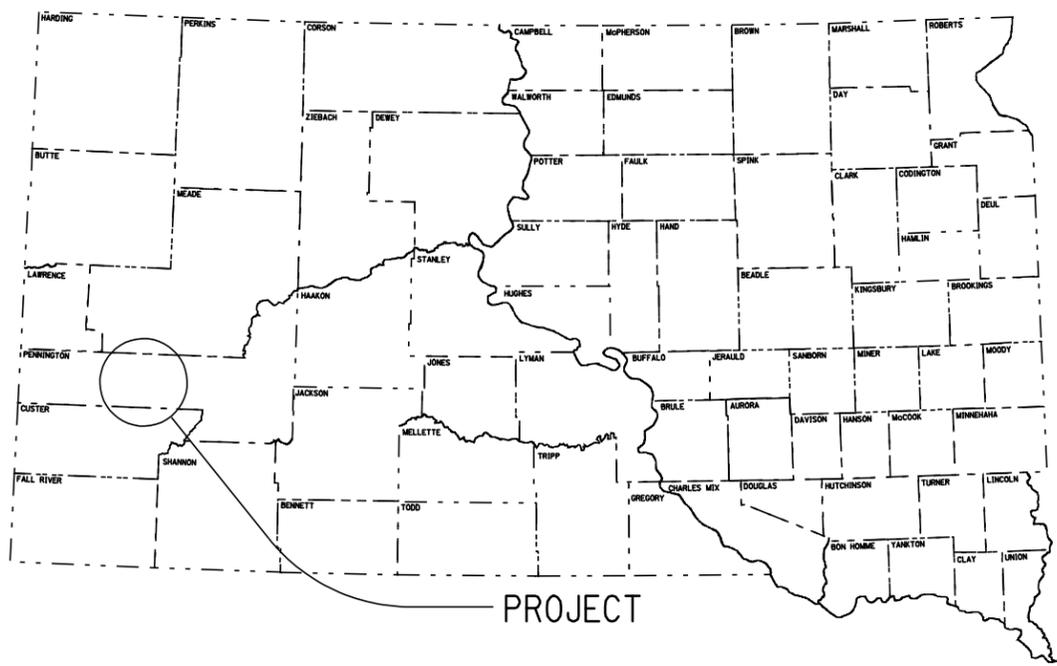


PLOT SCALE - 200,000000:1,000000

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	079-452		
	016-452	01	16
	016B-452		

Plotting Date: 23-MAY-2011



**STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED**

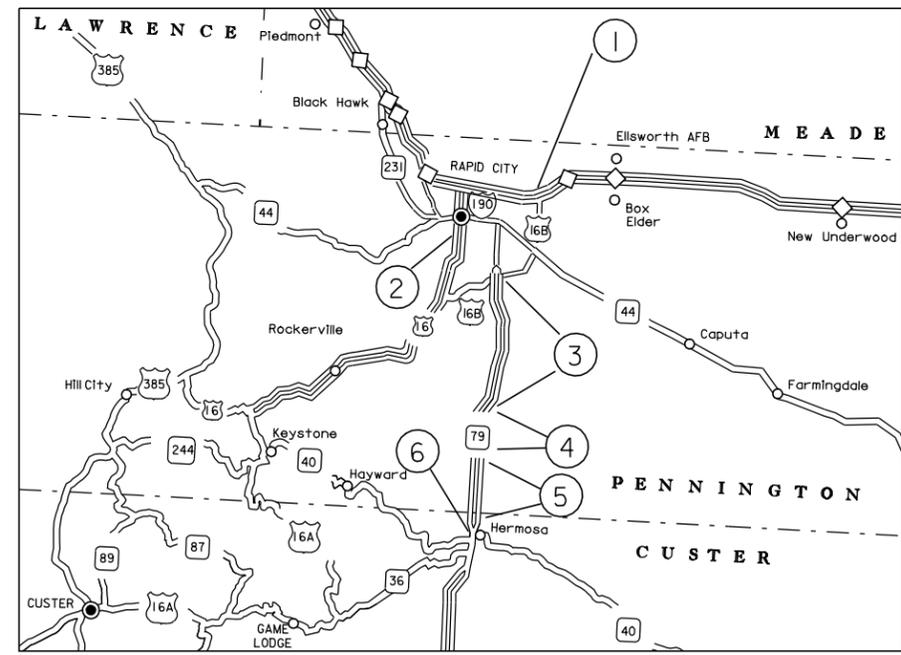
**PROJECTs 079-452, 079S-452,
016-452, & 016B-452
HIGHWAYS SD 79, US 16, & US 16B
PENNINGTON & CUSTER**

**PCC PAVEMENT REPAIR
PCNs i29k, i29m, i29n, i29p, i29q & i2ay**

- ① US 16B, MRM 73.1, 016B-452, i2ay
- ② US 16, MRM 68.8, 016-452, i29q
- ③ SD 79S, MRM 69.2 to MRM 74.7, 079S-452, i29p
- ④ SD 79, MRM 67.9 to MRM 69.2, 079-452, i29m
- ⑤ SD 79S, MRM 60.6 to MRM 67.9, 079S-452, i29n
- ⑥ SD 79, MRM 60.2 to MRM 60.6, 079-452, i29k

INDEX OF SHEETS

- Sheets 1: Title Sheets
- Sheets 2-8: Estimate of Quantities & Plan Notes
- Sheets 9-10: PCCP Repair Details
- Sheets 11-16: Standard Plates



Storm Water Permit
No Permit Required

PLOTTED FROM - ITRC11951

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ESTIMATE OF QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	079-452, 016-452, 016B-452	2	16

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
380E5030	Nonreinforced PCC Pavement Repair	809.8	SqYd
380E6000	Dowel Bar	150	Each
380E6110	Insert Steel Bar in PCC Pavement	568	Each
380E6310	Seal Random Cracks in PCC Pavement	314	Ft
390E0200	Repair Type A Spall	197.0	SqFt
633E1400	Pavement Marking Paint, 4" White	665	Ft
633E1405	Pavement Marking Paint, 4" Yellow	326	Ft
634E0100	Traffic Control	4,000	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0420	Type C Advance Warning Arrow Panel	8	Each
634E0640	Temporary Pavement Marking	215	Ft

SUMMARY OF QUANTITIES PER HIGHWAY SEGMENT

Highway	MRM to MRM	PCN	Nonreinforced PCC Pavement Repair SqYd	Dowel Bar Each	Insert Steel Bar in PCC Pavement Each	Repair Type A Spall SqFt	Seal Random Cracks in PCCP Ft	Traffic Control Unit	Type C Advance Warning Arrow Panel Each
US 16 B	73.1 to 73.1	i2ay	62.2	12.0	40	0.0	0.0	673	1
SD 79	60.2 to 60.6	i29k	0.0	0.0	0	10.0	0.0	673	1
SD 79	67.9 to 69.2	i29m	538.7	108.0	373	18.0	206.0	673	1
SD 79 S	60.6 to 67.9	i29n	57.8	6.0	75	0.0	0.0	673	1
SD 79 S	69.2 to 74.7	i29p	151.1	24.0	80	2.0	108.0	673	1
US 16	68.8 to 68.8	i29q	0.0	0.0	0	167.0	0.0	635	3
		Totals	809.8	150.0	568	197.0	314.0	4000	8

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	079-452, 016-452, 016B-452	3	16

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 Tom Lehmkuhl, DOT Environmental Engineer, 700 East Broadway Avenue, Pierre, SD 57501-2586 (605-773-3180). 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.

PERMIT FOR THE RAPID CITY AREA AIR QUALITY CONTROL ZONE

Administrative Rule of South Dakota (ARSD) 74:36:18:03 states that "no state facility or state contractor may engage in any construction activity or continuous operation activity within the Rapid City air quality control zone which may cause fugitive emissions of particulate to be released into the ambient air without first obtaining a permit issued by the board or the secretary."

In order to be considered eligible for authorization to conduct a construction activity under the terms and conditions of this permit, the owner operator must submit a Notice of Intent (NOI) form. The form must be submitted to the address below at least seven business days prior to the anticipated date of beginning the construction activity.

South Dakota Department of Environment and Natural Resources
Air Quality Program
523 East Capitol, Joe Foss Building
Pierre, South Dakota 57501-3181
605-773-3151

Construction activity is defined as any temporary activity at a state facility, which involves the removal or alteration of the natural or pre-existing cover of one acre or more of land. One acre of surface area is based on a cumulative area of disturbance to be completed for the entire project. Construction activity shall include, but not be limited to, stripping of topsoil, drilling, blasting, excavation, dredging, ditching, grading, street maintenance and repair, or earth moving. Construction activity is generally completed within one year. It also includes stockpiles, access roads, and disposal areas. An off-site disposal area of excess material will require an additional permit.

The permit requires the Contractor to use reasonably available technology to control fugitive dust emissions. The Contractor is required to use control measures for trackout, paved areas, unpaved roads, unpaved parking lots, disturbed areas, and for material handling and storage. The control measures that the Contractor is required to use are listed in the permit.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	079-452, 016-452, 016B-452	4	16

EXISTING PCC PAVEMENT

The existing pavement is 9.5" Nonreinforced PCC Pavement with limestone aggregate. The contraction joints are spaced at approximately 20'. Longitudinal joints are reinforced with No. 5 x 30" deformed tie bars spaced 48" center to center. The transverse joints are reinforced with 1 1/4" diameter dowel bars spaced 12" center to center.

RESTORATION OF GRAVEL CUSHION

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

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

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

NONREINFORCED PCC PAVEMENT REPAIR

Locations 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.

NONREINFORCED PCC PAVEMENT REPAIR (CONTINUED)

At repair locations where the new working joint is not opposite the existing working joint, the Contractor shall place a 1/4 inch preformed asphalt expansion joint material along the longitudinal joint from the existing working joint to the new working joint. The expansion joint material shall meet the requirements of AASHTO M33. Cost for this material shall be incidental to the contract unit price per square yard for Nonreinforced PCC Pavement Repair.

All joints (longitudinal and transverse) through and around the repair areas shall be sawed and sealed with Hot Poured Elastic Joint Sealer.

New pavement thickness shall be 9.5".

The slump requirement will be limited to 4" 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 high range 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 3,800 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. 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 3,800 psi, except for joint sawing operations. 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 (1/4" 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.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	079-452, 016-452, 016B-452	5	16

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. Payment will be based on actual area replaced.

The concrete patching material shall be packaged, dry, rapid-hardening cementitious mortar or concrete materials conforming to the requirements of ASTM C 928, Type R-3 and shall contain no chloride ions. Concrete patching material as per Section 390.2.B.3 of the Supplemental Specifications will not be allowed.

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.

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 patching product may be extended with aggregate as recommended by the manufacturer. The aggregate extender shall meet the requirements of Section 820 of the Standard Specifications. Section 820.2 D shall not apply to the aggregate extender. The Contractor's supplier of the patching product shall provide a concrete mix design, including all additives, to meet a minimum compressive strength of 4000 psi in six hours. This mix design shall be performed with the materials that will be used on the project.

The spall repair locations may be opened to traffic once the patch material has obtained a compressive strength of 4000 psi.

The Contractor shall provide test results to the Engineer to verify that the suppliers mix design is acceptable prior to beginning work. If the suppliers mix design is not satisfactory, the Contractor shall provide the Department with a mix design that meets the requirement prior to beginning work.

SEAL RANDOM CRACKS IN PCC PAVEMENT

The groove shall be formed with a saw or other equipment that will not damage and spall the concrete. The maximum width of the routed reservoir shall not be greater than 3/4" and over sawing will not be allowed.

Random cracks wider than 1/2 inch will not require widening. A blocking medium maybe used in the crack, so that the depth of sealant matches the width.

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".

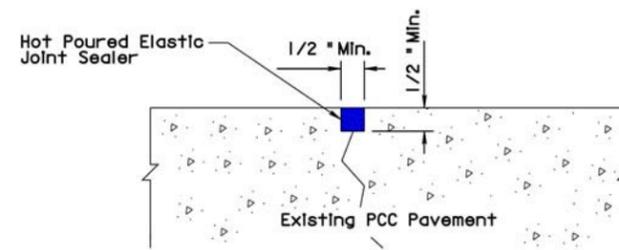


TABLE OF PCC PAVEMENT REPAIR (SD 79, PCN i29p)

MRM	Direction	Lane	Width	Length	Nonreinforced PCC Pavement Repair	1 1/4" Bar	#9 Bar	#5 Bar	Insert Steel Bar in PCC Pavement	Dowel Bar	Seal Random Cracks in PCC Pavement
SD 79			Ft	Ft	SqYd	Each	Each	Each	Each	Each	Ft
74.35	SB	DL	0	60	0.0						60
73.35	SB	DL	14	60	93.3	24		24	48	24	
71.98	SB	DL & PL	26	20	57.8	24		8	32		
71.33	SB	DL	0	20	0.0						20
70.68	SB	DL	0	14	0.0						14
70.20	SB	DL	0	14	0.0						14
Totals					151.1	48	0	32	80	24	108

TABLE OF PCC PAVEMENT REPAIR (SD 79, PCN i29m)

MRM	Direction	Lane	Width	Length	Nonreinforced PCC Pavement Repair	1 1/4" Bar	#9 Bar	#5 Bar	Insert Steel Bar in PCC Pavement	Dowel Bar	Seal Random Cracks in PCC Pavement
SD 79			Ft	Ft	SqYd	Each	Each	Each	Each	Each	Ft
69.18	SB	PL	12	32	42.7	12	8	13	33	12	
69.18	SB	DL	0	80	0.0						80
69.18	SB	PL	0	100	0.0						100
69.18	SB	DL	14	26	40.4	12	8	10	30	12	
69.18	SB	PL	12	40	53.3	24		16	40	12	
69.18	SB	PL	12	20	26.7	24		8	32		
69.18	SB	DL	14	20	31.1	24		8	32		
68.56	SB	DL	14	60	93.3	24		24	48	24	
68.48	SB	PL	12	28	37.3	12	8	11	31	12	
68.43	SB	PL	12	20	26.7	24		8	32		
68.17	SB	DL	0	20	0.0						20
68.16	SB	DL	0	6	0.0						6
68.50	NB	DL	14	86	133.8	12	8	34	54	36	
68.64	NB	PL	12	40	53.3	24		16	40		
Totals					538.7	192	32	149	373	108	206

TABLE OF PCC PAVEMENT REPAIR (SD 79, PCN i29n)

MRM	Direction	Lane	Width	Length	Nonreinforced PCC Pavement Repair	1 1/4" Bar	#9 Bar	#5 Bar	Insert Steel Bar in PCC Pavement	Dowel Bar
SD 79			Ft	Ft	SqYd	Each	Each	Each	Each	Each
65.18	SB	DL	14	6	9.3	12	8	2	22	
65.10	SB	DL & PL	6	26	17.3	6	4	10	20	6
62.04	SB	DL	14	20	31.1	24		8	32	
Totals					57.8	42	12	21	75	6

TABLE OF PCC PAVEMENT REPAIR (US 16B, PCN i2ay)

MRM	Direction	Lane	Width	Length	Nonreinforced PCC Pavement Repair	1 1/4" Bar	#9 Bar	#5 Bar	Insert Steel Bar in PCC Pavement	Dowel Bar
US16 B			Ft	Ft	SqYd	Each	Each	Each	Each	Each
73.1	SB	DL	14	40	62.2	24		16	40	12

TABLE OF SPALL REPAIR (SD 79, PCN i29p)

MRM	Direction	Lane	Width	Length	Repair Type A Spall
SD 79			Ft	Ft	SqFt
72.15	SB	DL	1.0	2.0	2.0

TABLE OF SPALL REPAIR (SD 79, PCN i29m)

MRM	Direction	Lane	Width	Length	Repair Type A Spall
SD 79			Ft	Ft	SqFt
69.18	SB	DL	1.0	2.0	2.0
69.18	SB	DL & PL	1.0	1.0	1.0
68.76	SB	DL	1.0	1.0	1.0
68.71	SB	DL	1.0	2.0	2.0
68.54	SB	DL	1.0	5.0	5.0
68.16	SB	PL	1.0	1.0	1.0
68.15	SB	DL	1.0	1.0	1.0
68.13	SB	PL	1.0	1.0	1.0
68.05	SB	DL	1.0	1.0	1.0
68.68	NB	DL	1.0	1.0	1.0
68.76	NB	PL	1.0	1.0	1.0
68.83	NB	PL	1.0	1.0	1.0
Total					18.0

TABLE OF SPALL REPAIR (SD 79, PCN i29k)

MRM	Direction	Lane	Width	Length	Repair Type A Spall
SD 79			Ft	Ft	SqFt
60.40	SB	PL	1.0	2.0	2.0
60.21	SB	PL	1.0	3.0	3.0
60.29	NB	DL	1.0	5.0	5.0
Total					10.0

TABLE OF SPALL REPAIR (US 16, MRM 68.8, PCN i29q)

US16, MRM 68.8	# of locations	Width Ft	Length Ft	Repair Type A Spall
				SqFt
SB Right Lane	1	2.0	15.0	30.0
SB Right Lane	2	2.0	1.0	4.0
SB Right Lane	2	0.5	14.0	14.0
SB Right Lane	5	0.5	3.0	7.5
SB Right Lane	2	0.5	1.0	1.0
SB Right Lane	1	0.5	17.0	8.5
SB Left Lane	3	0.5	6.0	9.0
SB Left Lane	8	0.5	2.0	8.0
SB Left Lane	2	0.5	6.0	6.0
SB Left Lane	1	0.5	10.0	5.0
Center Lane	6	0.5	12.0	36.0
Center Lane	8	0.5	2.0	8.0
NB Left Lane	2	0.5	12.0	12.0
NB Right Lane	3	0.5	12.0	18.0
			Total	167.0

MAINTENANCE OF TRAFFIC

Traffic control shall be in accordance with MUTCD Standards, Standard Specifications and these plans.

A maximum of 1 work zone in each direction shall be allowed.

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 no expense to the State.

The Contractor will be required to conduct operations such that access to commercial/individual entrances and side streets is maintained at all times throughout the project.

Work activities shall only be during daylight hours. Daylight hours are considered to be 1/2 hour before sunrise until 1/2 hour after sunset, with the exception of the spall repair work on US 16, MRM 68.8.

Lane closures for the spall repair work on US 16, MRM 68.8 (intersection of St. Joesph St. and Mt. Rushmore Road) will only be allowed during the evening hours between the time of 7:00 p.m. to 7:00 a.m.. Lane closures shall be removed and traffic shall be returned to normal operation prior to 7:00 a.m.

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

The quantity of traffic control units paid shall be for the greatest number of signs in place at any one time per project (PCN), regardless of the number of set-ups on the project.

MAINTENANCE OF TRAFFIC (CONTINUED)

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

The bottom of all 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 mounted on fixed supports during the time of initial installation, except portable sign supports will be allowed where surfacing prohibits installation.

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 materials, vehicles and equipment shall be stored a minimum distance of 30' from the traveled way and preferable along the right of way line during nonworking hours. Contractor's employees should mobilize to the work site in a minimized number of vehicles. Parking for employees should be located outside the right-of-way.

All vehicles entering and exiting closed lanes of traffic shall display a flashing amber light visible from all directions at a minimum distance of 1/4 mile.

A Type III Barricade shall be installed at the end of a lane closure taper as detailed in these plans and at a minimum spacing of 500' within the workzone. 3 drums shall be placed in front of any open concrete panel repair area, as directed by the Engineer. All lane closure openings for side streets and approaches shall be marked with a minimum of 3 drums per 12' lane on both sides of the opening. A Type III Barricade shall be placed on each side of a lane closure opening for side streets and far enough away from the intersection so that the sight distance is not obstructed.

Temporary Pavement Marking shown in the standard plates, and removal of the temporary pavement marking, shall be incidental to the contract unit price per lump sum for "Traffic Control Miscellaneous". Paint will not be allowed for Temporary Pavement Marking, and removal of the materials used for Temporary Pavement Marking shall be done in such a way as to not damage the surface of the concrete.

The Contractor shall have a traffic control person available 24 hours/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. All costs associated with this work shall be incidental to the contract unit price per lump sum price for "Traffic Control, Miscellaneous".

PRESS RELEASE ANNOUNCEMENTS

The DOT will prepare a Press Release to be released 48 hours prior to any work that affects traffic flow. The DOT will be responsible to keep law enforcement, emergency services, and the traveling public notified of changes in project access. The Contractor shall provide the Engineer with pertinent information 96 hours prior to any phase change or any other major change that affects traffic flow.

TABLE OF TRAFFIC CONTROL (US 16B, PCN i2ay)

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
G20-2A	36" x 18"	END ROAD WORK	1	17	17
R2-1	30" x 36"	SPEED LIMIT ##	4	23	92
W3-5	48" x 48"	SPEED REDUCTION	2	34	68
W4-2	48" x 48"	LEFT OR RIGHT LANE ENDS (SYMBOL)	2	34	68
W20-1	48" x 48"	ROAD WORK AHEAD	2	34	68
W20-5	48" x 48"	LT. OR RT. LANE CLOSED AHEAD	2	34	68
W20-7a	48" x 48"	FLAGGER	2	34	68
*****	*****	TYPE III BARRICADE - 8 FT. DOUBLE SIDED	4	56	224
TOTAL UNITS					673

TABLE OF TRAFFIC CONTROL (SD 79, PCN i29k)

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
G20-2A	36" x 18"	END ROAD WORK	1	17	17
R2-1	30" x 36"	SPEED LIMIT ##	4	23	92
W3-5	48" x 48"	SPEED REDUCTION	2	34	68
W4-2	48" x 48"	LEFT OR RIGHT LANE ENDS (SYMBOL)	2	34	68
W20-1	48" x 48"	ROAD WORK AHEAD	2	34	68
W20-5	48" x 48"	LT. OR RT. LANE CLOSED AHEAD	2	34	68
W20-7a	48" x 48"	FLAGGER	2	34	68
*****	*****	TYPE III BARRICADE - 8 FT. DOUBLE SIDED	4	56	224
TOTAL UNITS					673

TABLE OF TRAFFIC CONTROL (SD 79, PCN i29m)

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
G20-2A	36" x 18"	END ROAD WORK	1	17	17
R2-1	30" x 36"	SPEED LIMIT ##	4	23	92
W3-5	48" x 48"	SPEED REDUCTION	2	34	68
W4-2	48" x 48"	LEFT OR RIGHT LANE ENDS (SYMBOL)	2	34	68
W20-1	48" x 48"	ROAD WORK AHEAD	2	34	68
W20-5	48" x 48"	LT. OR RT. LANE CLOSED AHEAD	2	34	68
W20-7a	48" x 48"	FLAGGER	2	34	68
*****	*****	TYPE III BARRICADE - 8 FT. DOUBLE SIDED	4	56	224
TOTAL UNITS					673

TABLE OF TRAFFIC CONTROL (SD 79, PCN i29n)

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
G20-2A	36" x 18"	END ROAD WORK	1	17	17
R2-1	30" x 36"	SPEED LIMIT ##	4	23	92
W3-5	48" x 48"	SPEED REDUCTION	2	34	68
W4-2	48" x 48"	LEFT OR RIGHT LANE ENDS (SYMBOL)	2	34	68
W20-1	48" x 48"	ROAD WORK AHEAD	2	34	68
W20-5	48" x 48"	LT. OR RT. LANE CLOSED AHEAD	2	34	68
W20-7a	48" x 48"	FLAGGER	2	34	68
*****	*****	TYPE III BARRICADE - 8 FT. DOUBLE SIDED	4	56	224
TOTAL UNITS					673

TABLE OF TRAFFIC CONTROL (SD 79, PCN i29p)

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
G20-2A	36" x 18"	END ROAD WORK	1	17	17
R2-1	30" x 36"	SPEED LIMIT #	4	23	92
W3-5	48" x 48"	SPEED REDUCTION	2	34	68
W4-2	48" x 48"	LEFT OR RIGHT LANE ENDS (SYMBOL)	2	34	68
W20-1	48" x 48"	ROAD WORK AHEAD	2	34	68
W20-5	48" x 48"	LT. OR RT. LANE CLOSED AHEAD	2	34	68
W20-7a	48" x 48"	FLAGGER	2	34	68
*****	*****	TYPE III BARRICADE - 8 FT. DOUBLE SIDED	4	56	224
TOTAL UNITS					673

TABLE OF TRAFFIC CONTROL (US 16, MRM 68.5, PCN i29q)

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
G20-2A	36" x 18"	END ROAD WORK	3	17	51
R4-7	24" x 30"	KEEP RIGHT (SYMBOL)	3	18	54
W4-2	48" x 48"	LEFT OR RIGHT LANE ENDS (SYMBOL)	3	34	102
W20-1	48" x 48"	ROAD WORK AHEAD	3	34	102
W20-5	48" x 48"	LT. OR RT. LANE CLOSED AHEAD	3	34	102
*****	*****	TYPE III BARRICADE - 8 FT. DOUBLE SIDED	4	56	224
TOTAL UNITS					635

TEMPORARY PAVEMENT MARKING

Temporary Road Markers shall be used for the temporary pavement markings on this project. Two tabs of appropriate color shall be used to mark the centerline and skip lines. The tabs shall be placed at the beginning of the skip line followed by another four feet into the skip line. The skip line shall match the existing 40 ft interval. A solid stripe will be represented by tabs at 5' spacing. Temporary Road Markers shall be installed prior to opening completed sections to traffic.

The Contractor shall be responsible for maintaining visible and reflective lane lines throughout the project. Any marking covered or damaged shall be replaced prior to nightfall.

It is estimated that 215 ft. of Temporary Pavement Marking will be required on the project.

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.

It is estimated that 665 ft. of 4" white pavement marking and 326 ft. of yellow pavement marking will be required on the project.

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.

PLOT SCALE - 25.000000:1.000000

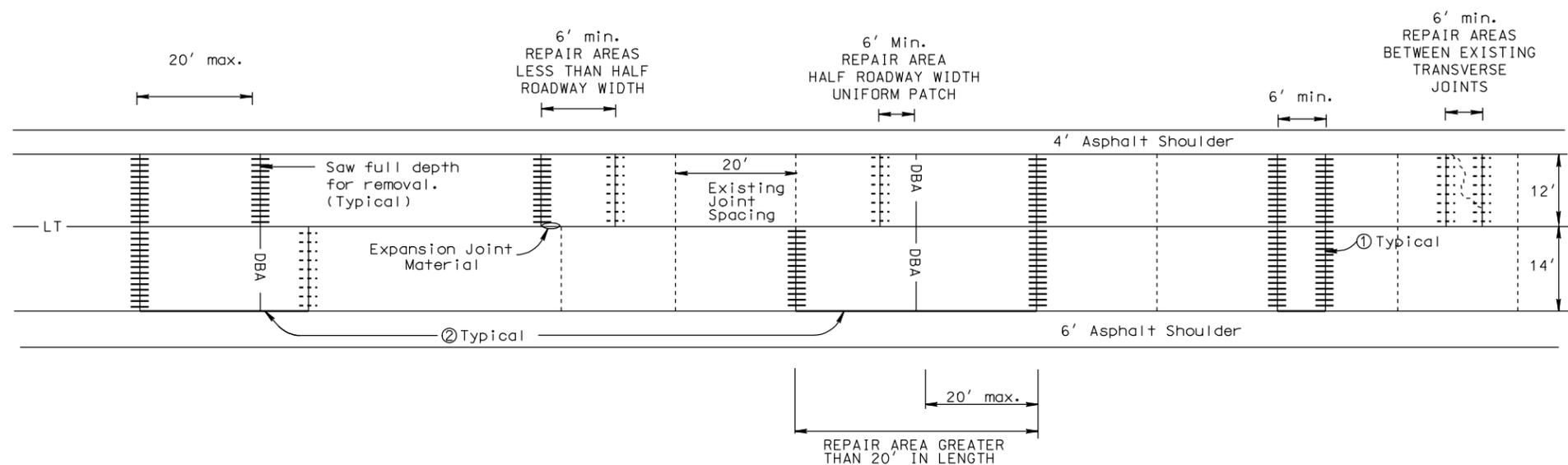
PLOTTED FROM - TRRC11951

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	079-452	09	16
	016-452		
	016B-452		

Plotting Date: 06-MAY-2011

NONREINFORCED PCC PAVEMENT REPAIR

TYPICAL REPAIR AREAS



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 width 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)

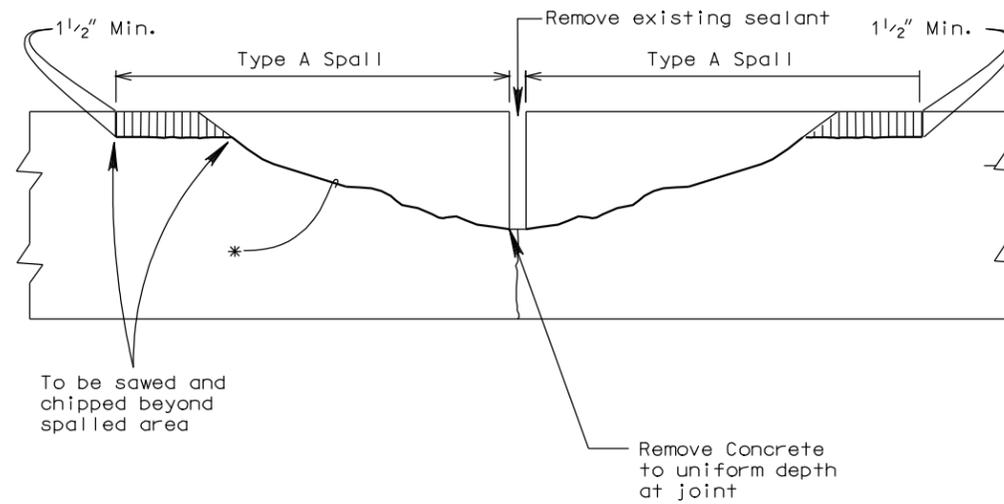
FILE - U:\REGION\RC\PR\2011\RC\M\PLANS\RC CONCRETE REPAIR\CONCRETE REPAIR\09

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
SOUTH DAKOTA	079-452 016-452 016B-452	10	16

Plotting Date: 06-MAY-2011

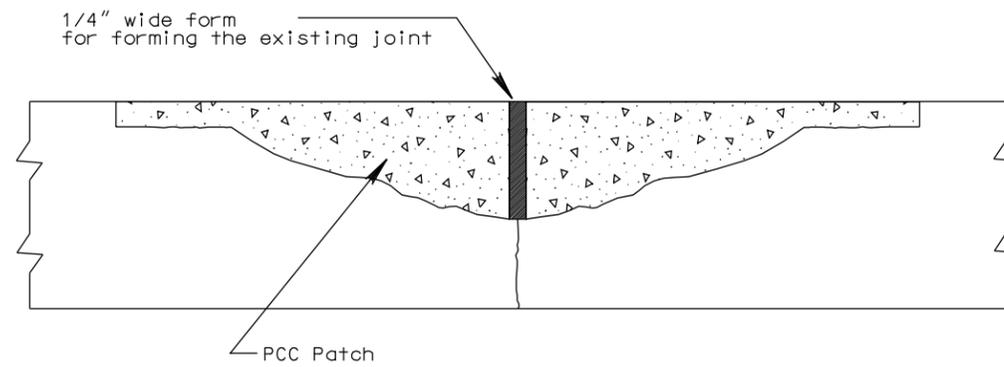
REPAIR OF TYPE A SPALLS

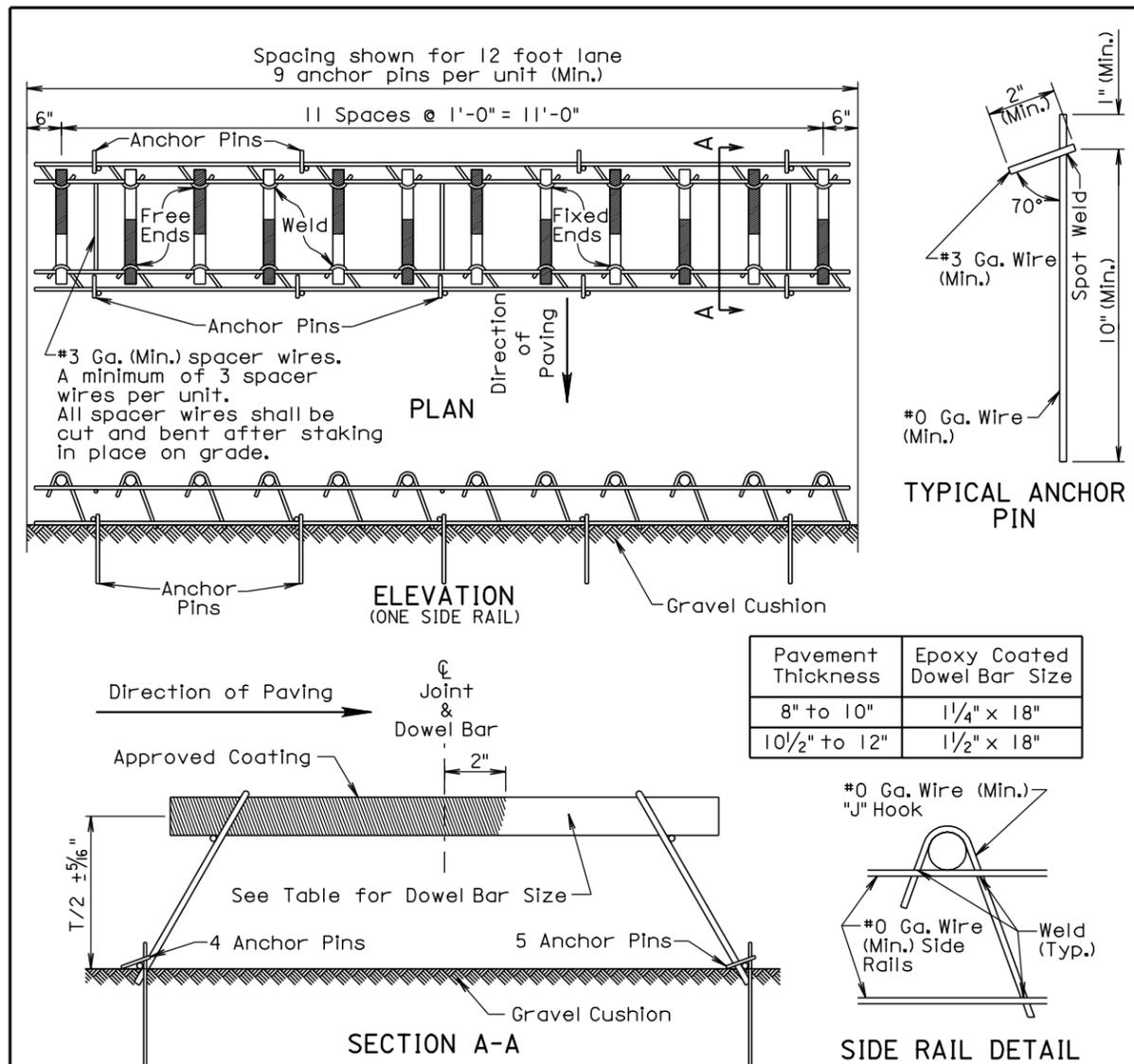
SPALL REMOVAL



* Remove and chip to sound concrete.

SPALL PATCH





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 $\pm 1/8$ inch in 18 inches and to all other dowel bars in the assembly $\pm 1/16$ inch in 18 inches.

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

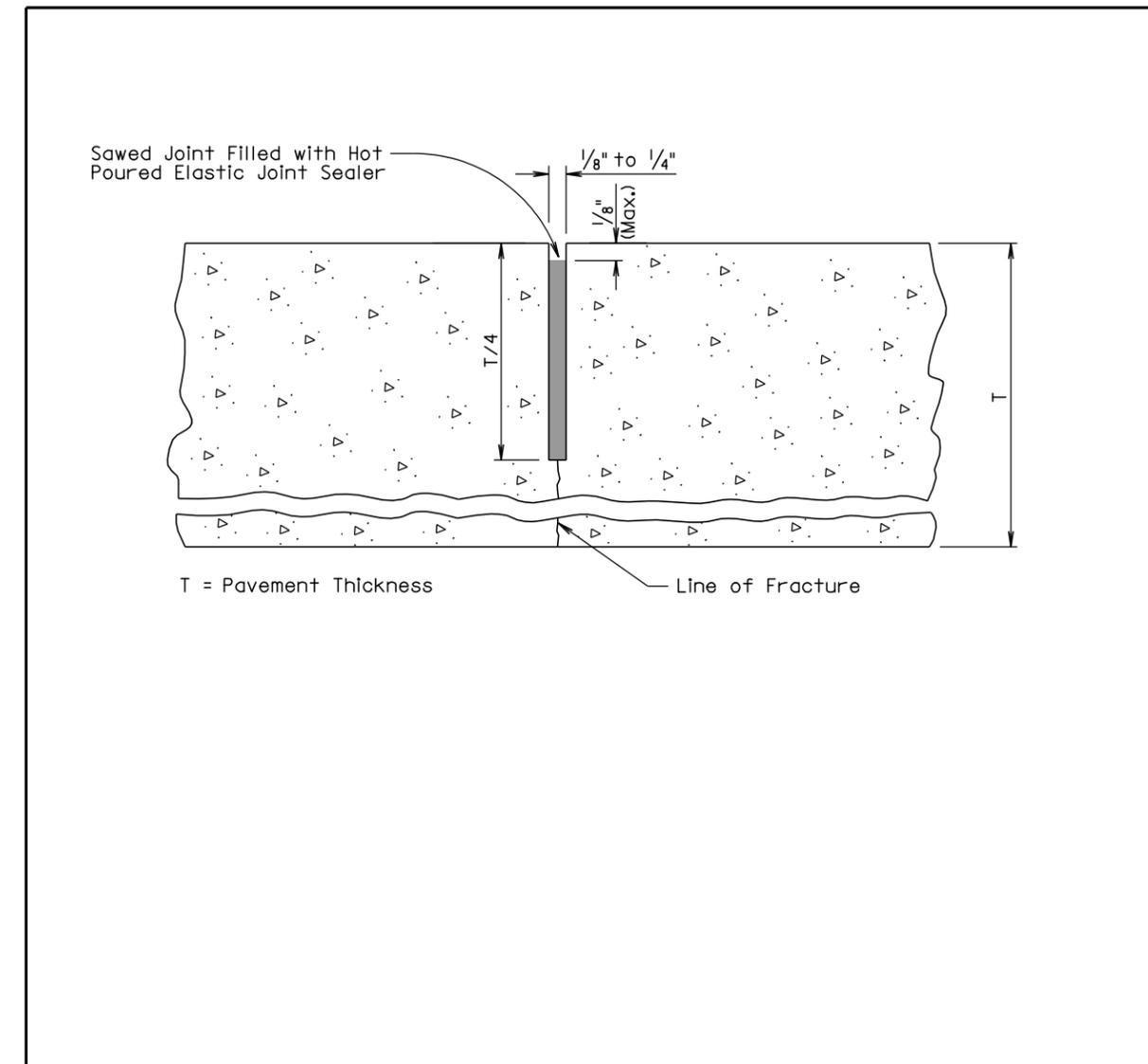
The transverse contraction joints shall be sawed perpendicular to the centerline of the roadway and the dowel bars shall be centered on the sawed joint ± 1 inch.

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

S D D O T	PCC PAVEMENT DOWEL BAR ASSEMBLY FOR TRANSVERSE CONTRACTION JOINTS	PLATE NUMBER 380.01
		Sheet 1 of 1

Published Date: 2nd Qtr. 2011



GENERAL NOTES:

The saw cut to control cracking shall be a minimum of 1/4 the thickness of the pavement.

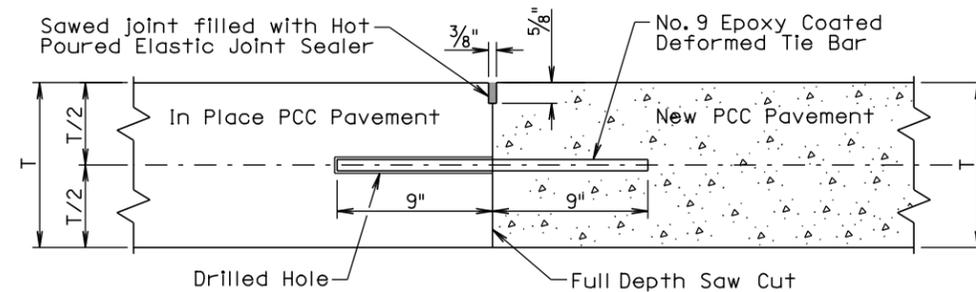
All hot poured elastic joint sealer material spilled on the surface of the concrete pavement shall be removed as soon as the material has cooled. The extent of removal of material shall be to the satisfaction of the Engineer. All costs for removal of the spilled joint sealer material shall be borne by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

December 23, 2007

S D D O T	PCC PAVEMENT TRANSVERSE CONTRACTION JOINT WITH OR WITHOUT DOWEL BAR ASSEMBLY	PLATE NUMBER 380.03
		Sheet 1 of 1

Published Date: 2nd Qtr. 2011

TRANSVERSE CONSTRUCTION JOINT WITH TIE BARS



T = In Place PCC Pavement and New PCC Pavement Thickness

GENERAL NOTES:

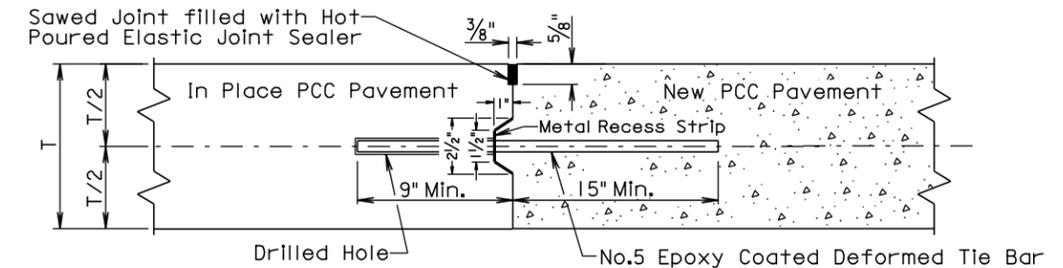
This detail shall be used when the transverse joint is less than 15 feet from the existing transverse contraction joint.

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 spaced 18 inches center to center and shall be a minimum of 3 inches and a maximum of 9 inches from the pavement edges.

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

LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS (DRILLED IN BARS)



T = Pavement Thickness

GENERAL NOTES:

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.

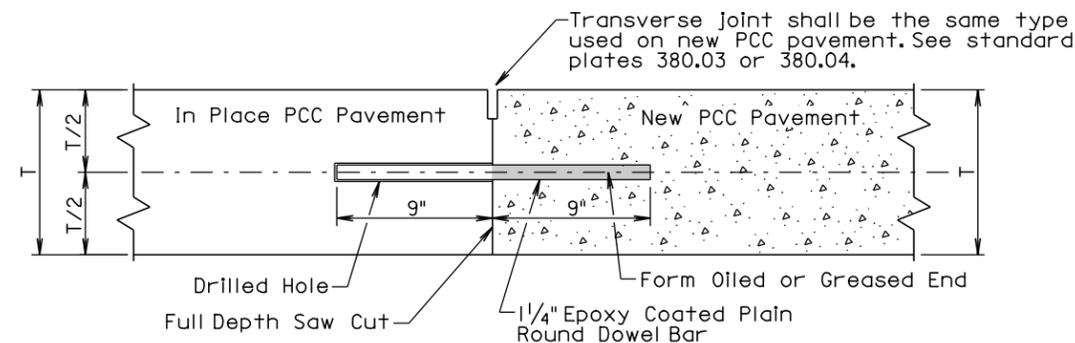
No. 5 epoxy coated deformed tie bars shall be spaced 48" center to center for a female keyway or 30" center to center for a vertical face and male keyway. The keyway shown above is a female keyway.

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

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

The 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.

TRANSVERSE CONSTRUCTION JOINT WITH DOWEL BARS



T = In Place PCC Pavement and New PCC Pavement Thickness

GENERAL NOTES:

This detail shall be used when the transverse joint is 15 feet or greater from the existing transverse contraction joint.

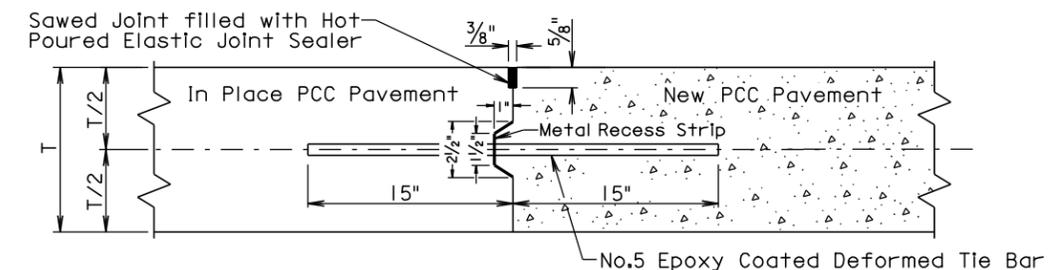
The plain round dowel bars shall be embedded a minimum depth of 9 inches into the in place PCC pavement and anchored with an epoxy resin adhesive.

The 1/4" epoxy coated plain round dowel bars shall be spaced 12 inches center to center and shall be a minimum of 3 inches and a maximum of 6 inches from the pavement edges.

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.

September 6, 2006

LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS (INSERTED OR FORMED IN BARS)



T = Pavement Thickness

GENERAL NOTES:

No. 5 epoxy coated deformed tie bars shall be spaced 48" center to center for a female keyway or 30" center to center for a vertical face and male keyway. The keyway shown above is a female keyway.

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

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

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

September 14, 2001

S D D O T	PCC PAVEMENT TRANSVERSE CONSTRUCTION JOINTS WITH TIE BARS OR DOWEL BARS	PLATE NUMBER 380.06
		Sheet 1 of 1

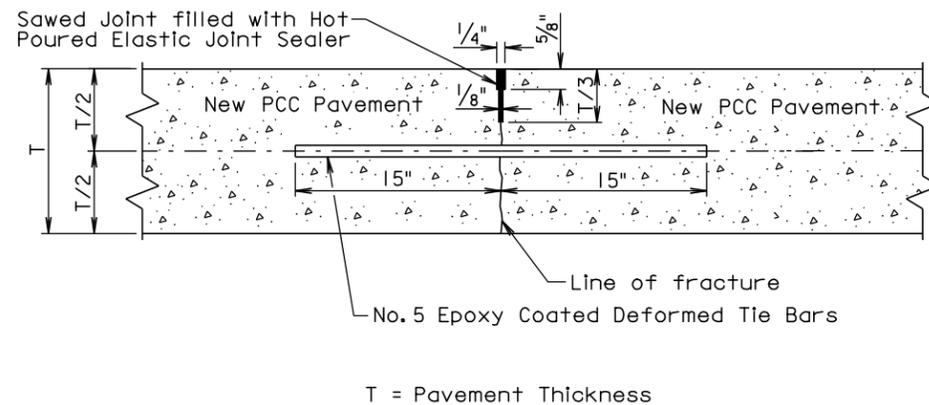
Published Date: 2nd Qtr. 2011

S D D O T	PCC PAVEMENT LONGITUDINAL JOINTS WITH TIE BARS	PLATE NUMBER 380.10
		Sheet 1 of 2

Published Date: 2nd Qtr. 2011

Plotting Date: 06-MAY-2011

SAWED LONGITUDINAL JOINT WITH TIE BARS (POURED MONOLITHICALLY)



GENERAL NOTES:

No. 5 epoxy coated deformed tie bars shall be spaced 48 inches center to center.

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

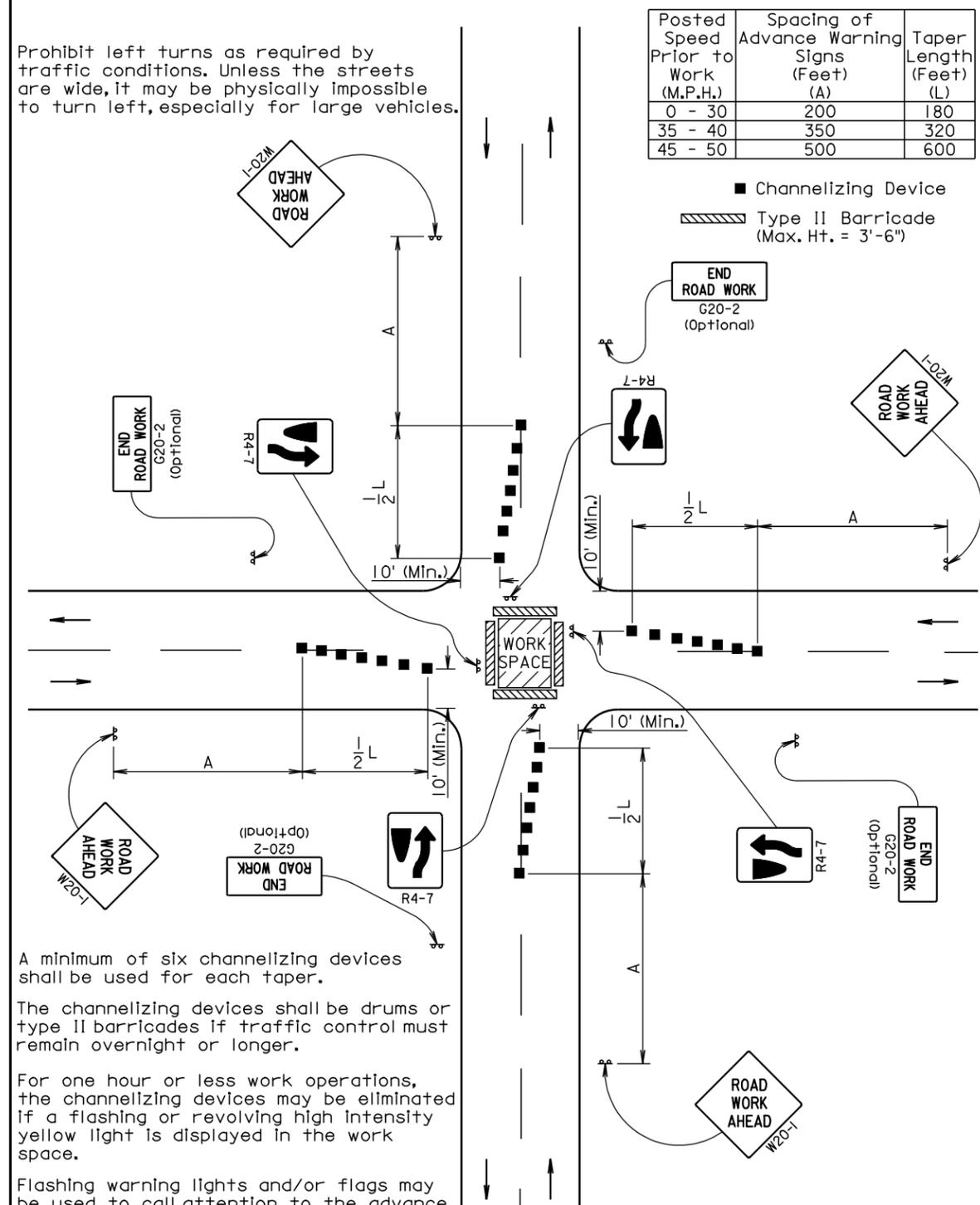
The first saw cut to control cracking shall be a minimum of 1/3 the thickness of the pavement. Additional sawing for widening the saw cut to provide the width for the installation of the hot poured elastic joint sealer will be necessary.

September 14, 2001

S D D O T	PCC PAVEMENT LONGITUDINAL JOINTS WITH TIE BARS	PLATE NUMBER 380.10
		Sheet 2 of 2

Published Date: 2nd Qtr. 2011

Prohibit left turns as required by traffic conditions. Unless the streets are wide, it may be physically impossible to turn left, especially for large vehicles.



A minimum of six channelizing devices shall be used for each taper.

The channelizing devices shall be drums or type II barricades if traffic control must remain overnight or longer.

For one hour or less work operations, the channelizing devices may be eliminated if a flashing or revolving high intensity yellow light is displayed in the work space.

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

February 14, 2011

S D D O T	GUIDES FOR TRAFFIC CONTROL DEVICES CLOSURE IN CENTER OF INTERSECTION	PLATE NUMBER 634.34
		Sheet 1 of 1

Published Date: 2nd Qtr. 2011

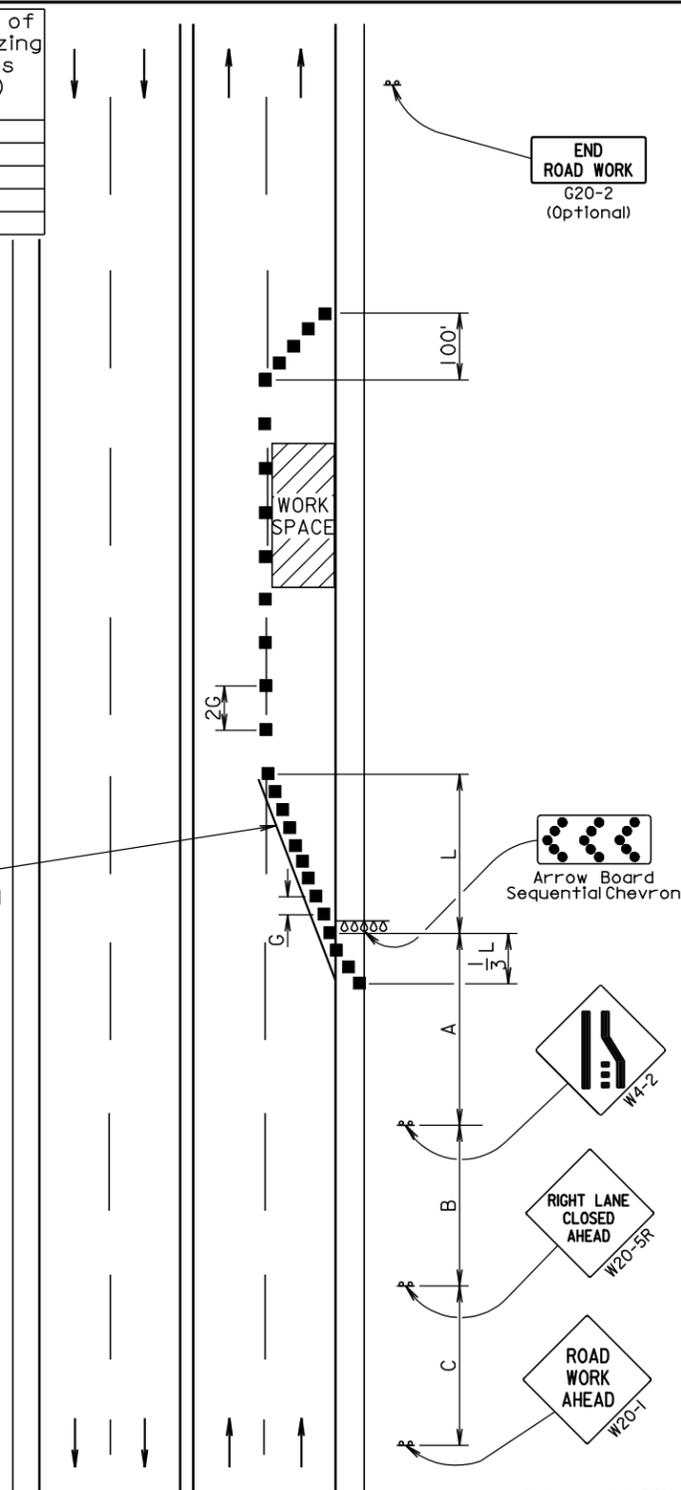
Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet)			Taper Length (Feet) (L)	Spacing of Channelizing Devices (Feet) (G)
	(A)	(B)	(C)		
0 - 30	200			180	25
35 - 40	350			320	25
45 - 50	500			600	50
55	750			660	50
60 - 65	1000			780	50

■ Channelizing Device

The channelizing devices shall be drums or 42" cones if traffic control must remain overnight or longer. During daylight hours, 42" cones may be used in lieu of drums along the centerline.

Longitudinal dimensions may be adjusted to fit project conditions such as horizontal curves, vertical curves, and other site restrictions.

Four inch white temporary pavement marking shall be used if traffic control must remain overnight or longer.



February 14, 2011

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet)			Taper Length (Feet) (L)	Spacing of Advanced Warning Signs (Feet)		
	(G)	(L)	(ABC)		(ABC)	(ABC)	(ABC)
0 - 30	25	180	200				
35 - 40	25	320	350				
45 - 50	50	600	500				
55	50	660	750				
60 - 65	50	780	1000				
70 - 75	50	900	1000	1500	2640		

■ Channelizing Device

* Speed appropriate for location.

4" white temporary pavement marking tape for right lane closures and 4" yellow temporary pavement marking tape for left lane closures or temporary road markers at 5' spacing shall be installed when the lane is closed for a period of 24 hours or more.

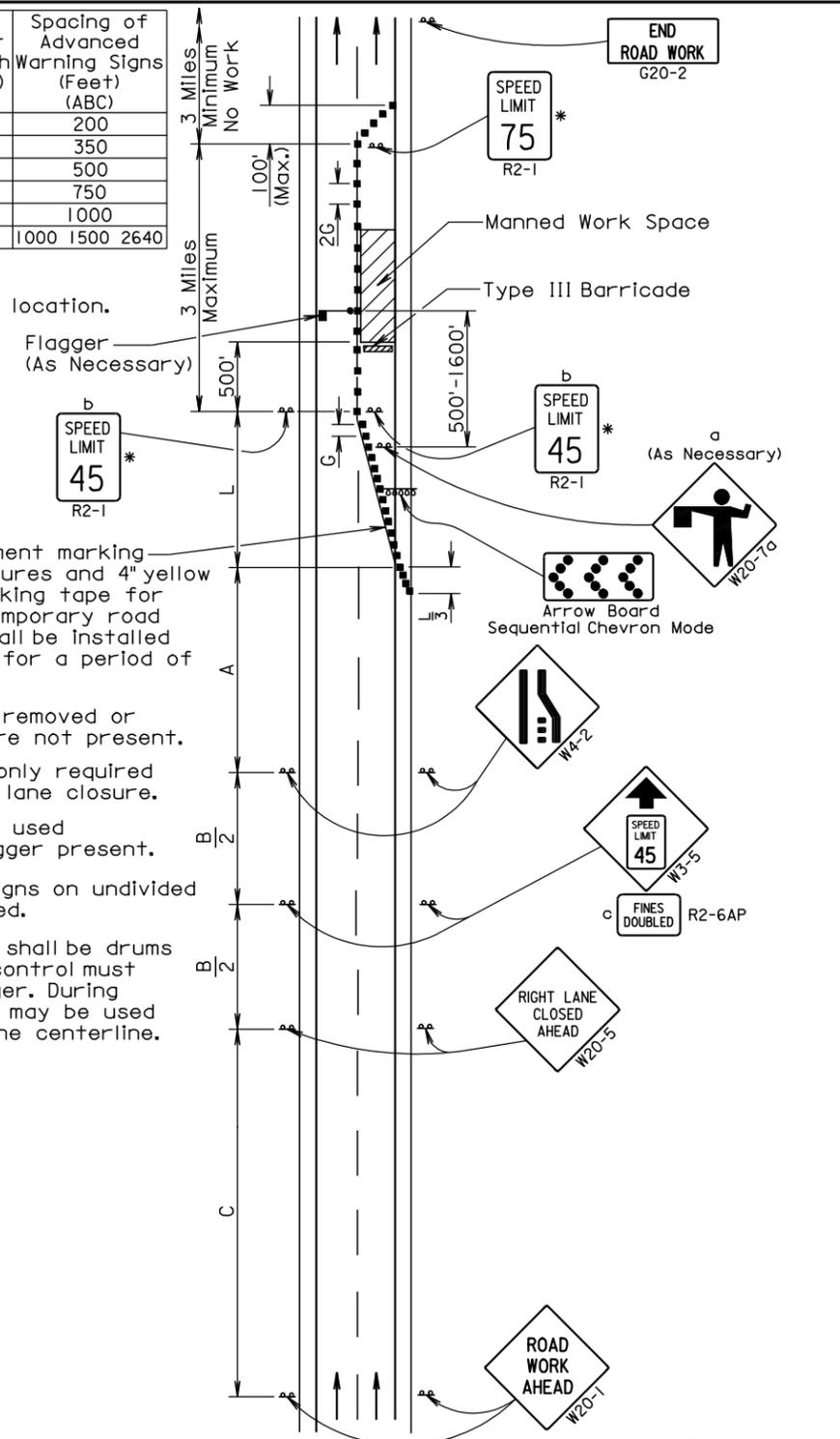
Signs a, b, and c shall be removed or covered when workers are not present.

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

The FLAGGER sign shall be used whenever there is a Flagger present.

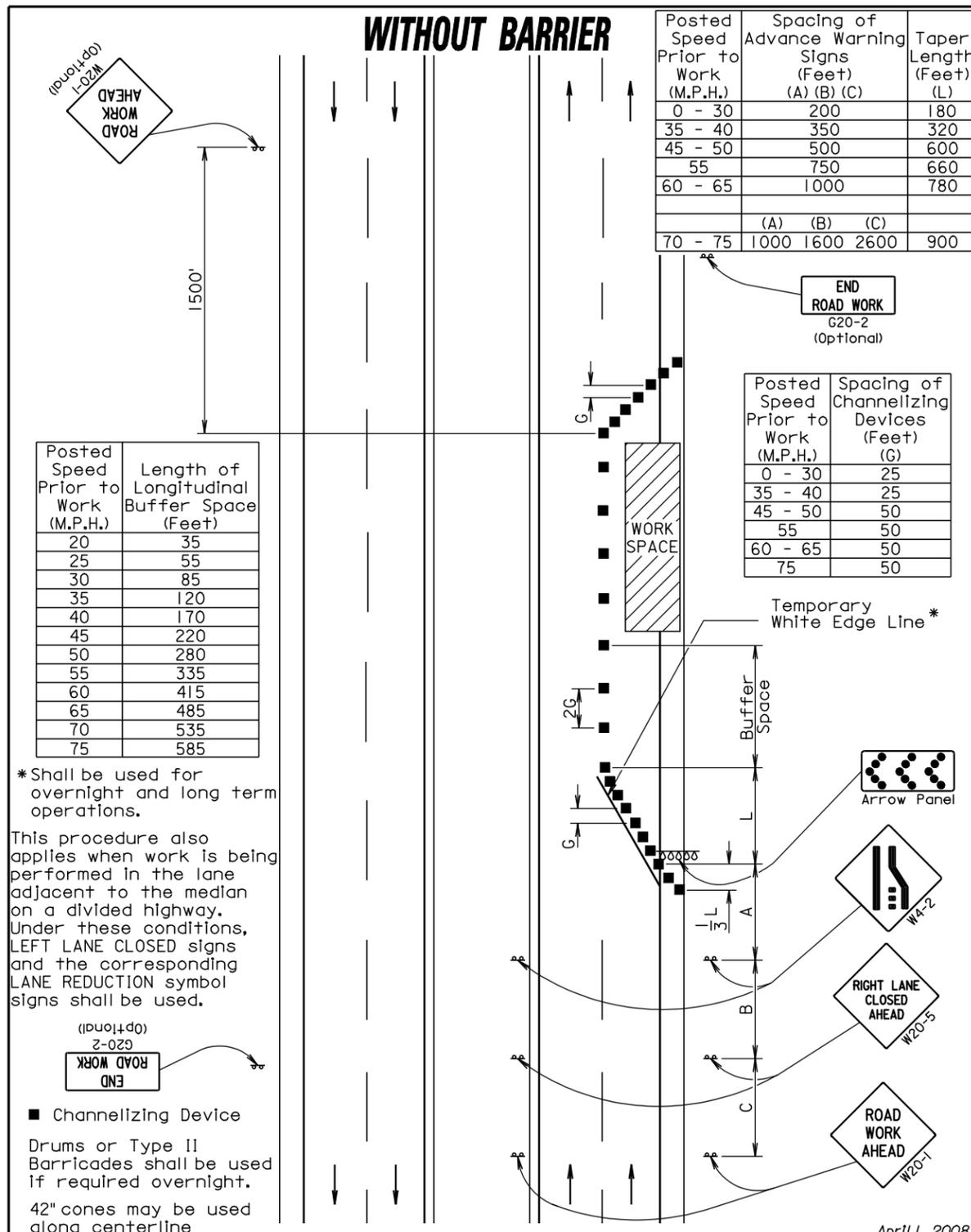
Left mounted advance signs on undivided highways are not required.

The channelizing devices shall be drums or 42" cones if traffic control must remain overnight or longer. During daylight hours, 42" cones may be used in lieu of drums along the centerline.



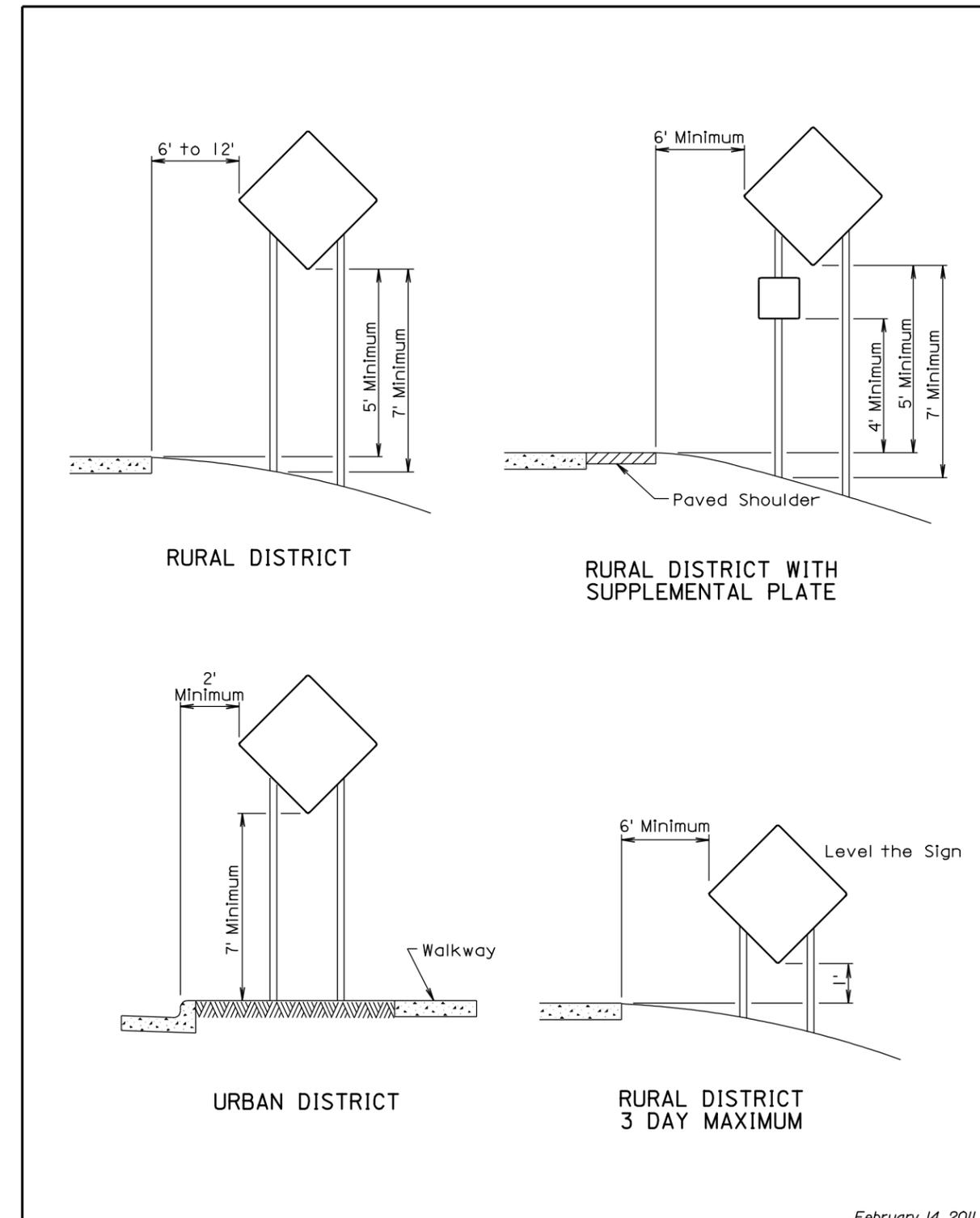
February 14, 2011

Plotting Date: 06-MAY-2011



April 11, 2008

S D D O T	GUIDES FOR TRAFFIC CONTROL DEVICES LANE CLOSURE WITHOUT BARRIER	PLATE NUMBER 634.64
Published Date: 2nd Qtr. 2011		Sheet 1 of 1



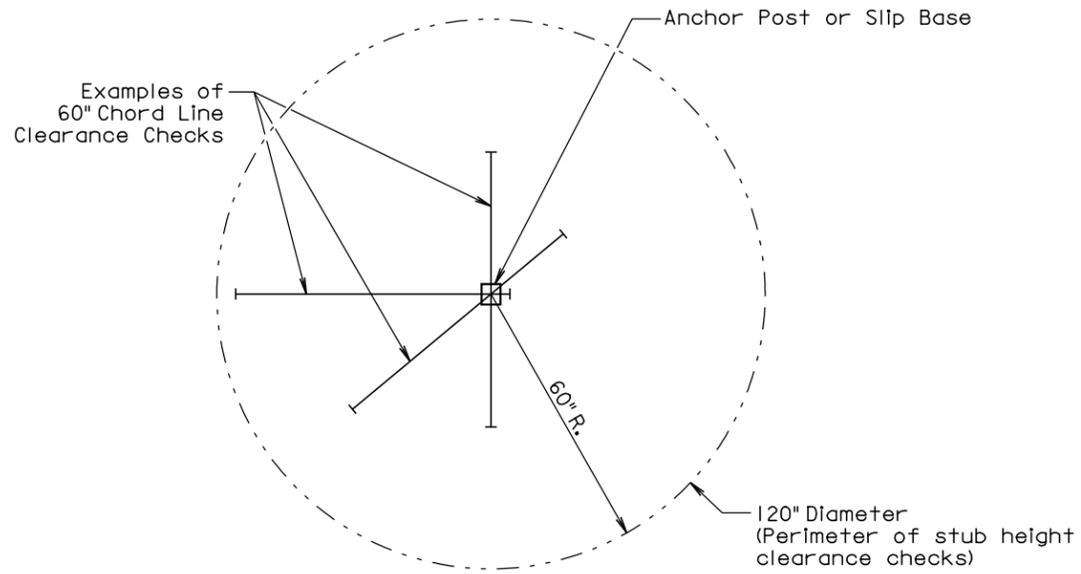
February 14, 2011

S D D O T	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85
Published Date: 2nd Qtr. 2011		Sheet 1 of 1

Username - trrc011951

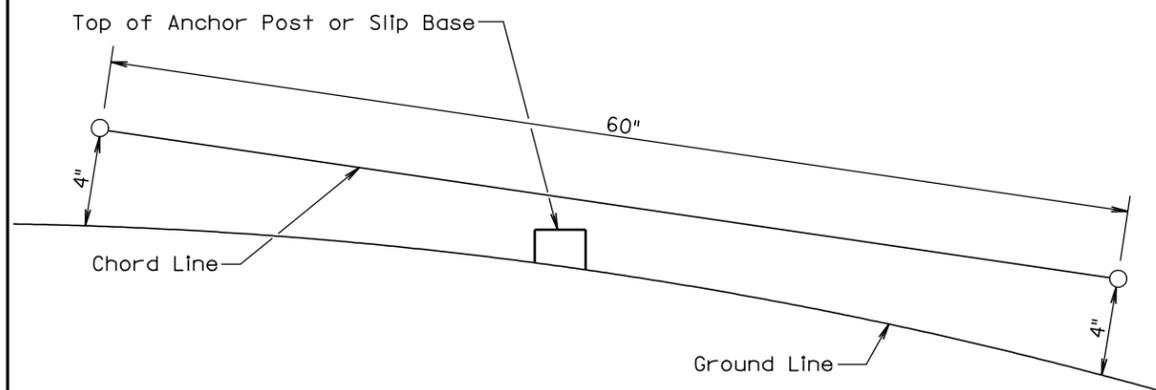
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	079-452	16	16
	016-452 016B-452		

Plotting Date: 06-MAY-2011



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

S D D O T	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
		Sheet 1 of 1

Published Date: 2nd Qtr. 2011