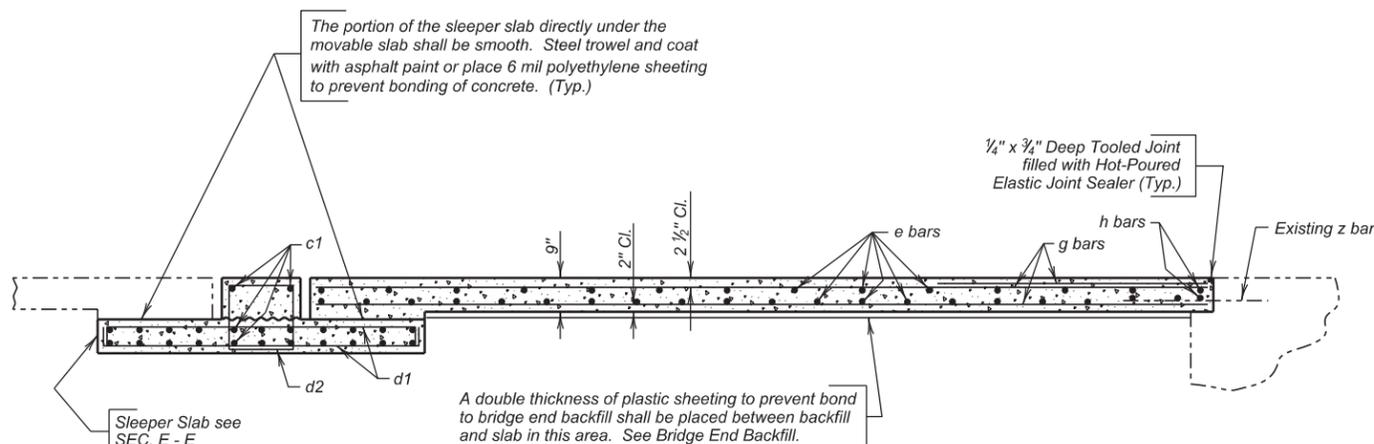


**SEC. E - E**  
(Sleeper Slab)

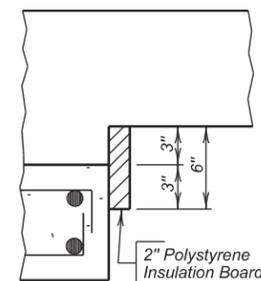


**DETAIL "Z"**  
(Bottom Steel Shown)

See Sheet No. 6 of 18 for location on Approach Slab.



**SEC. A - A**

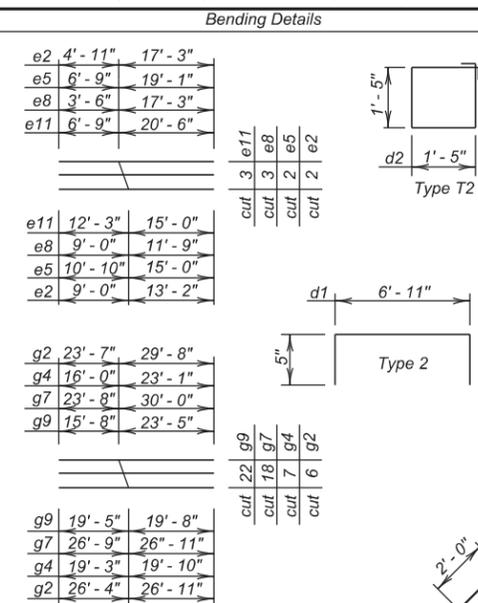


**DETAIL "W"**

The Polystyrene Insulation Board shall be firmly attached to the sleeper slab by a method to be approved by the Engineer.

**REINFORCING SCHEDULE**  
(For One Approach and Sleeper Slabs)

PHASE 1				
Mk.	No.	Size	Length	Type
a3	4	4	7'-4"	19A
c1	24	5	18'-9"	Str.
d1	38	4	7'-9"	2
d2	19	4	6'-5"	T2
e1	16	4	18'-9"	Str.
e2	2	4	22'-2"	Str.
e7	24	6	18'-9"	Str.
e8	3	6	20'-9"	Str.
g1	2	4	29'-7"	Str.
g2	6	4	53'-3"	Str.
g6	2	8	29'-7"	Str.
g7	18	8	53'-8"	Str.
g10	12	4	6'-0"	Str.
h1	2	6	18'-11"	Str.



PHASE 2				
Mk.	No.	Size	Length	Type
a3	4	4	7'-4"	19A
c2	24	5	22'-9"	Str.
d1	46	4	7'-9"	2
d2	23	4	6'-5"	T2
e3	10	4	22'-9"	Str.
e4	1	4	21'-9"	Str.
e5	2	4	25'-10"	Str.
e6	1	4	2'-7"	Str.
e9	15	6	22'-9"	Str.
e10	1	6	21'-9"	Str.
e11	3	6	27'-3"	Str.
e12	1	6	4'-0"	Str.
g3	2	4	14'-9"	Str.
g4	7	4	39'-1"	Str.
g5	1	4	23'-5"	Str.
g8	2	8	14'-9"	Str.
g9	22	8	39'-1"	Str.
g10	15	4	6'-0"	Str.
h2	2	6	23'-3"	Str.

⊗ These bars shall be spliced with mechanical splice devices Equivalent Splice Lengths  
No. 4 - 2'-0"  
No. 5 - 2'-6"  
No. 6 - 3'-0"

Note -  
All Dimensions are out to out of bars.  
All Bars to be Epoxy Coated.  
\* Cut Bars

**ESTIMATED QUANTITIES**  
(For One Approach and One Sleeper Slab)

ITEM	UNIT	QUANTITY	
		Phase 1	Phase 2
Remove Concrete Bridge Approach Slab	Sq Yd	86.5	76.6
Concrete Approach Slab for Bridge	Sq Yd	57.4	50.2
Concrete Approach Sleeper Slab for Bridge	Sq Yd	15.3	18.5
No. 4 Rebar Splice	Each	16	—
No. 5 Rebar Splice	Each	24	—
No. 6 Rebar Splice	Each	25	—

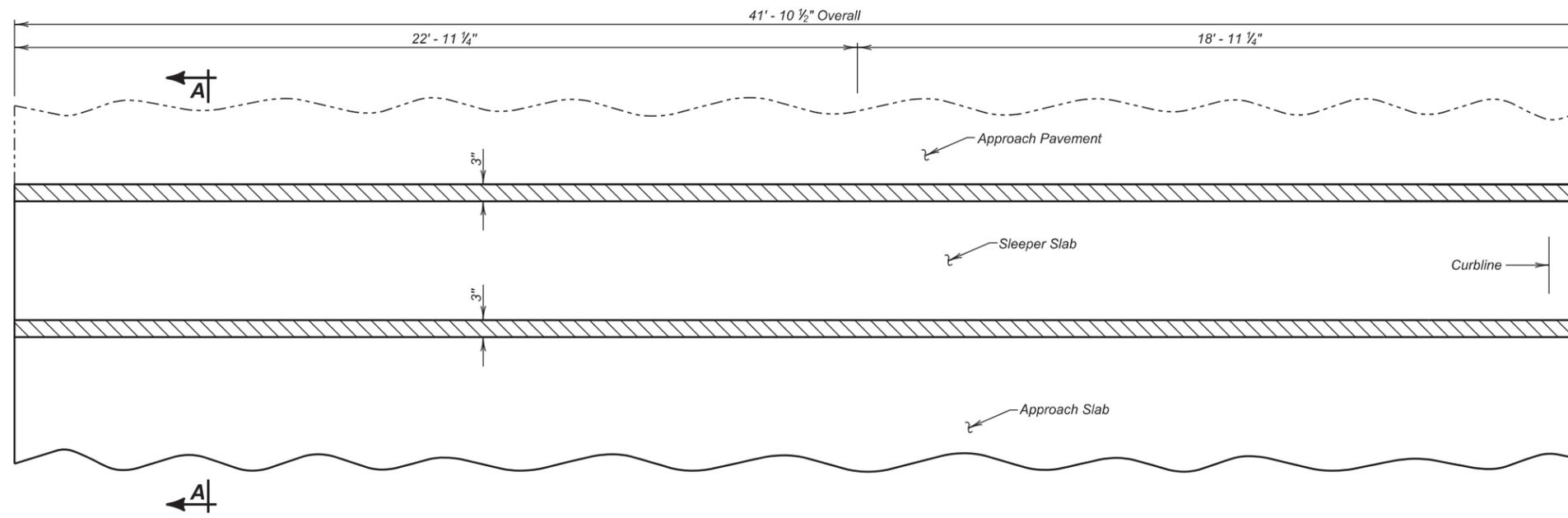
	PHASE 1	PHASE 2
1. Concrete in Approach Slabs.	14.8 Cu. Yd	13.1 Cu. Yd
2. Epoxy Coated Re-Steel in Approach Slabs.	4114 Lbs.	3619 Lbs.
3. Concrete in Sleeper Slabs	5.1 Cu. Yd	6.1 Cu. Yd
4. Epoxy Coated Re - Steel in Sleeper Slabs.	748 Lbs.	906 Lbs.
5. Polyethylene Sheeting	920 Sq. Ft	765 Sq. Ft

Items 1 thru 5 are approximate quantities contained in the above bid item and are for information only.

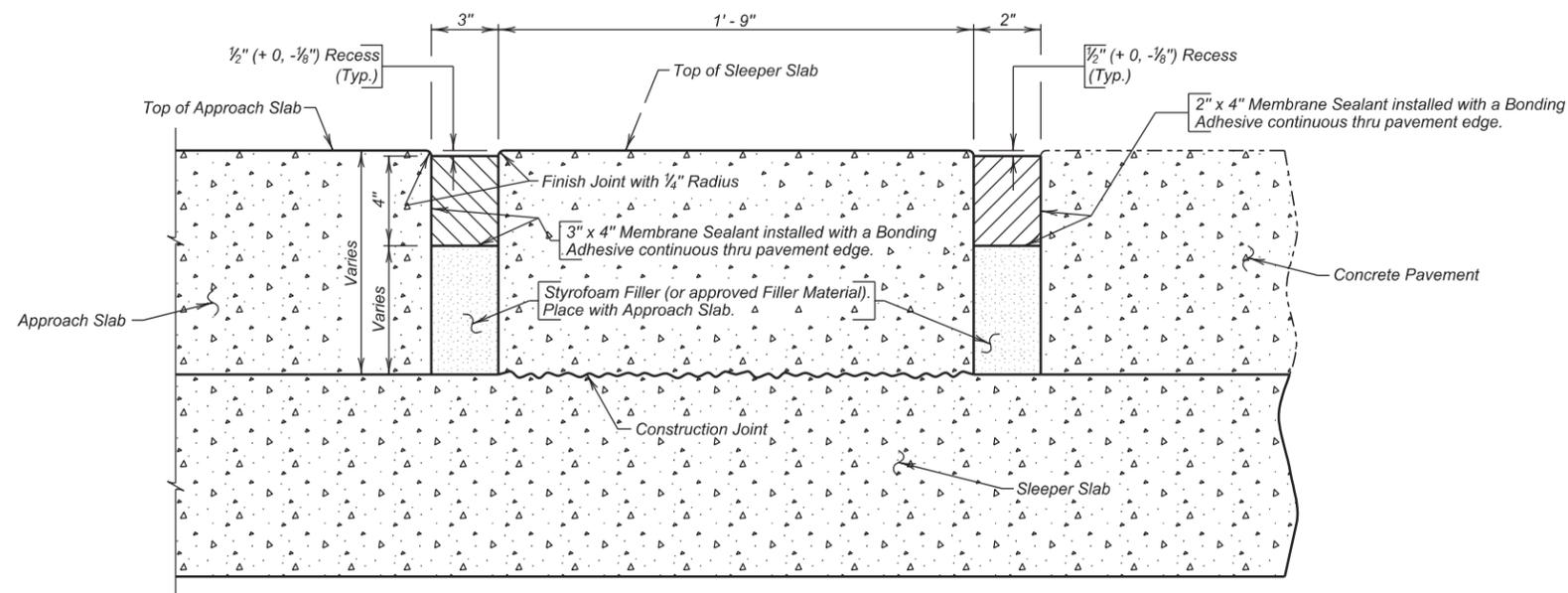
**APPROACH SLAB DETAILS AT ABUTMENT NO. 1 (CONTINUED)**  
FOR  
**326' - 1 9/16" CONTINUOUS COMP. GIRDER BRIDGE**  
40' - 0" ROADWAY  
OVER JAMES RIVER  
STR. NO. 68-180-200  
25° SKEW L.H.F.  
SEC. 12/13-T93N-R55W  
P 0050(123)390

YANKTON COUNTY  
S. D. DEPT. OF TRANSPORTATION

JUNE 2015



PLAN



SEC. A - A

ESTIMATED QUANTITIES			
ITEM	UNIT	QUANTITY	
		Phase 1	Phase 2
Membrane Sealant Expansion Joint	Ft	37.9	45.9

APPROACH SLAB JOINT DETAILS AT ABUTMENT NO. 1

FOR

326' - 1 9/16" CONTINUOUS COMP. GIRDER BRIDGE

40' - 0" ROADWAY

OVER JAMES RIVER

STR. NO. 68-180-200

25° SKEW L.H.F.

SEC. 12/13-T93N-R55W

P 0050( )390

YANKTON COUNTY

S. D. DEPT. OF TRANSPORTATION

JUNE 2015

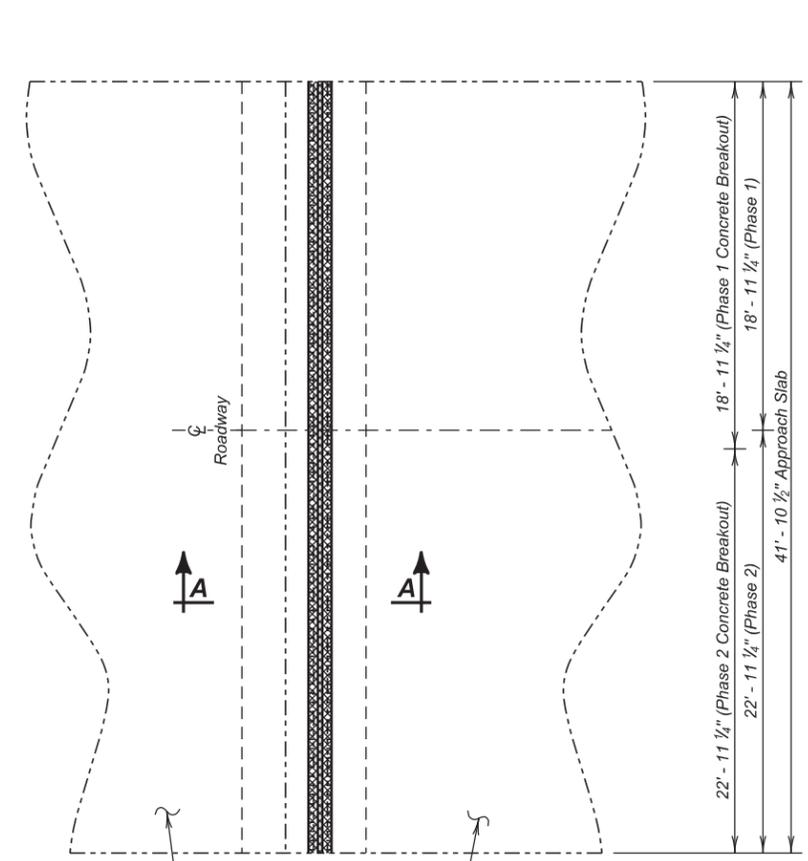
9 OF 18

DESIGNED BY NP YANK05HE	CK. DES. BY EJA 05HERA09	DRAFTED BY NP	Kevin N. Goeden BRIDGE ENGINEER
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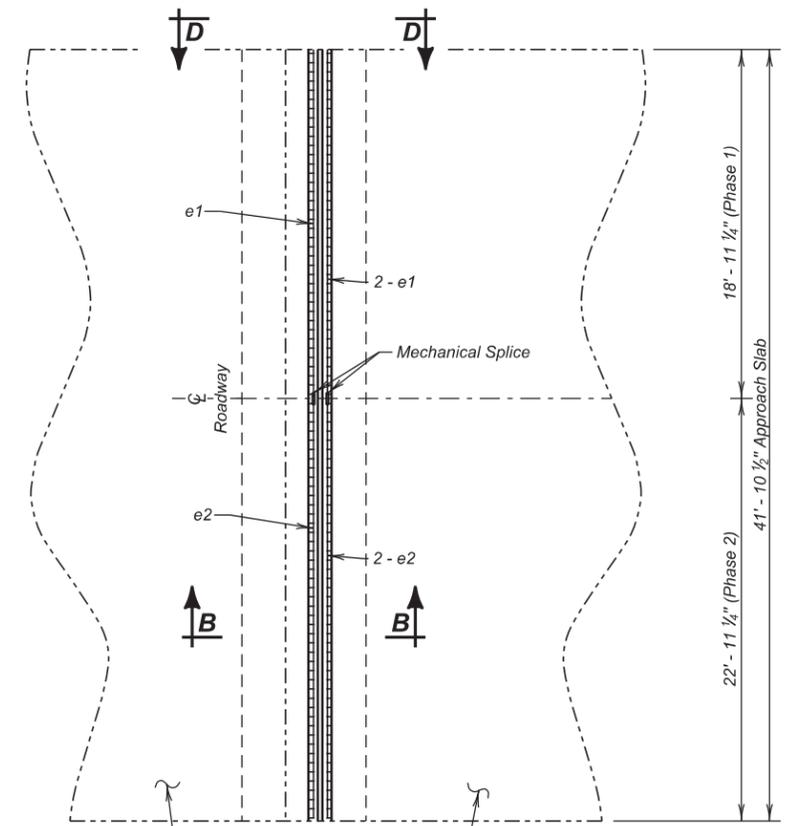
REINFORCING SCHEDULE				
Mk.	No.	Size	Length	Type
PHASE 1				
∅ e1	3	5	18' - 9"	Str.
PHASE 2				
∅ e2	3	5	22' - 9"	Str.

NOTES:  
All Dimensions are out to out of bars.  
All Bars to be Epoxy Coated.

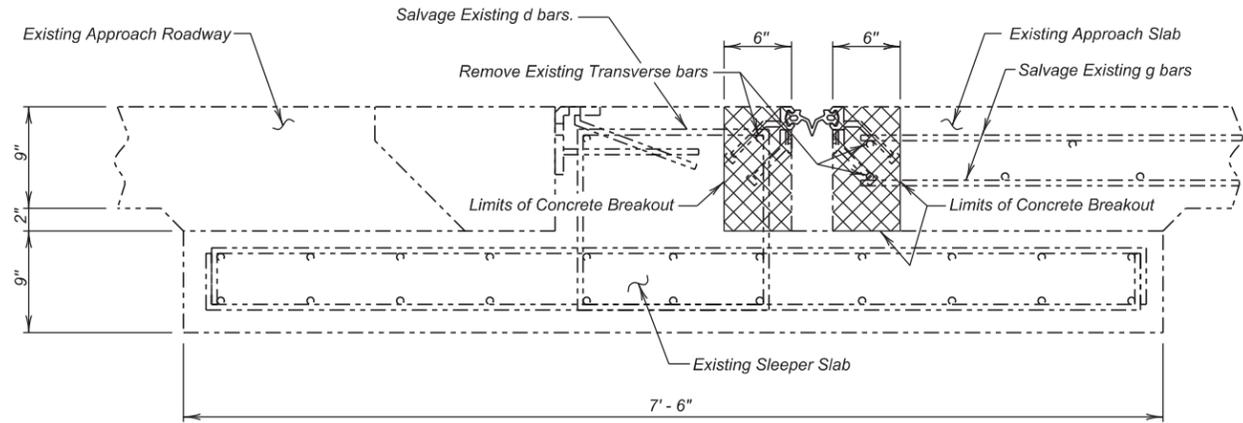
∅ These bars shall be spliced with mechanical splice devices  
Equivalent Splice Lengths  
No. 5 - 2' - 6"



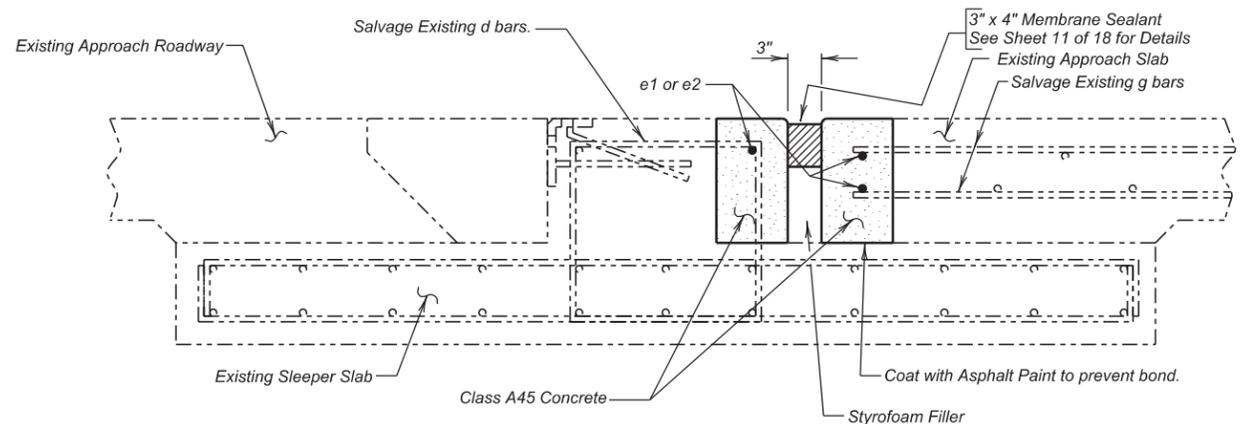
**PLAN VIEW**  
Showing Existing Joint



**PLAN VIEW**  
Showing New Joint



**SECTION A - A**  
(Concrete Removal Shown)



**SECTION B - B**  
(Joint Reconstruction Shown)

 Limits of Concrete Breakout

ITEM	UNIT	QUANTITY	
		Phase 1	Phase 2
Class A45 Concrete, Bridge Repair	Cu. Yd.	0.5	0.6
Breakout Structural Concrete	Cu. Yd.	0.6	0.6
Epoxy Coated Reinforcing Steel	Lb.	59	71
No. 5 Rebar Splice	Each	3	-
Galvanic Anode	Each	9	11

**DETAILS OF APPROACH SLAB JOINT REPLACEMENT  
ADJACENT TO ABUTMENT NO. 4**

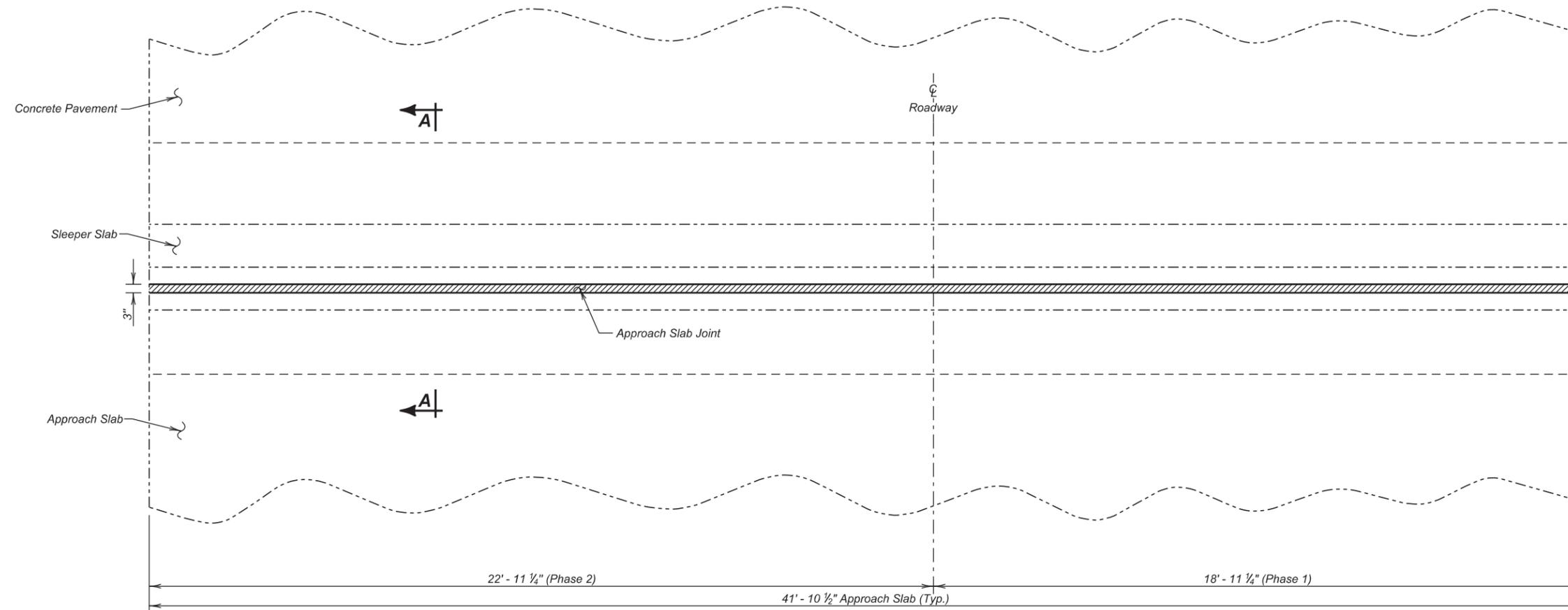
FOR  
326' - 1 9/16" CONTINUOUS COMP. GIRDER BRIDGE  
40' - 0" ROADWAY  
OVER JAMES RIVER  
STR. NO. 68-180-200

25° SKEW L.H.F.  
SEC. 12/13-T93N-R55W  
P 0050(123)390

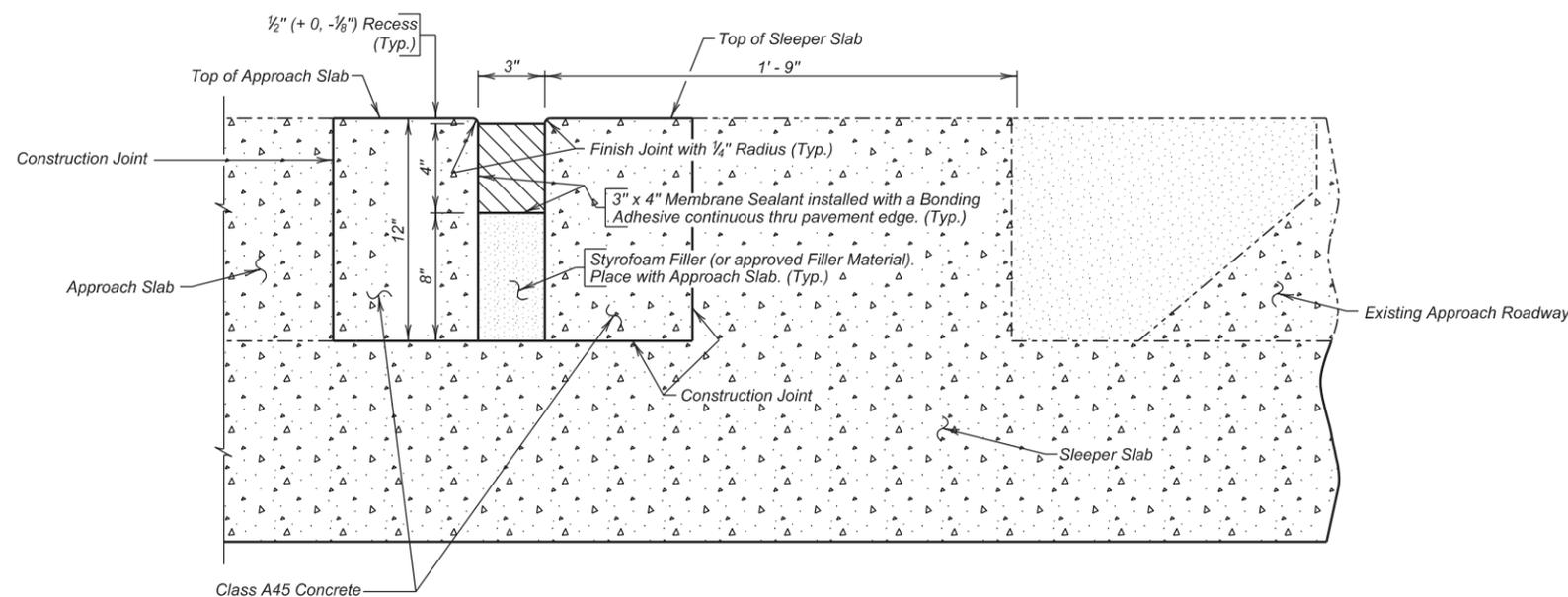
YANKTON COUNTY  
S. D. DEPT. OF TRANSPORTATION

JUNE 2015

Use this sheet in conjunction with Sheet No. 11 of 18.



PLAN



SEC. A - A

ESTIMATED QUANTITIES			
ITEM	UNIT	QUANTITY	
		Phase 1	Phase 2
Membrane Sealant Expansion Joint	Ft	18.9	22.9

MEMBRANE SEALANT DETAILS AT ABUTMENT NO. 4

FOR  
 326' - 1 9/16" CONTINUOUS COMP. GIRDER BRIDGE  
 40' - 0" ROADWAY  
 OVER JAMES RIVER  
 STR. NO. 68-180-200

25° SKEW L.H.F.  
 SEC. 12/13-T93N-R55W  
 P 0050(123)390

YANKTON COUNTY  
 S. D. DEPT. OF TRANSPORTATION

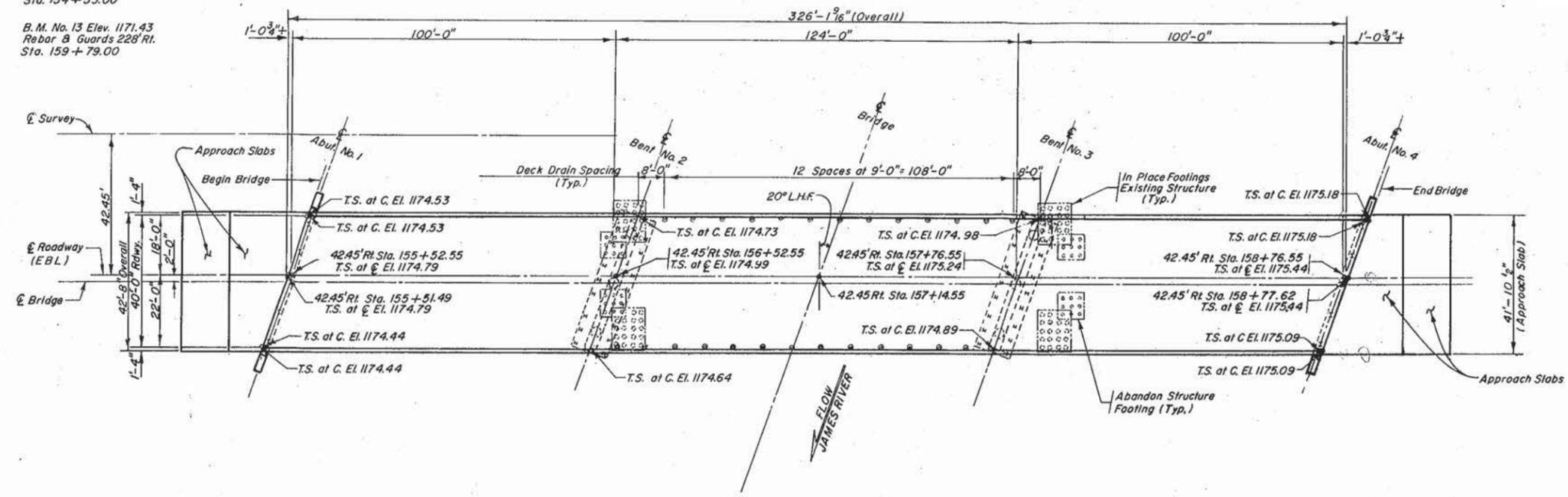
JUNE 2015

Use this sheet in conjunction with Sheet No. 10 of 18.

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	NH 0050(123)390	21	56

B.M. No. 12 Elev. 1170.12  
Rebar & Guard 237' Rt.  
Sta. 154+53.00

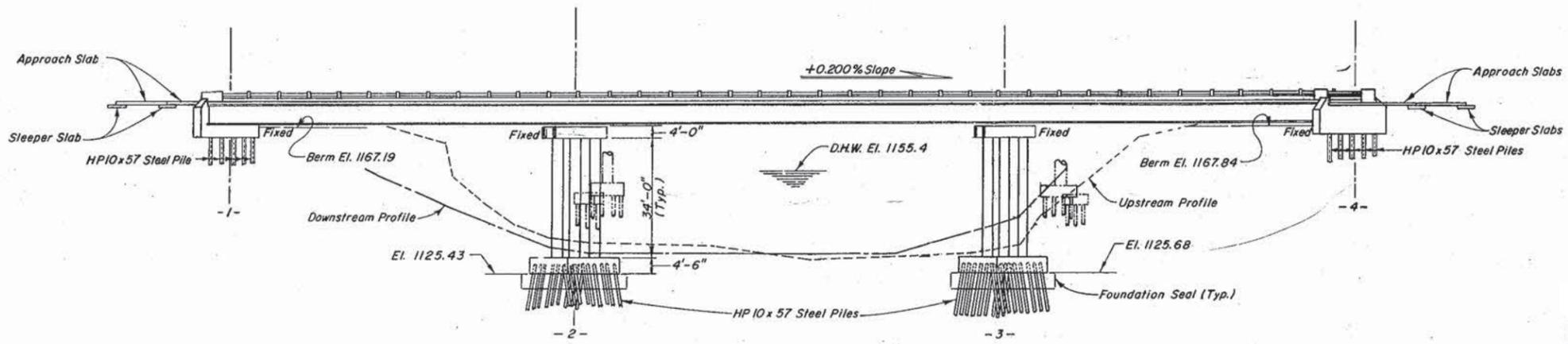
B.M. No. 13 Elev. 1171.43  
Rebar & Guards 228' Rt.  
Sta. 159+79.00



NOTE: T.S. at C.E.L. = Top of Slab at Center Line Elevation.  
T.S. at C. El. = Top of Slab at Curb Elevation.

PLAN

- X071-  
INDEX OF BRIDGE SHEETS -**
- Sheet No. 1 - General Drawing
  - Sheet No. 2 - Estimate of Structure Quantities and Notes
  - Sheet No. 3 - Notes (Cont.)
  - Sheet No. 4 - Subsurface Investigation and Piling Layout
  - Sheet No. 5 - Details of Abutment No. 1
  - Sheet No. 6 - Details of Abutment No. 4
  - Sheet No. 7 - Bent Details
  - Sheet No. 8 - Slab Details
  - Sheet No. 9 - End Block Details
  - Sheet No. 10 - Type RT-4 Steel Rail, Curb and Drain Details
  - Sheet No. 11 - Diaphragm Details
  - Sheet No. 12 - Girder Layout and Details
  - Sheet No. 13 - Framing Diagram and Erection Data
  - Sheet No. 14 - Details of Bolted Field Splices and Bearings
  - Sheet No. 15 - Details of Bridge End Backfill (Abut. No. 1 & 4)
  - Sheet No. 16 - Details of Approach Slabs Adjacent to Bridge
  - Sheet No. 17 - Approach Slab Joint Details
  - Sheet No. 18 - Details of Standard Plate No. 305 and No. 302
  - Sheet No. 19 - Details of Standard Plate No. 308 and 4-Bolt Insert Assembly.



ELEVATION

**ORIGINAL CONSTRUCTION PLANS**

Q <sub>100</sub>	23,670 cfs.
A	5947.23 sq. ft.
V <sub>100</sub>	3.98 f.p.s.

HYDRAULIC DATA

GENERAL DRAWING  
FOR  
**326'-1 9/16" CONT. COMP. GIRDER BRIDGE**  
40'-0" ROADWAY 20° SKEW L.H.F.  
OVER JAMES RIVER SEC. 12/13-T93N-R55W  
STA. 155+51.49 TO 158+77.62 BR F0050(20)390  
STR. NO. 68-180-200 HS 20-44 (& ALT.)  
PCEMS 6829 YANKTON COUNTY

S. D. DEPT. OF TRANSPORTATION

AUG. 1984 (12 OF 18)

Plans By:  
Office of Bridge Design, South Dakota Dept. of Transportation

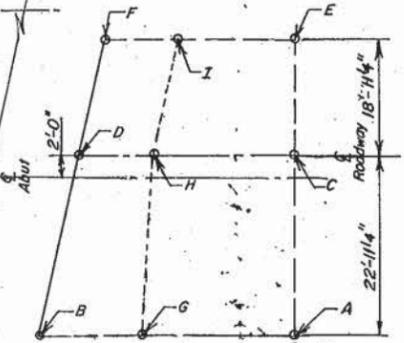
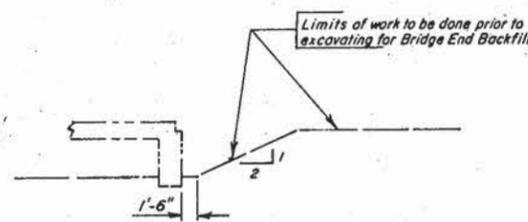
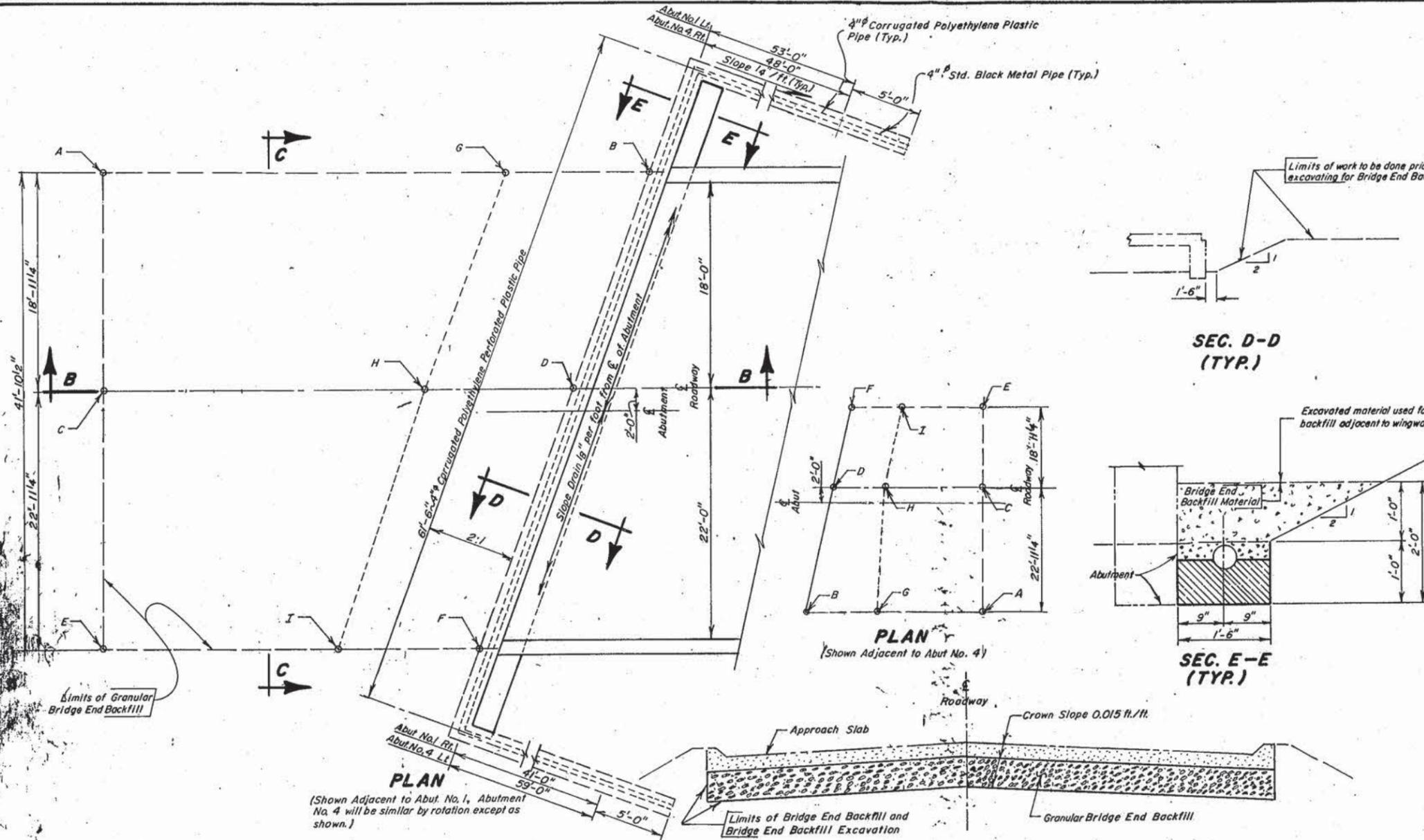
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
KG/GF	LAK		

BRIDGE ENGINEER

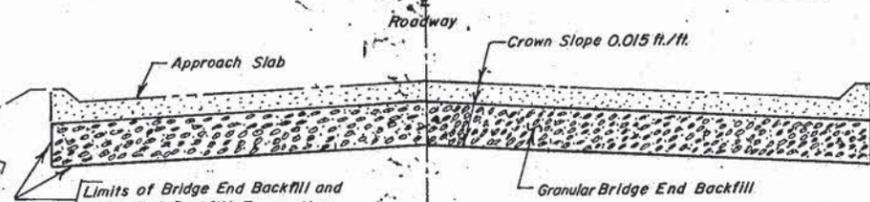
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	NH 0050(123)390	22	56

NC

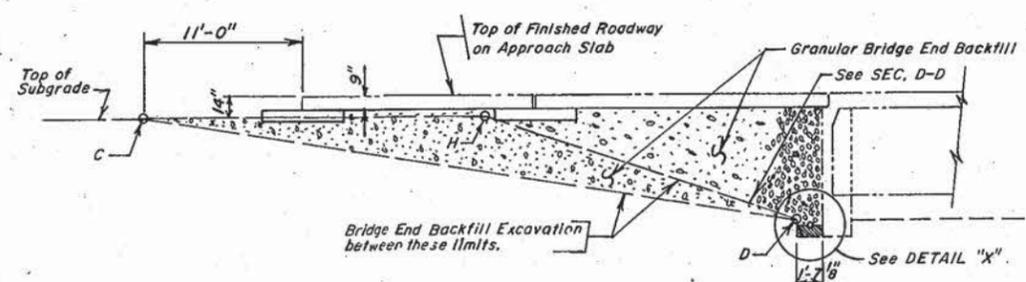
- For informational purposes only, the total length of 4" Corrugated Polyethylene Perforated Plastic Pipe or Tubing, for 2 abutments is 123 feet.
- For informational purposes only, the total length of 4" Corrugated Polyethylene Plastic Pipe or Tubing, for 2 abutments is 201 feet.
- Excavated material not used for backfill of Abutments, supplemented with Bridge End Backfill Material, if required, shall be used to build the spill cones around the ends of the wingwalls as directed by the Engineer.
- Total estimated length of 4" Standard Black Steel Pipe is 20 ft. for 2 Abut's.
- Bridge End Backfill Excavation will not be measured. Plans quantity payment will be full compensation for this item. The estimated quantity is 274 cubic yards for 2 Abut's.
- The total estimated theoretical volume of Granular Bridge End Backfill is 598 cubic yards for 2 Abutments. This quantity has been increased by a "shrinkage" factor of 1.3 to convert final compacted volume to loose volume.
- The total length of Bridge End Backfill Under Drain Pipe is 344 lineal feet for 2 abutments, including 4" Corrugated Polyethylene Plastic Pipe or Tubing, Perforated or Non-Perforated and 4" Standard Black Steel Pipe.



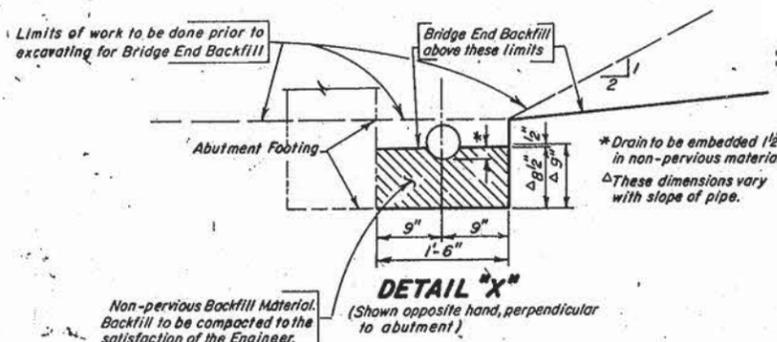
PLAN (Shown Adjacent to Abut. No. 4)



SEC. C-C



SEC. B-B (Roadway)



DETAIL 'X'

TABLE OF STATIONS AND ELEVATIONS

POINT	A	B	C	D	E	F	G	H	I
Begin Bridge	Station 155+07.68	155+56.78	155+07.68	155+49.89	155+07.68	155+41.55	155+43.74	155+36.28	155+28.70
	Elevation 1173.25	1167.19	1173.53	1167.19	1173.19	1167.19	1173.32	1173.59	1173.23
End Bridge	Station 159+19.97	158+70.86	159+19.97	158+79.21	159+19.97	158+86.10	158+83.86	158+92.98	158+99.29
	Elevation 1174.01	1167.84	1174.36	1167.84	1174.07	1167.84	1173.94	1174.30	1174.03

ORIGINAL CONSTRUCTION PLANS

DETAILS OF BRIDGE END BACKFILL (ABUT. NO. 1 & 4)  
 FOR  
**326'-1<sup>9</sup>/<sub>16</sub>" CONT. COMP. GIRDER BRIDGE**  
 40'-0" ROADWAY 20° SKEW L.H.F.  
 OVER JAMES RIVER SEC. 12/13-T93N-R55W  
 STA. 155+51.49 TO 158+77.62 BRFO050(20)390  
 STR. NO. 68-180-200 HS 20-44 (& ALT.)

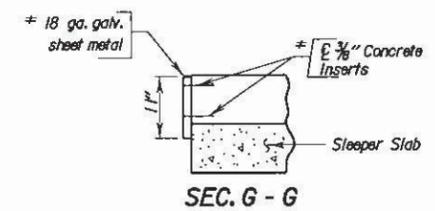
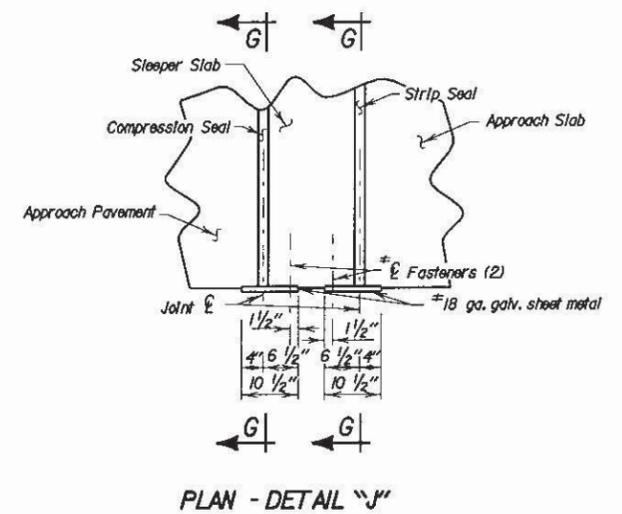
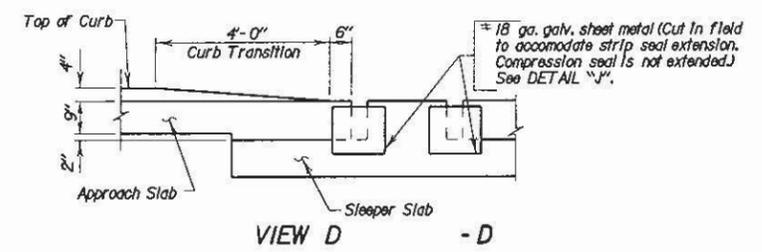
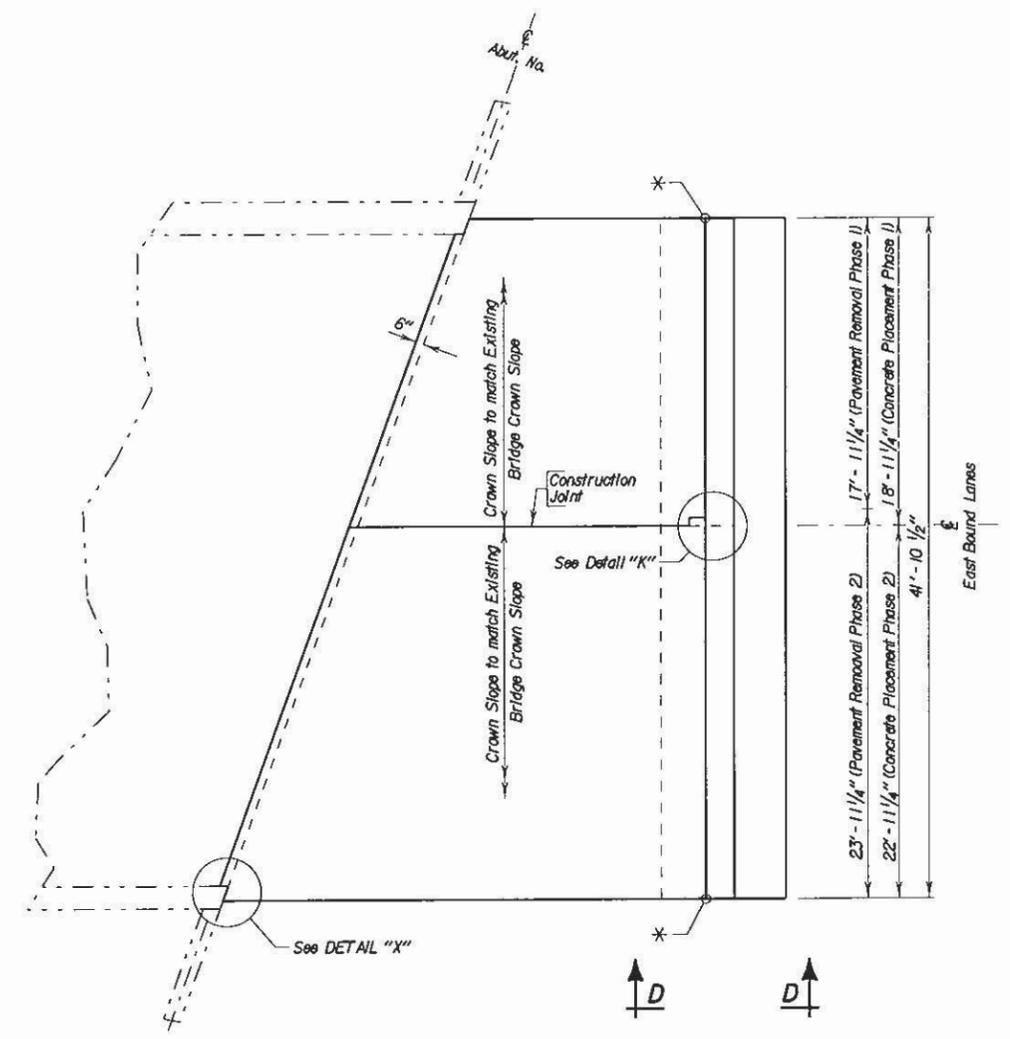
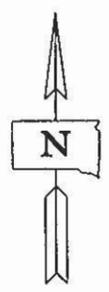
YANKTON COUNTY  
 S. D. DEPT. OF TRANSPORTATION

SEPT 1984 13 OF 18

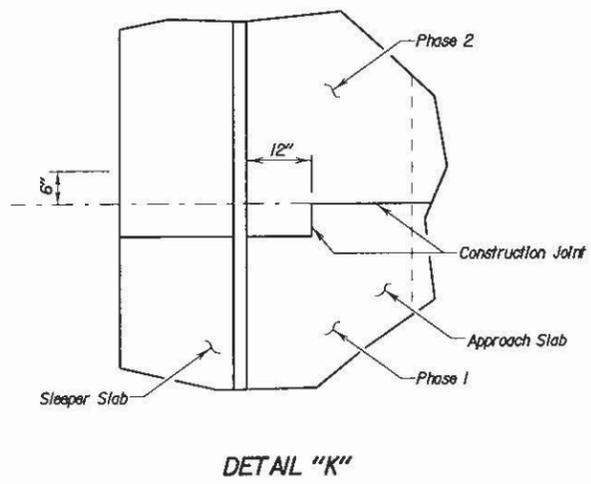
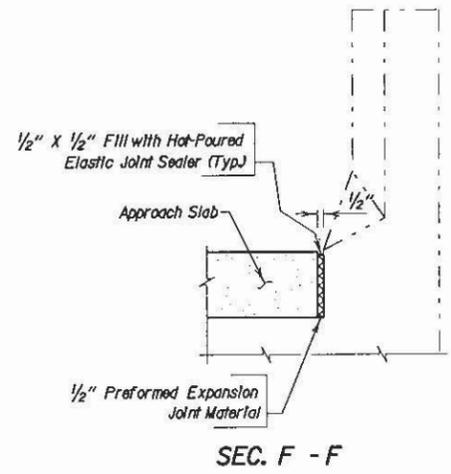
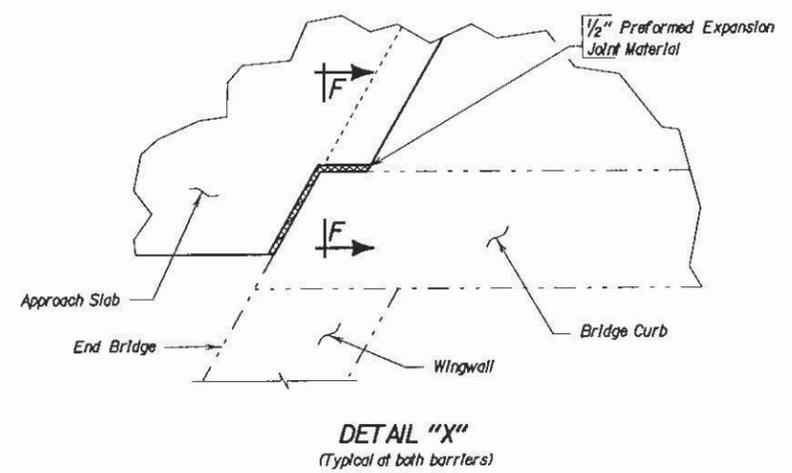
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
KG/GF	L.M.		



STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	NH 0050(123)390	24	56



\* Attach 1/8 ga. galv. Sheet Metal to both ends of Sleeper Slab only after slab has been poured. Use Fasteners that will not spall concrete, as approved by the Engineer.



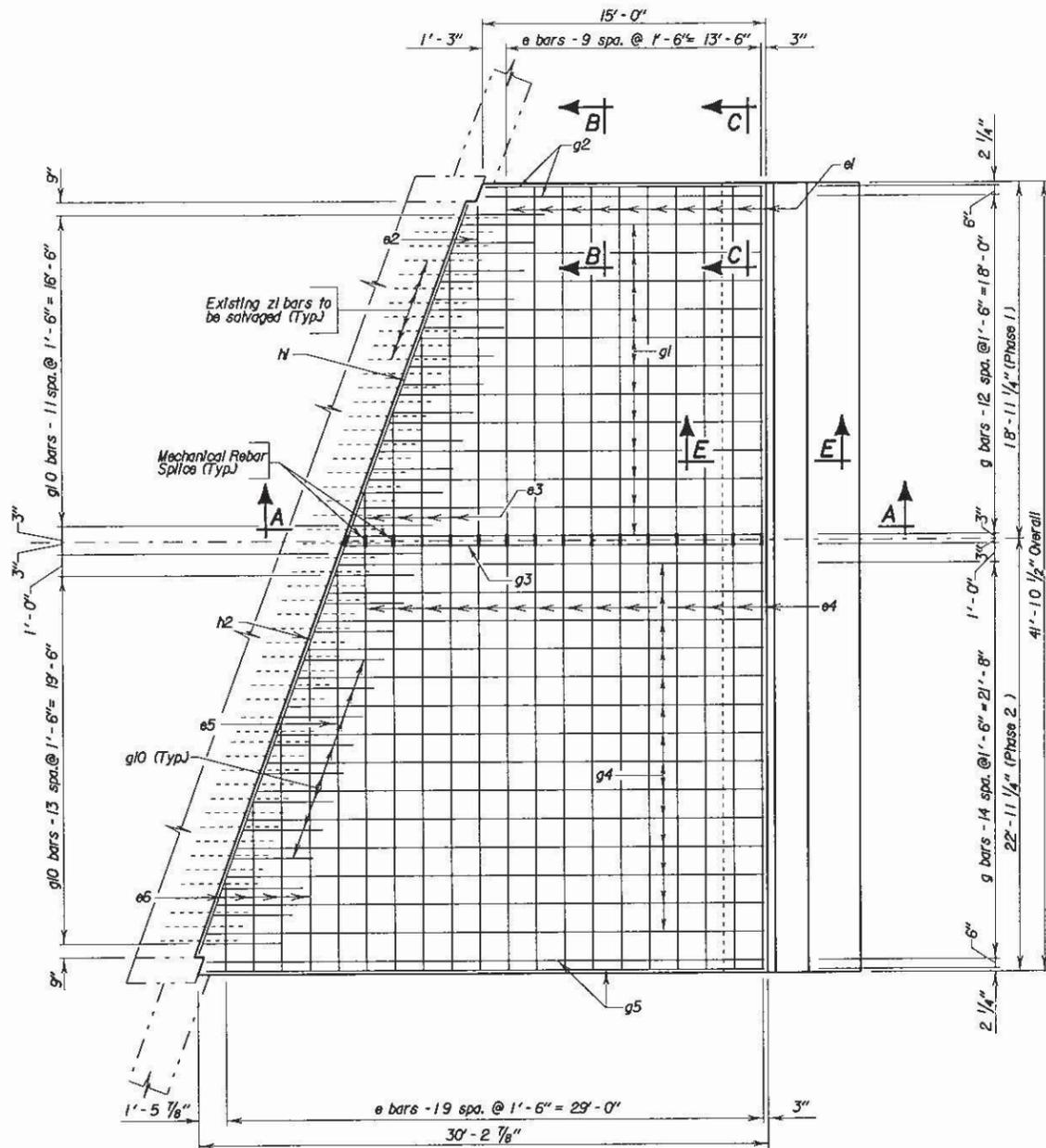
**ORIGINAL CONSTRUCTION PLANS**

(EAST BOUND LANES)  
 APPROACH SLAB LAYOUT ADJ. TO ABUT. NO. 4  
 FOR  
**326' - 1 1/16" CONT. COMP. GIRDER BRIDGE**  
 40' - 0" ROADWAY  
 STR. NO. 68-180-200  
 OVER JAMES RIVER

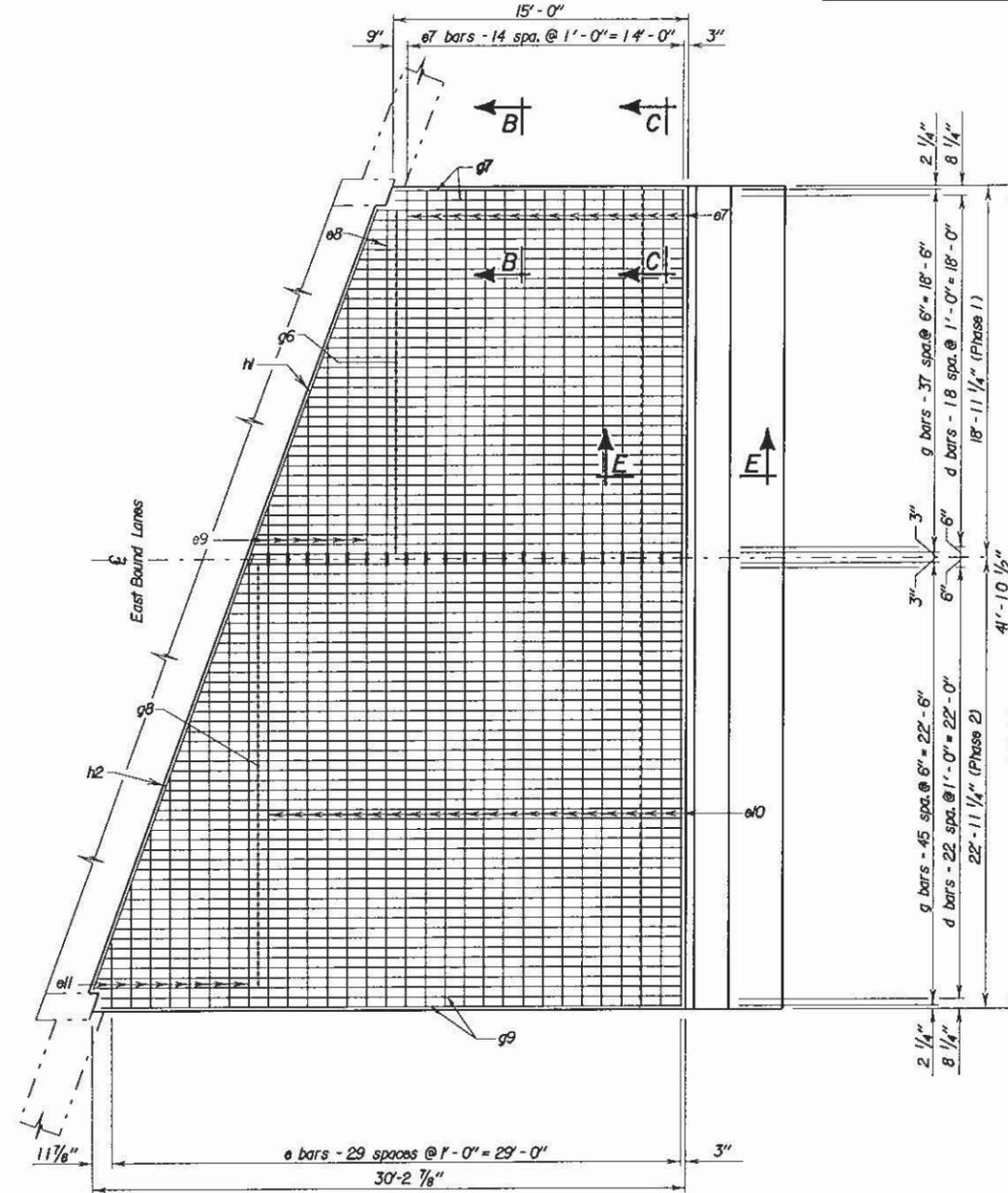
YANKTON COUNTY  
 S. D. DEPARTMENT OF TRANSPORTATION  
 JUNE 2008

DESIGNED BY EJA YANK6436	DRAWN BY JWL 64361A03	CHECKED BY BB	Kevin N. Goeden BRIDGE ENGINEER
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STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	NH 0050(123)390	25	56



PLAN  
(Top Steel Shown)



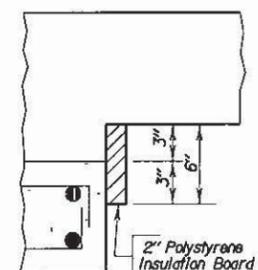
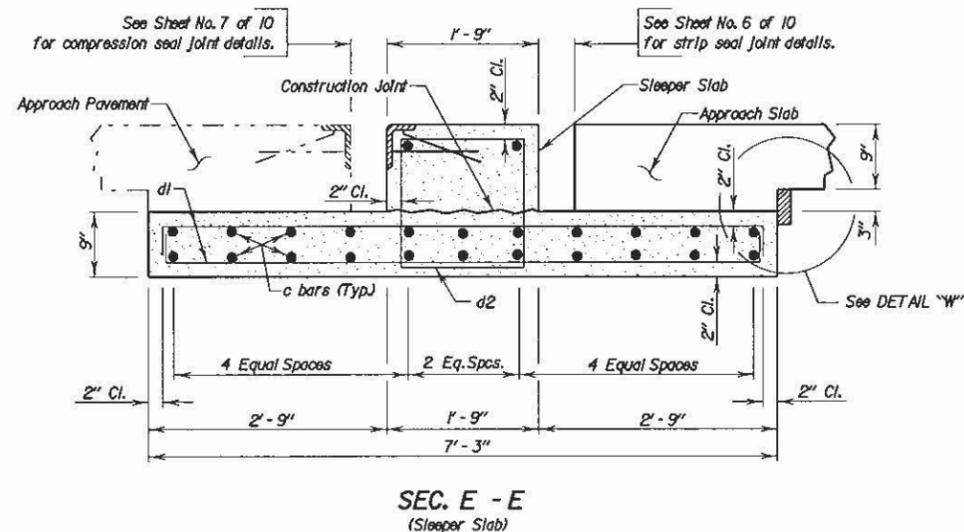
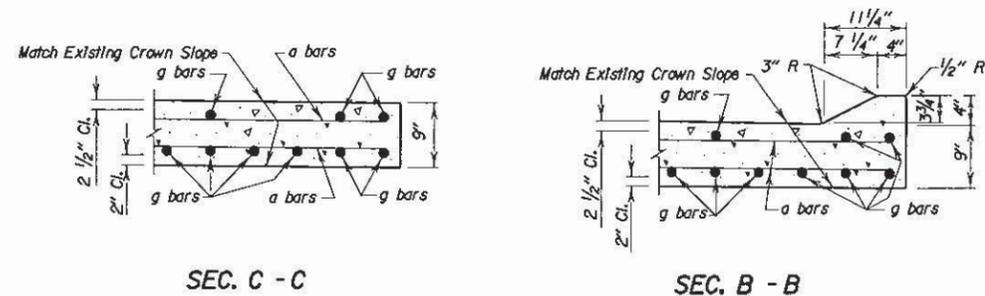
PLAN  
(Bottom Steel Shown)

**ORIGINAL CONSTRUCTION PLANS**

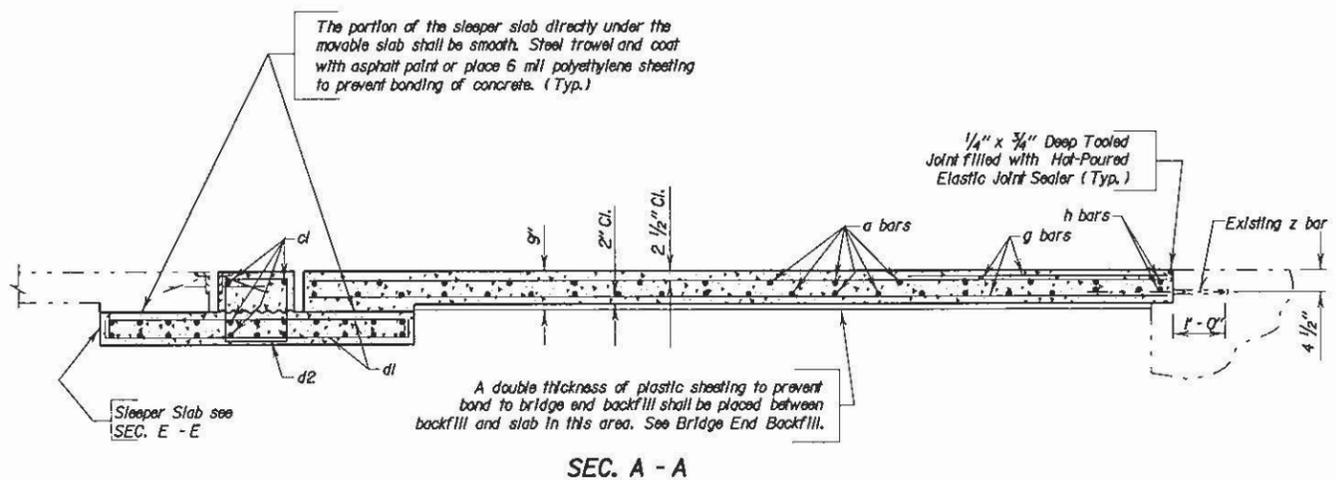
(EAST BOUND LANES)  
 DETAILS OF APPROACH SLAB ADJ. TO ABUT. NO. 4  
 FOR  
**326' - 1 1/16" CONT. COMP. GIRDER BRIDGE**  
 40' - 0" ROADWAY 20° SKEW L.H.F.  
 STR. NO. 68-180-200 SEC. 12/13-T93N-R55W  
 OVER JAMES RIVER NH 0050(64)388

YANKTON COUNTY  
 S. D. DEPARTMENT OF TRANSPORTATION  
 JUNE 2008

DESIGNED BY EJA YANK6436	DRAWN BY JWL 6436SA04	CHECKED BY BB	Kevin N. Goeden BRIDGE ENGINEER
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**DETAIL "W"**  
The Polystyrene Insulation Board shall be firmly attached to the sleeper slab by a method to be approved by the Engineer.



### REINFORCING SCHEDULE

(For One Approach and One Sleeper Slab)

PHASE 1					PHASE 2				
Mk.	No.	Size	Length	Type	Mk.	No.	Size	Length	Type
cl	24	5	18'-9"	Str.	c2	24	5	22'-9"	Str.
d1	19	4	7'-9"	2	d1	46	4	7'-9"	Str.
d2	19	4	6'-3"	T2	d2	23	4	6'-3"	Str.
e1	10	4	18'-9"	Str.	e7	15	6	18'-9"	Str.
e2	1	4	17'-9"	Str.	e8	1	6	17'-9"	Str.
e3	2	4	17'-10"	Str.	e9	3	6	19'-2"	Str.
e4	15	4	22'-9"	Str.	e10	23	6	22'-9"	Str.
e5	1	4	21'-5"	Str.	e11	4	6	26'-3"	Str.
e6	2	4	22'-2"	Str.	g6	18	8	37'-7"	Str.
g1	6	4	37'-11"	Str.	g7	2	8	14'-8"	Str.
g2	2	4	14'-8"	Str.	g8	22	8	52'-2"	Str.
g3	1	4	22'-2"	Str.	g9	2	8	22'-2"	Str.
g4	7	4	52'-2"	Str.	g10	15	4	6'-0"	Str.
g5	2	4	29'-7"	Str.	h2	2	4	23'-2"	Str.
g10	12	4	6'-0"	Str.					
N	2	6	19'-0"	Str.					

Banding Details	
e3 2'-9" ← 15'-1"	Type T2
e6 4'-11" ← 17'-3"	
e9 2'-9" ← 16'-5"	Type 2
e11 3'-6" ← 22'-9"	
d1 11'-9" ← 14'-6"	Type 2
e9 8'-2" ← 11'-0"	
e6 9'-0" ← 13'-2"	Type 2
e3 6'-10" ← 11'-0"	
g1 15'-11" ← 22'-0"	Type 2
g4 22'-6" ← 29'-8"	
g6 15'-7" ← 22'-0"	Type 2
g8 22'-2" ← 30'-0"	
g8 26'-0" ← 26'-2"	Type 2
g6 18'-8" ← 18'-11"	
g4 25'-10" ← 26'-4"	Type 2
g1 18'-8" ← 19'-3"	

**Note** - All Dimensions are out to out of bars. All Bars to be Epoxy Coated.  
 Δ Dowels  
 \* Cut Bars

⊗ These bars shall be spliced with mechanical splice devices. Equivalent Splice Lengths:  
 No. 4 - 2'-0"  
 No. 5 - 2'-6"  
 No. 6 - 3'-0"

### ESTIMATED QUANTITIES

(For One Approach and One Sleeper Slab)

ITEM	UNIT	PHASE 1	PHASE 2
		QUANTITY	QUANTITY
Remove Concrete Bridge Approach Slab	Sq Yd	67.8	82.8
Concrete Approach Slab For Bridge	Sq Yd	39.9	87.8
Concrete Approach Sleeper Slab For Bridge	Sq Yd	15.4	18.5
No. 4 Rebar Splices	Each	59	
No. 5 Rebar Splices	Each	24	
No. 6 Rebar Splices	Each	53	

	PHASE 1	PHASE 2
1. Concrete In Approach Slabs.	10.0 Cu.Yd	17.0 Cu.Yd
2. Epoxy Coated Re-Steel In Approach Slabs.	976 Lbs.	6638 Lbs.
3. Concrete In Sleeper Slabs	5.1 Cu.Yd	6.1 Cu.Yd
4. Epoxy Coated Re-Steel In Sleeper Slabs.	647 Lbs.	904 Lbs.
5. Polyethylene Sheeting	507 Sq.Ft	808 Sq.Ft

Items 1 thru 5 are approximate quantities contained in the above bid item and are for information only.

(EAST BOUND LANES)  
 DETAILS OF APPROACH SLAB ADJ. TO ABUT. NO. 4  
 (CONTINUED)  
 FOR  
**326' - 1 9/16" CONT. COMP. GIRDER BRIDGE**  
 40' - 0" ROADWAY  
 STR. NO. 68-180-200  
 OVER JAMES RIVER

20° SKEW L.H.F.  
 SEC. 12/13-T93N-R55W  
 NH 0050(64)388

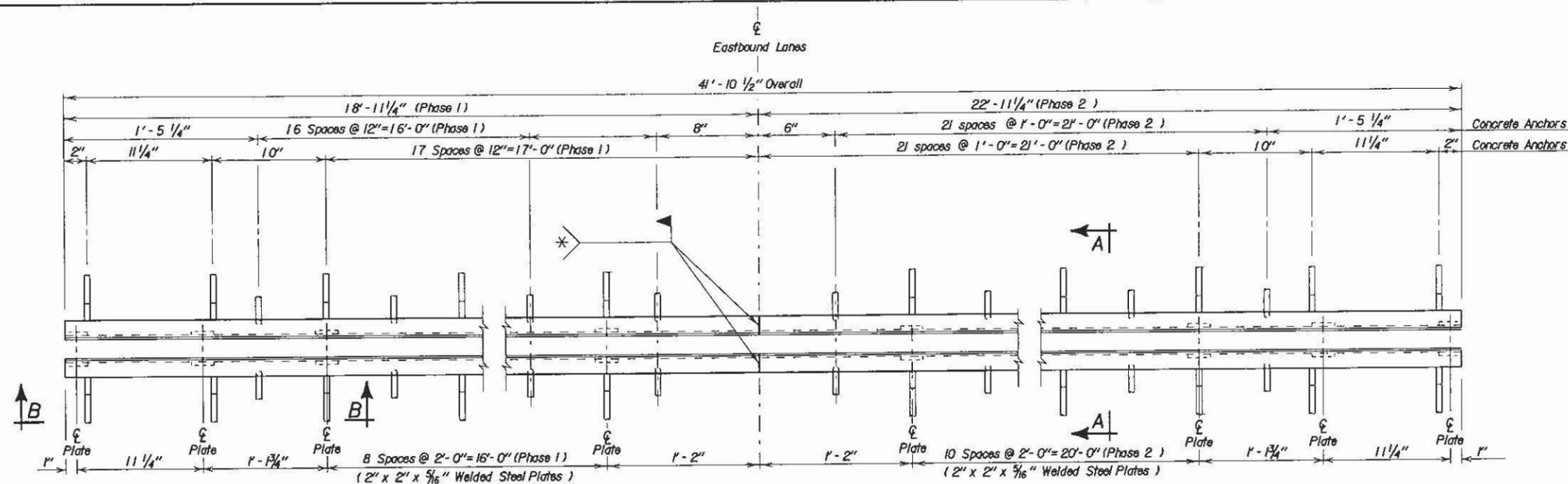
YANKTON COUNTY  
 S. D. DEPARTMENT OF TRANSPORTATION  
 JUNE 2008

DESIGNED BY EJA  
 YANK6436

DRAWN BY JWL  
 6436SA05

CHECKED BY BB  
 Kevin N. Goeden  
 BRIDGE ENGINEER

ORIGINAL CONSTRUCTION PLANS



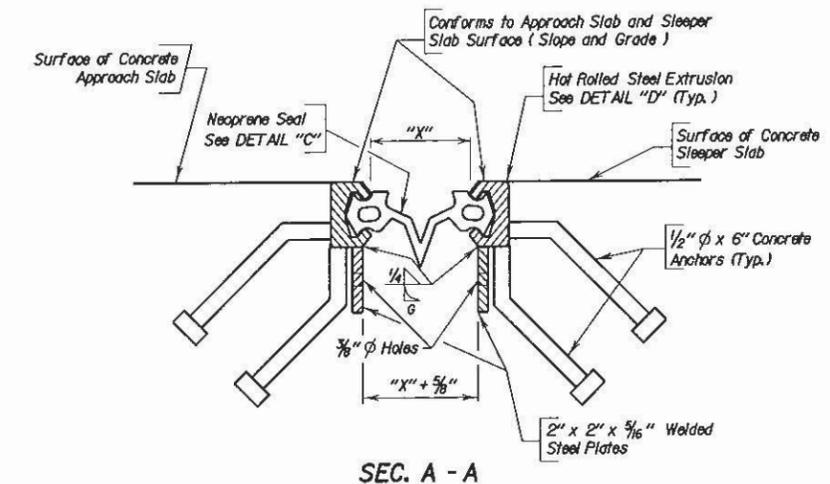
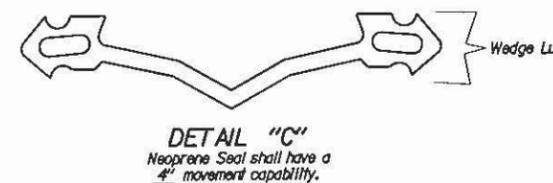
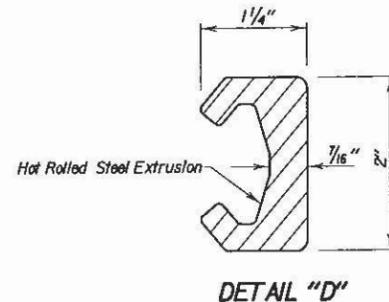
PLAN OF STRIP SEAL  
(Neoprene Seal not shown)

**JOINT INSTALLATION**

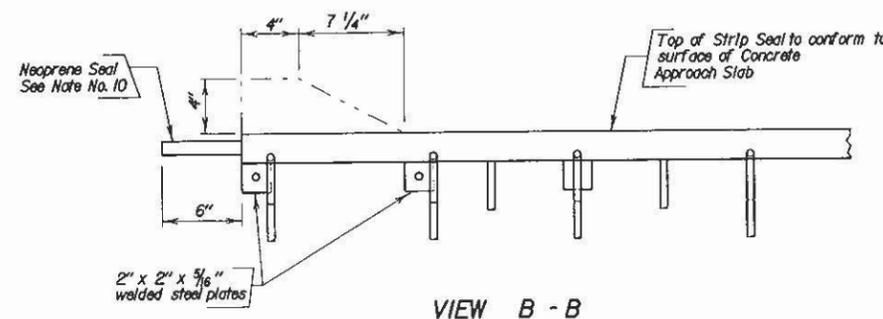
TEMP.	DIMENSION "X"
30°	3"
40°	2 3/4"
50°	2 1/2"
60°	2 1/4"
70°	2"
80°	1 3/4"
90°	1 1/2"

**GENERAL NOTES:**

- Materials for the Steel Extrusion shall conform to ASTM-A36, A242 or A588. Materials for the 2" x 2" x 5/16" welded steel plates shall conform to ASTM-A36. Material for the 1/2" diameter x 6" Concrete Anchors shall conform to Type A steel studs of Section 7 of the latest edition of the AWS D1.1 Structural Welding Code.
- Material for the neoprene seal shall conform to ASTM D262B modified to omit the recovery test. No splices will be permitted in the neoprene seal.
- A lubricant-adhesive shall be used to install the neoprene seal. The lubricant-adhesive shall be as recommended by the neoprene seal manufacturer.
- The installation of the neoprene seal shall be as recommended by its Manufacturer and approved by the Engineer, but in general shall be as follows: The neoprene seal shall be installed and bonded to the steel extrusion with a high-solids lubricant adhesive. The neoprene surfaces shall be roughened with a wire brush before the application of the lubricant adhesive. The neoprene seal may be installed either prior to or after the time the steel extrusions are concreted in the approach slabs. The steel extrusion shall be dry, clean, free from dirt, grease and contaminants at the time the neoprene seal is installed.
- Due to the length of the steel extrusions, splices are permitted. No welds shall be permitted in the internal section of the extrusion where the neoprene seal is located. Weld details shall be shown on the shop plans for approval by the Engineer. Welding shall be in accordance with latest edition of the AWS D1.1 Structural Welding Code. Galvanize the steel extrusions and anything welded to them after all welding is completed. They shall be galvanized in accordance with AASHTO M111 (ASTM A123). If welded splices are used subsequent to galvanizing, the weld details and the procedures for preparing the surface for welding and repainting the galvanizing after welding shall be included with the shop plans. Repair of galvanizing shall be by the zinc-based solder method in accordance with ASTM A780.
- The thickness and shape of the neoprene seal may vary from the sketch shown (Detail "C" on this sheet) according to the manufacturer's design; however, the wedge lugs must properly fit the groove in the steel extrusion. Before installation, the shop plans of the proposed neoprene seal showing the fixed dimensions, thickness of neoprene seal, and dimensions pertinent to the fit of the neoprene seal in the steel extrusion shall be submitted to and approved by the Engineer.
- Since the configuration and dimensions of the steel extrusion may vary according to each manufacturer's design, they need not conform exactly to that shown in Detail "D", however, any deviations from the plan shown configuration or dimensions must be approved by the Office of Bridge Design.
- The Strip Seal Expansion Joint supplier shall submit a detailed gland installation procedure with the shop plans for approval. Installation one half bridge width at a time will not be allowed unless approved, in writing by the Bridge Construction Engineer prior to installation.
- The cost of welding shall be incidental to the contract unit price per foot for Strip Seal Expansion Joint.
- The neoprene seal shall be of sufficient length such that a minimum length of 6" shall extend beyond each end of the steel extrusions.
- The Strip Seal Expansion Joint will be measured in feet to the nearest one-tenth foot, complete in place. Measurement will be made of the overall horizontal length. The Strip Seal Expansion Joint will be paid for at the contract unit price per foot complete in place. Payment for this item shall be full compensation for furnishing all the required materials in place, inclusive of labor, equipment and incidentals necessary to complete the work in accordance with plans and the foregoing specifications.
- Due to phased construction, the steel extrusion shall be spliced in the field at the location shown above. The Weld Details and the procedures for preparing the surface for welding and repainting the galvanizing after welding shall be included with the shop plans.



ESTIMATED QUANTITIES			
(For One Approach Slab)			
ITEM	UNIT	PHASE 1 QUANTITY	PHASE 2 QUANTITY
Strip Seal Expansion Joint	FL.	18.9	22.9



VIEW B - B

(EAST BOUND LANES)  
DETAILS OF STRIP SEAL  
FOR

326' - 1 5/8" CONT. COMP. GIRDER BRIDGE  
40' - 0" ROADWAY  
STR. NO. 68-180-200  
OVER JAMES RIVER

20° SKEW L.H.F.  
SEC. 12/13-T93N-R55W  
NH 0050(64)388

YANKTON COUNTY  
S. D. DEPARTMENT OF TRANSPORTATION  
JUNE 2008

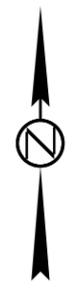
**ORIGINAL CONSTRUCTION PLANS**

DESIGNED BY EJA YANK6436	DRAWN BY JWL 64361A06	CHECKED BY BB	Kevin N. Coeden BRIDGE ENGINEER
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# SURFACING DETAILS (Removal)

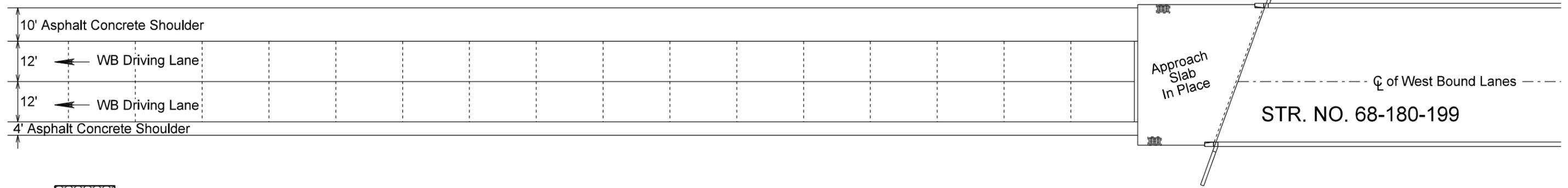
STATE OF SOUTH DAKOTA	PROJECT <b>NH 0050(123)390</b>	SHEET 28	TOTAL SHEETS 56
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Plotting Date: 12/01/2015

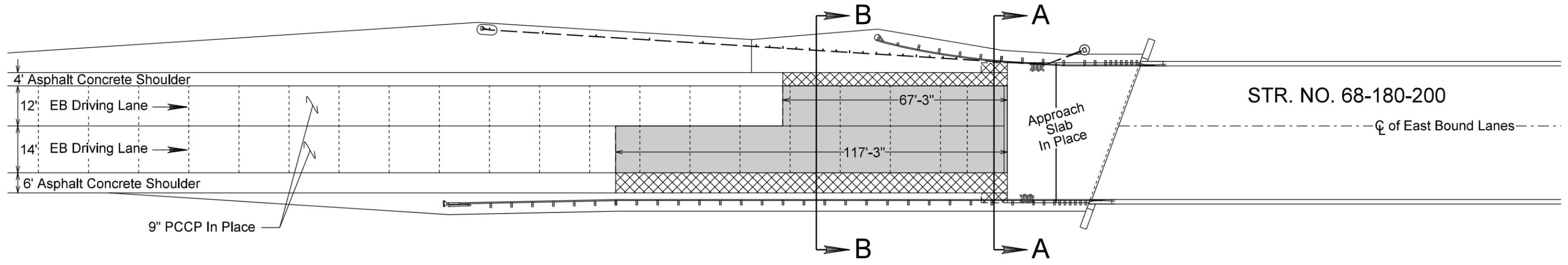


PLOT SCALE - 1:30

PLOT NAME - 2



- Unclassified Excavation
- Remove Concrete Pavement



Item	Quantity	Unit
Unclassified Excavation	85	CuYd
Remove Concrete Pavement	272	SqYd

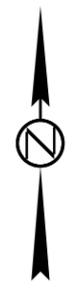
PLOTTED FROM - TRM111118

FILE - ... \PRJ2016\YANK05HE\05HE\_PCCP.DGN

# SURFACING DETAILS (Placement)

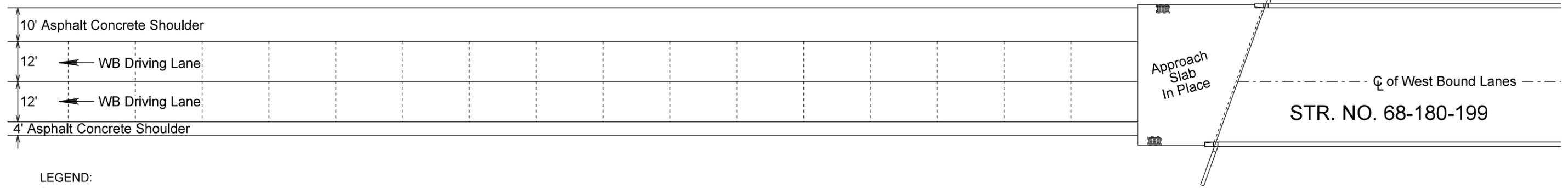
STATE OF SOUTH DAKOTA	PROJECT <b>NH 0050(123)390</b>	SHEET 29	TOTAL SHEETS 56
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Plotting Date: 12/01/2015

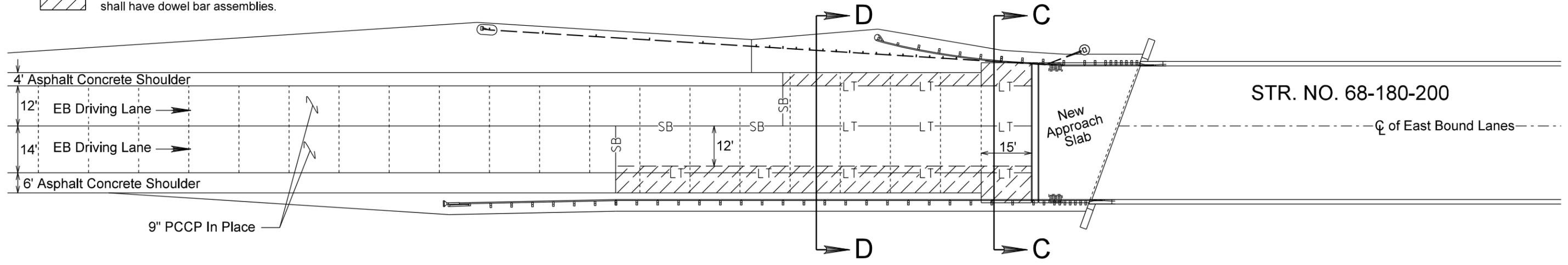


PLOT SCALE - 1:30

PLOT NAME - 3



**LEGEND:**  
 Sawed Longitudinal Joint with Tie Bars or Longitudinal Construction Joint With Tie Bars ——— LT ——— LT ——— LT ———  
 Transverse Contraction Joint - - - - -  
 Longitudinal Construction Joint without Tie Bars ——— L ——— L ——— L ——— L ———  
 Steel Bar Insertion in Longitudinal or Transverse Joints ——— SB ——— SB ———  
 Transverse contraction joints within these areas shall not have dowel bar assemblies. All other transverse contraction joints shall have dowel bar assemblies.



PLOTTED FROM - TRM111118

FILE - ... \PRJ2016\YANK05HE\05HE\_PCCP.DGN

Item	Quantity	Unit
9" Nonreinforced PCC Pavement	419	SqYd
Dowel Bar	156	Each
Insert Steel Bar In PCC Pavement	35*	Each

\*Quantity includes 16 No. 9 x 18" Deformed Tie Bars and 19 No. 5 x 24" Deformed Tie Bars.

# SURFACING DETAILS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0050(123)390	30	56

Plotting Date: 12/01/2015

PLOT SCALE - 1:6.6

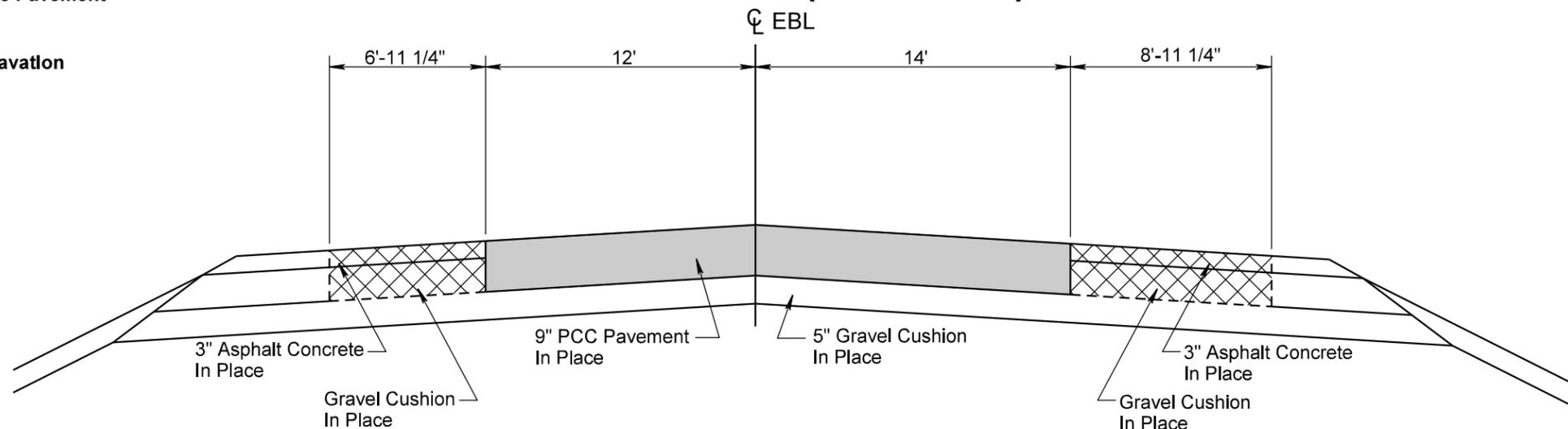
PLOT NAME - 4

FILE - ... \PRJ2016\YANK05HE\05HE\_PCCP.DGN

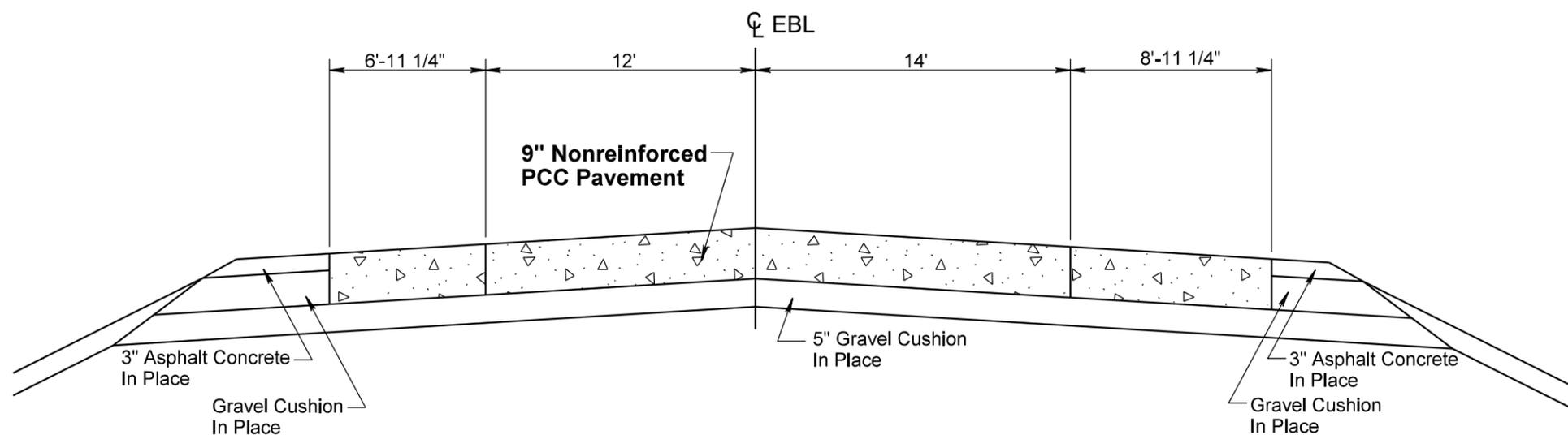
PLOTTED FROM - TRM111118

Remove Concrete Pavement
   
 Unclassified Excavation

## SECTION A-A (Removal)



## SECTION C-C (Placement)

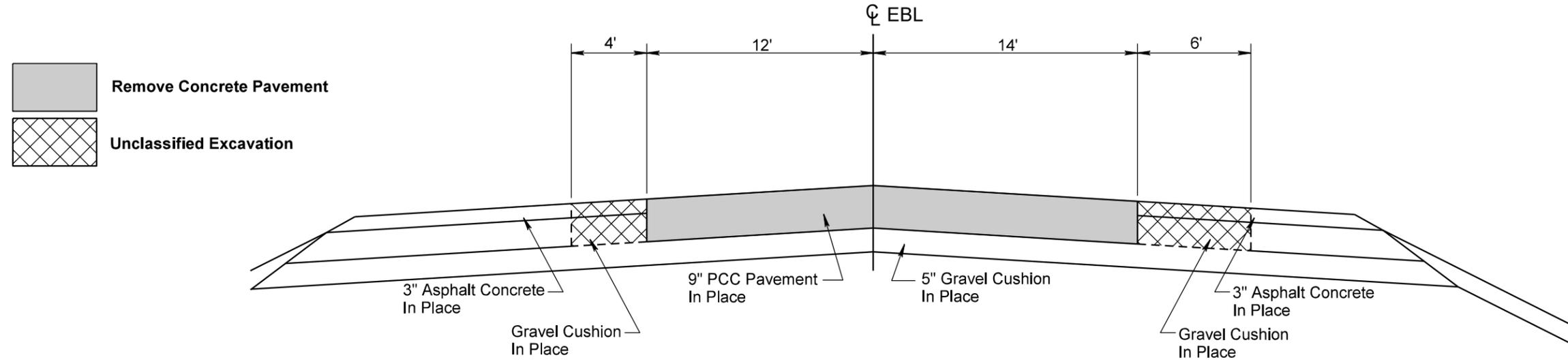


# SURFACING DETAILS

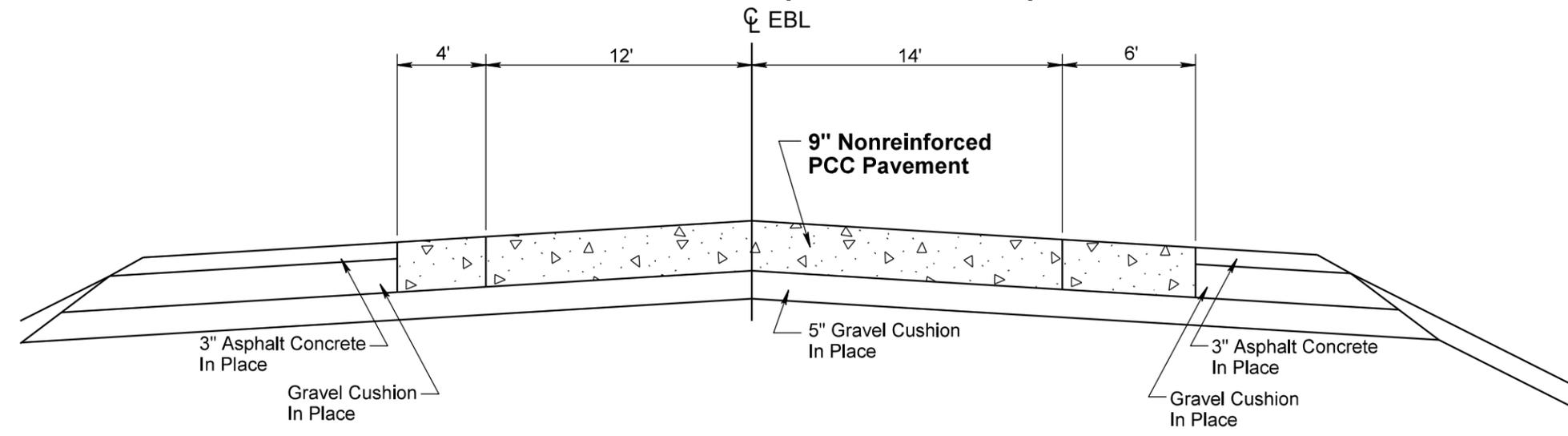
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0050(123)390	31	56

Plotting Date: 12/01/2015

## SECTION B-B (Removal)



## SECTION D-D (Placement)



PLOT SCALE - 1:6.6

PLOT NAME - 5

FILE - ... \PRJ2016\YANK05HE\05HE\_PCCP.DGN

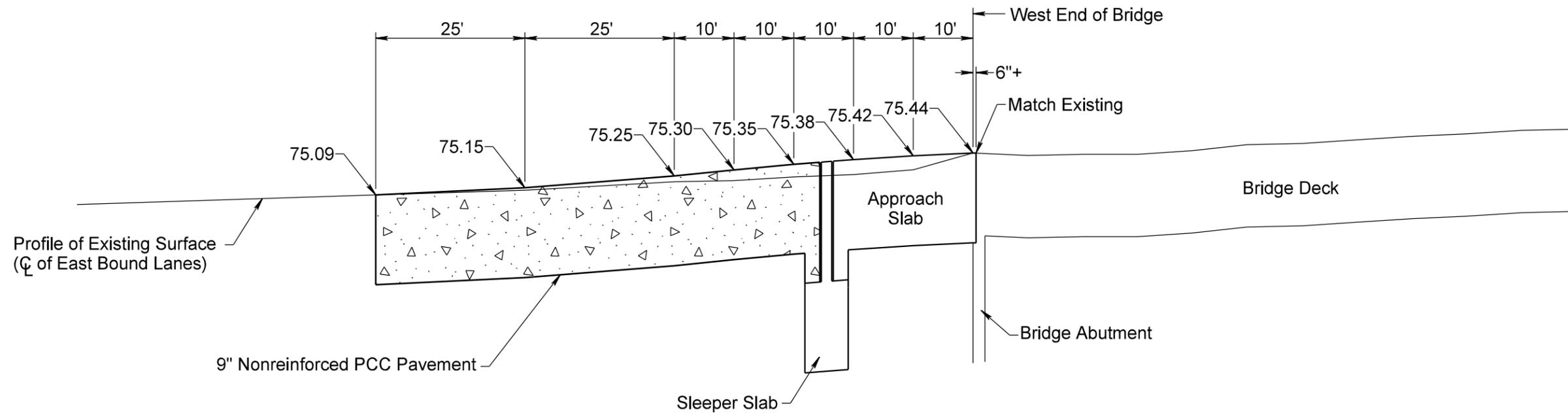
PLOTTED FROM - TRM111118

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0050(123)390	32	56

Plotting Date: 12/01/2015

# PAVEMENT PROFILE FOR BRIDGE AT WEST END OF STR. NO. 68-180-200

NOTE: Add 1100.00 to all elevations shown on profile.



PLOT SCALE - 1:1

PLOT NAME - 6

FILE - ... \PRJ2016\YANK05HE\05HE\_PCCP.DGN

PLOTTED FROM - TRM111118

# DROP INLET INSTALLATION

STR. NO. 68-180-200 SD50 MRM 390.05 EBL (WEST END)

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0050(123)390	33	56

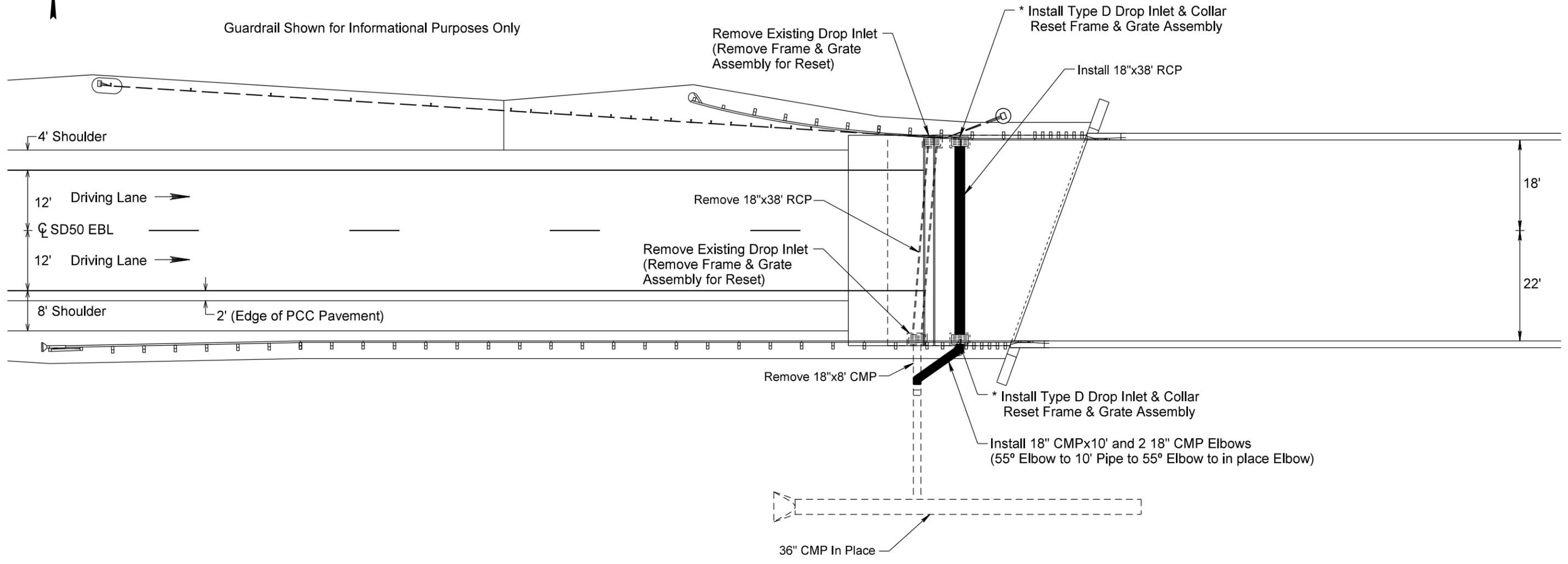
Plotting Date: 12/01/2015



PLOT SCALE - 1:20

PLOT NAME - 7

FILE - ... \PRJ2016\YANK05HE\DROP05HE.DGN



\* Elevations for New Drop Inlets will be determined by the Engineer.

PLOTTED FROM - TRM111118

# INSTALLATION OF GUARDRAIL

STR. NO. 68-180-200 SD50 MRM 390.05 EBL (WEST END ONLY)

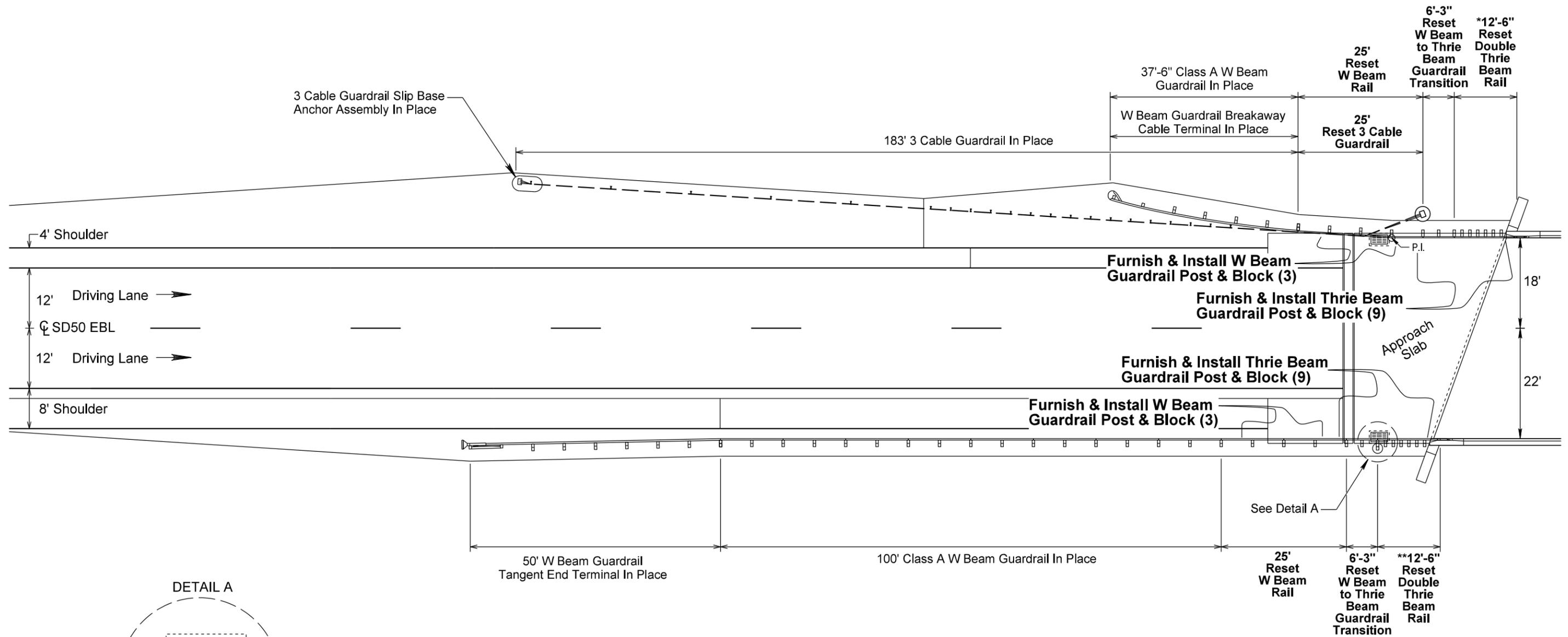
STATE OF SOUTH DAKOTA	PROJECT NH 0050(123)390	SHEET 34	TOTAL SHEETS 56
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Plotting Date: 12/01/2015

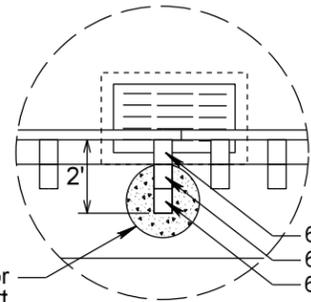


PLOT SCALE - 1:20

PLOT NAME - 8



DETAIL A



Concrete Anchor Footing for Short Guardrail Post (See Standard Plate 630.84 for Details)

6"x8"x22 1/2" Block  
6"x8"x22 1/2" Block  
6"x8" Post

\* 2'-7 1/16" of guardrail overlaps onto structure.  
\*\* 1'-10 1/8" of guardrail overlaps onto structure.

PLOTTED FROM - TRM111118

FILE - ... \PRJ2016\YANK05HE\T1GR05HE.DGN

# INSTALLATION OF GUARDRAIL

STR. NO. 68-180-200 SD50 MRM 390.05 EBL (EAST END ONLY)

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0050(123)390	35	56

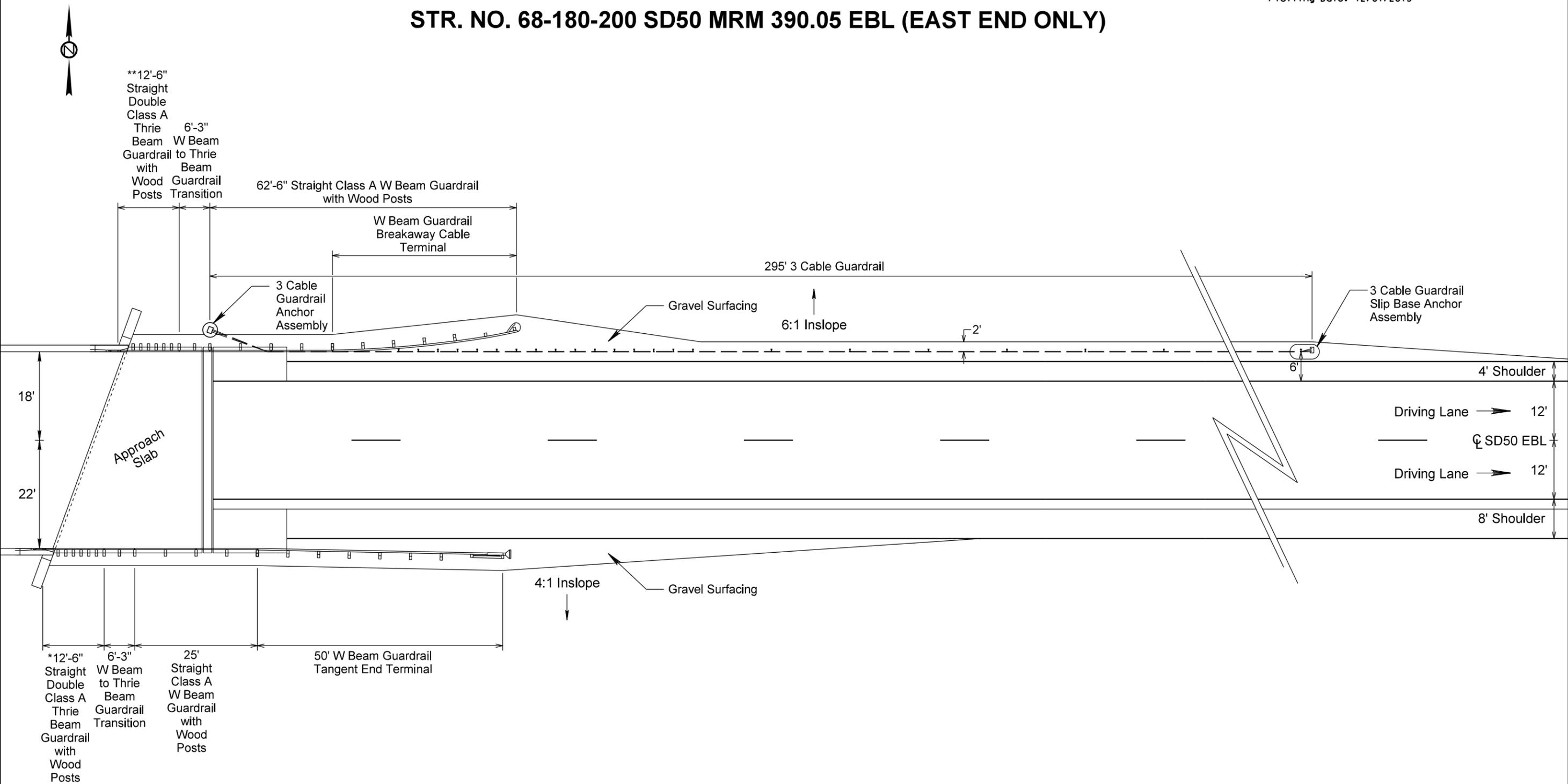
Plotting Date: 12/01/2015

PLOT SCALE - 1:20

PLOT NAME - 9

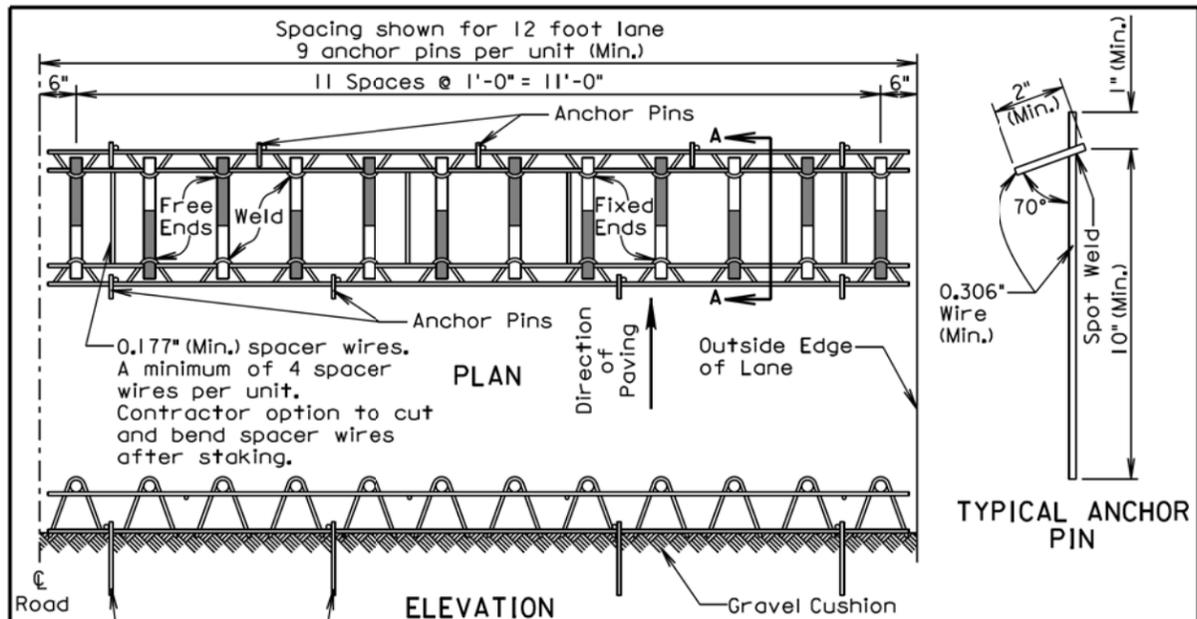
PLOTTED FROM - TRM111118

FILE - ... \PRJ2016\YANK05HE\T1GR05HE.DGN

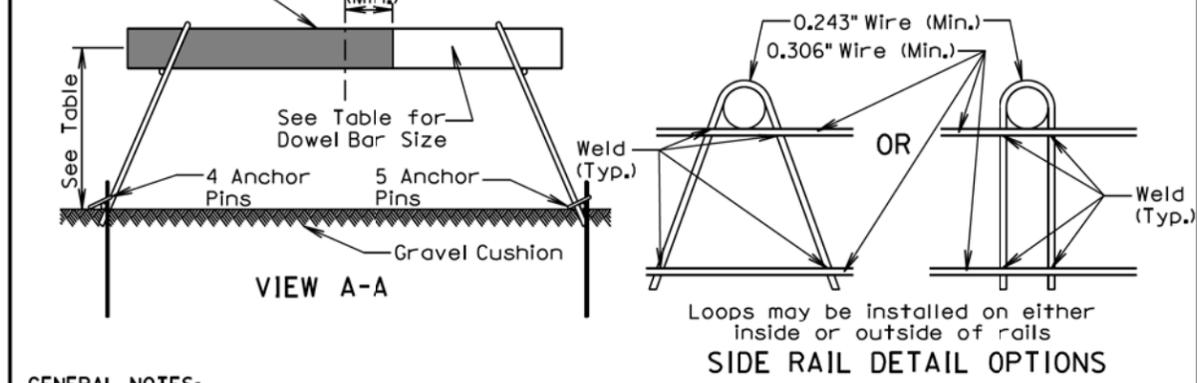


\* 2'-7 1/16" of guardrail overlaps onto structure.  
 \*\* 1'-10 1/8" of guardrail overlaps onto structure.

Plotting Date: 12/01/2015



PAVEMENT THICKNESS	EPOXY COATED DOWEL BAR SIZE	HEIGHT TO CENTER
7" to 7 1/2"	1" x 18"	3.0"
8" to 10"	1 1/4" x 18"	4.0"
10 1/2" to 12"	1 1/2" x 18"	5.0"



**GENERAL NOTES:**

Longitudinal joint tie bars shall be placed a minimum of 15 inches from the transverse contraction joint.

Centerline of individual dowel bars shall be parallel to top of subgrade  $\pm 1/8$  inch in 18 inches and to all other dowel bars in the assembly  $\pm 1/16$  inch in 18 inches.

Centerline of individual dowel bars shall be parallel to the centerline of the roadway  $\pm 1/2$  inch in 18 inches.

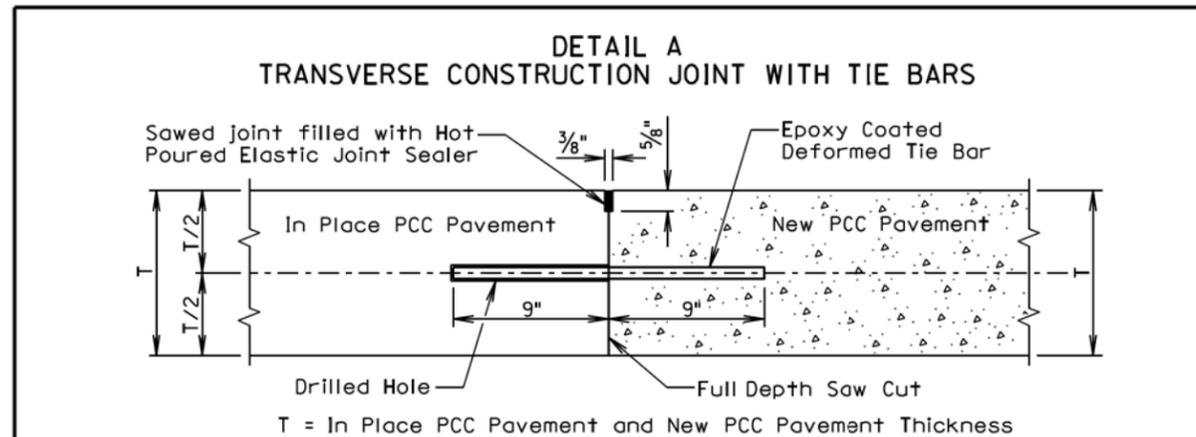
The transverse contraction joints shall be sawed perpendicular to the centerline of the roadway and the dowel bars shall be centered on the sawed joint  $\pm 1$  inch.

Supporting devices as shown on this sheet, or equivalent as approved by the Engineer, shall be used to maintain proper horizontal and vertical alignment of the dowel bars.

August 30, 2013

<b>S D D O T</b>	<b>PCC PAVEMENT DOWEL BAR ASSEMBLY FOR TRANSVERSE CONTRACTION JOINTS</b>	PLATE NUMBER <b>380.01</b>
	<b>12 Bar Assembly on Granular Base Material</b>	Sheet 1 of 1

Published Date: 4th Qtr. 2015



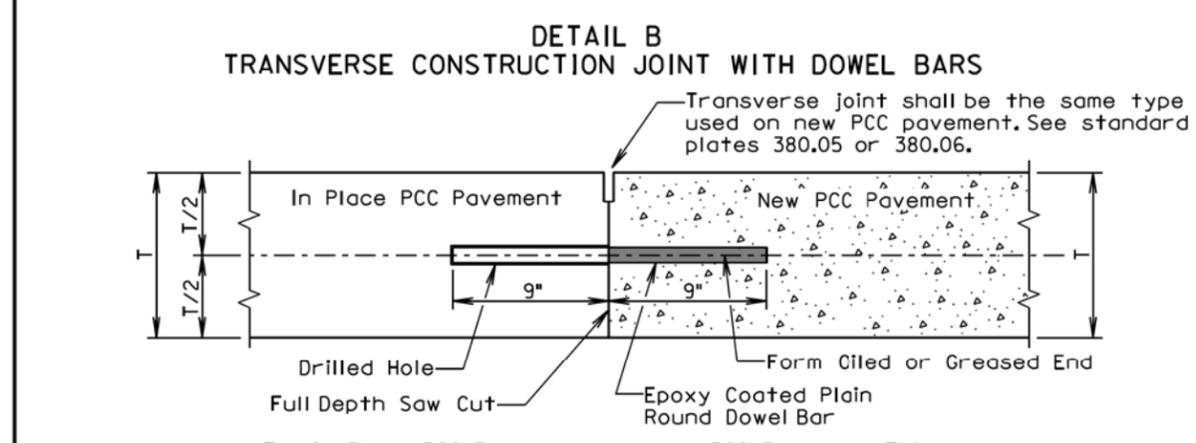
**GENERAL NOTES:**

The term "In Place PCC Pavement" in the above drawing indicates that the in place PCC pavement was placed on a previous project.

See sheet 2 of 2 of this standard plate to determine if Detail A shall be used.

The tie bars shall be embedded a minimum depth of 9 inches into the in place PCC pavement and anchored with an epoxy resin adhesive.

No. 9 epoxy coated deformed tie bars shall be used in 10 inch thickness and less PCC Pavement and No. 11 epoxy coated deformed tie bars shall be used in 10.5 inch thickness and greater PCC Pavement. The tie bar spacing shall be 18 inches center to center and shall be a minimum of 3 inches and a maximum of 9 inches from the pavement edges.



**GENERAL NOTES:**

The term "In Place PCC Pavement" in the above drawing indicates that the in place PCC pavement was placed on a previous project or current project.

See sheet 2 of 2 of this standard plate to determine if Detail B shall be used.

The plain round dowel bars shall be embedded a minimum depth of 9 inches into the in place PCC pavement and anchored with an epoxy resin adhesive.

The epoxy coated plain round dowel bar size, number, and spacing shall be the same as detailed on the corresponding dowel bar assembly standard plate (380.01, 380.02, 380.03, or 380.04). The epoxy coated plain round dowel bars shall be a minimum of 3 inches and a maximum of 6 inches from the pavement edges.

September 6, 2013

<b>S D D O T</b>	<b>PCC PAVEMENT TRANSVERSE CONSTRUCTION JOINTS WITH TIE BARS OR DOWEL BARS</b>	PLATE NUMBER <b>380.08</b>
	<b>Published Date: 4th Qtr. 2015</b>	Sheet 1 of 2

Published Date: 4th Qtr. 2015

PLOT SCALE - 1:200

PLOTTED FROM - TRM111118

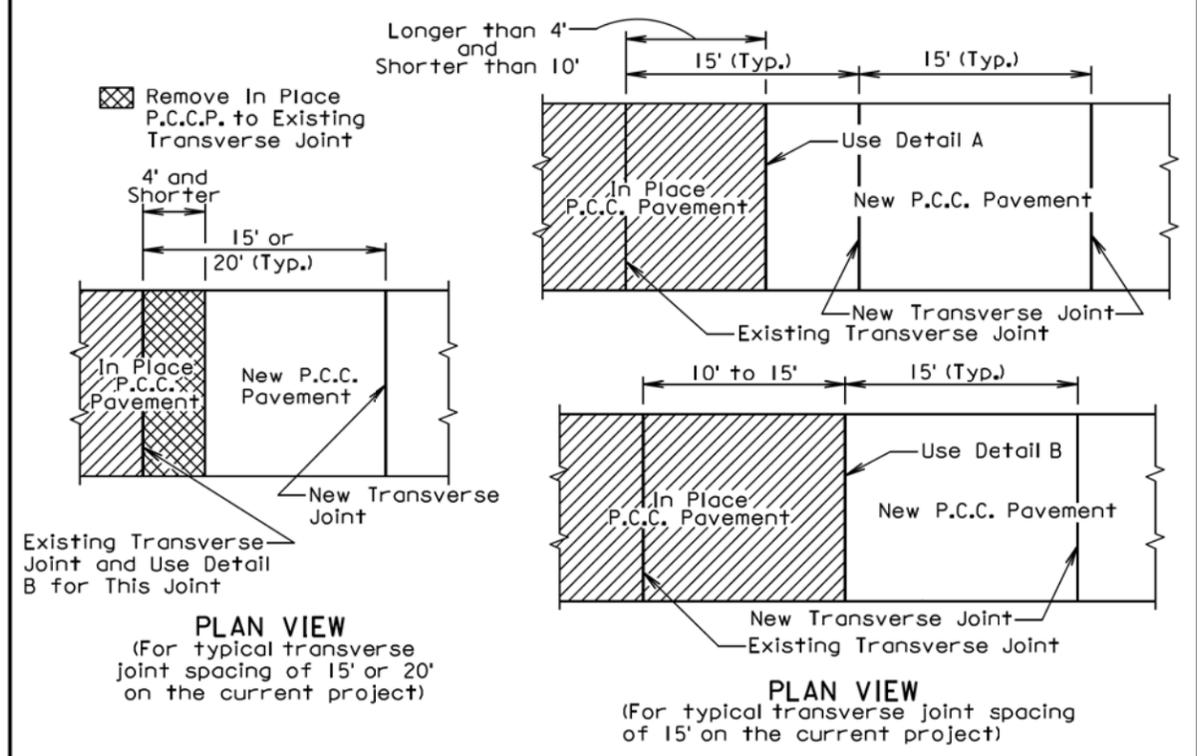
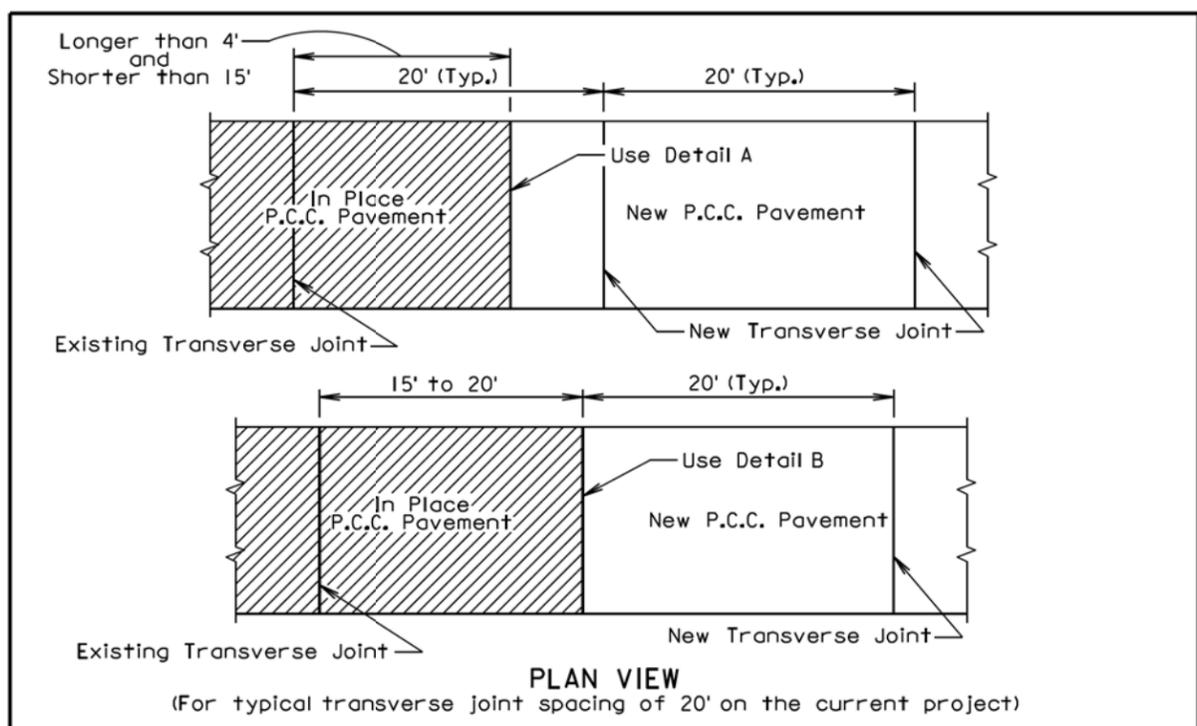
PLOT NAME - 10

FILE - ... \STANDARDPLATES\_08HE.DGN

Plotting Date: 12/01/2015

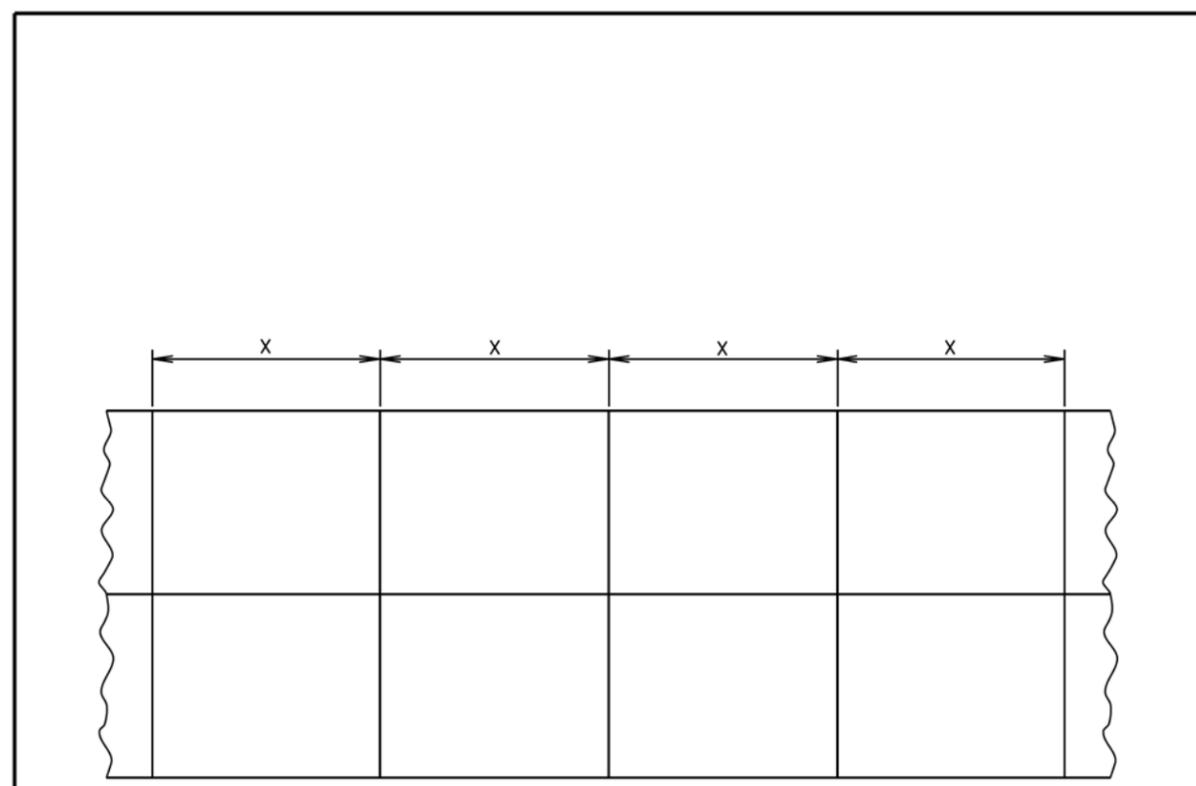
PLOT SCALE - 1:200

PLOT NAME - 11



September 6, 2013

Published Date: 4th Qtr. 2015	S D D O T	PCC PAVEMENT TRANSVERSE CONSTRUCTION JOINTS WITH TIE BARS OR DOWEL BARS	PLATE NUMBER 380.08
			Sheet 2 of 2



PCCP Thickness	Transverse Contraction Joint Spacing (X)
8" to 9.5"	15'
10" and Thicker	20'

August 31, 2013

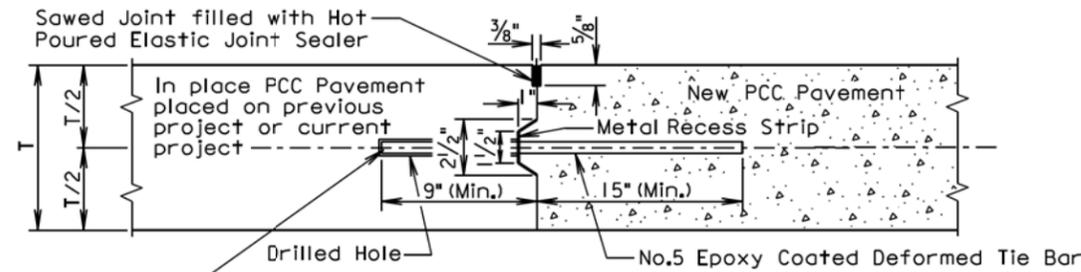
Published Date: 4th Qtr. 2015	S D D O T	PCC PAVEMENT TYPICAL CONTRACTION JOINT SPACING	PLATE NUMBER 380.09
			Sheet 1 of 1

PLOTTED FROM - TRM111118

FILE - ... \STANDARDPLATES\_08HE.DGN

**LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS**

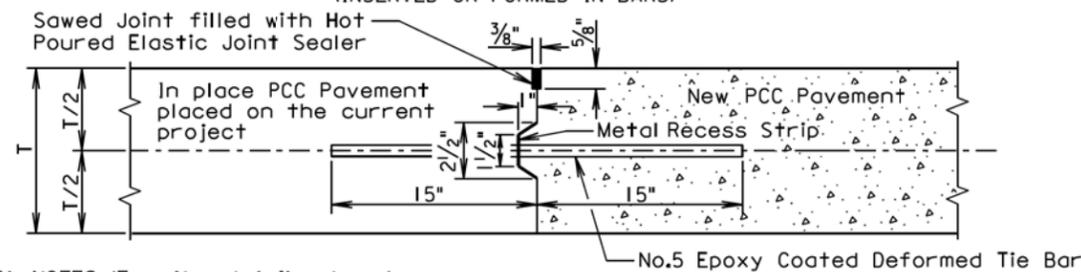
(DRILLED IN BARS)



The tie bars shall be embedded a minimum depth of 9 inches into the in place PCC pavement and anchored with an epoxy resin adhesive.

**LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS**

(INSERTED OR FORMED IN BARS)



**GENERAL NOTES (For the details above):**

The epoxy coated deformed tie bars shall be spaced in accordance with the following tables:

Tie Bar Spacing 48" Maximum	
Transverse Contraction Joint Spacing	Number of Tie Bars
6.5' to 10'	2
10.5' to 14'	3
14.5' to 18'	4
18.5' to 22'	5

Tie Bar Spacing 30" Maximum	
Transverse Contraction Joint Spacing	Number of Tie Bars
5' to 7'	2
7.5' to 9.5'	3
10' to 12'	4
12.5' to 14.5'	5
15' to 17'	6
17.5' to 19.5'	7
20' to 22'	8

The tie bars shall be placed a minimum of 15 inches from transverse contraction joints.

The required number of tie bars as shown in the table shall be uniformly spaced within each panel. The uniformly spaced tie bars shall be spaced a maximum of 48 inches center to center for a female keyway and shall be spaced a maximum of 30 inches center to center for a vertical face and male keyway. The maximum tie bar spacing shall apply to tie bars within each panel.

The keyway illustrated in the above details depict a female keyway.

The keyway is optional and is not required. When concrete pavement is formed and a keyway is provided, a metal recess strip shall be used. When concrete pavement is slip formed, a metal recess strip is not required.

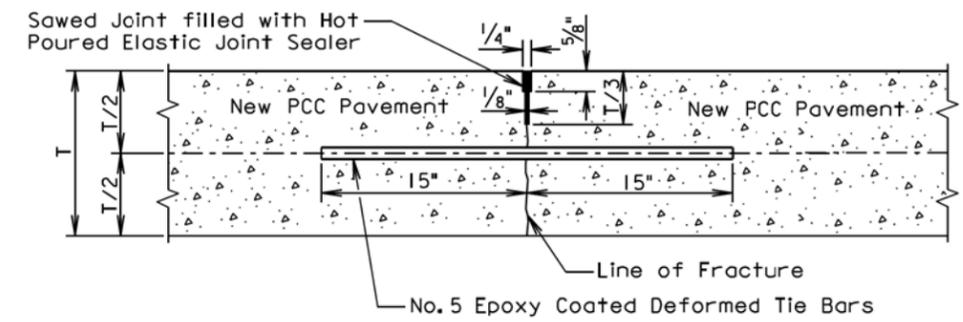
August 31, 2013

<b>S D D O T</b>	<b>PCC PAVEMENT LONGITUDINAL JOINTS WITH TIE BARS</b>	PLATE NUMBER <b>380.10</b>
		Sheet 1 of 2

Published Date: 4th Qtr. 2015

**SAWED LONGITUDINAL JOINT WITH TIE BARS**

(POURED MONOLITHICALLY)



T = Pavement Thickness

**GENERAL NOTES (For the detail above):**

The epoxy coated deformed tie bars shall be spaced in accordance with the following table:

Tie Bar Spacing 48" Maximum	
Transverse Contraction Joint Spacing	Number of Tie Bars
6.5' to 10'	2
10.5' to 14'	3
14.5' to 18'	4
18.5' to 22'	5

The tie bars shall be placed a minimum of 15 inches from the transverse contraction joints.

The required number of tie bars as shown in the table shall be uniformly spaced within each panel with a maximum space of 48 inches center to center. The maximum tie bar spacing shall apply to tie bars within each panel.

The first saw cut to control cracking shall be a minimum of 1/3 the thickness of the pavement. Additional sawing for widening the saw cut to provide the width for the installation of the hot poured elastic joint sealer is necessary.

August 31, 2013

<b>S D D O T</b>	<b>PCC PAVEMENT LONGITUDINAL JOINTS WITH TIE BARS</b>	PLATE NUMBER <b>380.10</b>
		Sheet 2 of 2

Published Date: 4th Qtr. 2015

PLOT SCALE - 1:200

PLOT NAME - 12

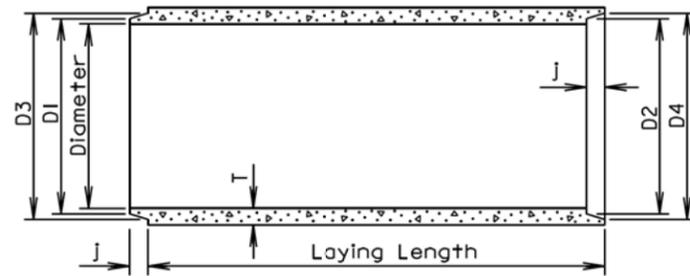
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.PLOTTED FROM - TRM111118

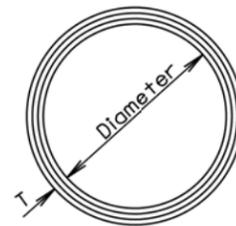
Plotting Date: 12/01/2015

**TOLERANCES IN DIMENSIONS**

Diameter:  $\pm 1.5\%$  for 24" Dia. or less and  $\pm 1\%$  or  $\frac{3}{8}$ " whichever is more for 27" Dia. or greater.  
 Diameters at joints:  $\pm \frac{3}{16}$ " for 30" Dia. or less and  $\pm \frac{1}{4}$ " for 36" or greater.  
 Length of joint (J):  $\pm \frac{1}{4}$ ".  
 Wall thickness (T): not less than design T by more than 5% or  $\frac{3}{16}$ ", whichever is greater.  
 Laying length: shall not underrun by more than  $\frac{1}{2}$ ".



**LONGITUDINAL SECTION**



**END VIEW**

**GENERAL NOTES:**

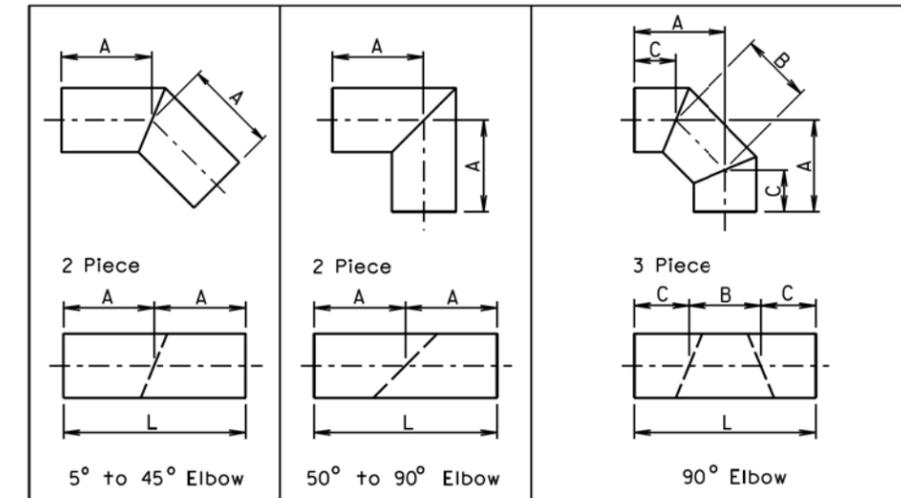
Construction of R. C. P. shall conform to the requirements of Section 990 of the Specifications.

Not more than 2 four-foot sections shall be permitted near the ends of any culvert. Four-foot lengths shall be used only to secure the required length of culvert.

Diam. (in.)	Approx. Wt. / Ft. (lb.)	T (in.)	J (in.)	D1 (in.)	D2 (in.)	D3 (in.)	D4 (in.)
12	92	2	1 3/4	13 1/4	13 5/8	13 1/8	14 1/4
15	127	2 1/4	2	16 1/2	16 7/8	17 1/4	17 5/8
18	168	2 1/2	2 1/4	19 5/8	20	20 3/8	20 3/4
21	214	2 3/4	2 1/2	22 1/8	23 1/4	23 3/4	24 1/8
24	265	3	2 3/4	26	26 3/8	27	27 3/8
27	322	3 1/4	3	29 1/4	29 5/8	30 1/4	30 5/8
30	384	3 1/2	3 1/4	32 3/8	32 3/4	33 1/2	33 7/8
36	524	4	3 3/4	38 3/4	39 1/4	40	40 1/2
42	685	4 1/2	4	45 1/8	45 5/8	46 1/2	47
48	867	5	4 1/2	51 1/2	52	53	53 1/2
54	1070	5 1/2	4 1/2	57 1/8	58 3/8	59 3/8	59 7/8
60	1296	6	5	64 1/4	64 3/4	66	66 1/2
66	1542	6 1/2	5 1/2	70 5/8	71 1/8	72 1/2	73
72	1810	7	6	77	77 1/2	79	79 1/2
78	2098	7 1/2	6 1/2	83 3/8	83 7/8	85 5/8	86 1/8
84	2410	8	7	89 3/4	90 1/4	92 1/8	92 5/8
90	2740	8 1/2	7	95 3/4	96 1/4	98 1/8	98 5/8
96	2950	9	7	102 1/8	102 5/8	104 1/2	105
102	3075	9 1/2	7 1/2	109	109 1/2	111 1/2	112
108	3870	10	7 1/2	115 1/2	116	118	118 1/2

June 26, 2015

<b>S D D O T</b>	<b>REINFORCED CONCRETE PIPE</b>	PLATE NUMBER <b>450.01</b>
	Published Date: 4th Qtr. 2015	Sheet 1 of 1



Diameter	A	L	Diameter	A	L	Diameter	A	B	C	L
Inches	Feet	Feet	Inches	Feet	Feet	Inches	Inches			Feet
12	1	2	12	2	4	12	25 1/2	11	18 1/2	4
15	1	2	15	2	4	15	26 1/2	12	18	4
18	1	2	18	2	4	18	27	14	17	4
21	2	4	21	2	4	21	27	15	16 1/2	4
24	2	4	24	2	4	24	27 1/2	16	16	4
27	2	4	27	2	4	27	27 1/2	17	15 1/2	4
30	2	4	30	3	6	30	40	19	26 1/2	6
33	2	4	33	3	6	33	40	20	26	6
36	2	4	36	3	6	36	40 1/2	21	25 1/2	6
42	2	4	42	3	6	42	41	23	24 1/2	6
48	2	4	48	4	8	48	53 1/2	26	35	8
54	3	6	54	4	8	54	54	28	34	8
60	3	6	60	4	8	60	54 1/2	31	32 1/2	8
66	3	6	66	4	8	66	54	33	31 1/2	8
72	3	6	72	5	10	72	67 1/2	36	42	10
78	3	6	78	5	10	78	68	39	40 1/2	10
84	3	6	84	5	10	84	68 1/2	41	39 1/2	10
90	3	6	90	6	12	90	70	46	37	10
96	3	6	96	6	12	96	82	46	49	12

**FABRICATED ELBOW LENGTHS FOR ALL CORRUGATIONS**

**GENERAL NOTES:**

All dimensions shown are nominal.

L = Linear Feet of C.M.P. required to fabricate fitting.

June 26, 2001

<b>S D D O T</b>	<b>C.M.P. FABRICATED LENGTHS FOR ELBOWS</b>	PLATE NUMBER <b>450.32</b>
	Published Date: 4th Qtr. 2015	Sheet 1 of 1

PLOT SCALE - 1:200

PLOT NAME - 13

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Plotting Date: 12/01/2015

**GENERAL NOTES:**

Flanged channel steel posts are shown on this standard plate, however, S3 X 5.7 steel I beam posts may be substituted for the flanged channel steel posts.

All costs associated with furnishing and installing the W Beam to 3 Cable Transition Bracket shall be incidental to the contract unit price per Ft. for "3 Cable Guardrail", "Reset 3 Cable Guardrail", or "Reset 3 Cable Guardrail, Cable Only".

See Standard Plates 630.31, 630.32, and 630.33 for details and payment information for W Beam Guardrail.

See Standard Plate 629.01 for details and payment information for 3 Cable Guardrail.

December 16, 2014

PLATE NUMBER  
**629.05**

Sheet 1 of 1

**SDOT**

**W BEAM TO 3 CABLE TRANSITION**

Published Date: 4th Qtr. 2015

**SDOT**

**3 CABLE GUARDRAIL SLIP BASE ANCHOR ASSEMBLY**

Published Date: 4th Qtr. 2015

(6) 3/4" ASH Hex Nuts with Flat Washers

Cable Anchor Bracket

Rods shall project 1 1/2" above the concrete

Class M6 Concrete Cast in place (No forms necessary)

ELEVATION VIEW (Anchor Assembly)

6'-0"

(8) 3/4" round x 18" long steel rods shall conform to ASTM A449 and the top 6" of the rods shall be galvanized in accordance with ASTM F2329.

Provide heavy hex nuts at each end of each rod and a flat washer shall be placed on each rod on the top end. The threads shall be punched after the top nuts are installed to prevent rotation. The heavy hex nuts shall conform to ASTM A563.

6" x 14" x 1/4" Steel Plate Punch or drill holes to the same plan pattern as the cable anchor bracket.

\* See Standard Plate 630.98

Face of cables and center of anchor

Center of post is 3" back from face of cables

PLAN VIEW (Anchor Assembly)

Remove soil prior to placement of concrete

ISOMETRIC VIEW

Remove soil prior to placement of concrete

ISOMETRIC VIEW

Anchor CONSTRUCTION NOTES:

1. Auger two 3' diameter by 3'-9" deep holes tangent to each other.
2. Clean out the top 6 inches of soil between the holes.
3. Place concrete in holes with anchor bolts and slip base stub post in place.
4. For informational purposes the neat line concrete volume of the anchor is 1.9 cubic yards.

June 26, 2015

December 16, 2014

PLATE NUMBER  
**629.10**

Sheet 1 of 3

**SDOT**

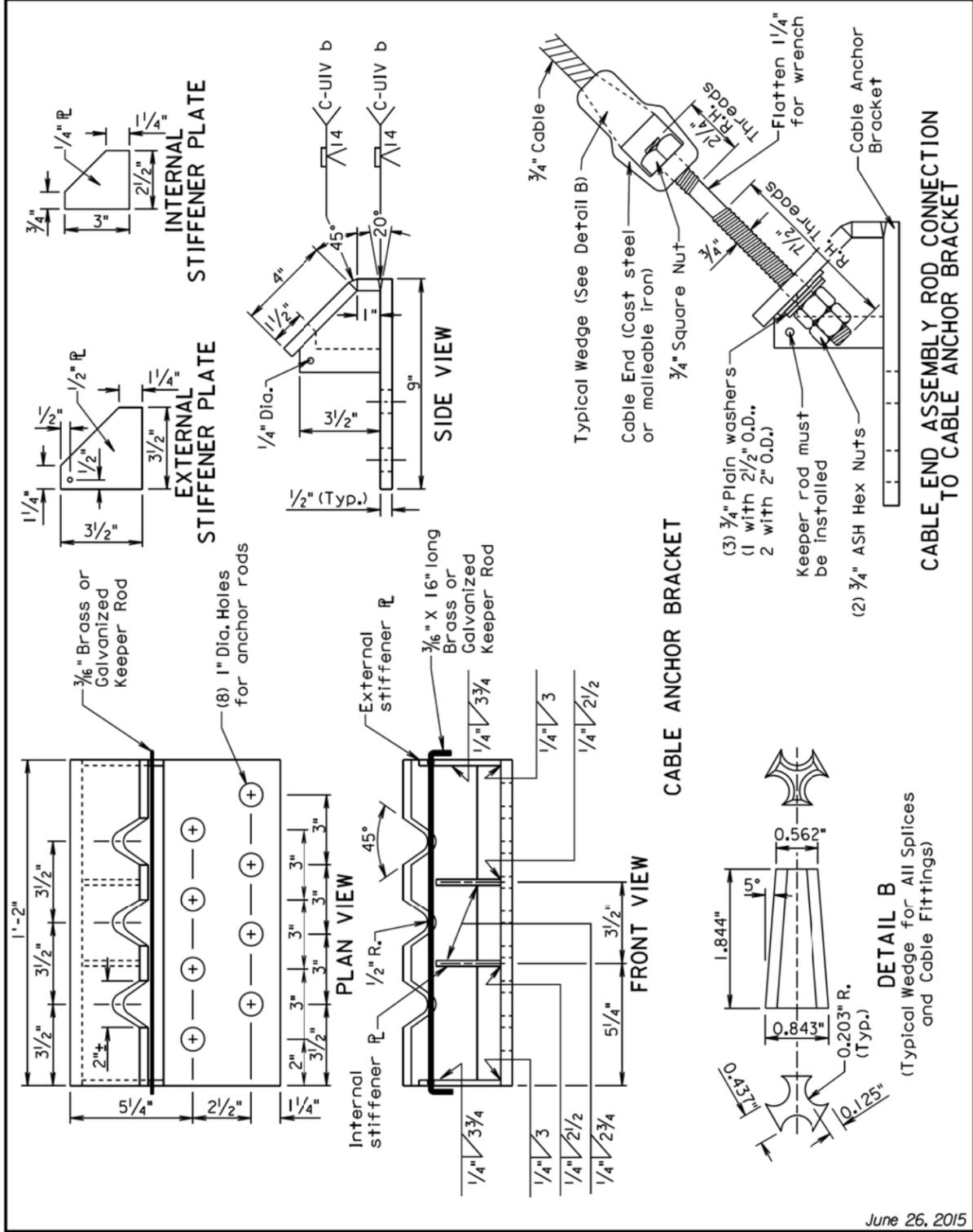
**3 CABLE GUARDRAIL SLIP BASE ANCHOR ASSEMBLY**

Published Date: 4th Qtr. 2015

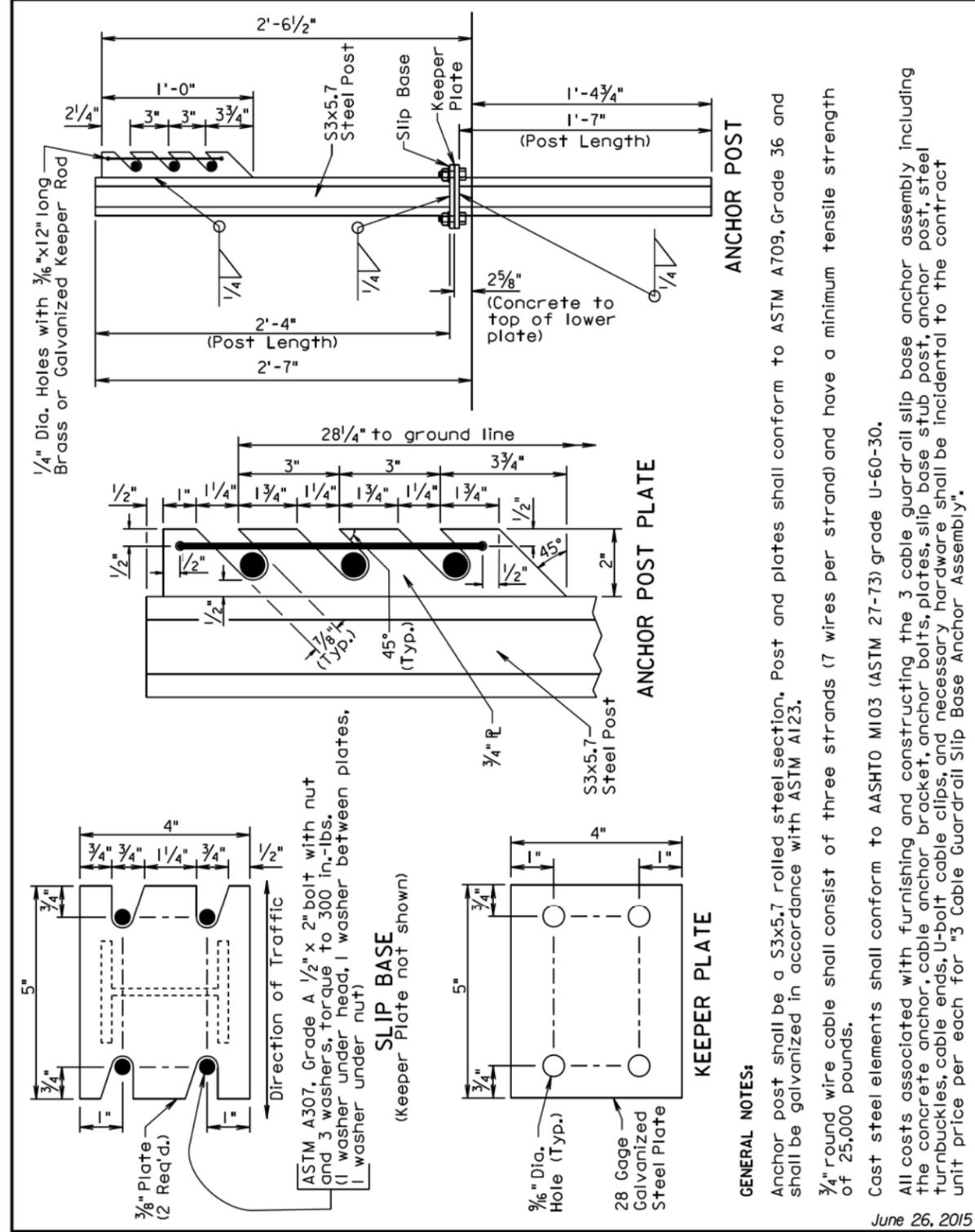
**SDOT**

**3 CABLE GUARDRAIL SLIP BASE ANCHOR ASSEMBLY**

Published Date: 4th Qtr. 2015

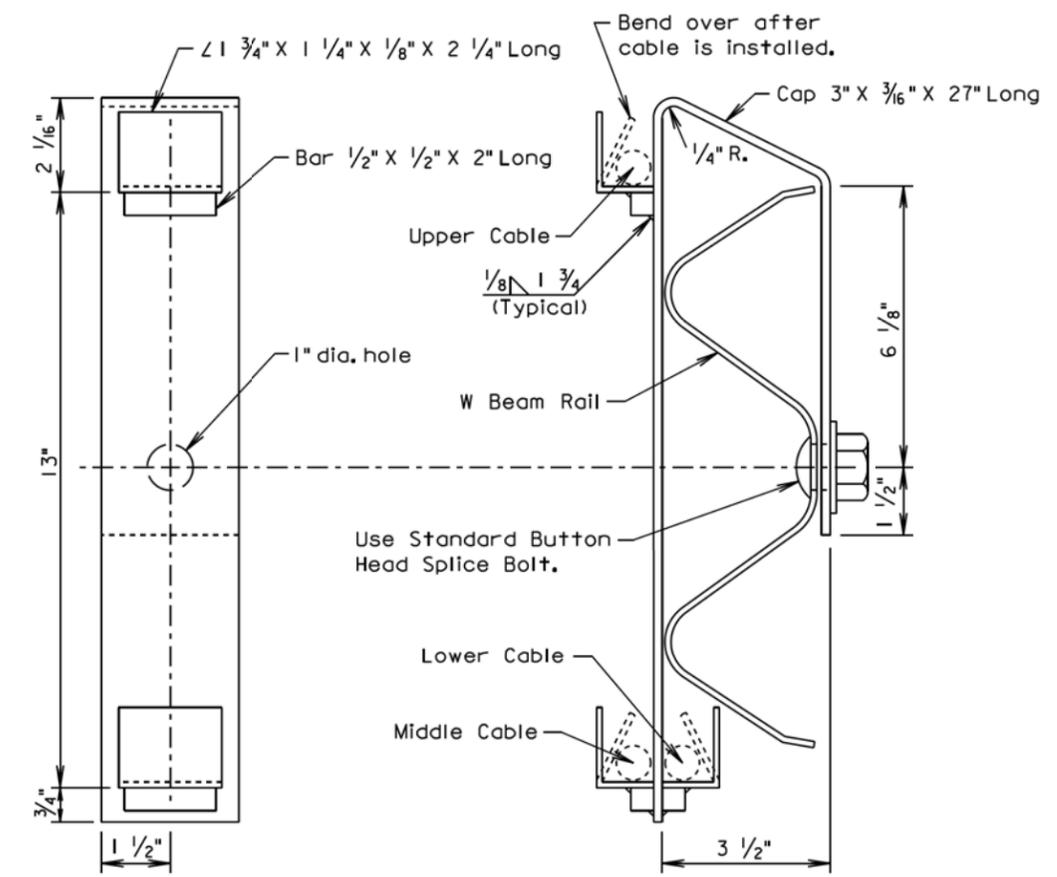


<b>SDOT</b>	<b>3 CABLE GUARDRAIL SLIP BASE ANCHOR ASSEMBLY</b>	PLATE NUMBER 629.10
		Sheet 2 of 3



<b>SDOT</b>	<b>3 CABLE GUARDRAIL SLIP BASE ANCHOR ASSEMBLY</b>	PLATE NUMBER 629.10
		Sheet 3 of 3

Plotting Date: 12/01/2015



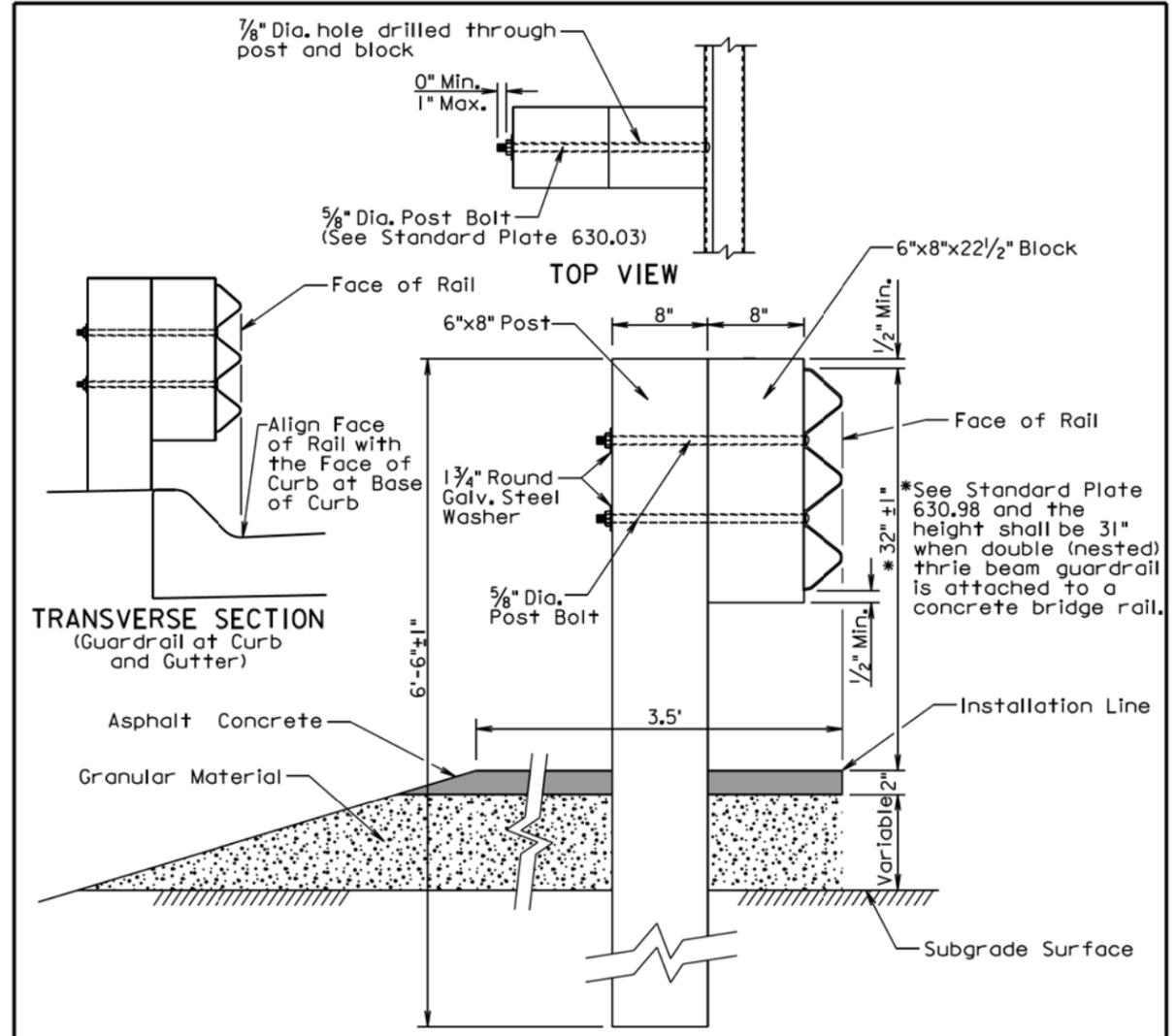
**ELEVATION (TRANSITION BRACKET)**  
**END VIEW (W BEAM RAIL AND TRANSITION BRACKET)**

**GENERAL NOTES:**  
Steel used in the fabrication of the bracket shall conform to ASTM A36 and the bracket shall be galvanized after fabrication in accordance with ASTM A123.

March 31, 2000

<b>S D D O T</b>	<b>W BEAM TO 3 CABLE TRANSITION BRACKET</b>	PLATE NUMBER 629.15
		Sheet 1 of 1

Published Date: 4th Qtr. 2015



**GENERAL NOTES:**  
Asphalt concrete shall be the same type used elsewhere on the project or shall be as specified in the plans. If asphalt concrete is not specified in the plans, the asphalt concrete shall conform to the Specifications for "Asphalt Concrete Composite." For informational purposes, the Rate of Materials for the 3.5' wide section of asphalt concrete as shown above shall be 4.80 Tons per Station.  
Granular material shall be the same type used elsewhere on the project or shall be as specified in the plans. If granular material type is not specified in the plans, the material shall conform to the Specifications for "Base Course". The granular material shall be placed the same thickness as the mainline surfacing or as specified in the plans.  
The cross slope for the surfacing and subgrade surface shall be as specified in the plans (See Typical Sections and/or Cross Sections).  
The top of post and top of block shall have a true square cut. The top of block shall be ±1 inch from the top of the post.

June 26, 2015

<b>S D D O T</b>	<b>THRIE BEAM GUARDRAIL POST INSTALLATION</b>	PLATE NUMBER 630.01
		Sheet 1 of 1

Published Date: 4th Qtr. 2015

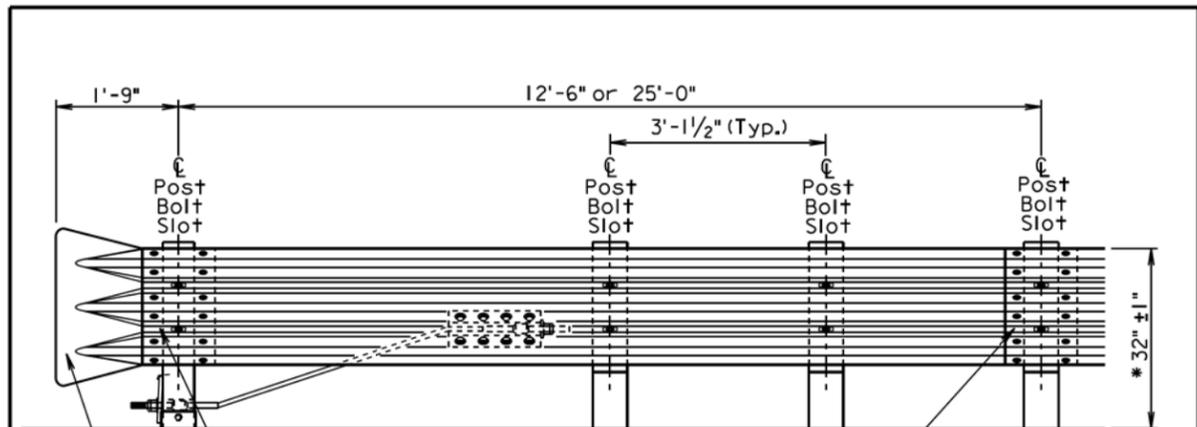
PLOT SCALE - 1:200

PLOTTED FROM - TRM111118

PLOT NAME - 19

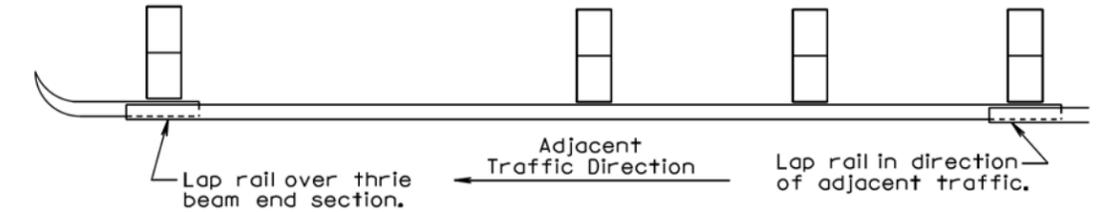
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Plotting Date: 12/01/2015



**ELEVATION**

\* See Standard Plate 630.98 and the height shall be 31" when double (nested) thrie beam guardrail is attached to a concrete bridge rail.



**PLAN**

THRIE BEAM GUARDRAIL DEFLECTION CRITERIA	
POST SPACING	MAXIMUM DEFLECTION
6'-3"	2'-6"
3'-1/2"	1'-9"

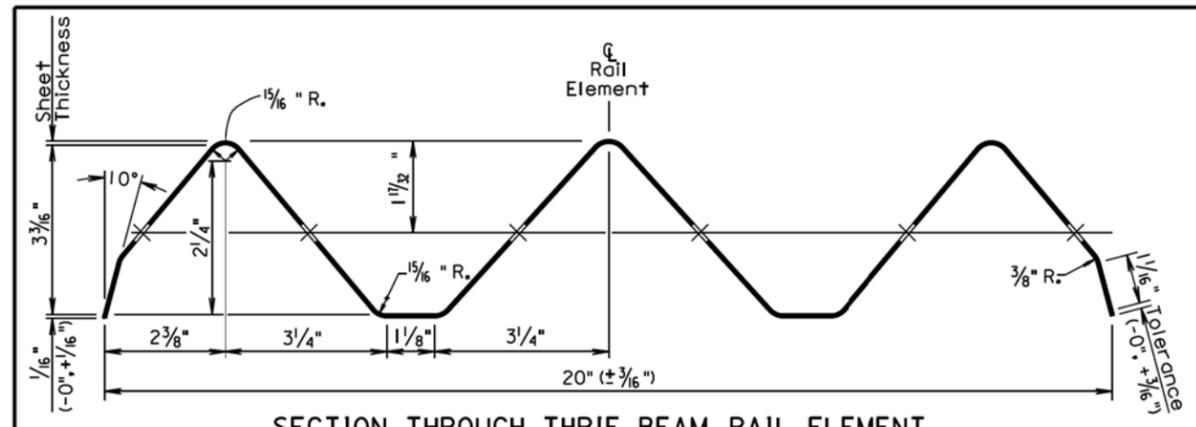
For Informational Purposes Only

**GENERAL NOTES:**

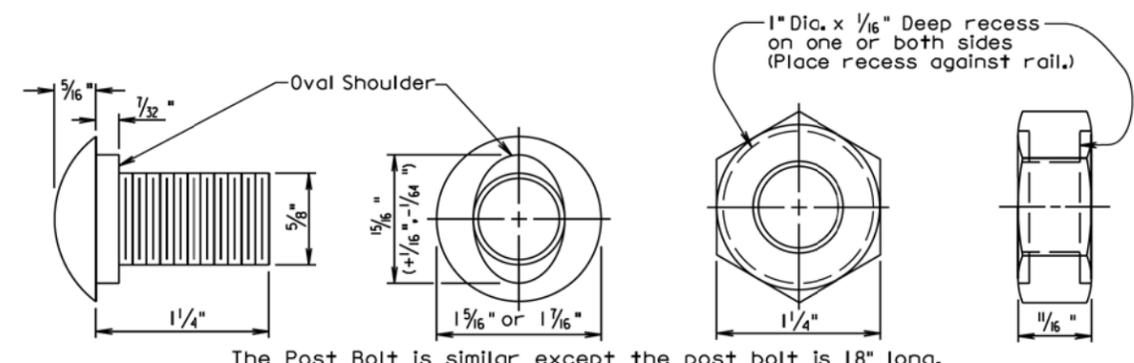
- All thrie beam rail shall be Type 1.
- There will be no separate payment for furnishing and installing Thrie Beam End Sections (Flared) and Thrie Beam Terminal Connectors. All costs for the Thrie Beam End Sections (Flared) and Thrie Beam Terminal Connectors shall be incidental to the contract unit price per foot for the respective "Thrie Beam Guardrail" bid item.
- Thrie beam rail section lengths may be 12'-6" and/or 25'-0". The combination of section lengths used shall be compatible with the total length of rail per site as shown in the plans.
- Thrie Beam End Sections (Flared) shall only be used in a one-way traffic situation. See Standard Plate 630.80 for Thrie Beam End Section (Flared) in the Beam Guardrail Trailing End Terminal.
- All costs for constructing thrie beam guardrail including labor, equipment, and materials including all posts, blocks, steel beam rail, and hardware shall be incidental to the contract unit price per foot for the respective "Thrie Beam Guardrail" bid item.

June 26, 2015

<b>S D D O T</b>	<b>THRIE BEAM GUARDRAIL INSTALLATION</b>	PLATE NUMBER <b>630.02</b>
	Published Date: 4th Qtr. 2015	Sheet 1 of 1

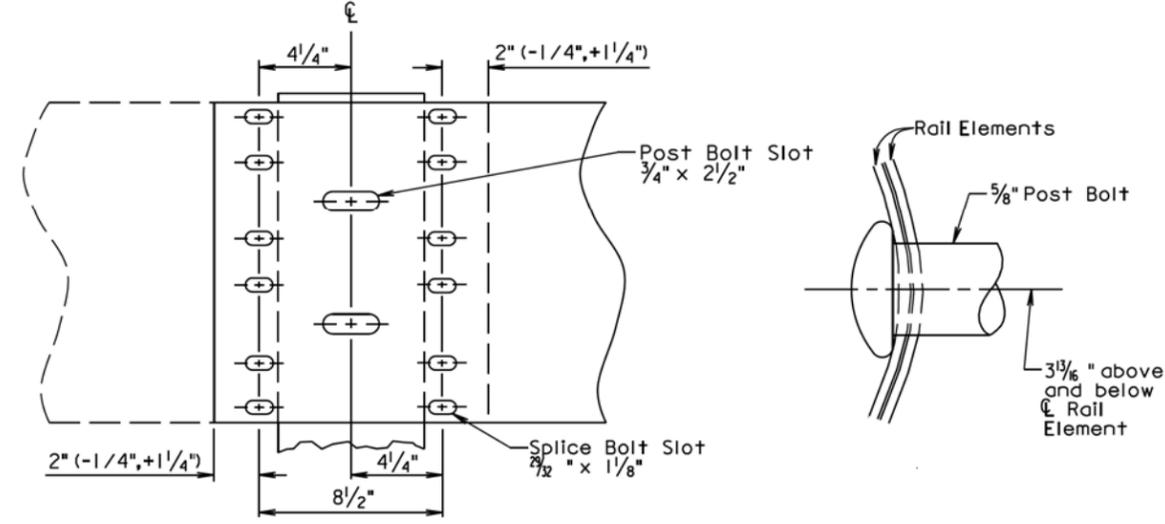


**SECTION THROUGH THRIE BEAM RAIL ELEMENT**



The Post Bolt is similar except the post bolt is 18" long.

**SPLICE BOLT (5/8" BUTTON HEAD BOLT AND RECESS NUT)**



Lap in direction of traffic.

**RAIL SPLICE**

March 31, 2000

<b>S D D O T</b>	<b>THRIE BEAM RAIL, RAIL SPLICE, AND HARDWARE</b>	PLATE NUMBER <b>630.03</b>
	Published Date: 4th Qtr. 2015	Sheet 1 of 1

PLOT SCALE - 1:200

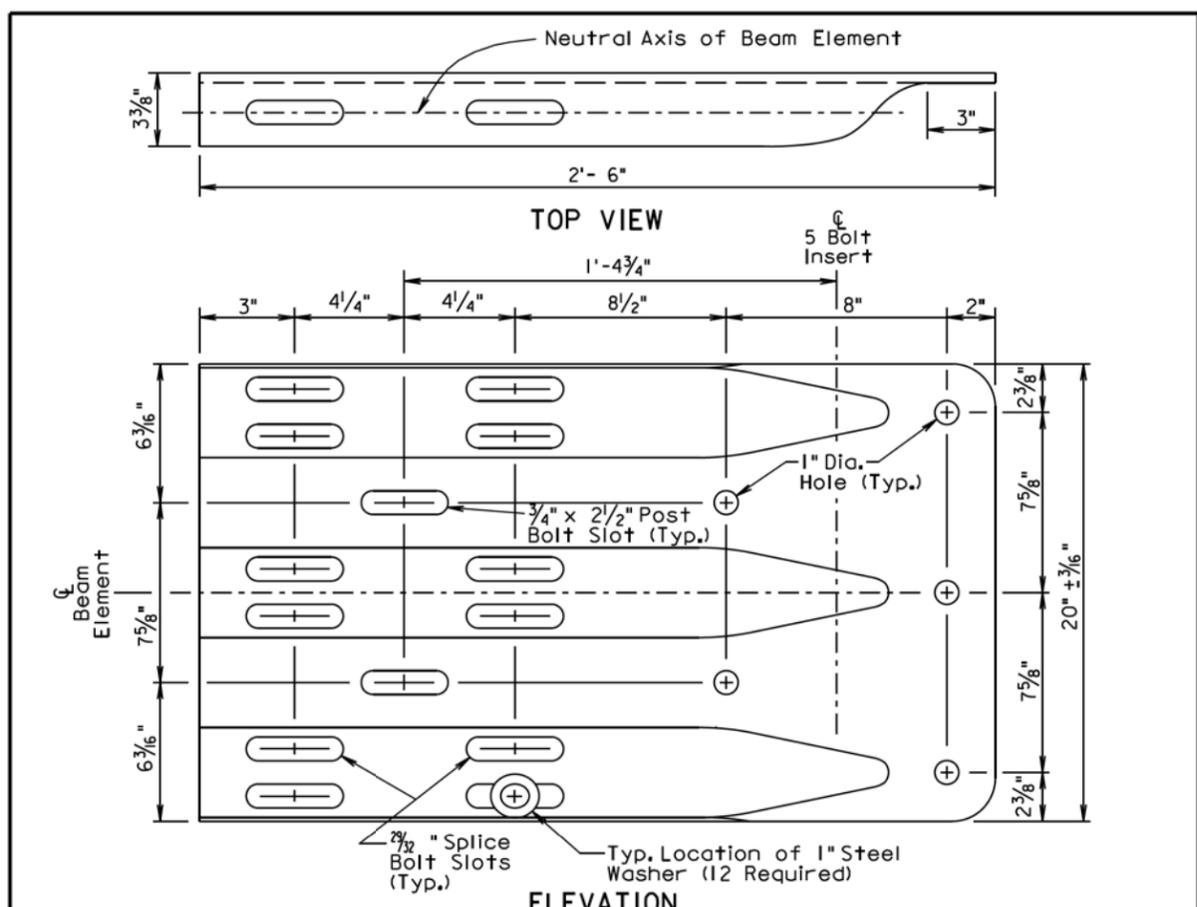
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PLOT NAME - 20

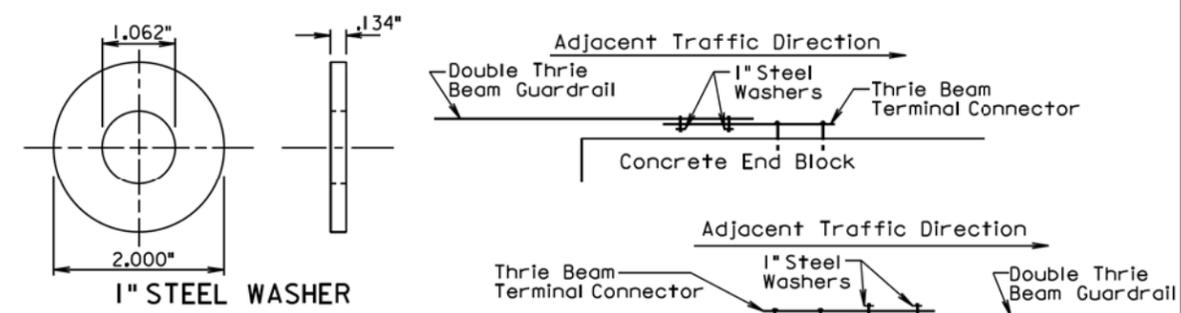
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Plotting Date: 12/01/2015

PLOT SCALE - 1:200



**THRIE BEAM TERMINAL CONNECTOR**



**1" STEEL WASHER**

**GENERAL NOTES:**

Thrie Beam Terminal Connectors shall be 10 gauge.

When the thrie beam terminal connector is used to connect the rail to the bridge, 1" steel washers shall be used at the lap splice and the washers shall be in direct contact with the 3" slots of the thrie beam terminal connector. See the drawings above for the typical locations of the 1" steel washers.

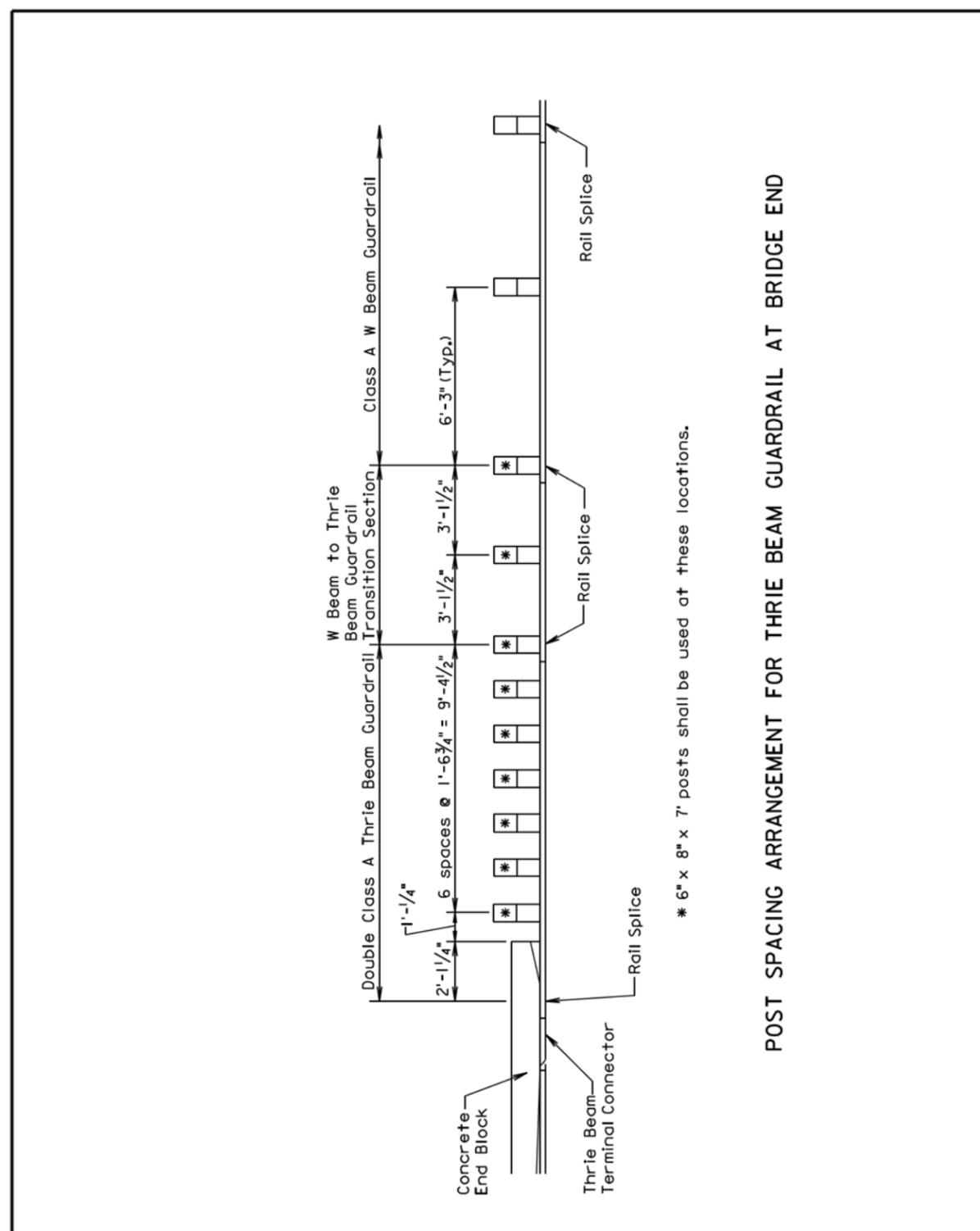
There will be no separate payment for furnishing and installing the Thrie Beam Terminal Connector. All costs for the Thrie Beam Terminal Connector shall be incidental to the contract unit price per foot for the respective "Thrie Beam Guardrail" bid item.

September 14, 2001

<b>S D D O T</b>	<b>THRIE BEAM TERMINAL CONNECTOR AND 1" STEEL WASHER</b>	PLATE NUMBER <b>630.05</b>
	Published Date: 4th Qtr. 2015	Sheet 1 of 1

PLOT NAME - 21

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**POST SPACING ARRANGEMENT FOR THRIE BEAM GUARDRAIL AT BRIDGE END**

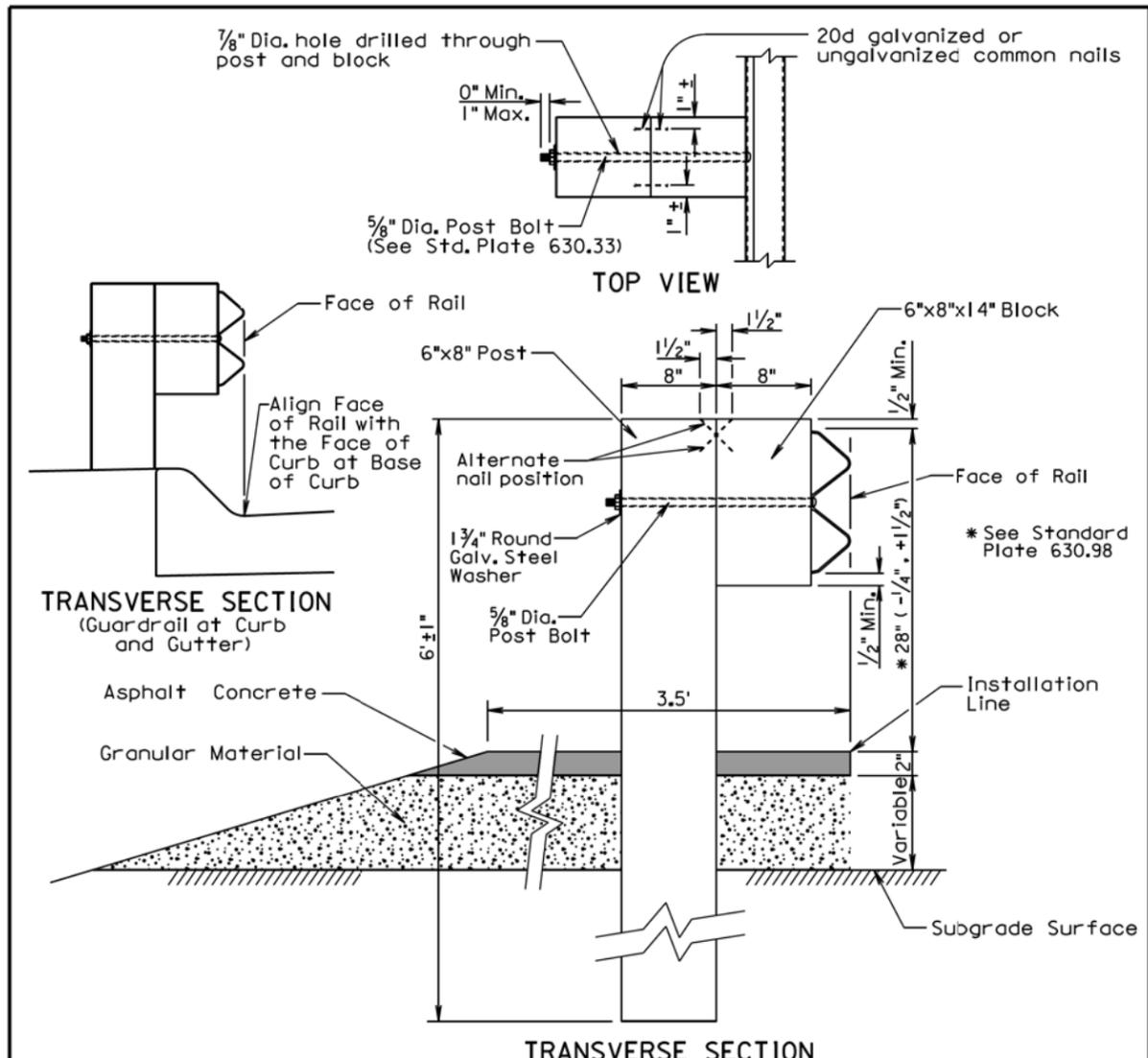
\* 6" x 8" x 7" posts shall be used at these locations.

December 23, 2002

<b>S D D O T</b>	<b>POST SPACING ARRANGEMENT FOR THRIE BEAM GUARDRAIL AT BRIDGE END</b>	PLATE NUMBER <b>630.15</b>
	Published Date: 4th Qtr. 2015	Sheet 1 of 1

PLOTTED FROM - TRM111118

Plotting Date: 12/01/2015



**GENERAL NOTES:**

Asphalt concrete shall be the same type used elsewhere on the project or shall be as specified in the plans. If asphalt concrete is not specified in the plans, the asphalt concrete shall conform to the Specifications for "Asphalt Concrete Composite." For informational purposes, the Rate of Materials for the 3.5' wide section of asphalt concrete as shown above shall be 4.80 Tons per Station.

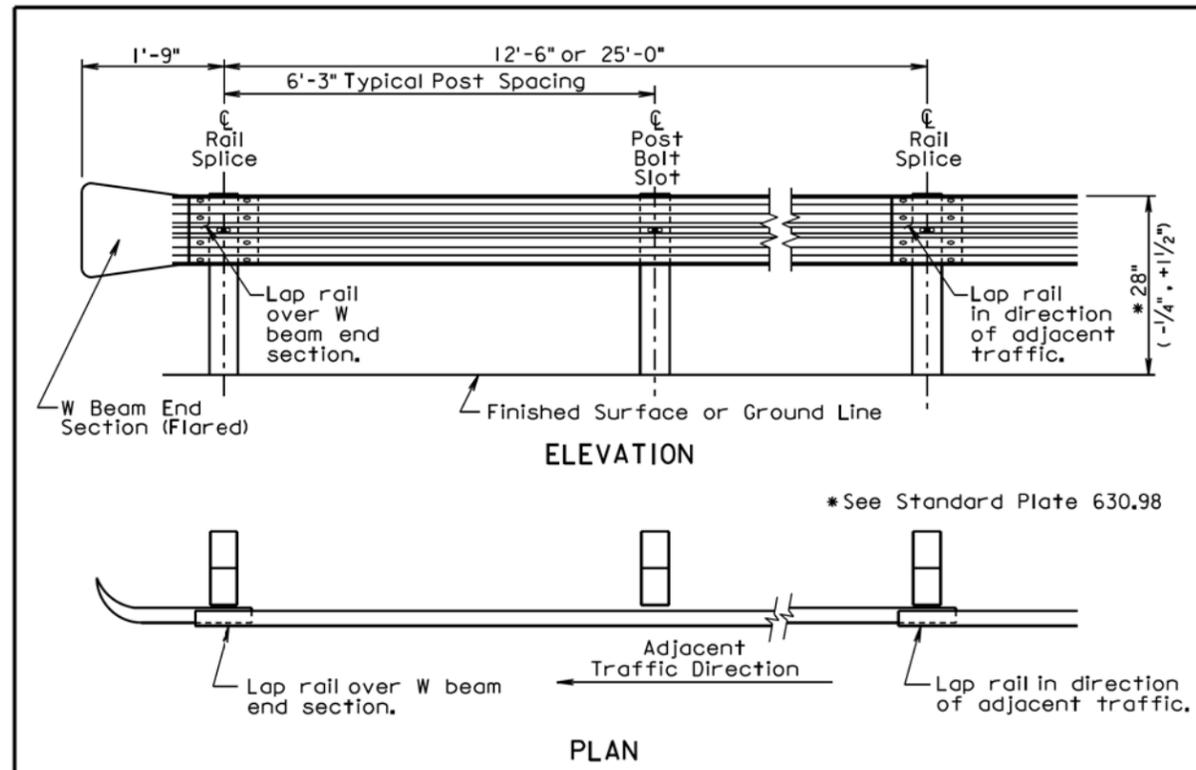
Granular material shall be the same type used elsewhere on the project or shall be as specified in the plans. If granular material type is not specified in the plans, the material shall conform to the Specifications for "Base Course". The granular material shall be placed the same thickness as the mainline surfacing or as specified in the plans.

The cross slope for the surfacing and subgrade surface shall be as specified in the plans (See Typical Sections and/or Cross Sections).

The top of post and top of block shall have a true square cut. The top of block shall be ±1 inch from the top of the post.

June 26, 2015

<b>S D D O T</b>	<b>W BEAM GUARDRAIL POST INSTALLATION</b>	PLATE NUMBER <b>630.31</b>
	Published Date: 4th Qtr. 2015	Sheet 1 of 1



\* See Standard Plate 630.98

W BEAM GUARDRAIL DEFLECTION CRITERIA	
POST SPACING	MAXIMUM DEFLECTION
6'-3"	5'-0"
3'-1 1/2"	3'-9"

For Informational Purposes Only

**GENERAL NOTES:**

All W beam rail shall be Type I.

There will be no separate payment for furnishing and installing W Beam End Sections (Flared) and W Beam Terminal Connectors. All costs for the W Beam End Sections (Flared) and W Beam Terminal Connectors shall be incidental to the contract unit price per foot for the respective "W Beam Guardrail" bid item.

W beam rail section lengths may be 12'-6" and/or 25'-0". The combination of section lengths used shall be compatible with the total length of rail per site as shown in the plans.

W Beam End Sections (Flared) shall only be used in a one way traffic situation. See Standard Plate 630.80 for W Beam End Section (Flared) in the Beam Guardrail Trailing End Terminal.

All costs for constructing W beam guardrail including labor, equipment, and materials including all posts, blocks, steel beam rail, and hardware shall be incidental to the contract unit price per foot for the respective "W Beam Guardrail" bid item.

June 26, 2015

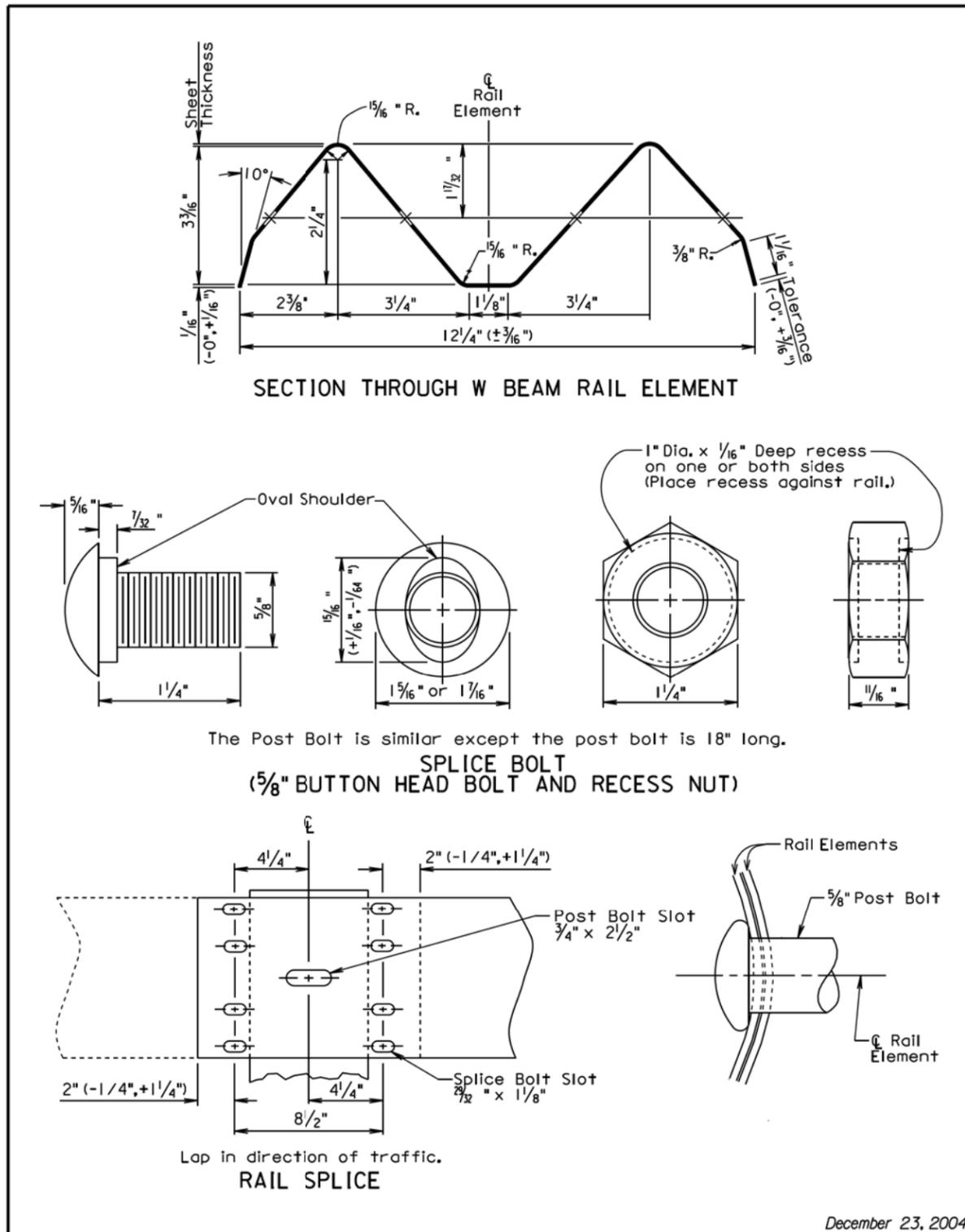
<b>S D D O T</b>	<b>W BEAM GUARDRAIL INSTALLATION</b>	PLATE NUMBER <b>630.32</b>
	Published Date: 4th Qtr. 2015	Sheet 1 of 1

PLOT SCALE - 1:200

PLOTTED FROM - TRM111118

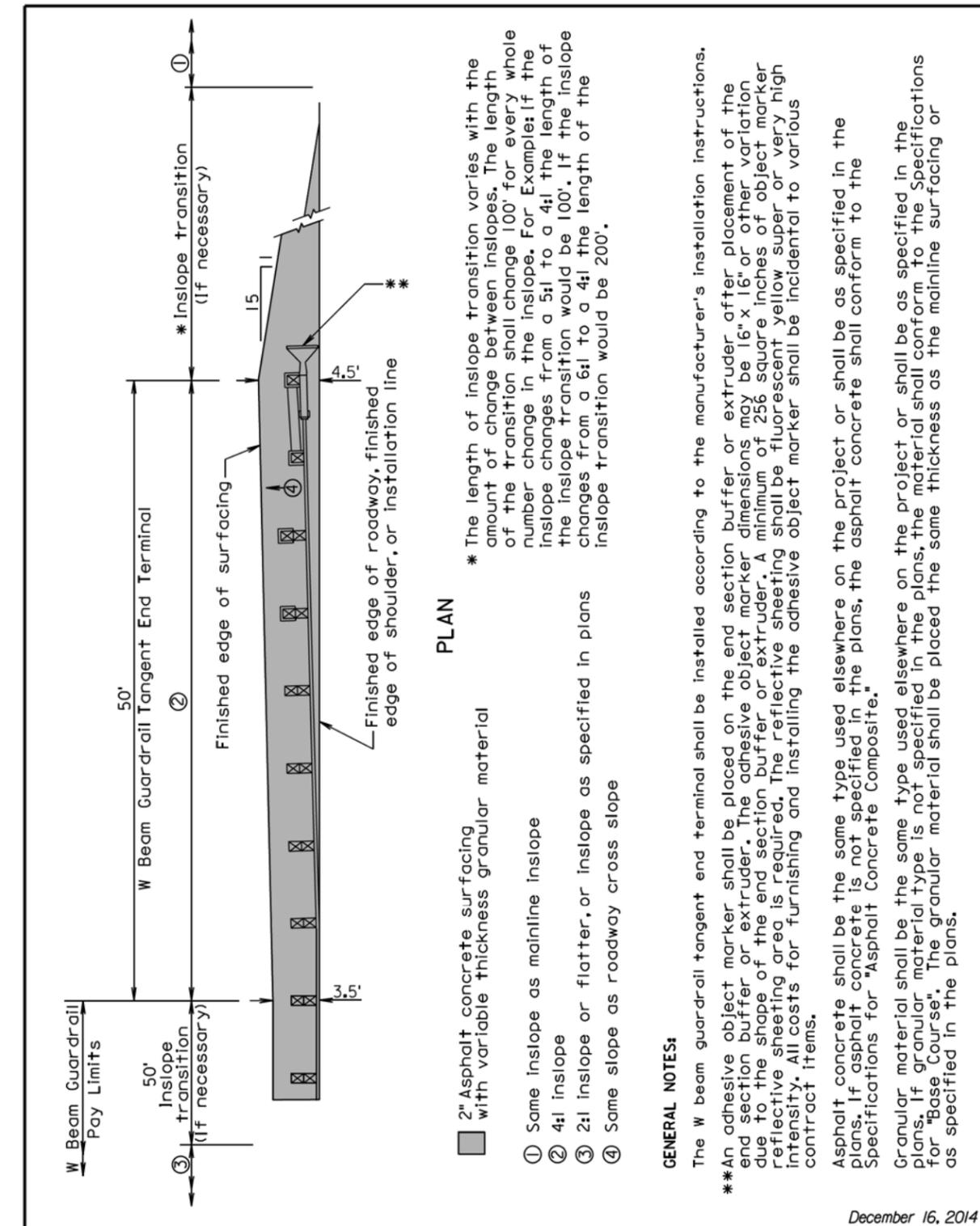
PLOT NAME - 22

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December 23, 2004

<b>S D D O T</b>	<b>W BEAM RAIL, RAIL SPLICE, AND HARDWARE</b>	PLATE NUMBER <b>630.33</b>
	Published Date: 4th Qtr. 2015	Sheet 1 of 1



December 16, 2014

<b>S D D O T</b>	<b>EMBANKMENT AND SURFACING FOR W BEAM GUARDRAIL TANGENT END TERMINAL</b>	PLATE NUMBER <b>630.46</b>
	Published Date: 4th Qtr. 2015	Sheet 1 of 1

POST	OFFSET
A	4.00'
B	2.79'
C	1.79'
D	1.01'
E	0.45'
F	0.11'

**GENERAL NOTES:**  
 The finished embankment surfacing cross slope shall match the roadway cross slope; however, if a steeper cross slope is necessary the steepest allowable cross slope is 10:1.  
 Asphalt concrete shall be the same type used elsewhere on the project or shall be as specified in the plans. If asphalt concrete is not specified in the plans, the asphalt concrete shall conform to the Specifications for "Asphalt Concrete Composite."  
 Granular material shall be the same type used elsewhere on the project or shall be as specified in the plans. If granular material type is not specified in the plans, the material shall conform to the Specifications for "Base Course". The granular material shall be placed the same thickness as the mainline surfacing or as specified in the plans.  
 \*\*An adhesive object marker shall be placed on the end section buffer after placement of the end section buffer. The adhesive object marker dimensions may be 16" x 16" or other variation due to the shape of the end section buffer. A minimum of 256 square inches of object marker reflective sheeting area is required. The reflective sheeting shall be fluorescent yellow super or very high intensity. All costs for furnishing and installing the adhesive object marker shall be incidental to various contract items.  
 Costs for constructing the W Beam Guardrail Breakaway Cable Terminal including labor, equipment, and materials including the anchor bracket, cable assembly, steel tubes, soil plates, bearing plate, pipe sleeve, W beam end section (buffer), modified W beam terminal connector, and all necessary hardware shall be incidental to the contract unit price per each for "W Beam Guardrail Breakaway Cable Terminal".

December 16, 2014

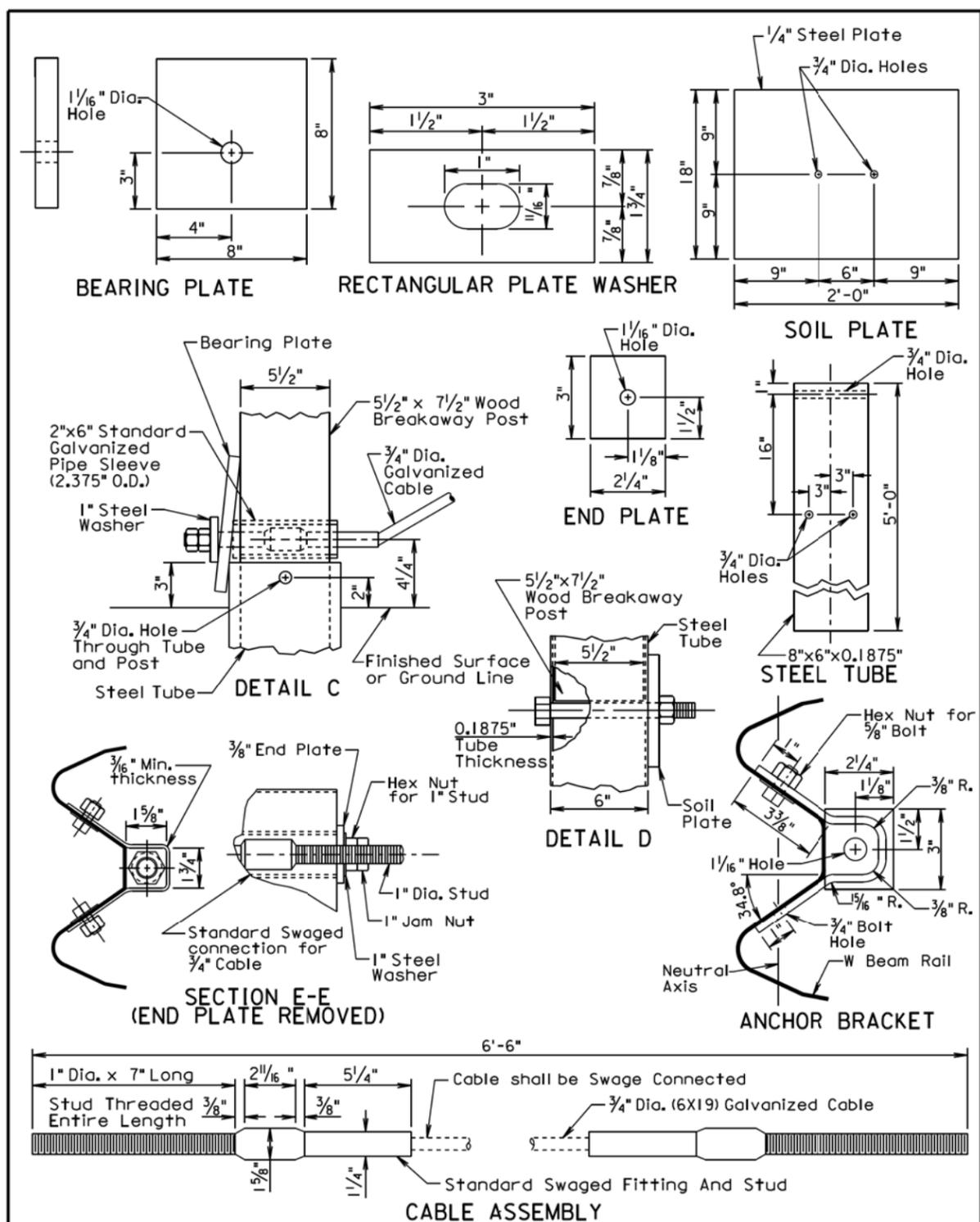
<b>S D D O T</b>	<b>W BEAM GUARDRAIL BREAKAWAY CABLE TERMINAL</b>	PLATE NUMBER <b>630.47</b>
	Published Date: 4th Qtr. 2015	Sheet 1 of 3

**GENERAL NOTES:**  
 All hardware shall be galvanized in accordance with ASTM A153.  
 The steel tubes shall meet the requirements of ASTM Specification A500, Grade B, and shall be galvanized after fabrication in accordance with the requirements of AASHTO Specification M111.  
 The anchor bracket, soil plate, and bearing plate shall be fabricated from steel that meets ASTM A36 Specifications. They shall be galvanized after fabrication in accordance with ASTM A123.  
 The W Beam End Section (Buffer) shall be 12 gage galvanized steel.  
 The cable shall be 3/4", Type II, with Class A coating in conformance with AASHTO M30.

December 16, 2014

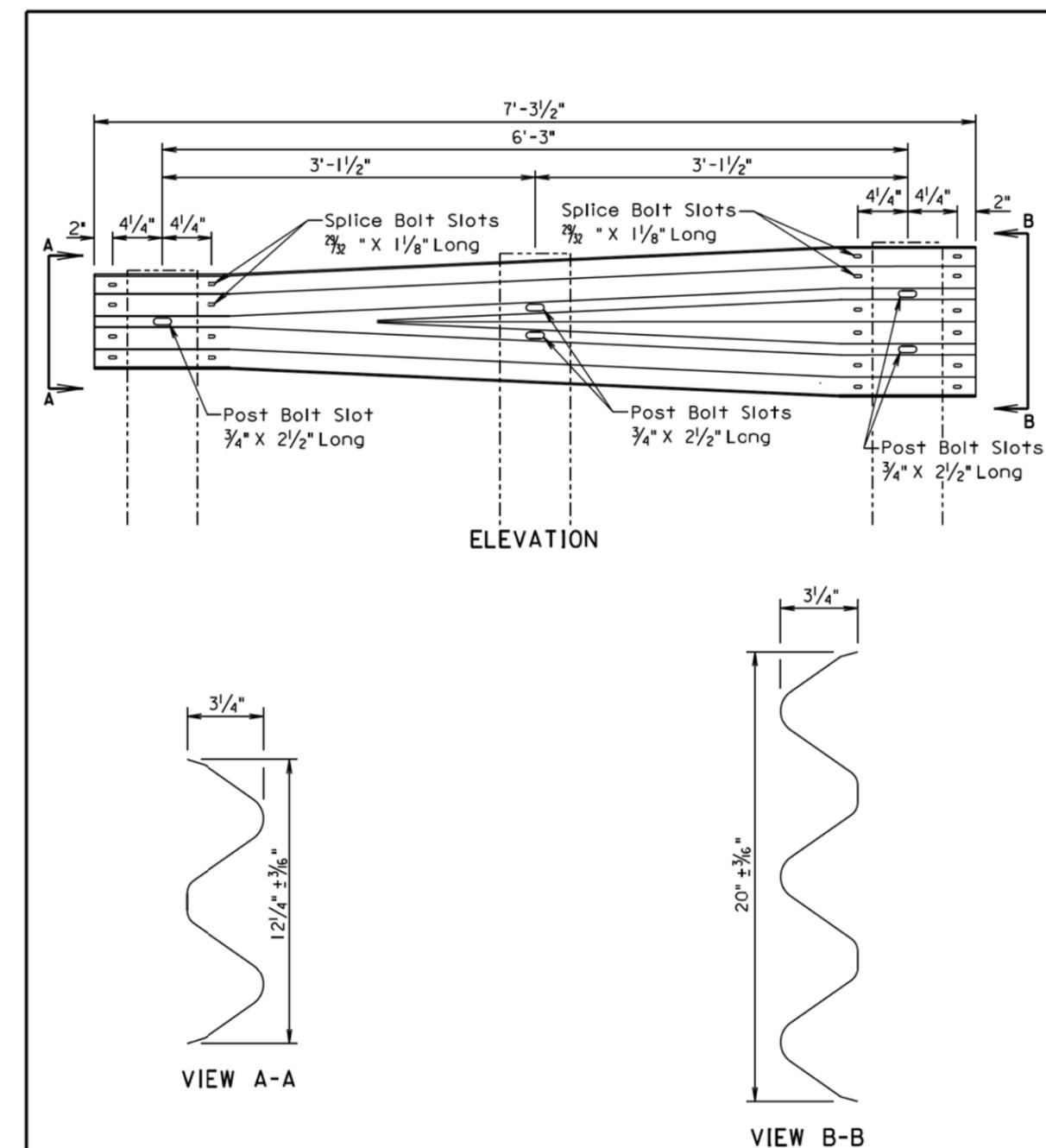
<b>S D D O T</b>	<b>W BEAM GUARDRAIL BREAKAWAY CABLE TERMINAL</b>	PLATE NUMBER <b>630.47</b>
	Published Date: 4th Qtr. 2015	Sheet 2 of 3

Plotting Date: 12/01/2015



December 16, 2014

<b>S D D O T</b>	<b>W BEAM GUARDRAIL BREAKAWAY CABLE TERMINAL</b>	PLATE NUMBER <b>630.47</b>
	Published Date: 4th Qtr. 2015	Sheet 3 of 3



**GENERAL NOTE:**

All costs for constructing the W Beam to Thrie Beam Guardrail Transition including labor, equipment, and materials including two posts, two blocks, W beam to thrie beam transition section, and hardware shall be incidental to the contract unit price per each for "W Beam to Thrie Beam Guardrail Transition".

March 31, 2000

<b>S D D O T</b>	<b>W BEAM TO THRIE BEAM GUARDRAIL TRANSITION SECTION</b>	PLATE NUMBER <b>630.82</b>
	Published Date: 4th Qtr. 2015	Sheet 1 of 1

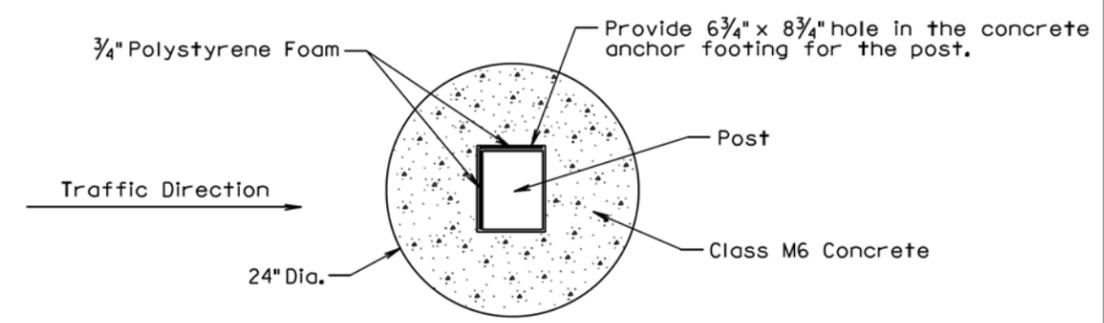
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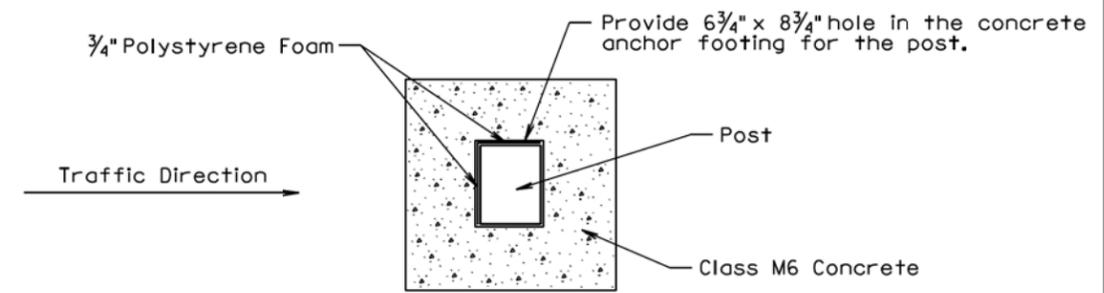
PLOT NAME - 25

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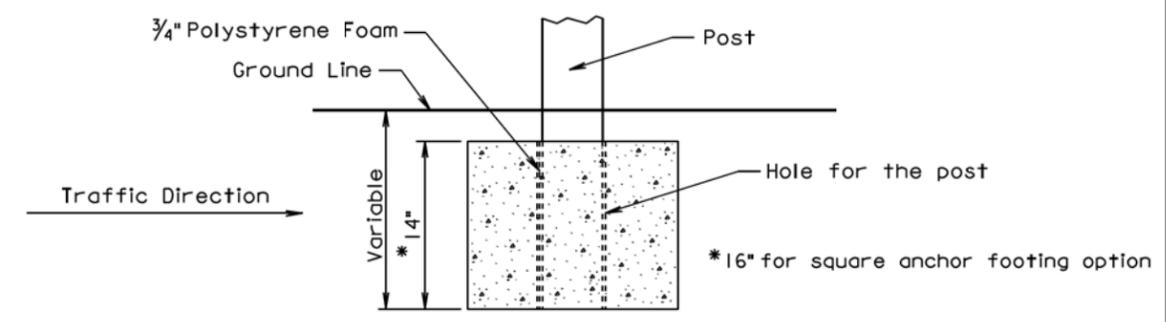
Plotting Date: 12/01/2015



**PLAN  
(PREFERRED 24" DIA. ROUND  
CONCRETE ANCHOR FOOTING)**



**PLAN  
(20" x 20" SQUARE  
CONCRETE ANCHOR FOOTING)**



**ELEVATION**

**GENERAL NOTES:**

In areas where the required guardrail wood post depth is not obtainable, shorter posts may be used and shall be anchored in concrete in accordance with the details shown on this standard plate.

A 20" x 20" square concrete anchor footing may be used in lieu of the 24" diameter round anchor footing.

Forms for the concrete anchor footing hole is not required.

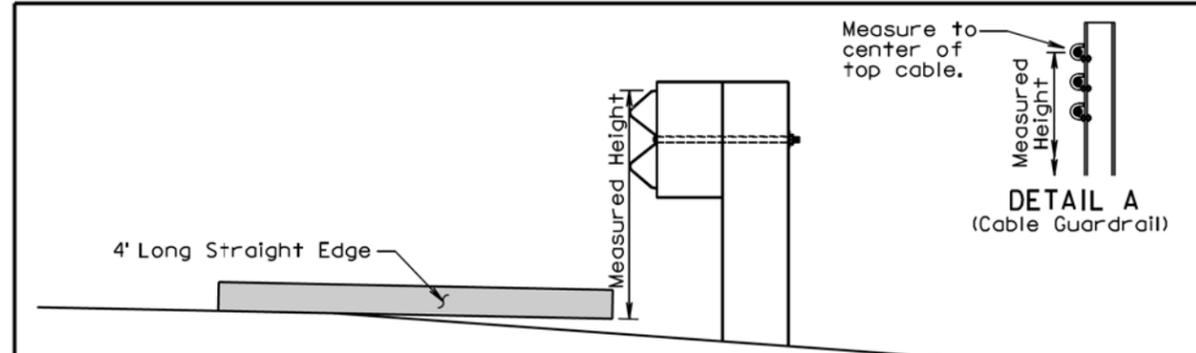
Concrete for the concrete anchor footing shall be Class M6.

Three quarter inch polystyrene foam shall be attached to two sides of the posts. See details above for placement position of the polystyrene foam.

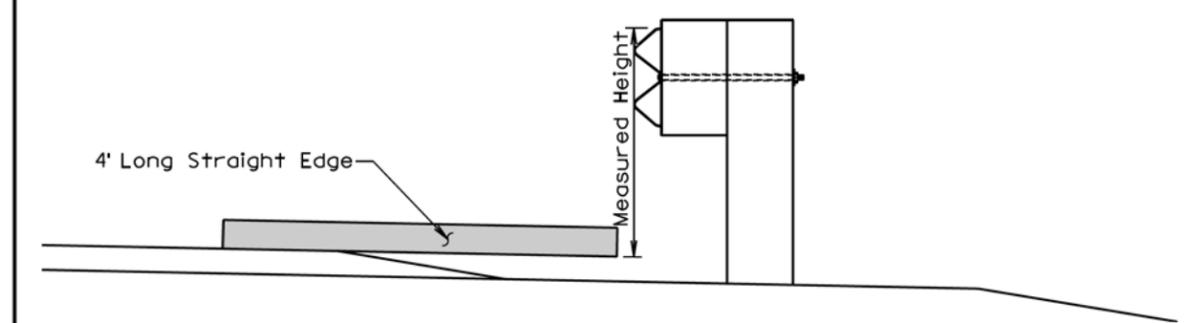
There will be no separate payment for furnishing and installing the concrete anchor footing for short guardrail post. All costs for concrete anchor footings shall be incidental to the contract unit price per foot for the respective "Thrie Beam or W Beam Guardrail" bid item.

March 31, 2000

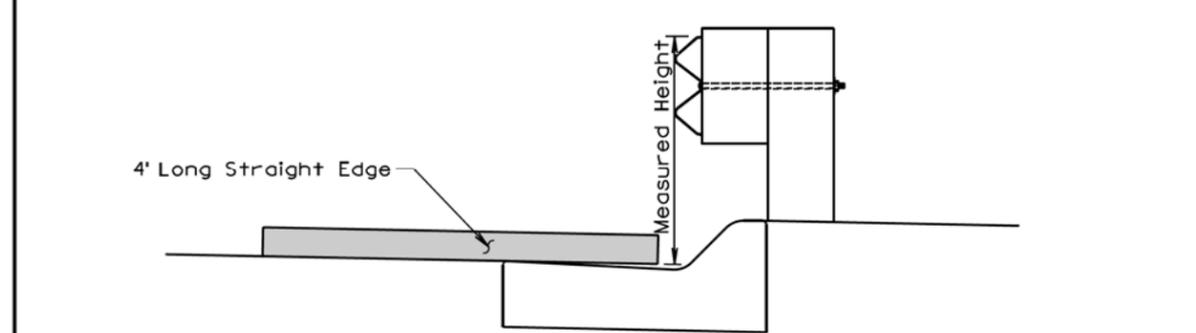
<b>S D D O T</b>	<b>CONCRETE ANCHOR FOOTING FOR SHORT GUARDRAIL POST</b>	PLATE NUMBER <b>630.84</b>
	Published Date: 4th Qtr. 2015	Sheet 1 of 1



**ELEVATION VIEW  
(Guardrail Adjacent to Differential Slopes)**



**ELEVATION VIEW  
(Guardrail Adjacent to Differential Surfacing Elevations)**



**ELEVATION VIEW  
(Guardrail at Curb and Gutter)**

**GENERAL NOTES:**

The W Beam guardrail shown is for illustrative purpose. The guardrail height for all types of guardrail systems shall be measured in accordance with this standard plate.

When measuring height of cable guardrail or cable barrier the height shall be measured to the center of the top cable. See Detail A.

June 26, 2010

<b>S D D O T</b>	<b>MEASURING GUARDRAIL HEIGHT</b>	PLATE NUMBER <b>630.98</b>
	Published Date: 4th Qtr. 2015	Sheet 1 of 1

PLOT SCALE - 1:200

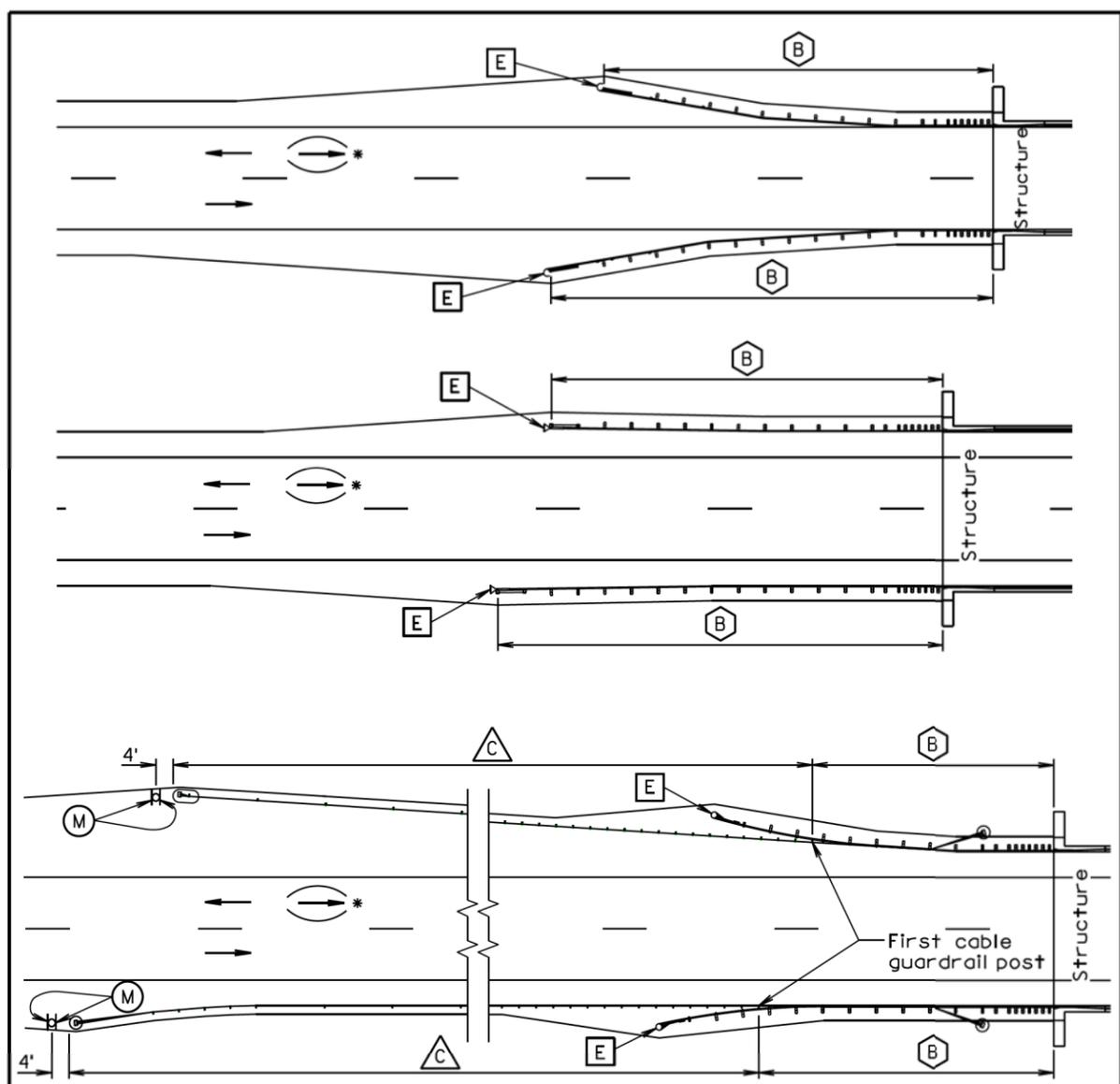
PLOTTED FROM - TRM111118

PLOT NAME - 26

FILE - ... \STANDARDPLATES\_05HE.DGN

Plotting Date: 12/01/2015

PLOT SCALE - 1:200



**TYPICAL GUARDRAIL LAYOUTS**

- B** Steel Beam Guardrail Delineation
- E** Guardrail Terminal End Object Marker
- C** 3 Cable Guardrail Delineation
- M** Type 2 Object Marker

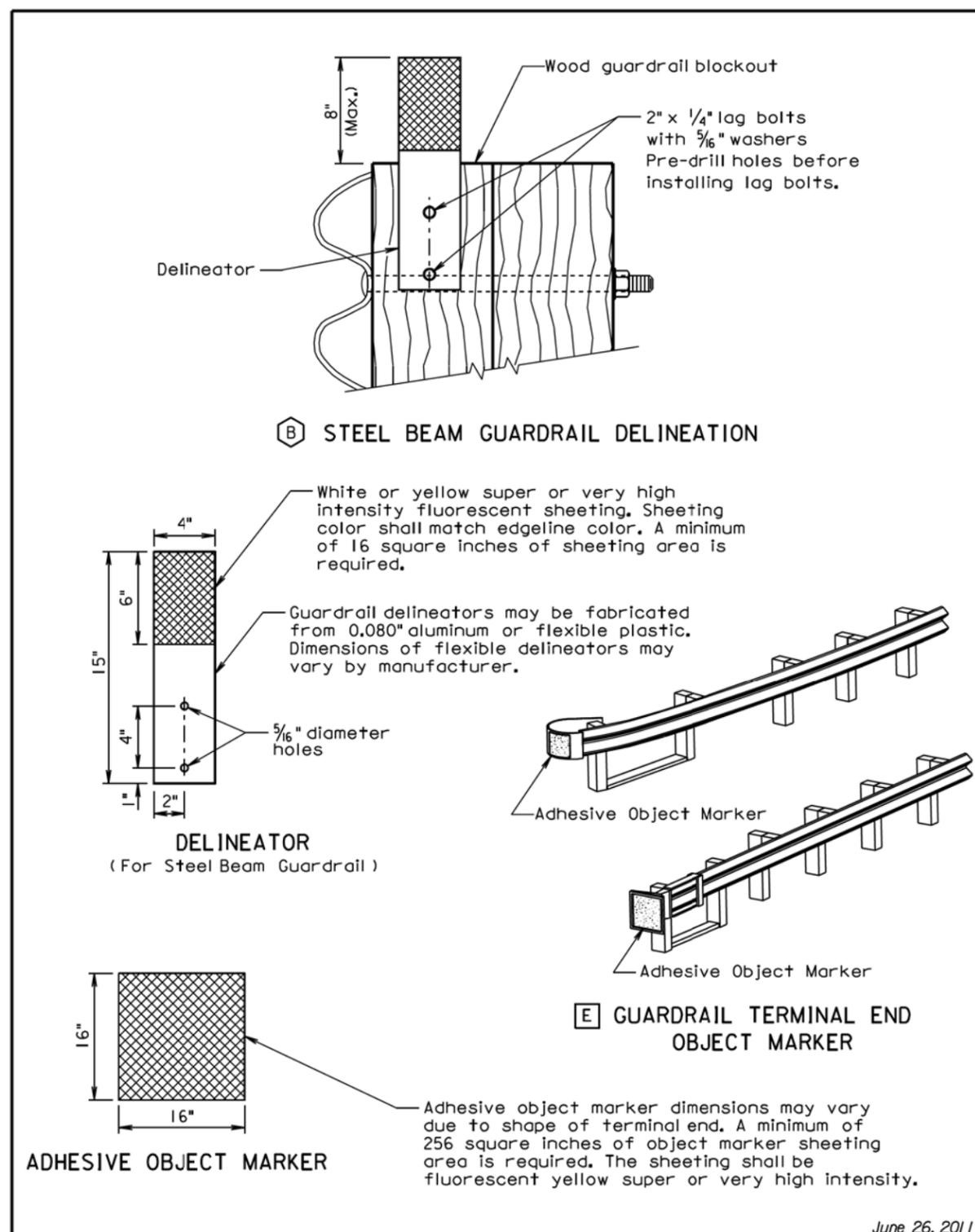
\*For two-way traffic, install delineation at the opposite end of structure the same as shown. Back-to-back delineation is required for two-way traffic, single-sided delineation for one-way traffic.

June 26, 2011

<b>S D D O T</b>	<b>DELINEATION OF GUARDRAIL AT BRIDGES</b>	PLATE NUMBER <b>632.40</b>
	Published Date: 4th Qtr. 2015	Sheet 1 of 4

PLOT NAME - 27

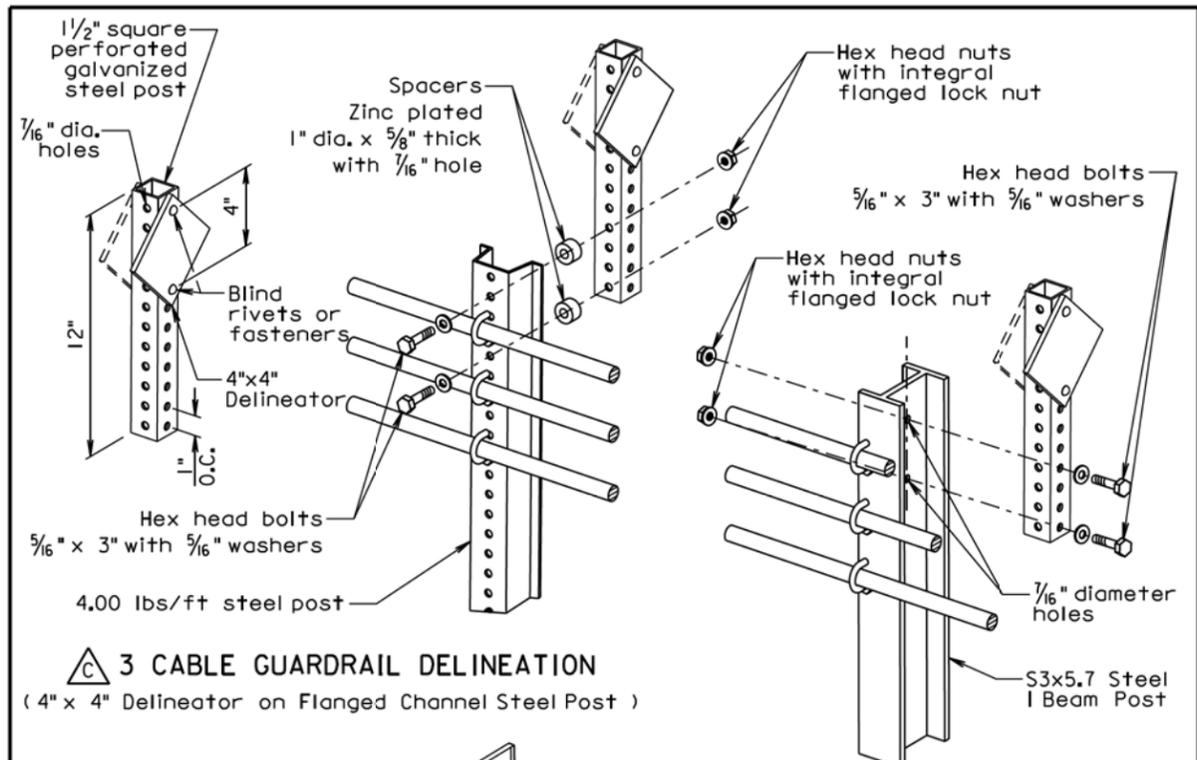
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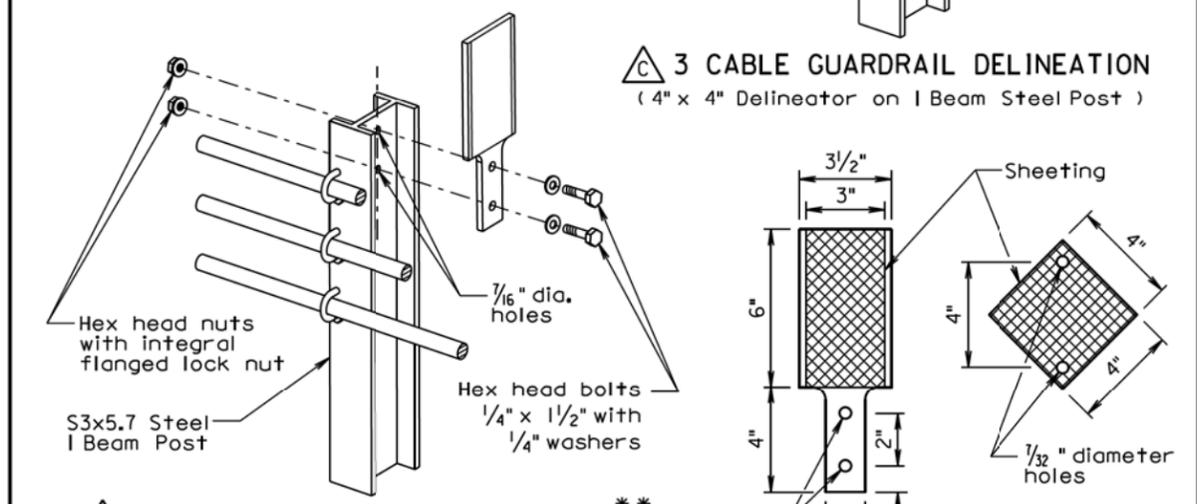
<b>S D D O T</b>	<b>DELINEATION OF GUARDRAIL AT BRIDGES</b>	PLATE NUMBER <b>632.40</b>
	Published Date: 4th Qtr. 2015	Sheet 2 of 4

PLOTTED FROM - TRM111118

Plotting Date: 12/01/2015



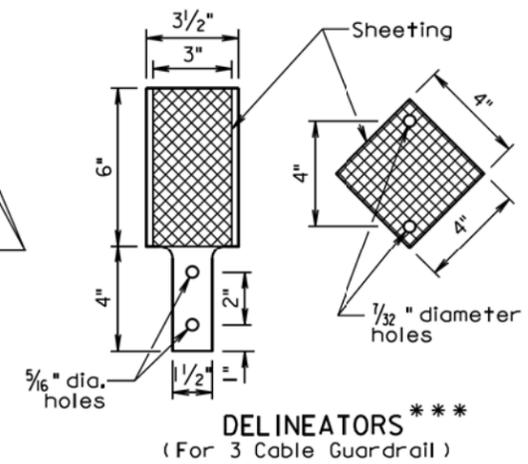
**△ 3 CABLE GUARDRAIL DELINEATION**  
( 4" x 4" Delineator on Flanged Channel Steel Post )



**△ 3 CABLE GUARDRAIL DELINEATION**  
( 4" x 4" Delineator on I Beam Steel Post )



**△ 3 CABLE GUARDRAIL DELINEATION\*\***  
( Flexible 3" x 6" Delineator on I Beam Post )



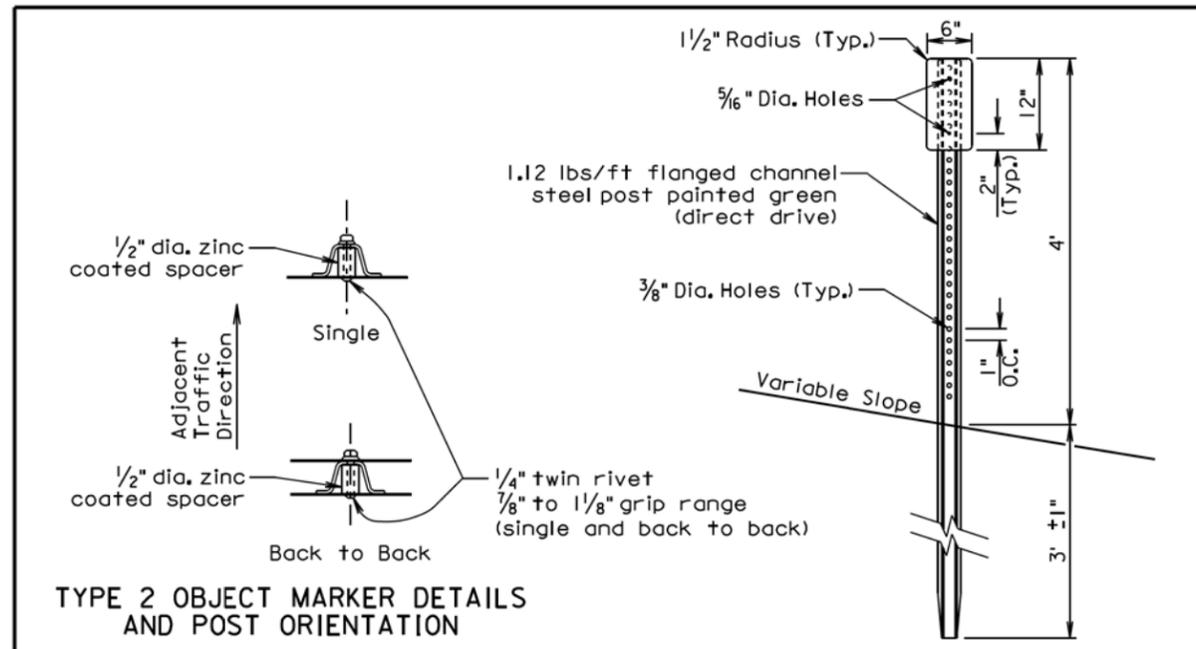
**DELINEATORS\*\*\***  
( For 3 Cable Guardrail )

\*\* Flexible delineators may be attached to post with manufacturer approved adhesive instead of bolts.  
\*\*\* Dimensions of flexible delineators may vary by manufacturer. A minimum of 16 square inches of sheeting area is required. The sheeting shall be white or yellow super or very high intensity fluorescent sheeting. The sheeting color shall match the edgeline color.

June 26, 2011

<b>S D D O T</b>	<b>DELINEATION OF GUARDRAIL AT BRIDGES</b>	PLATE NUMBER <b>632.40</b>
		Sheet 3 of 4

Published Date: 4th Qtr. 2015



**TYPE 2 OBJECT MARKER DETAILS AND POST ORIENTATION**

**Ⓜ TYPE 2 OBJECT MARKER**  
( For Marking 3 Cable Guardrail Anchor )

**GENERAL NOTES:**

The delineators shall be covered with a minimum of 16 square inches of reflective sheeting. The reflective sheeting shall be of either very high intensity or super high intensity material. For bridges along two-way roadways the sheeting shall be on both sides of the delineator and shall be white in color. For one-way roadways the sheeting will only be required on the side facing traffic and the color will be the same as the nearest pavement marking, yellow on the left side of the roadway and white on the right side.

The first delineator shall be attached to the post nearest the bridge with additional delineators spaced in advance of the bridge at approximately 50 foot intervals. At bridges with short lengths of guardrail, less than 200 feet, a minimum of 4 delineators shall be placed in addition to the yellow object marker. The spacing between the delineators shall be approximately one third of the length of the guardrail. This will provide for a shorter spacing. At bridges with longer lengths of guardrail, greater than 200 feet, including bridges that have cable guardrail transitioning into the steel beam guardrail, the delineators will be placed at a spacing of approximately 50 feet. Delineation shall extend throughout the length of the guardrail system.

All costs for furnishing and installing single or back to back guardrail delineation shall be included in the contract unit price per each for "Guardrail Delineator".

An adhesive object marker shall be placed on the end of the W beam guardrail end terminal. The adhesive object marker dimensions may vary due to the shape of the terminal end. A minimum of 256 square inches of object marker reflective sheeting area is required. The reflective sheeting shall be fluorescent yellow super or very high intensity. All costs for furnishing and installing the adhesive object marker shall be incidental to various contract items.

A type 2 object marker shall be placed adjacent to the 3 cable guardrail anchor at the location noted on sheet 1 of this standard plate. The type 2 object marker (6" x 12") shall have a fluorescent yellow very high or super high intensity reflective sheeting. All costs for furnishing and installing the type 2 object marker including the steel post, 6" x 12" reflective panel, and hardware shall be included in the contract unit price per each for "Type 2 Object Marker" for single-sided and "Type 2 Object Marker Back to Back" for back to back type 2 object markers.

June 26, 2011

<b>S D D O T</b>	<b>DELINEATION OF GUARDRAIL AT BRIDGES</b>	PLATE NUMBER <b>632.40</b>
		Sheet 4 of 4

Published Date: 4th Qtr. 2015

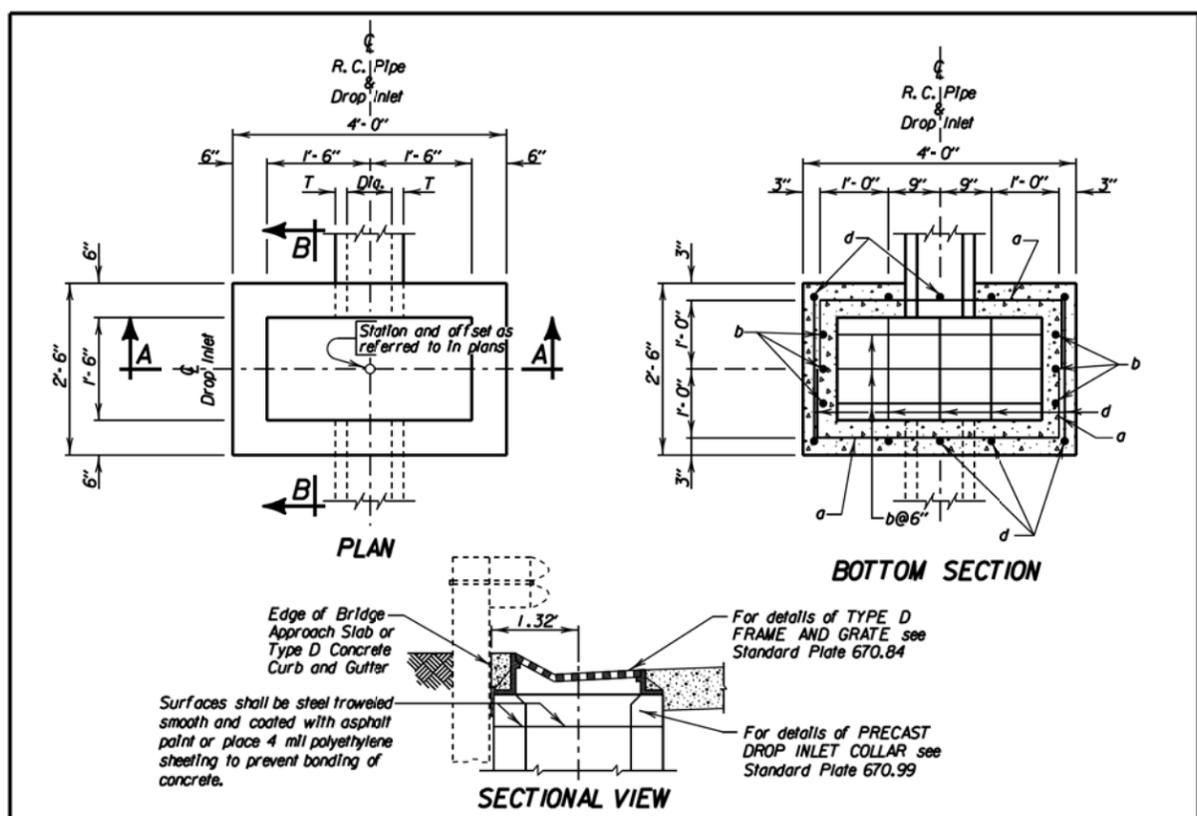
PLOT SCALE - 1:200

PLOTTED FROM - TRM111118

PLOT NAME - 28

FILE - ... \STANDARDPLATES\_05HE.DGN

Plotting Date: 12/01/2015



ESTIMATED QUANTITIES			
ITEM	UNIT	CONSTANT QUANTITY	VARIABLE QUANTITY
* Class M6 Concrete	Cu'd	0.22	0.20H
Reinforcing Steel	Lb	37	19.37H
Frame and Grate	Each	1	

**DROP INLETS FOR 12" TO 27" DIAMETER PIPE**

**GENERAL NOTES:**

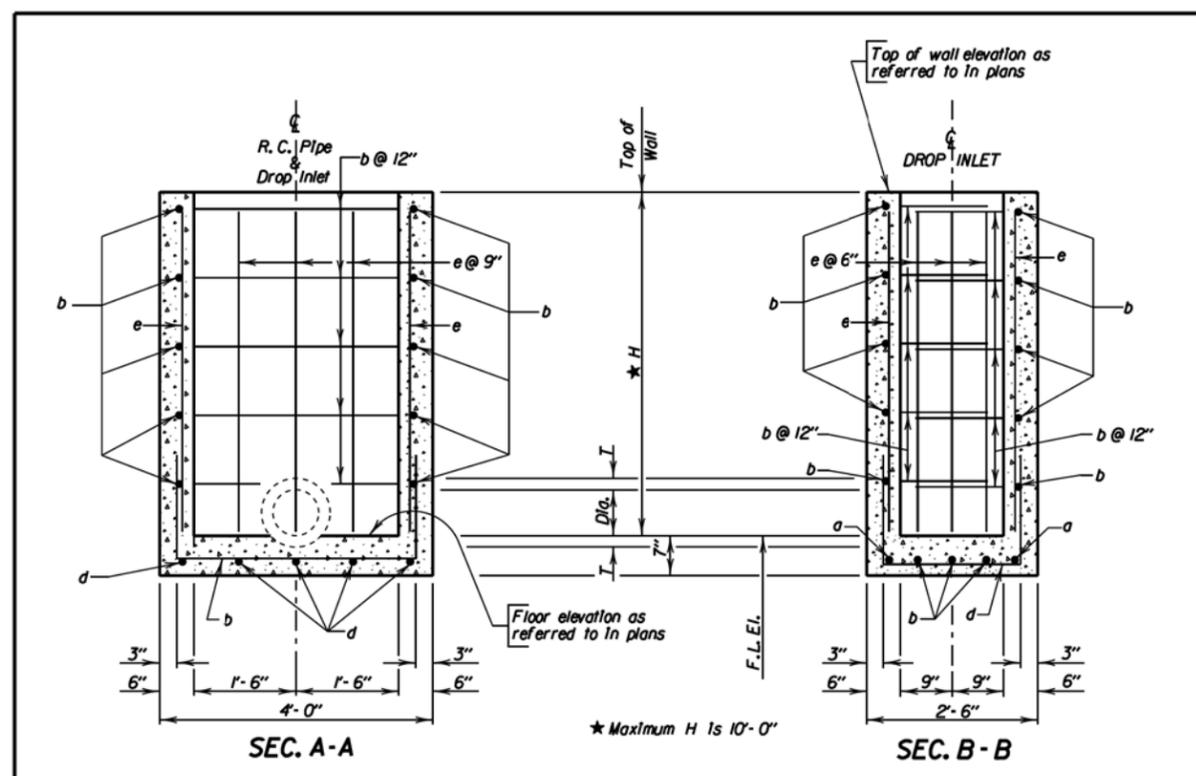
- \* Reduce total quantities of concrete by the amount of concrete displaced by the pipe. The total quantity of concrete shall be computed to the nearest hundredth of a cubic yard. The total quantity of reinforcing steel shall be computed to the nearest pound.
- Drop Inlets shown may be modified by the addition or omission of connecting pipes as shown on the layouts.
- Reinforcing steel shall conform to ASTM A615 Grade 60. The b bars shall be lapped 12 inches. Cut and bend reinforcing steel as required to place pipe(s) through the drop inlet wall.
- Pipe shall not enter through a corner of the drop inlet.
- Use 2" clear cover on all reinforcing steel unless otherwise noted.
- Precasting of reinforced drop inlets will be permissible. Prior to precasting, the Contractor shall submit details to the Engineer for approval.
- Maximum pipe diameter shall not exceed 12 inches on the 2.5 foot wide side and shall not exceed 27 inches on the 4 foot wide side of the drop inlet.
- The dimension of H is in feet.

**PIPE DISPLACEMENT REDUCTIONS**

R.C. Pipe Diameter Inches	T Inches	Class M6 Concrete Cu'd
12	2	0.03
15	2 1/4	0.04
18	2 1/2	0.05
24	3	0.09
27	3 1/4	0.11

December 23, 2009

<b>S D D O T</b>	<b>1.5' X 3' TYPE D REINFORCED CONCRETE DROP INLET</b>	PLATE NUMBER <b>670.20</b>
	Published Date: 4th Qtr. 2015	Sheet 1 of 2



**DROP INLETS FOR 12" TO 27" DIAMETER PIPE**

**REINFORCING SCHEDULE**

MK.	No.	Size	Length	Type	Bending Details
a	2	4	5'-6"	17	
b	3-2H	4	6'-6"	17	
d	5	4	5'-0"	17	
e	16	4	H - 2"	Str.	

NOTE:  
All dimensions are out to out of bars.

December 23, 2009

<b>S D D O T</b>	<b>1.5' X 3' TYPE D REINFORCED CONCRETE DROP INLET</b>	PLATE NUMBER <b>670.20</b>
	Published Date: 4th Qtr. 2015	Sheet 2 of 2

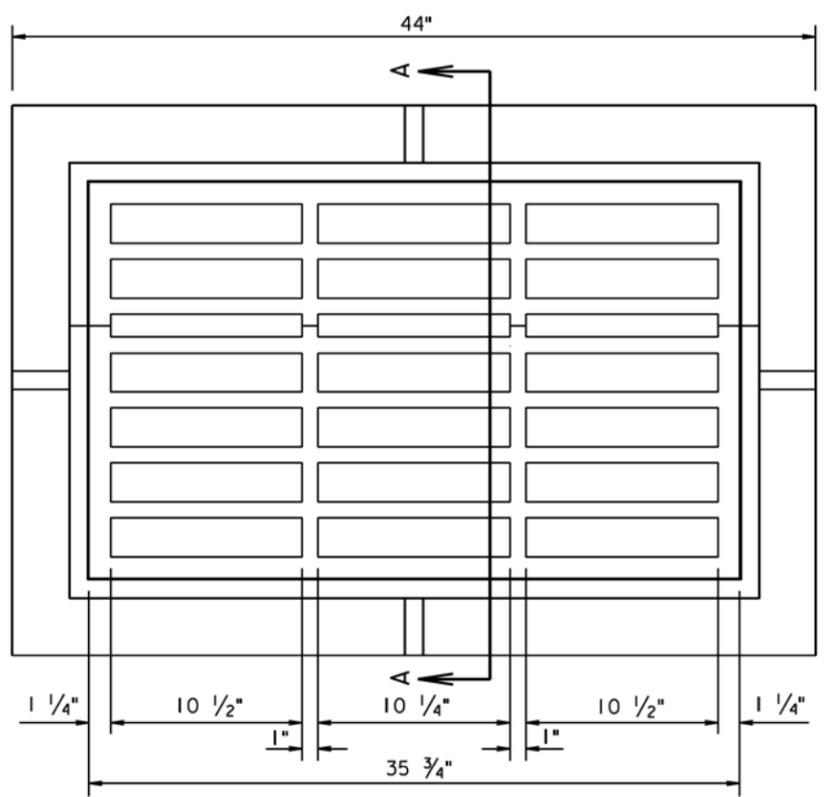
PLOT SCALE - 1:200

PLOTTED FROM - TRM111118

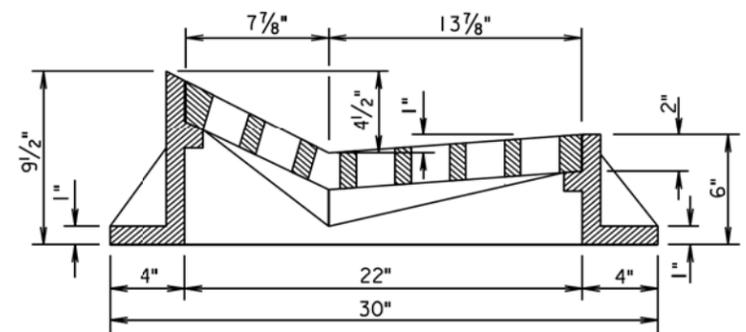
PLOT NAME - 29

FILE - ... \STANDARDPLATES\_05HE.DGN

Plotting Date: 12/01/2015



PLAN VIEW



SECTION A-A

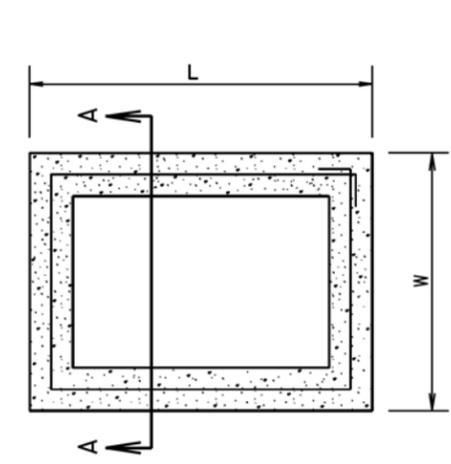
GENERAL NOTE:

The total weight of the frame and grate shall be 620 pounds minimum.

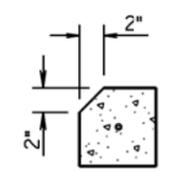
March 31, 2000

<b>S D D O T</b>	<b>TYPE D FRAME AND GRATE</b>	PLATE NUMBER <b>670.84</b>
		Sheet 1 of 1

Published Date: 4th Qtr. 2015

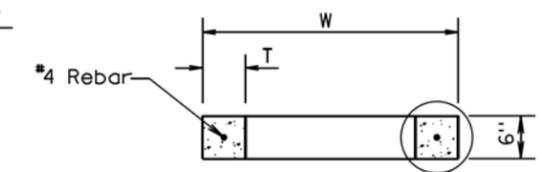


PLAN VIEW



For Type D Drop Inlets only:  
Use Precast Drop Inlet Collar with  
2" chamfer on L sides only.

DETAIL B



SECTION A-A

See Detail B  
(For Type D  
Drop Inlets Only)

INFORMATIONAL QUANTITIES					
FRAME AND GRATE TYPE	L Ft-In	W Ft-In	T In	CLASS M6 CONCRETE CuYd	REINFORCING STEEL Lb
TYPE B	4'-0"	3'-0"	6	0.11	9
TYPE C	5'-0"	4'-0"	6	0.15	11
TYPE D	4'-0"	2'-6"	6	0.10	8

GENERAL NOTES:

All reinforcing steel shall conform to ASTM A615, Grade 60.

The 1/2" diameter bar shall lap 6"± and shall be centered in the concrete.

The cost of furnishing and installing Precast Drop Inlet Collars, including labor, materials, and incidentals shall be incidental to the contract unit price per Each for "Precast Drop Inlet Collar".

March 31, 2000

<b>S D D O T</b>	<b>PRECAST DROP INLET COLLAR</b>	PLATE NUMBER <b>670.99</b>
		Sheet 1 of 1

Published Date: 4th Qtr. 2015

PLOT SCALE - 1:200

.PLOTTED FROM - TRM111118

PLOT NAME - 30

FILE - ... \STANDARDPLATES\_05HE.DGN