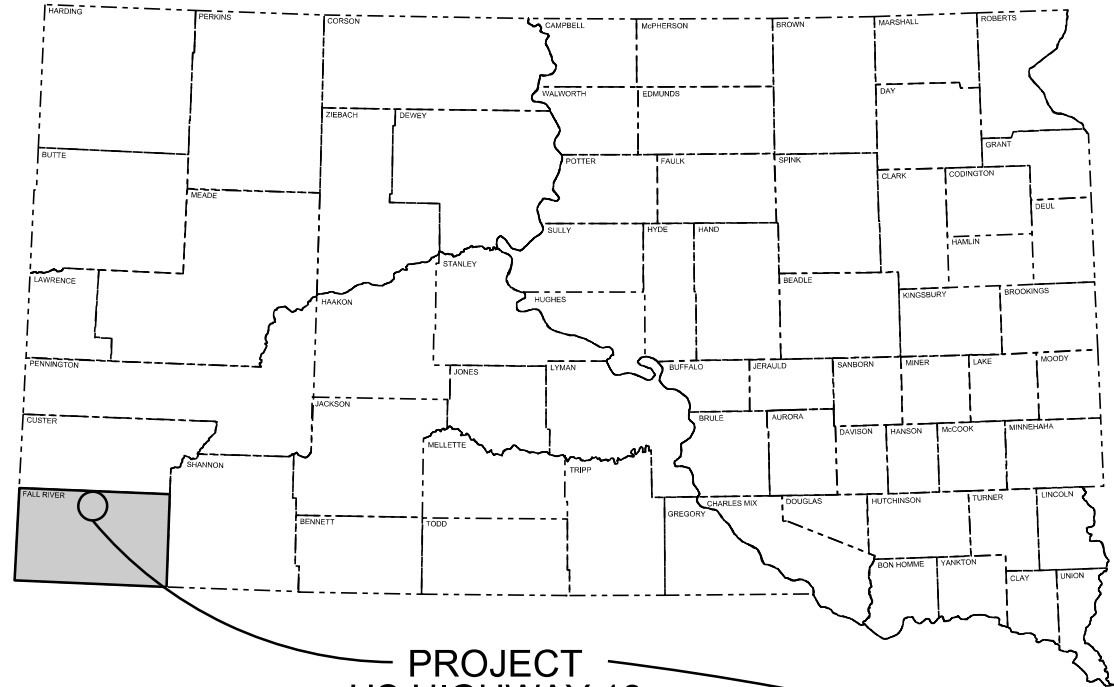


Plot Scale - 1:200

trc12808

Plotted From -



PROJECT  
US HIGHWAY 18  
MRM 39.6 to MRM 39.7

STATE OF SOUTH DAKOTA  
DEPARTMENT OF TRANSPORTATION  
PLANS FOR PROPOSED

PROJECT 018-492  
US HIGHWAY 18  
FALL RIVER COUNTY

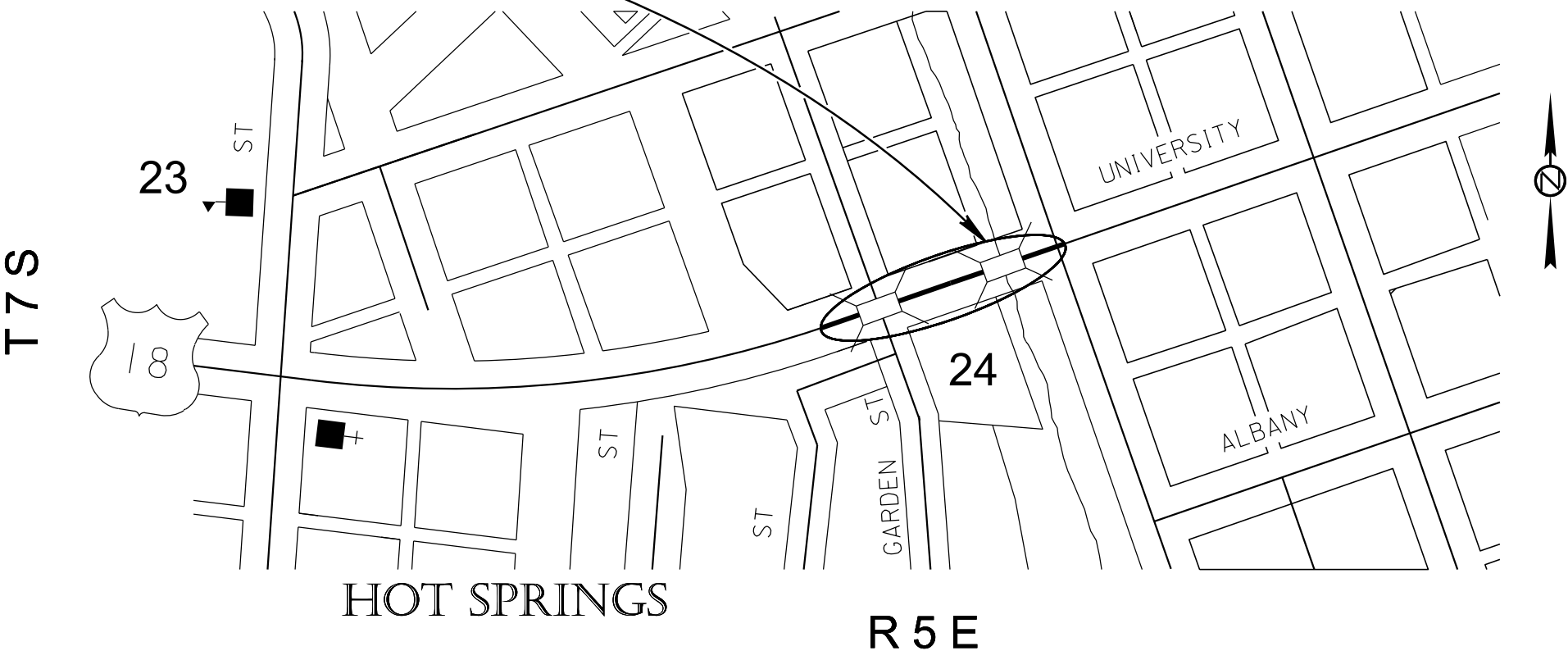
BRIDGE REPAIR  
PCN i2re

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	018-492	1	31

Plotting Date: 03/06/2013

INDEX OF SHEETS

Sheet No.	1:	Title Sheet and Index
Sheets No.	2 - 7:	Estimate of Quantities, Notes, & Tables
Sheet No.	8:	Plan Sheet
Sheet No.	9:	Joint Layouts
Sheet No.	10:	Typical Section
Sheet No.	11:	Curb and Gutter Detail
Sheet No.	12:	Membrane Sealant Expansion Joint Detail
Sheets No.	13 - 25:	Bridge Sheets
Sheets No.	26 - 31:	Standard Plates



DESIGN DESIGNATION

ADT (2011)	3252
ADT (2031)	3756
DHV	785.1
D	50%
T DHV	1.1
T ADT	2.5
V	25 mph

STORM WATER PERMIT

No Storm Water Permit required

ESTIMATE OF QUANTITIES

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
110E0300	Remove Concrete Curb and Gutter	2	Ft
110E1100	Remove Concrete Pavement	80.0	SqYd
110E1140	Remove Concrete Sidewalk	10.0	SqYd
250E0030	Incidental Work, Structure	Lump Sum	LS
260E2010	Gravel Cushion	20.0	Ton
380E0050	8" Nonreinforced PCC Pavement	83.0	SqYd
380E6110	Insert Steel Bar in PCC Pavement	48	Each
410E0030	Structural Steel, Miscellaneous	Lump Sum	LS
410E2600	Membrane Sealant Expansion Joint	65.5	Ft
410E2610	Membrane Sealant	75.5	Ft
460E0070	Class A45 Concrete, Bridge Repair	0.3	CuYd
460E0300	Breakout Structural Concrete	0.4	CuYd
633E0010	Cold Applied Plastic Pavement Marking, 4"	50	Ft
633E5000	Grooving for Cold Applied Plastic Pavement Marking, 4"	50	Ft
634E0010	Flagging	30	Hour
634E0100	Traffic Control	1,110	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0420	Type C Advance Warning Arrow Panel	1	Each
650E2100	Special Concrete Curb and Gutter	3	Ft
651E0040	4" Concrete Sidewalk	90	SqFt
734E0845	Sediment Control at Inlet with Frame and Grate	6	Each

SPECIFICATIONS

Standard Specifications for Roads & Bridges, 2004 Edition and Required Provisions, Supplemental Specifications and/or Special Provisions as included in the Proposal.

PRESS RELEASE

The Contractor shall issue a press release five days prior to the beginning of work. The Contractor shall coordinate the Press Release with the Engineer for content and distribution. Additional updates to the press release may be required. The Contractor shall coordinate with the Engineer for content and distribution. This item shall be incidental to other items. Separate measurement and payment will not be made.

UTILITIES

Utilities are not planned to be affected on this project. If utilities are identified near the improvement area through the SD One Call Process as required by South Dakota Codified Law 49-7A and Administrative Rule Article 20:25, the contractor shall contact the project engineer to determine modifications that will be necessary to avoid utility impacts.

Any damage done to a utility will be the Contractor’s responsibility to repair.

Utilities within the limits of the proposed construction shall be adjusted by the owner as addressed in SDCL 31-26-23 unless otherwise indicated in these plans.

WATER SOURCE

The Contractor shall not withdraw water with equipment previously used outside the State of South Dakota without prior approval from the DOT Environmental Office.

The DOT Environmental Office contact is the Environmental Project Scientist, 605-773-3268. The WATER SOURCE plan note does not relieve the Contractor of his/her responsibility to obtain the necessary permits from other agencies such as the Department of Environment and Natural Resources (DENR) and the United States Army Corps of Engineers (COE).

Storm Water

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.

SAWING IN EXISTING SURFACING

Where new Portland Cement Concrete Pavement (PCCP) is placed adjacent to existing PCCP, the existing pavement shall be sawed full depth to a true line with a vertical face. The cost for sawing shall be incidental to the various bid items on the project.

HISTORICAL PRESERVATION OFFICE CLEARANCES

To obtain State Historical Preservation Office (SHPO) clearance, a cultural resources survey may need to be conducted by a qualified archaeologist. In lieu of a cultural resources survey, the Contractor could request a records search from Jim Donohue, State Archaeological Research Center (SARC). Provide SARC 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 no artifacts have been found on the site. The Contractor shall arrange and pay for the cultural resource survey and/or records search.

If any earth disturbing activities occur within the current geographical or historic boundaries of any South Dakota reservation, the Contractor shall obtain Tribal Historical Preservation Office (THPO) clearance. If no THPO exists, the required SHPO clearance shall suffice, with documentation of Tribal contact efforts provided to SHPO.

To facilitate SHPO or THPO responses, the Contractor should submit a records search or cultural resources survey report to the DOT Environmental Engineer, 700 East Broadway Avenue, Pierre, SD 57501-2586 (605-773-3268). Allow 30 days from the date this information is submitted to the Environmental Engineer for SHPO/THPO approval. The Contractor is responsible for obtaining all required permits and clearances for staging areas, borrow sites, waste disposal sites, and all material processing sites. The Contractor shall provide the required permits and clearances to the Engineer at the preconstruction meeting.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	018-492	2	31

WASTE DISPOSAL SITE

The Contractor will be required to furnish a site(s) for the disposal of construction/demolition debris generated by this project.

Construction/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 Engineer.

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

- Construction/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/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”.
- 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.

REMOVAL OF EXISTING PCC PAVEMENT

Table of Concrete Pavement Removal	
	Remove Concrete Pavement
Location	SqYd
US Highway 18 Viaduct in Hot Springs Adjacent to the approach slab as shown in these plans.	80
Total	80

The Contractor shall dispose of the concrete pavement at a site approved by the Engineer in accordance with the WASTE DISPOSAL SITE notes.

The existing 8 inch P.C.C. Pavement is typically 48 feet wide and is 8” non-reinforced

The existing contraction joints are spaced at approximately 15 feet.

Dimensions for the P.C.C. panel replacement areas are estimates. Actual removal and replacement shall be to the in-place limits of the indicated panels and as directed by the Engineer.

The aggregate in the existing P.C.C. is limestone.

The method of lifting out the concrete panels is not to disturb the underlying subgrade.

TABLE OF CONCRETE CURB AND GUTTER REMOVAL

The Contractor shall breakout concrete around the existing steel. Damage to the existing steel shall be repaired by the Contractor as directed by the Engineer. All costs associated with this work shall be incidental to the contract unit per foot for Remove Concrete Curb and Gutter.

TABLE OF CONCRETE CURB AND GUTTER REMOVAL

Location	Quantity (Ft)
Adjacent to Concrete panel removal (L)	1.0
Adjacent to Concrete panel removal (R)	1.0
Total	2.0

SIDEWALK REMOVAL

To facilitate the removal and replacement of the Special Curb and Gutter concrete sidewalk replacement will also be required.

Additionally, two broken panels of sidewalk adjacent to the approach slab and as detailed in these plans shall be replaced.

All costs for the removal of the concrete sidewalk shall be paid fpr at the contract unit price per SqYd for Remove Concrete Sidewalk.

TABLE OF SIDEWALK REMOVAL

Location	Quantity (SqYd)
Adjacent to Concrete panel removal (L)	2.5
Adjacent to Concrete panel removal (R)	2.5
Two panels adjacent to approach slab as shown in these plans	5.0
Total	10.0

RESTORATION OF GRAVEL CUSHION

An inspection of the gravel cushion subgrade shall be made after removing concrete from the P.C.C. and sidewalk replacement areas. Areas of excess moisture shall be dried to the satisfaction of the Engineer. Loose and excess 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.

A quantity of 20 tons of Gravel Cushion is included in this project to compensate for potential voids beneath the pavement or sidewalk. This quantity may be modified by the Engineer depending on conditions found under the pavement after PCCP and/or sidewalk removal.

8” NON-REINFORCED PCC PAVEMENT

New pavement thickness shall be as indicated in the table of non-reinforced pavement.

The slump requirement will be limited to 3 maximum after water reducer is added and the concrete shall contain 4.5 to 7.0 entrained air. Coarse aggregate shall be crushed ledge rock, Size No. 1. The Contractor is responsible for the mix design used. The Contractor shall submit a mix design and supporting documentation for approval at least 2 weeks prior to use. In lieu of submitting a mix design the Contractor may use one of the following dependent upon type of cement to be used:

	LB./CU.YD.	LB./CU.YD.
CEMENT	800 (TYPE I or II)	710 (TYPE III)
WATER	282	300
FINE AGGREGATE	1039	1114
COARSE AGGREGATE	1726	1668

The use of a high range water reducer at manufacturer’s recommended dosage will be required.

Concrete shall be cured with Curing Compound (AASHTO M148 Type 2) A.S.A.P. 125 ftz/gal. Concrete shall be cured for a minimum of 48 hours before opening to traffic. The 48 hours is based upon a concrete surface temperature of 60 degrees Fahrenheit or higher throughout the cure period. If the concrete temperature falls below 60 degrees Fahrenheit, the cure time shall be extended or other measures shall be taken, at no additional cost to the State. In addition to the curing requirements a strength of 4,000 psi must be obtained prior to opening to traffic.

Concrete shall be covered with suitable insulation blanket consisting of a layer of closed cell polystyrene foam protected by at least one layer of plastic. Insulation blanket shall have an R value of at least 0.5, as rated by the manufacturer. Insulation blanket shall be left in place, except for joint sawing operations. Insulation blanket shall be overlapped on to the existing concrete by 4.

Cost for performing the aforementioned work including furnishing and placing concrete, curing, sawing and sealing joints, labor, tools and equipment shall be included in the contract unit price per square yard for 8” Nonreinforced PCC Pavement.

TABLE OF 8” NONREINFORCED PAVEMENT

Location	1 ¼” Plain Round Dowel Bar (Each)	8” Nonreinforced PCC Pavement (SqYd)
US Highway 18 Viaduct in Hot Springs Adjacent to the approach slab as shown in these plans.	48	83
Total	48	83

ALKALI SILICA REACTIVITY

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

Below is a list of known fine aggregate sources and the average corresponding 14 day expansion values:

Source	Location	Expansion Value
Bachman	Winner, SD	0.335*
Birdsall S&G	Creston, SD	0.158
Birdsall S&G	Oral, SD	0.131
Birdsall S&G	Wasta, SD	0.170
Bitterman	Delmont, SD	0.314*
Concrete Materials	Corson, SD	0.170
Croell	Quinn, SD	0.089
Emme Sand & Gravel	Oneil, NE	0.217
Fischer S&G	Rapid City, SD	0.092
Fischer S&G	Spearfish, SD	0.053
Fuchs	Pickstown, SD	0.275*
Higman	Akron, IA	0.198
Higman	Hudson, SD	0.187
Hilde	Madison, SD	0.116
Jensen	Herried, SD	0.276*
L.G. Everist	Brookings, SD	0.186
L.G. Everist	Hawarden, IA	0.166
L.G. Everist	Summit, SD	0.141
Morris	Blunt, SD	0.192
Morris – Richards pit	Onida, SD	0.188
Myrl & Roys Paving-Nelson Pit	Sioux Falls, SD	0.156
Northern Concrete Agg.	Rauville, SD	0.113
Northern Concrete Agg.	Luverne, MN	0.124
Opperman - Gunvordahl Pit	Burke, SD	0.337*
Opperman - Cahoy Pit	Herrick, SD	0.307*
Opperman - Jones Pit	Burke, SD	0.321*
Opperman – Randall Pit	Pickstown, SD	0.239
Thorpe Pit	Britton, SD	0.098
Wagner Building Supplies	Wagner, SD	0.241
Wasta Sand & Gravel	Wasta, SD	0.159

\* These sources will require Type V cement in the concrete mix design and Class F (Modified) fly ash as specified.

The Department will use the running average of the last three known expansion test results or less for determining acceptability of source and the required Type of cement. These expansion results are reported in the preceding table. Additional testing, when requested by the Contractor, will be performed by the Department at the Contractor's expense.

The values listed in the table are intended for use in bidding. If a previously tested pit by SDDOT with acceptable test values (less than 0.250) is discovered after letting to require Type V cement (greater than 0.250) the Department will accept financial responsibility for the change from Type II to Type V cement.

Type II or Type V cement will not change the requirement for the fly ash. The cost for either type of cement shall be subsidiary to the contract item.

SAW AND SEAL JOINTS

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

Joints shall not be sealed until 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.

Joints shall be sealed with Hot Poured Elastic Joint Sealer. Acceptance of the Hot Poured Elastic Joint Sealer will be based on visual inspection by the Engineer.

Cost for sawing and sealing of the joints shall be incidental to the contract unit price per square yard for 8” Nonreinforced PCC Pavement.

TIE BARS AND LONGITUDINAL JOINTS

No. 5 x 24” epoxy coated deformed tie bars shall be used for longitudinal joints

The use of automatic tie bar inserters will not be allowed.

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: ± T/6 for any part of the tie bar (T = slab thickness)
- Transverse Placement (side shift): ± 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.

This project will require a quantity of 18 No. 5 Deformed Tie bars.

STEEL BAR INSERTION

Locations and quantities of concrete repair 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) into drilled holes in the existing concrete pavement. An epoxy resin adhesive must be used to anchor the steel bar in the drilled hole.

Steel 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 BAR INSERTION (CONTINUED)

Epoxy resin adhesive shall be of the type intended for horizontal applications, and shall conform to the requirements of ASTM C 881, Type I, Grade 3 (equivalent to AASHTO M235, Type I, Grade 3).

The diameter of the drilled holes in the existing concrete pavement for the steel bars shall not be less than 1/8 inch nor more than 3/8 inch greater than the overall diameter of the steel bar. Holes drilled into the existing concrete pavement shall be located at mid-depth of the slab and true and normal. The drilled holes shall be blown out with compressed air using a device that will reach to the back of the hole to ensure that all debris or loose material has been removed prior to epoxy injection.

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.

Mix the epoxy resin as recommended by the manufacturer and apply by an injection method approved by the Engineer. If an epoxy pump is utilized, it shall be capable of metering the components at the manufacturer's designated rate and be equipped with an automatic shut-off. The pump shall shut off when any of the components are not being metered at the designated rate.

Fill the drilled holes 1/3 to 1/2 full of epoxy, or as recommended by the manufacturer, prior to insertion of the steel bar. Care shall be taken to prevent epoxy from running out of the horizontal holes prior to steel bar insertion. Rotate the steel bar during insertion to eliminate voids and ensure complete bonding of the bar. Insertion by the dipping method will not be allowed.

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.

REMOVE POLYMER MODIFIED ASPHALT GROWTH JOINT

All costs to remove the polymer modified asphalt growth joints shall be incidental to the contract unit price per square yard for Remove Concrete Pavement.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	018-492	4	31



MEMBRANE SEALANT EXPANSION JOINT

1. Install all membrane sealant expansion joints at the plan shown locations in conformance to the following notes.
2. The Membrane Sealant shall be one of membrane sealant types from the approved product list for Membrane Sealant Expansion Joints.
3. The manufacturer shall supply the membrane sealant in packaging that pre-compresses the membrane sealant. The precompressed dimension shall be as recommended by the sealant manufacturer to provide a water tight seal throughout a joint movement range of + 25% (minimum) from the specified joint opening dimension. In no case shall the pre-compressed 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.
4. The membrane sealant shall be supplied in pieces 5 feet in length or longer. The foam sealant shall be ultra-violet and ozone resistant.
5. The bonding adhesive used to attach the membrane sealant to the adjacent concrete shall be approved by the membrane sealant manufacturer.
6. Adhesive used to join adjacent pieces of the membrane sealant shall be as recommended by the manufacturer.
7. If Styrofoam filler material is used in the construction, it shall be closed cell and water-tight as approved by the Engineer.
8. The minimum ambient air temperature at the time of joint installation and adhesive curing shall be 40° F.
9. 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 insure the Contractor installs the joint to the Manufacturers recommendations.
10. The joint opening shall be constant width and shall have smooth vertical sides. Surfaces of material adjacent to the joint shall be at the correct grade and crown as approved by the Engineer.
11. Concrete 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 concrete surface. At a minimum two passes of abrasive blasting with the nozzle held at an angle to within 1 to 2 inches of the a concrete surface will be required. Cleaning of the concrete surfaces with solvents, wire brushing, or grinding shall not be permitted.
12. 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 concrete 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.

MEMBRANE SEALANT EXPANSION JOINT (CONTINUED)

13. Individual spliced sections shall be installed as per the manufacturers' recommendations. The membrane joint sealant manufacturer shall submit a detailed installation procedure to the Engineer at least 5 days prior to joint installation for his review.
14. Traffic shall not be allowed on the joint for a minimum 3 hours unless otherwise directed by the Engineer.
15. Forms for the joint shall be left in place for a minimum of 7 days. No construction equipment or traffic shall be allowed on the joint until the concrete has reached design strength. The joint edges shall be protected from damage by equipment and traffic.
16. 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, inclusive of labor, equipment and incidentals necessary to complete the work in accordance with the plans and the foregoing specifications.

LOCATION OF CONCRETE PAVEMENT JOINTS

The location of joints, as shown and designated on this sheet, are only approximate locations to be used as a guide in the final location of joints and to afford bidders a basis for estimating the construction cost of the joints. The final location of the joints are to be designated by the Engineer during construction.

PERMANENT PAVEMENT MARKINGS

Concrete panel removal areas:

Pavement marking material for skip, lane lines, arrows, solid area and diagonal hash lines shall be Cold Applied Plastic Pavement Marking, 3M 380ES or equivalent Type A as defined in Section 983 of the Standard Specifications.

This project will require 15 feet of double yellow centerline marking (30 ft total) and one 10 foot white skip line per direction of traffic (20 ft total).

The Contractor is responsible for properly locating the new striping in the original locations.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	018-492	5	31

GROOVE FOR PAVEMENT MARKING

All concrete pavement surfaces which require cold applied plastic tape shall be grooved prior to application.

The grooving, light grinding or sand blasting operation shall remove the existing pavement markings and provide the surface preparation required for application of the cold applied plastic tape.

The work shall generally consist of grooving the concrete surface and subsequent application of cold applied plastic tape.

The groove shall be made in a single pass dry cut using stacked diamond or carbide tipped cutting heads mounted on a floating head with controls capable of providing uniform depth and alignment. The equipment shall be self-vacuuming and leave the cut groove ready for pavement marking installation. Dry cut grooving without a vacuum shall only be allowed if markings run perpendicular to the roadway, such as "STOP BARS". The pavement marking shall be placed in the grooves the same day as the cut. Grooves shall be clean and dry prior to pavement marking application.

**Cutting head:** The spacing between each blade must be such that there is less than a 10 mil raise in the finished groove between the blades.

**Groove width:** Pavement marking width + 1/2 inch (+/- 1/8 inch)

**Groove depth:** 80 Mils (+ 5/-0 Mils) for cold applied plastic tape

**Groove length:** Full length of marking + 3 inch grooving transition each end

**Groove position:** Minimum of 2 inches from edge of longitudinal seam

**Groove cleaning:** Grooves must be cleaned by using high pressure compressed air (90 psi minimum). A leaf blower will not be an acceptable substitute for compressed air.

If the cold applied plastic tape (including primer if required) does not immediately follow dry pavement grooving, the following shall apply:

Within 24 hours prior to placing the cold applied plastic tape the groove shall be sandblasted and free of any residue and laitance. If the cold applied plastic tape is not placed within 24 hours of sandblasting, the groove shall be re-sandblasted.

The cold applied plastic tape shall be installed in accordance with the manufacturer's recommendations.

SEQUENCE OF OPERATIONS – GENERAL NOTES

1. Requests to deviate from the sequence of operations shall be submitted in writing to the Engineer for review. Approval of an alternate sequence of operations will only be allowed when the proposed changes meet with the Department's intent for traffic control and sequencing of the work. An alternate sequence shall be submitted for review a minimum of one week prior to potential implementation.
2. Unless otherwise stated in these plans, no work will be allowed during hours of darkness. Hours of darkness are defined, as ½ hour after sunset until ½ hour before sunrise.
3. Storage of vehicles and equipment shall be as near the right-of-way as possible. Contractor's employees should mobilize at a location off the right-of-way and arrive at the work sites in a minimum number of vehicles necessary to perform the work. Indiscriminate driving and parking of vehicles within the right-of-way will not be permitted. Any damage of 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.
4. Existing guide, route, informational logo, regulatory, and warning signs shall be temporarily reset and maintained during construction. Removing, relocating, covering, salvaging and resetting of existing traffic control devices, including delineation, shall be the responsibility of the Contractor. Non-applicable signing shall be covered or removed during periods of inactivity. Periods of inactivity shall be defined as no work taking place for a period of more than 36 hours. The cost of removing or covering non-applicable signs shall be incidental to the contract lump sum price for, Traffic Control, Miscellaneous.
5. Construction signing mounted on portable supports shall not be used for a duration of more than 3 days, unless approved by the Engineer. Construction signing that remains in the same location for more than 3 days shall be mounted on fixed location, ground mounted, breakaway supports.
6. If inappropriate/conflicting pavement markings exist, the markings shall be removed and replaced with applicable temporary pavement markings when the work duration is more than 3 days. When the work duration is less than 3 days, the channelizing devices in the area where the pavement markings conflict shall be placed at a spacing of ½ G. Pavement marking removals shall be paid for at the contract unit price for Remove Pavement Marking, 4" or equivalent. Temporary pavement marking shall be paid for at the contract unit bid price for Temporary Pavement Marking. The additional channelizing devices shall be incidental to the contract lump sum price for Traffic Control, Miscellaneous.
7. The quantity of Signs paid for will be for the greatest number of installations per sign in place at any one time regardless of the number of set-ups on the project.
8. Any delineators and signs damaged or lost shall be replaced by the Contractor at no cost to the State.
9. All materials and equipment shall be stored a minimum distance of 30' from the traveled way during nonworking hours.

SEQUENCE OF OPERATIONS – GENERAL NOTES (CONTINUED)

10. The Contractor shall provide documentation that all breakaway sign supports comply with FHWA NCHRP 350 or MASH crash-worthy requirements. The Contractor shall provide installation details at the preconstruction meeting for all breakaway sign support assemblies.
11. The Contractor shall be required to have a person available 24 hour/day, 7 days/week to maintain traffic control devices. The name and cellular telephone number of this individual shall be given to the Engineer at the preconstruction meeting.
12. The Contractor or designated traffic control subcontractor shall make night inspections at the initial set up of traffic control and every week thereafter to ensure the adequacy, legibility and reflectivity of each sign and device. A written summary of each inspection shall be given to the Engineer within 24 hours after completion of the inspection. The cost for the nighttime inspection work shall be incidental to the contract lump sum price for Traffic Control, Miscellaneous.
13. Vehicles working in traffic or alongside traffic shall be equipped with a flashing amber light visible from all directions. The amber light shall be mounted on the uppermost part of the contractor's vehicle. Lights must have peak intensity within the range of 40 to 400 candelas and must flash at 75 ± 15 flashes per minute. Vehicle flasher/hazard lights are not acceptable.
14. All construction operations shall be conducted in the general direction of traffic movement.
15. If there is a discrepancy between the traffic control plans, standard plates, and the MUTCD – whichever is more stringent shall be used.
16. Temporary Road Markers shall be used for lane closure tapers or lane shift tapers. Temporary Road Markers used for tapers and shifts will not be measured for payment and will be incidental to the contract lump sum price for Traffic Control, Miscellaneous.
17. Drums are required in all lane closure tapers.

SEQUENCE OF OPERATIONS

Standard Plate 634.44, shall be used for Phase 1. Standard Plate 634.46 shall be used for Phase 2. Standard Plate 634.33 shall be used for the sidewalk work adjacent to the lane that is closed.

1. Set up traffic control to close two lanes of roadway.
2. Phase 1: Complete all work required on closed lanes and sidewalk.
3. Switch traffic control to the other side.
4. Phase 2: Complete remaining work required on closed lanes and sidewalk.
5. Remove traffic control.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	018-492	6	31

TRAFFIC CONTROL DEVICES INVENTORY

SIGN CODE	SIGN SIZE	DESCRIPTION	#	UNITS PER SIGN	UNITS
G20-2	36" x 18"	END ROAD WORK	4	17	68
R3-1	24" x 24"	NO RIGHT TURN (SYMBOL)	1	16	16
R3-2	24" x 24"	NO LEFT TURN (SYMBOL)	3	16	48
R3-7R	30" x 30"	RIGHT LANE MUST TURN RIGHT	1	21	21
R4-7	24" x 30"	KEEP RIGHT (SYMBOL)	1	18	18
R9-9	24" x 12"	SIDEWALK CLOSED	1	4	4
R9-10	24" x 12"	SIDEWALK CLOSED, USE OTHER SIDE	2	4	8
W1-3	48" x 48"	REVERSE TURN SIGN (LEFT OR RIGHT)	2	34	68
W4-2	48" x 48"	LEFT OR RIGHT LANE ENDS (SYMBOL)	2	34	68
W4-7	48" 48"	THRU TRAFFIC MERGE LEFT	1	34	34
W11-2	36" x 36"	PEDSTRIAN (SYMBOL)	4	27	108
W13-1P	30" x 30"	ADVISORY SPEED PLATE	1	21	21
W16-7P	30" x 18"	DOWNWARD DIAGONAL ARROW	2	15	30
W16-9P	30" X 18"	AHEAD	2	15	30
W20-1	48" x 48"	ROAD WORK AHEAD	6	34	204
W20-4	48" x 48"	ONE LANE ROAD AHEAD	2	34	68
W20-5	48" x 48"	LT. OR RT. LANE CLOSED AHEAD	2	34	68
W20-7a	48" x 48"	FLAGGER	2	34	68
*****		TYPE III BARRICADE - 8 FT. SINGLE SIDED	4	40	160
TOTAL UNITS					1110

MANHOLE

The manhole shown in the sidewalk shall not be disturbed. Any damage to the manhole caused by construction activities shall be repaired by the Contractor at no additional cost to the State,

A working joint shall be formed in the concrete sidewalk at the midpoint of the manhole as shown in these plans.

SPECIAL CONCRETE CURB AND GUTTER

Special Concrete Curb and Gutter shall be constructed as shown in the details in these plans.

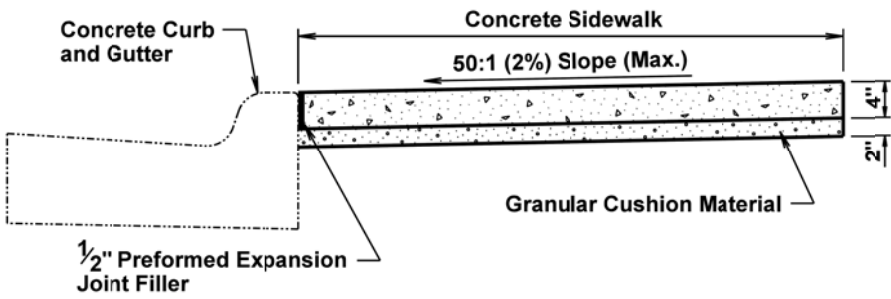
An additional 6 inches shall be added to the 1 foot sections for a total of 1.5 feet of new Special Curb and Gutter per side to compensate for the narrower dimensions of the new seal.

All reinforcing steel necessary shall be incidental to the contract unit price per foot for Special Concrete Curb and Gutter.

TABLE OF SPECIAL CONCRETE CURB AND GUTTER

Location			Quantity (Ft)
Adjacent to removal (L)	Concrete	panel	1.5
Adjacent to removal (R)	Concrete	panel	1.5
Total			3.0

CONCRETE SIDEWALK



A transverse working joint shall be placed at the midpoint of the manhole to allow for contraction  
The concrete sidewalk shall be constructed in accordance with Section 651 of the Standard Specifications. The sidewalk details shown above are typical of this project.

TABLE OF 4" CONCRETE SIDEWALK

Location			Quantity (SqFt)
Adjacent to removal (L)	Concrete	panel	22.5
Adjacent to removal (R)	Concrete	panel	22.5
Two panels adjacent to approach slab as shown in these plans			45.0
Total			90.0

SEDIMENT CONTROL AT INLETS WITH FRAMES AND GRATES

This type of sediment control device should be used where there is pavement in the vicinity of the drop inlets and storm water or sediment could possibly enter the frame and grate. Sediment Control at Inlets with Frame and Grates shall be installed prior to working in the vicinity of the drop inlets.

The Contractor shall be responsible for maintaining and repairing the sediment control devices for the duration of the project for which sediment control measures are required. Maintenance shall be scheduled to prevent storm water from backing up into the driving lane.

Sediment Control at Inlets with Frames and Grates will be paid for one time at each location, regardless of the number of times the sediment control devices are installed, inspected, cleaned, removed, repaired, or replaced. All costs associated with furnishing, installing, inspecting, maintaining, cleaning, sediment removal, and repairing Sediment Control at Inlets with Frames and Grates shall be incidental to the contract unit price per each for Sediment Control at Inlet with Frame and Grate.

Sediment collection devices shall be:

A commercial made sediment collection device from the Sediment Control at Inlet with Frame and Grate list or an approved equal. The device shall be installed in reinforced concrete drop inlets according to the manufacturer's recommendations.

OR

A sediment control device as shown on Standard Plate 734.10. Filter fabric used for constructing the sediment control at inlets with frames and grates shall be the same type of fabric that is used in high flow silt fence from the approved product list. The approved product list may be viewed at the following internet site:

<http://apps.sd.gov/Applications/HC54ApprovedProducts/main.asp>

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	018-492	7	31

SEDIMENT CONTROL AT INLETS WITH FRAMES AND GRATES  
(CONTINUED)

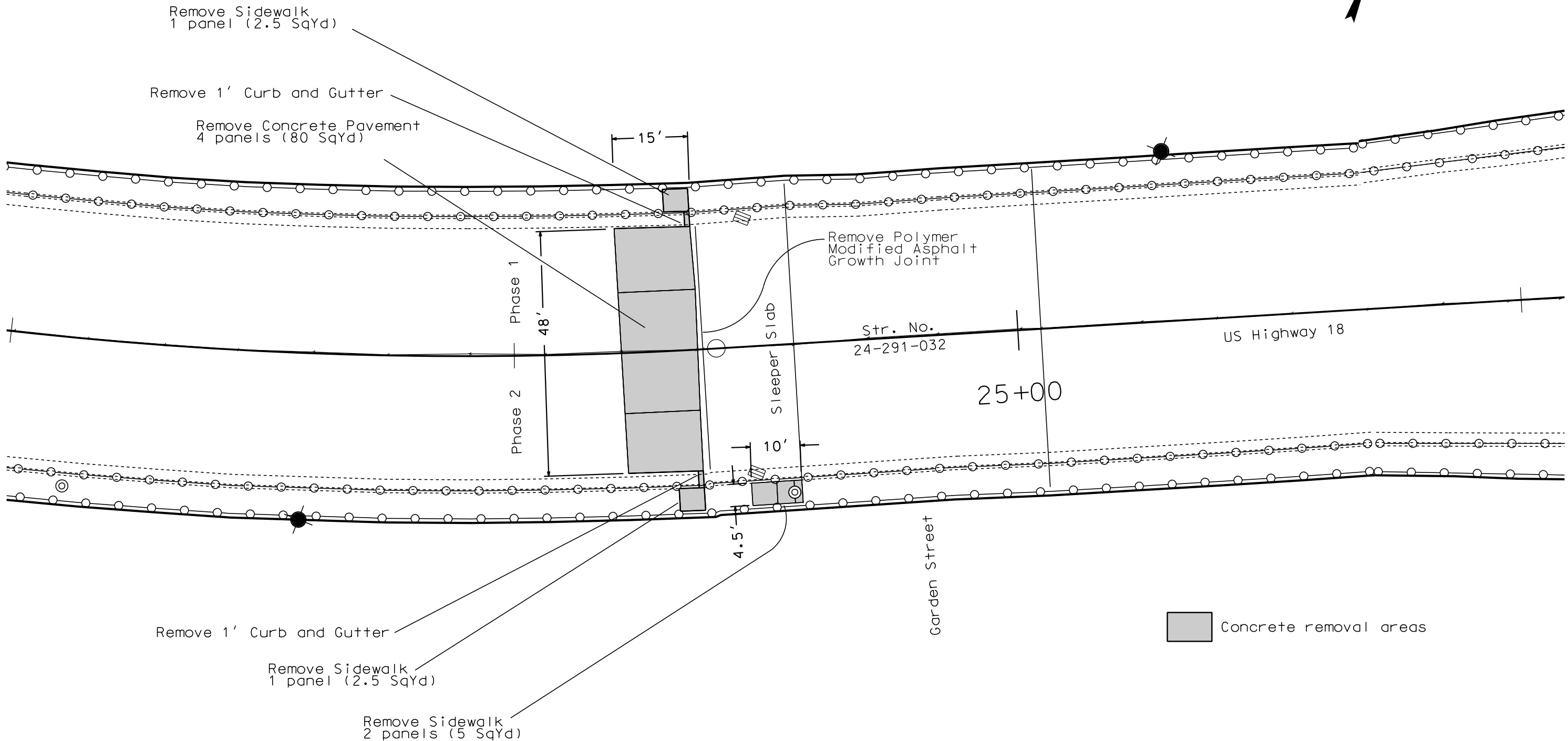
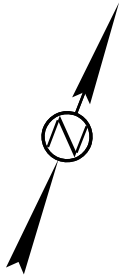
Sediment Control at Inlet with Frame and Grate Approved List:

Product	Manufacturer
InfraSafe Debris Collection Device with filter sock	Royal Environmental Systems, Inc. Stacy, MN Phone: 1-800-817-3240 <a href="http://www.royalenterprises.net">www.royalenterprises.net</a>
Dandy Curb Sack	Dandy Products Inc. Dublin, OH Phone: 1-800-591-2284 <a href="http://www.dandyproducts.com">www.dandyproducts.com</a>
Silt Trapper	Storm Water Solutions Lakeville, MN Phone: 1-952-461-4376 <a href="http://www.silttrapper.com">www.silttrapper.com</a>
DIP Basket	Skyview Construction Co., LLC Waubay, SD Phone: 1-605-520-0555 <a href="http://www.skyviewconst.com">www.skyviewconst.com</a>
FLEXSTORM Inlet Filters	Inlet and Pipe Protection, Inc. Naperville, IL Phone: 1-866-287-8655 <a href="http://www.inletfilters.com">www.inletfilters.com</a>
GR-8 Guard or Combo Guard	ERTEC Environmental Systems LLC Alameda, CA Phone: 1-866-521-0724 <a href="http://www.ertecsystems.com">www.ertecsystems.com</a>
Sediment Catchers	Shaun Jensen Brookings, SD Phone: 1-605-690-4950

It is estimated that 6 Sediment collection devices shall be required.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	018-492	8	31

Plotting Date: 03/07/2013





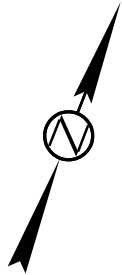
# PCC PAVEMENT JOINT AND SIDEWALK LAYOUT

Layout showing panel replacement and sidewalk replacement areas.

1" = 20'

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	018-492	9	31

Plotting Date: 03/07/2013



Install 22.5 SqFt 4" Concrete Sidewalk

Install 1.5' Special Concrete  
Curb and Gutter (Match existing  
elevation on both ends)

Crown Point  
US18

Install 83 SqYd 8" Nonreinforced PCC Pavement  
(Replace 4 panels)

Install 1.5' Special Concrete  
Curb and Gutter (Match existing  
elevation on both ends)

Install 22.5 SqFt 4" Concrete Sidewalk

Install 45 SqFt 4" Concrete Sidewalk

Install 54.7'  
Membrane Sealant  
Expansion Joint

Phase 1

Phase 2

Str. No.  
24-291-032

25+00

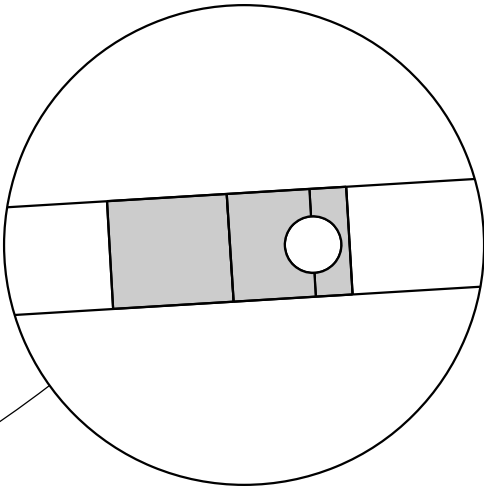
Sleeper Slab

Garden Street



PCCP replacement areas

4" Sidewalk Joint Detail



PLOT SCALE - 1:20

PLOTTED FROM - TRRC12608

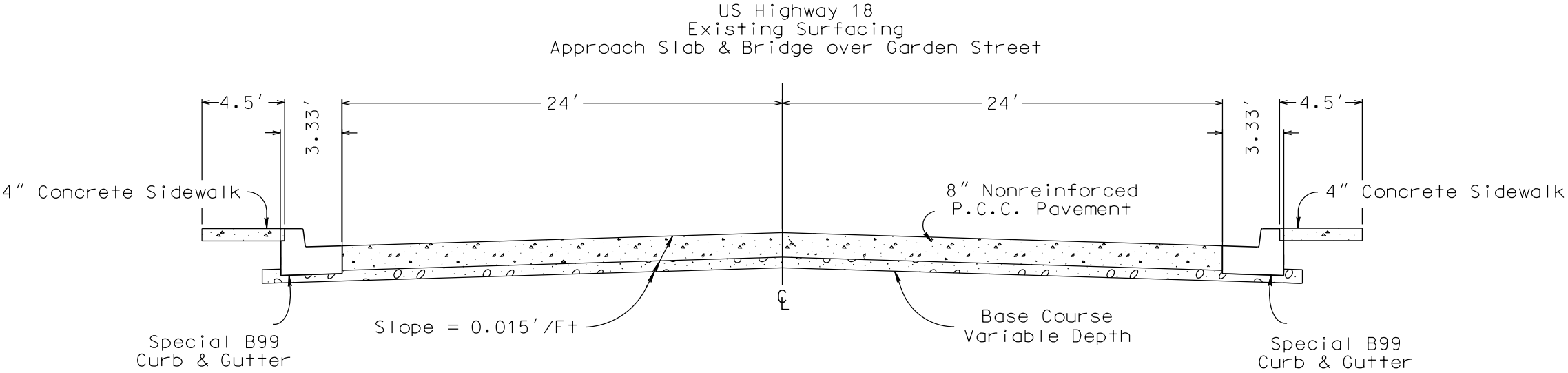
PLOT NAME - 3

FILE - ... \DESIGN\JOINTLAYOUT2.DGN

# TYPICAL SURFACING SECTION

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	018-492	10	31

Plotting Date: 03/07/2013



PLOT SCALE - 1:120

PLOTTED FROM - TRRC12608

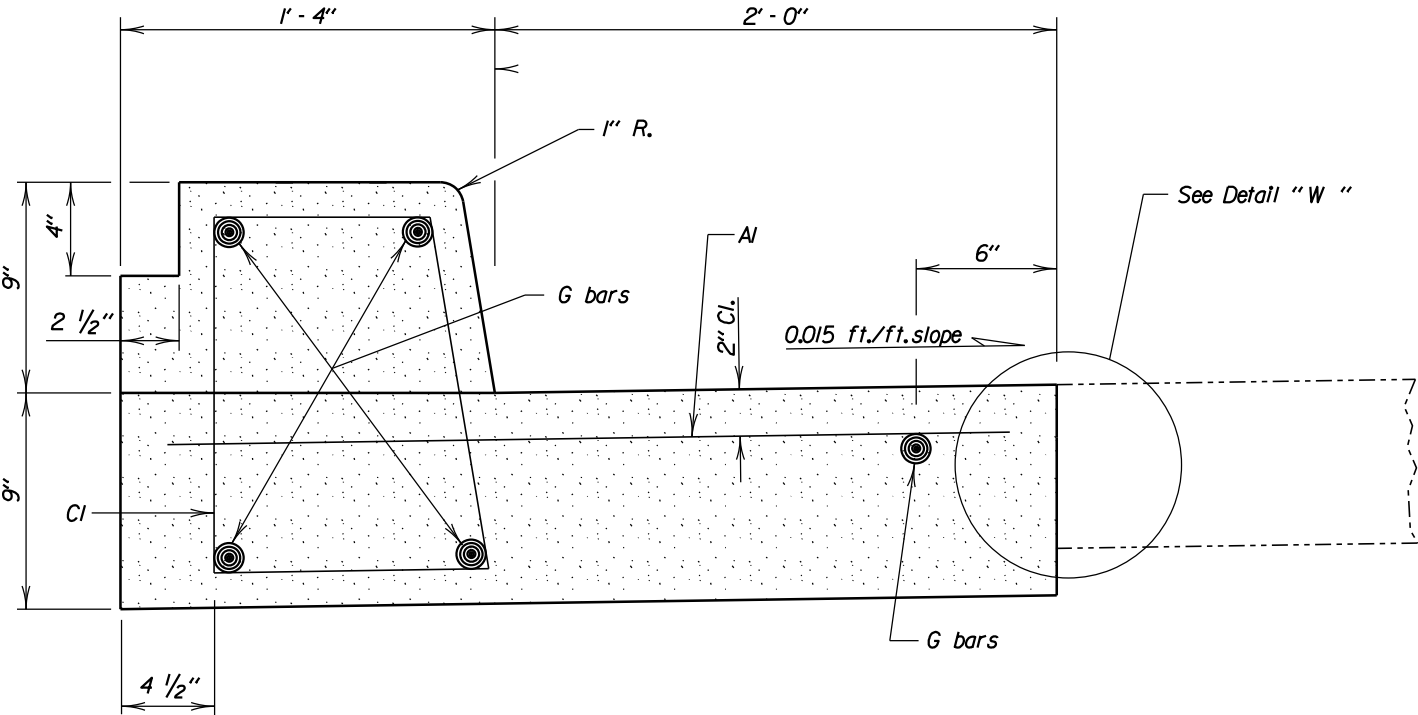
PLOT NAME - 4

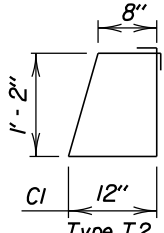
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DETAILS FOR  
SPECIAL CONCRETE CURB AND GUTTER

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	018-492	11	31

Plotting Date: 03/07/2013



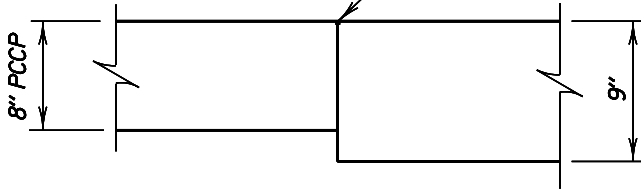
REINFORCING SCHEDULE					
Mk.	No.	Size	Length	Type	Bending Details
AI	2	6	3' - 0"	Str.	
CI	2	4	5' - 0"	T2	
G	10	4	1' - 6"	Str.	

Note -  
All Bars to be Epoxy Coated.  
All Dimensions are out to out of bars.  
△ Bend in field as necessary to fit, using  
Min. Lap of 2' - 6".

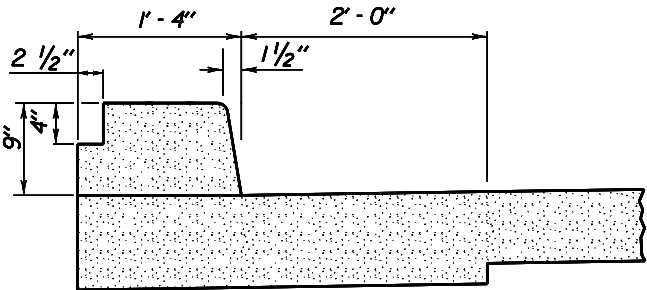
ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Remove Concrete Curb and Gutter	Ft.	2.0
Special Concrete Curb and Gutter	Ft.	3.0

The quantities for Epoxy Coated Reinforcing Steel  
and Class A45 Concrete are incidental to the contract  
unit price per foot for Special Curb and Gutter

3/4" x 3/4" Joint sawed in concrete filled  
with Hot-Poured Elastic Joint Sealer



DETAIL "W "



SECTION

PLOT SCALE - 1:0.2

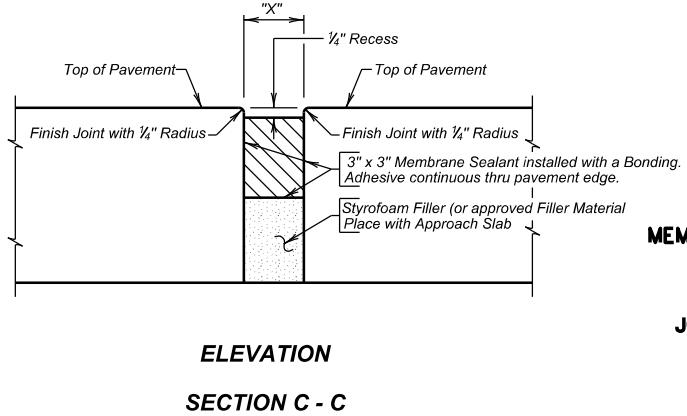
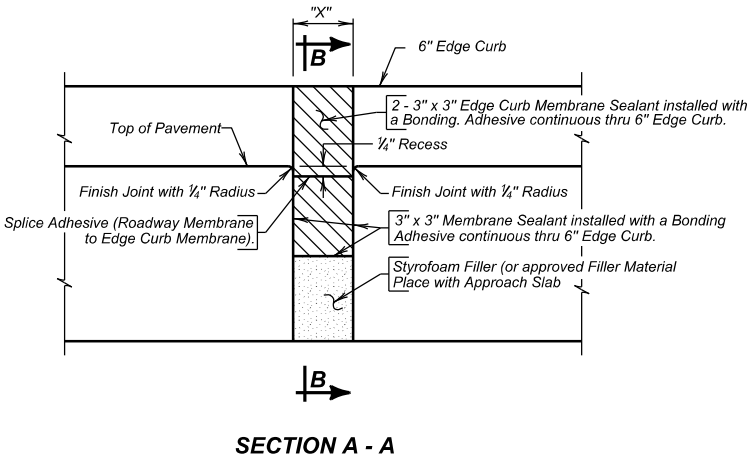
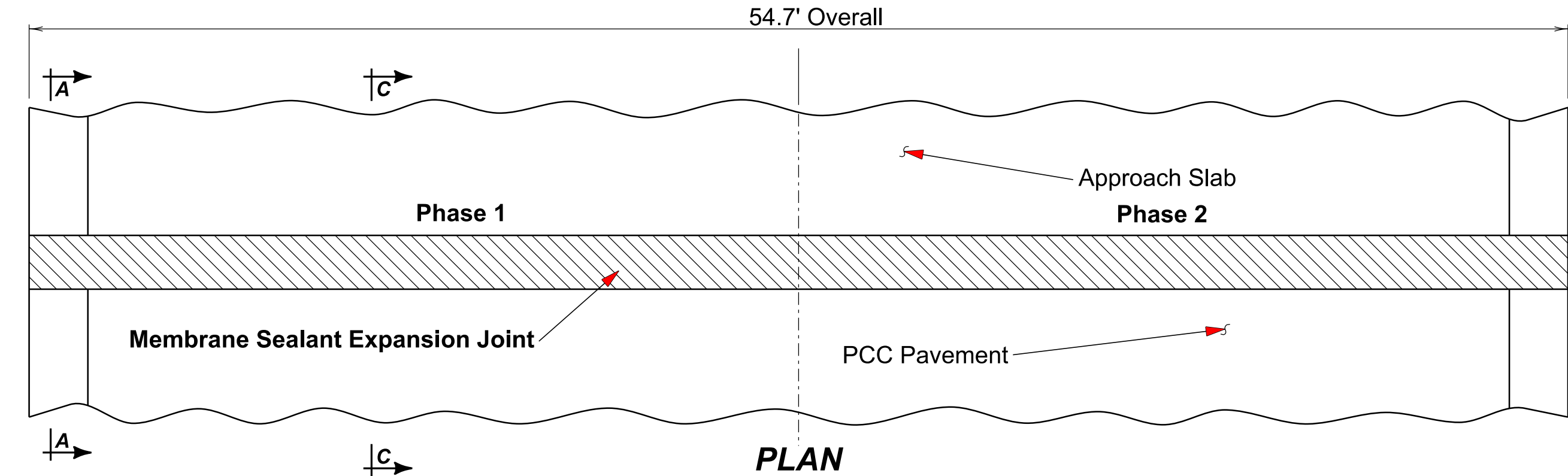
PLOTTED FROM - TRRC12608

# MEMBRANE SEALANT JOINT DETAIL

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	018-492	12	31

Plotting Date: 03/07/2013

FILE - ... \01CZ MEMBRANE SEALANT JOINT DETAILS.DGN PLOT NAME - 6



TEMP.	DIMENSION "X"
30°	3 1/8"
40°	3"
50°	2 7/8"
60°	2 3/4"
70°	2 1/16"
80°	2 9/16"
90°	2 1/16"

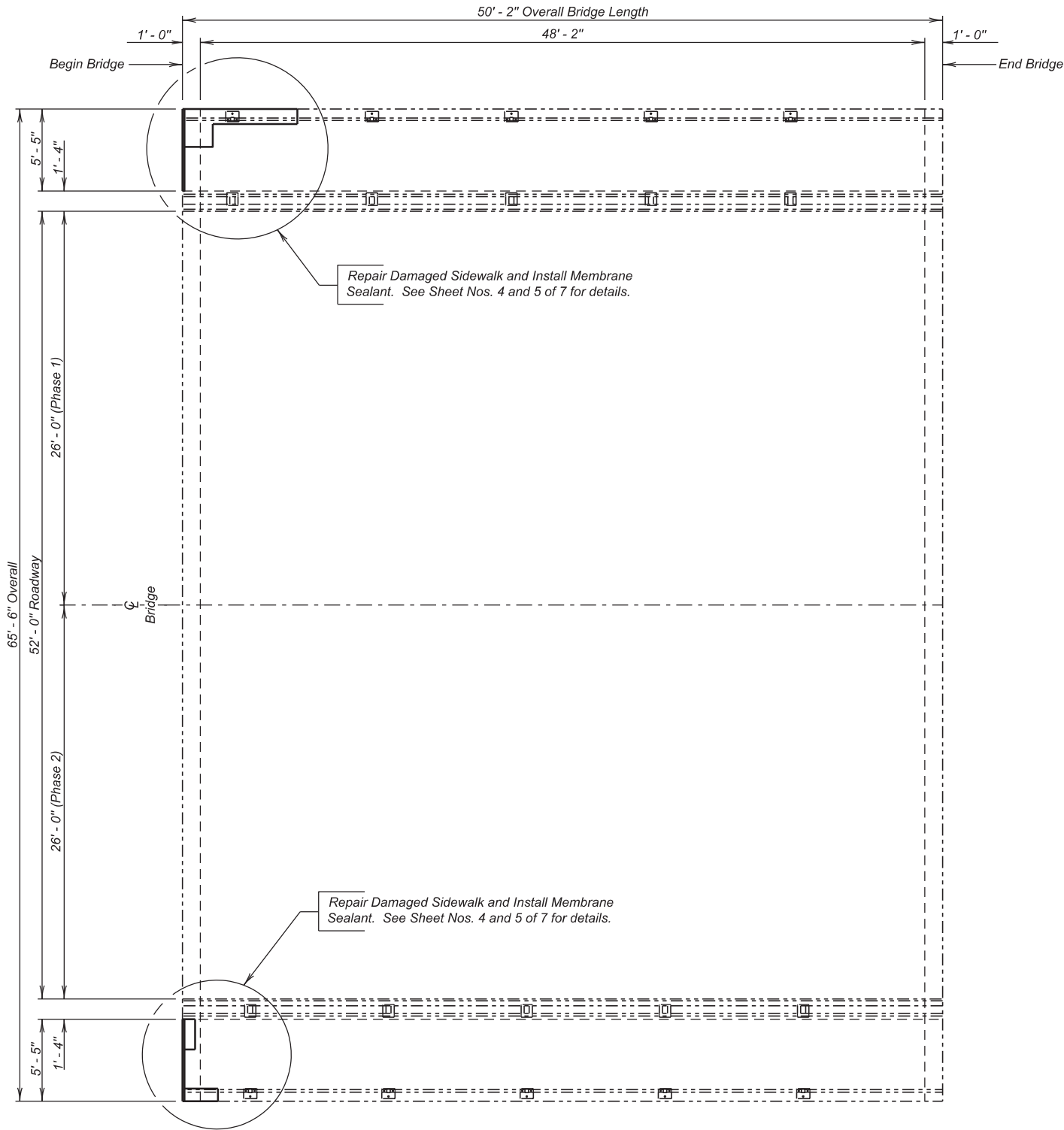
MEMBRANE SEALANT EXPANSION JOINT

DETAILS FOR  
JOINT BETWEEN SLEEPER SLAB  
AND PCC PAVEMENT

PENNINGTON COUNTY  
S. D. DEPT. OF TRANSPORTATION



STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	018-492	13	31



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 - Sidewalk Repair at Abutment No. 1
- Sheet No. 5 - Sidewalk Repair Details at Abutment No. 1
- Sheet Nos. 6 thru 7 - Original Construction Plans

**LAYOUT FOR UPGRADING  
FOR**

**50' - 2" SIMPLE SPAN CONCRETE BRIDGE**

52' - 0" ROADWAY 0° SKEW  
OVER GARDEN STREET SEC. 24-T7S-R5E  
STR. NO. 24-291-032 018-492  
PCN I2RE

FALL RIVER COUNTY  
S. D. DEPT. OF TRANSPORTATION

NOVEMBER 2012

1 OF 7

PLANS BY :  
OFFICE OF BRIDGE DESIGN, SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION

DESIGNED BY NP FRIV2RE	CK. DES. BY KSK I2RELA01	DRAFTED BY NP	<i>Kevin N. Goeden</i> BRIDGE ENGINEER
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ESTIMATE OF STRUCTURE QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
410E0030	Structural Steel, Miscellaneous	Lump Sum	LS
410E2600	Membrane Sealant Expansion Joint	10.8	Ft
460E0070	Class A45 Concrete, Bridge Repair	0.3	CuYd
460E0300	Breakout Structural Concrete	0.4	CuYd

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, 2004 Edition and Required Provisions, Supplemental Specifications and/or Special Provisions as included in the Proposal.
- All Welding and Welding Inspection shall be in conformance with the AASHTO/AWS Bridge Welding Code D1.5M/D1.5:2010 unless otherwise noted in this plan set.

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 elsewhere 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 preconstruction meeting.

- Repair the damaged areas of the bridge sidewalk as detailed in the plans for the first phase of construction.
- Install new pedestrian railing anchor bolts and anchor plate for the first phase of construction.
- Install a new membrane sealant expansion joint at the end of the bridge sidewalk as detailed in the plans for the first phase of construction.
- Switch traffic and repeat steps 1 and 3 for the second phase of construction.

GENERAL CONSTRUCTION - BRIDGE

- 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.

CONCRETE BREAKOUT

- The existing bridge sidewalk 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.
- Extreme care shall be used not to nick, gouge, scratch, or damage in any other way the existing steel pedestrian rail when breaking out the bridge sidewalk. In the event that any nicks, gouges, scratches, or other damage occur, the Office of Bridge Design shall be notified. All damage shall be repaired by the Contractor as recommended by the Office of Bridge Design. All costs involved in repairing any damage shall be at the expense of the Contractor.
- All broken out concrete shall be disposed of by the Contractor. Any disposal of discarded material shall be in accordance with the Construction Specifications.
- During concrete removal operations, no broken out concrete shall be allowed to fall onto Garden Street.
- The contract unit price per cubic yard for “Breakout Structural Concrete” shall include breaking out concrete, anchor bolts and anchor plate, cleaning, straightening existing reinforcing steel, cutting the existing sidewalk dowel bars, and disposal of all broken out material, including the ½” preformed expansion material.
- The existing reinforcing steel in the bridge sidewalk 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.

PEDESTRIAN RAILING

- New anchor bolt shall be installed to replace the removed anchor bolts. The anchor bolts shall conform to ASTM A307. The bolts, nuts and washers shall be galvanized in accordance with ASTM Specification A153.
- A new 8” x 3/16” x 10½” anchor plate shall be installed to replace the removed plate. The plate shall conform to ASTM A36.
- All costs associated with furnishing and installing the new anchor bolts and the 8” x 3/16” x 10½” anchor plate shall be incidental to the contract lump sum price for “Structural Steel Miscellaneous”.

MEMBRANE SEALANT EXPANSION JOINT

- Install all membrane sealant expansion joints at the plan shown locations in conformance to the following notes.
- The Membrane Sealant shall be one of membrane sealant types from 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 to provide a water tight seal throughout a joint movement range of + 25% (minimum) from the specified joint opening dimension. 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 be supplied in pieces 5 feet in length or longer. 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 as recommended by the manufacturer.
- If Styrofoam filler material is used in the construction, it shall be closed cell and water-tight as approved by the Engineer.

ESTIMATE OF STRUCTURE QUANTIES AND NOTES  
FOR  
50’ – 2” SIMPLE SPAN CONCRETE BRIDGE

Str. No. 24-291-032

NOVEMBER 2012

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	018-492	15	31

MEMBRANE SEALANT EXPANSION JOINT (CONTINUED)

8. The minimum ambient air temperature at the time of joint installation and adhesive curing shall be 40° F.
9. 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 insure the Contractor installs the joint to the Manufacturers recommendations.
10. The joint opening shall be constant width and shall have smooth vertical sides. Surfaces of material adjacent to the joint shall be at the correct grade and crown as approved by the Engineer.
11. Concrete 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 concrete surface. At a minimum two passes of abrasive blasting with the nozzle held at an angle to within 1 to 2 inches of the a concrete surface will be required. Cleaning of the concrete surfaces with solvents, wire brushing, or grinding shall not be permitted.
12. 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 concrete 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.
13. Individual spliced sections shall be installed as per the manufacturers' recommendations. The membrane joint sealant manufacturer shall submit a detailed installation procedure to the Engineer at least 5 days prior to joint installation for his review.
14. Traffic shall not be allowed on the joint for a minimum 3 hours unless otherwise directed by the Engineer.
15. Forms for the joint shall be left in place for a minimum of 7 days. No construction equipment or traffic shall be allowed on the joint until the concrete has reached design strength. The joint edges shall be protected from damage by equipment and traffic.
16. 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, inclusive of labor, equipment and incidentals necessary to complete the work in accordance with the plans and the foregoing specifications.

NOTES (CONTINUED)  
FOR  
50' – 2'' SIMPLE SPAN CONCRETE BRIDGE

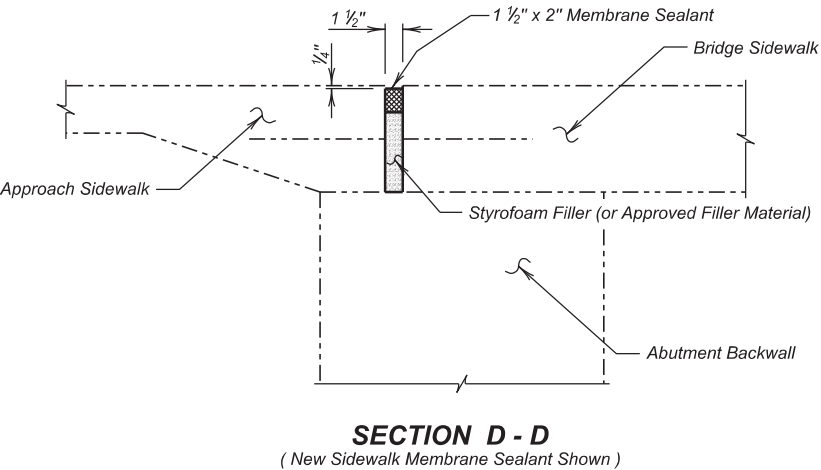
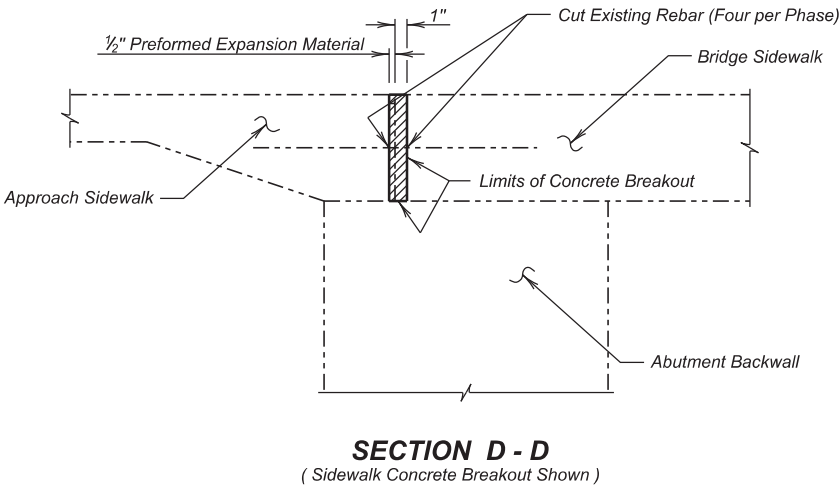
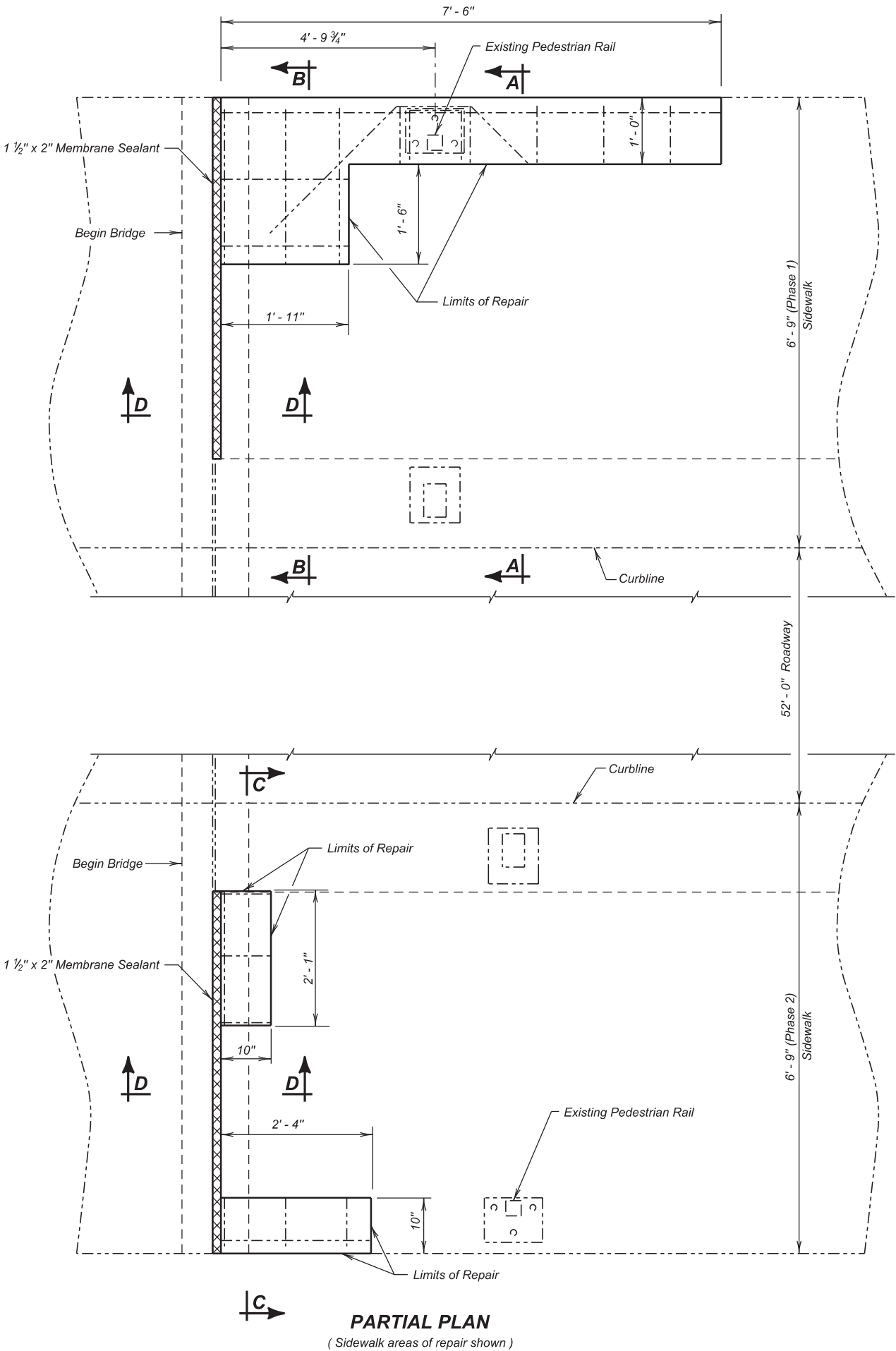
Str. No. 24-291-032

NOVEMBER 2012

3 OF 7

DESIGNED BY NP	CK. DES. BY KSK	DRAFTED BY: NP	
FRIVI2RE	I2RENOTA		BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	018-492	16	31



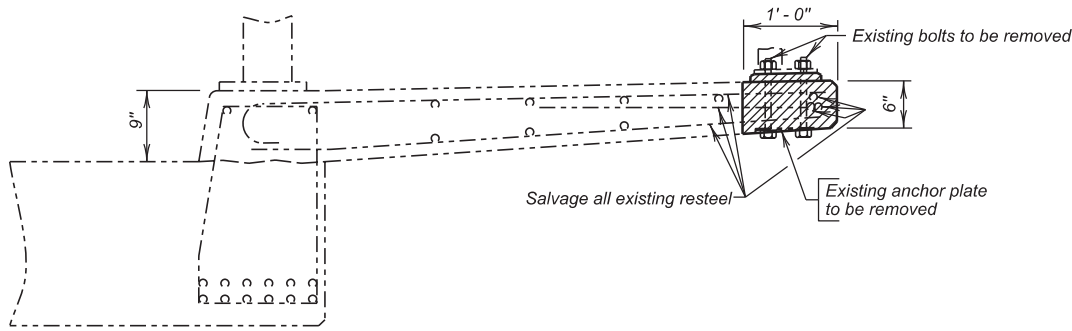
NOTE :  
This sheet is to be used in conjunction  
with Sheet No. 5 of 7.

**SIDEWALK REPAIR AT ABUTMENT NO. 1**  
FOR  
**50' - 2" SIMPLE SPAN CONCRETE BRIDGE**  
52' - 0" ROADWAY 0° SKEW  
OVER GARDEN STREET SEC. 24-T7S-R5E  
STR. NO. 24-291-032 018-492

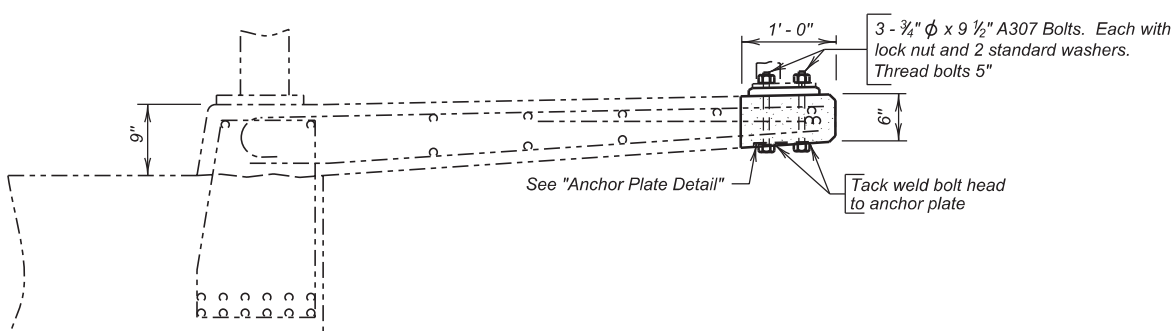
FALL RIVER COUNTY  
S. D. DEPT. OF TRANSPORTATION  
NOVEMBER 2012

DESIGNED BY NP FRIV2RE	CK. DES. BY KSK I2RELA04	DRAFTED BY CJD	Kevin N. Goeden BRIDGE ENGINEER
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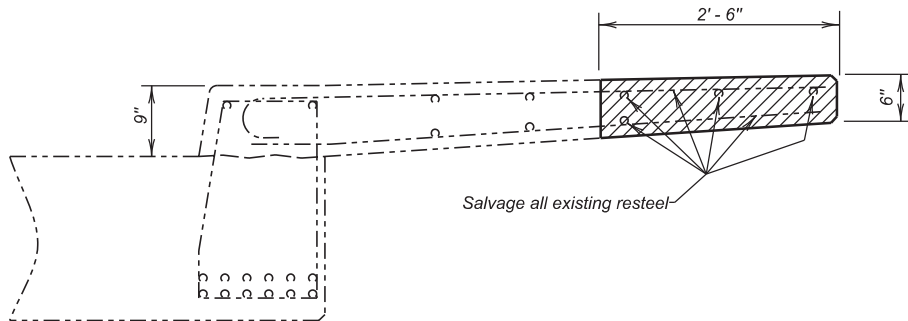




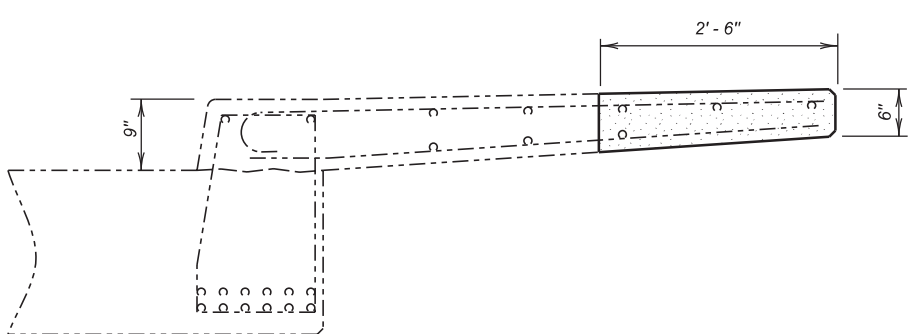
**SECTION A - A**  
( Concrete Breakout shown )



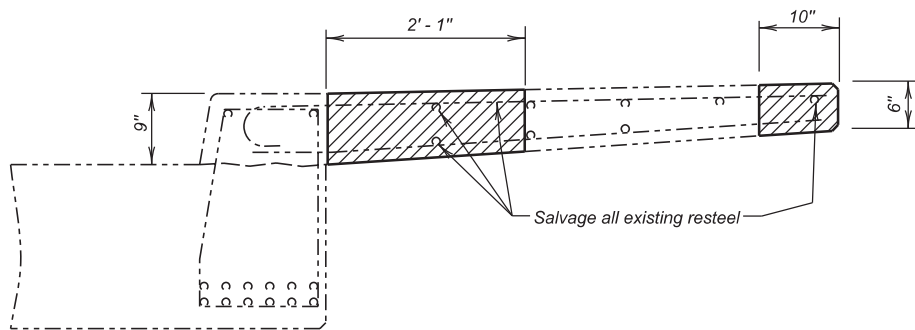
**SECTION A - A**  
( Reconstruction shown )



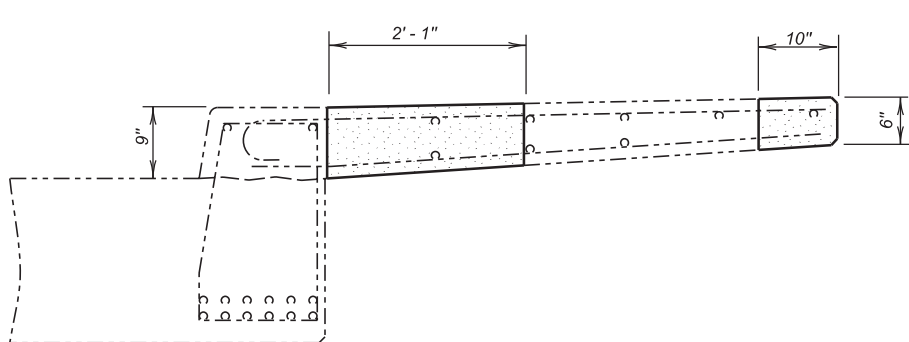
**SECTION B - B**  
( Concrete Breakout shown )



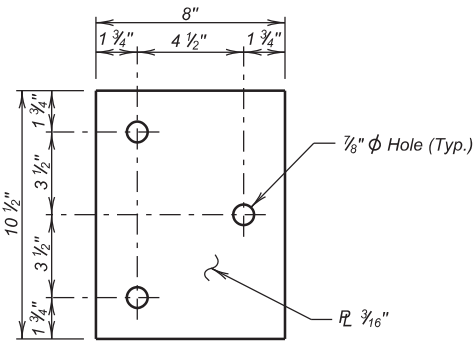
**SECTION B - B**  
( Reconstruction shown )



**SECTION C - C**  
( Concrete Breakout shown )



**SECTION C - C**  
( Reconstruction shown )



**Anchor Plate Detail**

ESTIMATED QUANTITIES			
ITEM	UNIT	QUANTITY	
		Phase I	Phase 2
Breakout Structural Concrete	Cu. Yd.	0.3	0.1
Class A45 Concrete, Bridge Repair	Cu. Yd.	0.2	0.1
Membrane Sealant Expansion Joint	Ft.	5.4	5.4

NOTE :  
This sheet is to be used in conjunction  
with Sheet No. 4 of 7.

**SIDEWALK REPAIR DETAILS AT ABUTMENT NO. 1**  
FOR  
**50' - 2" SIMPLE SPAN CONCRETE BRIDGE**  
52' - 0" ROADWAY 0° SKEW  
OVER GARDEN STREET SEC. 24-T7S-R5E  
STR. NO. 24-291-032 018-492

FALL RIVER COUNTY  
S. D. DEPT. OF TRANSPORTATION  
NOVEMBER 2012

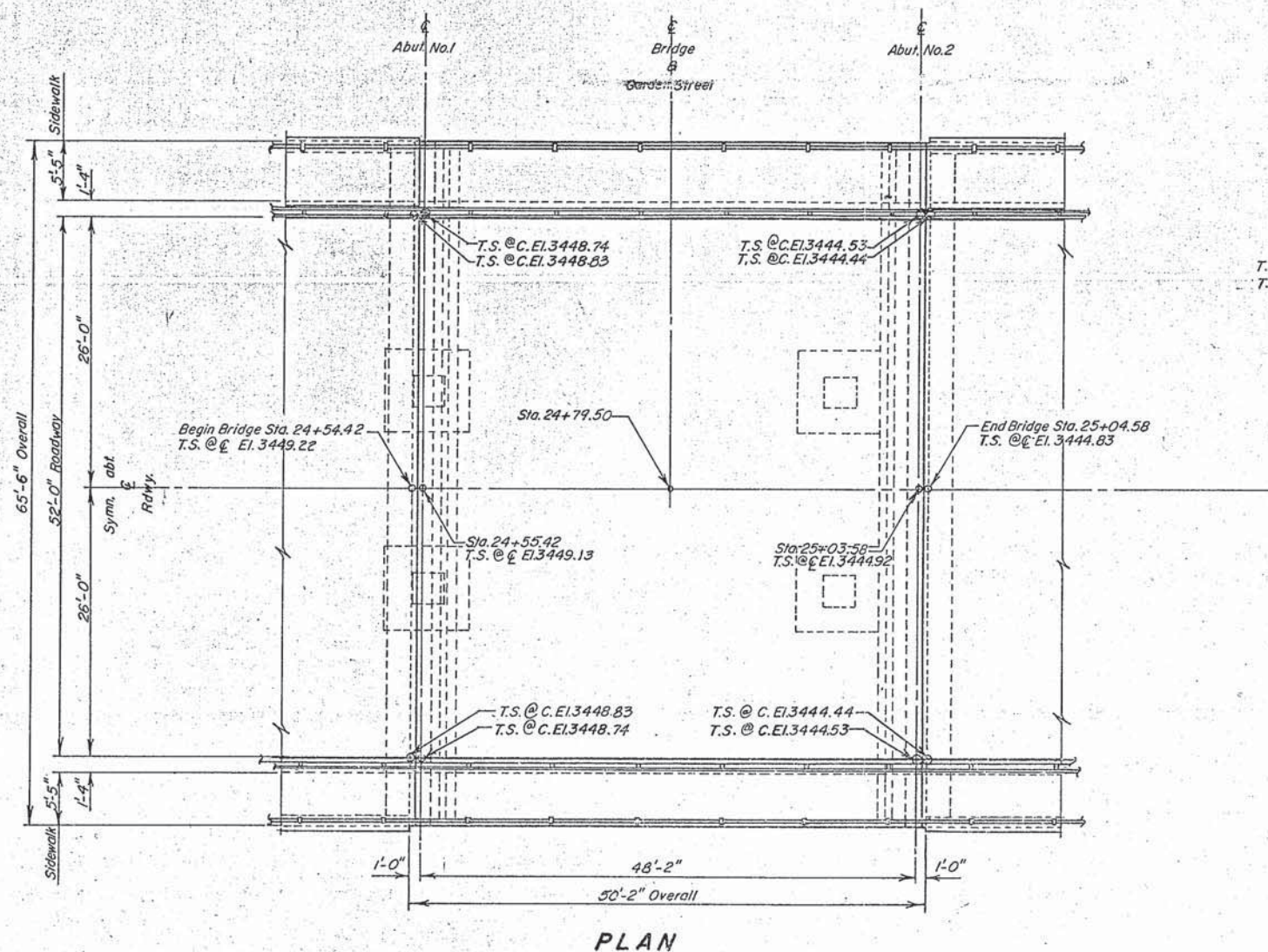


STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	018-492	18	31

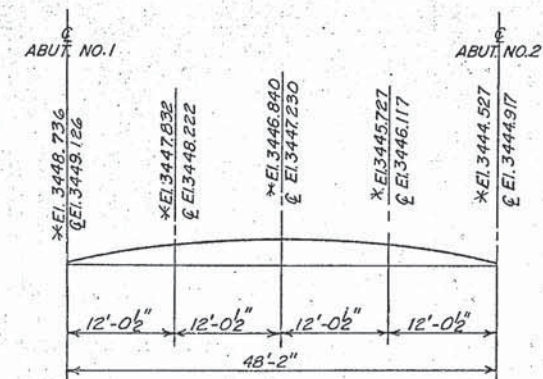
-X220-

# INDEX OF BRIDGE SHEETS—

- Sheet No. 1 - General Drawing.
- Sheet No. 2 - Details of Abutment No. 1 and No. 2
- Sheet No. 3 - Superstructure Details
- Sheet No. 4 - Sidewalk and Curb Details
- Sheet No. 5 - Rail and Rail Post Spacing Details
- Sheet No. 6 - Details of Approach Slab Adjacent to Abut. No. 1
- Sheet No. 7 - Standard Plate No. 308
- Sheet No. 8 - Drop Inlet and Pipe Installation Sheet

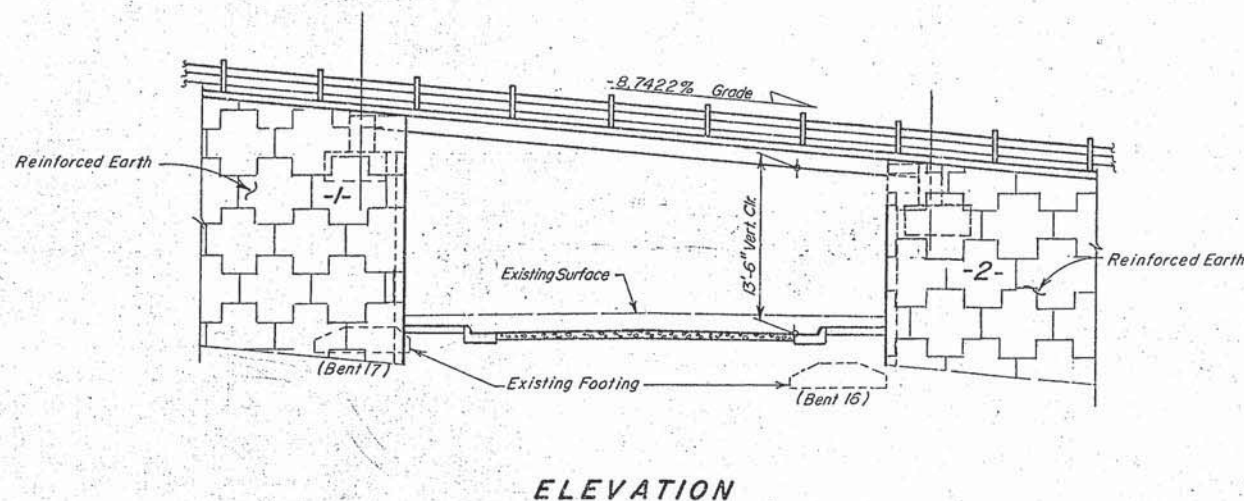


T.S. at C.E. = Top of Slab at Centerline Elevation  
T.S. at C.E. = Top of Slab at Curb Elevation



## CURB & C ELEVATIONS

Elevations indicated with \* are top of finished slab at CURB, and with E are top of slab at centerline. Camber for Dead Load Deflection plus Plastic Flow shown on sheet No. 3 of 8 of Bridge Plans have been included in the elevations shown above.



## ORIGINAL CONSTRUCTION PLANS

GENERAL DRAWING  
FOR

### 50'-2" SIMPLE SPAN CONCRETE BRIDGE

52'-0" ROADWAY 0° SKEW  
OVER GARDEN STREET SEC. 24-T7S-R5E  
STA. 24+54.42 TO STA. 25+04.58 BRFO018(23)39  
STR. NO. 24-291-032 HS 20-44  
(8 ALT.)

FALL RIVER COUNTY

S. D. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS

SEPT. 1981

6 OF 7

-X220-

SHEET OF SHEETS

PLANS BY:  
BRIDGE PROGRAM, S. DAK. DIVISION OF HIGHWAYS

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
	f.o.k.	W.C.P.	

BRIDGE ENGINEER

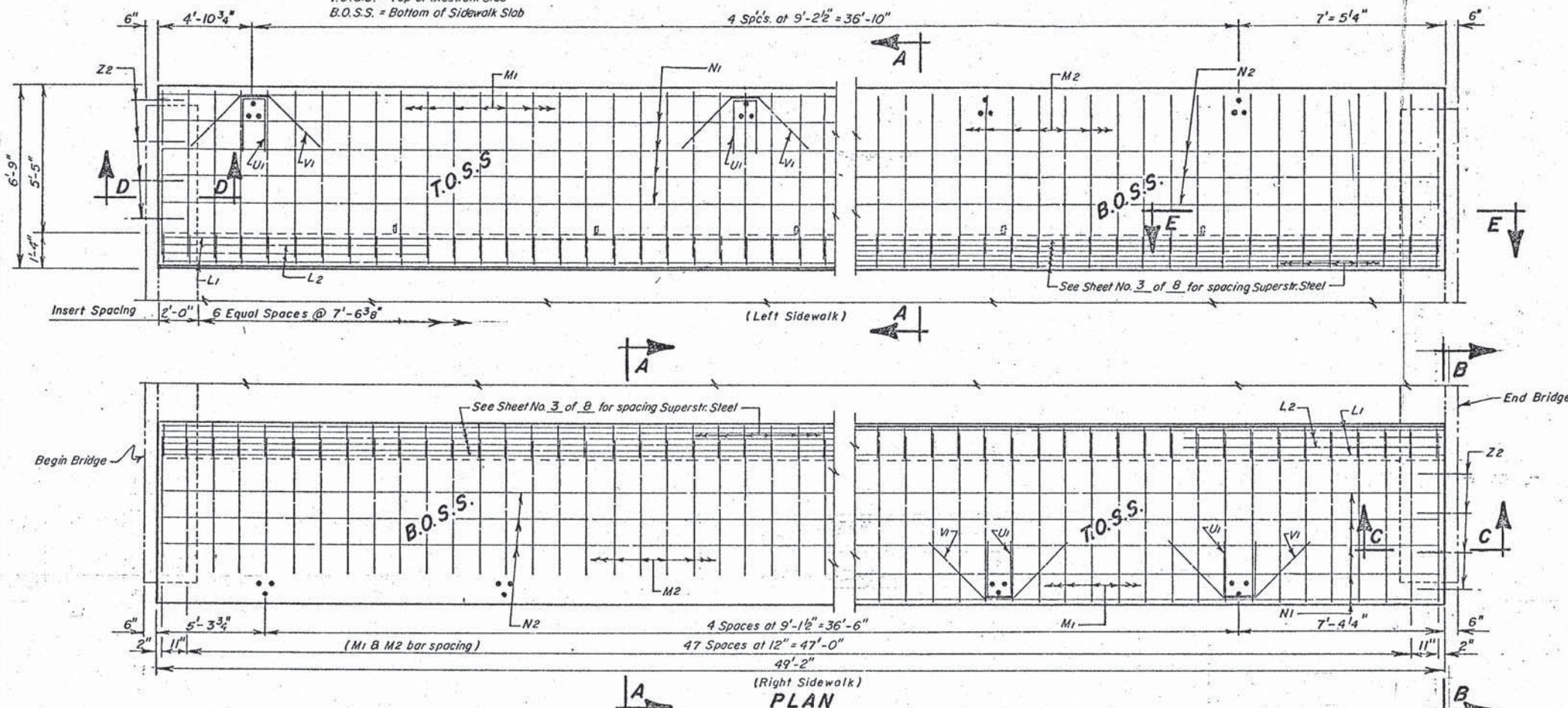
24-492



STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	018-492	19	31

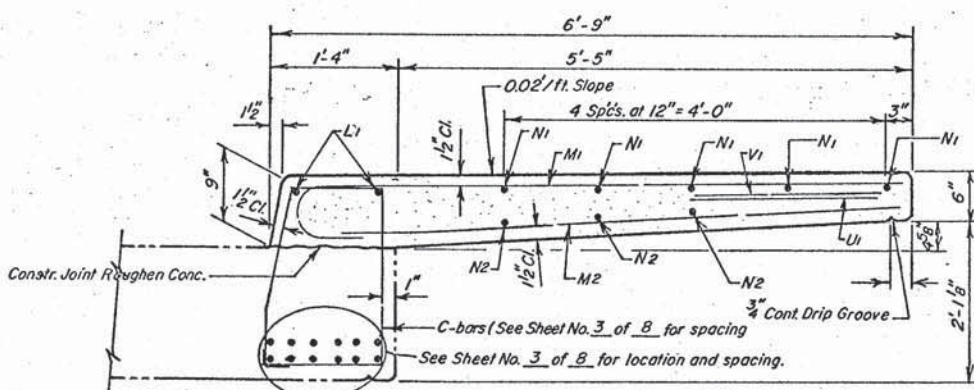
# LEGEND —

T.O.S.S. = Top of Sidewalk Slab  
B.O.S.S. = Bottom of Sidewalk Slab

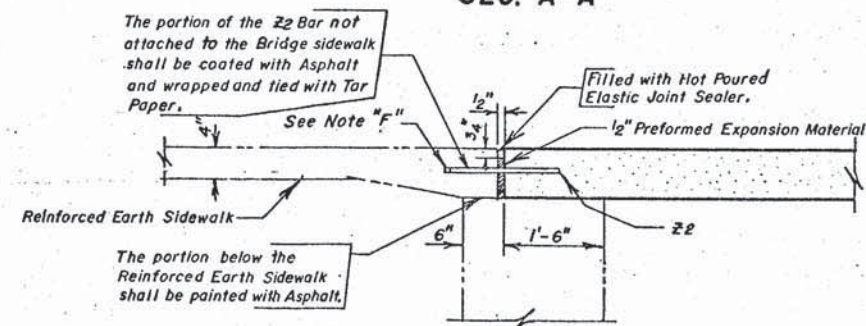


REINFORCING SCHEDULE (For Two Sidewalks and Curbs)				
Mk.	No.	Size	Length	Type
ΦL1	4	5	49'-10"	Str.
ΦL2	8	5	10'-0"	Str.
ΦM1	100	5	6'-9"	1A
ΦM2	100	5	6'-1"	19B
ΦN1	10	4	48'-10"	Str.
ΦN2	6	4	48'-10"	Str.
ΦU1	10	5	5'-0"	2
ΦV1	10	5	7'-8"	19A
ΦZ2	16	7	2'-0"	Str.

ESTIMATED QUANTITIES (For Two Sidewalks and Curbs)		
ITEM	UNIT	QUANTITY
Class "A" Concrete - Bridge Deck	Cu Yds.	15.3
Epoxy Coated Reinforcing Steel	Lbs.	2,380

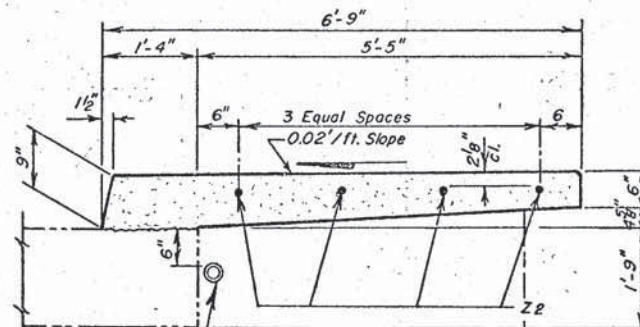


SEC. A-A

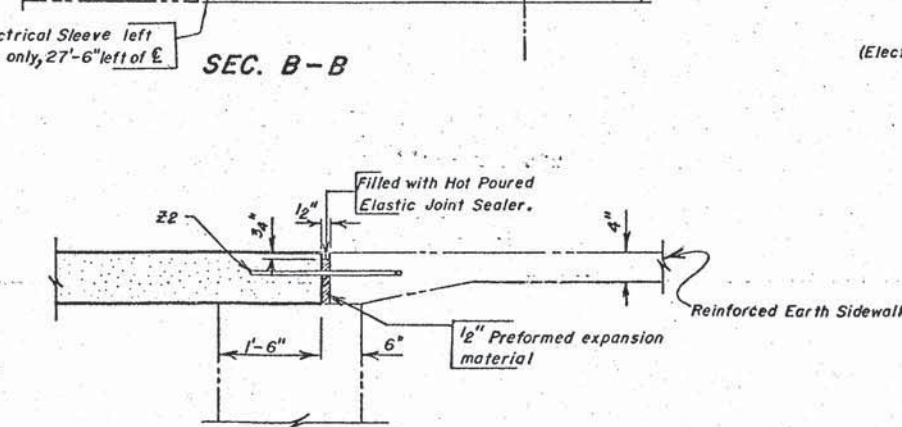


SEC. D-D

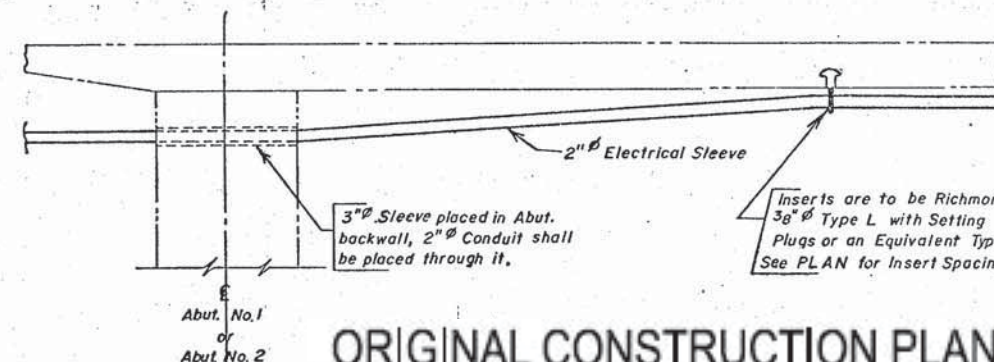
NOTE "F"  
Wrapping of the Tar Paper around the Z2 bar shall extend 4" beyond the end of the Z2 bar and filled with Tar to create a Void.



SEC. B-B



SEC. C-C



SEC. E-E  
(Electrical Sleeve Detail)

## ORIGINAL CONSTRUCTION PLANS

SIDEWALK AND CURB DETAILS  
FOR

50'-2" SIMPLE SPAN CONCRETE BRIDGE  
52'-0" ROADWAY 0° SKEW  
OVER GARDEN STREET SEC. 24-T7S-R5E  
STA. 24+54.42 TO 25+04.58 BR# 0018 (23) 39  
STR. NO. 24-291-032 HS 20-44

FALL RIVER COUNTY (8 ALT.)  
S.D. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS

SEPT. 1981

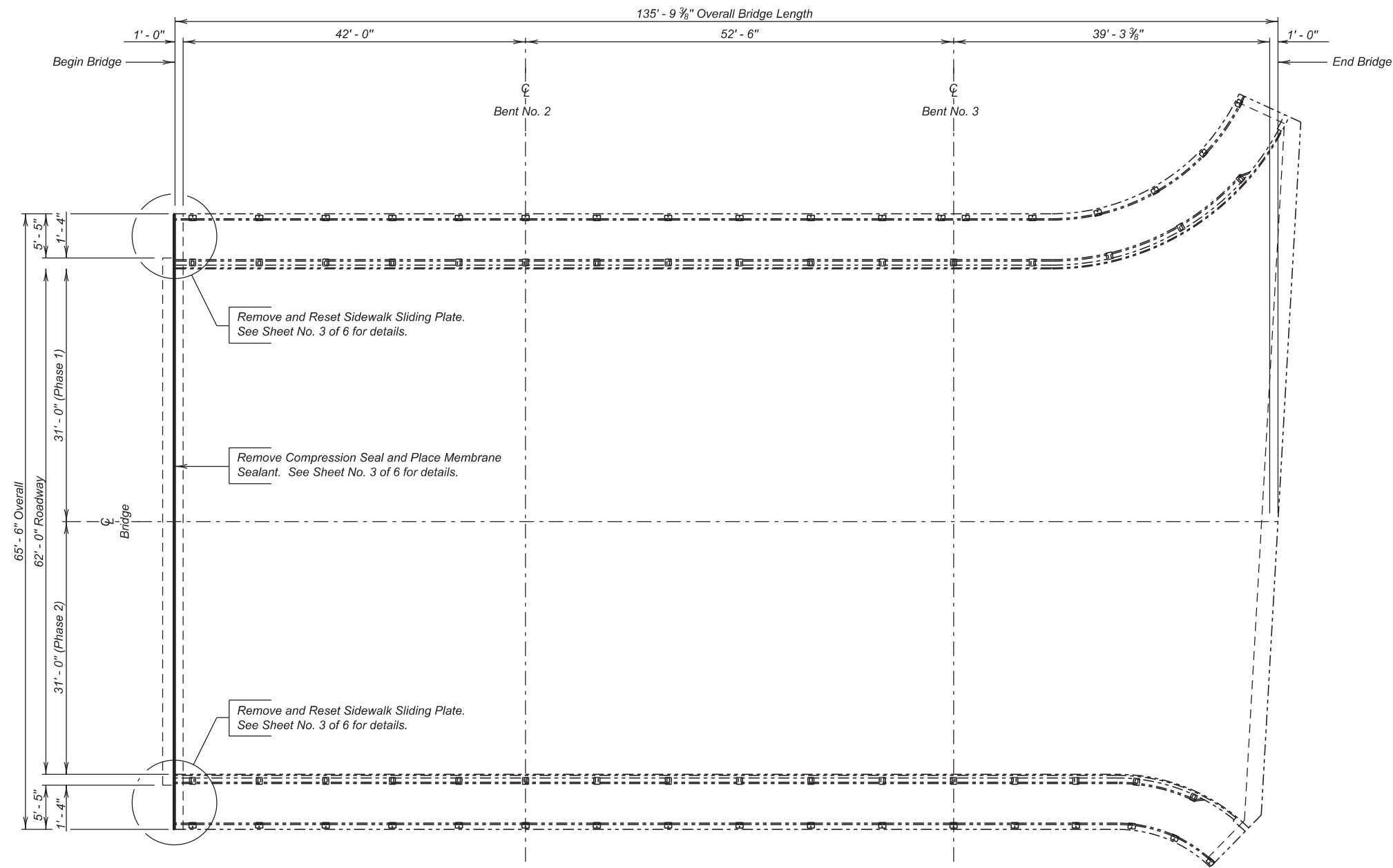
7 OF 7

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
	f.a.k.	L.M.	

BRIDGE ENGINEER



STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	018-492	20	31



PLAN

**INDEX OF BRIDGE SHEETS -**

Sheet No. 1 - Layout for Upgrading  
Sheet No. 2 - Estimate of Structure Quantities and Notes  
Sheet No. 3 - Modify Joint at Abutment No. 1  
Sheet Nos. 4 thru 6 - Original Construction plans

LAYOUT FOR UPGRADING  
FOR  
135' - 9  $\frac{3}{8}$ " CONT. CONCRETE BRIDGE  
62' - 0" ROADWAY 0° SKEW  
OVER FALL RIVER SEC. 24-T7S-R5E  
STR. NO. 24-292-032 018-492  
PCN I2RE  
FALL RIVER COUNTY  
S. D. DEPT. OF TRANSPORTATION  
NOVEMBER 2012

PLANS BY :  
OFFICE OF BRIDGE DESIGN, SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION

DESIGNED BY NP FRIV2RE	CK. DES. BY KSK I2RELB01	DRAFTED BY NP	<i>Kevin N. Goeden</i> BRIDGE ENGINEER
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ESTIMATE OF STRUCTURE QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
250E0030	Incidental Work, Structure	Lump Sum	LS
410E2610	Membrane Sealant	75.5	Ft

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, 2004 Edition and Required Provisions, Supplemental Specifications and/or 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 elsewhere 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 preconstruction meeting.

- Remove the compression seal and sidewalk sliding plates at Abutment No. 1 for the first phase of construction.
- Install a new membrane sealant expansion joint in the bridge deck and sidewalk for the first phase of construction.
- Reinstall the sidewalk sliding plates using new countersunk bolts for the first phase of construction.
- Switch traffic and repeat steps 1 through 3 for the second phase of construction.

REMOVE AND RESET SLIDING PLATE

- The sidewalk sliding plates at the expansion joint shall be removed to allow access for installation of the new Membrane Sealant and salvaged for reuse.
- The existing 3/8" counter-sunk screws have sheared off at some locations which will require them to be drilled out. Care shall be taken during the removal of the existing sheared off counter-sunk screws not to damage the surrounding sliding plate assembly. Any damage to the assembly shall be repaired by the Contractor, as approved by the Engineer, at no cost to the Department.

REMOVE AND RESET SLIDING PLATE (CONTINUED)

- The new 3/8" diameter counter-sunk screws shall conform to ASTM A307 and be galvanized in accordance with ASTM A153 or made of some other corrosion resistant material.
- All cost associated with removal and resetting of the sliding plate including all labor, materials, equipment, and incidentals shall be incidental to the contract lump sum price for "Incidental Work, Structure".

REMOVE COMPRESSION SEAL

- The existing compression seal at the location shown in the plans shall be removed prior to placement of the new Membrane Sealant.
- All cost associated with removal of the compression including all labor, equipment, and incidentals shall be incidental to the contract lump sum price for "Incidental Work, Structure".

MEMBRANE SEALANT EXPANSION JOINT

- Install all membrane sealant at the plan shown locations in conformance to the following notes.
- The Membrane Sealant shall be one of membrane sealant types from 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 to provide a water tight seal throughout a joint movement range of + 25% (minimum) from the specified joint opening dimension. 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 be supplied in pieces 5 feet in length or longer. The foam sealant shall be ultra-violet and ozone resistant.
- The bonding adhesive used to attach the membrane sealant to the adjacent steel armor angles shall be approved by the membrane sealant manufacturer.
- Adhesive used to join adjacent pieces of the membrane sealant shall be as recommended by the manufacturer.
- If Styrofoam filler material is used in the 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.

MEMBRANE SEALANT EXPANSION JOINT (CONTINUED)

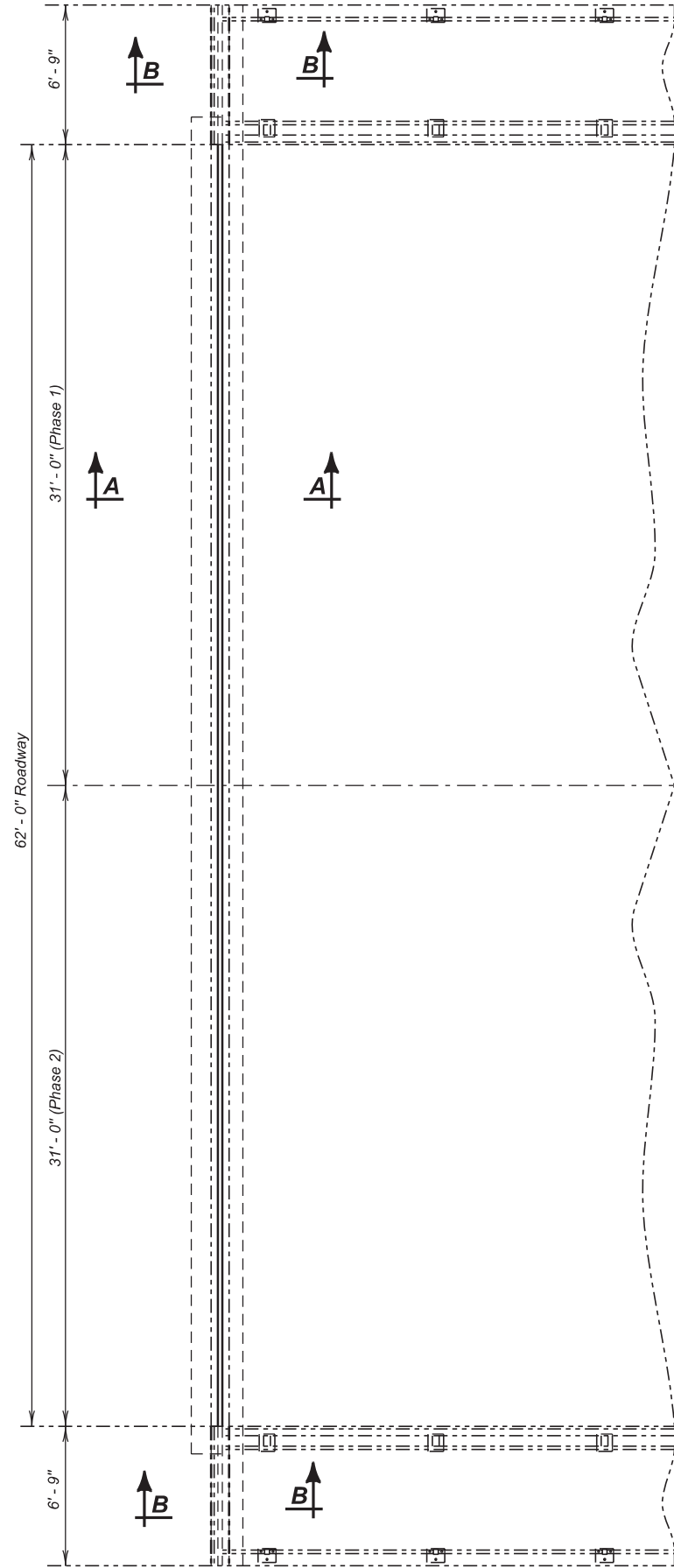
- A technical representative of the membrane sealant manufacturer shall be present at the jobsite during installation. The technical representative shall be knowledgeable in the correct procedures for the preparation and installation of the joint material to insure the Contractor installs the joint to the Manufacturers recommendations.
- The joint opening shall be constant width and shall have smooth vertical sides. Surfaces of material adjacent to the joint shall be at the correct grade and crown as approved by the Engineer.
- Steel 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, adhesive, etc.). At a minimum two passes of abrasive blasting with the nozzle held at an angle to within 1 to 2 inches of the a steel surface will be required. Cleaning of the steel surfaces with solvents, wire brushing, or grinding shall not be permitted.
- 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 steel 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.
- Individual spliced sections shall be installed as per the manufacturers' recommendations. The membrane joint sealant manufacturer shall submit a detailed installation procedure to the Engineer at least 5 days prior to joint installation for his review.
- Traffic shall not be allowed on the joint for a minimum 3 hours unless otherwise directed by the Engineer.
- The Membrane Sealant 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 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 the plans and the foregoing specifications.

ESTIMATE OF STRUCTURE QUANTIES AND NOTES FOR  
135' – 9 3/8" CONT. CONCRETE BRIDGE

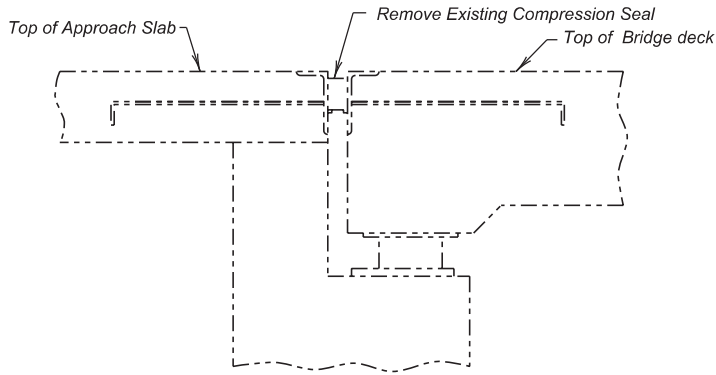
Str. No. 24-292-032

DECEMBER 2012

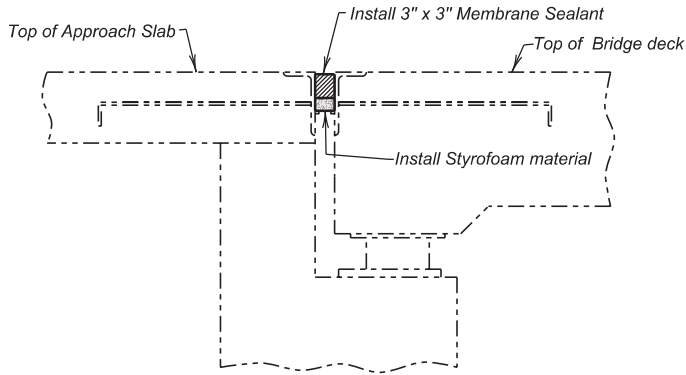
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	018-492	22	31



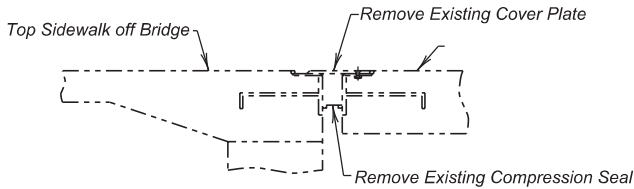
**PLAN**  
( At Abutment No. 1 )



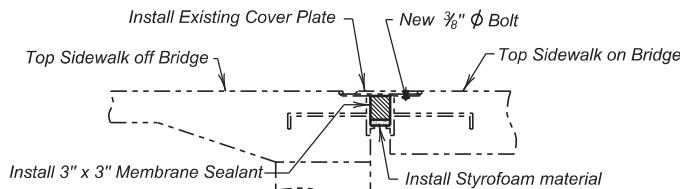
**SECTION A - A**  
( Removal Shown )



**SECTION A - A**  
( Reconstruction Shown )



**SECTION B - B**  
( Removal Shown )



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

**ESTIMATED QUANTITIES**

ITEM	UNIT	QUANTITY
Incidental Work, Structure	L.S.	Lump Sum
Membrane Sealant	Ft.	75.5

**MODIFY JOINT AT ABUTMENT NO. 1**  
FOR  
**135' - 9<sup>3</sup>/<sub>8</sub>" CONT. CONCRETE BRIDGE**  
62' - 0" ROADWAY  
OVER FALL RIVER  
STR. NO. 24-292-032

0° SKEW  
SEC. 24-T7S-R5E  
018-492

FALL RIVER COUNTY  
S. D. DEPT. OF TRANSPORTATION  
NOVEMBER 2012

3 OF 6

DESIGNED BY NP FR1V2RE	CK. DES. BY KSK I2REL03	DRAFTED BY CJD	<i>Kevin N. Goeden</i> BRIDGE ENGINEER
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B.M. No. 7 = El. 3432.89  
 "X" on top R. Ball South Side Fire Hydrant  
 45' Rt. Sta. 27+79.00

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	018-492	23	31

-X020-

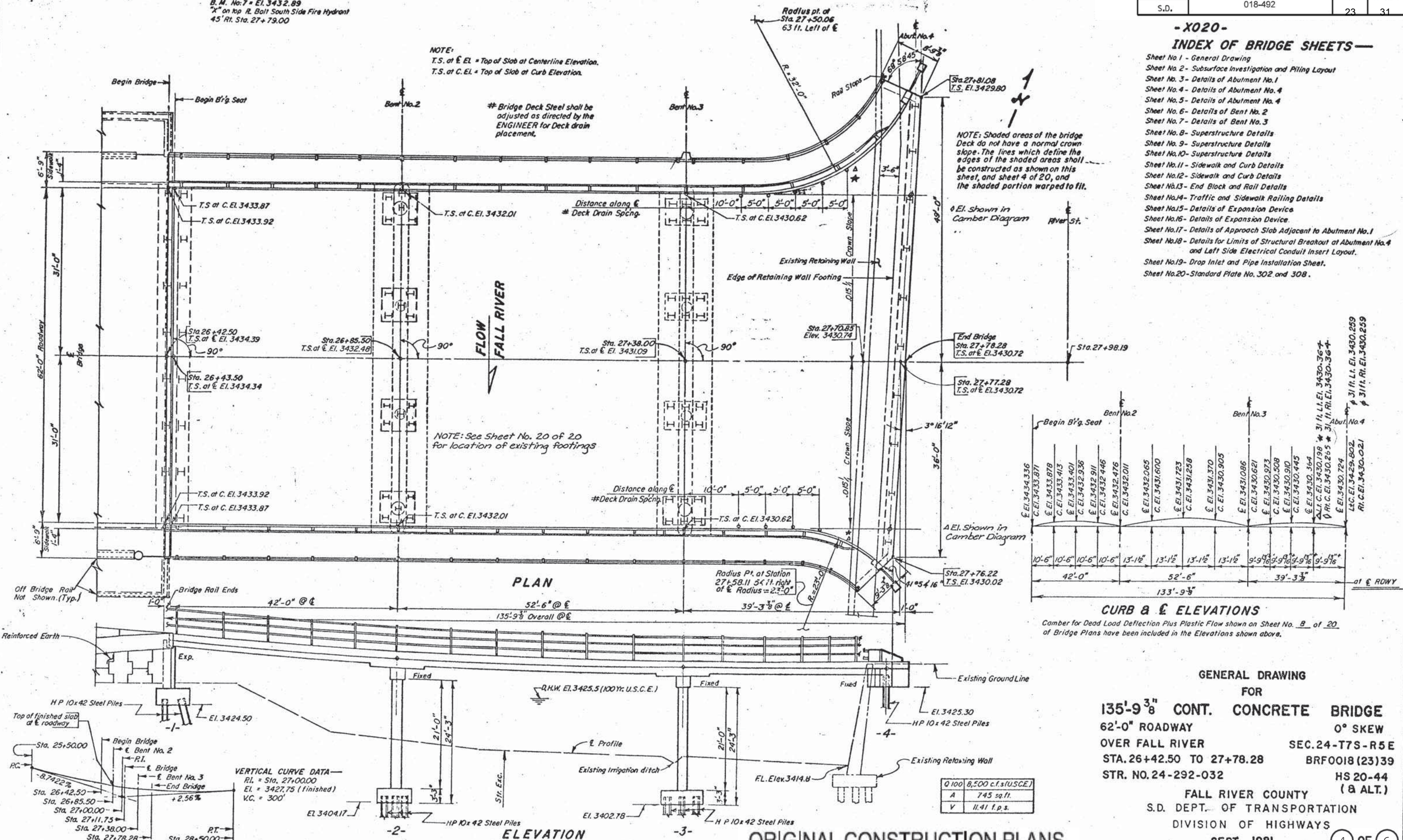
# INDEX OF BRIDGE SHEETS—

Sheet No. 1 - General Drawing  
 Sheet No. 2 - Subsurface Investigation and Piling Layout  
 Sheet No. 3 - Details of Abutment No. 1  
 Sheet No. 4 - Details of Abutment No. 4  
 Sheet No. 5 - Details of Abutment No. 4  
 Sheet No. 6 - Details of Bent No. 2  
 Sheet No. 7 - Details of Bent No. 3  
 Sheet No. 8 - Superstructure Details  
 Sheet No. 9 - Superstructure Details  
 Sheet No. 10 - Superstructure Details  
 Sheet No. 11 - Sidewalk and Curb Details  
 Sheet No. 12 - Sidewalk and Curb Details  
 Sheet No. 13 - End Block and Rail Details  
 Sheet No. 14 - Traffic and Sidewalk Railing Details  
 Sheet No. 15 - Details of Expansion Device  
 Sheet No. 16 - Details of Expansion Device  
 Sheet No. 17 - Details of Approach Slab Adjacent to Abutment No. 1  
 Sheet No. 18 - Details for Limits of Structural Breakout at Abutment No. 4 and Left Side Electrical Conduit Insert Layout.  
 Sheet No. 19 - Drop Inlet and Pipe Installation Sheet.  
 Sheet No. 20 - Standard Plate No. 302 and 308.

NOTE:  
 T.S. at E. El. = Top of Slab at Centerline Elevation.  
 T.S. at C. El. = Top of Slab at Curb Elevation.

## Bridge Deck Steel shall be adjusted as directed by the ENGINEER for Deck drain placement.

NOTE: Shaded areas of the bridge deck do not have a normal crown slope. The lines which define the edges of the shaded areas shall be constructed as shown on this sheet, and sheet 4 of 20, and the shaded portion warped to fit.



## CURB & E ELEVATIONS

Camber for Dead Load Deflection Plus Plastic Flow shown on Sheet No. 8 of 20 of Bridge Plans have been included in the Elevations shown above.

## GENERAL DRAWING

FOR

135'-9 3/8" CONT. CONCRETE BRIDGE

62'-0" ROADWAY

OVER FALL RIVER

STA. 26+42.50 TO 27+78.28

STR. NO. 24-292-032

SEC. 24-T7S-R5E

BRF0018(23)39

HS 20-44

(@ ALT.)

FALL RIVER COUNTY

S.D. DEPT. OF TRANSPORTATION

DIVISION OF HIGHWAYS

SEPT. 1981

4 OF 6

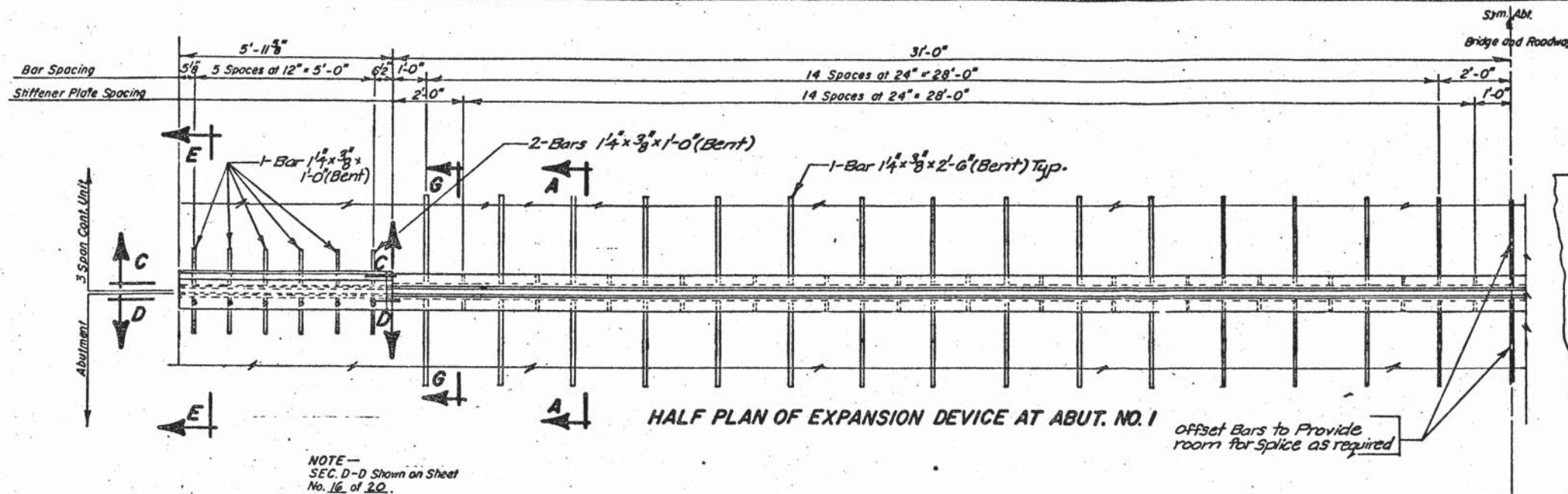
-X020-

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
	J. Gehring	W.C.P.	

BRIDGE ENGINEER

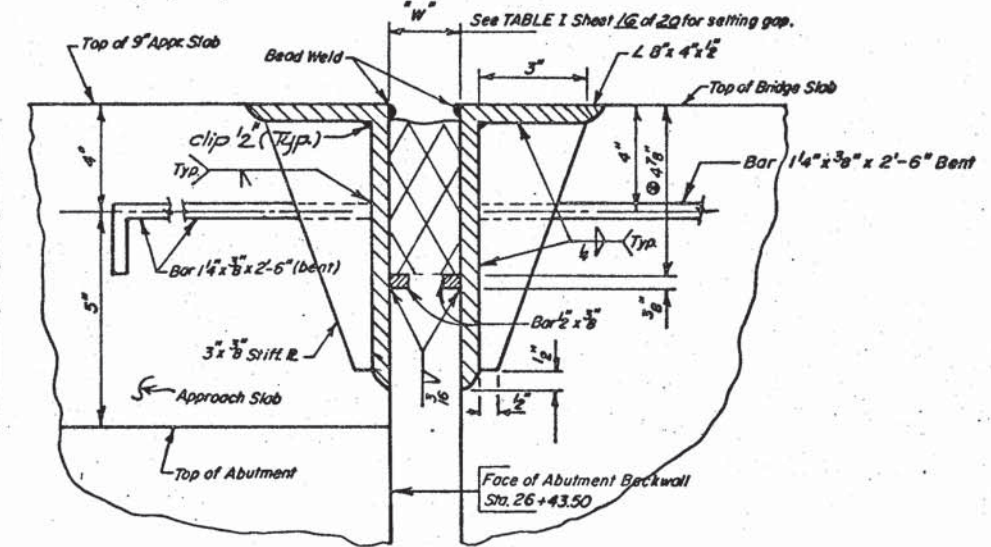


STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	018-492	24	31



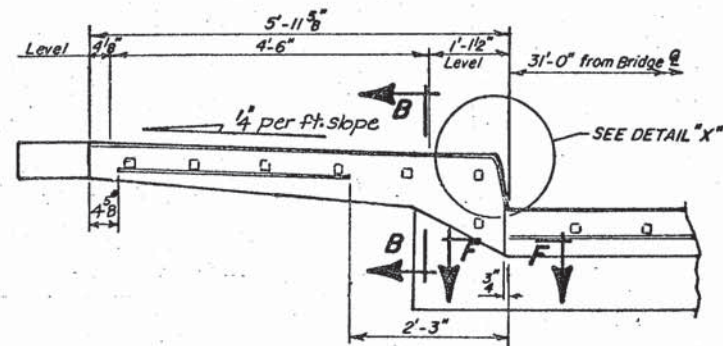
NOTE —  
SEC. D-D Shown on Sheet  
No. 16 of 20.

offset Bars to Provide  
room for Splice as required

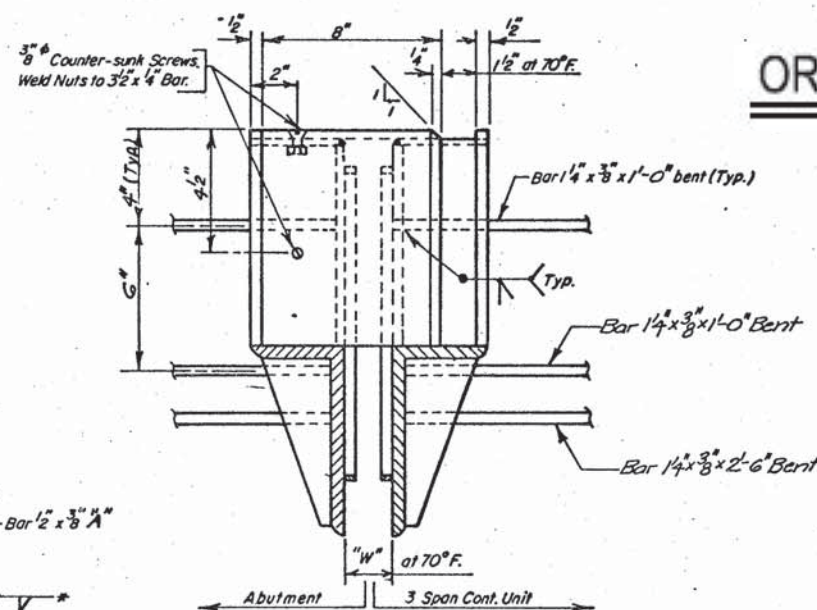


⊗ Since the depth of seats for the nominal size shown varies according to each manufacturer's design, this dimension may need to be adjusted according to manufacturer's recommendation. However the depth at which the compression seal is placed shall not be greater than 1/4\"/>

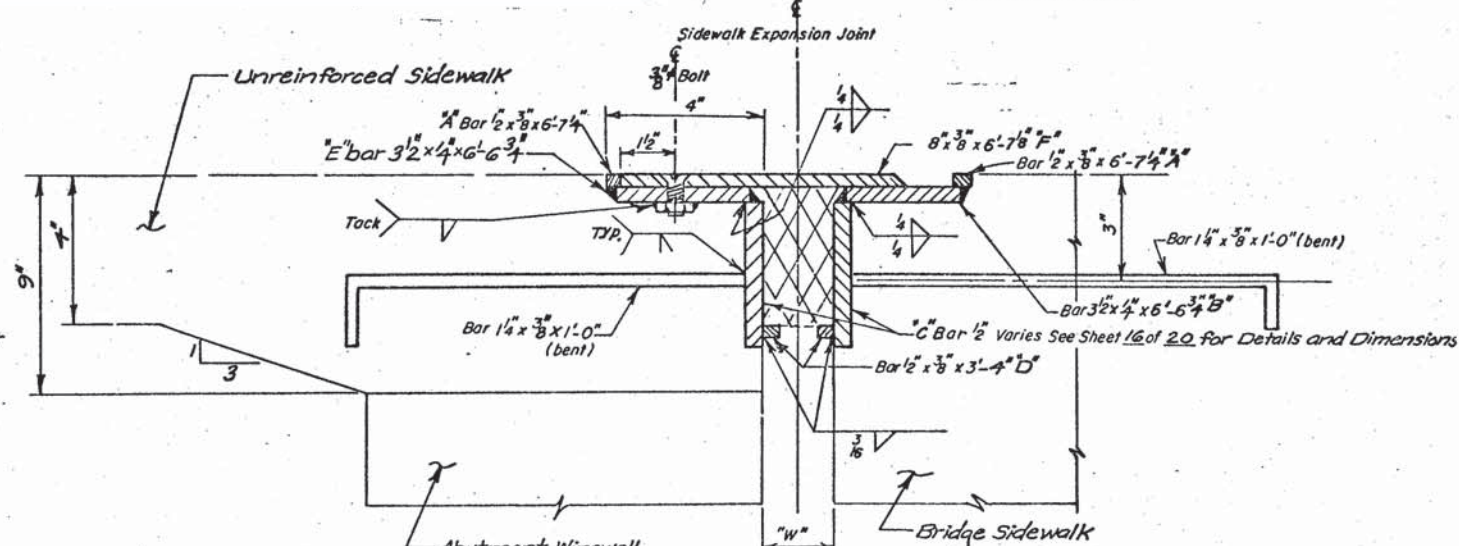
## ORIGINAL CONSTRUCTION PLANS



SEC. C-C



SEC. G-G



SEC. E-E  
(Expansion Device at Sidewalk)

### DETAILS OF EXPANSION DEVICE

FOR  
135'-9 3/8\"/>

FALL RIVER COUNTY  
S.D. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS

JULY 1981

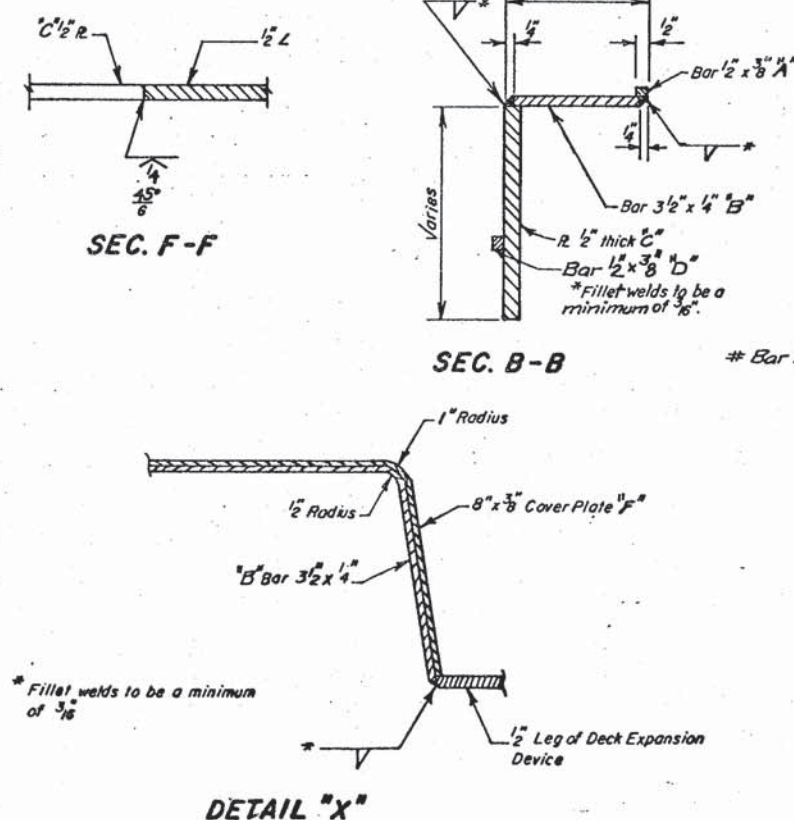
5 OF 6

SHEET \_\_\_\_\_ OF \_\_\_\_\_ SHEET

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
	f.a.k.	M.C.P.	

BRIDGE ENGINEER

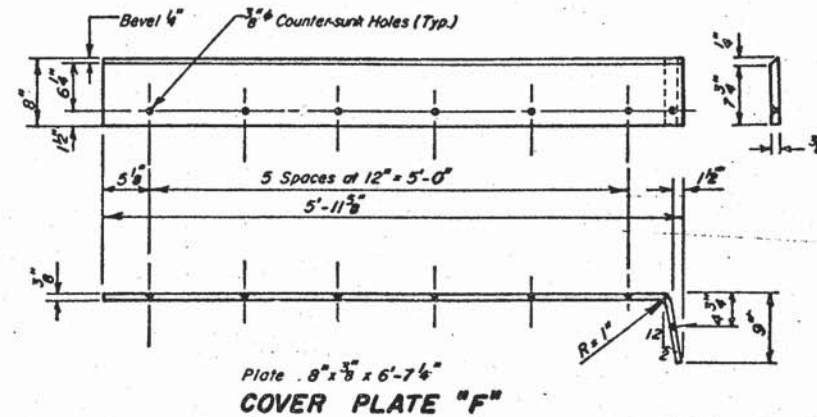
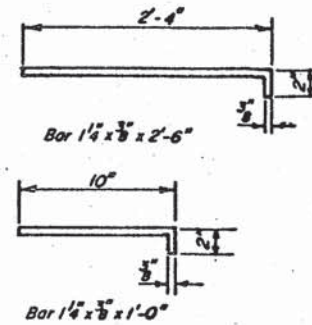
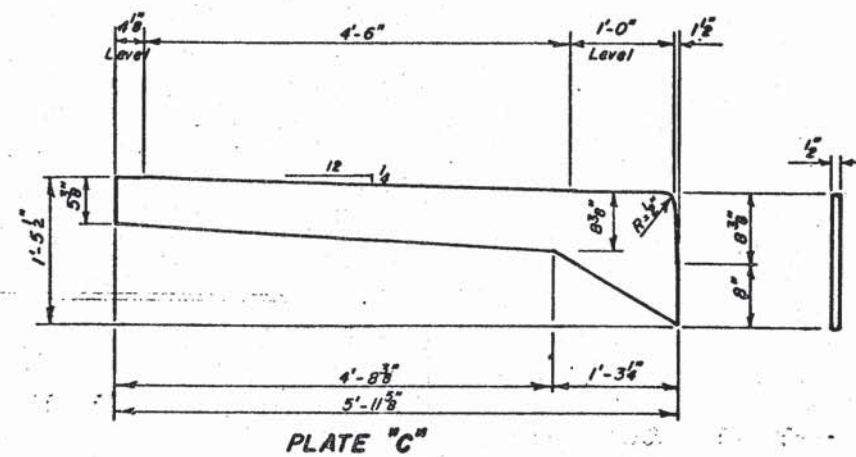
### EXPLODED ISOMETRIC VIEW OF EXPANSION DEVICE AT SIDEWALK



DETAIL "X"

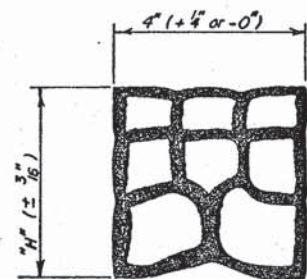
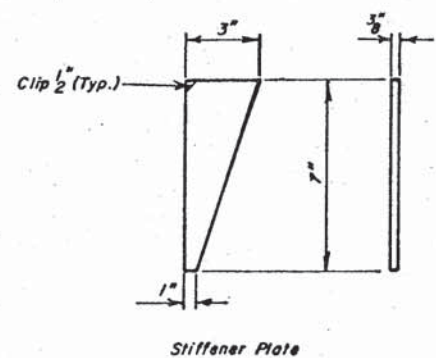
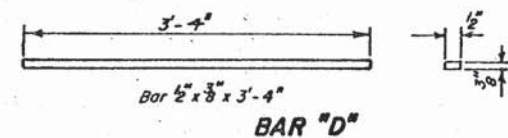
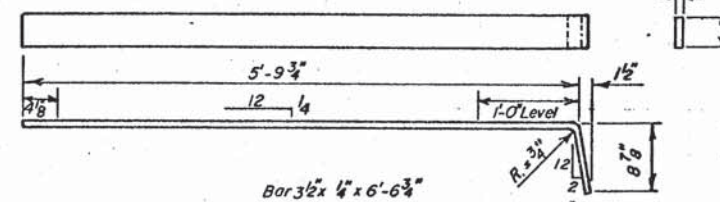
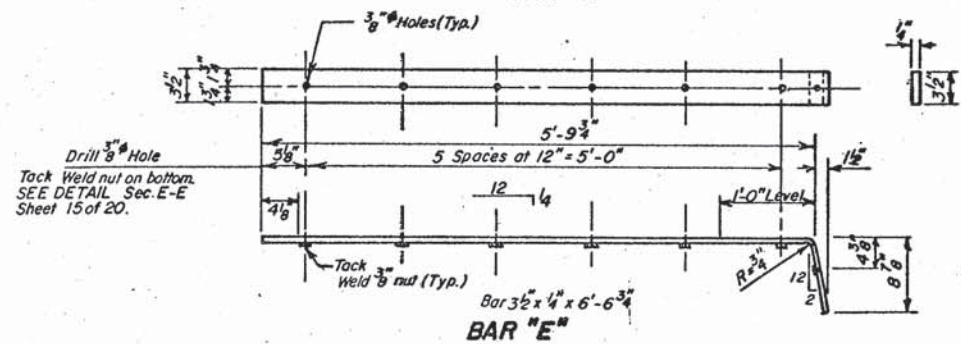
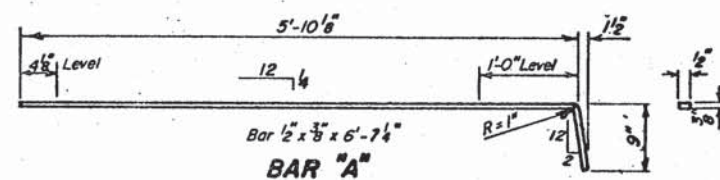


STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	018-492	25	31



# NOTES REGARDING EXPANSION DEVICE—

1. All costs involved in furnishing and installing the 4" Compression Seal shall be included in the unit price bid for 4 inch Compression Seal.
2. All costs involved in furnishing and installing the steel parts of the Expansion Device shall be included in the lump sum for Structural Steel. This includes welding and galvanizing. All Structural Steel shall conform to A.S.T.M. Specification A36.



# NOTE —

Since the depth of seals for the nominal size (Width) shown varies according to each manufacturer's design, the dimension "H" shall be known by the supplier prior to the fabrication of the expansion device. The dimension "H" must fall within a range of 4" to 5", however a fabrication tolerance of plus or minus 3/16" from the "H" specified by the manufacturer will be permitted.

ESTIMATED QUANTITIES			
ITEM	UNIT	QUANTITY	
Structural Steel	L.S.	L.S.	
4 inch Compression Seal	L.F.	74	

For Informational Purposes the weight of the structural steel is 3,456 lbs.

# ORIGINAL CONSTRUCTION PLANS

## DETAILS OF EXPANSION DEVICE FOR

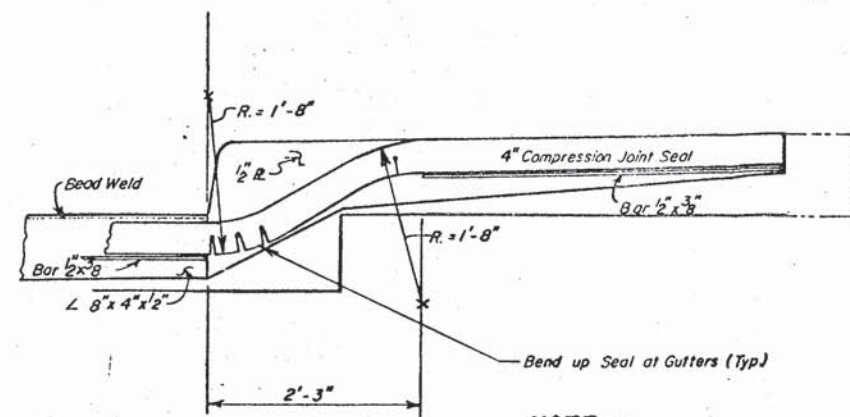
135'-9 3/8" CONT. CONCRETE BRIDGE  
62'-0" ROADWAY 0° SKEW  
OVER FALL RIVER SEC. 24-T7S-R5E  
STA. 26+42.50 TO 27+78.28 BRFO018 (23) 39  
STR. NO. 24-292-032 HS 20-44  
(8 ALT.)

FALL RIVER COUNTY  
S.D. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
AUG. 1981

6 OF 6

SHEET OF SHEET

TABLE I	
TEMP.	DIMENSION "W"
15°	2 1/8"
30°	2 1/8"
45°	2 1/8"
60°	2 1/8"
75°	2 1/8"
90°	2 1/8"
105°	2 1/8"



# NOTE —

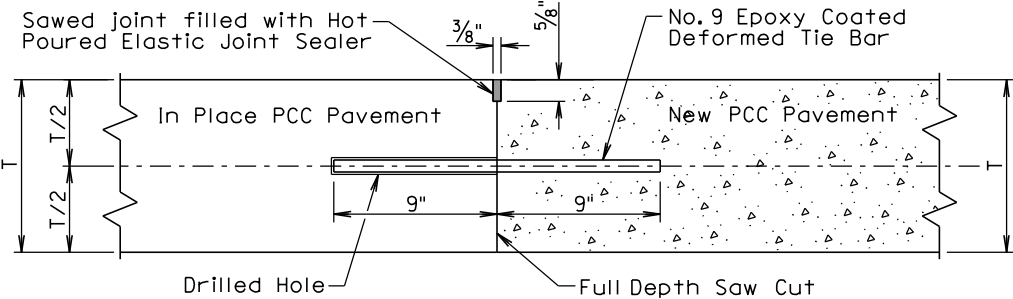
The compression seal shall be cut and bent according to the manufacturer's recommendations.

SEC. D-D  
(See Sheet 15 of 20 for location.)

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
	J.G.L.	H.C.P.	

BRIDGE ENGINEER

TRANSVERSE CONSTRUCTION JOINT WITH TIE BARS



T = In Place PCC Pavement and New PCC Pavement Thickness

GENERAL NOTES:

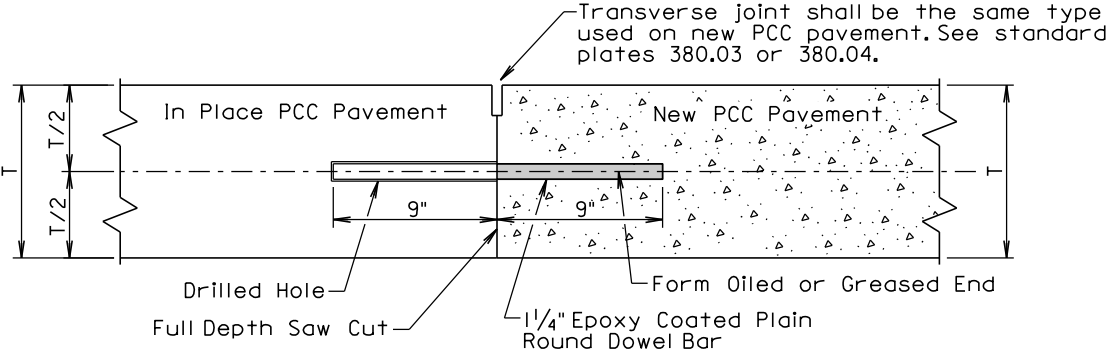
This detail shall be used when the transverse joint is less than 15 feet from the existing transverse contraction joint.

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 spaced 18 inches center to center and shall be a minimum of 3 inches and a maximum of 9 inches from the pavement edges.

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

TRANSVERSE CONSTRUCTION JOINT WITH DOWEL BARS



T = In Place PCC Pavement and New PCC Pavement Thickness

GENERAL NOTES:

This detail shall be used when the transverse joint is 15 feet or greater from the existing transverse contraction joint.

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 1 1/4 inch epoxy coated plain round dowel bars shall be spaced 12 inches center to center and shall be a minimum of 3 inches and a maximum of 6 inches from the pavement edges.

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.

September 6, 2006

Published Date: 1st Qtr. 2013

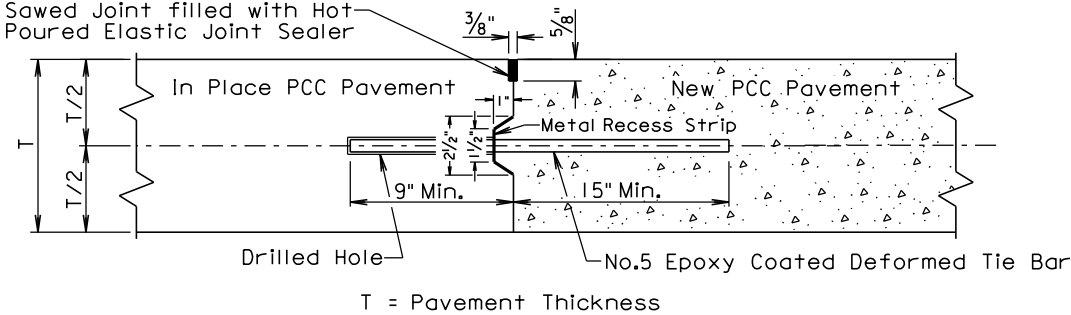
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PCC PAVEMENT TRANSVERSE CONSTRUCTION  
JOINTS WITH TIE BARS OR DOWEL BARS

PLATE NUMBER  
380.06

Sheet 1 of 1

LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS  
(DRILLED IN BARS)



T = Pavement Thickness

GENERAL NOTES:

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.

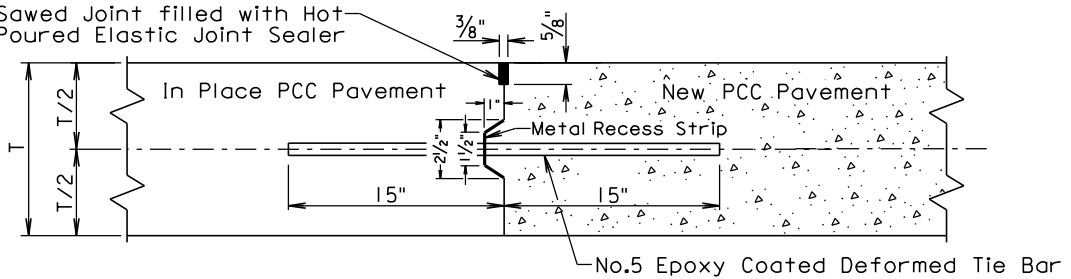
No.5 epoxy coated deformed tie bars shall be spaced 48" center to center for a female keyway or 30" center to center for a vertical face and male keyway. The keyway shown above is a female keyway.

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

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.

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.

LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS  
(INSERTED OR FORMED IN BARS)



T = Pavement Thickness

GENERAL NOTES:

No.5 epoxy coated deformed tie bars shall be spaced 48" center to center for a female keyway or 30" center to center for a vertical face and male keyway. The keyway shown above is a female keyway.

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

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.

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

September 14, 2001

Published Date: 1st Qtr. 2013

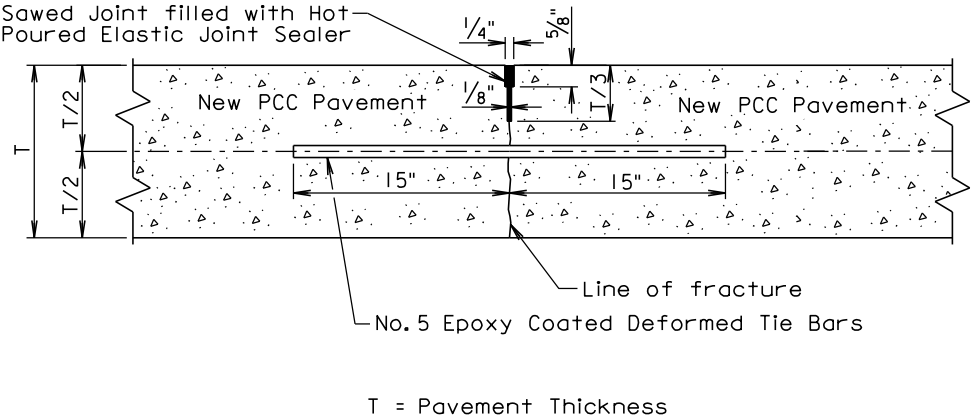
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PCC PAVEMENT LONGITUDINAL  
JOINTS WITH TIE BARS

PLATE NUMBER  
380.10

Sheet 1 of 2

SAWED LONGITUDINAL JOINT WITH TIE BARS  
(POURED MONOLITHICALLY)



GENERAL NOTES:

No.5 epoxy coated deformed tie bars shall be spaced 48 inches center to center.

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

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 will be necessary.

September 14, 2001

Published Date: 1st Qtr. 2013

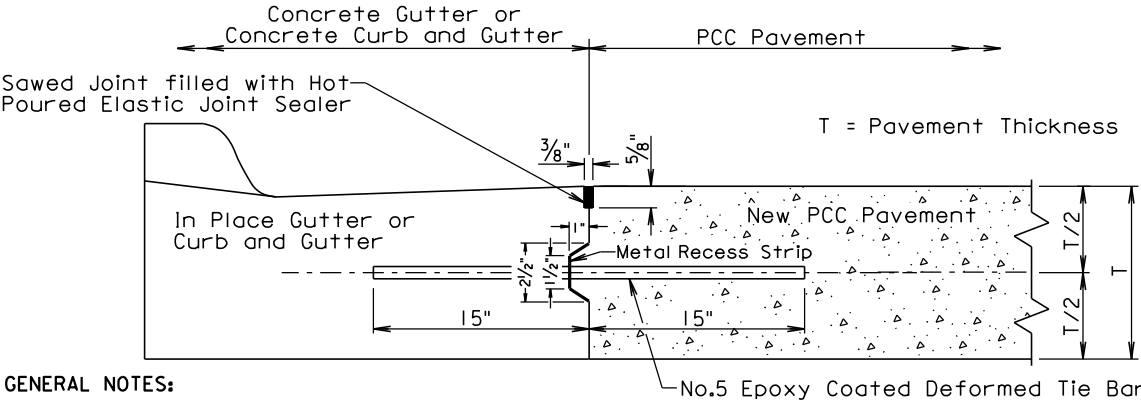
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PCC PAVEMENT LONGITUDINAL  
JOINTS WITH TIE BARS

PLATE NUMBER  
380.10

Sheet 2 of 2

LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS  
(INDIVIDUALLY FORMED)



GENERAL NOTES:

No.5 epoxy coated deformed tie bars shall be spaced 48" center to center. The keyway shown above is a female keyway.

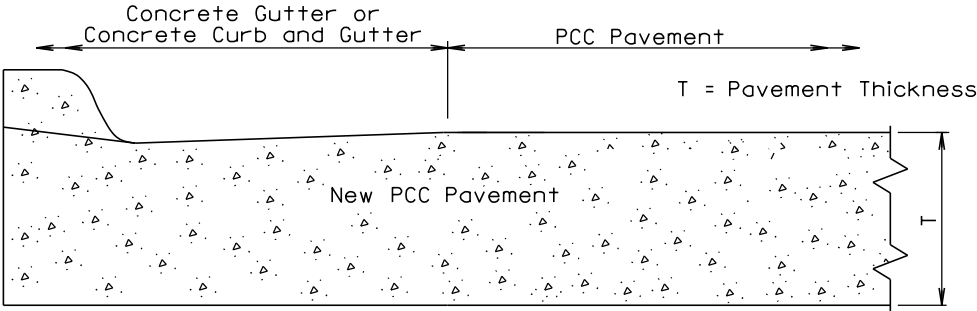
The tie bars shall be placed a minimum of 15 inches from existing transverse contraction joints.

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.

The transverse contraction joints in the concrete gutter or concrete curb and gutter shall be placed at each mainline PCC pavement transverse contraction joint. The transverse contraction joints in the concrete gutter or the concrete curb and gutter shall be 1/2" deep if formed in fresh concrete using a suitable grooving tool. If a saw is used to cut the transverse contraction joints, then the depth of the joint shall be at least 1/4 the thickness of the concrete gutter or concrete curb and gutter.

The term "In Place Gutter or Curb and Gutter" in the above drawing indicates that the in place concrete gutter and concrete curb and gutter was placed on the current project.

POURED MONOLITHICALLY



GENERAL NOTES:

The mainline curb and gutter may be placed monolithically with the PCC pavement. If this method of construction is used, the tie bars and the sawed joint between the curb and gutter and the PCC pavement shall be eliminated.

The gutter or curb and gutter shall be sawed transversely at each mainline transverse contraction joint. The transverse contraction joints in the gutter or curb and gutter shall be sawed and sealed same as the transverse contraction joints in the PCC pavement.

The slope of the gutter shall be the slope designated for the type of gutter or curb and gutter to be constructed. The bottom slope of the gutter or curb and gutter shall be constructed at the same slope as the mainline concrete pavement.

September 14, 2005

Published Date: 1st Qtr. 2013

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PCC PAVEMENT LONGITUDINAL CONSTRUCTION  
JOINTS WITH CONCRETE GUTTER OR  
CONCRETE CURB AND GUTTER

PLATE NUMBER  
380.11

Sheet 1 of 1



Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	200	25
35 - 40	350	25
45 - 50	500	50
55	750	50
60 - 65	1000	50

- Flagger  
■ Channelizing Device

For low-volume traffic situations with short work zones on straight roadways where the flagger is visible to road users approaching from both directions, a single flagger may be used.

The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (1 hour or less).

For tack and/or flush seal operations, when flaggers are not being used, the FRESH OIL sign (W21-2) shall be displayed in advance of the liquid asphalt areas.

Flashing warning lights and/or flags may be used to call attention to the advance warning signs.

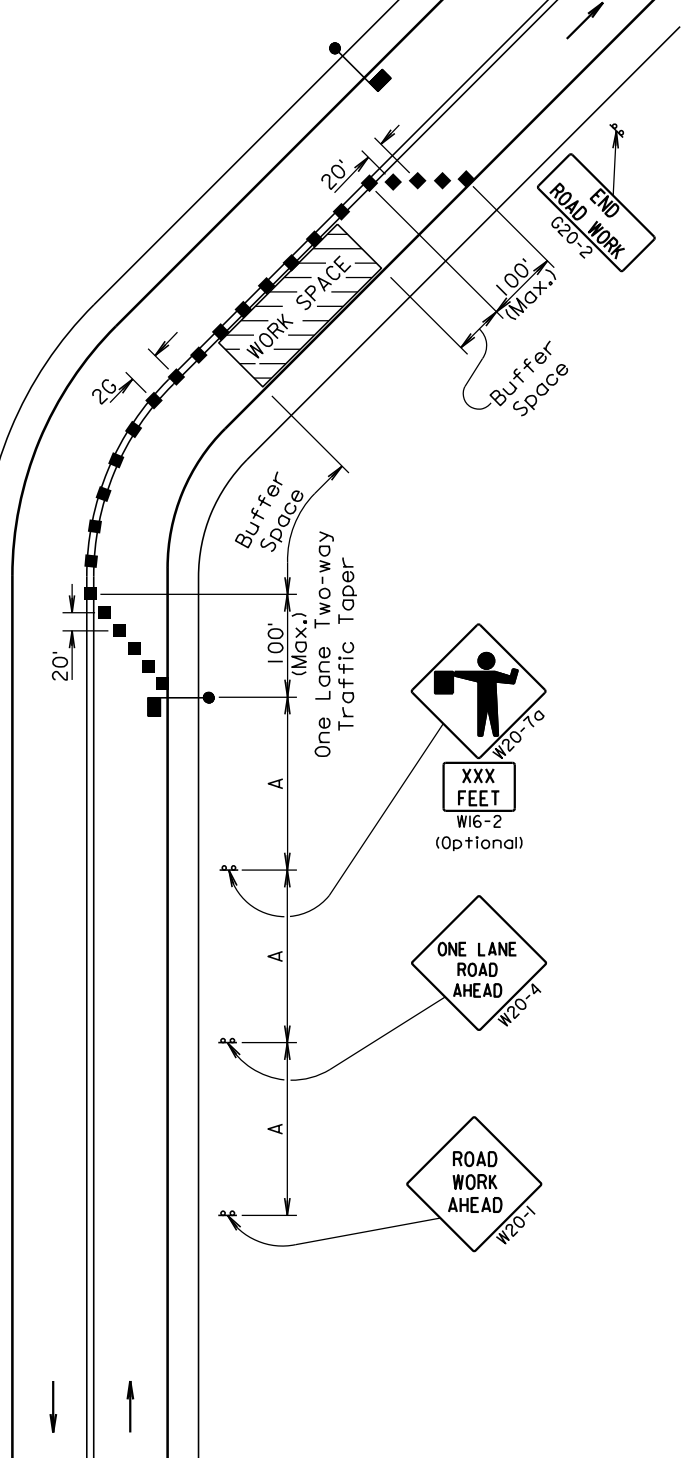
The channelizing devices shall be drums or 42" cones.

Channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.

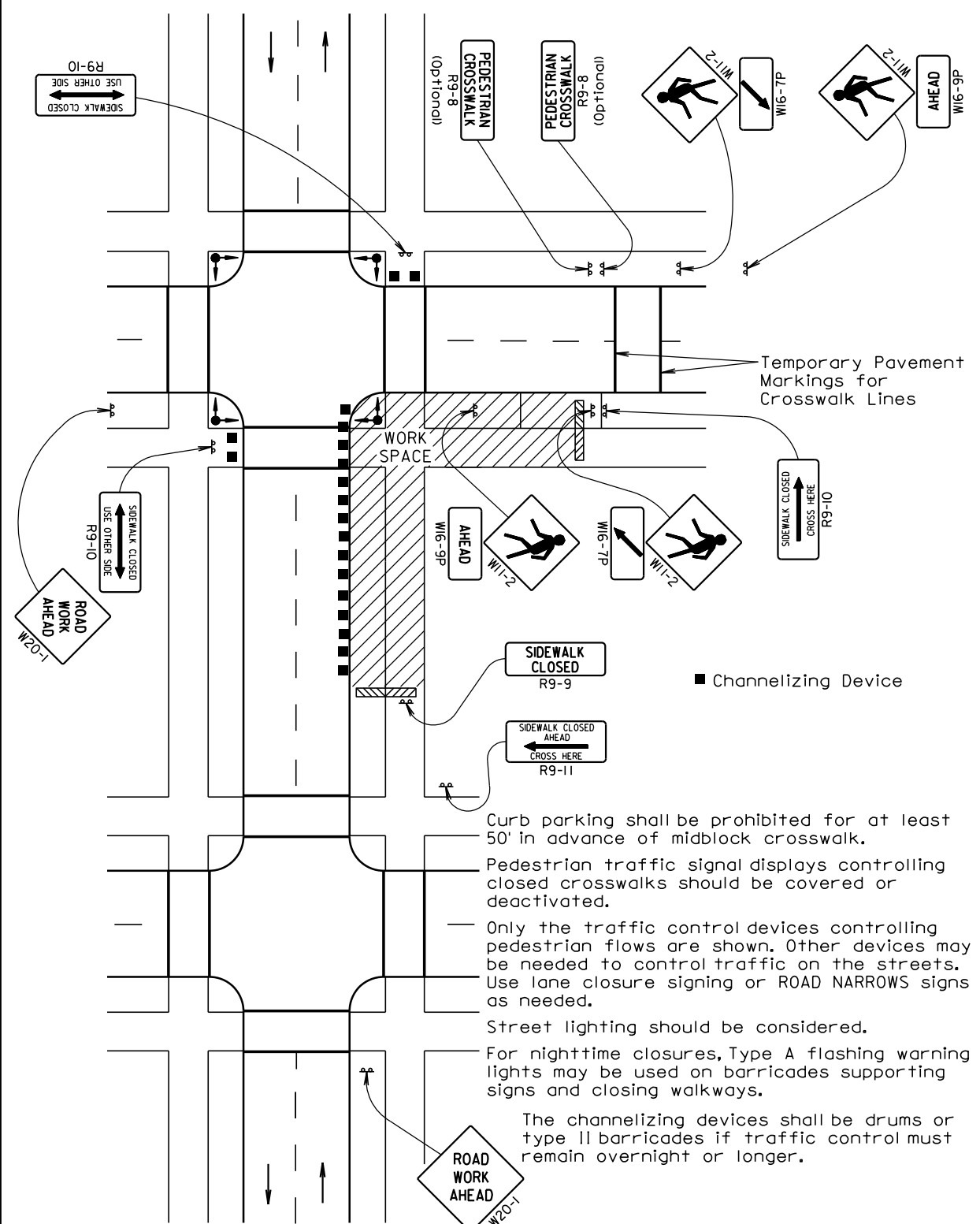
Channelizing devices and flaggers shall be used at intersecting roads to control intersecting road traffic as required.

The buffer space should be extended so that the two-way traffic taper is placed before a horizontal or vertical curve to provide adequate sight distance for the flagger and queue of stopped vehicles.

Warning sign sequence in opposite direction same as below.



February 14, 2011



Curb parking shall be prohibited for at least 50' in advance of midblock crosswalk.

Pedestrian traffic signal displays controlling closed crosswalks should be covered or deactivated.

Only the traffic control devices controlling pedestrian flows are shown. Other devices may be needed to control traffic on the streets. Use lane closure signing or ROAD NARROWS signs as needed.

Street lighting should be considered.

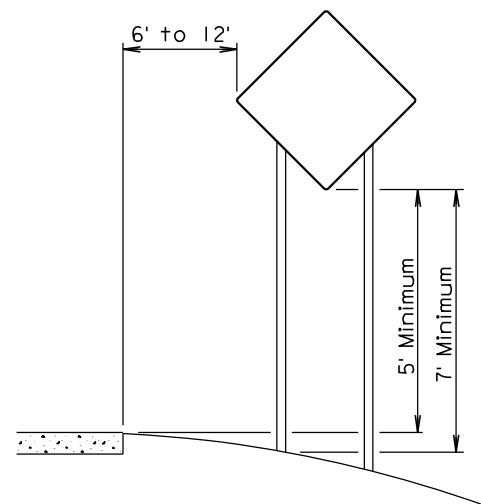
For nighttime closures, Type A flashing warning lights may be used on barricades supporting signs and closing walkways.

The channelizing devices shall be drums or type II barricades if traffic control must remain overnight or longer.

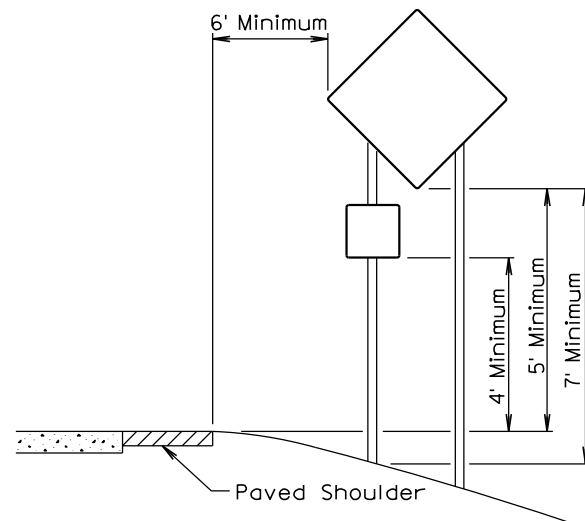
February 14, 2011



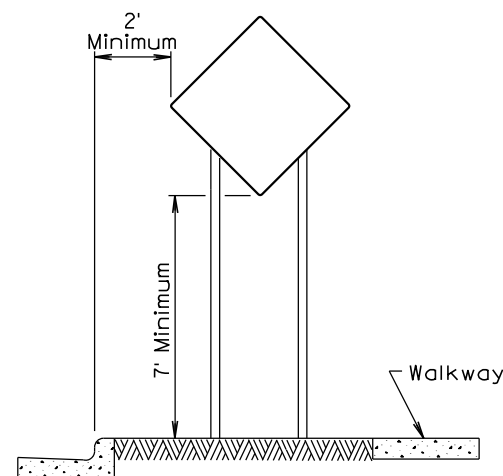




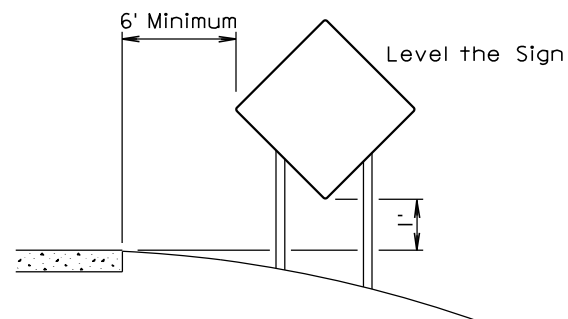
RURAL DISTRICT



RURAL DISTRICT WITH  
SUPPLEMENTAL PLATE



URBAN DISTRICT



RURAL DISTRICT  
3 DAY MAXIMUM

February 14, 2011

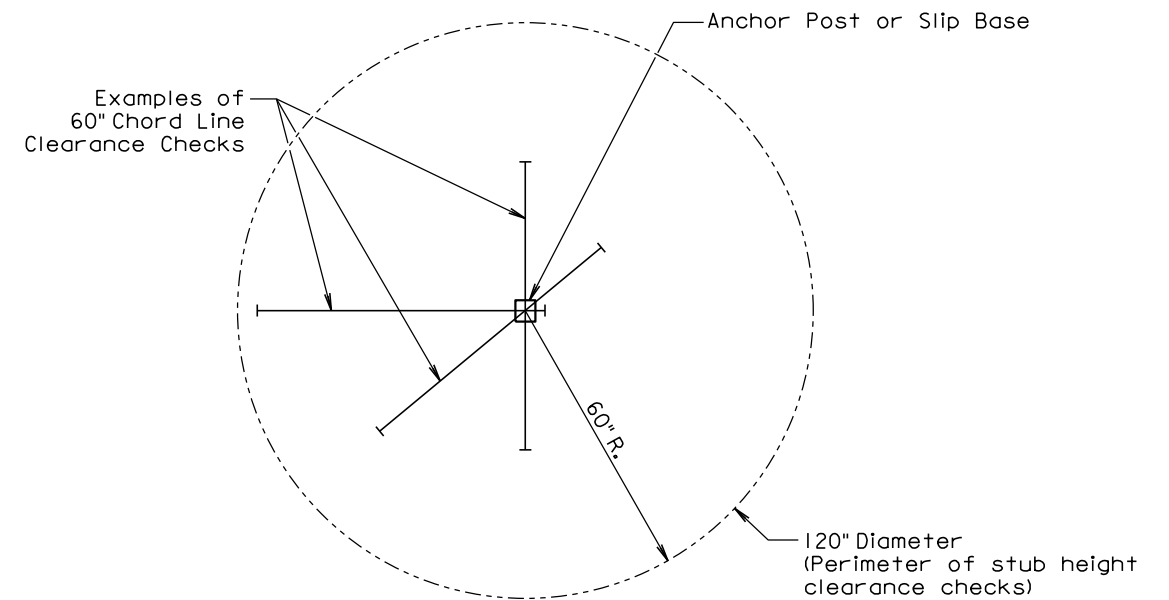
Published Date: 1st Qtr. 2013

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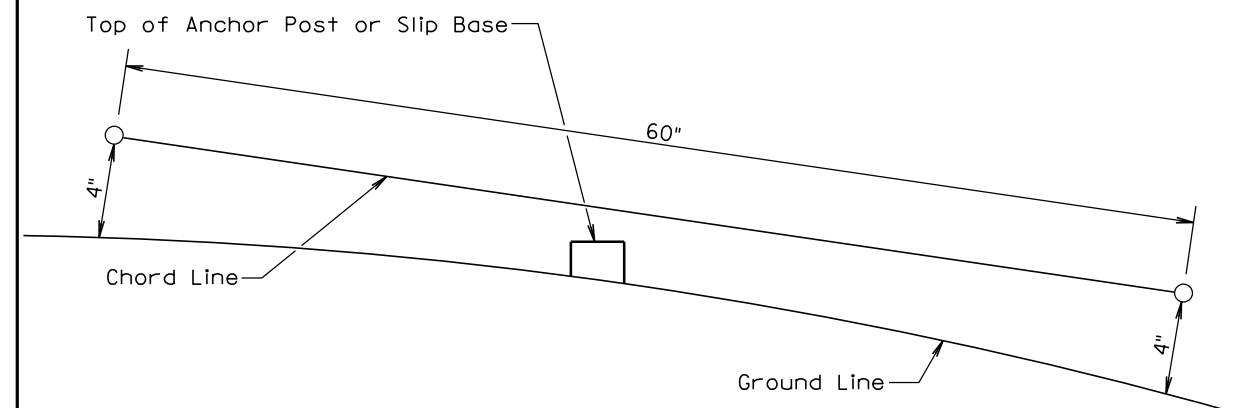
**CRASHWORTHY SIGN SUPPORTS**  
(Typical Construction Signing)

PLATE NUMBER  
634.85

Sheet 1 of 1



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

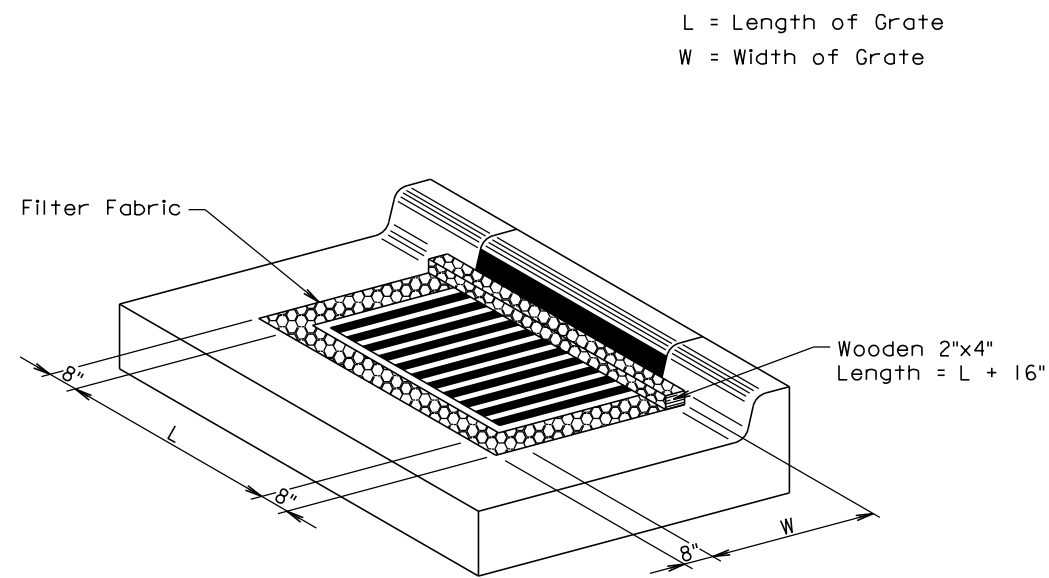
Published Date: 1st Qtr. 2013

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**BREAKAWAY SUPPORT STUB CLEARANCE**

PLATE NUMBER  
634.99

Sheet 1 of 1



ISOMETRIC VIEW

**GENERAL NOTES:**

- The grate and curb and gutter shown are for illustrative purposes only.
- The sediment control at inlet with frame and grate shall be placed at locations stated in the plans or at locations determined by the Engineer.
- The filter fabric shall be the type specified in the plans.
- The filter fabric shall be placed in the inlet opening prior to placing the grate. Approximately 18 inches of excess filter fabric shall be wrapped around the 2"x4" and stapled securely to the 2"x4" after the grate has been placed.
- The Contractor shall inspect and maintain the sediment control device once every week and within 24 hours after every rainfall event. The Contractor shall maintain the sediment control device by removing accumulated sediment and replacing torn filter fabric with new filter fabric.
- The removed sediment shall be placed at a location away from the drop inlet where the sediment will not be washed back into the drop inlet or other storm sewer system.
- All costs for furnishing, installing, inspecting, maintaining, removing, and replacing the sediment control device at the inlet including labor, equipment, and materials shall be incidental to the contract unit price per each for "Sediment Control at Inlet with Frame and Grate".

September 14, 2005

Published Date: 1st Qtr. 2013

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**SEDIMENT CONTROL AT INLETS  
WITH FRAMES AND GRATES**

**PLATE NUMBER  
734.10**

Sheet 1 of 1