

PLOT SCALE - 1"=11900'

PLOTTED FROM - TRM11215

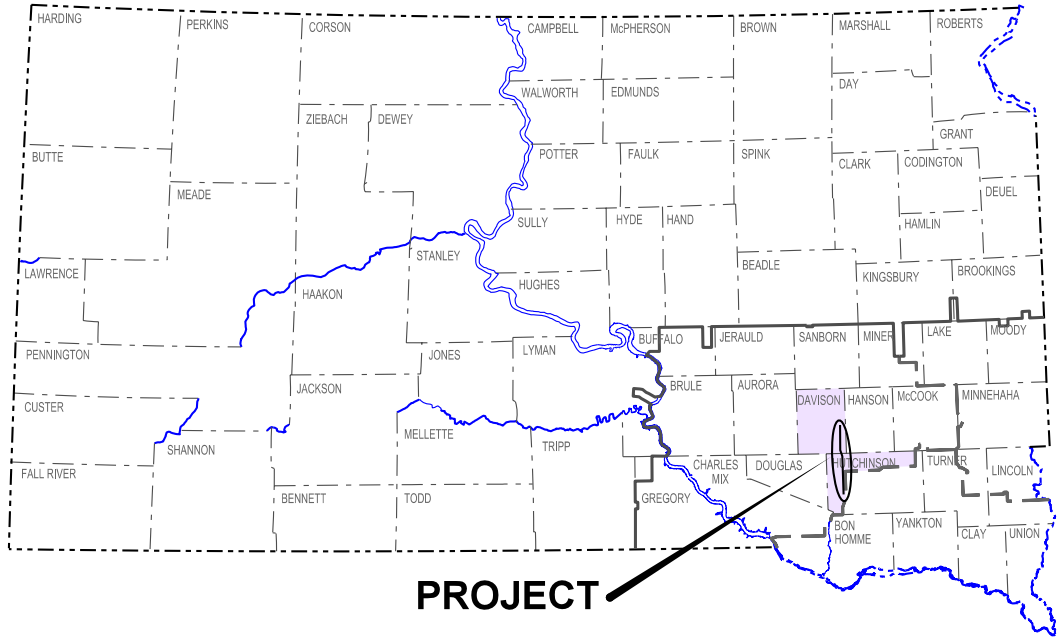
STATE OF SOUTH DAKOTA  
DEPARTMENT OF TRANSPORTATION  
PLANS FOR PROPOSED  
037-252  
HUTCHINSON & DAVISON COUNTIES  
PCC PAVEMENT REPAIR, SPALL REPAIR,  
TIE BAR RETROFIT (STITCHING) &  
SEALING RANDOM CRACKS  
PCN I2W3

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	037-252	1	21

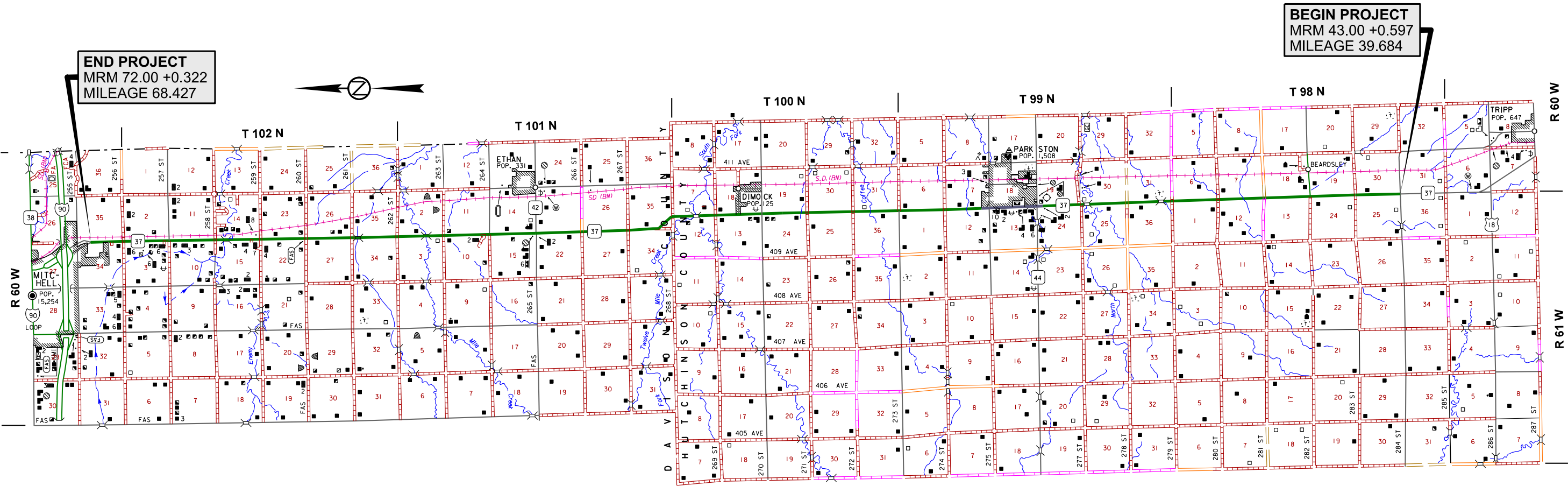
Plotting Date: 05/23/2013

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PROJECT



DESIGN DESIGNATION	
ADT(2012)	2,979
ADT(2032)	3,878
DHV	535
D	51%
T DHV	6.8%
T ADT	14.9%
V (RURAL)	65 MPH
V (MITCHELL)	45 MPH
V (PARKSTON)	45 MPH

STORM WATER PERMIT
(None required)

Length: 28.743 Miles

FILE - J:\TRAVIS H\12W3\T1L12W3.DGN

PLOT NAME - 1

ESTIMATE OF QUANTITIES

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
380E5020	Fast Track Concrete for PCC Pavement Repair	1,273.3	SqYd
380E6000	Dowel Bar	189	Each
380E6110	Insert Steel Bar in PCC Pavement	1,050	Each
380E6200	Tie Bar Retrofit, Stitching	57	Each
380E6310	Seal Random Cracks in PCC Pavement	398	Ft
390E0200	Repair Type A Spall	277.0	SqFt
634E0010	Flagging	900	Hour
634E0020	Pilot Car	400	Hour
634E0100	Traffic Control	2,438	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0610	4" Temporary Pavement Marking Tape Type 2	7,920	Ft

SPECIFICATIONS

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

TABLE FOR PCC PAVEMENT REPAIR WITH CENTER TURN LANE

		SB LANE		CENTER TURN LANE		NB LANE		PCCP SqYds	NEW JOINT CON-FIG.	INSERT STEEL BAR IN PCC PAVEMENT 1" x 18" PLAIN ROUND DOWEL BARS Each		No. 5 x 24" DEFORMED TIE BARS Each
MRM	LANE	L Ft	W Ft	L Ft	W Ft	L Ft	W Ft					
45.590		6	14	6	12	6	14	26.7	W	48		4
58.141		9	14	9	3	9	14	31.0	W	36		6
TOTALS:								57.7		84		10

**PCC PAVEMENT REPAIR AREA TYPES**  
W = Two Working Joints (Use only if repair is full roadway width and uniform length (across all lanes))  
T = Two Tied Joints  
B = One Working & One Tied Joint  
R = Two Tied Joints with Original Joint Restored with Dowel Bar Assembly

**PLAIN  
ROUND  
DOWEL  
BARS  
Each**

**Ft**

TABLE FOR PCC PAVEMENT REPAIR

MRM	LANE	SB LANE		NB LANE		PCCP SqYds	NEW JOINT CON- FIG.	INSERT IN PCC 1" x 18" PLAIN ROUND DOWEL BARS Each	No. 8 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each	DOWEL BAR Each	TIE BAR RETROFIT STITCHING Each	TYPE A SPALL SIZE		REPAIR TYPE A SPALL SqFt	SEAL RANDOM CRACKS IN PCC PAVEMENT Ft
		L Ft	W Ft	L Ft	W Ft			L	W							
54.571		20	14	20	14	62.2	W	32		8						
54.582		12	14			18.7	B	8	8	4						
54.584		8	14	20	14	43.6	R	8	24	8	12					
54.594		10	14	10	14	31.1	W	32		4						
54.752																28
54.763																28
55.203		40	14	40	14	124.4	W	32		16	24					
55.294													12"	12"	1.00	
55.316													12"	12"	1.00	
55.336													12"	12"	1.00	
55.359													12"	12"	1.00	
55.381													12"	12"	1.00	
55.400													12"	12"	1.00	
55.442													24"	12"	2.00	
55.537													12"	12"	1.00	
55.587													24"	12"	2.00	
55.619													36"	12"	3.00	
55.713													12"	12"	1.00	
55.786													12"	12"	1.00	
55.800													12"	12"	1.00	
55.905													36"	12"	3.00	
55.990																14
56.439													24"	12"	2.00	
56.669													24"	24"	4.00	
56.710		40	14	40	14	124.4	W	32		16	24					
56.846													12"	24"	2.00	
57.569													12"	12"	1.00	
57.603													36"	24"	6.00	
57.848													12"	12"	1.00	
57.878													12"	12"	1.00	
57.993													36"	36"	9.00	
58.034													12"	24"	2.00	
58.076													24"	12"	2.00	
58.083													12"	24"	2.00	
58.098																26
58.158													12"	12"	1.00	
58.720													12"	12"	1.00	
58.811													12"	12"	1.00	
59.010		10	14			15.6	B	8	8	4						
59.707													12"	12"	1.00	
60.161													24"	12"	2.00	14
60.925													60"	12"	5.00	
62.030																28
62.120													36"	24"	6.00	
62.206		10	14	10	14	31.1	W	32		4						
62.262													36"	12"	3.00	
62.339													48"	12"	4.00	
62.394													24"	12"	2.00	
62.448													24"	24"	4.00	
62.489													24"	24"	4.00	
62.491													12"	12"	1.00	
62.552													12"	12"	1.00	
62.555													12"	60"	5.00	
62.591													12"	12"	1.00	
62.621													24"	12"	2.00	
62.662													48"	12"	4.00	

TABLE FOR PCC PAVEMENT REPAIR

MRM	LANE	SB LANE		NB LANE		PCCP SqYds	NEW JOINT CON-FIG.	INSERT IN PCC 1" x 18" PLAIN ROUND DOWEL BARS Each	No. 8 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each	DOWEL BAR Each	TIE BAR RETROFIT STITCHING Each	TYPE A SPALL SIZE		REPAIR TYPE A SPALL SqFt	SEAL RANDOM CRACKS IN PCC PAVEMENT Ft
		L Ft	W Ft	L Ft	W Ft								L	W		
62.670													24"	12"	2.00	
62.689													48"	12"	4.00	
62.895													12"	24"	2.00	
63.513		20	14			31.1	W	16		8						
63.519													36"	12"	3.00	
63.553													72"	12"	6.00	
63.562																40
63.579													12"	12"	1.00	
63.820													12"	12"	1.00	
63.908													24"	24"	4.00	
63.926		11	14	11	14	34.2	W	32		4						
64.134		14	14			21.8	B	8	8	5						
64.303												22				44
64.974		8	14	8	14	24.9	W	32		3						
64.987		7	14	7	14	21.8	W	32		3						
66.392													12"	12"	1.00	
66.494		10	14	10	14	31.1	W	27		4						
66.784		40	8			35.6	W	5		16	14					
69.425				10	14	15.6	B	8	8	4						
69.428												10				20
69.941													24"	12"	2.00	
69.948													24"	12"	2.00	
70.164												25				50
70.285				140	8.5	132.2	W	10		56	42					
70.471													12"	12"	1.00	
70.645													12"	12"	1.00	
70.672													12"	24"	2.00	
70.672													24"	12"	2.00	
70.688													24"	12"	2.00	
70.696													12"	12"	1.00	
71.030													24"	12"	2.00	
71.041													96"	12"	8.00	
71.077		8	14			12.4	B	8	8	3						
71.235		8	14			12.4	B	8	8	3						
71.342													48"	12"	4.00	
71.503													12"	12"	1.00	
71.902													12"	12"	1.00	
71.915													12"	12"	1.00	
TOTALS:		1215.6						602	128	226	189	57			277.0	398

**PCC PAVEMENT REPAIR AREA TYPES**  
W = Two Working Joints (Use only if repair is full roadway width and uniform length (across all lanes))  
T = Two Tied Joints  
B = One Working & One Tied Joint  
R = Two Tied Joints with Original Joint Restored with Dowel Bar Assembly



UTILITIES

The Contractor shall contact the involved utility companies through South Dakota One Call (1-800-781-7474) prior to starting work. It shall be the responsibility of the Contractor to coordinate work with the utility owners to avoid damage to existing facilities.

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

SCOPE OF WORK

This project consists of tie bar retrofit, spall repair, and full depth replacement of concrete pavement in areas where concrete pavement blowups or major failures have occurred. Full depth areas vary in length and width; however the minimum size is 6 feet square. Spall repairs shall have a minimum size of 12 inches square.

WHOOPING CRANE

The Whooping Crane is a spring and fall migratory bird in South Dakota that typically roosts overnight at a single location. If a Whooping Crane is sighted roosting in the vicinity of the project, borrow pit, or staging site associated with the project, notify the Environmental Project Scientist of the DOT Environmental Office at 605-773-3268 and cease construction activities in the affected area until the Whooping Crane departs.

HISTORICAL PRESERVATION OFFICE CLEARANCES

To obtain State Historical Preservation Office (SHPO) clearance, a cultural resources survey may need to be conducted by a qualified archaeologist. In lieu of a cultural resources survey, the Contractor could request a records search from Jim Donohue, State Archaeological Research Center (SARC). Provide SARC with the following: a topographical map or aerial view on which the site is clearly outlined, site dimensions, project number, and PCN. If applicable, provide evidence that the site has been previously disturbed by farming, mining, or construction activities with a landowner statement that no artifacts have been found on the site. The Contractor shall arrange and pay for the cultural resource survey and/or records search.

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

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

WASTE DISPOSAL SITE

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

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

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

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

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

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

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

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

Cost 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.

TRAFFIC COUNTER SENSORS

The State has traffic counter sensors in the existing pavement at MRM 56.511 in both Northbound and Southbound lanes.

Any damage to the traffic counter sensors shall be repaired at the Contractor's expense.

EXISTING PCC PAVEMENT

The existing pavement is 8" Nonreinforced PCC Pavement.

Existing contraction joints are spaced at approximately 20'. Longitudinal joints are reinforced with No. 5 x 30" deformed tie bars spaced 48" center to center. Transverse joints are reinforced with 1¼" x 18" plain round dowel bars spaced 12" center to center.

The aggregate in the existing PCC Pavement is quartzite.

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 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 prices per square yard for Fast Track Concrete for PCC Pavement Repair.

GRAVEL CUSHION

If quarried ledge rock is used in the Gravel Cushion, a maximum blend of 40% quarried ledge rock will be allowed.

NONREINFORCED PCC PAVEMENT REPAIR - GENERAL

Locations and size (length or width) of concrete repair areas are subject to change in the field, at the discretion of the Engineer, at no additional cost to the state. Payment will be based on 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.

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 will be at the original location. Any existing dowel bar assemblies/steel bars shall be sawed off and removed.

At full roadway width repairs and when specified, a working joint will be reconstructed at both ends of each pavement replacement area as shown in these plans.

Concrete placed adjacent to gravel and asphalt concrete shoulders shall be formed full depth to match the width of existing concrete pavement. Asphalt concrete shoulders adjacent to concrete pavement replacements shall be repaired with new hot-mix asphalt concrete.

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 Fast Track Concrete for PCC Pavement Repair.

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

**FAST TRACK CONCRETE FOR PCC PAVEMENT REPAIR**

New pavement thickness shall be 8”.

Fast Track Concrete shall be used at all full depth repair locations to ensure that the pavement repair area has obtained 3,800 psi by 7 a.m. the day after placement so it can be opened to traffic.

An initial cylinder shall be made and the Engineer shall calibrate a Swiss Hammer to it. All subsequent strength tests shall be by Swiss Hammer. Cylinders will be made according to Materials Manual requirements and the Swiss Hammer calibration regularly updated according to the early break cylinders.

The Engineer will test the repair areas after an initial 8 hour cure period by Swiss Hammer. If the area does not meet strength after the 8 hour cure period, the area will be tested every 2 hours until nightfall, then not again until 7 a.m. No section is to be opened to traffic without the permission of the Engineer.

The slump requirement prior to use of a set accelerator or super-plasticizer will be limited to 2" maximum. After the addition of all admixtures the maximum slump shall be 8" and the concrete shall contain 4.5% to 7.5% entrained air. The concrete 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 mix design shall contain at least 700 lbs. of Type I or II cement or 650 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 use of a set accelerator and/or super-plasticizer at manufacturer's recommended dosage will be required. Both admixtures shall be added at the project site.

Fast Track 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. In addition, the concrete shall be immediately covered with suitable insulation blanket consisting of a layer of closed cell polystyrene foam protected by at least one layer of plastic. The insulation blanket shall have an R value of at least 0.5, as rated by the manufacturer. Insulation blanket shall be overlapped on to the existing concrete by 4'. The insulation blanket shall be left in place, except for joint sawing operations, until 3,800 psi strength is attained.

The contraction joint sawing shall be performed as soon as possible after placement of concrete to avoid random cracking. Contraction joints shall be initially sawed to the plans detailed depth and to a width of 1/8”.

The concrete repair area shall be removed and replaced in the same day during daylight hours.

Once concrete is placed, if it does not achieve 3,800 psi prior to nightfall, the Contractor shall maintain traffic control and provide positive delineation on centerline until the Engineer determines that the 3,800 psi has been achieved.

**FAST TRACK CONCRETE FOR PCC PAVEMENT REPAIR (CONTINUED)**

If the concrete does not achieve 3,800 psi by 7 a.m. the day after placement, the Contractor shall provide all proper traffic control needed (at no cost to the State) until the Engineer determines the 3,800 psi has been obtained. No additional work zones will be set up until strength requirement is met. If strength requirement has not been met by 36 hours after placement, the patches shall be removed and replaced at no cost to the State.

Upon placement of the concrete, repair areas shall be straight edged to ensure a smooth riding surface and shall be textured longitudinally with the pavement by finishing with a stiff broom. Repair areas shall then be checked with a 10' foot straight edge. The permissible longitudinal and transverse surface deviation shall be 1/8” in 10’.

Cost for performing the aforementioned work including sawing and removing concrete, furnishing and placing Fast Track Concrete, sawing and sealing joints, repairing gravel and asphalt concrete shoulders, labor, tools and equipment shall be included in the contract unit price per square yard for Fast Track Concrete for 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 will be responsible for ordering the actual quantity of steel bars necessary to complete the work.

The Contractor shall insert the steel bars (1" x 18" epoxy coated plain round dowel bars and No. 8 x 18" epoxy coated deformed tie bars for transverse 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 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).

Steel bars shall be inserted in the transverse joint on 18" centers. The first steel bar in the transverse joint shall be placed 9" from the edge of the slab closest to centerline. Steel bars shall be inserted in the longitudinal joint on 30" centers and shall be a minimum of 15" from either transverse joint. A typical one-lane patch 14' wide and 6' long will require 20 steel bars (9 in each transverse joint and 2 in the longitudinal joint). It will be necessary to laterally adjust the location of some of the inserted steel bars when the dimensions above interfere with existing steel bar locations.

The diameter of the drilled holes in the existing concrete pavement for the steel bars shall not be less than 1/8 inch nor more than 3/8 inch greater than the overall diameter of the steel bar. Holes drilled into the existing concrete pavement shall be located at mid-depth of the slab and true and normal.

The drilled holes shall be blown out with compressed air using a device that will reach to the back of the hole to ensure that all debris or loose material has been removed prior to epoxy injection.

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

**STEEL BAR INSERTION (CONTINUED)**

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

Fill the drilled holes 1/3 to 1/2 full of epoxy, or as recommended by the manufacturer, prior to insertion of the steel bar. Care shall be taken to prevent epoxy from running out of the horizontal holes prior to steel bar insertion. Rotate the steel bar during insertion to eliminate voids and ensure complete bonding of the bar. Insertion by the dipping method will not be allowed. The epoxy shall start to gel before placing fresh concrete or as per manufacturer's recommendations if given.

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

**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 joints shall be sealed with Low Modulus Silicone Sealant. Longitudinal joints shall be sealed with Low Modulus Silicone Sealant or Hot Poured Elastic Joint Sealant.

Cost for sawing and sealing of the longitudinal construction joint and both transverse joints shall be incidental to the contract unit price per square yard for Fast Track Concrete for PCC Pavement Repair.



REPAIR TYPE A SPALLS

The Contractor shall saw an area a minimum of 12” x 12” and remove the material to a minimum depth of 1½” until sound concrete is found. After sawing the Contractor shall remove the vertical edge by chipping with a jackhammer not to exceed 15 lbs.

Spall repair locations will be marked in the field by the Engineer. Spall locations not large enough to be repaired will be marked for resealing.

Type A Spalls shall conform to Section 390 with the following exceptions:

The Contractor shall be advised that the Supplemental Specification to Standard Specifications for Roads and Bridges require that the concrete patching material shall be packaged, dry, rapid-hardening cementitious mortar or concrete materials conforming to the requirements of ASTM C928, Type R-3 and shall contain no chloride ions. If extender aggregate is used, it shall be crushed ledge rock conforming to Section 820. It will not be an option to use the concrete patch mixture as provided in Section 390 of the Standard Specifications.

Grout for bonding the concrete patching material to the existing concrete shall consist of equal parts by weight of Portland Cement and sand, mixed with sufficient water to form a thick slurry. A grout admixture shall be added to the grout mixture in accordance with the manufacturer’s recommendations.

Grout admixture shall be a one component acrylic bonding additive. The additive shall be one of the grout admixtures from the Approved Products List, or an approved equal as determined by the Office of Bridge Design. The bonding additive shall be compatible with the patching material as recommended by the manufacturer.

Grout shall be applied on all of the existing concrete surfaces within the removal area immediately prior to placement of the concrete patching material. Grout shall be scrubbed into the surface with a stiff bristle brush in a thin and uniform coat. Care shall be taken to ensure that excess grout does not collect in low areas, that the grout is confined only to the immediate area in which concrete patching material is to be placed, and that the rate of application is limited to an amount such that the grout will be covered with concrete patching material before the grout dries.

Concrete patching material shall be mixed and placed in accordance with the manufacturer’s technical data sheet. The Contractor shall provide a manufacturer’s technical data sheet to the Engineer prior to performing the work. The concrete patching material shall be maintained at or above 45°F (7°C) for at least 72 hours after placement.

Patched areas shall be wet cured for a minimum of 8 hours then sprayed with curing compound as per Section 390.

Repair areas can be opened to traffic once the repair material meets 3,800 psi as long as the above requirement for temperature can be met.

An initial cylinder shall be made and the Engineer shall calibrate a Swiss Hammer to it. All subsequent strength tests shall be by Swiss Hammer. Cylinders will be made according to Materials Manual requirements and the Swiss Hammer calibration regularly updated according to the early break cylinders.

The Engineer will test the repair areas after an initial 8 hour cure period by Swiss Hammer. If the area does not meet strength after the 8 hour cure period, the area will be tested every 2 hours until nightfall, then not again until 7 a.m. No section is to be opened to traffic without the permission of the Engineer.

REPAIR TYPE A SPALLS (CONTINUED)

Material used to form the joint shall be a foam core board or other stiff material capable of standing without deflection. The Contractor shall fill the area (with the foam core board or other approved material in place) with an approved patching material. The patching material shall be vibrated with a small hand held vibrator capable of thoroughly consolidating the patching compound into the area. The top surface of the filled area shall be trowel finished and cured.

After screeding and finishing, the same bonding grout shall be used to paint the edges of the repair. Any saw cuts that extend beyond the patch perimeter shall be filled with patching material and must also have the surface painted with bonding grout.

After removal of the form material, the repaired length of the joint(s) shall be sealed. Cost for removing the form material and sealing the joint(s) shall be incidental to contract unit price for Repair Type A Spalls.

Spalls which are repaired according to plans and specifications and exhibit partial respalling or cracking, shall be repaired to the satisfaction of the Engineer at no additional cost to the Department of Transportation.

If the concrete does not achieve 3,800 psi by 7 a.m. the day after placement, the Contractor shall provide required traffic control (at no cost to the State) until the Engineer determines the 3,800 psi has been obtained. No additional work zones will be set up until strength requirement is met. If strength requirement has not been met by 36 hours after placement, the patches shall be removed and replaced at no cost to the State.

**TIE BAR RETROFIT, STITCHING**

Tie Bar Retrofit, Stitching shall be done on longitudinal random cracks as marked out by the Engineer. Locations may also be identified along the longitudinal joint.

The Contractor shall insert No. 5 epoxy coated deformed tie bars into drilled holes in the existing concrete pavement. An epoxy resin adhesive must be used to anchor the steel bar in the drilled hole. . A rotary drill or other approved drill shall be used that will not damage the concrete surface. The diameter of the disturbed surface from drilling shall be less than 2 inches. A rigid frame or mechanical device will be required to guide the drill to ensure the proper angle of the steel bars in the drilled holes.

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 pavement for the steel bars shall not be less than 1/8 inch nor more than 3/8 inch greater than the overall diameter of the steel bar. The holes shall be drilled at an angle alternating from opposite sides of the joint to produce a cross-stitching pattern. 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. Damage to pavement shall be repaired to the satisfaction of the Engineer at the Contractor’s expense.

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

TIE BAR RETROFIT, STITCHING (CONTINUED)

Fill the drilled holes sufficiently with epoxy prior to the insertion of the tie bar such that the epoxy will be level with the top of the concrete pavement after insertion of the tie bar. Rotate the steel bar during insertion to eliminate voids and ensure complete bonding of the bar. Insertion of the bars by the dipping method will not be allowed. The top of the drilled hole shall be filled with epoxy or excess epoxy removed such that the epoxy is level with the existing pavement.

No bars shall be inserted within 15” of an existing transverse contraction joint. Any bars not functioning or damaged shall be repaired or replaced at the Contractor’s expense.

Cost for the epoxy resin adhesive, tie bars, drilling of holes, debris or loose material removal, applying the adhesive, inserting the tie bars into the drilled holes and incidentals necessary for the insertion of the tie bars shall be included in the contract unit price per each for Tie Bar Retrofit, Stitching.



SEAL RANDOM CRACKS IN PCC PAVEMENT

Random cracks shall be repaired in accordance with the detail for Sealing Random Cracks. Reservoir dimensions may vary slightly from the details, due to the nature of this operation. However, any variance due to Contractor negligence will be repaired at the Contractor's expense.

Only those random cracks in the existing concrete pavement that are open and accept water and incompressible materials as selected by the Engineer shall be prepared and sealed with Low Modulus Silicone Sealant.

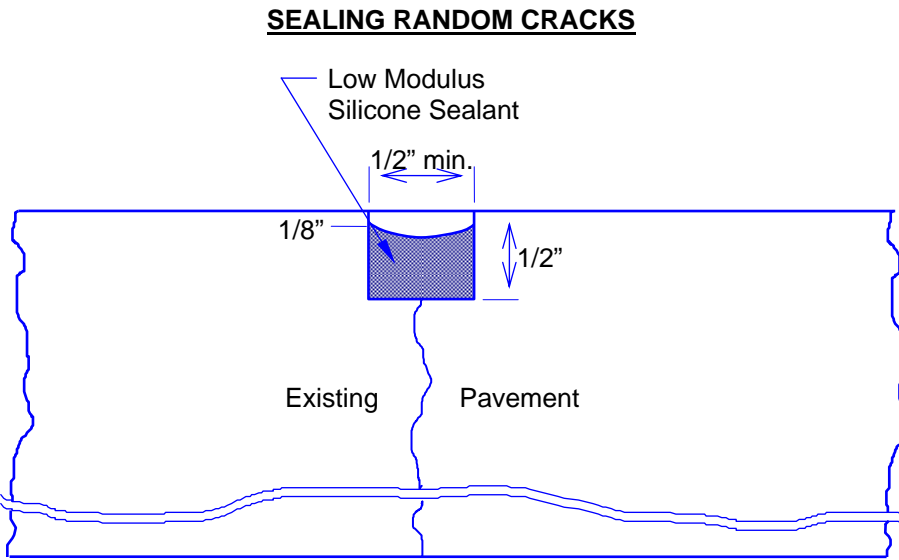
Prior to sealing, each random crack shall be routed and thoroughly cleaned with compressed air or by other methods satisfactory to the Engineer. Routing shall be performed with a saw designed for that purpose.

Random cracks narrower than 1/2 inch shall be routed and sealed 1/2 inch wide by 1/2 inch deep. Random cracks wider than 1/2 inch may require the placement of a backer rod prior to sealing.

Sealant shall be placed in the routed reservoir with equipment and by methods that insure complete and uniform filling. Sealant shall be placed level with the driving surface of the concrete. Low Modulus Silicone Sealant shall have a tooled surface with the top middle portion of the sealant recessed. Any excess or overrun of sealant shall be removed by the Contractor at no additional cost to the state.

Seal Random Cracks in PCC Pavement will be measured by the foot to the nearest 0.1 foot of random cracks sealed and accepted on the project.

Seal Random Cracks in PCC Pavement will be paid for at the contract unit price per foot measured for payment. Payment shall be full compensation for all labor, equipment, material and incidentals required for crack routing, cleaning, furnishing and installing backer rod when necessary, furnishing and placing sealant and removing routed and foreign material from the roadway.



REPAIR OF ASPHALT CONCRETE SHOULDERS

Cost for asphalt concrete required on the shoulder adjacent to full depth pavement replacement sections that are not in areas where traffic has damaged the shoulder shall be incidental to the contract unit price per square yard for Fast Track Concrete for PCC Pavement Repair.

GENERAL MAINTENANCE OF TRAFFIC

Removing, relocating, covering, salvaging and resetting of permanent 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.

Storage of vehicles and equipment shall be outside the clear zone and as near as possible to the right-of-way line. 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.

Routing traffic onto the shoulders during any phase of the construction will not be allowed.

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

Sufficient traffic control devices have been included in these plans to sign one flagger controlled workspace and two stop controlled workspaces. If the Contractor elects to work on additional sites simultaneously, the cost for additional traffic control devices shall be incidental to the contract unit price per unit for Traffic Control. Only one flagger controlled workspace will be allowed at any given time.

MAINTENANCE OF TRAFFIC – PCC PAVEMENT REPAIR

A Type III Barricade shall be installed at the end of a lane closure taper as detailed in these plans. Additional Type III Barricades shall be installed facing traffic within the closed lane at a spacing of 1/4 mile. At intersecting roadways, two additional Type III Barricades shall be used to block the entire closed lane and shoulder.

Channelizing devices shall be placed on centerline at the spacing shown in the standard plate. Channelizing devices shall be required in all work spaces.

Each mainline concrete repair location from which the in place concrete has been removed shall be marked with a minimum of two reflectorized cones (42" minimum height) or two reflectorized drums. In areas containing numerous concrete repair locations, two reflectorized drums should be installed at a spacing of 660' alternating with the Type III Barricades.

Signs may be mounted on portable supports.

PCC Pavement Repair is intended to be completed during the daytime and concrete cured overnight. See notes for Fast Track Concrete for PCC Pavement Repair in these plans.

Drivers in one lane two-way traffic stop controlled workspaces must be able to see approaching traffic through and beyond the workspaces.

The distance between the closest points of any two construction workspaces, including channeling devices, shall not be less than 3 miles. Flagger controlled workspaces shall be limited to 2 miles in length.

When work is in progress within an intersection, Flaggers will be required to direct traffic.

MAINTENANCE OF TRAFFIC – PCC PAVEMENT REPAIR (CONTINUED)

The Contractor shall use Flaggers during peak traffic hours and at times specified by the Engineer to supplement the stop condition and signing shown on Standard Plate 634.25. It is possible that Flagging will be required during all daytime hours. Advance warning Flagger signs will be required when Flaggers are present and removed when no Flaggers are present.

Damage to the shoulders, median or ditch due to the Contractor's operations shall be repaired by the Contractor, to the satisfaction of the Engineer, at no expense to the State. This includes the apparent routing of traffic onto these shoulders around the work zones.

Extra care shall be taken to protect the in place asphalt concrete shoulders between Parkston and Mitchell. In all workspaces in these areas, the same channelizing devices and spacing used on centerline will also be required on the shoulders. These channelizing devices shall be placed in locations to adequately keep traffic completely off these shoulders. Continuous maintenance of the shoulder devices will be required to keep them in place. Cost for these extra channelizing devices shall be incidental to the contract lump sum price for Traffic Control Miscellaneous.

Type B warning lights shall be placed on top of flagging station signing as per Section 634.3A and shall comply with the MUTCD. This shall be incidental to the contract lump sum price for Traffic Control Miscellaneous.

The Contractor shall notify businesses/home owners a minimum of two weeks prior to construction to inform them of upcoming construction and again a minimum of 48 hours prior to any blocked access to make appropriate arrangements.

It is required that the flaggers and pilot car operators all have radio or telephone contact with one another. This equipment is to be used to assist with traffic movement and in the event that an emergency vehicle needs to pass through the project in an expedient manner. Cost associated with this shall be incidental to the contract lump sum price for Traffic Control Miscellaneous.

Two additional sets of flagger warning signs and additional flagger hours have been included in the Estimate of Quantities for use on intersecting roads. These flaggers will be used as directed by the Engineer and will be used primarily during daytime hours. Also included in the Estimate of Quantities are SD37 ONE LANE ROAD WAIT FOR PILOT CAR signs for use on intersecting roads. These signs shall be mounted on 6' barricades and placed at the stop sign.

Traffic approaching the project from intersecting roadways, streets and approaches must be adequately accommodated. Major intersections or large commercial entrances may require additional signing, flaggers and channelizing devices on a temporary basis until work activities pass these areas.

Work activities (not including flagging and pilot car) during nondaylight hours are subject to prior approval.

A minimum roadway width of 16 feet shall be maintained throughout the project at all times.

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 pavement in rural areas. Portable sign supports may be used as long as the duration is less than 3 days. If the duration is more than 3 days the signs shall be on fixed location, ground mounted, breakaway supports.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	037-252	10	21

**LIGHTING FOR NIGHT TIME WORK**

Flagger stations, working construction equipment and active workspaces shall be lighted between sunset and sunrise. Nonglare light sources are to be provided.

Light levels as defined in NCHRP 476 shall be furnished and measured as:

- Level I: 59 lux (5 foot-candles),
- Level II: 108 lux (10 foot-candles),
- Level III: 215 lux (20 foot-candles).

Light in conformance with Level I is to be provided at the active workspaces.

Acceptable light sources for Level I are existing roadway lighting that produce 59 lux (5 foot-candles), Contractor furnished standalone lights, or vehicle/equipment mounted lights. Standalone units shall be marked with a minimum of two reflectorized drums on an approaching traffic side.

Light in conformance with Level II shall be provided at the locations of working construction equipment.

Light in conformance with Level III is to be provided where labor intensive work is being completed such as during hand work, pavement sawing, project inspection, materials testing and flagging.

Acceptable light sources for Level II and Level III will be Contractor furnished stand-alone lights or vehicle/equipment mounted lights.

Cost for this lighting shall be included in the contract lump sum price for Traffic Control Miscellaneous.

**DAKOTAFEST**

No work will be allowed within 2 miles of Spruce Street in Mitchell from August 20 through August 22, 2013.

PLOT SCALE - 1:11900

PLOTTED FROM - TRM11.025

# TRAFFIC CONTROL

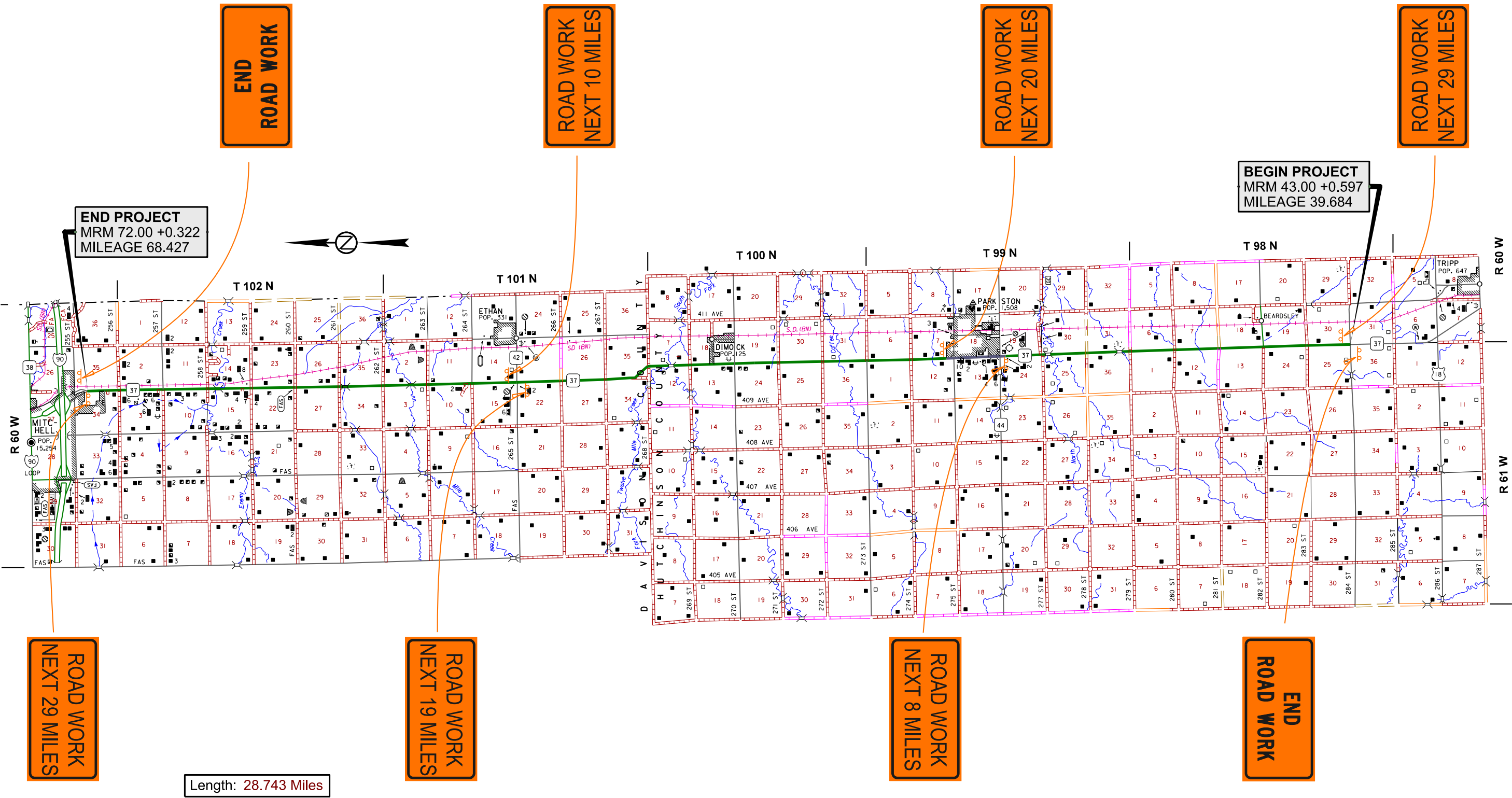
FIXED LOCATION SIGNS  
(GROUND MOUNTED SUPPORTS)

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	037-252	11	21

Plotting Date: 04/22/2013

PLOT NAME - 1

FILE - J:\TRAVIS H\12W3\PERM SIGNS.DGN

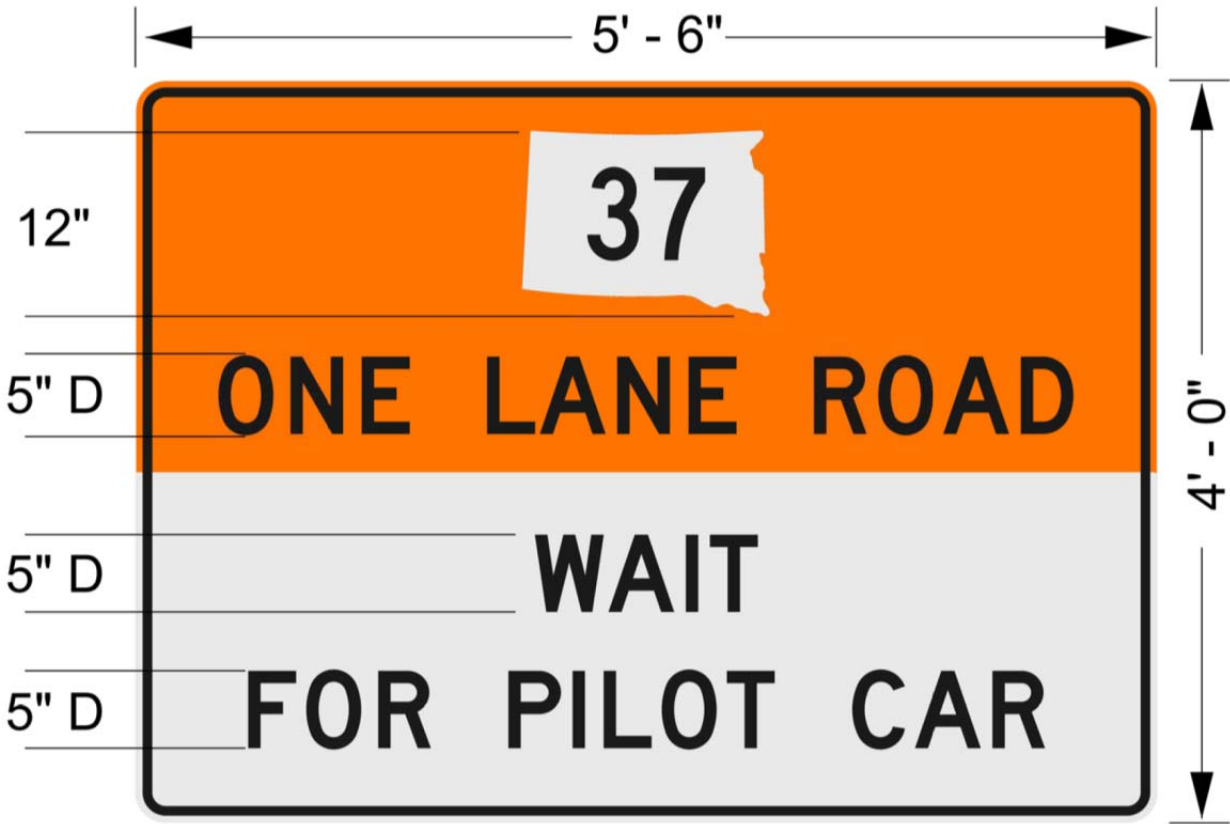


Length: 28.743 Miles

ITEMIZED LIST FOR TRAFFIC CONTROL

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
G20-1	48" x 24"	ROAD WORK NEXT 29 MILES	2	24	48
G20-1	48" x 24"	ROAD WORK NEXT 20 MILES	1	24	24
G20-1	48" x 24"	ROAD WORK NEXT 19 MILES	1	24	24
G20-1	48" x 24"	ROAD WORK NEXT 10 MILES	1	24	24
G20-1	48" x 24"	ROAD WORK NEXT 8 MILES	1	24	24
G20-2	36" x 18"	END ROAD WORK	2	17	34
R1-1	48" x 48"	STOP	4	34	136
W1-4	48" x 48"	REVERSE CURVE SIGN (LEFT OR RIGHT)	2	34	68
W3-1	48" x 48"	STOP AHEAD (SYMBOL)	4	34	136
W20-1	48" x 48"	ROAD WORK AHEAD	10	34	340
W20-4	48" x 48"	ONE LANE ROAD AHEAD	6	34	204
W20-7a	48" x 48"	FLAGGER	6	34	204
SPECIAL	66" x 48"	SD 37 ONE LANE ROAD - WAIT FOR PILOT CAR	4	41	164
*****	*****	TYPE III BARRICADE - 6 FT. DOUBLE SIDED	4	42	168
*****	*****	TYPE III BARRICADE - 8 FT. DOUBLE SIDED	15	56	840
TOTAL UNITS					2438

SPECIAL SIGNING DETAIL





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

- Flagger  
■ Channelizing Device

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

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

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

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

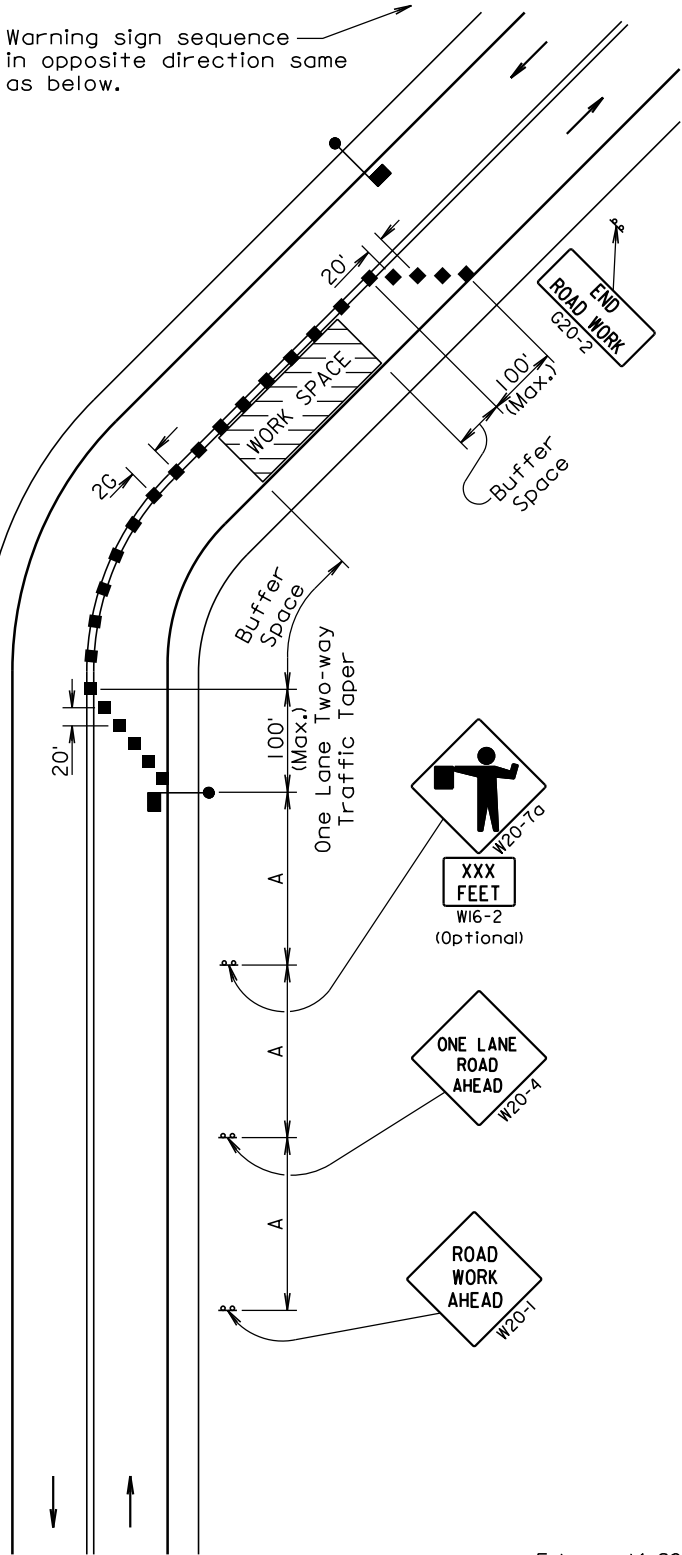
The channelizing devices shall be drums or 42" cones.

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

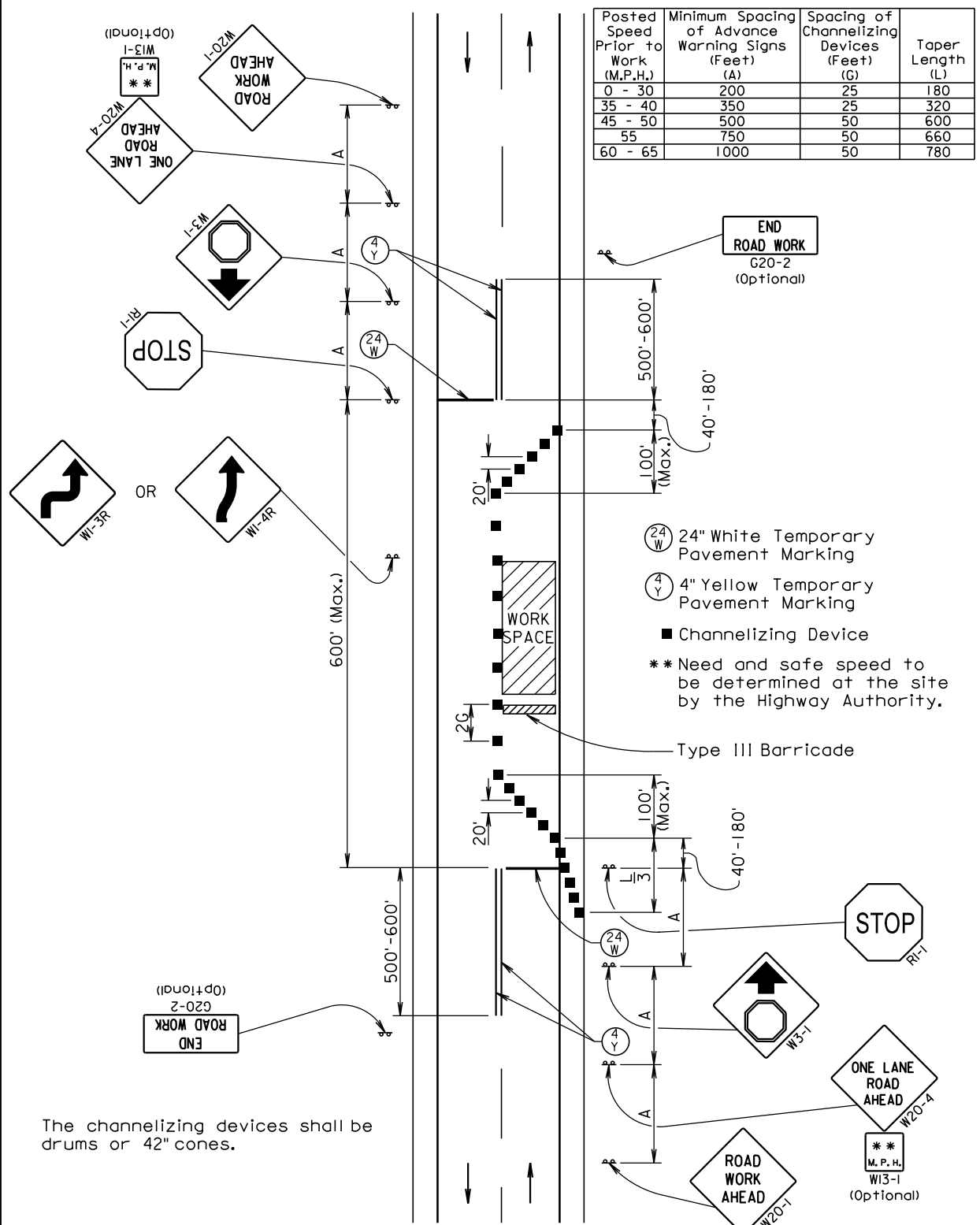
Channelizing devices and flaggers shall be used at intersecting roads to control intersecting road traffic as required.

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

Warning sign sequence in opposite direction same as below.



February 14, 2011



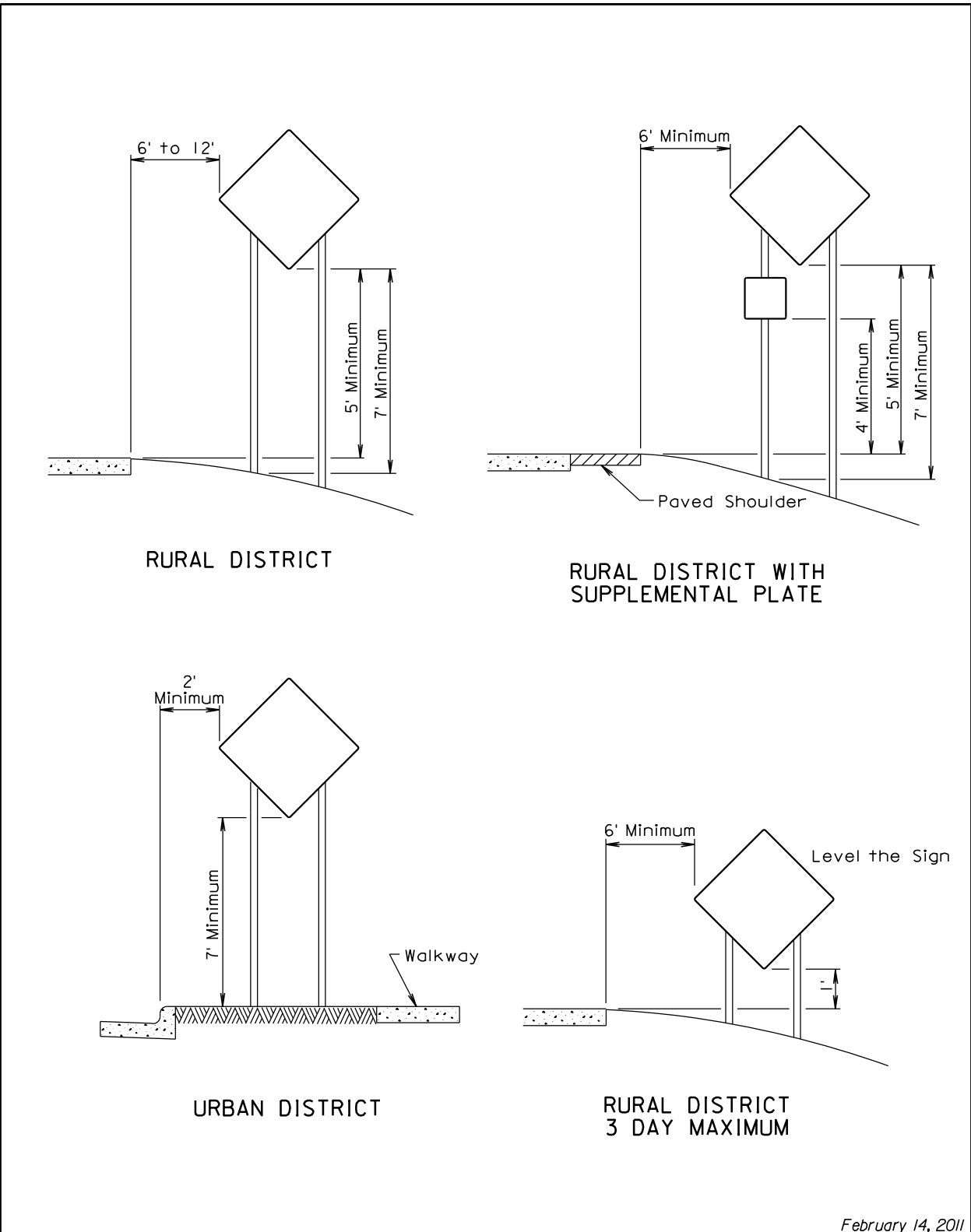
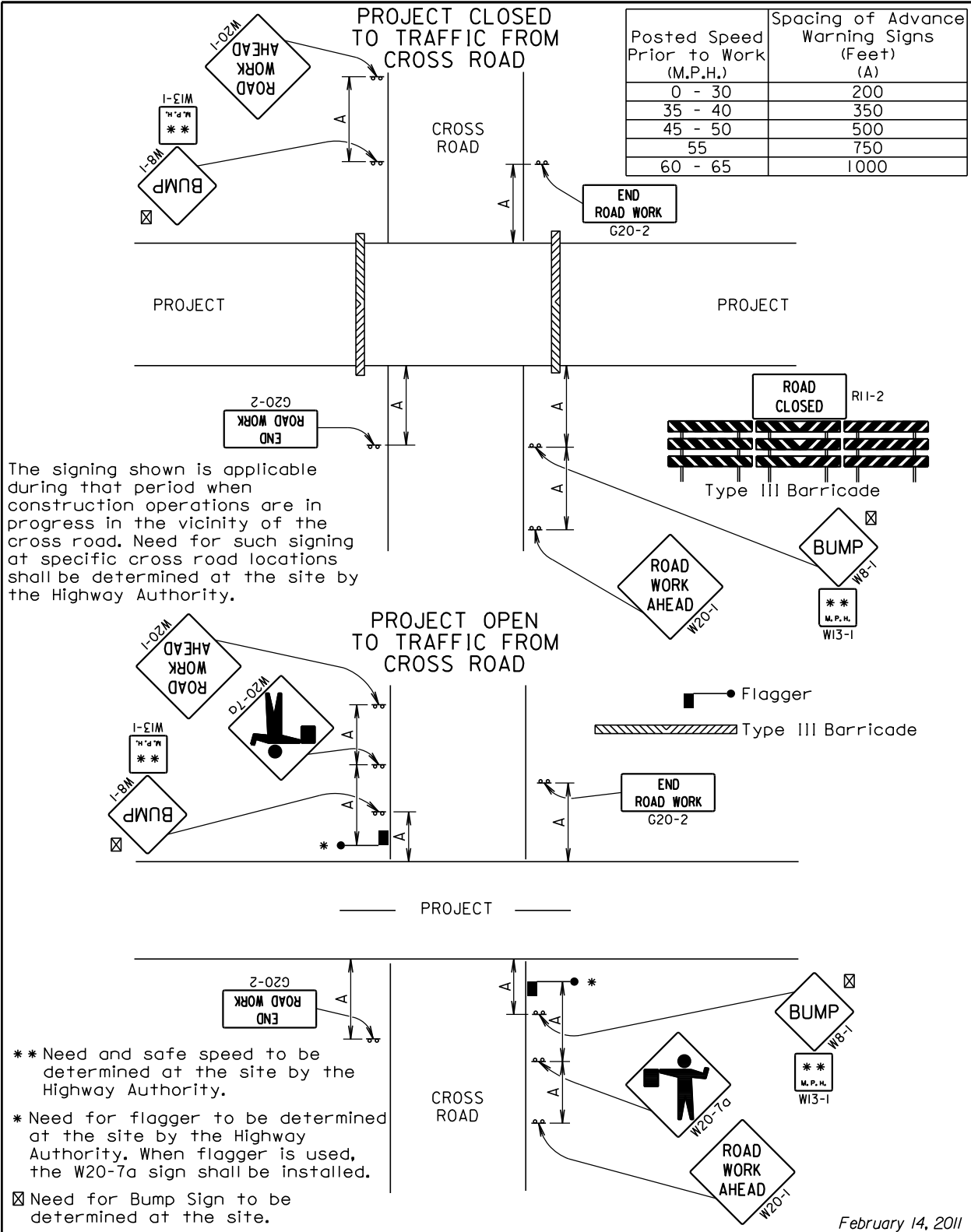
The channelizing devices shall be drums or 42" cones.

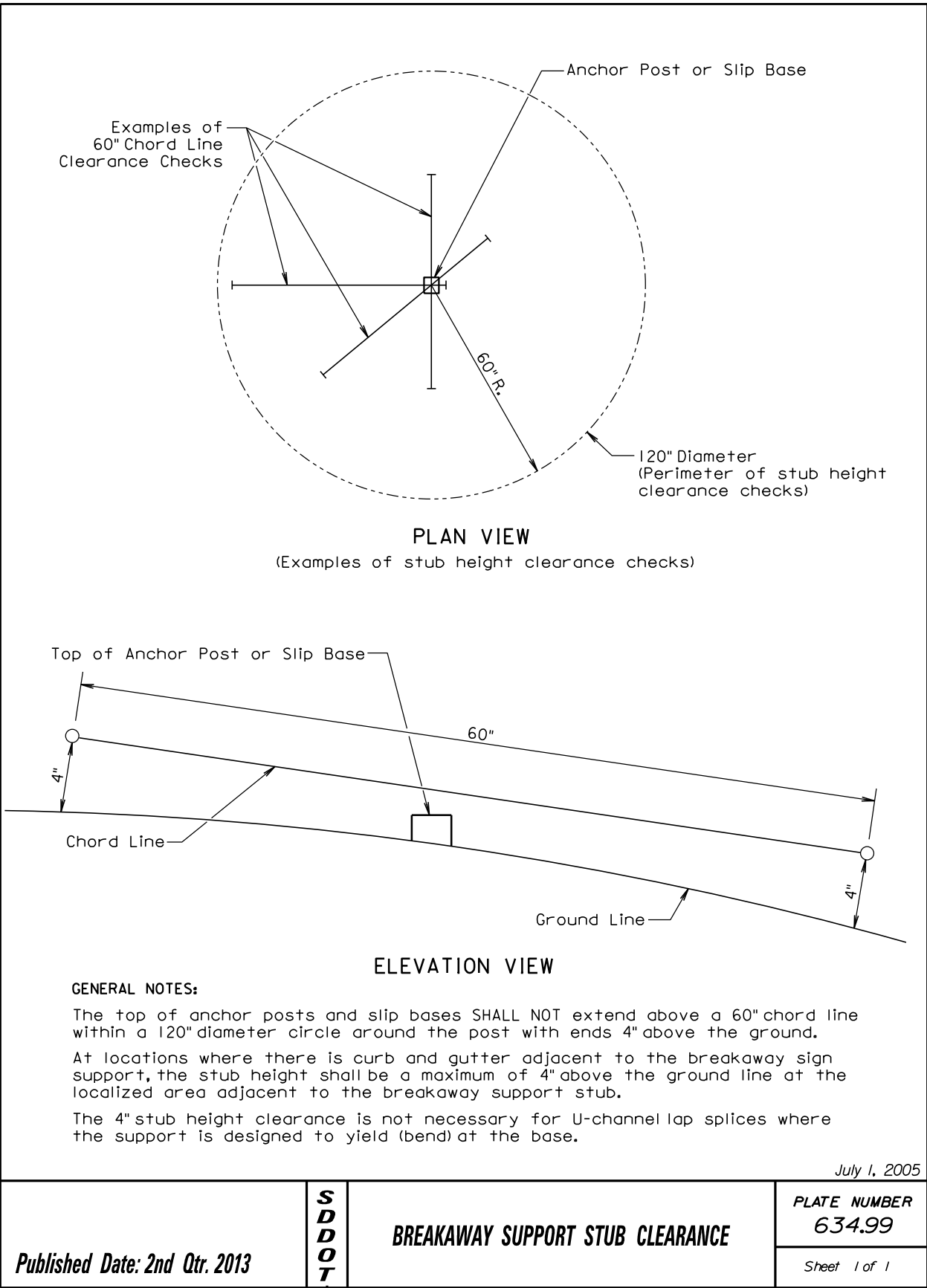
Posted Speed Prior to Work (M.P.H.)	Minimum Spacing of Advance Warning Signs (Feet) (A)	Spacing of Channelizing Devices (Feet) (G)	Taper Length (L)
0 - 30	200	25	180
35 - 40	350	25	320
45 - 50	500	50	600
55	750	50	660
60 - 65	1000	50	780

- ②④ W 24" White Temporary Pavement Marking  
④ Y 4" Yellow Temporary Pavement Marking  
■ Channelizing Device  
\*\* Need and safe speed to be determined at the site by the Highway Authority.

Type III Barricade

December 23, 2010



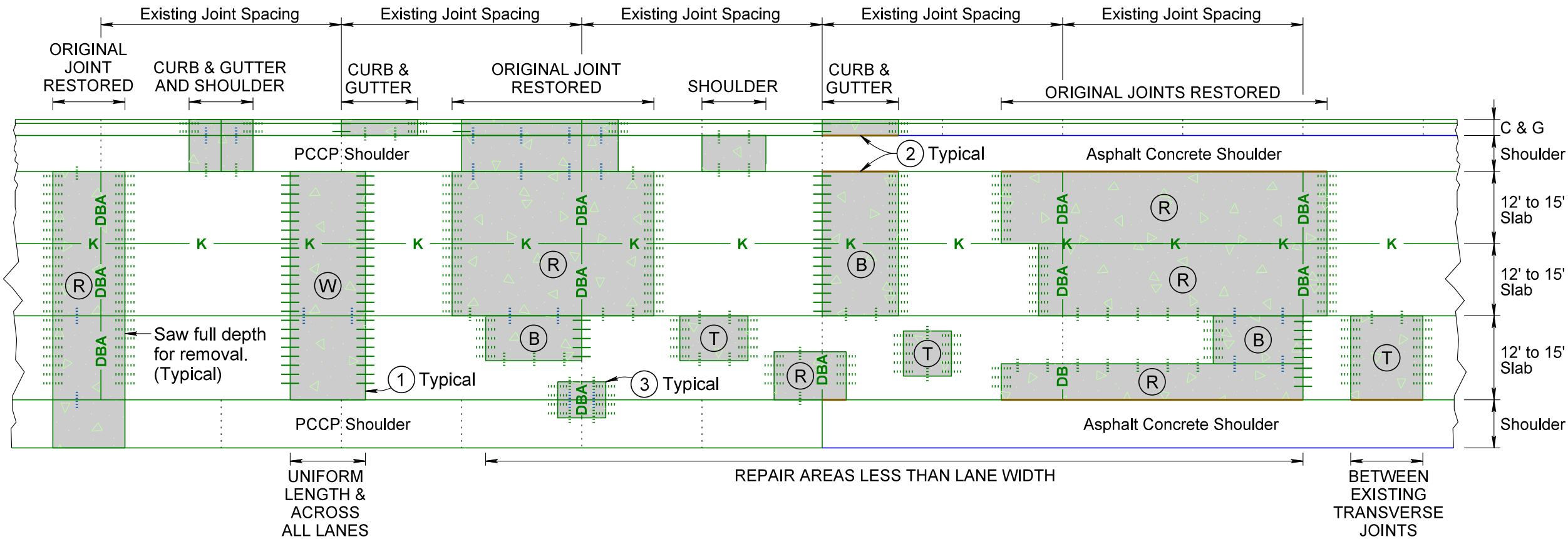


# NONREINFORCED PCC PAVEMENT REPAIR

UP TO TWO LANE ROADWAY WITH CENTER LANE OR UP TO SIX LANE DIVIDED ROADWAY  
TYPICAL REPAIR AREAS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	037-252	16	21

Plotting Date: 05/23/2013



**KEY:**

 PCC Pavement Repair Area

**PCC PAVEMENT REPAIR AREA TYPES:**

- (W) Two Working Joints (Use only if repair is full roadway width and uniform length (across all lanes))
- (T) Two Tied Joints
- (B) One Working & One Tied Joint
- (R) Two Tied Joints with Original Joint Restored with Dowel Bar Assembly

**Longitudinal Keyway Joints Without Bars**

— K — Where a repair area intersects an existing longitudinal keyway joint without tie bars, the newly constructed joint should also be a keyway without tie bars.

**Steel Bars for Transverse Joints**

**Pavement Thickness  $\geq 10.5$ "**

— Drilled in  $1\frac{1}{2}$ " x 18" epoxy coated plain round dowel bars spaced 18" center to center.

..... Drilled in No. 11 x 18" epoxy coated deformed tie bars spaced 18" center to center.

**Pavement Thickness  $\geq 8.5$ " and  $< 10.5$ "**

— Drilled in  $1\frac{1}{4}$ " x 18" epoxy coated plain round dowel bars spaced 18" center to center.

..... Drilled in No. 9 x 18" epoxy coated deformed tie bars spaced 18" center to center.

**Pavement Thickness  $< 8.5$ "**

— Drilled in 1" x 18" epoxy coated plain round dowel bars spaced 18" center to center.

..... Drilled in No. 8 x 18" epoxy coated deformed tie bars spaced 18" center to center.

DBA Dowel Bar Assembly

**Steel Bars for Longitudinal Joints**

..... No. 5 x 30" epoxy coated deformed tie bars.  
Sawed Joint - spaced 48" center to center.  
Construction Joint - spaced 48" center to center.

..... No. 5 x 24" epoxy coated deformed tie bars.  
Drilled In - spaced 30" center to center.

**NOTES:** Saw around repair areas full depth for removal.

- ① Where possible, transverse joints shall be constructed/maintained full roadway width.
- ② Edges of repair areas shall be formed to match the width of the existing concrete pavement.
- ③ Need for bars in small repair areas on/near the shoulder to be determined on a case-by-case basis, on construction by the Engineer.

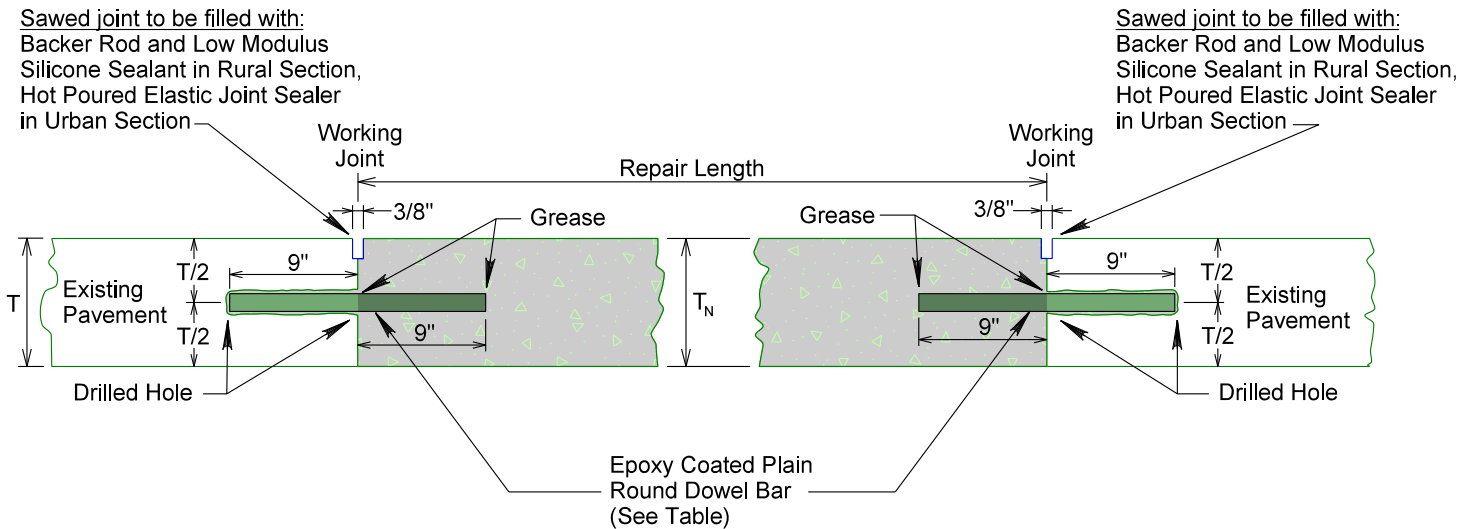


NONREINFORCED PCC PAVEMENT REPAIR

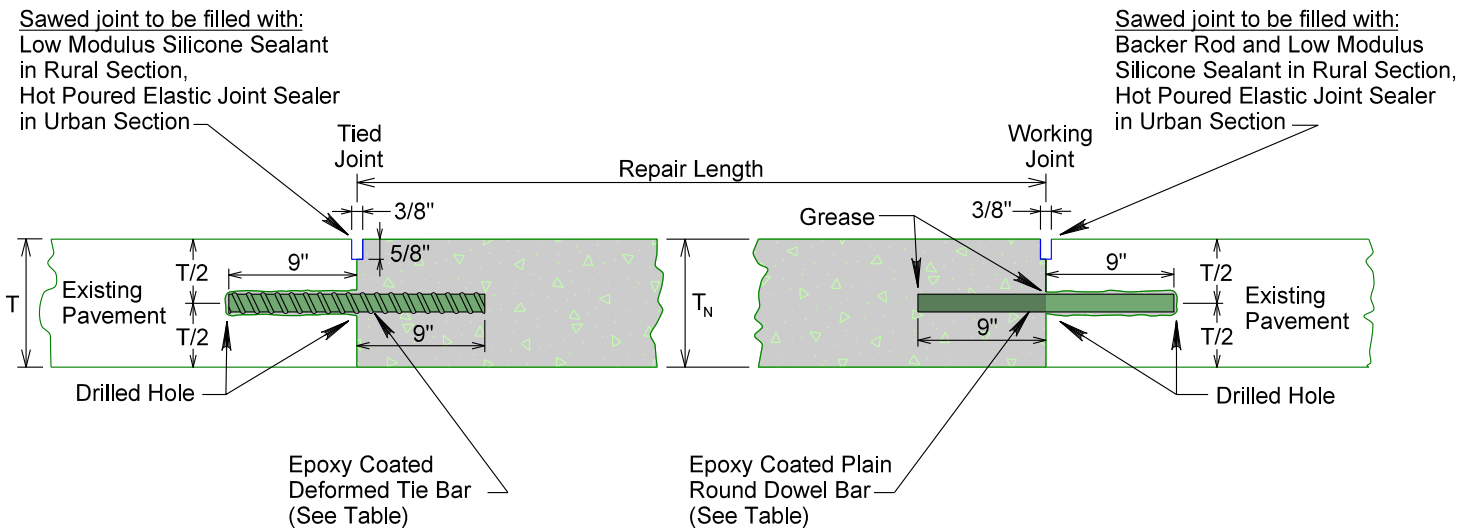
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	037-252	17	21

Plotting Date: 05/23/2013

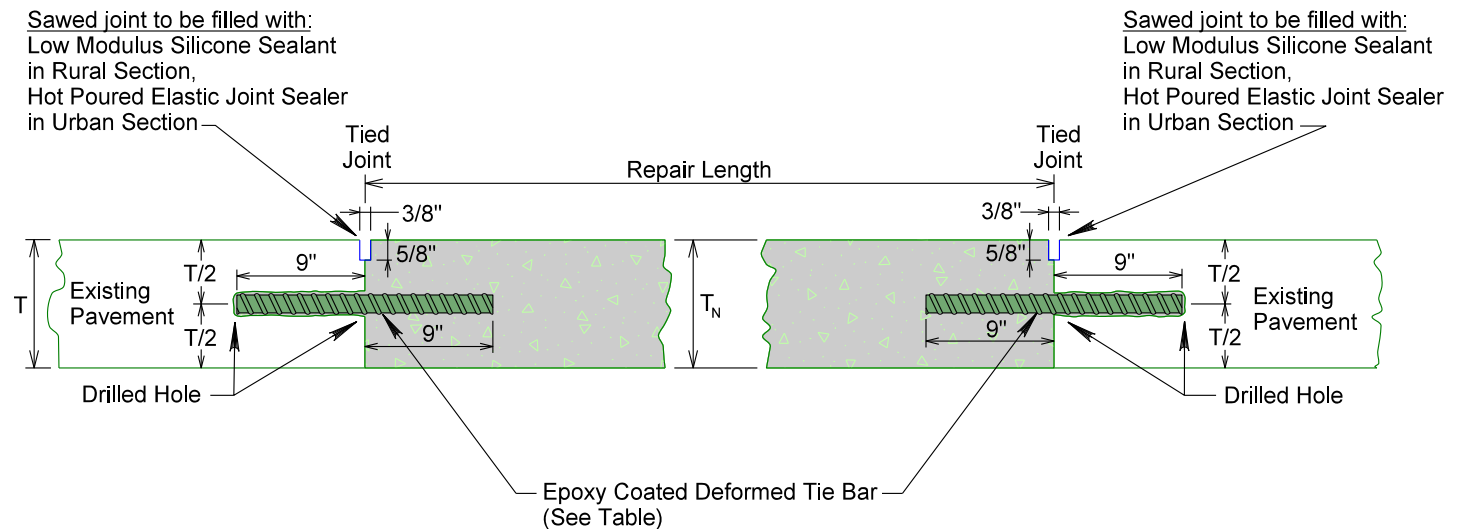
PLAIN ROUND DOWEL BAR INSERTION  
TYPE W - (TWO WORKING JOINTS)



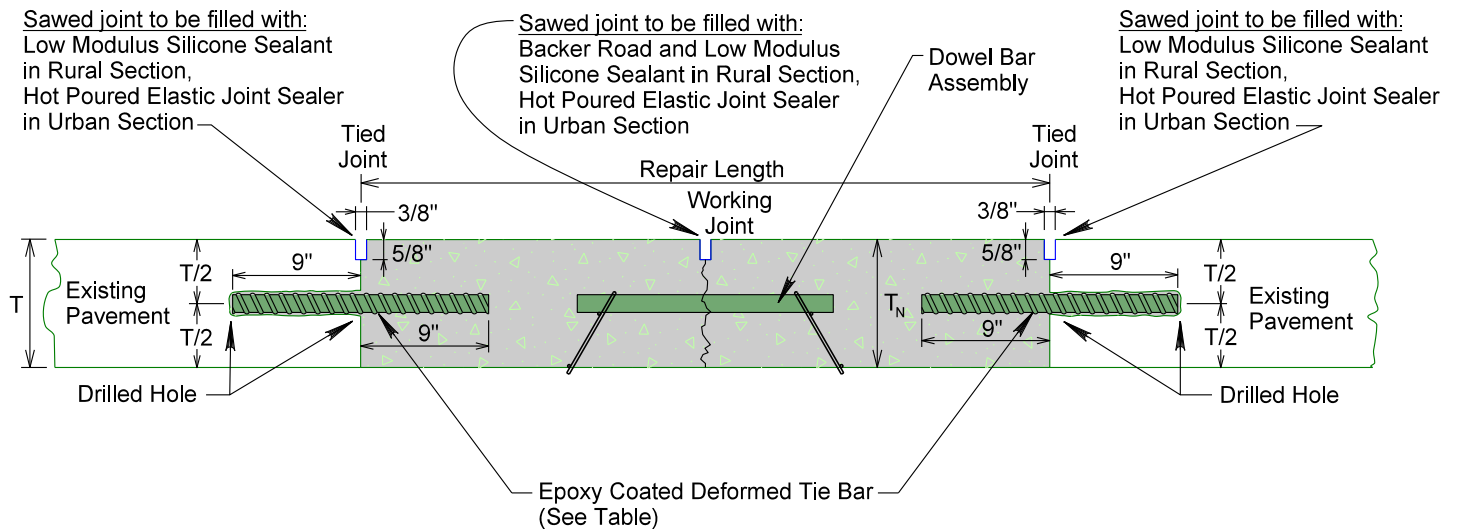
DEFORMED TIE BAR AND PLAIN ROUND DOWEL BAR INSERTION  
TYPE B - (ONE TIED JOINT AND ONE WORKING JOINT)



DEFORMED TIE BAR INSERTION  
TYPE T - (TWO TIED JOINTS)



DEFORMED TIE BAR INSERTION WITH DOWEL BAR ASSEMBLY  
TYPE R - (TWO TIED JOINTS AND ONE WORKING JOINT - ORIGINAL JOINT RESTORED)



Existing Pavement Thickness	Epoxy Coated Deformed Tie Bar Size	Epoxy Coated Plain Round Dowel Bar Size
T ≥ 10.5"	No. 11 x 18"	1½" x 18"
T ≥ 8.5" & T < 10.5"	No. 9 x 18"	1¼" x 18"
T < 8.5"	No. 8 x 18"	1" x 18"

T = Existing pavement thickness.  
T<sub>N</sub> = New pavement thickness.

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

Cost for furnishing and inserting steel bars (deformed tie and plain round dowel) shall be included in the contract unit price per each for Insert Steel Bar in PCC Pavement.

Cost for furnishing and installing dowel bar assembly shall be included in the contract unit price per each for Dowel Bar.

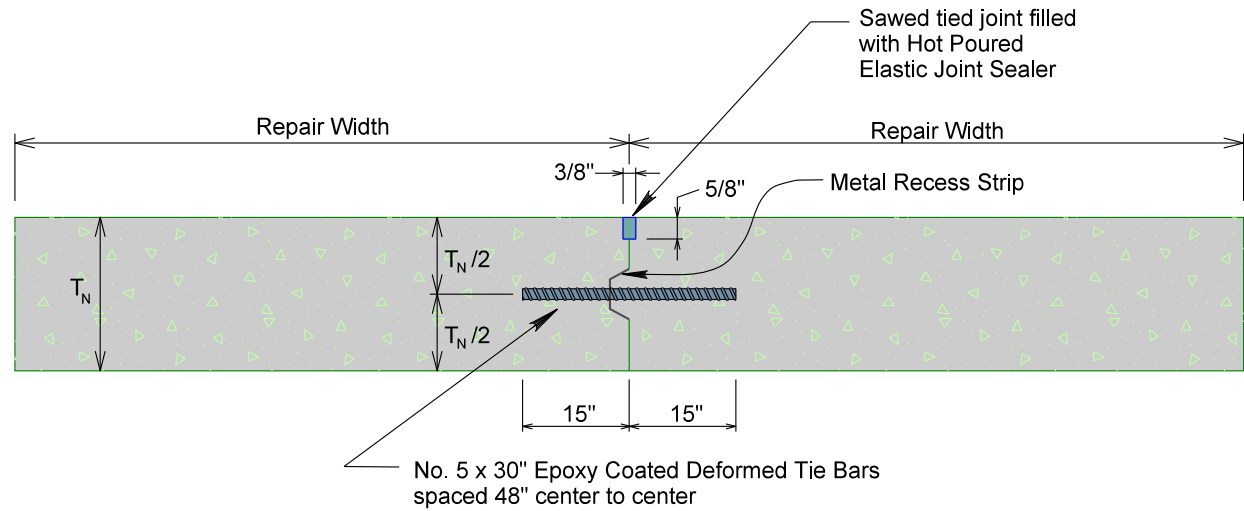
For T ≥ 8.5", T<sub>N</sub> = T  
For T < 8.5", T<sub>N</sub> = T + 1"  
(top of new pavement shall be flush with top of existing pavement)

# NONREINFORCED PCC PAVEMENT REPAIR

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	037-252	18	21

Plotting Date: 05/23/2013

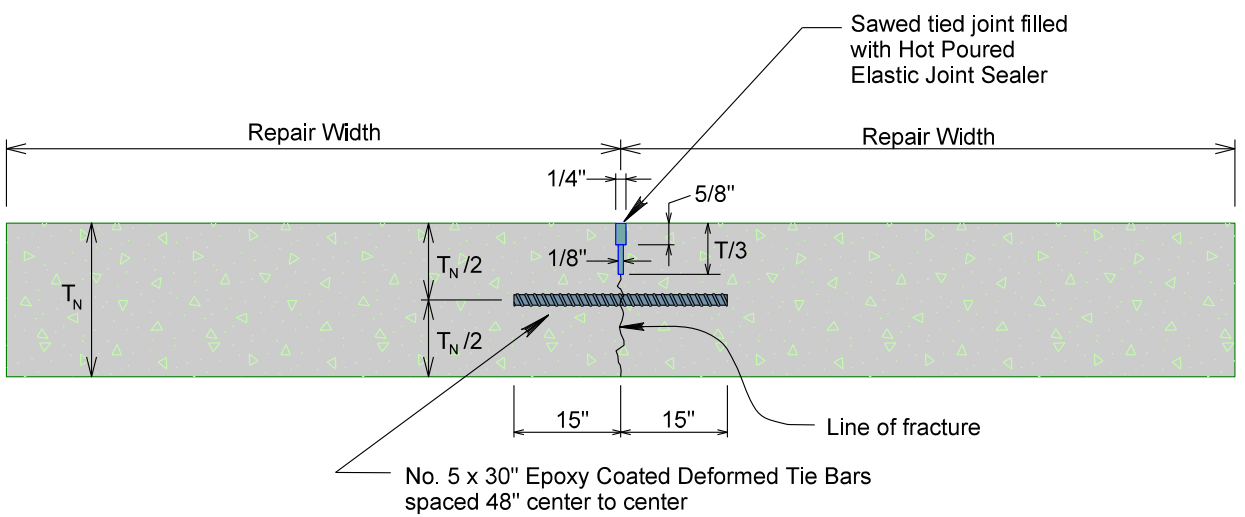
## LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS & KEYWAY



$T_N$  = New pavement thickness.

Cost for furnishing and inserting tie bars shall be incidental to the contract unit price per square yard for Fast Track Concrete for PCC Pavement Repair.

## SAWED LONGITUDINAL JOINT

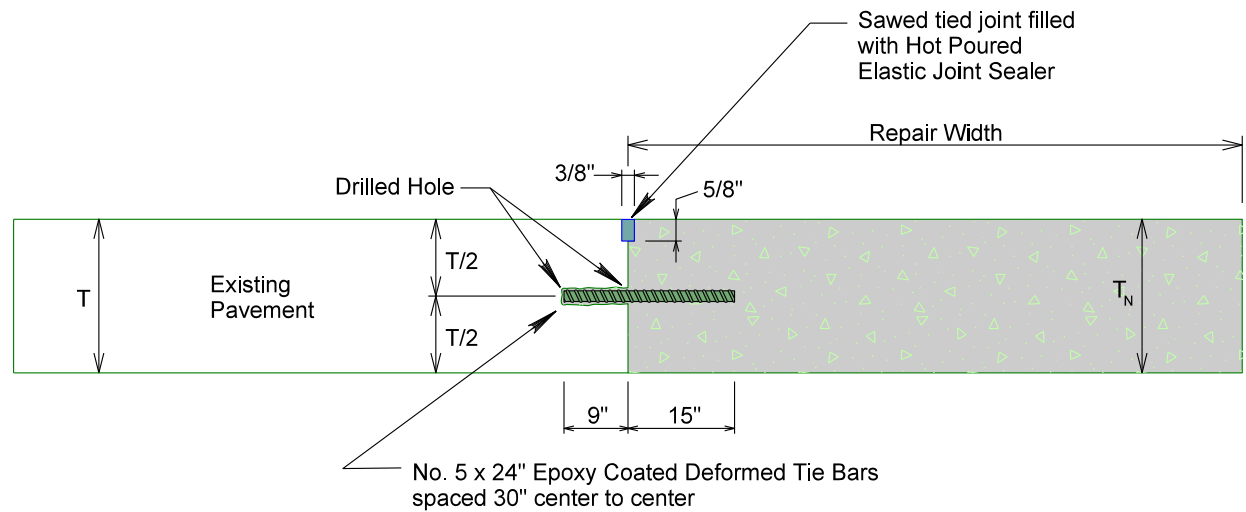


$T_N$  = New pavement thickness.

The first saw cut to control cracking shall be a minimum of 1/3 the depth of the pavement. Additional sawing for widening the saw cut will be necessary.

Cost for furnishing and inserting tie bars shall be incidental to the contract unit price per square yard for Fast Track Concrete for PCC Pavement Repair.

## LONGITUDINAL CONSTRUCTION JOINT WITH DRILLED IN TIE BARS



$T$  = Existing pavement thickness.

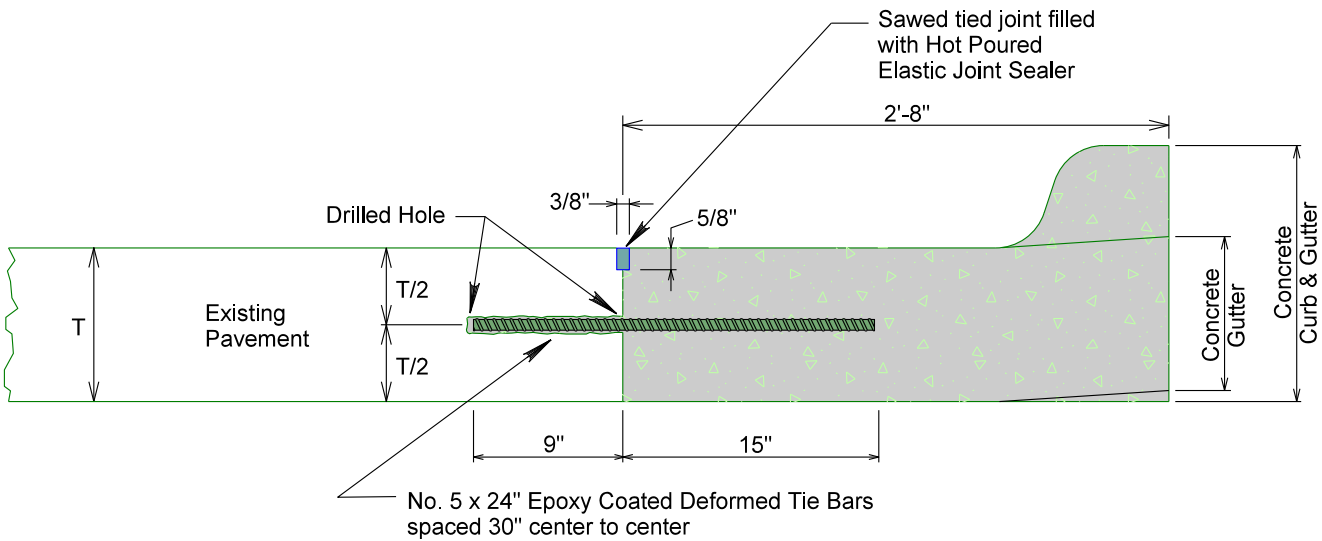
$T_N$  = New pavement thickness.

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 joints.

Cost for furnishing and inserting drilled in tie bars shall be included in the contract unit price per each for Insert Steel Bar in PCC Pavement

## LONGITUDINAL CONSTRUCTION JOINT WITH DRILLED IN TIE BARS



$T$  = Existing 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 joints.

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

PLOT SCALE - 1:11.25

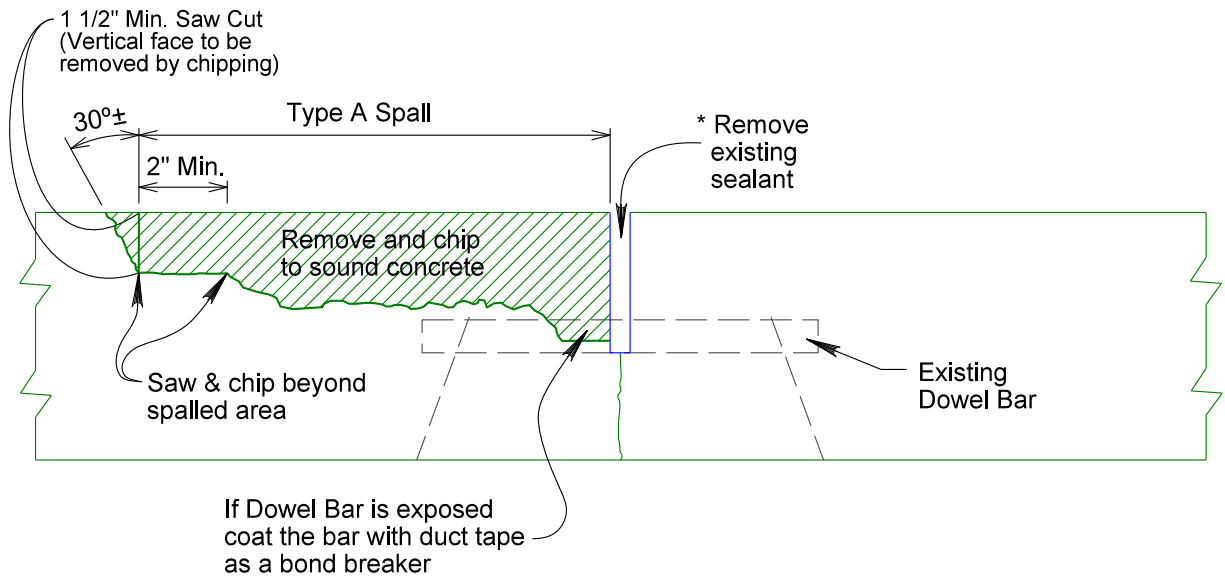
PLOTTED FROM - TRM11115

PLOT NAME - 1

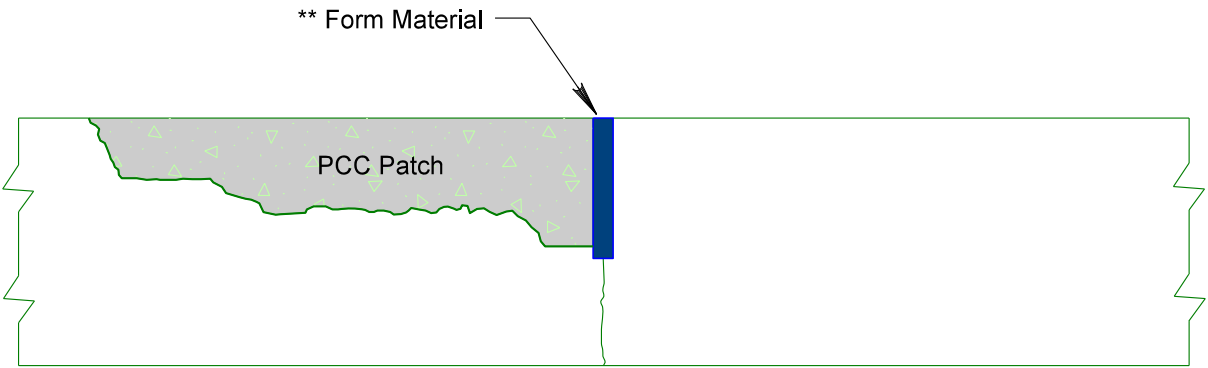
FILE - J:\TRAVIS H\12W3\BARS.DGN

# REPAIR OF TYPE A SPALLS

## SPALL REMOVAL

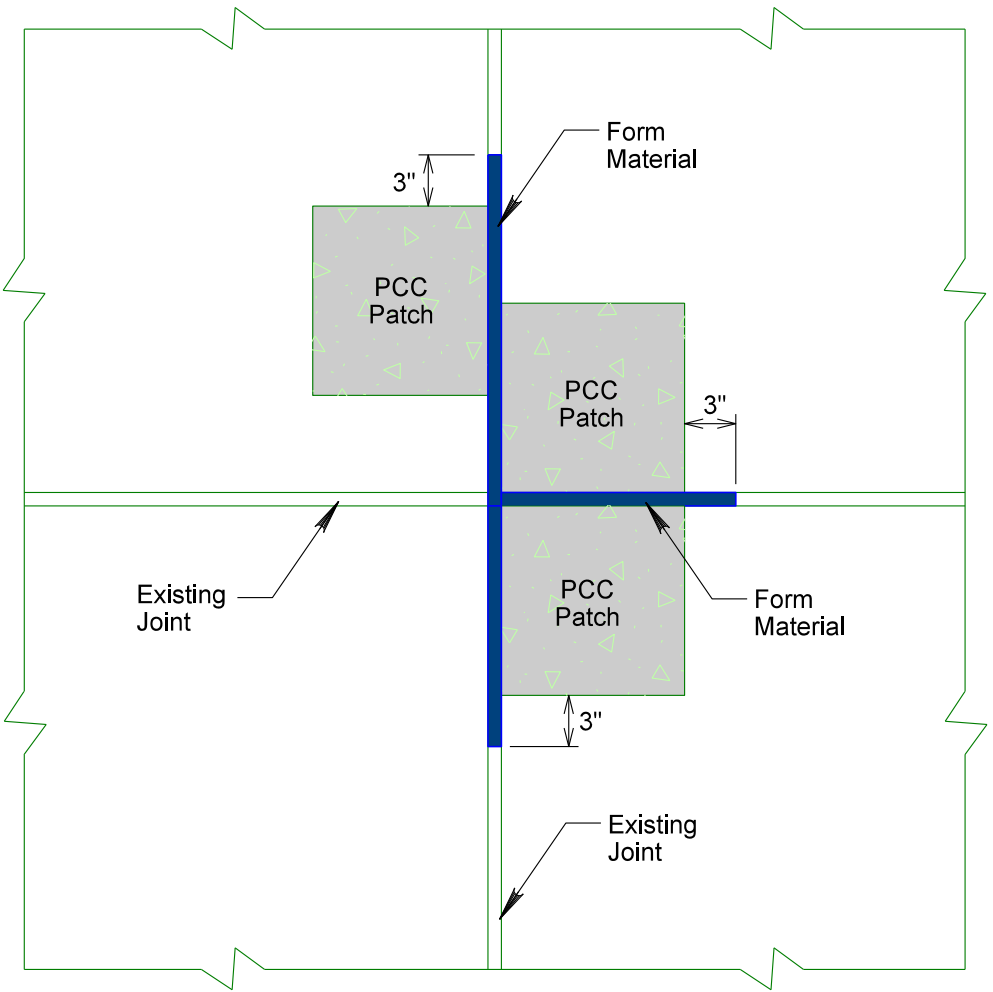


## SPALL PATCH



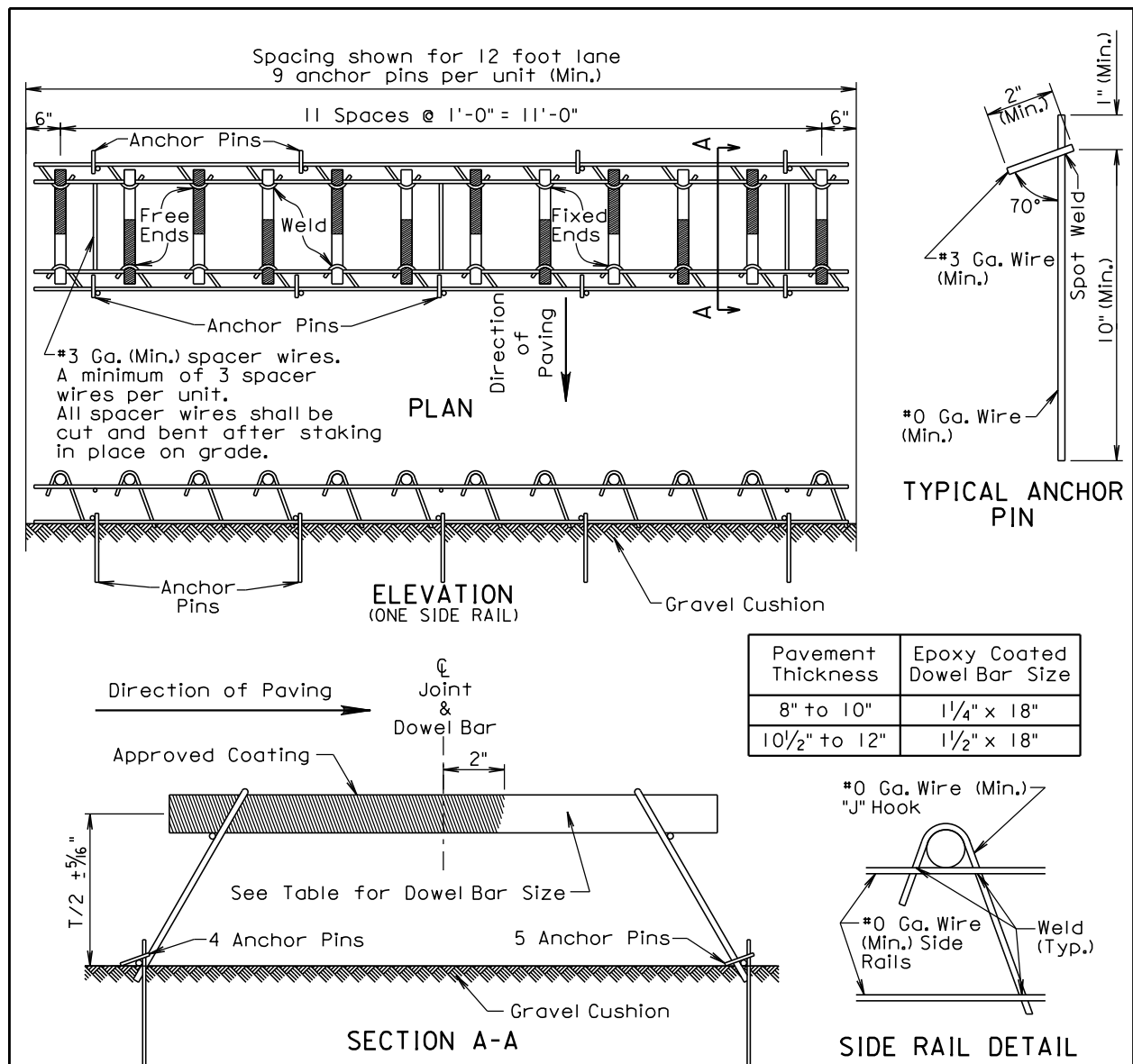
# REPAIR OF TYPE A SPALLS

## SPALL PATCHES (PLAN VIEW)



T	A	B	Length of Tie Bar
8"	5"	1½"±	10"
8½"	5¼"	1⅜"±	11"
9"	5⅝"	1¼"±	12"
9½"	6"	1⅝"±	12½"
10"	6⅜"	1½"±	13½"
10½"	6¾"	1⅜"±	14½"
11"	7"	1¼"±	15½"
11½"	7⅜"	1⅜"±	16"
12"	7¾"	1⅜"±	16½"
12½"	8⅛"	1¼"±	17½"





**GENERAL NOTES:**

Longitudinal construction joint tie bars shall be placed a minimum of 15 inches from the transverse contraction joint.

Centerline of individual dowel bars shall be parallel to top of subgrade ±1/8 inch in 18 inches and to all other dowel bars in the assembly ±1/16 inch in 18 inches.

Centerline of individual dowel bars shall be parallel to the centerline of the roadway ±1/2 inch in 18 inches.

The transverse contraction joints shall be sawed perpendicular to the centerline of the roadway and the dowel bars shall be centered on the sawed joint ± 1 inch.

Supporting devices of the type shown on this sheet, or equivalent as approved by the Engineer, shall be used to maintain proper horizontal and vertical alignment of the dowel bars.

December 23, 2007

Published Date: 2nd Qtr. 2013	S D D O T	PCC PAVEMENT DOWEL BAR ASSEMBLY FOR TRANSVERSE CONTRACTION JOINTS	PLATE NUMBER 380.01
			Sheet 1 of 1