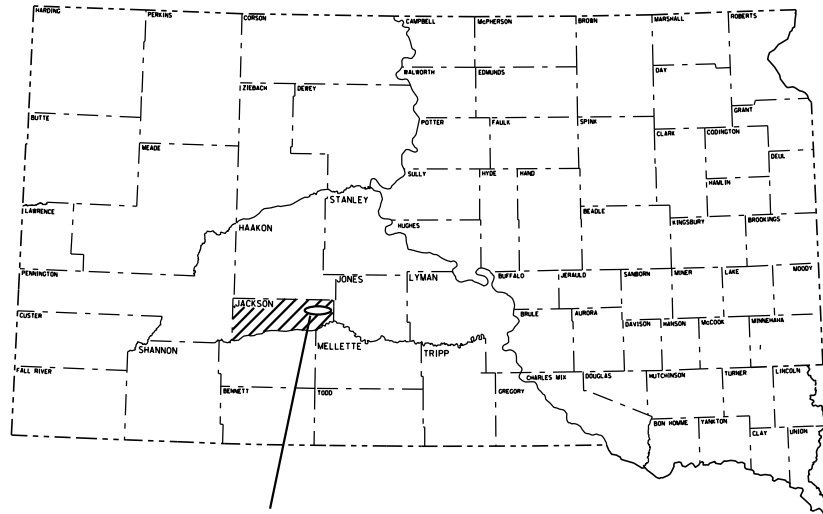


Plot Scale - 1:200

tw1m23

-Plotted From-



PROJECT
090E-391
090W-391

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

PROJECT 090E-391 & 090W-391
INTERSTATE 90
JACKSON COUNTY

FULL DEPTH CONCRETE REPAIR
PCN i37w & i37x

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	090E-391 & 090W-391	1	15

Plotting Date: 02/25/2014

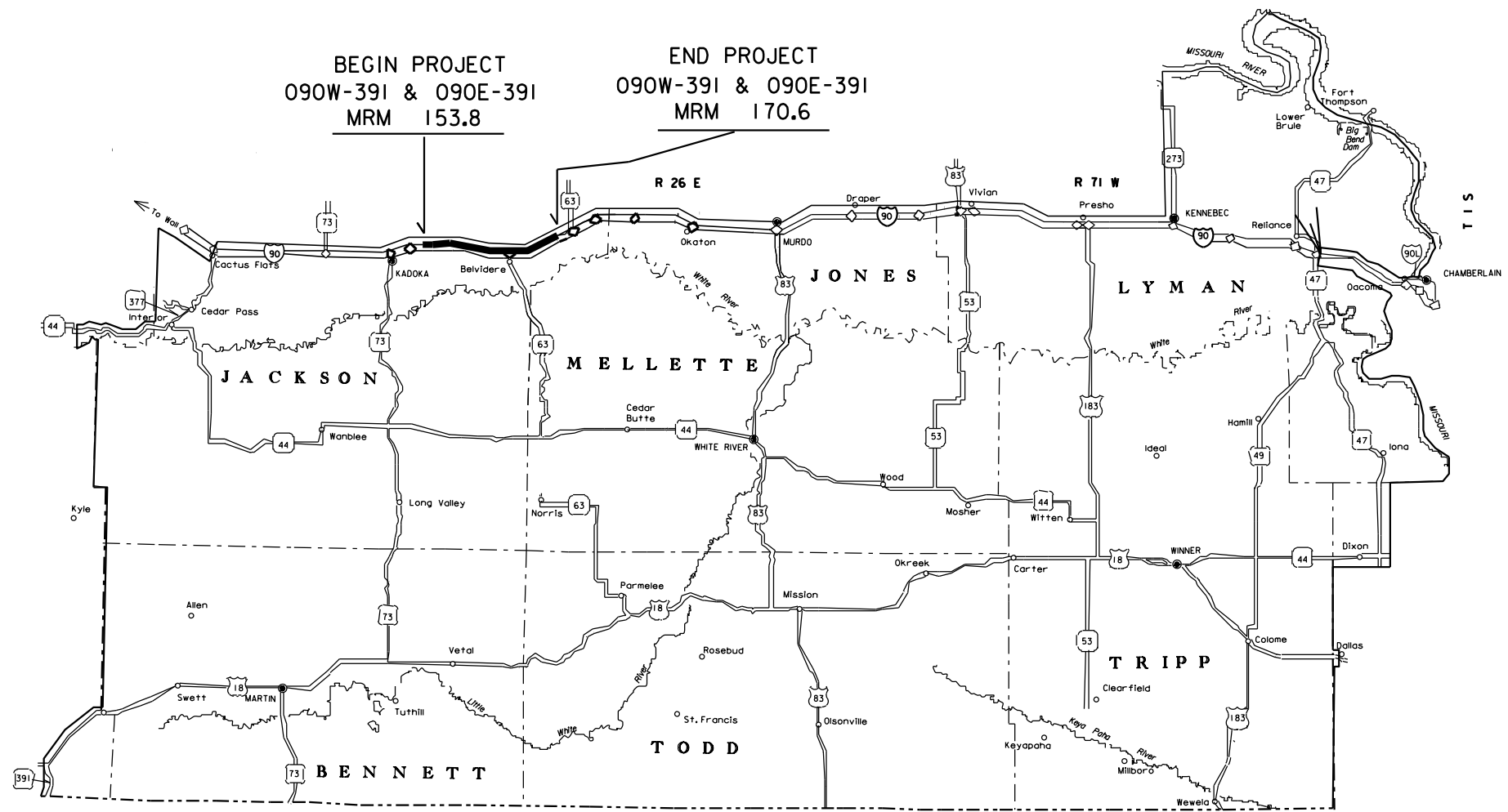
INDEX OF SHEETS

Sheet No. 1	Title Sheet & Layout Map
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Sheet Nos. 2-3	Environmental Commitments
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Sheet Nos. 8-11	Removals & Reinforcement Details
Sheet No. 12	Fixed Location Signing
Sheet Nos. 13-15	Standard Plates

090E-391 & 090W-391
JACKSON COUNTY
i37w & i37x

DESIGN DESIGNATION

ADT (2013)	5582
ADT (2033)	6426
DHV	1060
D	50%
T DHV	12.8%
T ADT	28.1%



ESTIMATE OF QUANTITIES

090E-391 PCN i37w

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
110E1100	Remove Concrete Pavement	98.5	SqYd
380E5100	Continuously Reinforced PCC Pavement Repair	98.5	SqYd
380E6110	Insert Steel Bar in PCC Pavement	140	Each
634E0010	Flagging	18	Hour
634E0100	Traffic Control	1,514	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0420	Type C Advance Warning Arrow Panel	2	Each

090W-391 PCN i37x

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
110E1100	Remove Concrete Pavement	75.1	SqYd
380E5100	Continuously Reinforced PCC Pavement Repair	75.1	SqYd
380E6110	Insert Steel Bar in PCC Pavement	140	Each
634E0010	Flagging	12	Hour
634E0100	Traffic Control	1,634	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.

ENVIRONMENTAL COMMITMENTS

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

COMMITMENT B2: WHOOPING CRANE

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

Action Taken/Required:

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

COMMITMENT H: WASTE DISPOSAL SITE

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

Action Taken/Required:

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

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

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

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

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

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

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

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

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

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	090E-391 & 090W-391	3	15

**COMMITMENT I: HISTORICAL PRESERVATION OFFICE
CLEARANCES**

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

Action Taken/Required:

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

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

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

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

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

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

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	090E-391 & 090W-391	4	15

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.

For sequencing planning purposes, another SDDOT project, IM0903(90)174, PCN 020L, will be under construction in the westbound lanes of Interstate 90 from MRM 174.134 to MRM 189.634. The Contractor will coordinate work schedule and traffic closures with this project to maintain a minimum distance of 3 miles, or as approved by the Engineer, between work zones.

GENERAL MAINTENANCE OF TRAFFIC

Traffic control shall be in accordance with Section 634 of the Standard Specifications and the Plan Notes. Traffic shall be maintained in accordance with the Manual on Uniform Traffic Control Devices (MUTCD).

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. The name and phone number of person or persons shall be provided to the SD Department of Transportation (605-842-0810), SD Highway Patrol State Radio (email to Jason.Husby.state.sd.us), Jackson County Sheriff Department (605-837-2285), and the Jones County Sheriff Department (605-669-7111).

The length of repair zones (encompassing more than one repair location) will depend on the Contractor's operation, however, the length shall not exceed 4 miles, or as approved by the Engineer, 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 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.

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 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.

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 Report 350 or MASH crash-worthy requirements. The Contractor shall provide installation details at the preconstruction meeting for all breakaway sign support assemblies.

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.

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 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 a maximum of 25 each Type III Barricades, providing at least 25 barricades are in use at the same time, throughout the four work zones. If the Contractor chooses to remove more than 25 repair sections at any one time, the Contractor shall furnish additional barricades at no expense to the State.

Signs shall be removed or covered, and channelizing devices shall be 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.

GENERAL MAINTENANCE OF TRAFFIC (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”.

Additional standard signs, as ordered by the Engineer, shall be available within 2 working days. Failure to provide signs within this time limit will result in Liquidated Damages being assessed in the amount of \$400.00 per Calendar Day. Payment for additional signs will be paid using the contract unit price per unit for Traffic Control.

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.

ITEMIZED LIST OF TRAFFIC CONTROL DEVICES

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
G20-1	48" x 24"	ROAD WORK NEXT ## MILES	4	24	96
G20-2	36" x 18"	END ROAD WORK	8	17	136
R2-1	30" x 36"	SPEED LIMIT ##	12	23	276
W3-5	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	16	34	544
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
R2-6AP	30" x 24"	FINES DOUBLED	8	18	144
*****	*****	TYPE III BARRICADE - 8 FT. SINGLE SIDED	25	40	1000
TOTAL UNITS					3148

CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR

Two alternatives of CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR are available to the Contractor. One method is the full-depth saw cut method, Alternate A. The other method, Alternate B, is a combination of full depth removal and partial removal utilizing jackhammers, leaving a portion of existing reinforcing steel intact.

Full Depth Saw Cut Method – Alternate A

The Contractor shall saw the in-place concrete transversely full depth at the limits of the repair area. The area within the full depth saw cuts shall be removed by the lift out method or break out method. Damage to the face of in place concrete will not be permitted.

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

After removal of the in-place concrete and repair of the gravel cushion subgrade, new reinforcing steel shall be installed according to the 24’ Continuously Reinforced PCC Pavement Repair Area, Alternate A plan details.

No. 5 longitudinal bars shall be drilled 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.

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 16” minimum with the drilled in bars. The drilled holes and rebar shall be installed per the steel bar installation note.

Full Depth / Partial Removal Method – Alternate B

The transverse boundaries are sawn to a depth of one and one-half to two inches (1-1/2 to 2”). Location of the full-depth transverse cuts will be eighteen inches (18”) inside the partial depth transverse cuts and at the longitudinal boundaries. The eighteen-inch (18”) area between the saw cuts will be the lap area for reinforcing steel.

The area inside the full-depth saw cuts will be removed by the lift-out or breakout method. Beginning at the center of the repair area, a type of pavement breaking device, such as a hydro hammer or other heavy equipment, may be used to shatter the concrete. The use of a ballbreaker will not be permitted as the large shockwaves may damage the adjacent concrete or reinforcing steel. No heavy break-up will be allowed within two feet of the full-depth saw cuts. The broken concrete may be removed by backhoe or other approved methods.

Jackhammers used to remove concrete in the lap area shall not exceed 30 pounds, with 15-pound jackhammers to be used along vertical walls and around existing reinforcing steel. Bending or damaging the existing reinforcing steel will not be permitted. Reinforcing steel damaged during removal of the lap area will require lap area extension at the Contractor’s expense.

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 16” minimum with the drilled in bars. The drilled holes and rebar shall be installed per the steel bar installation note.

New no. 5 longitudinal reinforcing steel shall be installed according to the 24’ Continuously Reinforced PCC Pavement Repair Area, Alternate B plan details. The No. 5 longitudinal bars shall overlap the existing reinforcing steel 16” on both sides of the repair area.

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	090E-391 & 090W-391	6	15

CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR – GENERAL

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

The Contractor shall remove and dispose of the in-place concrete and shape and compact 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.

The quantity estimated for the CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR, was based on the full depth / partial depth removal, Alternate B. The quantity may vary if a different method of removal is used, as the quantity for the full depth / partial depth removal; Alternate B includes the removal of extra concrete for splicing rebar. Payment for this item will be calculated based on actual measurements taken by the Engineer on site.

The Engineer will mark locations of the areas to be repaired in the field. The Contractor must understand that it is impossible to estimate the exact quantities of CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR. It is the Contractor's responsibility to examine the project limits prior to the bid letting to become familiar with the work involved. There will be no absolute quantities established and the Engineer may increase or decrease the number of removal sites and removal areas listed without additional compensation for the bid item for CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR.

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 (Exit 192). This material is royalty free to the Contractor. Furnish cost to the State for this state furnished asphalt concrete cold mix type material is \$81.00 per ton. This project will use a conversion factor of 1.9 ton per cubic yard for this material. 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; 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. All delivery methods shall meet the requirements pertaining to delivery and placement of the concrete as noted in the Standard Specifications Section 380.3.G and 380.3.H.

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 of 8".

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

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 700 lbs of cementitious material per cubic yard. 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 60° F or higher throughout the cure period. If the concrete temperature falls below 60° 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, strength of 4,000 psi must be attained prior to opening to traffic.

Concrete shall be covered with a 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 a strength of 4000 psi is attained. Insulation blanket shall be overlapped on to the existing concrete by 4'. This requirement for covering repair areas with insulation blanket may be waived during periods of hot weather upon approval of the Engineer.

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

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.

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".

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 for the No. 5 longitudinal 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 for the No. 5 transverse bars shall be incidental to the contract unit price per each for "Insert Steel Bar in PCC Pavement".

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".

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.

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 existing center line longitudinal joints located within concrete repair areas shall be re-sawed and sealed.

Joints shall be thoroughly clean and dry prior to placement of any sealant. 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 either a hot pour sealant or a low modulus silicone sealant in accordance with joint detail shown on Standard Plate 380.10 or 380.13.

All costs associated with the sawing and sealing of the longitudinal center line joints shall be incidental to the contract unit price per square yard for “Continuously Reinforced PCC Pavement Repair”.

TABLE OF CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR
WESTBOUND LANES

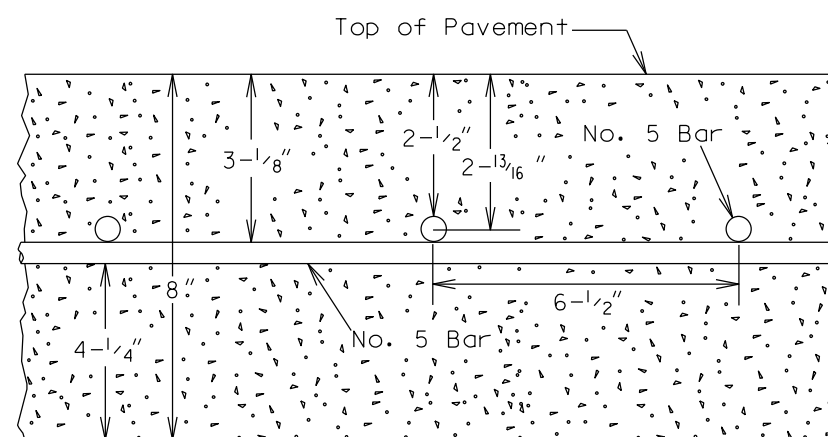
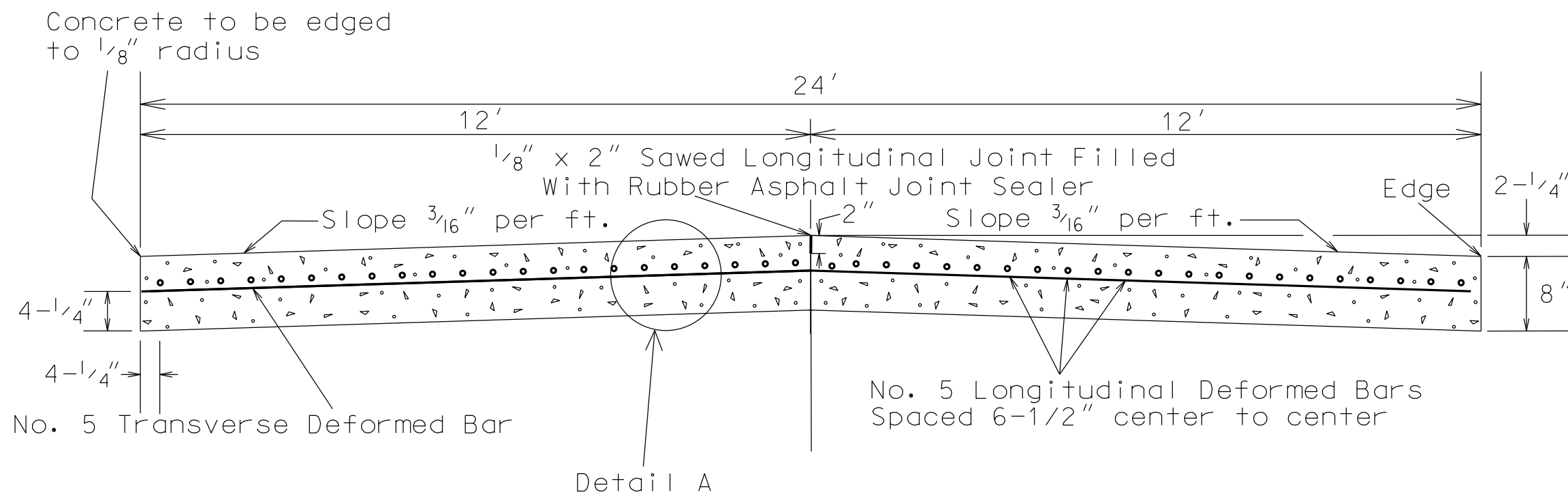
LOCATION	LANE	LENGTH FEET	WIDTH FEET	SQ YDS
153.874	DL	12	4	5.3
154.094	DL	6	4	2.7
155.927	DL	12	4	5.3
156.094	DL	12	4	5.3
156.094	PL	12	4	5.3
157.886	DL	6	4	2.7
158.154	PL	5	4	2.2
158.986	DL	4	4	1.8
158.987	DL	4	4	1.8
159.651	PL	5	4	2.2
159.651	DL	12	4	5.3
160.717	DL	12	4	5.3
161.811	DL	6	5	3.3
161.815	DL	5	5	2.8
162.364	DL	4	4	1.8
162.417	DL	5	4	2.2
166.326	DL	4	4	1.8
168.482	DL	12	4	5.3
168.842	DL	5	5	2.8
169.397	DL	4	4	1.8
170.011	DL	4	7	3.1
170.511	DL	5	4	2.2
170.594	DL	5	5	2.8
Total =				75.1

TABLE OF CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR
EASTBOUND LANES

LOCATION	LANE	LENGTH FEET	WIDTH FEET	SQ YDS
154.084	DL	6	6	4.0
154.552	PL	12	5	6.7
154.988	DL	5	4	2.2
157.242	DL	4	12	5.3
157.242	PL	4	12	5.3
157.369	DL	4	12	5.3
157.369	PL	4	12	5.3
158.248	DL	4	4	1.8
158.370	PL	4	12	5.3
159.667	DL	4	12	5.3
159.832	DL	4	4	1.8
159.833	DL	4	12	5.3
162.046	DL	4	4	1.8
162.380	DL	4	12	5.3
162.807	DL	6	4	2.7
164.685	DL	4	4	1.8
164.740	DL	5	4	2.2
165.753	PL	12	4	5.3
166.667	DL	12	4	5.3
167.348	DL	4	4	1.8
168.739	DL	6	12	8.0
168.817	DL	4	4	1.8
169.212	PL	12	4	5.3
169.551	DL	4	4	1.8
170.029	DL	4	4	1.8
			Total =	98.5

TYPICAL SECTIONS OF IN PLACE CRC PAVEMENT

MRM 152 TO MM 174

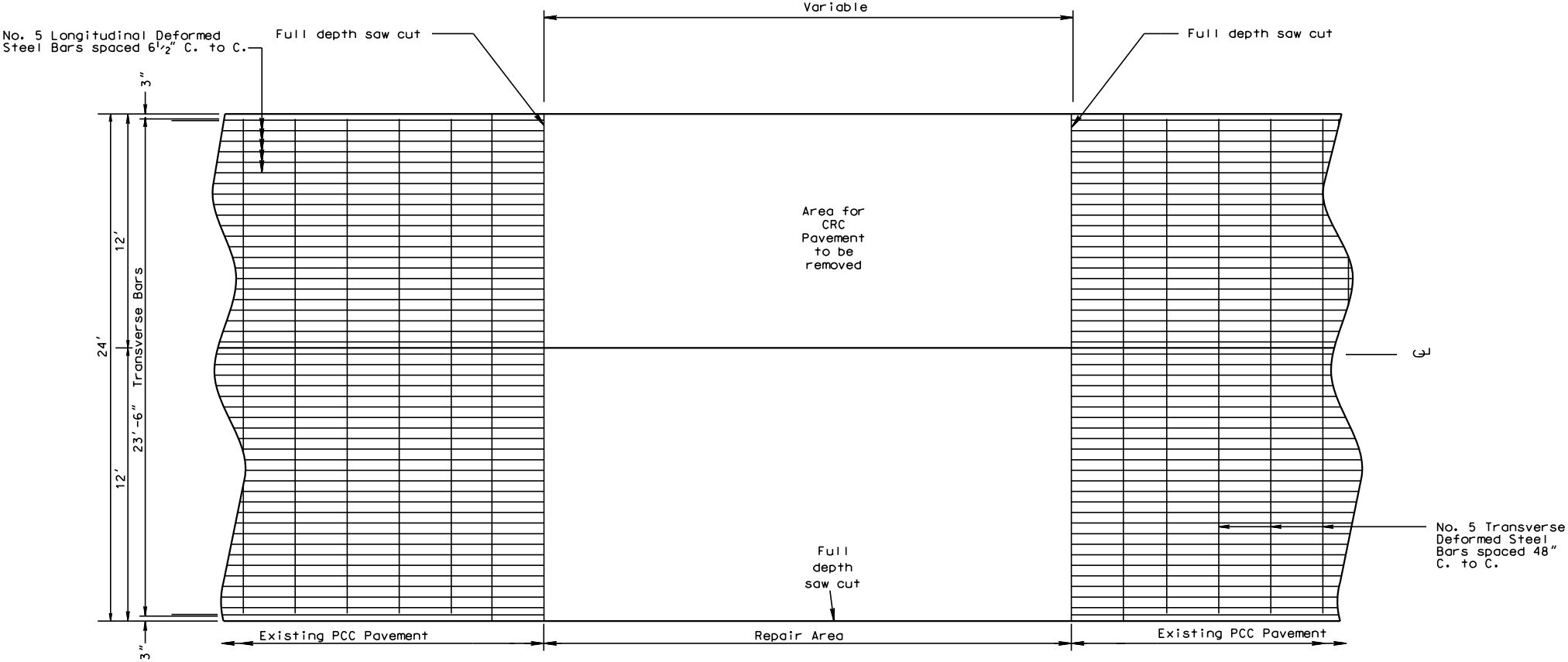


Detail A

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	090E-391 & 090W-391	9	15

Plotting Date: 02/25/2014

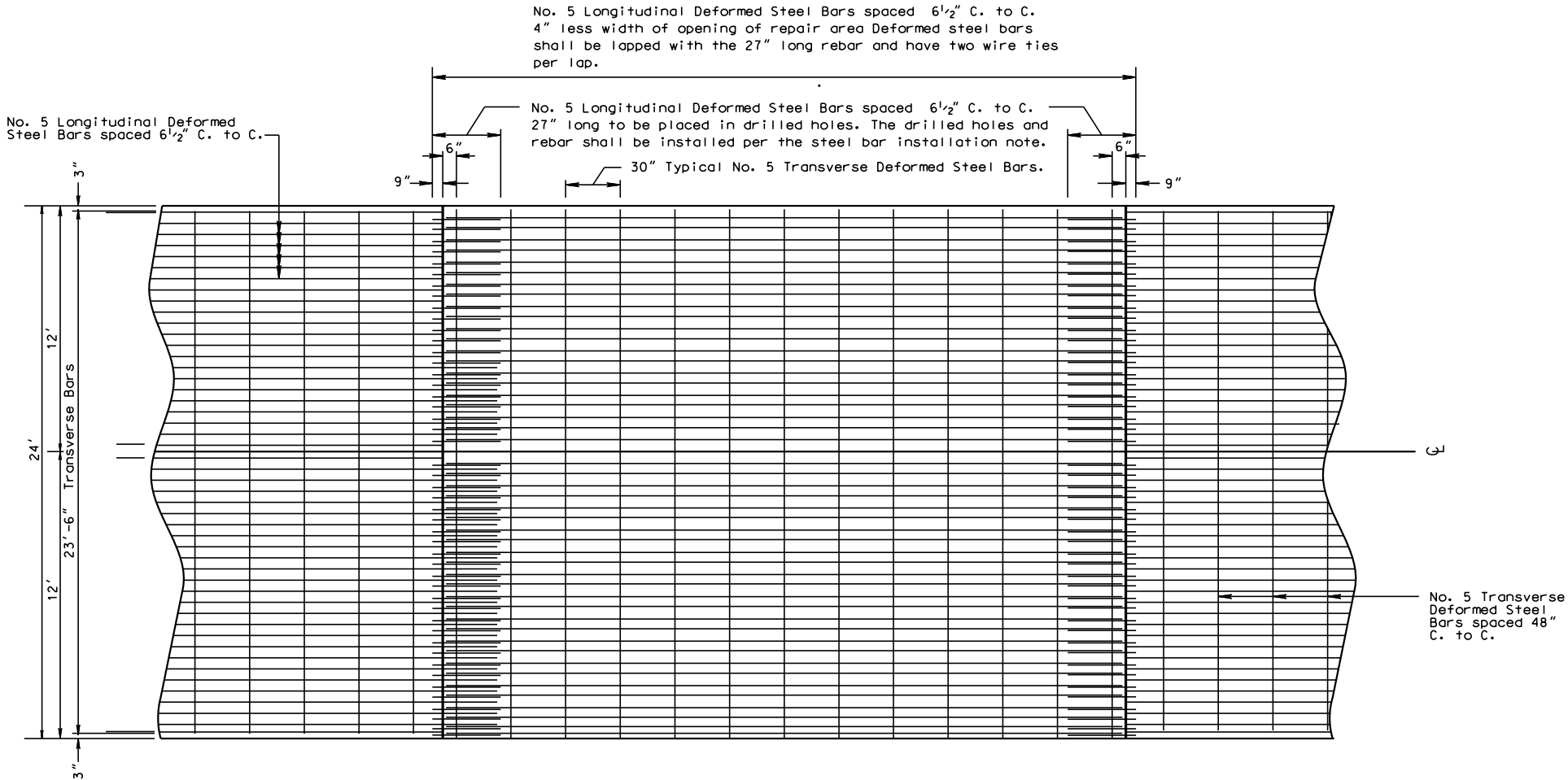
24' CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR AREA
MRM 152 TO MM 174
ALTERNATE A



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	090E-391 & 090W-391	10	15

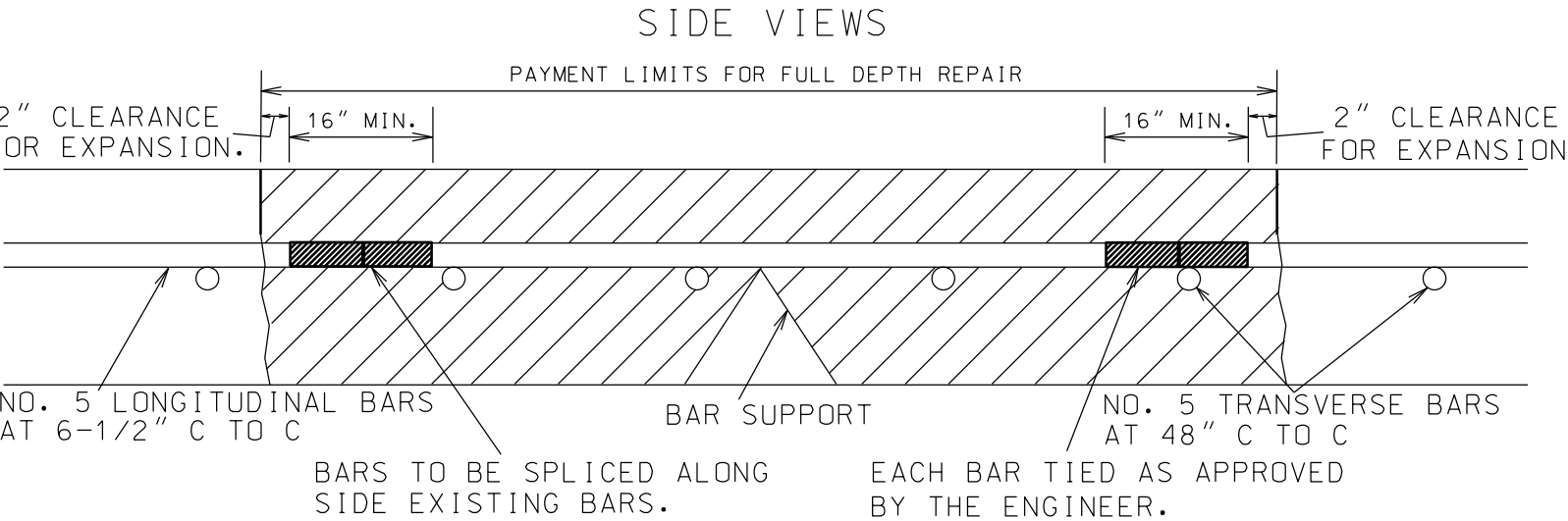
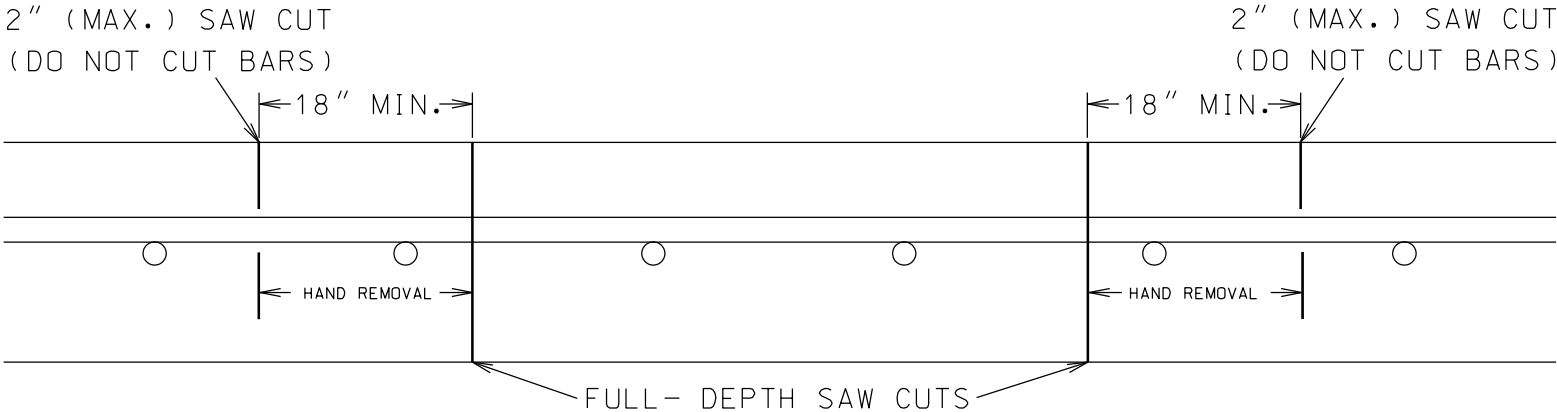
Plotting Date: 02/25/2014

24' CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR AREA
MRM 152 TO MRM 174
ALTERNATE A



24' CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR AREA

MRM 152 TO MRM 174
ALTERNATE B



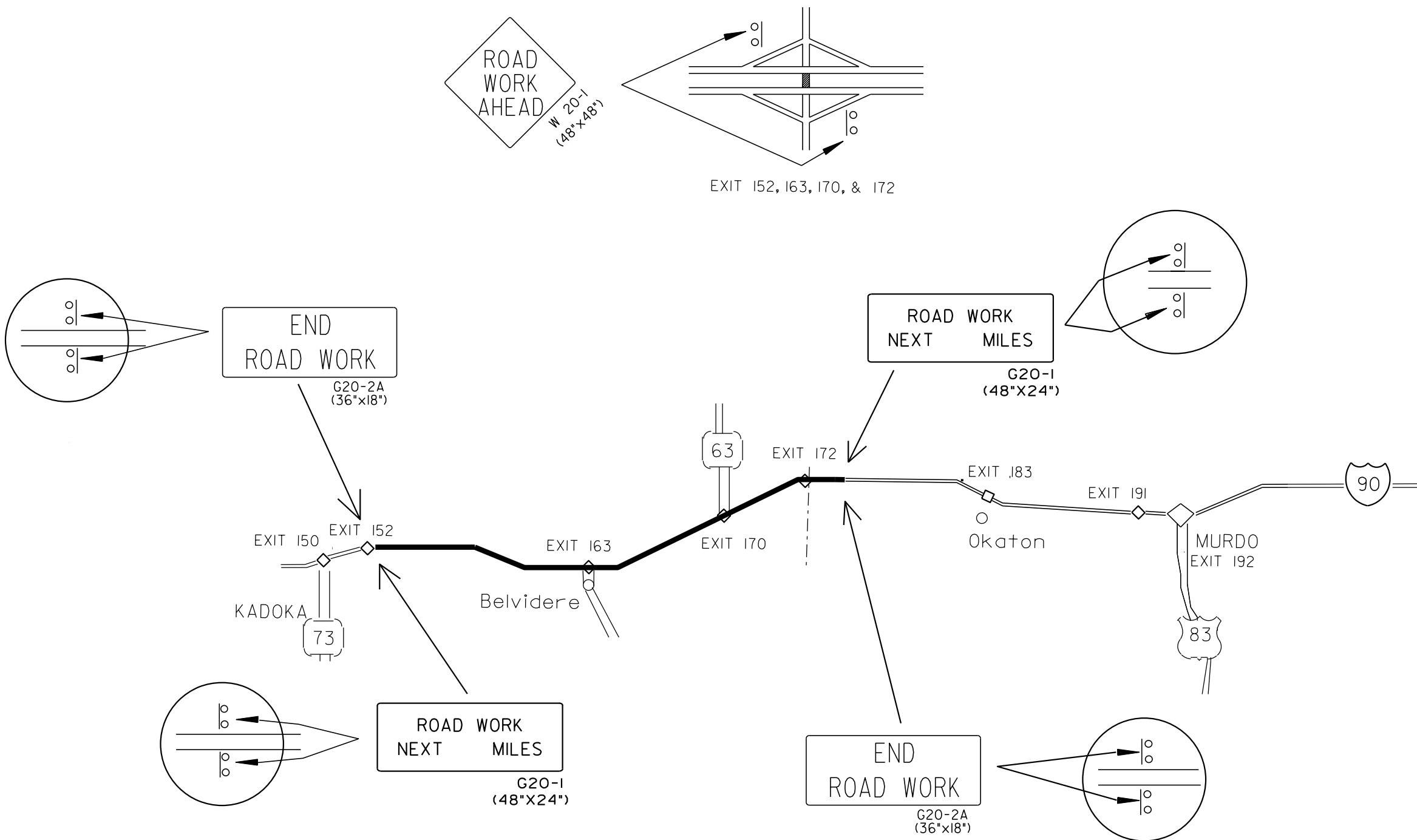
Plot Scale - 1:200

Plotted From - twf1m23

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	090E-391 & 090W-391	12	15

Plotting Date: 02/25/2014

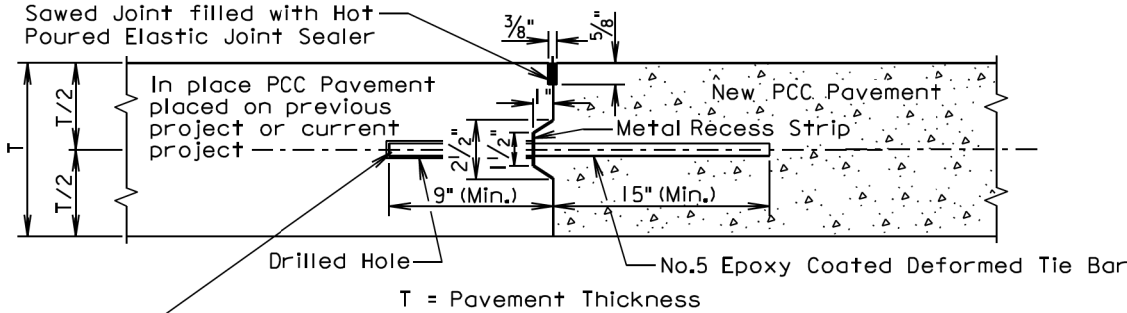
FIXED LOCATION SIGN LAYOUT



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

LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS

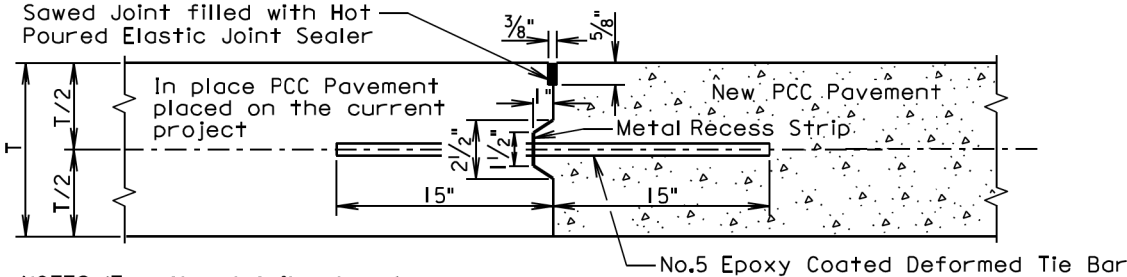
(DRILLED IN BARS)



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

LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS

(INSERTED OR FORMED IN BARS)



GENERAL NOTES (For the details above):

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

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

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

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

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

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

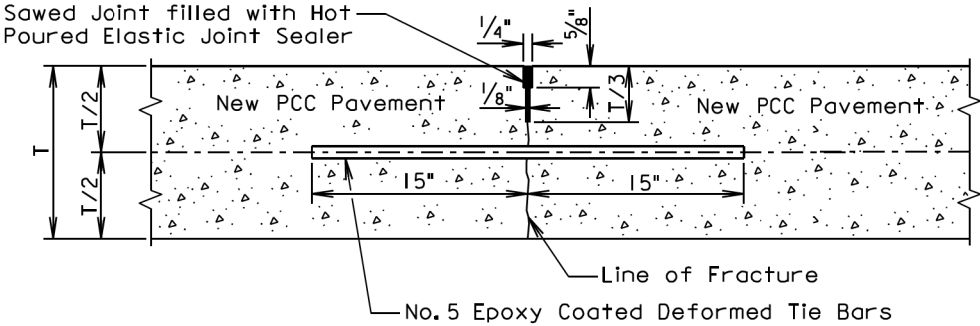
The keyway is optional and is not required. When concrete pavement is formed and a keyway is provided, a metal recess strip shall be used. When concrete pavement is slip formed, a metal recess strip is not required.

August 31, 2013

Published Date: 1st Qtr. 2014	S D D O T	PCC PAVEMENT LONGITUDINAL JOINTS WITH TIE BARS	PLATE NUMBER 380.10
			Sheet 1 of 2

SAWED LONGITUDINAL JOINT WITH TIE BARS

(POURED MONOLITHICALLY)



T = Pavement Thickness

GENERAL NOTES (For the detail above):

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

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

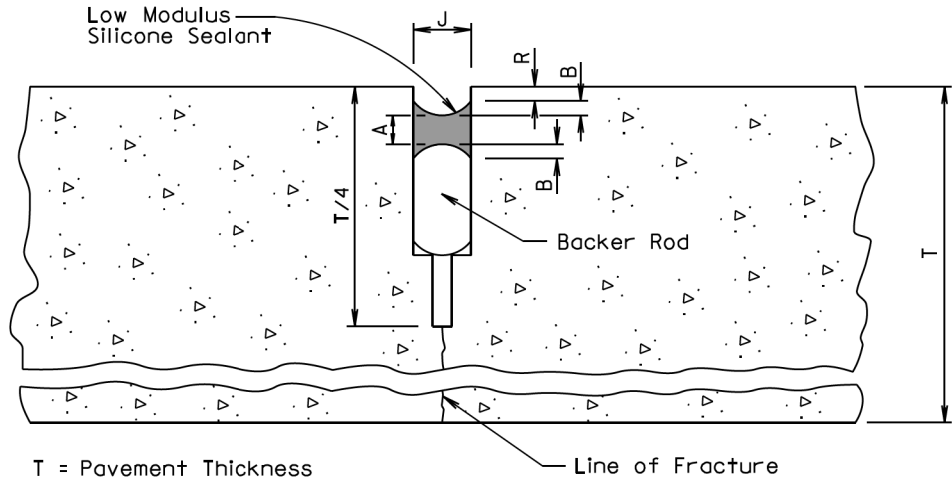
The tie bars shall be placed a minimum of 15 inches from the transverse contraction joints.

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

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

August 31, 2013

Published Date: 1st Qtr. 2014	S D D O T	PCC PAVEMENT LONGITUDINAL JOINTS WITH TIE BARS	PLATE NUMBER 380.10
			Sheet 2 of 2



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:

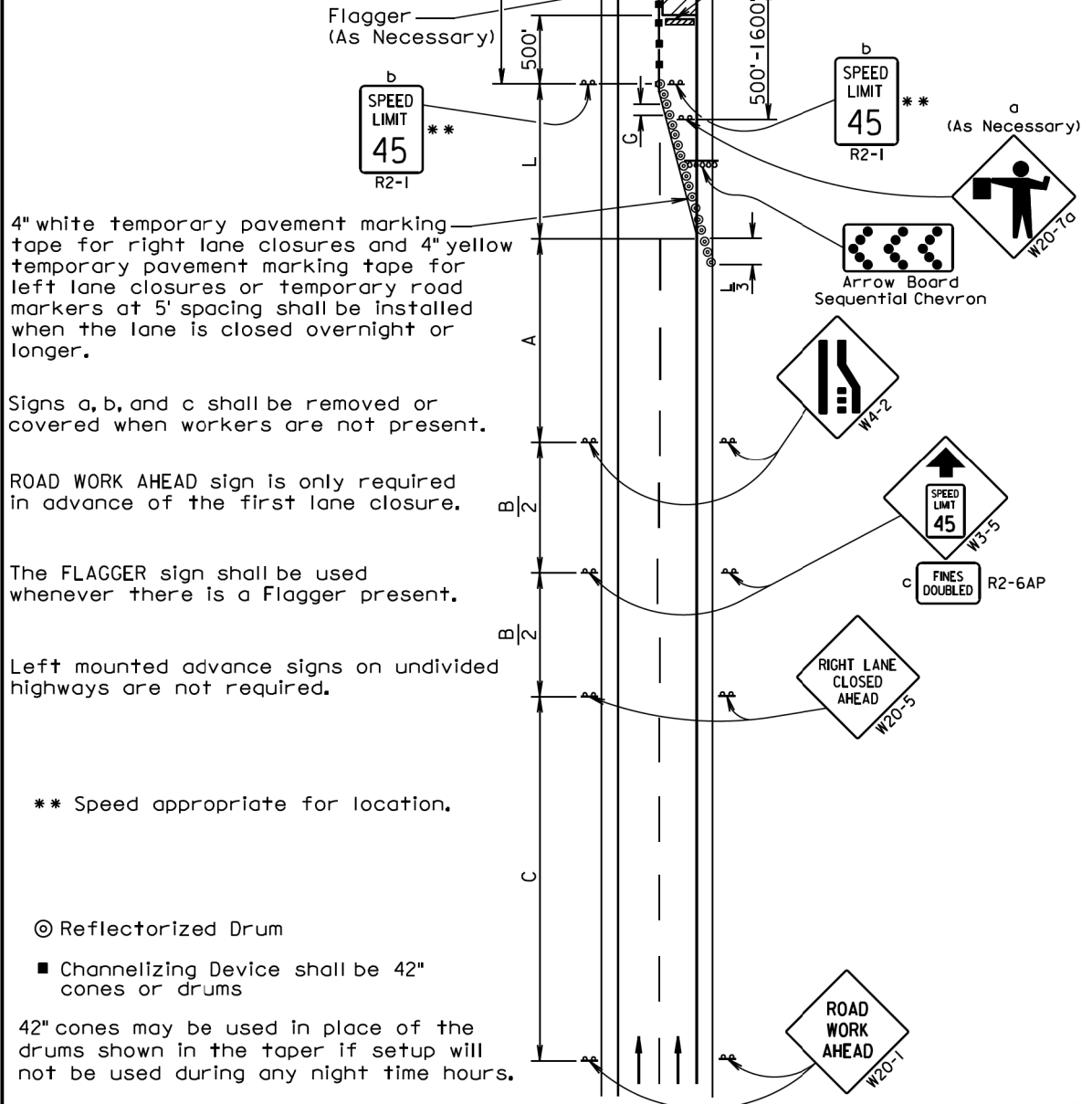
The backer rod shall be a nonmoisture absorbing resilient material approximately 25% larger in diameter than the width of the joint to be sealed.

February 14, 2011

Published Date: 1st Qtr. 2014	S D D O T	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) (C)	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

* Spacing to be every 40' for 42" cones.



December 23, 2012

Published Date: 1st Qtr. 2014	S D D O T	MANNED WORK SPACE SIGNING FOR DIVIDED AND UNDIVIDED HIGHWAYS	PLATE NUMBER
			634.63
			Sheet 1 of 1

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	090E-391 & 090W-391	15	15

Plotting Date: 02/25/2014

