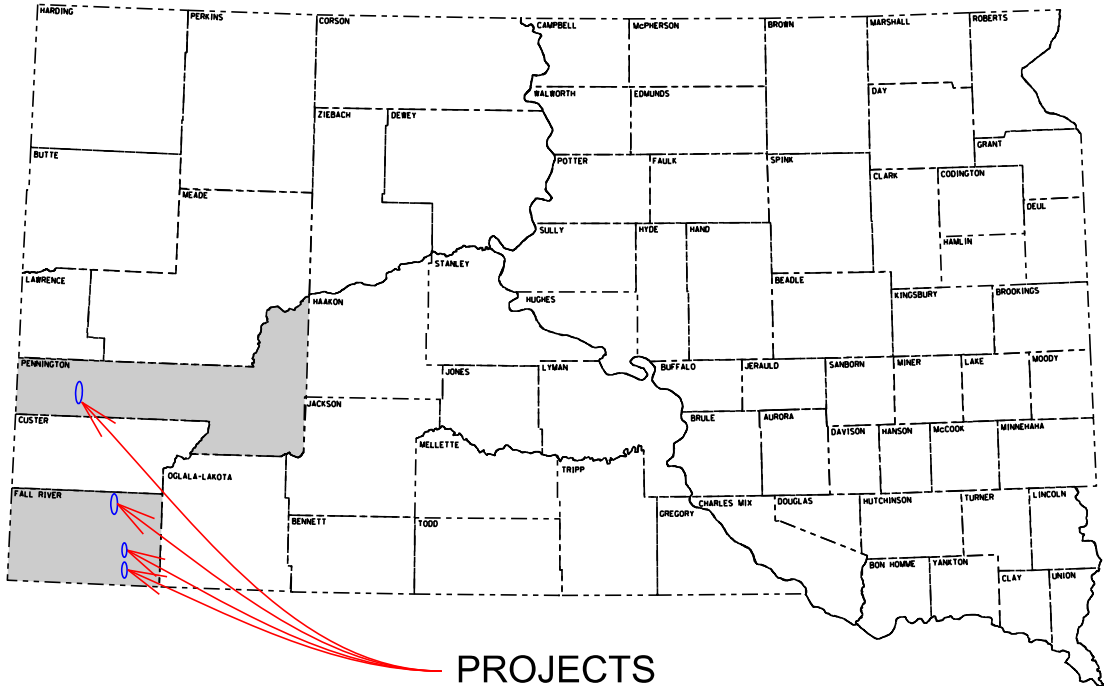


PLOT SCALE - 1:200

PLOTTED FROM - TRR011951

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	016-491, etc.	1	16

Plotting Date: 05/18/2017



PROJECTS

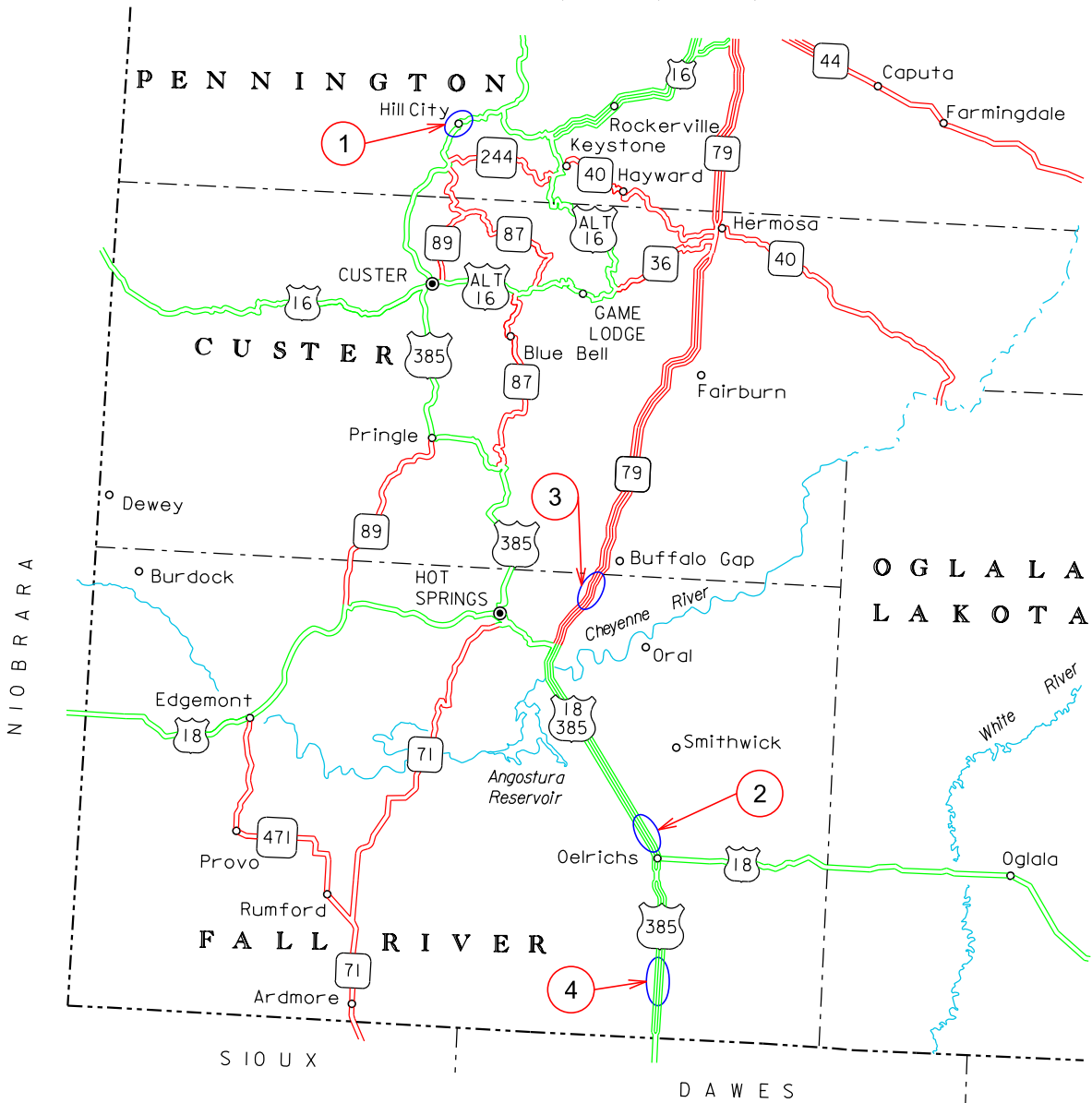
STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED
**PROJECTS 016-491, 018W-492,
079N-492 & 385N-492**
**US HIGHWAYS 16, 18 & 385
& SD HIGHWAY 79**
**PENNINGTON & FALL RIVER
COUNTIES**
PCC PAVEMENT REPAIR
PCNs i4r1, i4r4, i4r5, & i4r6

INDEX OF SHEETS

Sheet 1	Title Sheet
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Sheet 7	PCCP Repair Details
Sheet 8	Subgrade Repair
Sheets 9 to 10	Pavement Marking Details
Sheets 11 to 16	Standard Plates

1 016 - 491, PCN i4r1 MRM 40.4 to MRM 40.4 DESIGN DESIGNATION	2 018W - 492, PCN i4r4 MRM 61.1 to MRM 61.1 DESIGN DESIGNATION
ADT (2016) 5593	ADT (2016) 891
ADT (2036) 8115	ADT (2036) 1129
DHV 1282	DHV 287
D 51 %	D 51 %
T DHV 3.2%	T DHV 8.6%
T ADT 7%	T ADT 18.9%
V 35 MPH	V 70 MPH
3 079N - 492, PCN i4r5 MRM 30.8 to MRM 30.8 DESIGN DESIGNATION	4 385N - 492, PCN i4r6 MRM 6.7 to MRM 6.7 DESIGN DESIGNATION
ADT (2016) 2107	ADT (2016) 673
ADT (2036) 2670	ADT (2036) 853
DHV 326	DHV 104
D 50 %	D 50 %
T DHV 8%	T DHV 9.6%
T ADT 17.6%	T ADT 21.0%
V 70 MPH	V 70 MPH

Storm Water Permit
No Permit Required



PLOT NAME - 1
FILE - ...\\14R1 DESIGN\\14R1 TITLE.DGN

ESTIMATE OF QUANTITIES

PCN i4r1

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
120E0100	Unclassified Excavation, Digouts	27	CuYd
260E2010	Gravel Cushion	12.2	Ton
260E5000	Shot Rock	33.8	Ton
380E5030	Nonreinforced PCC Pavement Repair	41.3	SqYd
380E6000	Dowel Bar	12	Each
380E6110	Insert Steel Bar in PCC Pavement	48	Each
633E1400	Pavement Marking Paint, 4" White	31	Ft
633E1405	Pavement Marking Paint, 4" Yellow	62	Ft
633E5100	Grooving for Durable Pavement Marking, 4"	93	Ft
634E0010	Flagging	80.0	Hour
634E0110	Traffic Control Signs	137.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0285	Type 3 Barricade, 8' Double Sided	2	Each
650E4680	Type P8 Concrete Gutter	31	Ft
831E0300	Reinforcement Fabric (MSE)	90	SqYd

PCN i4r4

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
120E0100	Unclassified Excavation, Digouts	22	CuYd
260E2010	Gravel Cushion	13.2	Ton
260E5000	Shot Rock	39.0	Ton
320E1200	Asphalt Concrete Composite	1.6	Ton
380E5030	Nonreinforced PCC Pavement Repair	173.3	SqYd
380E6000	Dowel Bar	48	Each
380E6110	Insert Steel Bar in PCC Pavement	48	Each
430E0700	Precast Concrete Headwall for Drain	1	Each
633E1400	Pavement Marking Paint, 4" White	75	Ft
633E1405	Pavement Marking Paint, 4" Yellow	60	Ft
633E5100	Grooving for Durable Pavement Marking, 4"	135	Ft
634E0010	Flagging	48.0	Hour
634E0110	Traffic Control Signs	210.5	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0285	Type 3 Barricade, 8' Double Sided	1	Each
634E0420	Type C Advance Warning Arrow Board	1	Each
680E0240	4" Corrugated Polyethylene Drainage Tubing	46	Ft
831E0300	Reinforcement Fabric (MSE)	98	SqYd

PCN i4r5

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
120E0100	Unclassified Excavation, Digouts	58	CuYd
260E2010	Gravel Cushion	35.1	Ton
260E5000	Shot Rock	97.5	Ton
320E1200	Asphalt Concrete Composite	3.4	Ton
380E5030	Nonreinforced PCC Pavement Repair	43.3	SqYd
380E6110	Insert Steel Bar in PCC Pavement	48	Each
430E0700	Precast Concrete Headwall for Drain	2	Each
633E1400	Pavement Marking Paint, 4" White	19	Ft
633E1405	Pavement Marking Paint, 4" Yellow	15	Ft
633E5100	Grooving for Durable Pavement Marking, 4"	34	Ft
634E0010	Flagging	48.0	Hour
634E0110	Traffic Control Signs	210.5	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0285	Type 3 Barricade, 8' Double Sided	1	Each
634E0420	Type C Advance Warning Arrow Board	1	Each
680E0240	4" Corrugated Polyethylene Drainage Tubing	88	Ft
831E0300	Reinforcement Fabric (MSE)	243	SqYd

PCN i4r6

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
120E0100	Unclassified Excavation, Digouts	22	CuYd
260E2010	Gravel Cushion	13.2	Ton
260E5000	Shot Rock	39.0	Ton
320E1200	Asphalt Concrete Composite	1.6	Ton
380E5030	Nonreinforced PCC Pavement Repair	43.3	SqYd
380E6110	Insert Steel Bar in PCC Pavement	48	Each
430E0700	Precast Concrete Headwall for Drain	1	Each
633E1400	Pavement Marking Paint, 4" White	24	Ft
633E1405	Pavement Marking Paint, 4" Yellow	15	Ft
633E5100	Grooving for Durable Pavement Marking, 4"	39	Ft
634E0010	Flagging	48.0	Hour
634E0110	Traffic Control Signs	210.5	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0285	Type 3 Barricade, 8' Double Sided	1	Each
634E0420	Type C Advance Warning Arrow Board	1	Each
680E0240	4" Corrugated Polyethylene Drainage Tubing	46	Ft
831E0300	Reinforcement Fabric (MSE)	98	SqYd

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
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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 E: STORM WATER

Construction activities constitute less than 1 acre of disturbance.

Action Taken/Required:

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

COMMITMENT H: WASTE DISPOSAL SITE

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

Action Taken/Required:

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

The waste disposal site(s) shall be managed and reclaimed in accordance with the following from the General Permit for 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 Public 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 Public 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.

COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES (Continued)

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.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
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COMMITMENT R: FIRE PREVENTION IN THE BLACK HILLS AREA

This project is located within the confines of the Black Hills Forest Fire Protection Boundary.

Action Taken/Required:

The Contractor shall adhere to the “Special Provision for Fire Plan”.

SUBGRADE REPAIR

Included in the Estimate of Quantities is Unclassified Excavation, Digouts for the necessary removal of unstable material.

Backfill shall be Shot Rock and Gravel Cushion installed in accordance with the detail for Subgrade Repair.

The MSE fabric shall be placed on the bottom and the sides of the excavated subgrade. Additional fabric shall be provided to allow for wrapping the top of the shot rock backfill. Shot rock shall be placed in lifts not to exceed 8 inches. The shot rock shall be watered and compacted by at least 4 complete vibratory roller passes per lift.

When the shot rock backfill has reached a compacted depth of 1.5 feet, the shot rock shall be covered with MSE fabric. Gravel Cushion shall be placed on top of the MSE fabric.

The Corrugated Polyethylene Drainage Tubing within the limits of the shot rock shall be perforated and wrapped with the MSE Fabric. The Corrugated Polyethylene Drainage Tubing crossing the shoulder which outlets to the in-slope shall be solid-walled (or non-perforated). The slope of the pipe shall be at least 1%. All tubing shall be incidental to the contract unit price per foot for 4” Corrugated Polyethylene Drainage Tubing.

The Contactor shall saw cut the asphalt shoulder for installation of the drainage tubing. The drainage tubing shall be backfilled with material that was removed from the trench. 6” of Gravel Cushion shall be placed on top of the trench backfill. 3” of Asphalt Concrete Composite shall be placed on top of the Gravel Cushion.

SHOT ROCK

Shot Rock shall consist of broken or crushed ledge rock produced from blasting or quarrying operations. Shot Rock material utilized in subgrade stabilization shall be less than 8” in diameter with a nominal size of 4”. Gypsum may not be used as Shot Rock.

Compaction shall be to the satisfaction of the Engineer. Acceptance of Shot Rock material shall be visually inspected and may be used without further testing as directed by the Engineer.

ASPHALT CONCRETE COMPOSITE

A Flush Seal will not be required on the asphalt concrete patching.

Locations and quantities of asphalt repair are subject to change. The exact locations of replacement will be determined in the field by the Engineer. The Engineer reserves the right to adjust quantities and/or add locations at no additional cost to the state.

EXISTING PCC PAVEMENT

The existing pavement US Hwy 16 & US 385, PCN's i4r1 & i4r6 is 8" Nonreinforced PCC Pavement with limestone aggregate. The existing pavement US Hwy 18E & SD 79N, PCN's i4r4 & i4r5 is 8.5" Nonreinforced PCC Pavement with limestone aggregate. Longitudinal joints are reinforced with No. 5x30" deformed tie bars spaced 30" to 48" center to center. Transverse joints are reinforced with 1 1/4" steel dowel bars spaced 12" center to center.

RESTORATION OF GRAVEL CUSHION

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

If additional gravel cushion material is required, the Contractor shall furnish, place and compact gravel cushion to the satisfaction of the Engineer.

All costs associated with this work shall be incidental to the contract unit price per square yard for "Nonreinforced PCC Pavement Repair".

NONREINFORCED PCC PAVEMENT REPAIR

Locations and size (length or width) of concrete repair areas are subject to change in the field, at the discretion of the Engineer. There will be no increase in the contract unit price for these changes. Payment will be based on the actual area replaced.

Existing concrete pavement shall be sawed full depth at the beginning and end 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.

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 will be at the original location.

Upon removal of the concrete, the Engineer shall inspect for existing tie bars along the longitudinal joint to determine if tie bar installation will be required.

Concrete placed adjacent to asphalt shoulders shall be formed full depth to match the width of existing concrete pavement. Asphalt shoulders adjacent to concrete pavement replacements shall be repaired with Asphalt Concrete Composite. If rumble strips exist, they shall be formed in the asphalt to match existing.

At repair locations where the new working joint is not opposite the existing working joint, the Contractor shall place a 1/4 inch 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 with Hot Poured Elastic Joint Sealer.

Saw cuts that extend beyond the repair area shall be minimized and filled with Hot Pour Elastic Joint Sealant at the Contractor's expense.

New pavement thickness shall match existing pavement thickness.

The slump requirement will be limited to 3" maximum after water reducer is added and the concrete shall contain 4.5% to 7.0% entrained air. Coarse aggregate shall be crushed ledge rock, Size No. 1, unless an alternative gradation is approved by the concrete engineer as part of the mix design submittal. The concrete mixture shall contain a minimum of 50% coarse aggregate by weight. The concrete mix shall contain at least 600 lbs. of type I, II or 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 may need to modify the mix design to meet contract time requirements on the project. The Contractor shall submit a mix design and supporting documentation for approval at least 2 weeks prior to use.

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

Concrete shall be cured with white pigmented curing compound 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 degrees Fahrenheit or higher throughout the cure period. If the concrete temperature falls below 60 degrees Fahrenheit, the cure time shall be extended or other measures shall be taken, at no additional cost to the State. In addition to the curing requirements, strength of 4,000 psi must be obtained prior to opening to traffic.

The initial contraction joint sawing shall be performed as soon practical to avoid random cracking.

All costs for performing this work including sawing and removing concrete, furnishing and placing concrete, #5 tie bars cast in place, curing, sawing and sealing joints, labor, tools and equipment shall be incidental to the contract unit price per square yard for "Nonreinforced PCC Pavement Repair".

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
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STEEL BAR INSERTION

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

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.

TABLE OF PCCP REPAIR

PCN	Highway	Location	Lane	"L"	"W"	PCCP Repair	#5 Bar	1 1/4" Bar	Dowel Bar	Insert Steel Bar
		MRM		(ft.)	(ft.)	(sq. yds)	(each)	(each)	(each)	(each)
i4r1	US 16	40.387	EB	31	12	41.3	24	24	12	48
i4r4	US 18W	61.095	WB DL/PL	60	26	173.3	0	48	48	48
i4r5	SD 79N	30.75	NB DL/PL	15	26	43.3	0	48	0	48
i4r6	US 385N	6.807	NB DL/PL	15	26	43.3	0	48	0	48

PERMANENT PAVEMENT MARKING – GENERAL NOTES

The Contractor shall survey and mark the location of no passing zones prior to covering pavement marking.

The Contractor shall repaint all the existing pavement marking paint including centerline, edge line, lane lines, arrows, gore areas, etc. The Contractor will be required to inventory and mark, with appropriately colored tabs, the extent and location of the existing word messages, turn arrows, stop bars, railroad crossings, pedestrian crossings, gore areas, etc. before the markings are obliterated. Locations of pavement marking tape shall be masked. The Contractor shall provide a copy of the pavement marking inventory to the Engineer. All costs associated with this work shall be incidental to the various pavement marking bid items.

Striper and advance and trailing warning vehicles shall be equipped with flashing amber or arrow panel warning lights.

TABLE OF PAVEMENT MARKING QUANTITIES

PCN	Highway	Location MRM	Pavement Marking Paint, White (Ft.)	Pavement Marking Paint, Yellow (Ft.)
i4r1	US 16	40.387	31	62
i4r4	US 18W	61.095	75	60
i4r5	SD 79N	30.75	19	15
i4r6	US 385N	6.807	24	15

WATERBORNE PAVEMENT MARKING PAINT WITH HIGH GRADE POLYMER

All materials shall be applied as per manufacturer's recommendations.

This material shall consist of a durable high build, low VOC, fast drying, waterborne traffic paint with a 100% acrylic polymer (Dow DT-400 or Dow HD-21A or equivalent). The Contractor shall provide certification that the material is one of the following products or an equivalent as approved by the Operations Traffic Engineer:

Diamond Vogel's Waterborne High Build Polymer Marking Paint
Ennis-Flint's High Build Polymer Marking Paint

No further testing of this material will be required. Reflective media consisting of glass beads as well as bonded core reflective elements shall be adhered to the paint.

The bonded core reflective elements shall contain either clear or yellow tinted microcrystalline ceramic beads bonded to the outer surface. All microcrystalline ceramic beads bonded to reflective elements shall have a minimum index of refraction of 1.8 when tested using the liquid oil immersion method.

RATES OF MATERIALS FOR WATERBORNE PAVEMENT MARKING PAINT WITH HIGH GRADE POLYMER

Solid 4" line = 27.8 Gals/Mile
Glass Beads = 5.3 Lbs/Gal.
Composite Reflective Elements = 2.1 Lbs/Gal.

All cost for materials, labor and equipment necessary to furnish and install the pavement markings shall be incidental to the contract unit price per foot for "Waterborne Pavement Marking Paint with High Grade Polymer, White or Yellow".

GROOVE PAVEMENT FOR PAINT WITH HIGH GRADE POLYMER

The Contractor shall establish a positive means for the removal of the grinding and/or grooving residue. Solid residue shall be removed from the pavement surfaces before being blown by traffic action or wind. Residue shall not be permitted to flow across lanes being used by public traffic or into gutter or drainage facilities. Residue, whether in solid or slurry form, shall be disposed of in a manner that will prevent it from reaching any waterway in a concentrated state.

Unless otherwise specified in the plans, the Contractor shall groove the surface for Pavement Marking Paint with High Grade Polymer as specified in these plans and as per manufacture's instructions.

The grooving shall be completed within the following tolerances:

Depth of Groove:	70 mils ± 5 mils
Width of 4" Groove:	5" to 6"
Length of Skip Lines:	10'-6" with tolerance of ± 3"
Tapers at Begin/End Lines:	6" to 9"

The equipment shall be capable of the following:

- Grooving the total width of the groove in one pass or uniform depths with multiple passes.
- Grooving without causing damage to the pavement joints or joint sealant material.
- Providing uniform alignment and depth.
- Moving continuously to permit a mobile traffic work operation.

If damage to joints, joint sealant material, backer rod, etc. occurs, the grooving operation shall be stopped and modifications shall be made to the grooving operation to prevent further damage. The Contractor may be required to use specially prepared circular diamond blade cutting heads to prevent damage at the joints. Damage caused to joints, the joint sealant material, backer rod, etc. shall be repaired or replaced by the Contractor, as directed by the Engineer. No additional payment will be made for the repair work or any reapplication of the pavement marking in the area of the repair.

Grooving on bridge decks will not be required. The Contractor shall not damage bridge joints near any pavement marking grooving. Markings on bridge decks shall be surface applied.

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TRAFFIC CONTROL – GENERAL NOTES

Requests to deviate from the sequence of operations shall be submitted in writing to the Engineer for review. Approval of an alternate sequence of operations will only be allowed when the proposed changes meet with the Department’s intent for traffic control and sequencing of the work. An alternate sequence shall be submitted for review a minimum of one week prior to potential implementation.

No work will be allowed during hours of darkness as defined by the Specifications.

Existing guide, route, informational logo, regulatory, warning signs and delineation shall be temporarily reset and maintained during construction as directed by the Engineer. Removing, relocating, salvaging and resetting of the above items shall be the responsibility of the Contractor.

All materials and equipment shall be stored a minimum distance of 30’ from the traveled way during nonworking hours.

All haul trucks shall be equipped with a second flashing amber light that is visible from the backside of the haul truck. The costs for the flashing amber lights shall be incidental to the various related contract bid items.

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

If there is a discrepancy between the traffic control plans, standard plates, and the MUTCD – whichever is more stringent shall be used, as determined by the Engineer.

Temporary Flexible Vertical Markers (Tabs) shall be used for lane closure tapers or lane shift tapers and shall be installed at 5’ spacing. Tabs used for tapers and shifts will not be measured for payment. All costs associated to furnish, install, maintain (including replacement as required by the Engineer at no added cost to the Department), and remove all markers will be incidental to the contract lump sum price for Traffic Control, Miscellaneous.

At no time shall mainline traffic be exposed to differential elevations in traveling lanes due either to milling or paving operations. All lanes that are milled or paved shall be left closed until the adjacent lane is completed in a similar manner with no drop offs. All transitions shall be paved for a smooth ride as approved by the Engineer..

The Contractor shall keep the portion of the project being used by public traffic in a condition that will adequately and safely accommodate traffic.

Road Work Ahead (W20-1) signs shall be placed at applicable intersecting roads and as directed by the Engineer.

INVENTORY OF TRAFFIC CONTROL DEVICES

PCN i4r1

SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R2-1	SPEED LIMIT <u> </u>	6	24" x 30"	5.0	30.0
W3-5	SPEED REDUCTION AHEAD (<u> </u> MPH)	4	48" x 48"	16.0	64.0
W4-2	LEFT or RIGHT LANE ENDS (symbol)	2	48" x 48"	16.0	32.0
W20-1	ROAD WORK AHEAD	2	48" x 48"	16.0	32.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	1	48" x 48"	16.0	16.0
G20-2	END ROAD WORK	1	36" x 18"	4.5	4.5
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT 210.5			

ITEM DESCRIPTION	QUANTITY
Type 3 Barricade, 8' Double Sided	2 Each

PCN i4r4

SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R2-1	SPEED LIMIT <u> </u>	6	24" x 30"	5.0	30.0
W3-5	SPEED REDUCTION AHEAD (<u> </u> MPH)	4	48" x 48"	16.0	64.0
W4-2	LEFT or RIGHT LANE ENDS (symbol)	2	48" x 48"	16.0	32.0
W20-1	ROAD WORK AHEAD	2	48" x 48"	16.0	32.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	1	48" x 48"	16.0	16.0
G20-2	END ROAD WORK	1	36" x 18"	4.5	4.5
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT 210.5			

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

ITEM DESCRIPTION	QUANTITY
Type C Arrow Board	1 Each

PCN i4r5

SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R2-1	SPEED LIMIT <u> </u>	6	24" x 30"	5.0	30.0
W3-5	SPEED REDUCTION AHEAD (<u> </u> MPH)	4	48" x 48"	16.0	64.0
W4-2	LEFT or RIGHT LANE ENDS (symbol)	2	48" x 48"	16.0	32.0
W20-1	ROAD WORK AHEAD	2	48" x 48"	16.0	32.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	1	48" x 48"	16.0	16.0
G20-2	END ROAD WORK	1	36" x 18"	4.5	4.5
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT 210.5			

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

ITEM DESCRIPTION	QUANTITY
Type C Arrow Board	1 Each

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	016-491, etc.	6	16

PCN i4r6

SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R2-1	SPEED LIMIT <u> </u>	6	24" x 30"	5.0	30.0
W3-5	SPEED REDUCTION AHEAD (<u> </u> MPH)	4	48" x 48"	16.0	64.0
W4-2	LEFT or RIGHT LANE ENDS (symbol)	2	48" x 48"	16.0	32.0
W20-1	ROAD WORK AHEAD	2	48" x 48"	16.0	32.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	1	48" x 48"	16.0	16.0
G20-2	END ROAD WORK	1	36" x 18"	4.5	4.5
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT 210.5			

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

ITEM DESCRIPTION	QUANTITY
Type C Arrow Board	1 Each

SEQUENCE OF OPERATIONS PCN i4r1

1. Set up traffic control to close one lane.
2. Complete concrete repair.
3. Install Permanent Pavement Marking.
4. Remove traffic control.

SEQUENCE OF OPERATIONS PCNs i4r4,i4r5 & i4r6

1. Set up traffic control to close one lane.
2. Complete passing lane concrete repair.
3. Switch traffic control to close adjacent lane.
4. Complete driving lane concrete repair
5. Install Permanent Pavement Marking.
6. Remove traffic control.

OVERWIDTH TRAFFIC

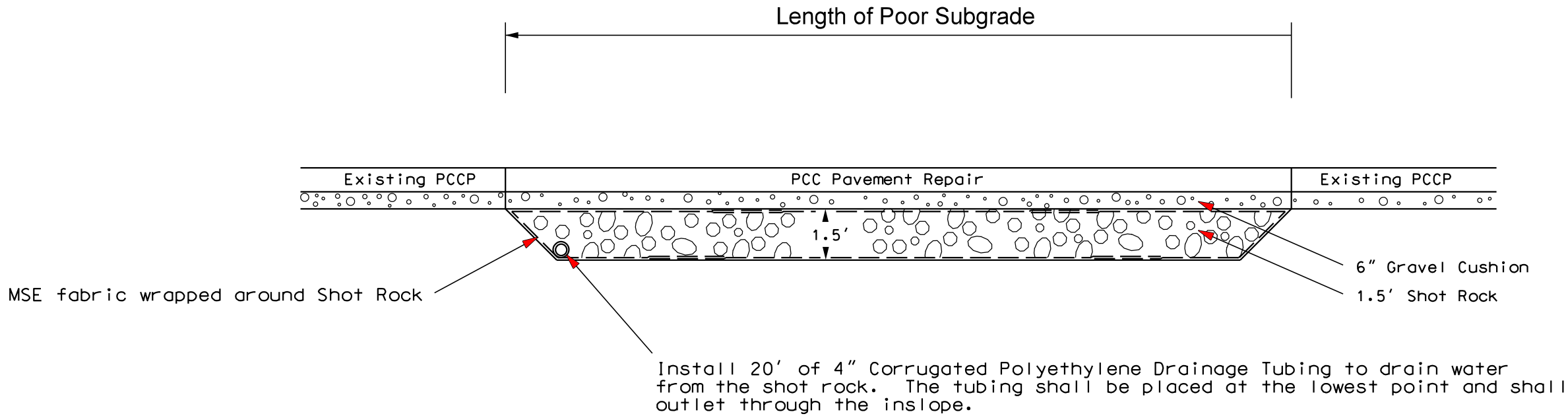
The Contractor shall maintain a minimum width of 16’ for the travel lanes at all times.

PRESS RELEASE ANNOUNCEMENTS

The SDDOT will prepare a Press Release to be released 5 days prior to any phase change or any other major change that affects traffic flow. The SDDOT will be responsible to keep law enforcement, emergency services, and the traveling public notified of changes in project access. The Contractor shall provide the Engineer with pertinent information 7 days prior to any phase change or any other major changes that affect traffic flow.

Subgrade Repair Detail

LONGITUDINAL SECTION ALONG CENTERLINE



TYPICAL PAVEMENT MARKING LAYOUT

2-LANE ROAD

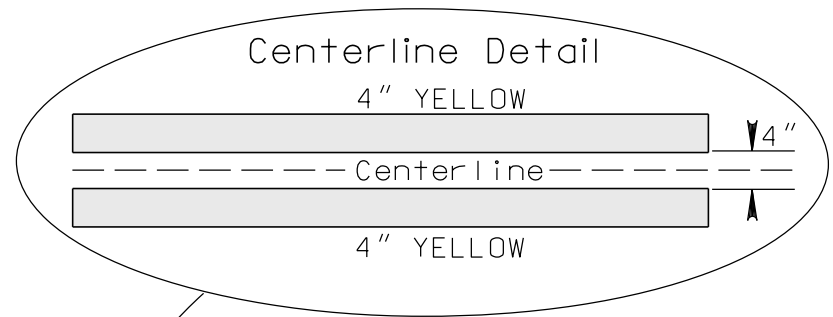
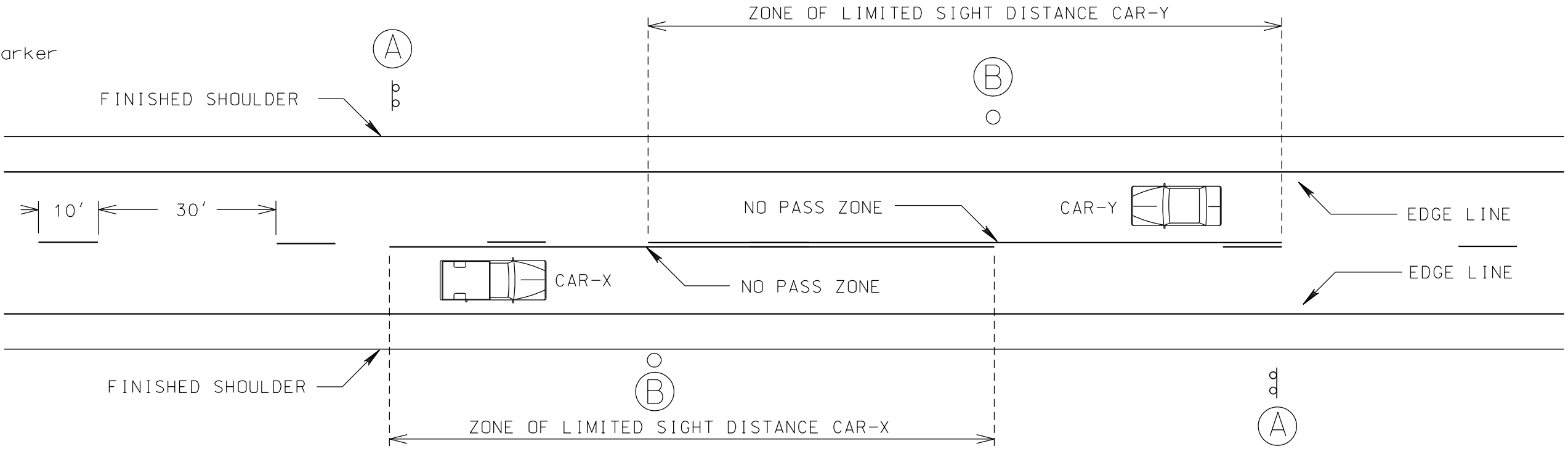
STATE OF SOUTH DAKOTA	PROJECT 016-491, etc.	SHEET 9	TOTAL SHEETS 16
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Plotting Date: 05/17/2017

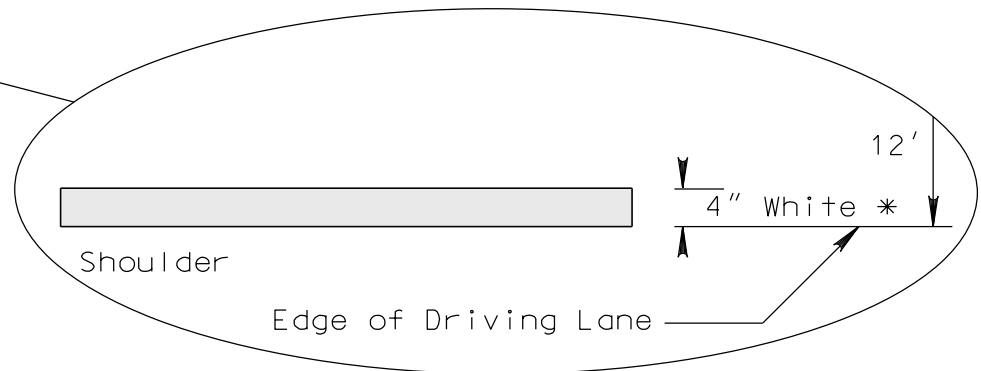
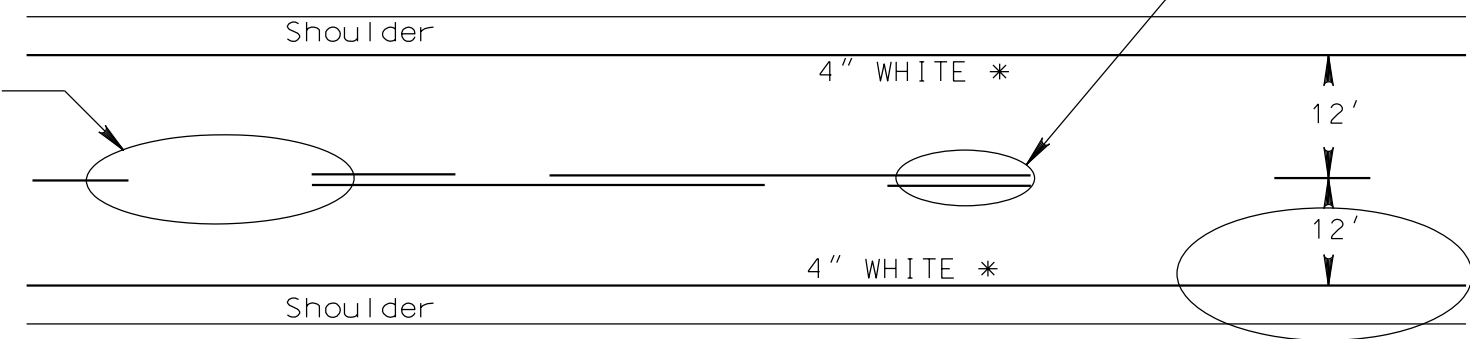
Plot Scale - 1:20



End of Zone Marker



NOTE: A THREE "GUN" SYSTEM SHALL BE USED TO OBTAIN THIS PATTERN.



* 8" WHITE - As per locations in plans with shoulders less than 2' width.

Plotted From - tnc11951

File - ...\\dr1 Pvm\\MarkingDetails_2.dgn

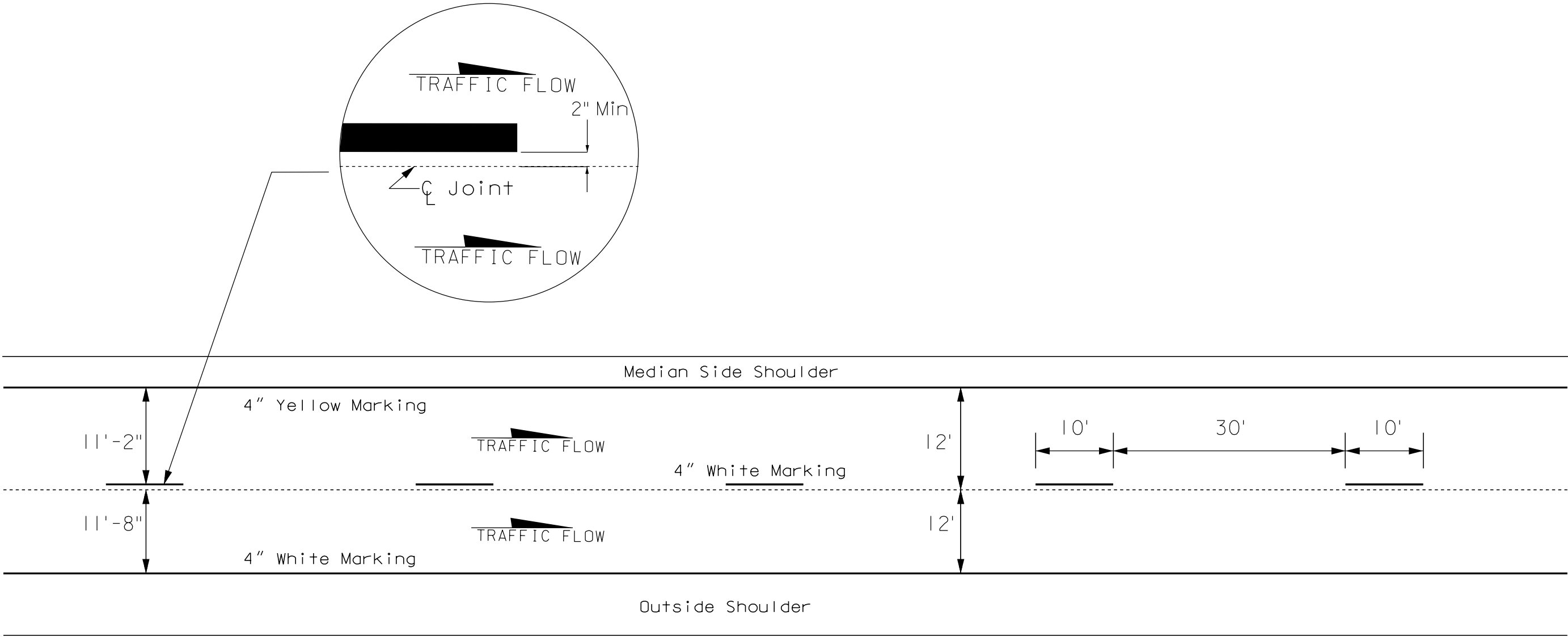
Plot Scale - 1:200

Plotted From - trc11951

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	016-491, etc.	10	16

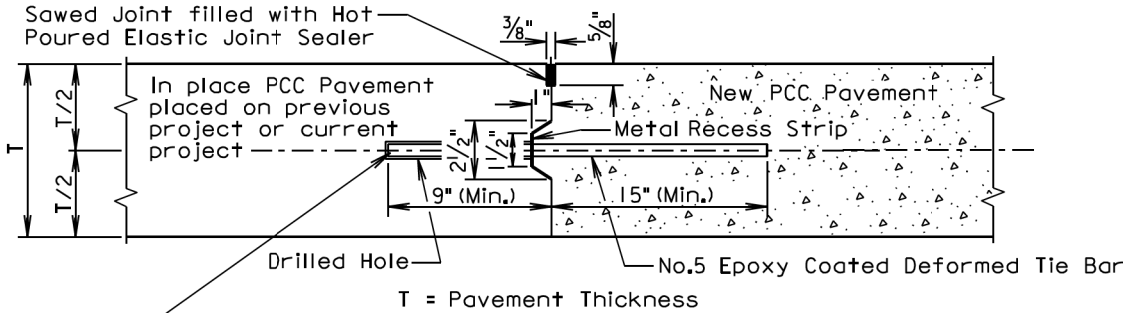
Plotting Date: 05/17/2017

TYPICAL PAVEMENT MARKING LAYOUT 4-LANE DIVIDED



LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS

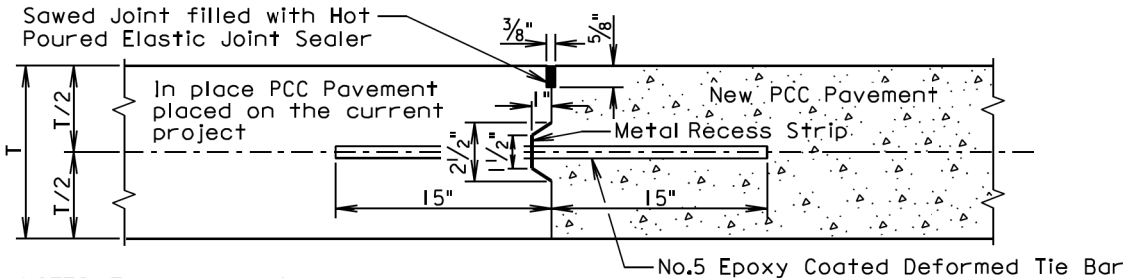
(DRILLED IN BARS)



T = Pavement Thickness
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.

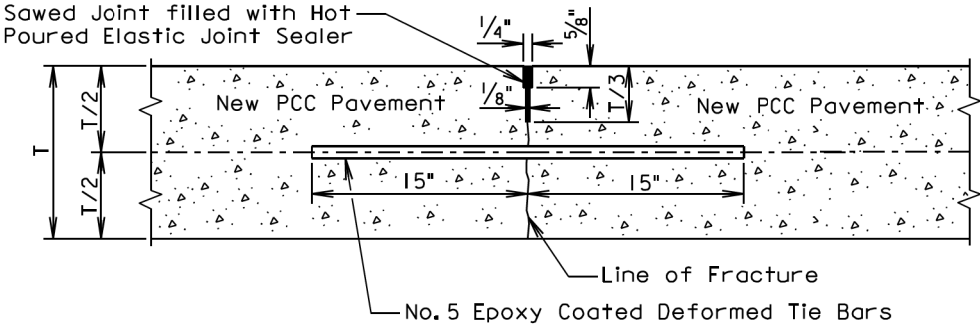
The keyway is optional and is not required. When concrete pavement is formed and a keyway is provided, a metal recess strip shall be used. When concrete pavement is slip formed, a metal recess strip is not required.

August 31, 2013

Published Date: 2nd Qtr. 2017	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 table:

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

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

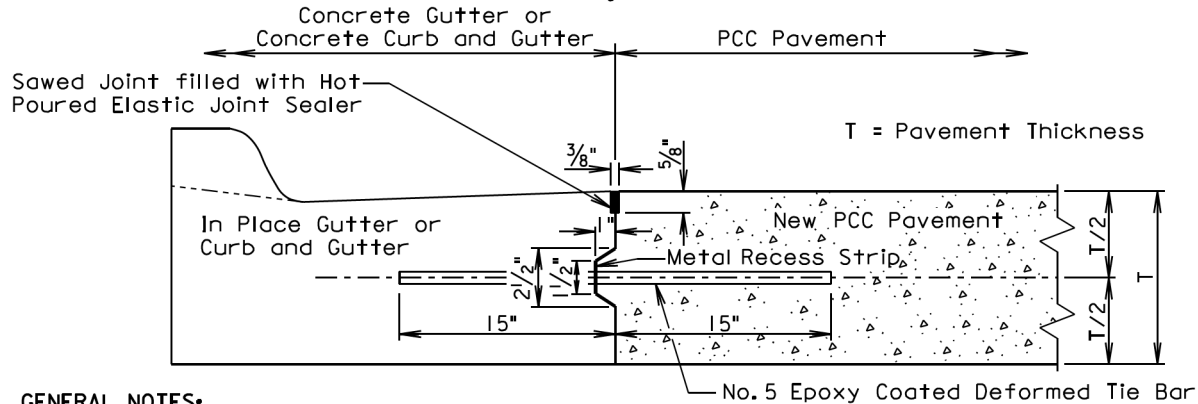
The required number of tie bars as shown in the table shall be uniformly spaced within each panel with a maximum space of 48 inches center to center. The maximum tie bar spacing shall apply to tie bars within each panel.

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

August 31, 2013

Published Date: 2nd Qtr. 2017	S D D O T	PCC PAVEMENT LONGITUDINAL JOINTS WITH TIE BARS	PLATE NUMBER 380.10
			Sheet 2 of 2

LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS
(Individually Formed)



GENERAL NOTES:

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

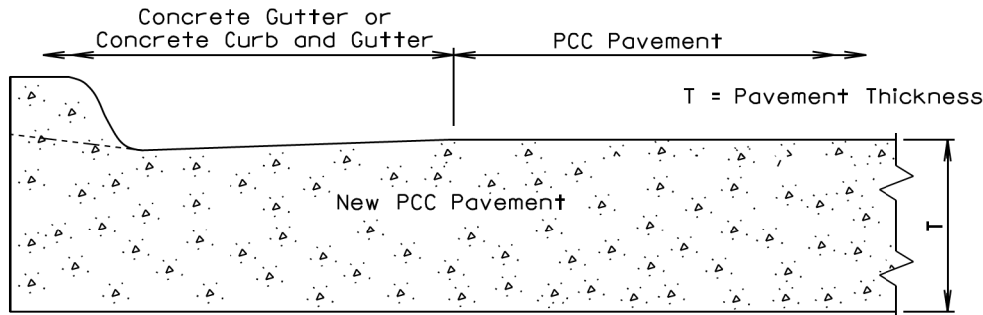
The tie bars shall be placed a minimum of 15 inches from existing transverse contraction joints.

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

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

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

POURED MONOLITHICALLY



GENERAL NOTES:

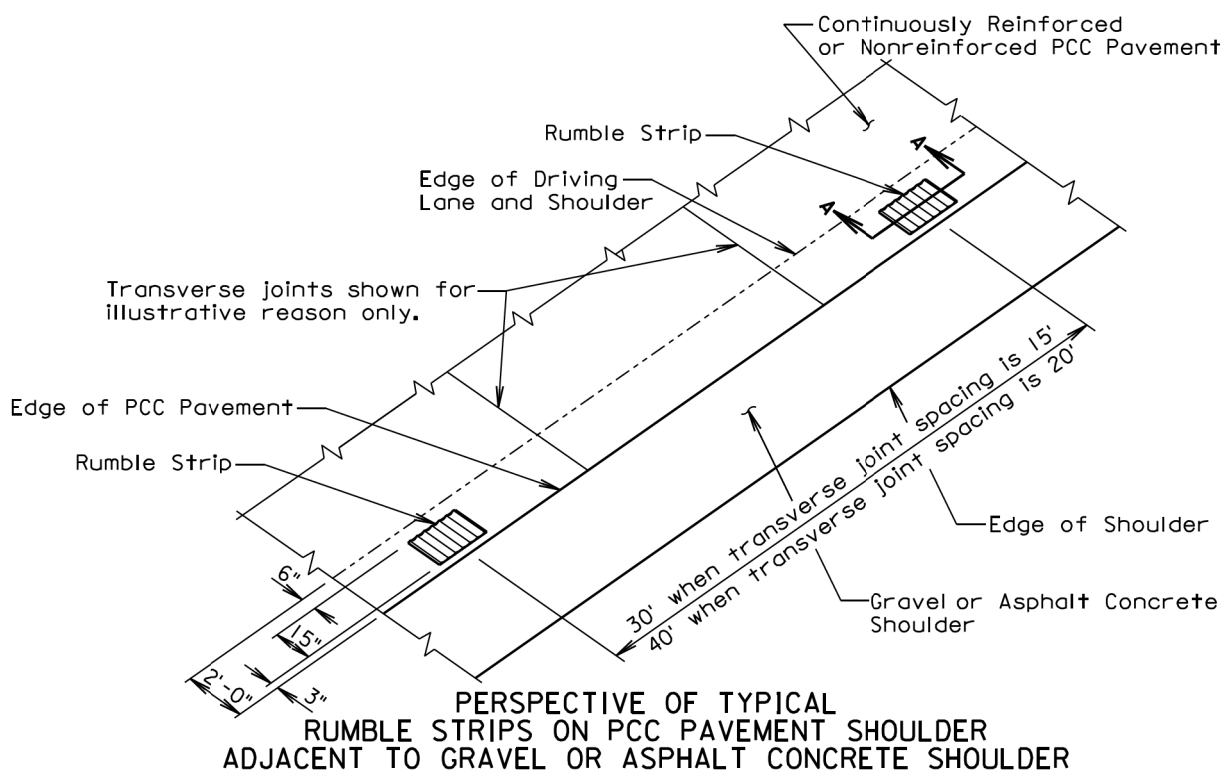
The mainline curb and gutter may be placed monolithically with the PCC pavement if the mainline lane width is less than or equal to 12 feet. If this method of construction is used, the tie bars and the sawed joint between the curb and gutter and the PCC pavement shall be eliminated.

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

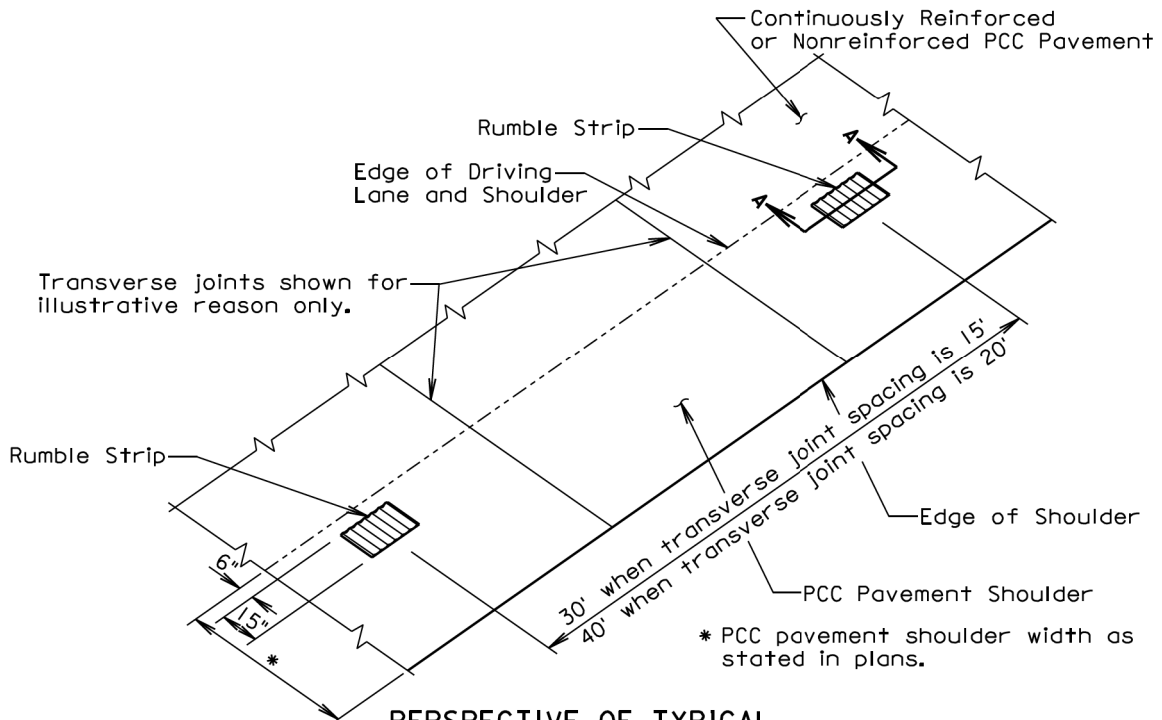
The slope of the gutter shall be the slope designated for the type of gutter or curb and gutter to be constructed. The bottom slope of the gutter or curb and gutter shall be constructed at the same slope as the mainline concrete pavement.

June 26, 2013

<i>Published Date: 2nd Qtr. 2017</i>	S D D O T	PCC PAVEMENT LONGITUDINAL CONSTRUCTION JOINTS WITH CONCRETE GUTTER OR CONCRETE CURB AND GUTTER	PLATE NUMBER <i>380.II</i>
			<i>Sheet 1 of 1</i>



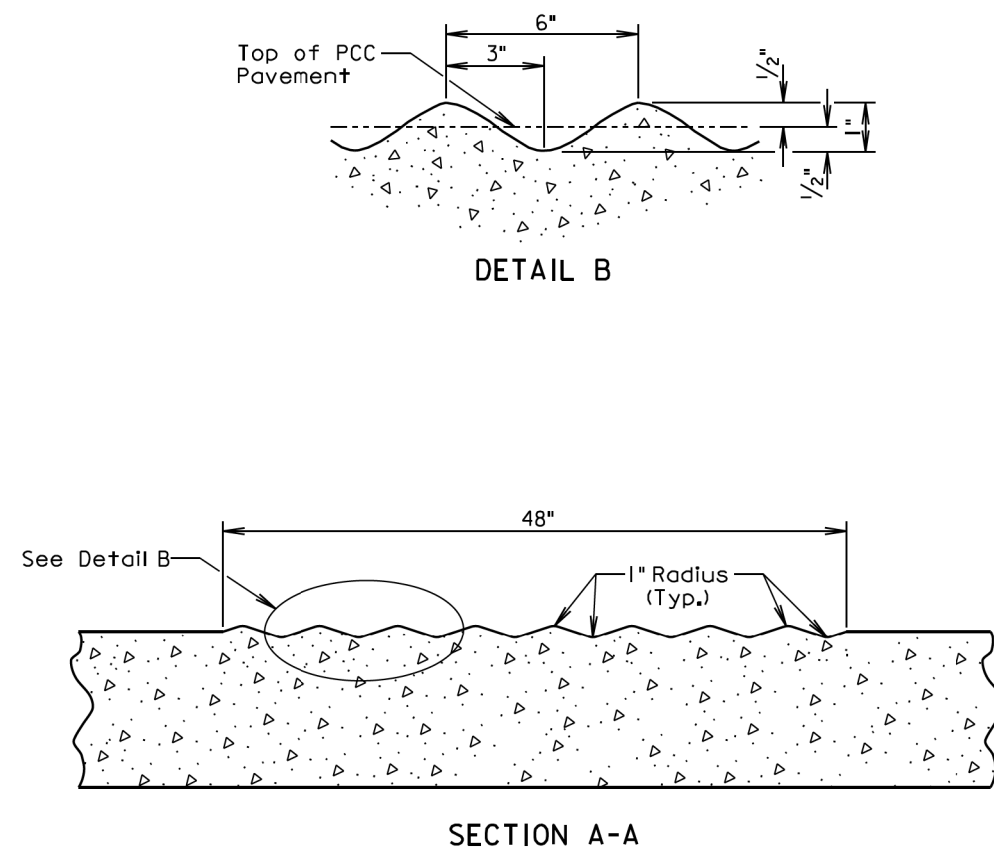
PERSPECTIVE OF TYPICAL
RUMBLE STRIPS ON PCC PAVEMENT SHOULDER
ADJACENT TO GRAVEL OR ASPHALT CONCRETE SHOULDER



PERSPECTIVE OF TYPICAL
RUMBLE STRIPS ON PCC PAVEMENT SHOULDER

August 31, 2013

<i>Published Date: 2nd Qtr. 2017</i>	S D D O T	RUMBLE STRIP ON PCC PAVEMENT SHOULDER	PLATE NUMBER 380.15
			<i>Sheet 1 of 2</i>



GENERAL NOTES:

The rumble strips shall be evenly spaced and shall not coincide with any transverse contraction joints.

The rumble strips shall NOT be placed along areas adjacent to entrance ramps, exit ramps, and gore areas.

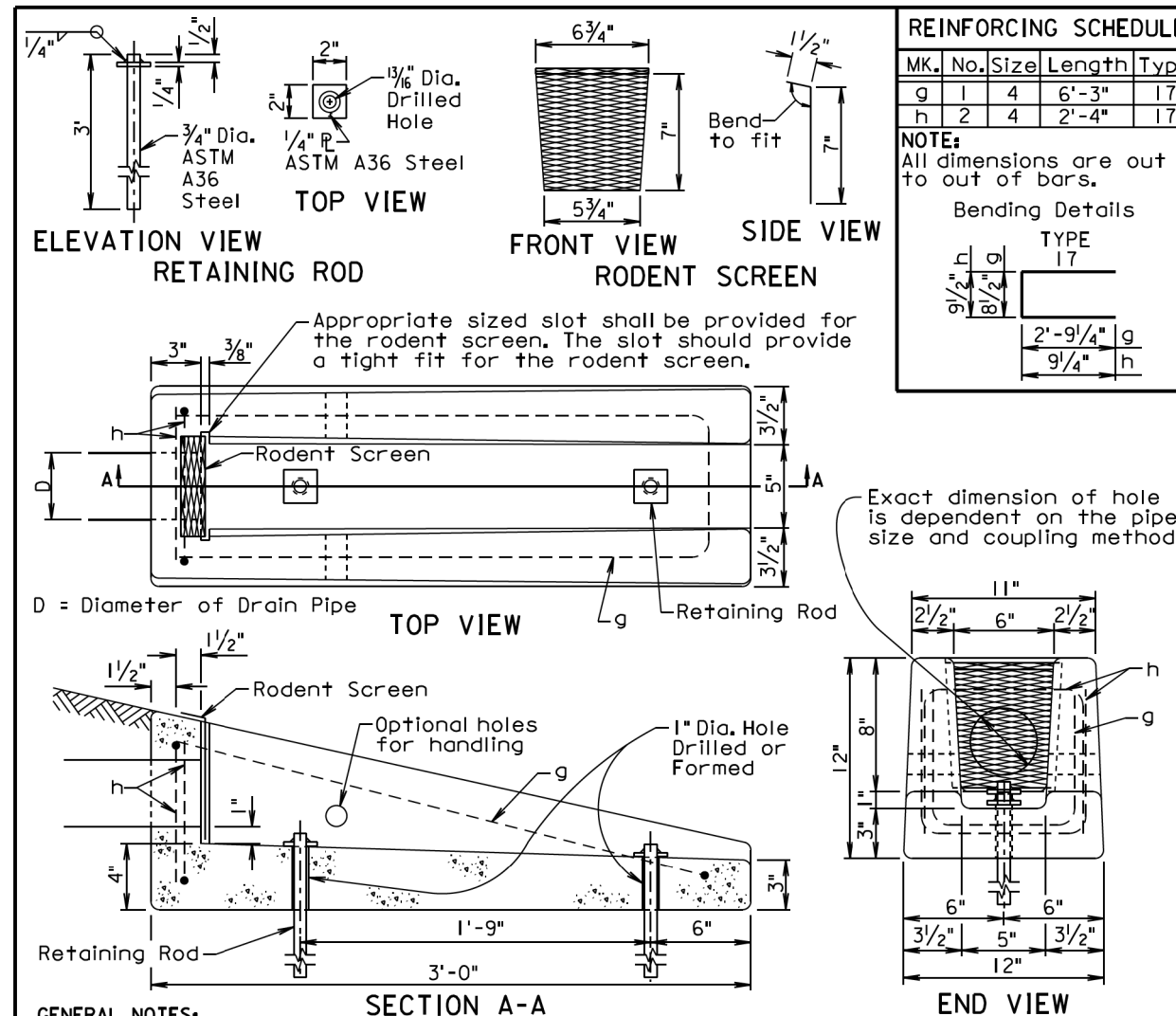
Payment for constructing the PCC Pavement Rumble Strips shall be incidental to the contract unit price per square yard for the corresponding PCC Pavement bid item.

August 31, 2013

<p><i>Published Date: 2nd Qtr. 2017</i></p>	<p>S D D O T</p>	<p>RUMBLE STRIP ON PCC PAVEMENT SHOULDER</p>	<p>PLATE NUMBER 380.15</p>
			<p>Sheet 2 of 2</p>

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	016-491, etc.	13	16

Plotting Date: 05/18/2017



GENERAL NOTES:

The concrete shall be Class M6. The concrete shall conform to the requirements of Section 462 of the Specifications. It is estimated that each unit weighs approximately 210 pounds.

All reinforcing steel shall conform to ASTM A615 Grade 60 and shall be epoxy coated. The reinforcing steel shall be securely retained to prevent displacement during placement of concrete. It is estimated that 7.3 pounds of reinforcing steel is required for each unit.

The pipe shall be placed in the concrete headwall with the pipe end flush with the concrete surface adjacent to the rodent screen.

The rodent screen shall be galvanized 13 Ga. steel with a diamond shaped flattened mesh pattern. The size shall be 1/2". The size refers to the measurement across the smallest diamond shaped opening measured from the centers of the wires.

The retaining rod shall be galvanized in accordance with ASTM A123 after all shop welding has been completed.

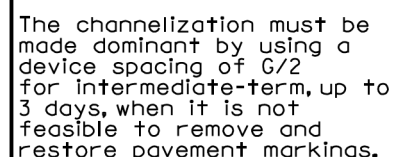
The drawing indicates using 1/2" fillets; however, 3/4" chamfers may be substituted for the 1/2" fillets.

All costs for furnishing and installing the concrete headwall including equipment, labor, and materials including concrete, reinforcing steel, retaining rods, and rodent screen shall be incidental to the contract unit price per each for "Precast Concrete Headwall for Drain".

June 26, 2015

<p><i>Published Date: 2nd Qtr. 2017</i></p>	<p>S D D O T</p>	<p>PRECAST CONCRETE HEADWALL FOR DRAIN</p>	<p>PLATE NUMBER</p>
			<p>430.50</p>
			<p>Sheet 1 of 1</p>

* Spacing is 40' for 42" cones.



June 3, 2016

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PLATE NUMBER
634.53

Sheet 1 of 1

- ⦿ Reflectorized Drum
- Channelizing Device

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



June 3, 2016

SDDOT

PLATE NUMBER
634.63

Sheet 1 of 2

