

Estimate of Quantities

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
380E5030	Nonreinforced PCC Pavement Repair	1,150.4	SqYd
380E6000	Dowel Bar	380	Each
380E6110	Insert Steel Bar in PCC Pavement	933	Each
390E0100	Saw and Seal Joint	1,539	Ft
634E0110	Traffic Control Signs	388	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0285	Type 3 Barricade, 8' Double Sided	4	Each
634E0600	4" Temporary Pavement Marking Tape Type I	17,808	Ft
634E0640	Temporary Pavement Marking	2,857	Ft
634E0900	Portable Temporary Traffic Control Signal	4	Unit

SPECIFICATIONS

Standard Specifications for Roads and Bridges, 2015 Edition and Required Provisions, Supplemental Specifications and 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 B: FEDERALLY THREATENED, ENDANGERED, AND PROTECTED SPECIES

COMMITMENT B2: WHOOPING CRANE

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

Action Taken/Required:

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

COMMITMENT B4: BALD EAGLE

Bald eagles are known to occur in this area.

Action Taken/Required:

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

COMMITMENT E: STORM WATER

Construction activities constitute less than 1 acre of disturbance.

Action Taken/Required:

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

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	018-392	2	17

ENVIRONMENTAL COMMITMENTS - CONTINUED

COMMITMENT H: WASTE DISPOSAL SITE

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

Action Taken/Required:

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

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

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

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

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

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

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

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

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

COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES

The SDDOT has obtained concurrence with the State Historical Preservation Office (SHPO or THPO) for all work included within the project limits and all department designated sources and designated option material sources, stockpile sites, storage areas, and waste 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: Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas.

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 Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas 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.

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SEQUENCE OF OPERATIONS

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

The Contractor shall plan their work to allow passage of normal traffic up to sixteen feet in width and traffic shall be maintained through the project at all times.

Once work that inconveniences traffic has commenced on a site, it shall be pursued in a near continuous, expeditious manner to its completion. Any work that restricts the motorist from driving the posted speed limit, reduces existing roadway with, or causes a potentially unsafe condition due to Contractor operations such as frequent movement of equipment or materials on or through the project, is considered to be an inconvenience to traffic.

Seven separate Portable Temporary Traffic Control Signal setups will be required to complete the work on the seven sites within this Contract. The anticipated setups are detailed in the Table of PCC Pavement Repair on sheet 8 of the plans. The Contractor will be allowed to work on up to two separate sites simultaneously and only two setups will be paid for as part of this Contract. Portable Temporary Traffic Control Signals may be required to be utilized more than once within this Contract to satisfy the requirement of seven separate setups needed. All costs associated with utilizing the same setup multiple times to complete the work within this Contract shall be incidental to the contract unit price per unit for "Portable Temporary Traffic Control Signal".

GENERAL MAINTENANCE OF TRAFFIC

The Contractor may perform work on the roadway during daylight hours only, unless additional hours are approved by the Engineer.

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

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

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

The bottom of signs on portable or temporary supports shall not be less than seven feet above the pavement in urban areas and one foot above the ground in rural areas. Construction signing that remains in the same location for more than 3 days shall be mounted on fixed location supports, unless approved by the Engineer. If the duration is more than 3 days the signs shall meet the minimum mounting heights of 5 foot for rural areas and 7 foot for urban areas.Additional standard signs, as ordered by the Engineer, shall be available within 2 working days. Payment for additional signs will be paid using the contract unit price per square foot for Traffic Control Signs.

Channelizing devices in a series shall be of the same type. Channelizing drums shall be of a two part construction with breakaway bases. The Contractor may use 42" Grabber Cones for longitudinal delineation only. All tapers and lane transitions shall be accomplished utilizing drums.

Type III Barricades 8' wide shall mark both ends of the construction work area within each closure.

Additional Road Work Ahead and One Lane Road signs have been included in the estimate of quantities to be placed on intersecting roads within repair location sites. These signs shall be placed as advance warning on each intersecting road within a repair site location.

Traffic Control Signs, as shown in the Estimate of Quantities, are estimated based on a total of two traffic control setups for the contract. The Contractor's sequence of operation may require adjustments in quantities, either more or less. Payment will be made only for the maximum number of individual signs in use at any one time, actually ordered by the Engineer. Traffic Control signs may be required to be utilized more than once within this Contract to satisfy the requirement of seven separate site setups needed. All costs associated with utilizing the same signs multiple times to complete the work within this Contract shall be incidental to the contract lump sum price for "Traffic Control, Miscellaneous".

Reflectorized Sheeting Requirements for Temporary Traffic Control Devices

Delete the first paragraph of Section 984.1 and replace with the following:

Temporary traffic control devices, including signs, drums, cones, tubular markers, barricades, vertical panels, and direction indicator barricades shall be reflectorized with sheeting applied to a satisfactory backing. Flat surfaced temporary traffic control devices including, but not limited to; signs, barricades, vertical panels, and direction indicator barricades shall be reflectorized with super/very high intensity reflectorized sheeting meeting the standards of Type XI as defined by AASHTO M 268 (ASTM D4956). Round surfaced temporary traffic control devices including, but not limited to; drums, cones, and tubular markers shall be reflectorized with high intensity reflectorized sheeting meeting the standards of Type IV as defined by AASHTO M 268 (ASTM D4956). All orange colored material shall be fluorescent.

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TEMPORARY TRAFFIC CONTROL SIGNAL

The Contractor shall furnish, install, operate, and maintain a "Portable Temporary Traffic Control Signal" during construction phases as determined by the Engineer.

The Portable Temporary Traffic Control Signal shall be set up to dwell in red.

The green time may be adjusted as needed.

Initial Timing for the sites is as detailed below:

Red = 60 sec. Yellow = 7 sec. Green = 35 sec.

The aforementioned dwell timings are based on 1,300 feet between opposing STOP BARS.

TEMPORARY PAVEMENT MARKING

After completion of applicable site work, Temporary Flexible Vertical Markers (Tabs) shall be installed as per Specifications to mark centerline and edge lines throughout the repair area.

Temporary Flexible Vertical Markers (Tabs) may also be used to mark the tapers and tangent section used to close the roadway for the work area.

Approximately 144 feet of 4 inch white temporary pavement marking tape, type 1, (24" stop bar reduced to 4" equivalent) and 2,400 feet of 4 inch yellow temporary pavement marking tape, type 1, will be required per site. The Contractor will be paid only once for tape placement at each site. The Contractor is responsible for maintaining and cleaning the tape throughout the duration of the project and for removing all temporary pavement marking tape when it is no longer required.

PERMANENT PAVEMENT MARKING

No permanent pavement marking paint will be required.

RESTORATION OF GRAVEL CUSHION

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

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

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

NONREINFORCED PCC PAVEMENT REPAIR

Locations, size (length or width) and type of concrete repair are subject to change in the field. The Engineer will determine location, size, and type of each concrete repair area at the time of construction. Payment shall be based on actual area replaced.

Existing concrete pavement shall be sawed full depth on all sides of the PCCP repair areas. When either the beginning or end of a PCCP repair area falls close to an existing joint or crack, the PCCP repair area shall be extended to eliminate the existing joint or crack. Where possible, new working joints shall be adjacent to existing working joints.

Saw cuts that extend beyond the repair area shall be minimized and filled with a non-shrinkage mortar mix at the Contractor's expense.

Existing concrete pavement in the replacement areas shall be removed by the lift out method or by means that minimize damage to the base and sides of remaining in place concrete. All removed material shall be removed from within the right-of-way by the end of the workday. Damage to adjacent concrete caused by the Contractor's operations shall be removed and replaced at the Contractor's expense.

If the pavement replacement area is entirely on either side of the existing contraction joint, the location of one of the working joints shall be at the original location. Any existing dowel bar assemblies shall be sawed off or removed.

At repair locations where the new working joint is not opposite the existing working joint, the Contractor shall place a ¼" preformed asphalt expansion joint material along the longitudinal joint from the existing working joint to the new working joint. The expansion joint material shall meet the requirements of AASHTO M33. Cost for this material shall be incidental to the contract unit price per square yard for Nonreinforced PCC Pavement Repair.

All joints (longitudinal and transverse) through and around the repair areas shall be sawed and sealed in accordance with the details shown in these plans. Refer to Saw and Seal Joints notes.

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NONREINFORCED PCC PAVEMENT REPAIR (CONTINUED)

New pavement thickness shall be 8.0" at all locations.

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

The fine aggregate shall be screened over a one-inch square-opening screen just prior to introduction into the concrete paving mix if required by the Engineer.

The slump requirement shall 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. The concrete mix shall contain at least 650 lbs. of Type I or II cement or 600 lbs. of Type III cement 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 28 day compressive strength acceptance shall be in accordance with Section 460.3 B except if the Contractor utilizes the option to core as specified in Section 460.3 B, all cost for the coring and compressive testing shall be borne by the Contractor and the Department will not reimburse the Contractor for coring and compressive testing.

The use of a water reducer at manufacturer's recommended dosage shall 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, a strength of 3,500 psi must be attained prior to opening to traffic.

Insulation blankets will be used to cover concrete at intersecting streets, driveways and areas designated by the Engineer to expedite the curing of the concrete. 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 3,500 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. Covering repair areas with insulation blankets may be waived during periods of hot weather upon approval of the Engineer.

Cost for performing the aforementioned work including sawing, removal of existing pavement, furnishing and placing concrete, labor, tools and equipment shall be incidental to the contract unit price per square yard for Nonreinforced PCC Pavement Repair.

STEEL BAR INSERTION

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

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

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

Epoxy coated plain round steel bars shall be installed on 12 inch centers in the transverse joint. The first steel bar shall be placed a minimum of 3 inches and a maximum of 6 inches from the outside edge of the slab.

Epoxy coated deformed steel bars shall be inserted on 18 inch centers in the transverse joint. The first steel bar shall be placed a minimum of 3 inches and a maximum of 9 inches from the outside edge of the slab.

Epoxy coated deformed steel bars shall be inserted on 30 inch centers in the longitudinal joint and shall be placed a minimum of 15 inches from the existing transverse contraction joint.

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

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

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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 traces of dust.

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

Cost for sawing and sealing of the longitudinal and transverse joints, including backer rod, shall be incidental to the contract unit price per foot for Saw and Seal Joint.

ITEMIZED LIST FOR TRAFFIC CONTROL

			PCN I	42Q	
SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R10-6	STOP HERE ON RED	4	24" x 36"	6	24
W1-4	REVERSE CURVE (L or R)	2	48" x 48"	16	32
W3-3	SIGNAL AHEAD (symbol)	4	48" x 48"	16	64
W13-1P	ADVISORY SPEED (plaque)	4	30" x 30"	6	24
W20-1	ROAD WORK AHEAD	7	48" x 48"	16	112
W20-4	ONE LANE ROAD AHEAD	7	48" x 48"	16	112
G20-2	END ROAD WORK	4	36" x 18"	5	20
CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT		388			

TYPE 3 BARRICADES

ITEM DESCRIPTION	QUANT
Type 3 Barricade, 8' Double Sided	4

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											STATE OF	PROJECT	SHEET NO.	TOTAL SHEET
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ABLE OF PU	<u>J PAVEMENT REPAIR</u>													
Reference		Repa	ir Size	Nonreinforced PCC Pavement	Dowel Bar	Inser PC	t Steel C Pave	Bar In	Saw and					
Point	Description	Length	Width	Repair (8.0")			Each	I	Seal Joint	Comments	I	1		
		Ft	Ft	Sq Yd	Each	#5	#9	1 ¼"	Ft	1		1		
						1		1				1		
234.497	EB Lane	10'	14'	15.6		6	10	14	38	Set Up #1 -one tied & one working joint	i.	1		
234.611	EB Lane	80'	14'	124.4	42	48		28	150	Replace four panels				
234.611	WB Lane	80'	14'	124.4	42	'		28	70	Replace four panels		1		
						<u> </u>		ا ا	<u> </u>			4		
235.385	EB Lane	120'	14'	186.7	70	72	<u> </u>	28	218	Set Up #2 – Replace six panels		4		
235.385	WB Lane	120'	14'	186.7	70	'	<u> </u>	28	98	Replace six panels		4		
		′	_	_	+	·'	<u> </u>	ا <u> </u>	 	Cat I in #2. Danlage up to C' avery from	oviotina	1		
257 620	FBLane	34'	14'	52 9	14	!	14	14	42	Asphalt Growth Joint on both ends of br	existing dae	1		
257.620	WBLane	54'	14'	84.0	28	32	14	14	110		luge	1		
257.660	EB Lane	34'	14'	52.9	14	++	14	14	42			1		
257.660	WB Lane	34'	14'	52.9	14	20	14	14	76			1		
						1 1		1				1		
259.272	EB Lane	6'	14'	9.3		3	14	14	34	Set Up #4 -one tied & one working joint				
259.276	EB Lane	6'	14'	9.3		3	14	14	34	One tied and one working joint]		
259.280	EB Lane	6'	14'	9.3		3	14	14	34	One tied and one working joint		4		
		′	<u> </u>			'	↓	' ا				4		
261.892	EB Lane	6'	14'	9.3	<u> </u>	<u>3</u> '	14	14	34	Set Up #5 -one tied and one working joi	int	4		
261.926	EB Lane	24'	14'	37.3	14	14			66	Panel plus 4' beyond joint		1		
261.944		<u> </u>	14	<u>49.8</u>	28		14	14	88	Panel plus 6' beyond each joint		1		
201.902		12'	14	18.7	14		28	<u>14</u>	54	Replace 6' each side of existing joint		1		
201.000				10.7				,l				1		
262.482	EB Lane	6'	14'	9.3		3	14	14	34	Set Up #6 -one tied & one working joint		1		
262.493	EB Lane	6'	6'	4.0		3	8	6	24			1		
262.500	EB Lane	6'	6'	4.0		3	8	6	24			1		
262.504	EB Lane	6'	14'	9.3		3	14	14	34	One tied & one working joint		1		
262.519	EB Lane	6'	6'	4.0		3	8	6	24]		
262.523	EB Lane	6'	6'	4.0		3	8	6	24			1		
262.527	EB Lane	6'	6'	4.0		3'	8	6	24			1		
262.530	EB Lane	6'	6'	4.0		3	8	6	24			4		
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272.545	WB Lane	45'	15'	75.0	30	36	—	30	105	Set Up #7 (Replace 3 Panels)		1		
	+		+	1150.4				074	4520			1		
		101		1150.4	380	291	200	3/4	1539]	L		

Note: Quantities provided are for information only. Actual quantities to be determined on construction. Reference points above are not to be associated with MRM displacements.





	STATE	PROJECT	SHEET	TOTAL SHEET
	SOUTH DAKOTA	018-392	10	17
	Plotting	Date: 02/11/2016		
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Sawe	d tie	ed joint		
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([Drill	ed Hole		



PCC PAVEMENT REPAIR, NONREINFORCE

LONGITUDINAL CONSTRUCTION JOINT WITH DRILLED IN TIE BARS



T = New existing and new pavement thickness.

Bar embedded a minimum depth of 9 inches into the existing pavement by utilizing an epoxy resin adhesive.

Bars shall be placed a minimum of 15 inches from existing transverse contraction j

Cost for furnishing and installing drilled in centerline tie bars shall be included in the contract unit price per each for Install Steel Bar in PCC Pavement.

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	STATE	PROJECT	SHEET	TOTAL	1
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	Plotting	018-392 Date: 02/11/2016	12	17	
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Tie Bar Spacing 48"M	laximum
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

			STATE OF	PROJECT		SHEET	SHEETS
			DAKOTA	018-392	2	14	17
			Plotting Date:	01/28/2016			
LONGITUDINA	L C	ONSTRUCT	ON JOINT WITH TIE BA	RS			
		(DRILLED	IN BARS)				
Sawed Joint filled with Poured Elastic Joint S	1 Ho	+					
	6010			·····			
	Pav	ement		ement			
project or o	urr	us ∍n <u>† </u>	Metal Recess Strip				
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	/		15" (Min.)				
				A A A			
Dri	led	Hole	└──No.5 Epoxy Coate	d Deformed	Tie Bar		
		T = Pavem	ent Thickness				
\angle The tie bo	rs s	hall be embe	dded				
a minimum the in play		th of 9 inche	end				
anchored	vith	an epoxy re	esin adhesive.				
LONGITUDINA	LC	ONSTRUCTIO	ON JOINT WITH TIE BAF	RS			
Sowed latet filled with	41) 	ISERTED OR F(⁺	DRMED IN BARS)				
Poured Elastic Joint S	eale	r <u>¾</u>					
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Î <Î _ In place PCC	Pav Pa c	ement ->	New PCC Pave	ement 🕹			
H project	, o .		Metal Recess Strip				
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		15"					
<u>V V </u>				A A A			
CENEDAL NOTES (For the details	~ b <i>c</i>		└──No.5 Epoxy Coate	ed Deformed	Tie Bar		
GENERAL NULES (FOR THE DETUNS	abu	Ver		11 Collevie			
tables:	e bu	Irs shall be a	spacea in accordance with	the tollowin	g		
			Tie Bar Spacing 30"	Maximum			
			Transverse Contraction	Number of			
Tie Bar Spacing 48	Max	imum	Joint Spacing	lie Bars			
Transverse Contractio	ר Nu	mber of	5' to 7'	2			
JOINT SPACING	+-'	ie Bars	7.5' to 9.5'	3			
6 . 5' to 10'	\square	2	10' to 12'	4			
10.5' to 14'		3	12.5 to 14.5	5			
14.5' to 18'		4	15' to 17'	6			
18 . 5' to 22'		5	17.5 to 19.5	7			
			20' to 22'	8			
The tie bars shall be placed a		imum of 15 ir	oches from transverse cor	traction ioi	ote		
The the bars shall be placed a	mini				1.04		
	min						
The required number of the back papel. The uniformly space	min ors o ed	is shown in tie bars sha	the table shall be uniformly	y spaced wit 48 inches ce	hin Inter		
The required number of the bo each panel. The uniformly space to center for a female keywo	min ars (ced y ar	s shown in tie bars sha nd shall be s	the table shall be uniformly Il be spaced a maximum of paced a maximum of 30 inc	y spaced wit 48 inches ce hes center	hin enter to		
The required number of the bo each panel. The uniformly space to center for a female keywork center for a vertical face and the bars within each panel	min ors (ced y ar d ma	tie bars sha tie bars sha d shall be sj le keyway. T	the table shall be uniformly Il be spaced a maximum of paced a maximum of 30 inc he maximum tie bar spacing	y spaced wit 48 inches ce hes center g shall apply	hin enter to to		
The required number of the bo each panel. The uniformly space to center for a female keywo center for a vertical face an the bars within each panel.	min ors o ced y ar d ma	s shown in tie bars sha nd shall be s ile keyway. T	the table shall be uniformly Il be spaced a maximum of paced a maximum of 30 inc 'he maximum tie bar spacing	y spaced wit 48 inches ce hes center g shall apply	hin enter to to		
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Published Date: 1st Qtr. 2016

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			Plotting Date	e: 02/17	1/2016			
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	5/							013.d
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STATE OF	PROJECT	SHEET	TOTAL SHEETS	
DAKOTA	018-392	17	17	
Plotting Date:	02/11/2016			