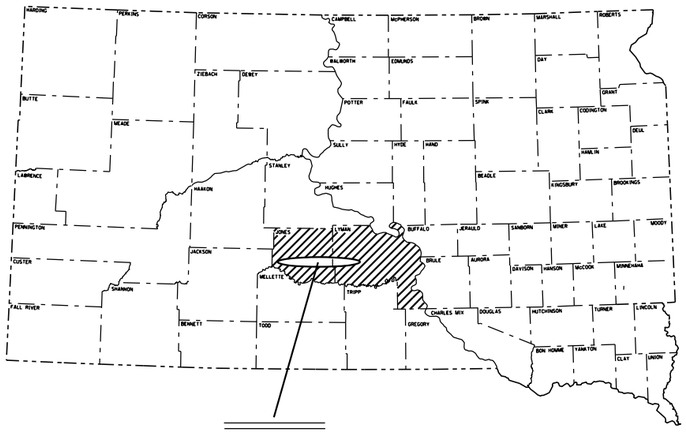
STATE OF SD	PROJECT	SHEET NO.	TOTAL SHEETS
	090E-391 & 090W-391		



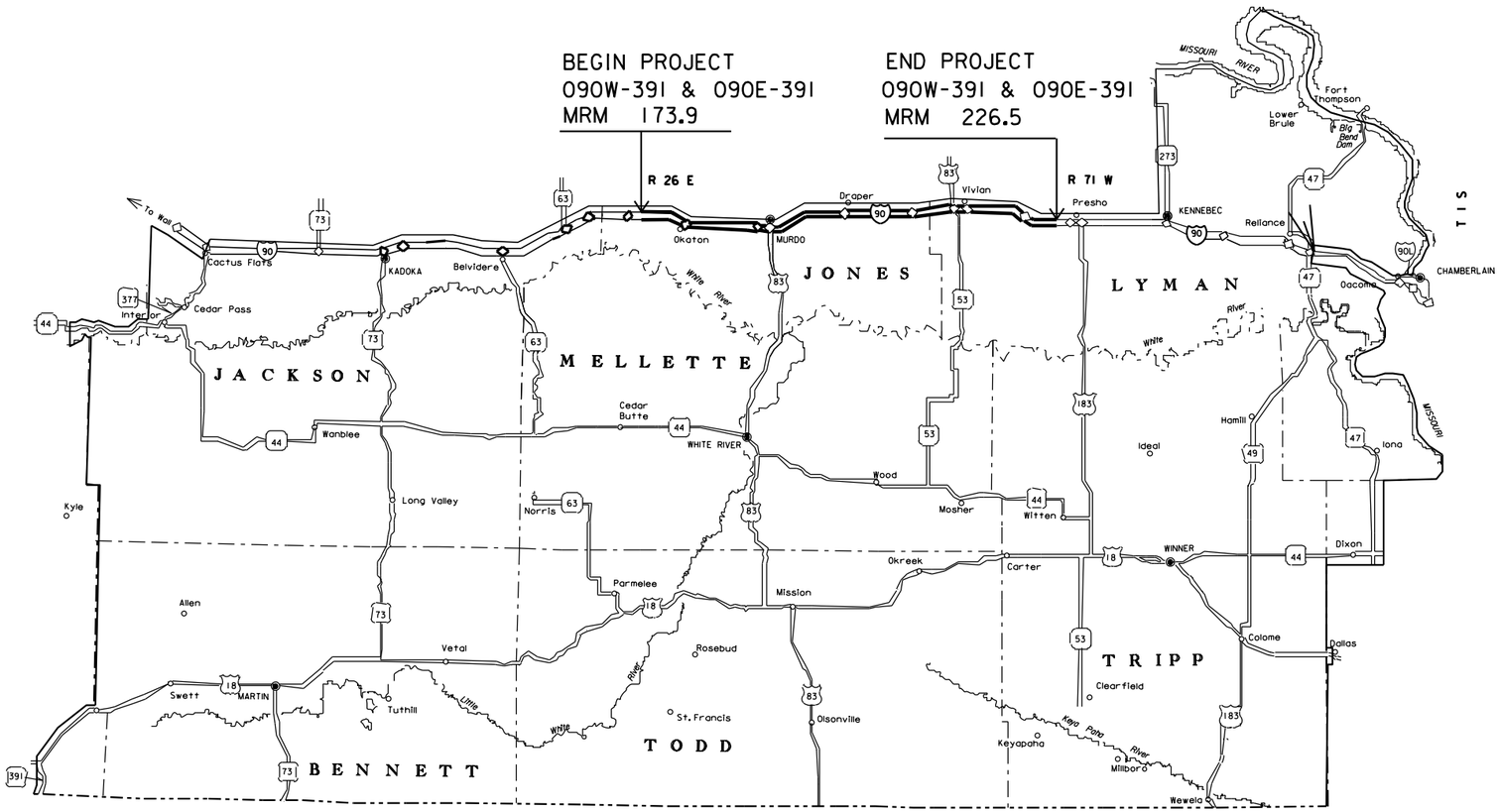
STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

PROJECT 090E–391 & 090W–391
INTERSTATE HIGHWAY 90
LYMAN & JONES COUNTIES

FULL DEPTH CONCRETE REPAIR

PCN 12FK & 12FL

INDEX OF SHEETS



090E-391 &
090W-391
LYMAN & JONES COUNTIES
12FK & 12FL

DESIGN DESIGNATION

ADT (2011)	6136
ADT (2031)	7088
DHV	1144
D	51%
T DHV	11.5%
T ADT	25.3%

STORM WATER PERMIT

No Permit Required

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
SD	090E-391 & 090W-391		

ESTIMATE OF QUANTITIES

090E-391 PCN I2FK

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
110E1010	Remove Asphalt Concrete Pavement	28.9	SqYd
110E1100	Remove Concrete Pavement	271.9	SqYd
380E0110	11" Nonreinforced PCC Pavement	45.3	SqYd
380E5100	Continuously Reinforced PCC Pavement Repair	255.5	SqYd
380E6110	Insert Steel Bar in PCC Pavement	1,955	Each
410E2600	Membrane Sealant Expansion Joint	26.0	Ft
634E0010	Flagging	30	Hour
634E0100	Traffic Control	1,491	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0420	Type C Advance Warning Arrow Panel	2	Each

090W-391 PCN I2FL

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
110E1100	Remove Concrete Pavement	58.5	SqYd
380E5100	Continuously Reinforced PCC Pavement Repair	58.5	SqYd
380E6110	Insert Steel Bar in PCC Pavement	469	Each
634E0010	Flagging	30	Hour
634E0100	Traffic Control	1,491	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0420	Type C Advance Warning Arrow Panel	2	Each

SPECIFICATIONS

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

SCOPE OF WORK

This project consists of full depth replacement of Continuously Reinforced Concrete (CRC) Pavement in areas where concrete pavement blowups or major failures have occurred. Full depth areas may vary in length and width throughout the project. The exact size and number of repair areas will be determined on construction by the Engineer.

SEQUENCE OF OPERATIONS

The Contractor shall submit his proposed sequence of operations for the Engineer's approval at least two weeks prior to the preconstruction meeting.

TRAFFIC CONTROL

Full depth concrete repairs shall be confined to a single lane width, leaving the adjoining lane open as a through traffic lane. Traffic shall not be routed onto the bituminous shoulders. Closure of both mainline lanes will not be permitted.

It will be permissible to work on both the eastbound and westbound lanes simultaneously.

All construction operations shall be conducted in the general direction of traffic movement.

The length of repair zones (encompassing more than one repair location) will depend on the Contractor's operation, however, the length shall not exceed 3 miles and it will be classified and signed as one repair zone by placement of continuous channelization throughout the entire length of the repair zone. Under no circumstances will the Contractor be allowed to set up two work zones in the same direction of travel which are closer than 3 miles apart.

The Contractor's vehicles and equipment will not be allowed to use the maintenance crossovers at any time during the construction of the project.

Contractor's vehicles or equipment entering or leaving a closed work area or when traveling in an open lane at speeds less than 40 MPH shall display a flashing amber light.

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 to the vegetation, surfacing, embankment, delineators and existing signs resulting from such indiscriminate use shall be repaired and/or restored by the Contractor, at no expense to the State, and to the satisfaction of the Engineer.

TRAFFIC CONTROL (CONTINUED)

Work activities will not be allowed during non-daylight hours.

All traffic control sign locations shall be set in the field by the Contractor and verified by the Engineer prior to installation.

Fixed location signing placed more than two days prior to the start of construction shall be covered until the time of construction. The cost of materials, labor and equipment necessary to complete this work shall be incidental to other contract items. No separate payment will be made.

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

The Contractor shall provide documentation that all breakaway sign supports comply with FHWA NCHRP 350 crash-worthy requirements. The contractor shall provide post installation details at the preconstruction meeting for all steel post breakaway sign support assemblies.

The Contractor shall designate an employee whose primary responsibility is for the maintenance of traffic, 24 hours a day and 7 days a week. The designated person must have sufficient training and experience in the field of construction traffic control and be knowledgeable about the Manual of Uniform Traffic Control Devices (MUTCD). The cost of the traffic control person shall be incidental to the contract lump sum price for TRAFFIC CONTROL, MISCELLANEOUS. The employee selected shall be approved by the Engineer. Name, phone number, and location of person or persons shall be provided to the SD Department of Transportation, SD Highway Patrol, and the respective County Sheriff's Departments.

Traffic will be maintained on the proper directional set of lanes and ramps throughout the project during repair operations. No crossing over of traffic to the opposing set of lanes or wrong way movement on ramps will be allowed. The Contractor will so arrange the details of their operations as to cause a minimum of inconvenience and delay to the traveling public.

TRAFFIC CONTROL (CONTINUED)

At interchange ramp tapers, location of signs, barricades and channelizing devices on the mainline shall be adjusted to accommodate traffic entering or leaving the work area.

Certified flaggers will be required in a work zone occupied by workers and or equipment when work activity presents a hazard to the worker or through traffic.

The Contractor will be paid for the actual quantity of movable signs and advance warning arrow panels used, not to exceed four repair zones, regardless of the number of times they are moved or the number of work zones. No payment will be made for signs used in traffic set ups exceeding four repair zones. Signs may use a hinged section or tabs to expedite changing the message. If hinged signs or tabs are used, cost of the hinged section and tabs shall be incidental to the contract unit price per unit for Traffic Control and shall be considered as one sign for payment purposes.

The Contractor shall place an eight foot Type III Barricade in front of each repair area prior to the removal of the concrete repair section. The Contractor will be paid for 20 Type III Barricades, providing at least 20 are in use at the same time. If the Contractor chooses to remove more than 20 repair sections at any one time, The Contractor at no expense to the State, shall furnish additional barricades.

Signs shall be removed, covered or turned from view and channelizing devices removed when no longer applicable. Resetting, temporary relocation and/or covering of existing traffic control devices as necessary to adequately maintain traffic or perform the work shall be the responsibility of the contractor and the cost shall be incidental to the contract lump sum price for “Traffic Control, Miscellaneous”.

The Contractor is responsible to ensure that all traffic control devices are displayed in accordance with the MUTCD, corresponding plan sheets and standard plates illustrated in the plans. If a device is improperly displayed, or not displayed at all when it should be, it will be considered as an infraction upon the plans.

The Contractor may use 42" Grabber Cones for longitudinal delineation only. All tapers, lane transitions, and marking of full depth repairs shall be accomplished utilizing drums in accordance with the MUTCD.

TRAFFIC CONTROL (CONTINUED)

Channelizing drums are to be of a two part type construction with breakaway bases. All individual drum locations shall be adequately marked on the roadway surface to expedite their replacement upon the event that any drums become displaced. The cost of these devices shall be incidental to the contract lump sum price for “Traffic Control, Miscellaneous”.

All traffic control devices are to be in like new condition. Any traffic control device that warrants replacement due to its poor condition or absence shall be replaced immediately by the Contractor at his expense.

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
G20-1	48" x 24"	ROAD WORK NEXT ## MILES	4	24	96
G20-2A	36" x 18"	END ROAD WORK	4	17	68
R2-1	30" x 36"	SPEED LIMIT ##	12	23	276
R3-5	48" x 48"	REDUCE SPEED AHEAD (SYMBOL) 45 MPH	8	34	272
W4-2	48" x 48"	LEFT OR RIGHT LANE ENDS (SYMBOL)	8	34	272
W20-1	48" x 48"	ROAD WORK #### FT. OR AHEAD	19	34	646
W20-5	48" x 48"	LT. OR RT. LANE CLOSED #### FT. OR AHEAD	8	34	272
W20-7a	48" x 48"	FLAGGER	4	34	136
SPECIAL	30" x 24"	FINES DOUBLED	8	18	144
****	***	TYPE III BARRICADE - 8 FT. SINGLE SIDED	20	40	800
				TOTAL UNITS	**2982**

CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR – EAST OF MRM 210

The Engineer will mark the location of the area to be repaired on construction.

The Contractor shall saw the in place concrete transversely at four locations for each repair area. Two saw cuts, spaced a minimum of 4’, shall be full depth. The other two saw cuts shall be partial depth saw cuts and shall be made to a depth just above the in place reinforcing steel, and be placed 4’ outside of the previous full depth saw cuts.

CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR – EAST OF MRM 210 (CONTINUED)

The Contractor shall lift out or break out the center section (including reinforcing steel) and then use hand held jackhammers (not exceeding 45 pounds) to remove the remaining 4’ of concrete at each end of the repair area, leaving the reinforcing steel in place. Hand held jackhammers (not exceeding 15 pounds) shall be used to remove the last 1’ of concrete leading up to the partial depth saw cut. Care shall be taken not to cut, bend or otherwise damage the in place reinforcing steel. Damage to in place reinforcing steel or to in place concrete beyond the repair area will be replaced at the Contractor’s expense, to the satisfaction of the Engineer.

The Contractor shall remove and dispose of the in place concrete and shape and recompact the underlying base material prior to placement of concrete.

Existing exposed reinforcing steel and concrete faces shall be cleaned by sandblasting and compressed air to remove dirt and debris prior to placement of concrete.

Place reinforcing steel according to the notes and layout for 26’ Continuously Reinforced PCC Pavement Repair Area East of MRM 210.

No. 4 transverse deformed steel bars 30” center to center 5’ long shall be placed in drilled holes. A drilled hole shall be placed six inches from the full depth transverse saw cut on both ends of the repair area. No.4 deformed steel bars shall be placed across the width of the repair area and lapped 4’ minimum with the drilled in bars. The drilled holes and rebar shall be installed per the steel bar installation note.

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	090E-391 & 090W-391		

CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR – WEST OF MRM 210

The Engineer will mark the location of the area to be repaired on construction.

The Contractor shall saw the in place concrete transversely full depth at the limits of the repair area.

The Contractor shall lift out or break out the center section of concrete (including reinforcing steel).

The Contractor shall remove and dispose of the in place concrete and shape and recompact the underlying base material prior to placement of concrete.

Existing concrete faces shall be cleaned by sandblasting and compressed air to remove dirt and debris prior to placement of concrete.

Place reinforcing steel according to the notes and layout for 24’ Continuously Reinforced PCC Pavement Repair Area West of MRM 210.

No. 5 transverse deformed steel bars 30” center to center 5’ long shall be placed in drilled holes. A drilled hole shall be placed six inches from the full depth transverse saw cut on both ends of the repair area. No.5 deformed steel bars shall be placed across the width of the repair area and lapped 4’ minimum with the drilled in bars. The drilled holes and rebar shall be installed per the steel bar installation note.

CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR – GENERAL

Concrete placed adjacent to asphalt concrete shoulders shall be formed full depth to match the width of existing concrete pavement. Care shall be taken to limit the amount of shoulder damaged during concrete removal and form placement. The excavated area of the asphalt concrete shoulder adjacent to repair areas shall be filled with asphalt concrete cold millings furnished by the State and located in the Murdo Maintenance Yard. Payment for loading, hauling and any incidentals required for placing the cold millings shall be incidental to the contract unit price per square yard for “Continuously Reinforced PCC Pavement Repair”.

A central stationary plant site or truck mixers, or self contained, mobile, continuous mixers, meeting the requirements of Section 460.3D or 460.3E, shall be used for all concrete repair work unless otherwise approved by the Engineer. Either delivery method must ensure that all requirements pertaining to delivery and placement of the concrete as noted in the Standard Specifications Section 380.3.G and 380.3.H are met.

To allow the adjacent concrete to reach its maximum expansion, concrete shall not be placed in the repair areas before 12:00 (noon) or as directed by the Engineer.

Any saw cuts that extend beyond the boundaries of the repair area will be filled with a non-shrinkage mortar mix at the Contractor’s own expense.

Upon placement of the concrete, all repair areas will be straight edged to ensure a smooth riding surface and shall be textured transversely with the pavement by finishing with a stiff broom. Repair areas longer than ten (10) feet shall be checked with a ten (10) foot straight edge. The permissible longitudinal and transverse surface deviation shall be 1/8 inch in 10 feet.

New pavement thickness shall be equal to existing pavement thickness (10” East of MRM 210 and 8” West of MRM 210).

Concrete shall meet the requirements of the Standard Specifications Section 380, except as modified by the following notes:

CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR – GENERAL (CONTINUED)

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. The concrete mix shall contain a minimum of 50% coarse aggregate by weight. Coarse aggregate shall be crushed ledge rock, Size No. 1 unless an alternative gradation is approved by the Concrete Engineer as part of the mix design submittal. The concrete mix shall contain at least 750 lbs of cementitious material per cubic yard. Fly ash will be required at 20% of cement, or lithium can be used as approved by the concrete engineer for all repairs East of MRM 210. The minimum 28 day compressive strength shall be 4,000 psi. 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.

The use of a water reducer at manufacturer's recommended dosage will be required.

Concrete shall be cured with white pigmented curing compound (AASHTO M148, Type 2) applied as soon as practical at a rate of 125 square feet per gallon. 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 60º F or higher throughout the cure period. If the concrete temperature falls below 60º F, 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 attained 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, until the 4000 psi is attained. Insulation blanket shall be overlapped on to the existing concrete by 4’. The initial contraction joint sawing shall be performed as soon as practical after placement to avoid random cracking.

Locations and quantities of Continuously Reinforced PCC Pavement Repair are subject to change in the field at the discretion of the Engineer.

CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR – GENERAL (CONTINUED

Continuously Reinforced Pavement Repair will be measured to the nearest tenth of a foot and computed to the nearest tenth of a square yard.

Continuously Reinforced Pavement Repair, measured as provided above, will be paid for at the contract unit price per square yard. This will be full compensation for all labor, equipment, materials, and incidentals necessary for the saw cutting, removing of material, preparation of removed area, furnishing and placing concrete, finishing and curing of Continuously Reinforced Pavement Repair.

RESTORATION OF GRAVEL CUSHION

After removal of full depth concrete pavement, an inspection of the gravel cushion subgrade is to be made. Areas of excess moisture are to be dried to the satisfaction of the Engineer. Loose material shall be removed and disturbed areas 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.

Gravel Cushion material shall be approved by the Engineer and shall be furnished by the Contractor. Gravel Cushion material shall conform to Section 882.

Cost of this work, including gravel cushion material, shall be incidental to the contract unit price bid per square yard for "Continuously Reinforced PCC Pavement Repair".

RESTORATION OF ASPHALT CONCRETE BOND BREAKER

After removal of full depth concrete pavement, an inspection of the asphalt concrete bond breaker is to be made. Loosed material shall be removed and disturbed areas leveled and compacted to the satisfaction of the Engineer. Asphalt concrete cold millings shall be used to replace any damaged areas.

Cost for this work, including asphalt concrete cold millings, shall be incidental to the contract unit bid price per square yard for "Continuously Reinforced PCC Pavement Repair".

PLACEMENT OF REINFORCING STEEL FOR CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR – WEST OF MRM 210

After removal of the in place concrete and repair of the gravel cushion subgrade, new reinforcing steel shall be installed according to plan details. Refer to the Pavement Repair Area details.

1. No. 5 longitudinal bars shall be drilled in between every in place longitudinal steel bar. The No. 5 longitudinal bars shall overlap into the existing concrete 9" on both sides of the repair area. Drilled holes will be required and the additional longitudinal bars shall be inserted in accordance with the notes for Steel Bar Insertion. The additional longitudinal bars shall then be lap spliced with new No. 5 longitudinal bars across the length of the repair area.

2. No. 5 transverse bars shall be drilled in starting 6" from both ends of the repair area. The spacing shall then be 30" center to center throughout the length of the repair area. The transverse bars shall overlap 9" into the existing concrete. New No. 5 deformed steel bars shall be placed across the width of the repair area and lapped 4' minimum with the drilled in bars. The drilled holes and rebar shall be installed per the steel bar installation note.

Cost for the reinforcing steel, ties, labor and equipment shall be incidental to the contract unit price per square yard for "Continuously Reinforced PCC Pavement Repair".

PLACEMENT OF REINFORCING STEEL FOR CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR – EAST OF MRM 210

After removal of the in place concrete and repair of the gravel cushion subgrade, new reinforcing steel shall be installed according to plan details. Refer to the Pavement Repair Area details.

1. New No. 6 longitudinal bars shall be lap spliced with the preserved in place longitudinal bars.

2. Additional No. 6 longitudinal bars shall be centered between every other set of two spliced longitudinal bars throughout the width of the repair area. The additional longitudinal bars shall overlap into the existing concrete 9" on both sides of the repair area. Drilled holes will be required and the additional longitudinal bars shall be inserted in accordance with the notes for Steel Bar Insertion. The additional longitudinal bars shall then be lap spliced with No. 6 longitudinal bars across the length of the repair area.

3. No. 4 transverse bars shall be drilled in starting 6" from both ends of the repair area. The spacing shall then be 30" center to center throughout the length of the repair area. The transverse bars shall overlap 9" into the existing concrete. New No. 4 deformed steel bars shall be placed across the width of the repair area and lapped 4' minimum with the drilled in bars. The drilled holes and rebar shall be installed per the steel bar installation note.

Cost for the reinforcing steel, ties, labor and equipment shall be incidental to the contract unit price per square yard for "Continuously Reinforced PCC Pavement Repair".

11” NONREINFORCED PCC PAVEMENT

After removal of the in place concrete and repair of the gravel cushion subgrade, new reinforcing steel shall be installed as follows.

1. New No. 6 longitudinal bars shall be installed at 12” intervals center to center in the nonrinforced pcc pavement. New No. 4 transverse bars shall be installed at 30” intervals center to center in the nonreinforced pcc pavement. The reinforcing steel shall be placed at the midpoint of the slab.

2. Both the longitudinal and transverse bars shall start 6” from the edge of the pcc pavement. The transverse bars shall overlap 9” into the adjacent concrete. The drilled holes and rebar shall be installed per the steel bar installation note.

Concrete shall meet the requirements of the Standard Specifications Section 380, except as modified by the following notes:

The concrete mix shall contain a minimum of 55% coarse aggregate by weight. Coarse aggregate shall be crushed ledge rock, Size No. 1 unless an alternative gradation is approved by the Concrete Engineer as part of the mix design submittal. The concrete mix shall contain at least 750 lbs of cementitious material per cubic yard. Fly ash will be required at 20% of cement, or lithium can be used as approved by the concrete engineer. The minimum 28 day compressive strength shall be 4,000 psi. 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.

The use of a water reducer at manufacturer's recommended dosage will be required.

Cost for the reinforcing steel, ties, labor and equipment shall be incidental to the contract unit price per square yard for “11”Nonreinforced PCC Pavement”.

REMOVE CRC TERMINAL ANCHOR

All costs to cut and remove the upper portion of the CRC terminal anchor shall be incidental to the contract unit price per square yard for “REMOVE CONCRETE PAVEMENT”.

STEEL BAR INSERTION

The Contractor shall insert steel bars into drilled holes in the joints as specified. An epoxy resin adhesive must be used to anchor the steel bar into the drilled hole.

The 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.

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

The diameter of the drilled holes in the existing concrete 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 and 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 one-third to one-half 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 eliminated voids and ensure complete bonding of the bar. Insertion of the bars by the dipping method will not be allowed.

STEEL BAR INSERTION (CONTINUED)

Cost for the steel bars shall be incidental to the contract unit price per square yard for “Continuously Reinforced PCC Pavement Repair”.

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

SAW AND SEAL JOINTS

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

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

All joints shall be sealed with low modulus silicone sealant.

Cost for sawing and sealing of the longitudinal construction joints and transverse joints shall be incidental to the contract unit price per square yard for “Continuously Reinforced PCC Pavement Repair”.

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	090E-391 & 090W-391		

TABLE OF PROJECT QUANTITIES (For Information Only)

BID ITEM	090E-391	090W-391
Mobilization	LS	LS
Remove Concrete Pavement(SqYd)	271.9	58.5
Remove Asphalt Concrete (SqYd)	28.9	-
CRC Repair (Sqyd)	255.5	58.5
11” Nonreinforced PCC Pavement	45.3	-
Insert Steel Bar in PCC Pavement (Each)	1955	469
Membrane Sealant Expansion Joint	26	-
Flagging (Hour)	30	30
Traffic Control (Unit)	1491	1491
Traffic Control, Miscellaneous	LS	LS
Type C Advance Warning Arrow Panel (Each)	2	2

TABLE OF CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR – WESTBOUND LANES

LOCATION	LANE	LENGTH FEET	WIDTH FEET	SQYDS
WESTBOUND LANES				
197.937	DL	4	4	1.8
195.469	DL	4	4	1.8
195.428	DL	4	4	1.8
194.419	DL	6	6	4.0
195.238	DL	4	4	1.8
195.163	DL	12	12	16.0
195.163	PL	4	12	5.3
194.487	DL	4	4	1.8
194.467	DL	4	4	1.8
194.456	DL	6	12	8.0
194.443	DL	4	4	1.8
193.590	DL	4	4	1.8
192.962	DL	4	4	1.8
192.850	DL	4	4	1.8
192.840	DL	4	4	1.8
192.259	DL	4	4	1.8
191.500	DL	4	4	1.8
191.495	DL	4	4	1.8
			Total	58.5

TABLE OF CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR – EASTBOUND LANES

LOCATION	LANE	LENGTH FEET	WIDTH FEET	SQYDS
EASTBOUND LANES				
173.980	DL	4	4	1.8
174.353	DL	4	4	1.8
175.571	DL	4	12	5.3
175.880	DL	4	8	3.6
176.845	DL	4	6	2.7
178.950	DL	4	4	1.8
179.650	DL	4	4	1.8
180.728	PL	4	12	5.3
180.921	DL	4	4	1.8
180.988	DL	10	12	13.3
180.988	PL	4	12	5.3
181.180	DL	10	12	13.3
181.183	DL	10	12	13.3
181.234	DL	6	6	4.0
181.350	PL	4	12	5.3
181.350	DL	4	12	5.3
181.520	DL	4	4	1.8
181.557	PL	4	12	5.3
185.991	DL	4	4	1.8
186.263	DL	4	4	1.8
186.506	DL	4	4	1.8
189.991	DL	4	4	1.8
190.196	DL	4	4	1.8
190.300	DL	4	4	1.8
190.330	DL	4	6	2.7
190.790	DL	4	4	1.8
191.330	DL	4	4	1.8
191.526	DL	4	4	1.8
191.536	DL	4	4	1.8
191.557	DL	4	4	1.8
191.560	DL	4	4	1.8
191.740	DL	4	4	1.8
191.744	DL	4	4	1.8

TABLE OF CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR – EASTBOUND LANES (CONTINUED)

191.758	DL	4	4	1.8
191.817	DL	4	12	5.3
191.817	PL	4	12	5.3
191.846	DL	4	4	1.8
191.918	DL	4	4	1.8
192.510	DL	4	4	1.8
192.526	DL	4	4	1.8
192.980	DL	4	4	1.8
193.022	DL	4	4	1.8
193.690	DL	4	4	1.8
193.795	DL	4	4	1.8
194.069	DL	4	6	2.7
194.121	DL	4	4	1.8
194.152	DL	4	6	2.7
195.128	DL	4	4	1.8
195.145	DL	4	12	5.3
195.154	DL	4	4	1.8
195.269	DL	4	12	5.3
195.290	DL	4	4	1.8
195.331	DL	4	4	1.8
195.389	DL	4	6	2.7
195.463	DL	4	4	1.8
195.535	DL	4	4	1.8
195.567	DL	4	12	5.3
196.228	DL	4	4	1.8
196.388	DL	4	6	2.7
196.673	DL	4	4	1.8
196.735	DL	4	4	1.8
196.811	DL	6	12	8.0
196.928	DL	4	12	5.3
210.141	DL	1.3	14	2.0
210.141	PL	1.3	12	1.7
216.469	DL	12	12	16.0
223.325	DL	12	12	16.0
223.447	DL	4	4	1.8
225.444	DL	4	4	1.8
226.463	DL	6	12	8.0
226.475	DL	4	6	2.7
			Total	255.5

MEMBRANE SEALANT EXPANSION JOINT

Install all membrane sealant expansion joints at the plan shown locations in conformance to the following notes.

The Membrane Sealant is a foam sealant consisting of an open-cell high density polyurethane foam impregnated with either a polymer modified bitumen or a neoprene rubber suspended in chlorinated hydrocarbons. The Membrane Sealant shall be supplied by one the following companies:

Wabo HSeal
Watson Bowman Acme Corp.
95 Pineview Drive, Amherst NY 14228
Phone: 716-691-7566
Fax: 716-691-9239
Web site: http://www.wbacorp.com

Sealtite 50N
Schul International Company, LLC
One Industrial Drive
Pelham, NH 03076
Phone: 800-848-1120
Fax: 800-998-9105
Web site: http://www.sealtiteusa.com

Polytite N
Sunshine Industrial
5051 Merriam Drive
Merriam, KS 66203
Phone: 913-362-6300

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. Miter the ends of each piece for ease of joining to the adjacent pieces. The membrane sealant shall have a minimum depth of 4 inches. The foam sealant shall be ultra-violet and ozone resistant.

MEMBRANE SEALANT EXPANSION JOINT (CONTINUED)

The bonding adhesive used to attach the membrane sealant to the adjacent concrete shall be a waterproof epoxy adhesive that adheres to concrete surfaces and is approved by the membrane sealant supplier.

Adhesive used to join adjacent pieces of the membrane sealant shall be as recommended by the manufacturer.

The Styrofoam filler material shall be closed cell and water-tight as approved by the Engineer.

The minimum ambient air temperature at the time of joint installation and adhesive curing shall be 40° F.

A technical representative of the membrane sealant supplier shall be present at the jobsite during installation.

The joint opening shall be formed during the concrete placement by Styrofoam block out material. The Styrofoam block out material shall remain in-place until the adjacent concrete has cured for a minimum of 28 days. After curing the 28 days the Styrofoam shall be removed to the plan specified depth to allow for placement of the membrane sealant material.

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.

After abrasive blasting and 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.

Individual spliced sections shall be installed as per the manufacturers' recommendations. The membrane joint sealant supplier shall submit a detailed installation procedure to the Engineer at least 5 days prior to joint installation for his review.

MEMBRANE SEALANT EXPANSION JOINT (CONTINUED)

Traffic shall not be allowed on the joint for a minimum 3 hours unless otherwise directed by the Engineer.

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.

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.

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:

1. 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”.

2. Concrete and asphalt concrete debris may be stockpiled within view of the ROW for a period of time not to exceed the duration of the project. Prior to project completion, the waste shall be removed from view of the ROW or buried and the waste disposal site reclaimed as noted above.

WASTE DISPOSAL SITE (CONTINUED)

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.

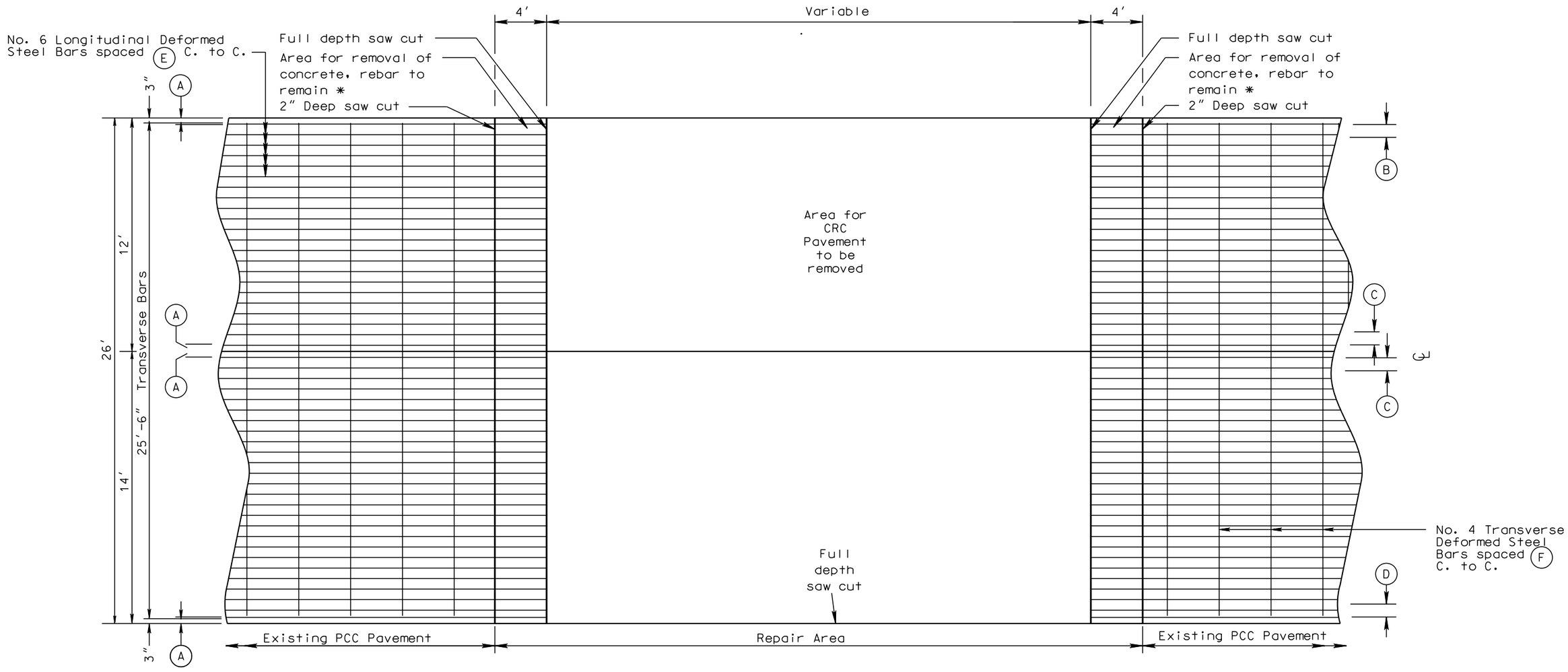
All costs associated with furnishing waste disposal site(s), disposing of waste, maintaining control of access (fence, gates, and signs), and reclamation of the waste disposal site(s) shall be incidental to the various contract items.

26′ CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR AREA

EAST OF MRM 210

Sheet 1 of 2

* All Bent, Broken or Damaged rebar shall be straightened or replaced to the satisfaction of the Engineer.

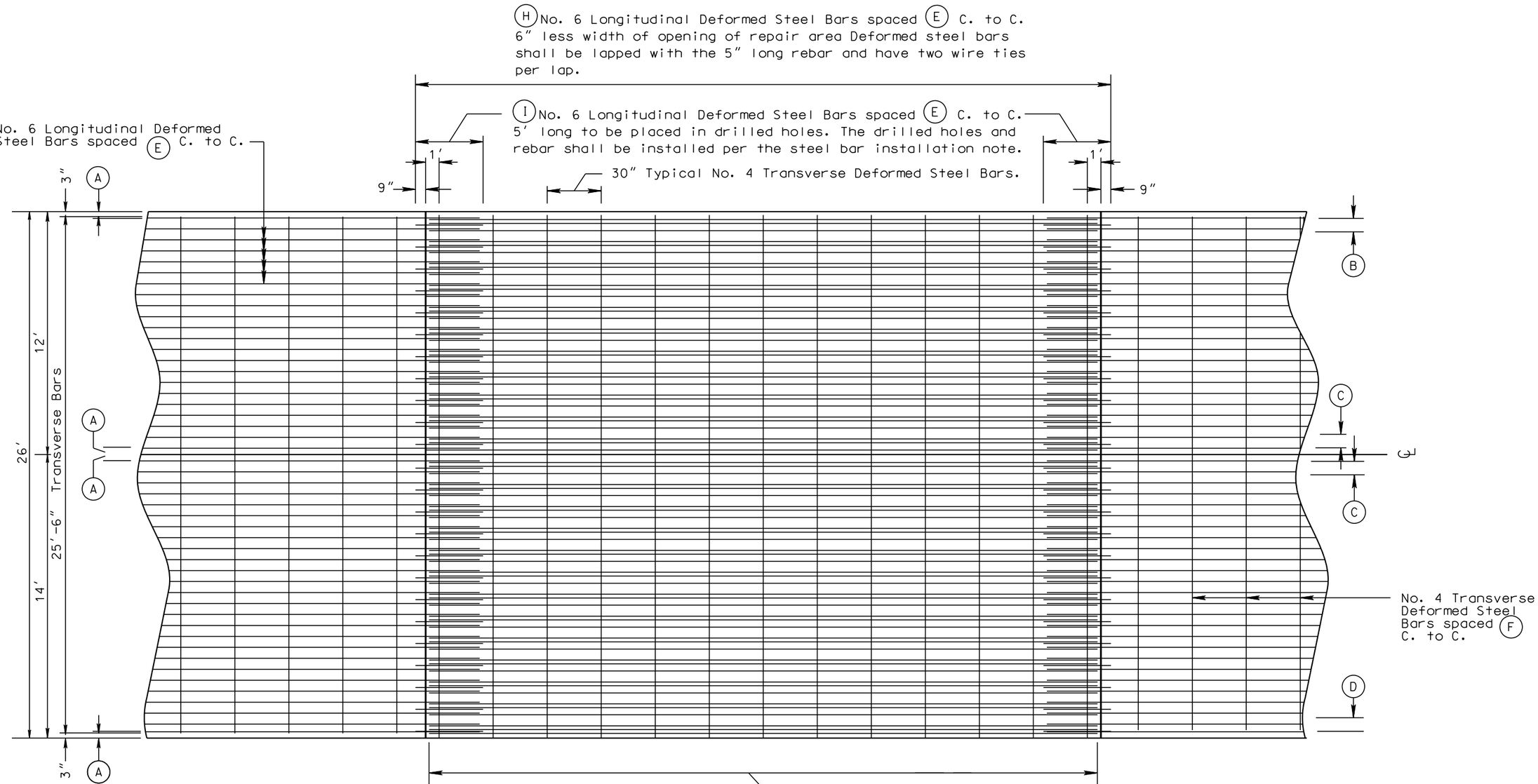


Depth of Pavement	A	B	C	D	E	F
8″	4″	8″	8″	8″	8″	36″
8.5″	4″	4″	4½″	5½″	7½″	36″
9″	4″	5″	5″	8″	7″	48″
9.5″	3¾″	6½″	6½″	4½″	6½″	48″
10″	3¾″	6½″	6½″	4½″	6½″	48″
10.5″	4″	5″	5″	5″	6″	48″
11″	4″	5″	5″	5″	6″	48″

26′ CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR AREA

EAST OF MRM 210

Sheet 2 of 2



Depth of Pavement	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
8"	4"	8"	8"	8"	8"	36"	39	19	38
8.5"	4"	4"	4½"	5½"	7½"	36"	43	21	42
9"	4"	5"	5"	8"	7"	48"	45	22	44
9.5"	3¾"	6½"	6½"	4½"	6½"	48"	48	24	48
10"	3¾"	6½"	6½"	4½"	6½"	48"	48	24	48
10.5"	4"	5"	5"	5"	6"	48"	52	26	52
11"	4"	5"	5"	5"	6"	48"	52	26	52

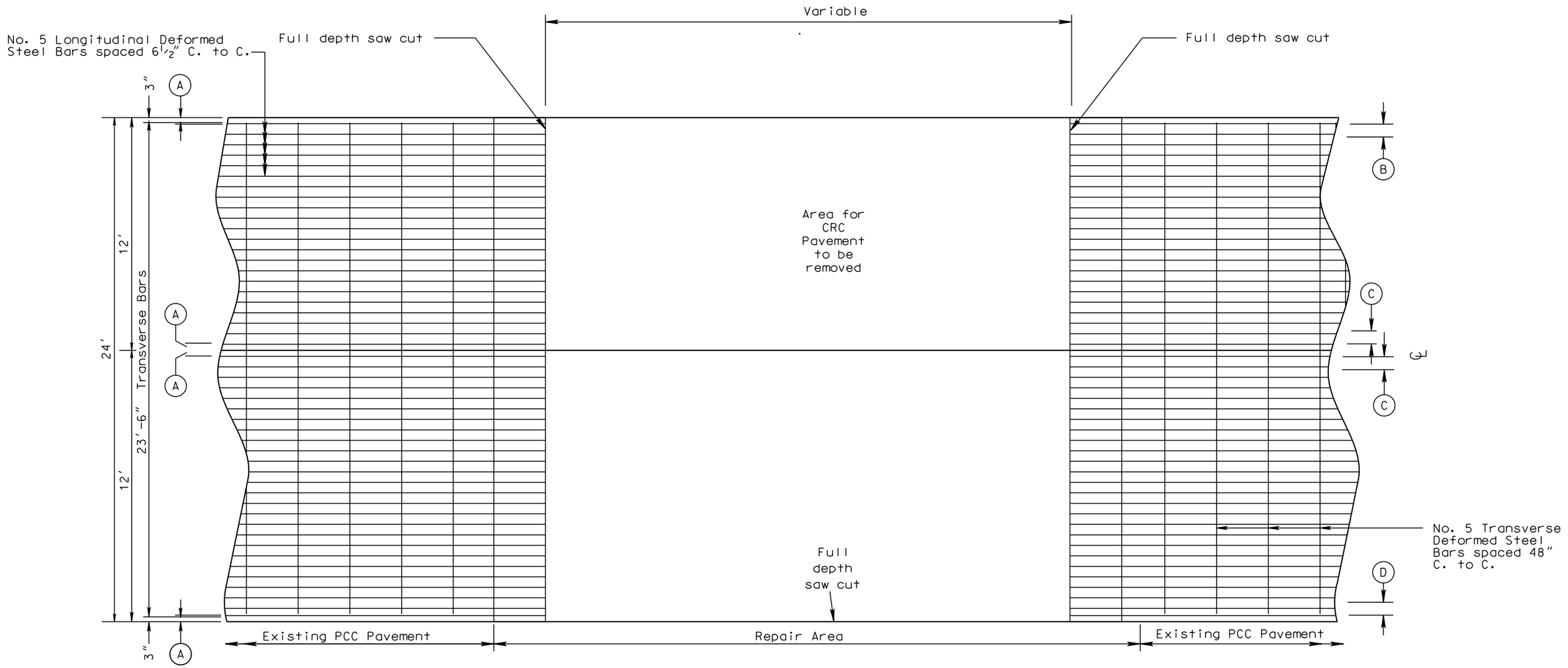
(G) No. 6 Longitudinal Deformed Steel Bars spaced (E) C. to C., 6" less than width of opening of repair area and centered. Deformed Steel Bars shall be lapped with existing rebar and have two wire ties per lap.

All rebar splice length shall be 4′ or Contractor may use Mechanical splicers.

24′ CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR AREA

WEST OF MRM 210

Sheet 1 of 2

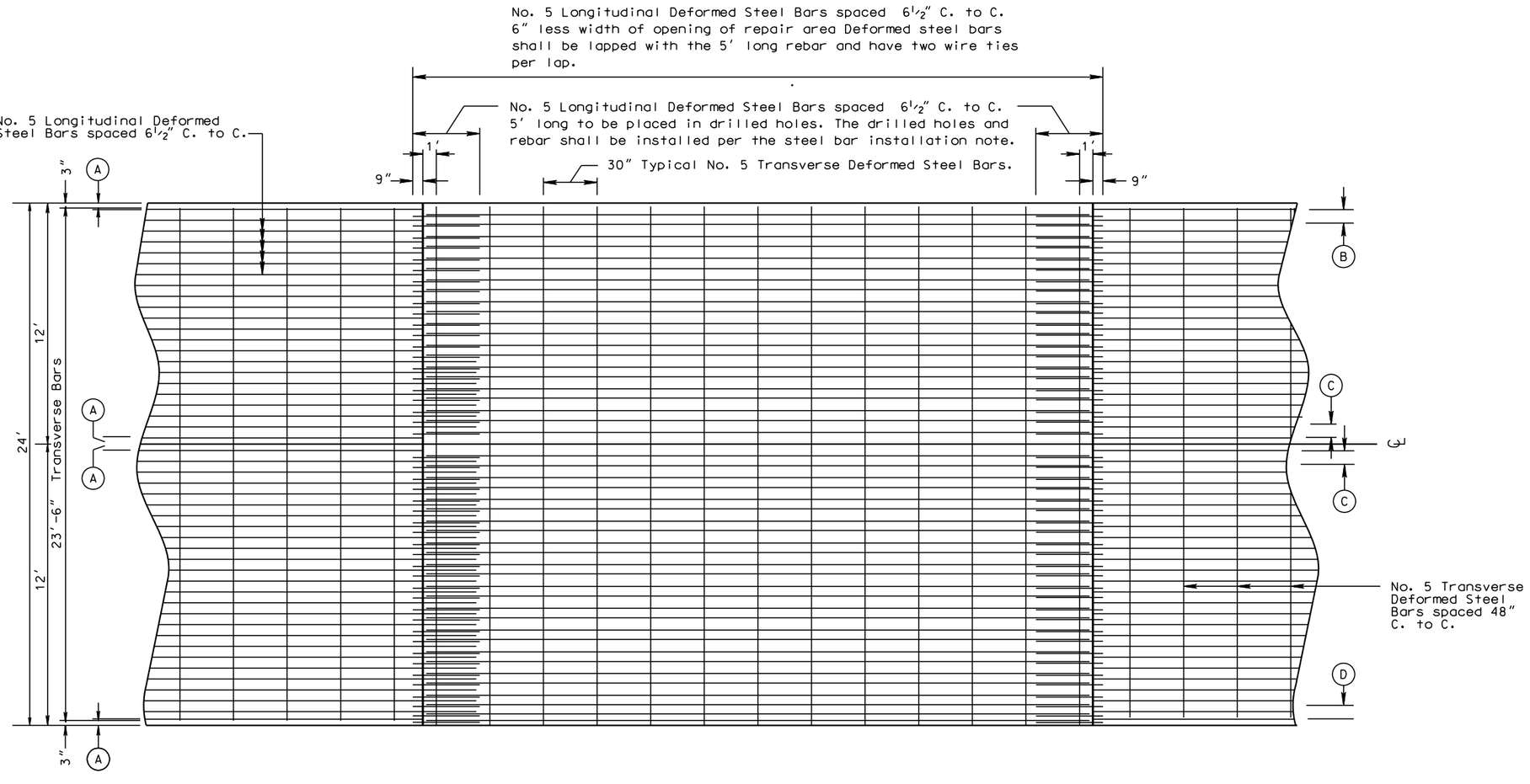


Depth of Pavement	(A)	(B)	(C)	(D)	(E)	(F)
8"	4"	8"	8"	8"	8"	36"
8.5"	4"	4"	4½"	5½"	7½"	36"
9"	4"	5"	5"	8"	7"	48"
9.5"	3¾"	6½"	6½"	4½"	6½"	48"
10"	3¾"	6½"	6½"	4½"	6½"	48"
10.5"	4"	5"	5"	5"	6"	48"
11"	4"	5"	5"	5"	6"	48"

24′ CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR AREA

WEST OF MRM 210

Sheet 2 of 2

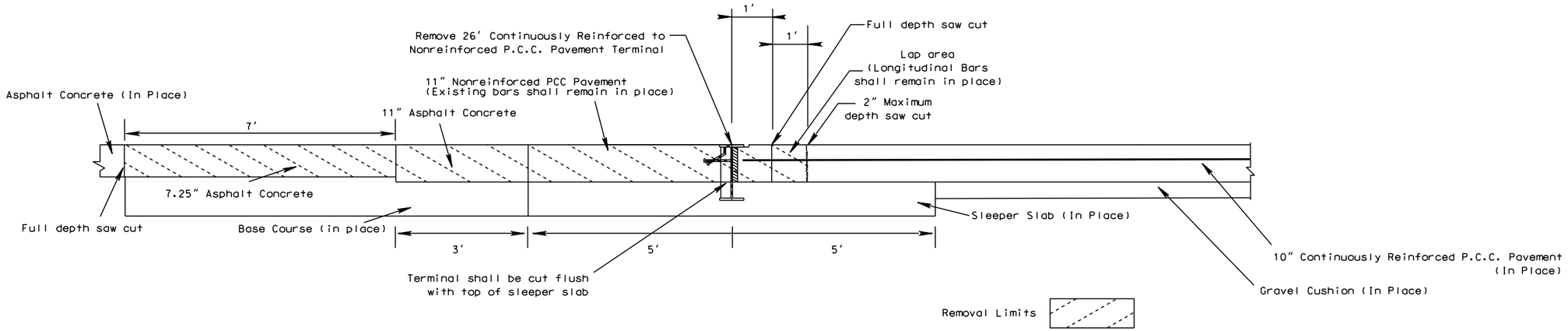


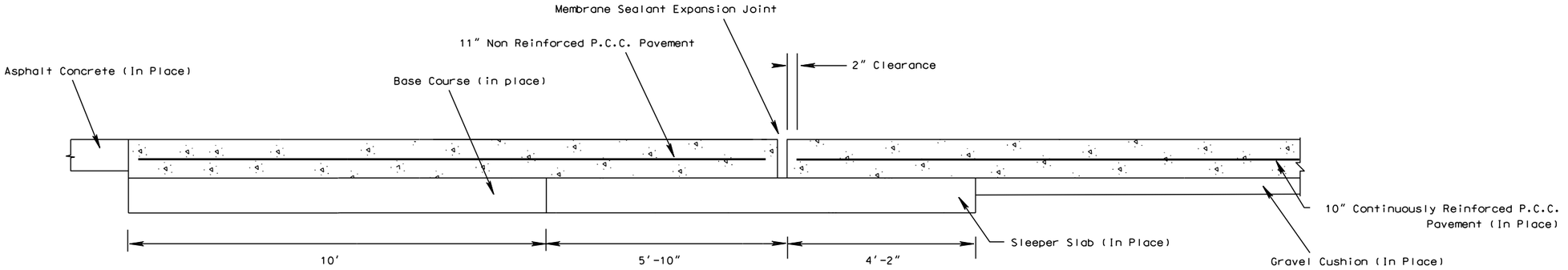
Depth of Pavement	A	B	C	D	E	F	G	H	I
8"	4"	8"	8"	8"	8"	36"	39	19	38
8.5"	4"	4"	4½"	5½"	7½"	36"	43	21	42
9"	4"	5"	5"	8"	7"	48"	45	22	44
9.5"	3¾"	6½"	6½"	4½"	6½"	48"	48	24	48
10"	3¾"	6½"	6½"	4½"	6½"	48"	48	24	48
10.5"	4"	5"	5"	5"	6"	48"	52	26	52
11"	4"	5"	5"	5"	6"	48"	52	26	52

All rebar splice length shall be 4′ or Contractor may use Mechanical splicers.

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	090E-391 & 090W-391		

Plotting Date: 05/04/2012



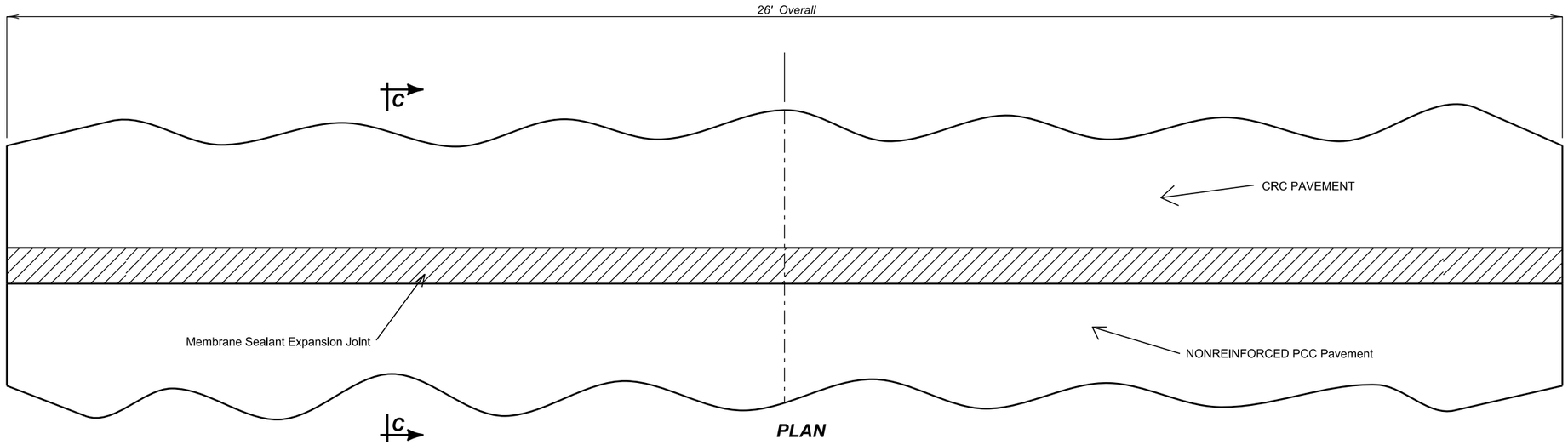


PCC PAVEMENT REMOVAL LIMITS

DETAILS FOR PCC PAVEMENT REMOVAL AT MRM 210.141 EASTBOUND LANES

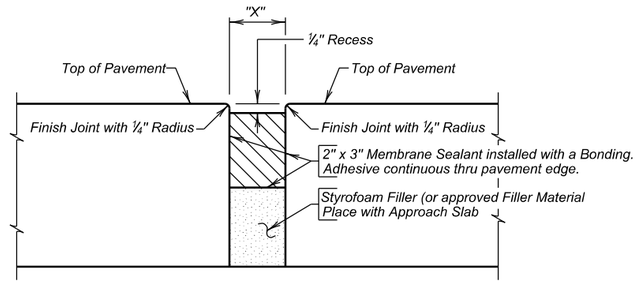
LYMAN AND JONES COUNTIES
S. D. DEPT. OF TRANSPORTATION
MARCH 2012

PLOT SCALE - 1:0.154037
PLOTTED FROM - TRW1INT20
PLOT NAME - 1
FILE - ...\MEMBRANE SEALANT JOINT DETAILS_REMOVALS.DGN



PLAN

TEMP.	DIMENSION "X"
40°	2
50°	1 1/8"
60°	1 13/16"
70°	1 3/4"
80°	1 5/8"
90°	1 9/16"
100°	1 7/16"



ELEVATION

SECTION C - C

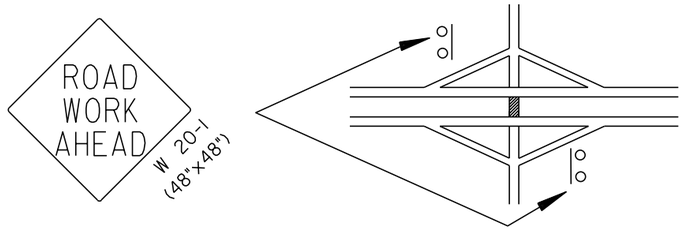
MEMBRANE SEALANT EXPANSION JOINT

DETAILS FOR
JOINT BETWEEN CRC PAVEMENT
AND NONREINFORCED PCC PAVEMENT AT
MRM 210.141 EASTBOUND LANES

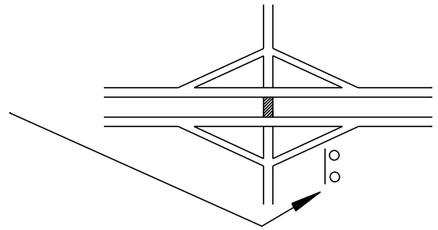
LYMAN AND JONES COUNTIES
S. D. DEPT. OF TRANSPORTATION
MARCH 2012

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	090E-391 & 090W-391		

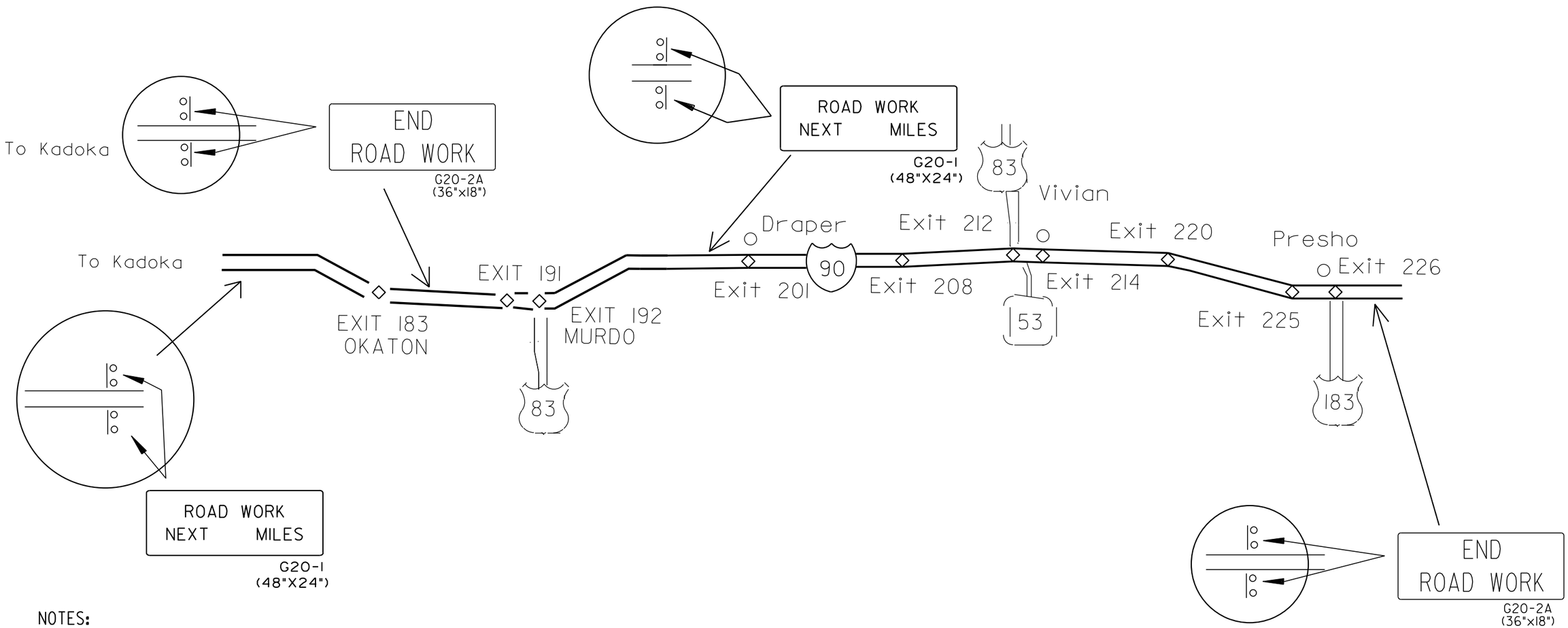
FIXED LOCATION SIGN LAYOUT



EXIT 201

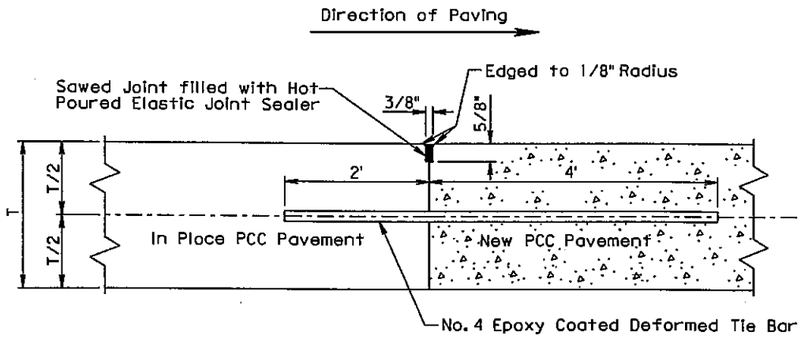


EXIT 191, 192, 208, 212, 214, 220, 225, & 226



NOTES:

SIGN LOCATIONS WILL BE VERIFIED IN THE FIELD
BY THE ENGINEER PRIOR TO INSTALLATION



T = Pavement Thickness

GENERAL NOTES:

No. 4 epoxy coated deformed tie 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 minimum distance between a transverse construction joint with tie bars and an adjacent transverse contraction joint shall be 5 feet.

When a transverse construction joint is made, paving will not be allowed in this area for 12 hours.

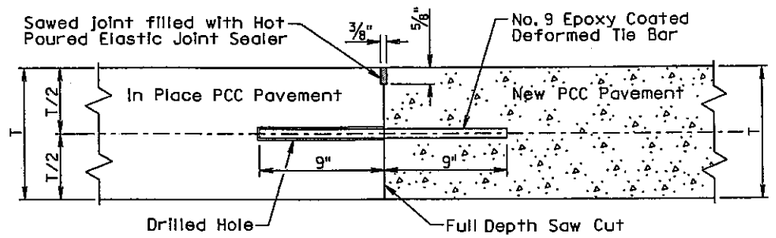
A transverse construction joint may be placed in lieu of the transverse contraction joint when shown in the plans.

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: 2nd Qtr. 2012	SDDOT	PCC PAVEMENT MID PANEL TRANSVERSE CONSTRUCTION JOINT	PLATE NUMBER 380.05
			Sheet 1 of 1

TRANSVERSE CONSTRUCTION JOINT WITH TIE BARS



T = In Place PCC Pavement and New PCC Pavement Thickness

GENERAL NOTES:

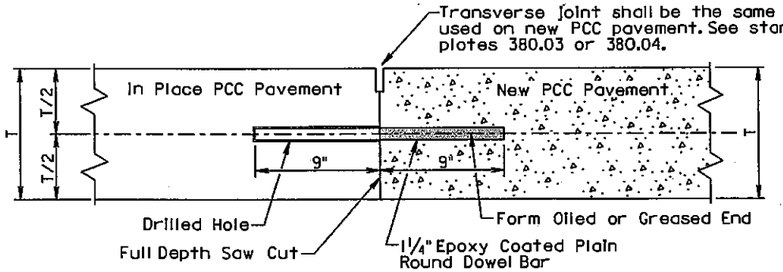
This detail shall be used when the transverse joint is less than 15 feet from the existing transverse contraction joint.

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.

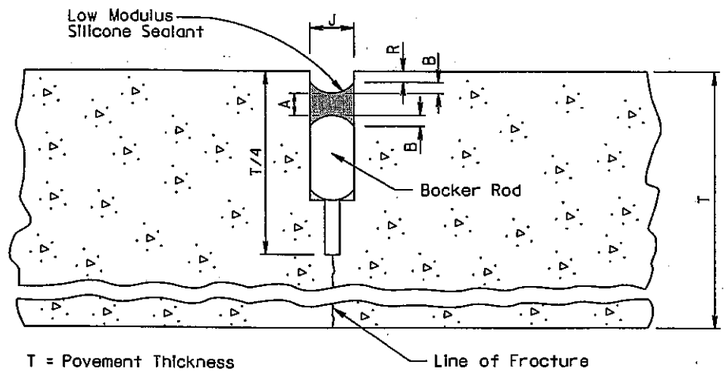
The plain round dowel bars shall be embedded a minimum depth of 9 inches into the in place PCC pavement and anchored with an epoxy resin adhesive.

The 1¼" 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: 2nd Qtr. 2012	SDDOT	PCC PAVEMENT TRANSVERSE CONSTRUCTION JOINTS WITH TIE BARS OR DOWEL BARS	PLATE NUMBER 380.06
			Sheet 1 of 1



LOW MODULUS SILICONE SEALANT ALLOWABLE CONSTRUCTION TOLERANCES

J = 3/8"				
A (Min.) (In)	A (Max.) (In)	B (Min.) (In)	B (Max.) (In)	R (In)
3/16	5/16	1/8	1/4	1/4

J = 1/2"				
A (Min.) (In)	A (Max.) (In)	B (Min.) (In)	B (Max.) (In)	R (In)
3/16	3/8	1/8	1/4	1/4

J = 5/8"				
A (Min.) (In)	A (Max.) (In)	B (Min.) (In)	B (Max.) (In)	R (In)
1/4	7/16	1/8	5/16	1/4

J = 3/4"				
A (Min.) (In)	A (Max.) (In)	B (Min.) (In)	B (Max.) (In)	R (In)
5/16	1/2	3/16	3/8	5/16

J = 1"				
A (Min.) (In)	A (Max.) (In)	B (Min.) (In)	B (Max.) (In)	R (In)
3/8	5/8	3/16	1/2	5/16

GENERAL NOTE:

The backer rod shall be a nonmoisture absorbing resilient material approximately 25% larger in diameter than the width of the joint to be sealed.

February 14, 2011

Published Date: 2nd Qtr. 2012	SDDOT	RESEAL PCC PAVEMENT JOINT (SILICONE)	PLATE NUMBER 380.13
			Sheet 1 of 1

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet) (G)	Taper Length (Feet) (L)	Spacing of Advanced Warning Signs (Feet) (ABC)
0 - 30	25	180	200
35 - 40	25	320	350
45 - 50	50	600	500
55	50	660	750
60 - 65	50	780	1000
70 - 75	50	900	1000 1500 2640

▪ Channelizing Device

* Speed appropriate for location.

4" white temporary pavement marking tape for right lane closures and 4" yellow temporary pavement marking tape for left lane closures or temporary road markers at 5' spacing shall be installed when the lane is closed for a period of 24 hours or more.

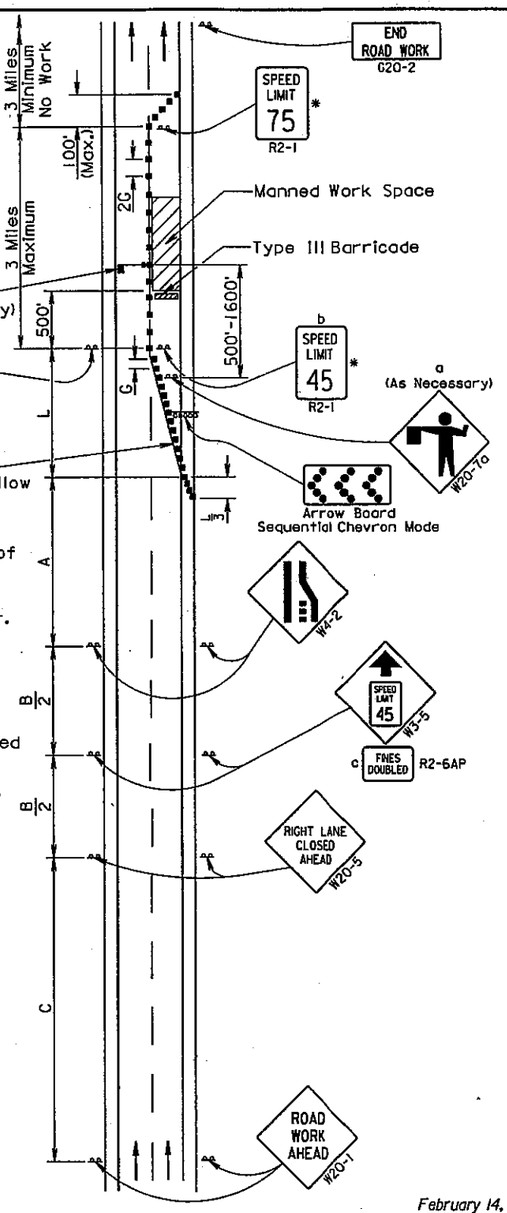
Signs a, b, and c shall be removed or covered when workers are not present.

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

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

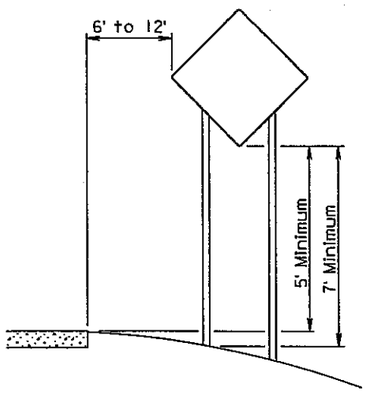
Left mounted advance signs on undivided highways are not required.

The channelizing devices shall be drums or 42" cones if traffic control must remain overnight or longer. During daylight hours, 42" cones may be used in lieu of drums along the centerline.

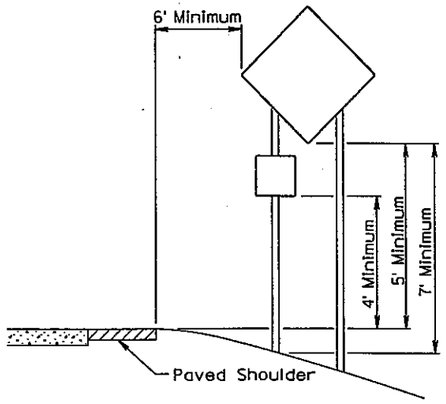


February 14, 2011

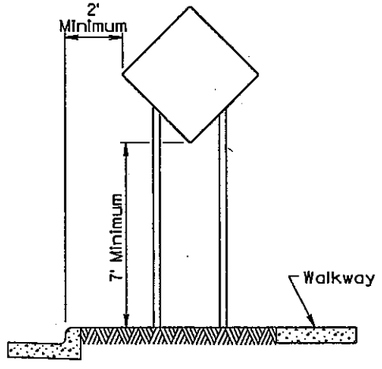
Published Date: 2nd Qtr. 2012	SDDOT	MANNED WORK SPACE SIGNING FOR DIVIDED AND UNDIVIDED HIGHWAYS	PLATE NUMBER 634.63
			Sheet 1 of 1



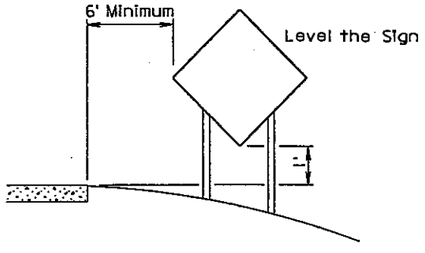
RURAL DISTRICT



RURAL DISTRICT WITH SUPPLEMENTAL PLATE



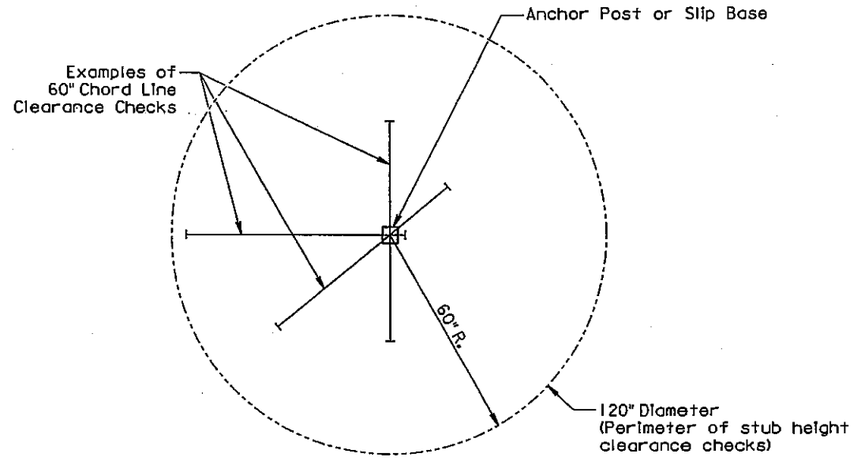
URBAN DISTRICT



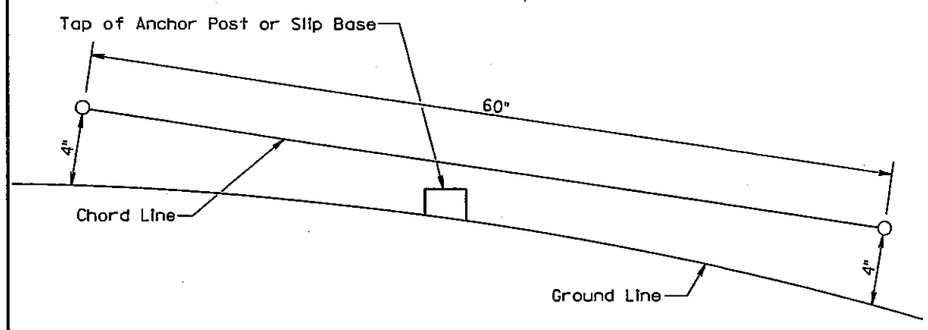
RURAL DISTRICT 3 DAY MAXIMUM

February 14, 2011

Published Date: 2nd Qtr. 2012	SDDOT	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 graund.

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

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