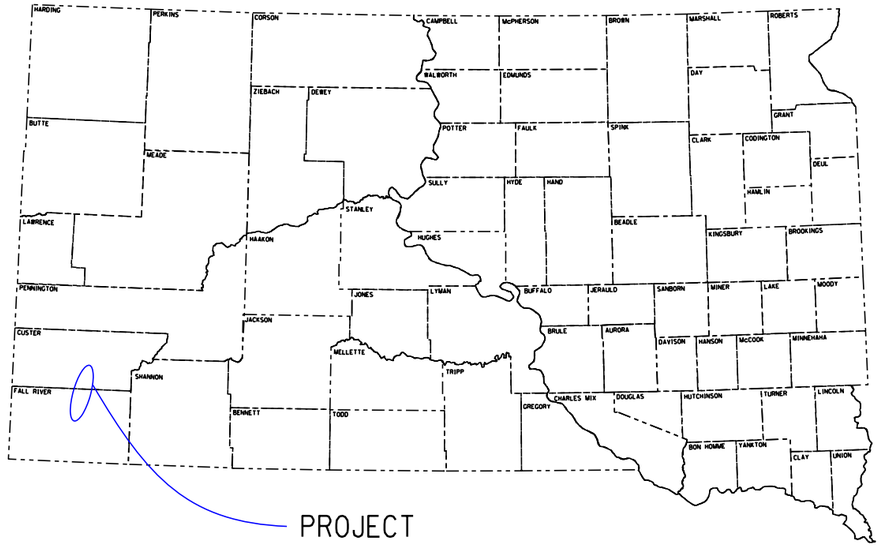
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	492-079, 492-079, & 492-079S	1	16

Plotting Date: 04/24/2015



STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION

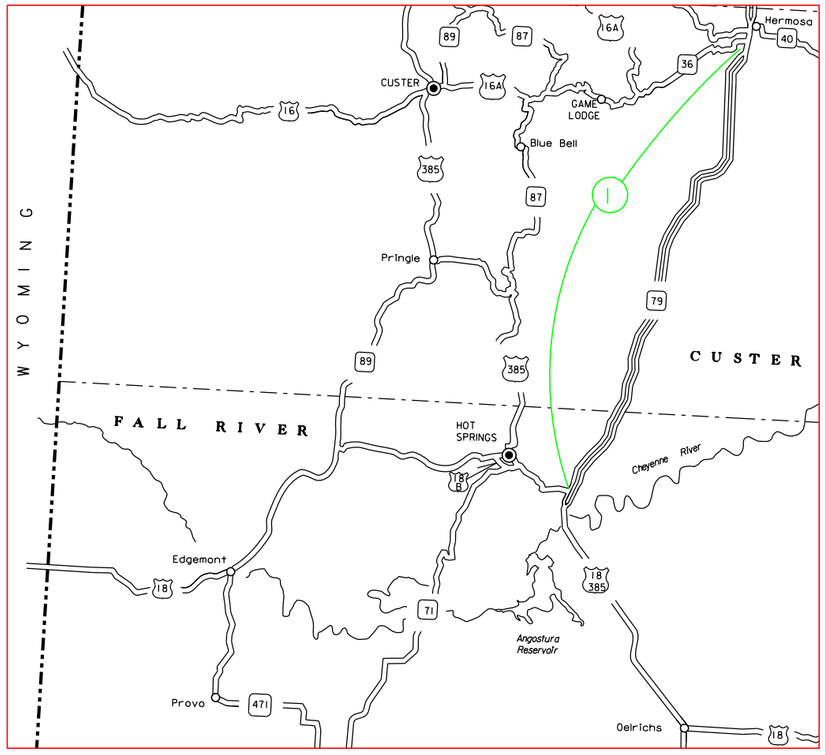
PLANS FOR PROPOSED

PROJECT 079S–492
HIGHWAY SD 79
FALL RIVER & CUSTER COUNTIES

PCC PAVEMENT REPAIR
PCNs i3tp, i3tq & i3tr

INDEX OF SHEETS

(1) SD 79, MRM 26.7 to MRM 27.0, PCN i3tp
SD 79, MRM 58.9 to MRM 59.5, PCN i3tq
SD 79S, MRM 27.0 to MRM 58.9, PCN i3tr



Storm Water Permit
No Permit Required

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PLOT NAME - 2
FILE - ...\DESKTOP\13TP PLANS.DGN
PLOTTED FROM - TRCU10206

ESTIMATE OF QUANTITIES

PCN i3tp

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
380E5030	Nonreinforced PCC Pavement Repair	15.6	SqYd
380E6110	Insert Steel Bar in PCC Pavement	22	Each
380E6310	Seal Random Cracks in PCC Pavement	6	Ft
390E0200	Repair Type A Spall	4.0	SqFt
633E1400	Pavement Marking Paint, 4" White	20	Ft
633E1405	Pavement Marking Paint, 4" Yellow	20	Ft
634E0010	Flagging	10	Hour
634E0100	Traffic Control	353	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS

PCN i3tq

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
380E5030	Nonreinforced PCC Pavement Repair	31.1	SqYd
380E6000	Dowel Bar	14	Each
380E6110	Insert Steel Bar in PCC Pavement	22	Each
380E6310	Seal Random Cracks in PCC Pavement	174	Ft
390E0200	Repair Type A Spall	32.0	SqFt
633E1400	Pavement Marking Paint, 4" White	20	Ft
633E1405	Pavement Marking Paint, 4" Yellow	20	Ft
634E0010	Flagging	10	Hour
634E0100	Traffic Control	353	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS

PCN i3tr

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
120E0010	Unclassified Excavation	191	CuYd
260E2010	Gravel Cushion	94.8	Ton
260E5000	Shot Rock	214.0	Ton
380E5030	Nonreinforced PCC Pavement Repair	462.3	SqYd
380E6000	Dowel Bar	82	Each
380E6110	Insert Steel Bar in PCC Pavement	445	Each
380E6310	Seal Random Cracks in PCC Pavement	827	Ft
390E0200	Repair Type A Spall	76.0	SqFt
633E1400	Pavement Marking Paint, 4" White	230	Ft
633E1405	Pavement Marking Paint, 4" Yellow	230	Ft
634E0010	Flagging	150.0	Hour
634E0100	Traffic Control	1,490	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
680E0240	4" Corrugated Polyethylene Drainage Tubing	230	Ft
680E2010	Precast Concrete Headwall for Drain	5	Each
831E0300	MSE Geotextile Fabric	356	SqYd

SPECIFICATIONS

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

HISTORICAL PRESERVATION OFFICE CLEARANCES

To obtain State Historical Preservation Office (SHPO) clearance, a cultural resources survey may need to be conducted by a qualified archaeologist. In lieu of a cultural resources survey, the Contractor could request a records search from Jim Donohue, State Archaeological Research Center (SARC).

Provide SARC with the following: a topographical map or aerial view on which the site is clearly outlined, site dimensions, project number, and PCN. If applicable, provide evidence that the site has been previously disturbed by farming, mining, or construction activities with a landowner statement that no artifacts have been found *on* the site. The Contractor shall arrange and pay for the cultural resource survey and/or records search.

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

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

WASTE DISPOSAL SITE

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

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

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

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

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

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

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

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.

EXISTING PCC PAVEMENT

The existing pavement on SD 79 is 8” Nonreinforced PCC Pavement with limestone aggregate. Longitudinal joints are reinforced with No. 5x30” deformed tie bars spaced 48” 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 bid 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 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 ¼ 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.

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 shall submit a mix design and supporting documentation for approval at least 2 weeks prior to use.

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

Concrete shall be cured with white pigmented curing compound (AASHTO M148, Type 2) applied as soon as practical at a rate of 125 square feet per gallon. Concrete shall be cured for a minimum of 48 hours before opening to traffic. The 48 hours is based upon a concrete surface temperature of 60 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.

Concrete shall be covered with suitable insulation blanket consisting of a layer of closed cell polystyrene foam protected by at least one layer of plastic at the direction of the Engineer. Insulation blanket shall have an R-value of at least 0.5, as rated by the manufacturer. Insulation blanket shall be left in place until the concrete has obtained strength of 4,000 psi. The initial contraction joint sawing shall be performed as soon practical to avoid random cracking. Insulation blanket shall be overlapped on to the existing concrete.

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, repairing asphalt shoulders, labor, tools and equipment shall be incidental to the contract unit price per square yard for Nonreinforced PCC Pavement Repair.

STEEL BAR INSERTION

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

The Contractor shall insert the steel bars (1¼" x 18" epoxy coated plain round dowel bars and No. 9 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.

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

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

The diameter of the drilled holes in the existing concrete 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.

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.

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.

TABLE OF PCCP REPAIR

PCN i3tp

MRM	Size	Sq. Yds.	Lane	#5 Bar	1 1/4 Bar	Dowel Bar	Insert Steel Bar
				Each	Each	Each	Each
26.826	14x10	15.55	DL	8	0	14	22
	Total:	**15.55**		**8**	**0**	**14**	**22**

PCN i3tr

MRM	Size	Sq. Yds.	Lane	#5 Bar	1 1/4 Bar	Dowel Bar	Insert Steel Bar
				Each	Each	Each	Each
56.754	27x20	60	DL/PL	8	52	0	52
53.292	14x10	15.55	DL	4	14	14	18
50.11	8x26	23.11		10	52	0	62
47.884	8x14	12.44		5	28	14	33
47.32	14x40	62.22	DL	16	28	14	44
	12x20	26.67	PL	8	24	0	32
35.147	26x40	115.6	DL/PL	16	52	26	68
35.121	14x40	62.22	DL/PL	16	28	14	44
34.992	38x20	84.44		16	76	0	92
	Total:	**462.25**		**99**	**354**	**82**	**445**

PCN i3tq

MRM	Size	Sq. Yds.	Lane	#5 Bar	1 1/4 Bar	Dowel Bar	Insert Steel Bar
				Each	Each	Each	Each
59.5	14x20	31.11	SBDL	8	14	14	22
	Total:	**31.11**		**8**	**14**	**14**	**22**

REPAIR TYPE A SPALL

Locations and size (length or width) of concrete spall repair areas are subject to change in the field, at the discretion of the Engineer, at no additional cost to the state. The minimum dimension of the repair area shall be 6". Payment will be based on actual area replaced.

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

The concrete patching material used for spall repair shall be a bagged MNDOT 3U18 patching material that includes Air Entraining Agent. The product shall be submitted and be approved by the Concrete Engineer. A product known to meet this requirement is Spec Mix/TCC Materials "Air Entrained Concrete Patching Mix".

Grout for bonding the concrete patching material to the existing concrete shall consist of two parts by weight of Portland Cement and one part sand, mixed with sufficient water to form a creamy slurry. Grout shall be applied on all of the existing concrete surfaces within the removal area immediately prior to placement of the concrete patching material. The 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.

The 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 sprayed with curing compound as per Section 390. An additional coat of curing compound shall be applied not less than 20 minutes and not more than 1 hour after the first application.

Repair areas can be opened to traffic once the repair material meets 3,000 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.

The Engineer will test the repair areas after an initial cure period by Swiss Hammer. No section is to be opened to traffic without the permission of the Engineer.

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.

Material used to form the joint shall be a foam core board, waxed cardboard, 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 the contract unit price per square foot for Repair Type A Spall.

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.

The asphalt patching material used for spall repair shall be in accordance with the requirements of Section 324 of the Specifications.

TABLE OF REPAIR TYPE A SPALL

PCN i3tp

MRM	Size	Sq.Ft.	Lane
26.988	(2)1x2	4.0	PL
	Total	4.0	

PCN i3tq

MRM	Size	Sq.Ft.	Lane
59.499	4x2	8.0	SBDL
59.497	1x2	2.0	
	1x2	2.0	PL
	1x2	2.0	
	1x2	2.0	
58.972	2x3	6.0	DL
58.931	1x2	2.0	DL
58.972	2x3	6.0	DL
58.931	1x2	2.0	DL
	Total	32.0	

PCN i3tr

MRM	Size	Sq.Ft.	Lane
57.122	2x3	6.0	DL
56.284	1x1	1.0	CL
56.284	2x1	2.0	
54.986	3x1	3.0	
50.841	1x3/1x2	5.0	DL/PL
50.158	2x2	2.0	PL
48.021	2x2	4.0	PL
46.936	1x1	1.0	
45.02	1x2	2.0	DL
44.776	(2)1x2	4.0	DL
44.67	1x2	2.0	DL
44.218	1x2	2.0	DL
44.207	1x1	1.0	PL
	1x2	2.0	
44.197	1x2	2.0	PL
44.191	1x2	2.0	PL
44.187	1x2	2.0	PL
44.18	(2)1x2	4.0	PL
42.609	1x2	2.0	DL
39.302	2x2	4.0	PL
39.282	1x2	2.0	PL
38.025	1x3	3.0	PL
37.221	(2)2x3	12.0	DL
	1x1	1.0	PL
33.698	1x2	2.0	DL
33.664	1x1	1.0	DL
	1x2	2.0	PL
	Total	76.0	

SEAL RANDOM CRACKS IN PCC PAVEMENT

PCN i3tp

MRM	LENGTH	LANE
26.826	6	DL
Total	**6**	

PCN i3tq

MRM	LENGTH	LANE
59.296	30	SBPL
59.188	120	DL
	24	
Total	**174**	

PCN i3tr

MRM	LENGTH	LANE
57.661	6	SBDL
57.38	50	
56.457	28	DL/PL
54.807	10	DL
53.474	24	DL
52.799	28	DL/PL
50.809	30	DL/PL
49.3	12	DL
49.29	12	DL
48.402	30	
47.807	30	
47.32	20	PL
46.353	6	
45.642	30	
44.659	13	PL
44.1	30	
43.642	40	DL/PL
43.33	16	DL
43.124	20	PL
42.259	13	PL
42.163	40	DL/PL
39.857	30	
38.157	30	
37.868	15	PL
35.675	45	DL
33.799	40	DL/Pl
33.714	50	DL/PL
33.706	6	PL
33.698	26	DL/PL
33.664	26	
33.642	28	
33.618	28	
27.12	15	
Total	**827**	

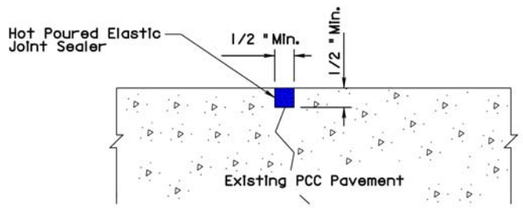
SEAL RANDOM CRACKS IN PCC PAVEMENT

The groove shall be formed with a saw or router designed for that purpose. The maximum width of the routed reservoir shall not be greater than ¾" and over sawing will not be allowed.

Random cracks wider than ½ inch will not require widening. A blocking medium maybe used in the crack, so that the depth of sealant does not exceed 2".

Sealing Random Cracks shall be done in accordance with Sec. 380.3 R of the Standard Specifications.

All costs associated with this work shall be incidental to the contract unit price per foot "Seal Random Cracks in PCC Pavement".



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 Geotextile 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 Geotextile Fabric. Gravel Cushion shall be placed on top of the MSE Geotextile Fabric.

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. All costs associated with installation of the drainage tubing through the shoulder shall be incidental to the contract unit price per foot "4" Corrugated Polyethylene Drainage Tubing".

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.

TABLE OF SUBGRADE REPAIR (SD 79,)

Location	L	W	Unclass exc Digouts	Shot Rock	MSE Geo Fabric	4" Corr Poly Drain Tube	Pre Cast Concr Head Head Wall For Drain	Gravel Cushion	Lane
MRM	Ft	Ft	CuYd	Ton	SqYd	Ft	Each	Ton	
PCN i3tr									
47.32	40	14	42	47	73	40	1	20.7	SBDL
47.32	10	12	9	10	23	40	1	4.4	PL
35.147	40	14	42	47	73	40	1	20.7	DL
35.121	40	14	42	47	73	40	1	20.7	DL
34.992	20	38	56	63	114	70	1	28.1	DL/PL/Turn
		Totals:	**191**	**214**	**356**	**230**	**5**	**94.8**	

MAINTENANCE OF TRAFFIC

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.

Unless otherwise stated in these plans, no work will be allowed during hours of darkness. Hours of darkness are defined, as ½ hour after sunset until ½ hour before sunrise.

Storage of vehicles and equipment shall be as near the right-of-way as possible. Contractor's employees should mobilize at a location off the right-of-way and arrive at the work sites in a minimum number of vehicles necessary to perform the work. Indiscriminate driving and parking of vehicles within the right-of-way will not be permitted. Any damage of 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.

Existing guide, route, informational logo, regulatory, and warning signs shall be temporarily reset and maintained during construction. Removing, relocating, covering, salvaging and resetting of existing traffic control devices, including delineation, shall be the responsibility of the Contractor. Non-applicable signing shall be covered or removed during periods of inactivity. Periods of inactivity shall be defined as no work taking place for a period of more than 36 hours. The cost of removing or covering non-applicable signs shall be incidental to the contract lump sum price for, Traffic Control, Miscellaneous.

Construction signing mounted on portable supports shall not be used for a duration of more than 3 days, unless approved by the Engineer. Construction signing that remains in the same location for more than 3 days shall be mounted on fixed location, ground mounted, breakaway supports.

If inappropriate/conflicting pavement markings exist, the markings shall be removed and replaced with applicable temporary pavement markings when the work duration is more than 3 days. When the work duration is less than 3 days, the channelizing devices in the area where the pavement markings conflict shall be placed at a spacing of ½ G. Pavement marking removals shall be paid for at the contract unit price for Remove Pavement Marking, 4" or equivalent. Temporary pavement marking shall be paid for at the contract unit bid price for Temporary Pavement Marking. The additional channelizing devices shall be incidental to the contract lump sum price for Traffic Control, Miscellaneous.

The quantity of signs paid for will be for the greatest number of installations per sign per PCN in place at any one time regardless of the number of set-ups on the project.

Any delineators and signs damaged or lost shall be replaced by the Contractor at no cost to the State.

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

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.

The Contractor shall be required to have a person available 24 hour/day, 7 days/week to maintain traffic control devices. The name and cellular telephone number of this individual shall be given to the Engineer at the preconstruction meeting.

The Contractor or designated traffic control subcontractor shall make night inspections at the initial set up of traffic control and every week thereafter to ensure the adequacy, legibility and reflectivity of each sign and device. A written summary of each inspection shall be given to the Engineer within 24 hours after completion of the inspection. The cost for the nighttime inspection work shall be incidental to the contract lump sum price for Traffic Control, Miscellaneous.

Vehicles working in traffic or alongside traffic shall be equipped with a flashing amber light visible from all directions. The amber light shall be mounted on the uppermost part of the contractor's vehicle. Lights must have peak intensity within the range of 40 to 400 candelas and must flash at 75 ± 15 flashes per minute. Vehicle flasher/hazard lights are not acceptable.

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.

Temporary Road Markers shall be used for lane closure tapers or lane shift tapers and lane lines. Temporary Pavement Marking installed in accordance with the traffic control standard plates will not be measured for payment and will be incidental to the contract lump sum price for Traffic Control, Miscellaneous.

Drums are required in all lane closure tapers.

Traffic shall be maintained on the driving lanes. Use of the shoulder as a driving lane will not be permitted. Any damage to the shoulder due to rerouted traffic or Contractor's equipment shall be repaired at the Contractor's expense and no expense to the State.

A Type III Barricade shall be installed as per the details in these plans and at a minimum spacing of 2000' within the lane closure. 3 drums shall be placed across the lane closure in front of any open concrete panel repair area, as directed by the Engineer.

Six sets of work zone signing for standard plate 634.25 are provided in the estimate of quantities. The Contractor shall try to group the work zones together, so that vehicle speeds are kept low traveling from one work zone to the next. The length of the lane closures shall provide adequate sight distance to oncoming vehicles and be kept to a minimum to reduce the delay to the traveling public.

When full width replacement is called for the Contractor shall repair the passing lane first and shall keep the traveling public from driving on the shoulder as much as possible.

TABLE OF TRAFFIC CONTROL

PCN i3tr

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
G20-2	36" x 18"	END ROAD WORK	2	17	34
R2-1	24" x 30"	SPEED LIMIT ##	8	18	144
W3-5	48" x 48"	REDUCED SPEED LIMIT AHEAD	4	34	136
W4-2	48" x 48"	LEFT OR RIGHT LANE ENDS (SYMBOL)	4	34	136
W20-1	48" x 48"	ROAD WORK #### FT. OR AHEAD	4	34	136
W20-5	48" x 48"	LT. OR RT. LANE CLOSED #### FT. OR AH	4	34	136
W20-7a	48" x 48"	FLAGGER	4	34	136
SPECIAL	30" x 24"	Fines Doubled	4	18	72
*****		TYPE III BARRICADE - 8 FT. DOUBLE SIDED	10	56	560
				TOTAL UNITS	**1490**

PCN i3tp

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
G20-2	36" x 18"	END ROAD WORK	1	17	17
R2-1	24" x 30"	SPEED LIMIT ##	2	18	36
W3-5	48" x 48"	REDUCED SPEED LIMIT AHEAD	1	34	34
W4-2	48" x 48"	LEFT OR RIGHT LANE ENDS (SYMBOL)	1	34	34
W20-1	48" x 48"	ROAD WORK #### FT. OR AHEAD	1	34	34
W20-5	48" x 48"	LT. OR RT. LANE CLOSED #### FT. OR AH	1	34	34
W20-7a	48" x 48"	FLAGGER	1	34	34
SPECIAL	30" x 24"	Fines Doubled	1	18	18
*****		TYPE III BARRICADE - 8 FT. DOUBLE SIDED	2	56	112
				TOTAL UNITS	**353**

PCN i3tg

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
G20-2	36" x 18"	END ROAD WORK	1	17	17
R2-1	24" x 30"	SPEED LIMIT ##	2	18	36
W3-5	48" x 48"	REDUCED SPEED LIMIT AHEAD	1	34	34
W4-2	48" x 48"	LEFT OR RIGHT LANE ENDS (SYMBOL)	1	34	34
W20-1	48" x 48"	ROAD WORK #### FT. OR AHEAD	1	34	34
W20-5	48" x 48"	LT. OR RT. LANE CLOSED #### FT. OR AH	1	34	34
W20-7a	48" x 48"	FLAGGER	1	34	34
SPECIAL	30" x 24"	Fines Doubled	1	18	18
*****		TYPE III BARRICADE - 8 FT. DOUBLE SIDED	2	56	112
				TOTAL UNITS	**353**

RATES OF APPLICATION

*Edgeline striping – 16.9 gallons per mile
Glass beads – 8.0 pounds per gallon

*Rate is the Region average and is for one 4” edgeline.

PERMANENT PAVEMENT MARKINGS

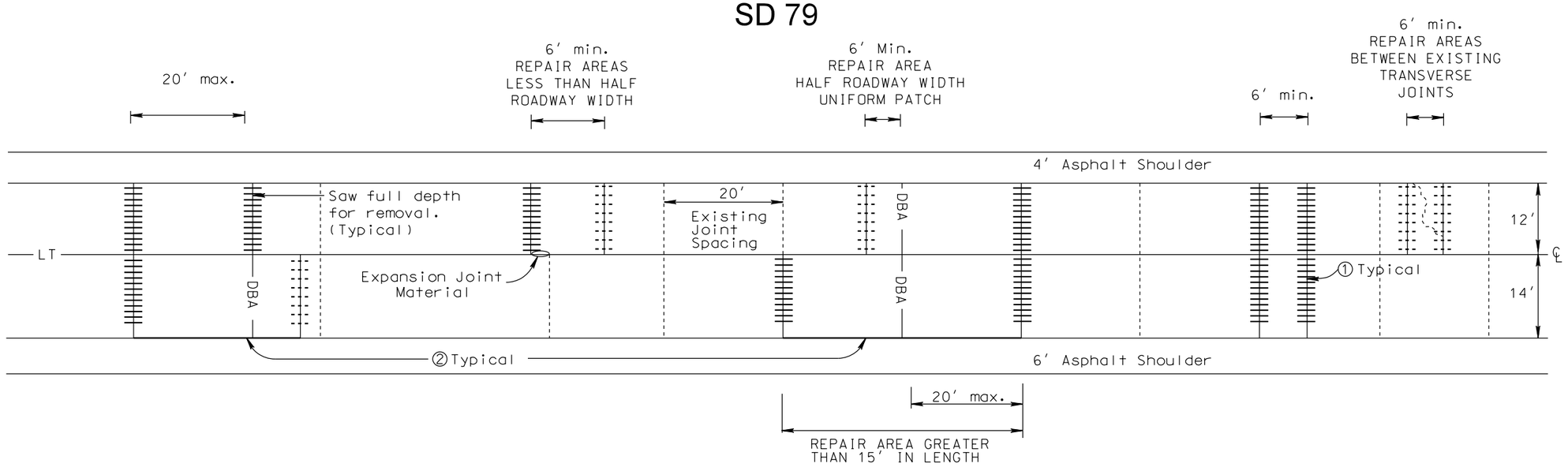
The location of the existing pavement marking shall be documented prior to removal, so that replacement can be at the existing location.

Application of permanent pavement marking shall be completed within 14 calendar days following completion of the pavement repair.

NONREINFORCED PCC PAVEMENT REPAIR

TYPICAL REPAIR AREAS

SD 79



NOTES:

1. Where possible, transverse joints shall be constructed full roadway width.
2. All edges of repair areas that are adjacent to asphalt concrete shall be formed to match the depth of the existing concrete pavement and replaced with new asphalt.

Legend:

— Drilled in 1 1/4 ″ x 18″ epoxy coated plain round dowel bar

--- Drilled in No. 9 x 18″ epoxy coated deformed tie bars

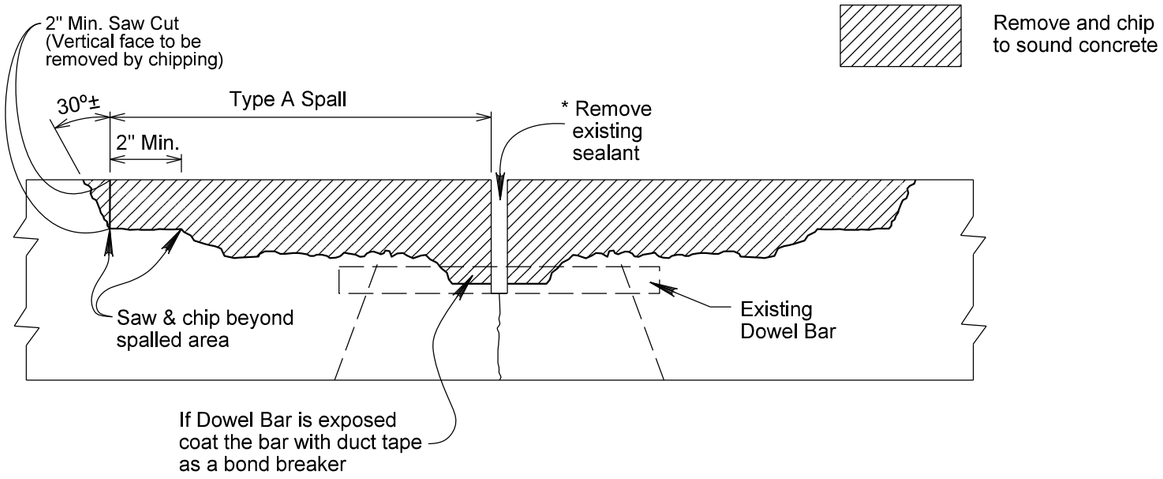
DBA Dowel Bar Assembly (for repair areas greater than 20′ in length)

—— L —— Longitudinal Construction Joint Without Tie Bars (Keyway Joint)

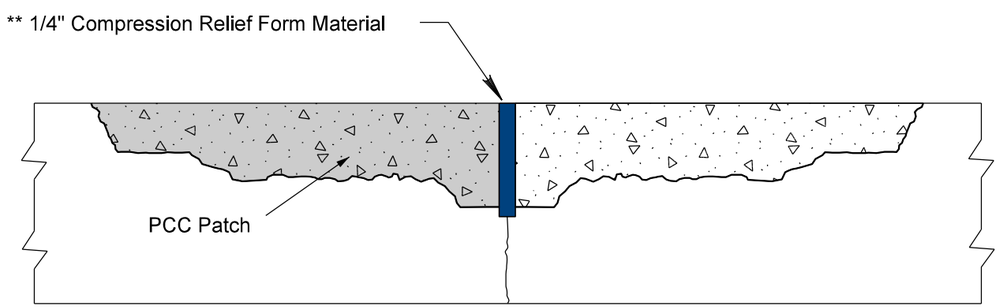
—— LT —— Longitudinal Construction Joint With Tie Bars
(Do not tie more than 48′ width of pavement)

REPAIR OF TYPE A SPALLS

SPALL REMOVAL



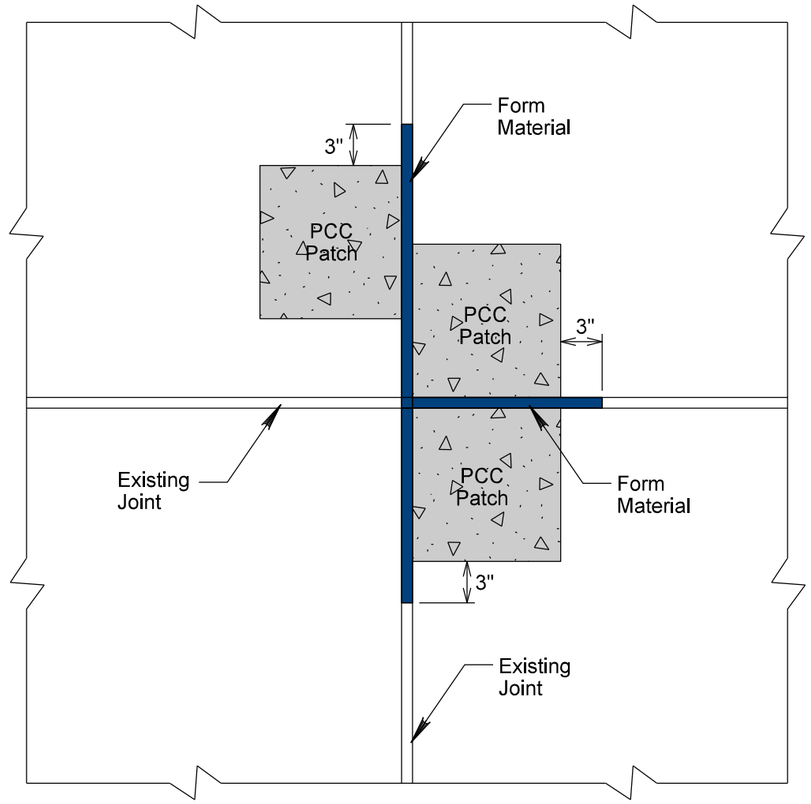
SPALL PATCH



** Compression Relief Form Material shall be removed by sawing or other means approved by the Engineer. Spall repaired joints shall then be sealed with Hot Poured Elastic Joint Sealer.

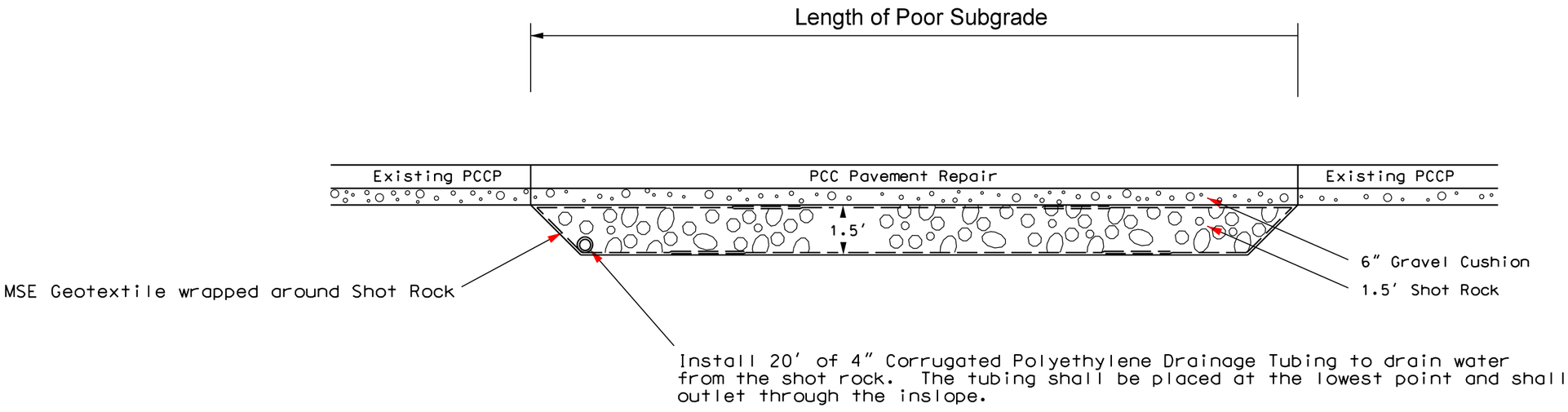
REPAIR OF TYPE A SPALLS

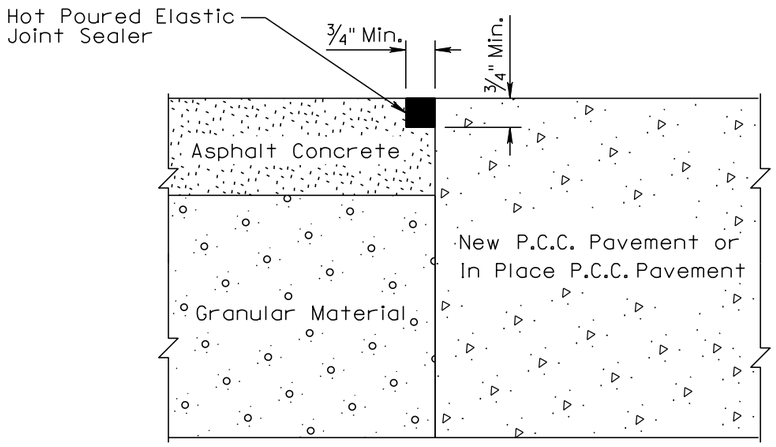
SPALL PATCHES (PLAN VIEW)



Subgrade Repair Detail

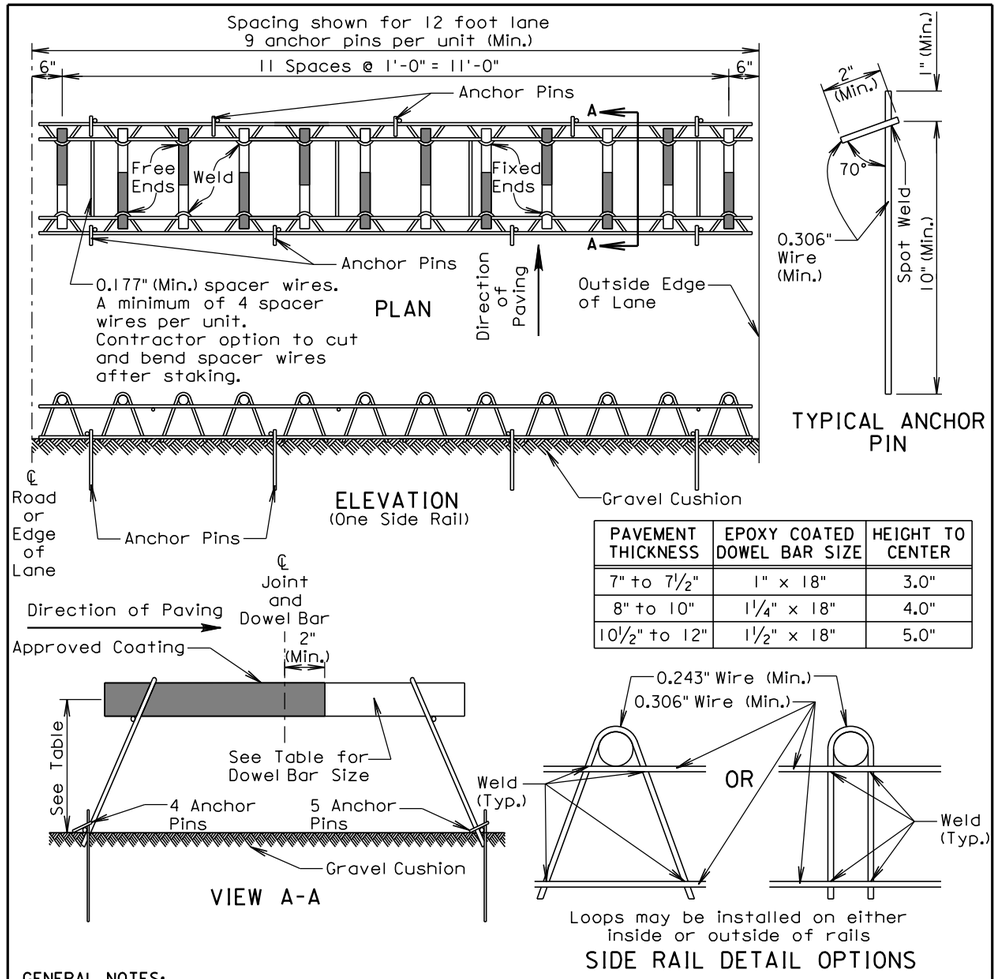
LONGITUDINAL SECTION ALONG CENTERLINE





March 31, 2000

Published Date: 2nd Qtr. 2015	SDDOT	ASPHALT CONCRETE SHOULDER JOINT ADJACENT TO PCC PAVEMENT	PLATE NUMBER 320.15
			Sheet 1 of 1



PAVEMENT THICKNESS	EPOXY COATED DOWEL BAR SIZE	HEIGHT TO CENTER
7" to 7½"	1" x 18"	3.0"
8" to 10"	1¼" x 18"	4.0"
10½" to 12"	1½" x 18"	5.0"

GENERAL NOTES:

Longitudinal 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.

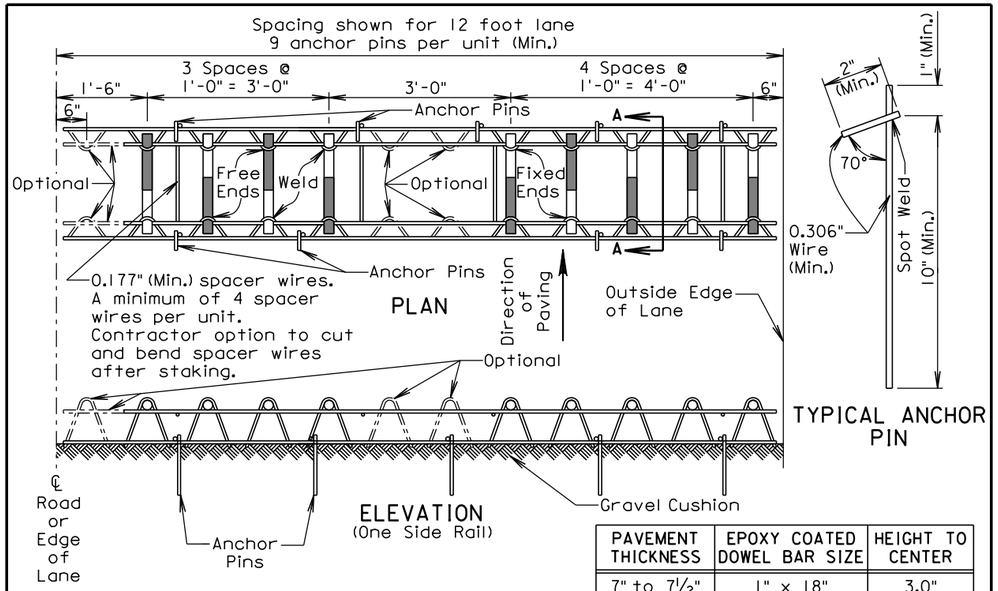
Centerline of individual dowel bars shall be parallel to the centerline of the roadway ±1/2 inch in 18 inches.

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 as 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.

August 30, 2013

Published Date: 2nd Qtr. 2015	SDDOT	PCC PAVEMENT DOWEL BAR ASSEMBLY FOR TRANSVERSE CONTRACTION JOINTS 12 Bar Assembly on Granular Base Material	PLATE NUMBER 380.01
			Sheet 1 of 1



PAVEMENT THICKNESS	EPOXY COATED DOWEL BAR SIZE	HEIGHT TO CENTER
7" to 7½"	1" x 18"	3.0"
8" to 10"	1¼" x 18"	4.0"
10½" to 12"	1½" x 18"	5.0"

GENERAL NOTES:

Longitudinal 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.

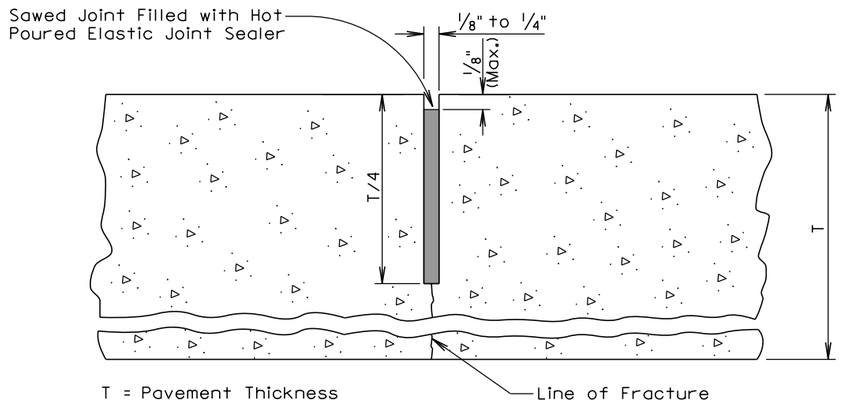
Centerline of individual dowel bars shall be parallel to the centerline of the roadway ±1/2 inch in 18 inches.

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 as 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.

August 30, 2013

Published Date: 2nd Qtr. 2015	SDDOT	***PCC PAVEMENT DOWEL BAR ASSEMBLY FOR TRANSVERSE CONTRACTION JOINTS 9 Bar Assembly on Granular Base Material***	*PLATE NUMBER* 380.03 *Sheet 1 of 1*



GENERAL NOTES:

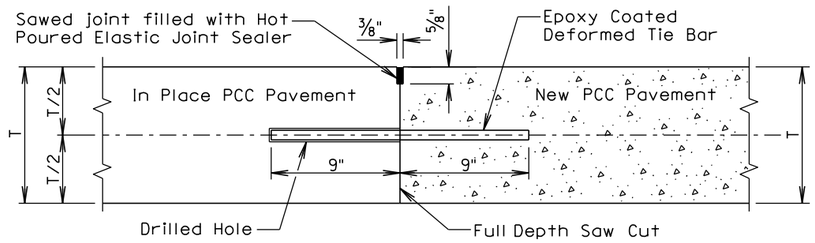
The saw cut to control cracking shall be a minimum of ¼ the thickness of the pavement.

All hot poured elastic joint sealer material spilled on the surface of the concrete pavement shall be removed as soon as the material has cooled. The extent of removal of material shall be to the satisfaction of the Engineer. All costs for removal of the spilled joint sealer material shall be borne by the Contractor.

June 26, 2013

Published Date: 2nd Qtr. 2015	SDDOT	***PCC PAVEMENT TRANSVERSE CONTRACTION JOINT WITH OR WITHOUT DOWEL BAR ASSEMBLY***	*PLATE NUMBER* 380.05 *Sheet 1 of 1*

DETAIL A
TRANSVERSE CONSTRUCTION JOINT WITH TIE BARS



T = In Place PCC Pavement and New PCC Pavement Thickness

GENERAL NOTES:

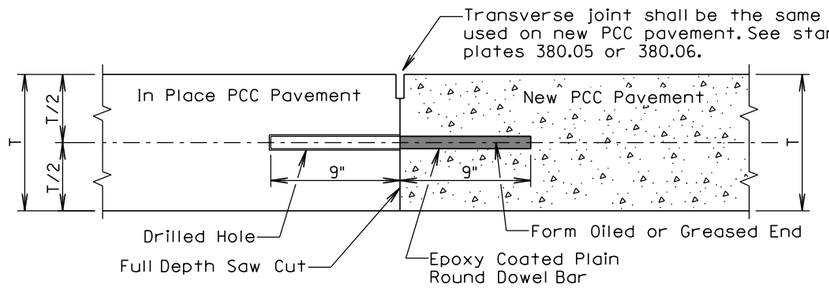
The term "In Place PCC Pavement" in the above drawing indicates that the in place PCC pavement was placed on a previous project.

See sheet 2 of 2 of this standard plate to determine if Detail A shall be used.

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

No. 9 epoxy coated deformed tie bars shall be used in 10 inch thickness and less PCC Pavement and No. 11 epoxy coated deformed tie bars shall be used in 10.5 inch thickness and greater PCC Pavement. The tie bar spacing shall be 18 inches center to center and shall be a minimum of 3 inches and a maximum of 9 inches from the pavement edges.

DETAIL B
TRANSVERSE CONSTRUCTION JOINT WITH DOWEL BARS



T = In Place PCC Pavement and New PCC Pavement Thickness

GENERAL NOTES:

The term "In Place PCC Pavement" in the above drawing indicates that the in place PCC pavement was placed on a previous project or current project.

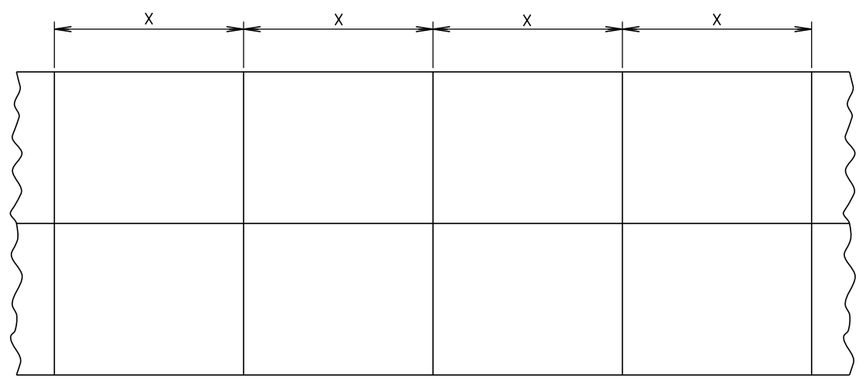
See sheet 2 of 2 of this standard plate to determine if Detail B shall be used.

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

The epoxy coated plain round dowel bar size, number, and spacing shall be the same as detailed on the corresponding dowel bar assembly standard plate (380.01, 380.02, 380.03, or 380.04). The epoxy coated plain round dowel bars shall be a minimum of 3 inches and a maximum of 6 inches from the pavement edges.

September 6, 2013

Published Date: 2nd Qtr. 2015	SDDOT	*PCC PAVEMENT TRANSVERSE CONSTRUCTION JOINTS WITH TIE BARS OR DOWEL BARS*	*PLATE NUMBER* 380.08 *Sheet 1 of 2*

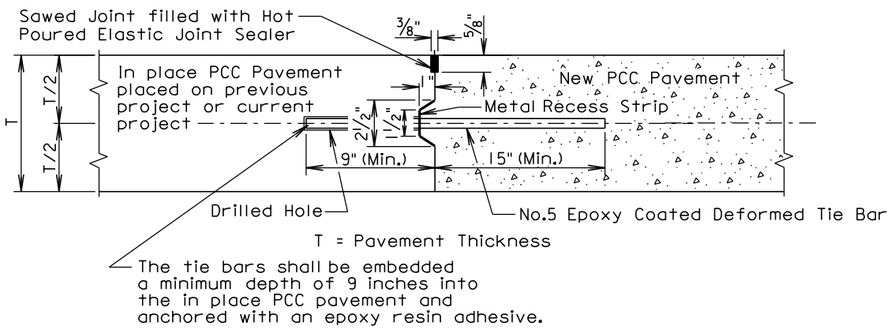


PCCP Thickness	Transverse Contraction Joint Spacing (X)
8" to 9.5"	15'
10" and Thicker	20'

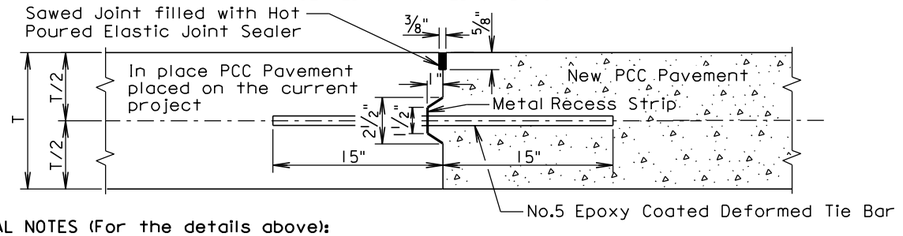
August 31, 2013

Published Date: 2nd Qtr. 2015	SDDOT	*PCC PAVEMENT TYPICAL CONTRACTION JOINT SPACING*	*PLATE NUMBER* 380.09 *Sheet 1 of 1*

LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS
(DRILLED IN BARS)



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.

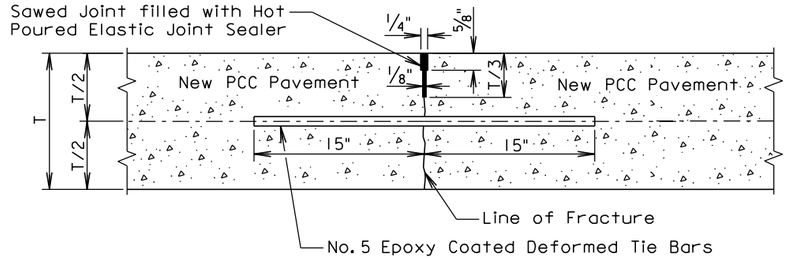
The keyway illustrated in the above details depict a female keyway.

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. 2015	SDDOT	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. 2015	SDDOT	PCC PAVEMENT LONGITUDINAL JOINTS WITH TIE BARS	PLATE NUMBER 380.10
			Sheet 2 of 2

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A) (B) (C)
0 - 30	200
35 - 40	350
45 - 50	500
55	750
60 - 65	1000
	(A) (B) (C)
70 - 75	1000 1500 2640

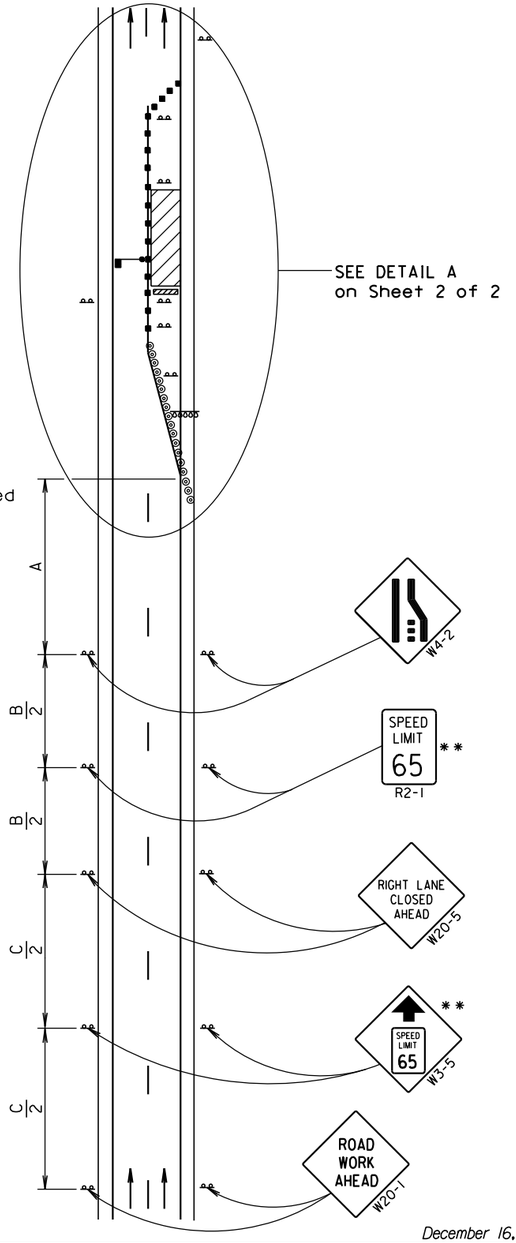
** Speed appropriate for location.

◎ Reflectorized Drum

■ Channelizing Device

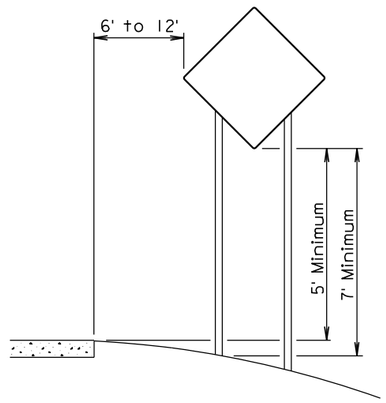
ROAD WORK AHEAD sign is only required in advance of the first lane closure.

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

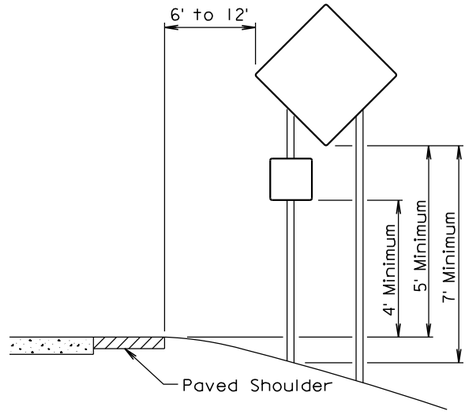


December 16, 2014

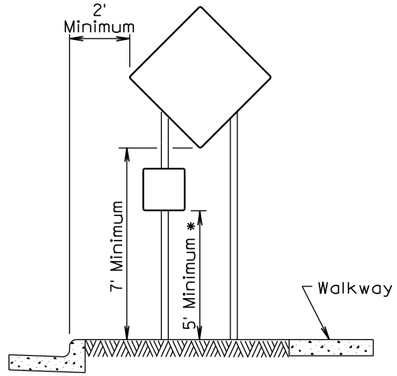
Published Date: 2nd Qtr. 2015	SDDOT	WORK ZONE SPEED REDUCTION FOR INTERSTATE AND HIGH SPEED MULTI-LANE HIGHWAYS	PLATE NUMBER 634.63
			Sheet 1 of 2



RURAL DISTRICT

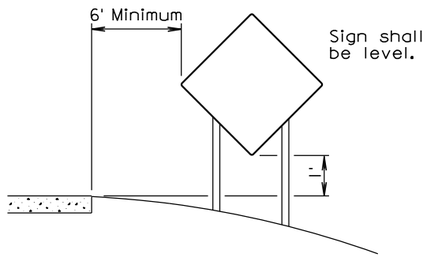


RURAL DISTRICT WITH SUPPLEMENTAL PLATE



URBAN DISTRICT

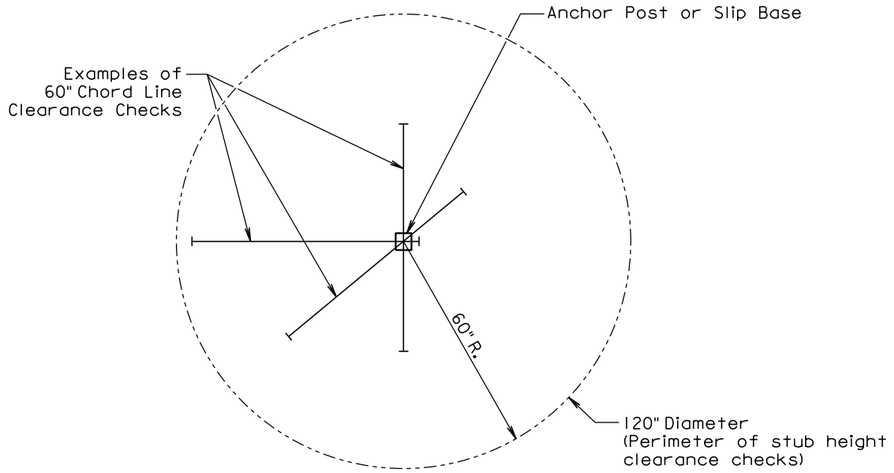
* If the bottom of supplemental plate is mounted lower than 7 feet above a pedestrian walkway, the supplemental plate should not project more than 4" into the pedestrian facility.



RURAL DISTRICT
3 DAY MAXIMUM
(Not applicable to regulatory signs)

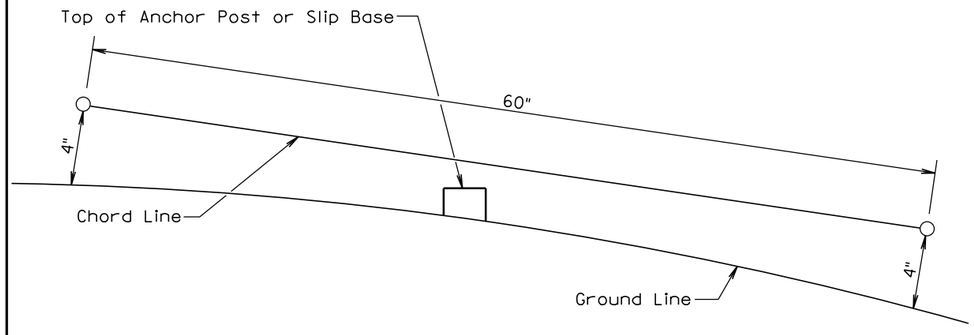
September 22, 2014

Published Date: 2nd Qtr. 2015	SDDOT	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85
			Sheet 1 of 1



PLAN VIEW

(Examples of stub height clearance checks)



ELEVATION VIEW

GENERAL NOTES:

The top of anchor posts and slip bases SHALL NOT extend above a 60" chord line within a 120" diameter circle around the post with ends 4" above the ground.

At locations where there is curb and gutter adjacent to the breakaway sign support, the stub height shall be a maximum of 4" above the ground line at the localized area adjacent to the breakaway support stub.

The 4" stub height clearance is not necessary for U-channel lap splices where the support is designed to yield (bend) at the base.

July 1, 2005

Published Date: 2nd Qtr. 2015	SDDOT	***BREAKAWAY SUPPORT STUB CLEARANCE***	***PLATE NUMBER*** *634.99*
			Sheet 1 of 1