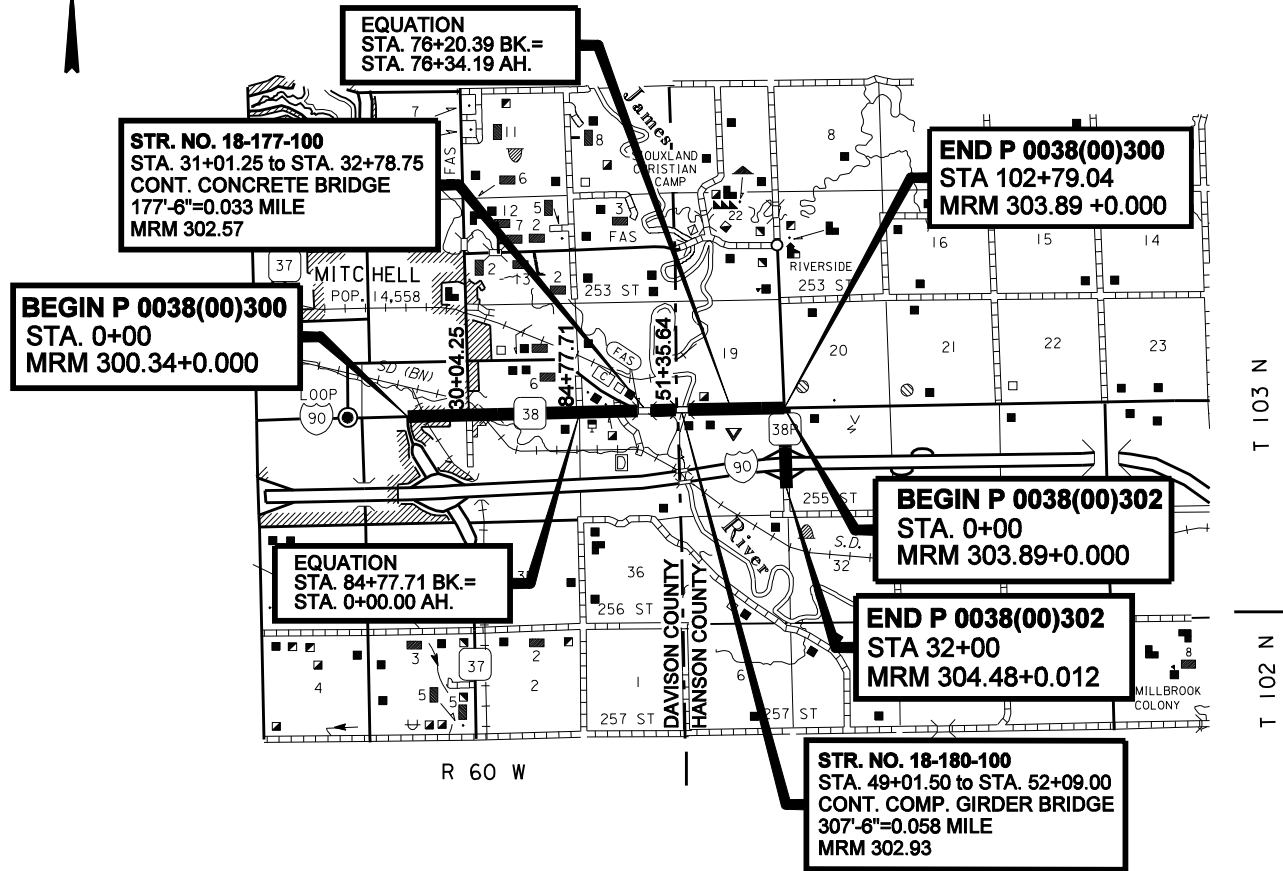


**P 0038(00)300 & P 3038(00)302
 DAVISON & HANSON COUNTIES
 PCC PAVEMENT REPAIR,
 RESEAL PCC PAVEMENT JOINTS
 & SEAL RANDOM CRACKS
 LENGTH SD38: 3.550 MILES
 LENGTH SD38P: 0.606 MILE
 PCN 003C & 00HN**



P 0038(00)300	
DESIGN DESIGNATION	
ADT(2005)	3470
ADT(2025)	4765
DHV	810
D	50%
T DHV	4.4%
T ADT	9.7%
V	65 MPH

P 3038(00)302	
DESIGN DESIGNATION	
ADT(2005)	1455
ADT(2025)	2365
DHV	405
D	50%
T DHV	2.7%
T ADT	6.0%
V	65 MPH

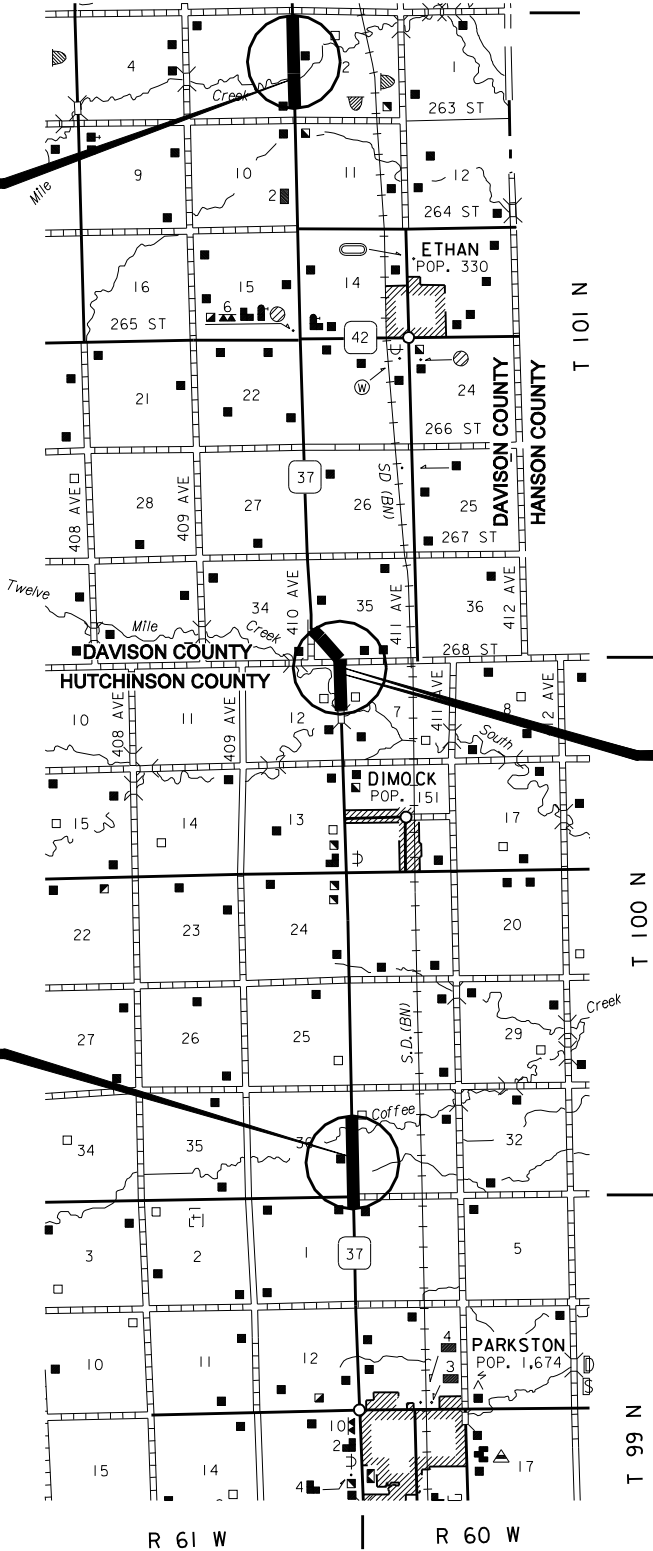
037-252 DAVISON & HUTCHINSON COUNTIES PCC PAVEMENT REPAIR PCN 011D



MRM 64.980

**MRM 59.020 &
MRM 59.054**

MRM 55.197



DESIGN DESIGNATION	
ADT(2005)	2980
ADT(2025)	4210
DHV	715
D	50%
T DHV	5.8%
T ADT	12.8%
V	65 MPH

**P 0038(00)300, P 3038(00)302 & 037-252
DAVISON, HANSON & HUTCHINSON COUNTIES**

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**P 0038(00)300, P 3038(00)302 & 037-252
DAVISON, HANSON & HUTCHINSON COUNTIES**

TABLE FOR PCC PAVEMENT REPAIR FOR P 0038(00)300 (4 LANE)

MRM	EB PASSING LANE		EB DRIVING LANE		WB PASSING LANE		WB DRIVING LANE		DRIVING PASSING LANE		DRIVING PASSING LANE		PCCP		1" x 18" PLAIN ROUND DOWEL BARS		No. 8 x 18" DEFORMED TIE BARS		No. 5 x 24" DEFORMED DOWEL BAR		REMOVE & REPLACE B68 C&G		REMOVE & REPLACE P8 GUTTER		SEAL RANDOM CRACKS IN PCC PAVEMENT		
	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	SqYds	Each	Each	Each	Each	Each	Each	Ft	Ft	Ft	Ft	Ft	Ft	
300.412	6.0		6.0					12	12	12	12	12	16.0		32		2									5	WB Driving Lane
300.424								12	12	12	12	24.0			50		2					6					
300.427	6.0		6.0					12	12	12	12	13.3			9		4					10					
300.434							10.0	12	12	12	12																
300.453								12	12	12	12																
300.503								12	12	12	12																
300.522							6.0	12	12	12	12	8.0			18		2					6					
300.533							6.0	12	12	12	12	8.0			18		2					6					
300.583	6.0		6.0					12	12	12	12	16.0			17									6			
300.594	24.0		24.0				24.0	12	12	12	12	128.0			68						48	48					
300.600							6.0	12	12	12	12	8.0			18		2					6					
300.632								12	12	12	12																
300.646							6.0	12	12	12	12	8.0			9		2					6					
300.658								12	12	12	12																
300.662								12	12	12	12																
300.680								12	12	12	12																
300.694								12	12	12	12	16.0			17							6					
300.711							6.0	12	12	12	12	8.0			18		2					6					
300.725	6.0		6.0					12	12	12	12	16.0			34							6					
300.729	24.0		24.0				84.0	12	12	12	12	208.0			68		27				132	120					
300.754								12	12	12	12																
300.762								12	12	12	12																
300.775								12	12	12	12																
300.779								12	12	12	12																
300.790								12	12	12	12																
300.791								12	12	12	12																
300.807							44.0	12	12	12	12	58.7			18		16				36	44					
300.831								12	12	12	12																
300.852								12	12	12	12																
300.853								12	12	12	12																
300.854								12	12	12	12																
300.875								12	12	12	12																
300.884								12	12	12	12																
300.884								12	12	12	12																
300.886								12	12	12	12																
300.886								12	12	12	12																
300.892								12	12	12	12																
300.897								12	12	12	12																
TOTAL:												536.0		52	394	61	216	270	635								
*ADDITIONAL QUANTITIES:												40.0		40	10	-	18.0	-	-								
GRAND TOTAL:												576.0		92	434	71	216	288	635								

*Additional Quantities to be used, as needed, at the discretion of the Engineer.

**P 0038(00)300, P 3038(00)302 & 037-252
DAVISON, HANSON & HUTCHINSON COUNTIES**

TABLE FOR PCC PAVEMENT REPAIR FOR P 0038(00)300 (2 LANE)

MRM	WB LANE LENGTH Ft	EB LANE LENGTH Ft	WIDTH Ft	PCCP TRACK SqYds	1" x 18"			SEAL			
					PLAIN ROUND DOWEL BARS Each	No. 8 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each	RANDOM CRACKS IN PCC PAVEMENT Ft	DOWEL BAR Each	PAVEMENT Ft	
301.199			15								14 WBL
301.236			15								35 WBL
301.270		6.0	15	10.0	10	10	1				
302.075		11.0	15	18.3	10	10	4				
302.175	24.0	24.0	15	80.0		40		60			20 WBL
302.182			15								10 WBL
302.293			15								40 (20' WBL & 20' EBL)
302.551			15								16 EBL
** 302.553	6.0	6.0	15	20.0							
** 302.595	6.0	6.0	15	20.0							
302.612		33.0	15	55.0		20	12	30			7 WBL
302.761			15								1 EBL
302.870			15								11 EBL
302.871			15								14 EBL
302.890			15								
** 302.894	6.0	6.0	15	20.0		20		15			
** 302.967	6.0	22.0	15	46.7		20	5				
302.969			15								13 (8' WBL & 5' EBL)
302.971			15								13 WBL
302.985			15								1 WBL
302.986			15								14 WBL
302.999			15								1 EBL
303.073	24.0	24.0	15	80.0		40		60			
303.718			15								20 EBL
303.798			15								100 WBL
303.887			15								24 (12' WBL & 12' EBL)
303.888			15								12 EBL
303.890			15								12 WBL
TOTAL:				350.0	20	160	22	165	378		
* ADDITIONAL QUANTITIES:				40.0	36	36	8	-	-		
GRAND TOTAL:				390.0	56	196	30	165	378		

* Additional Quantities to be used, as needed, at the discretion of the Engineer.
 ** Restore existing Growth Joint (For details see Layout for Polymer Modified Asphalt Growth Joint).

**P 0038(00)300, P 3038(00)302 & 037-252
DAVISON, HANSON & HUTCHINSON COUNTIES**

TABLE FOR PCC PAVEMENT REPAIR FOR P 3038(00)302

MRM	SB LANE LENGTH Ft	NB LANE LENGTH Ft	WIDTH Ft	PCCP FAST TRACK SqYds	1 1/4" x 18"		No. 9 x 18" DEFORMED TIE BARS Each	No. 5 x 24" DEFORMED TIE BARS Each	SEAL RANDOM CRACKS IN PCC PAVEMENT Ft
					PLAIN ROUND DOWEL BARS Each	INSERT STEEL BAR IN PCC PAVEMENT			
303.869									8 NBL
303.907	6.0	6.0	12	16.0	16	16	1	1	
303.924		6.0	8.4	5.6	5	5	1	1	
303.943		6.0	12	8.0	8	8	2	2	
303.951	6.0		12	8.0	8	8	1	1	
303.960		6.0	12	8.0	8	8	1	1	
303.967	6.0	6.0	12	16.0	16	16	1	1	
303.993		6.0	12	8.0	8	8	1	1	
304.075	6.0	6.0	12	16.0	16	16	1	1	
304.083		6.0	12	8.0	8	8	1	1	
304.191	6.0	6.0	12	16.0	16	16	1	1	
304.199	6.0		12	8.0	8	8	1	1	
304.271	6.0		12	8.0	8	8	1	1	
304.314	6.0		12	8.0	8	8	1	1	
304.391									24 (12' SBL & 12' NBL)
304.449	6.0	6.0	12	16.0	16	16	1	1	
304.451	6.0		12	8.0	8	8	1	1	
304.460									12 NBL
TOTAL:				157.6	157	157	12	12	44
*ADDITIONAL QUANTITIES:				24.0	24	24	6	6	-
GRAND TOTAL:				181.6	181	181	18	18	44

*Additional Quantities to be used, as needed, at the discretion of the Engineer.

TABLE FOR PCC PAVEMENT REPAIR FOR 037-252
 INSERT STEEL BAR
 IN PCC PAVEMENT

MRM	NB LANE LENGTH		WIDTH Ft	PCCP FAST TRACK SqYds	1" x 18" PLAIN ROUND DOWEL BARS		No. 8 x 18" DEFORMED TIE BARS		No. 5 x 24" DEFORMED TIE BARS		DOWEL BAR Each
	Ft	SB LANE LENGTH			Each	Each	Each	Each			
55.197	84.0	84.0	14	261.3			36			140	
59.020	44.0	44.0	14	136.9			36			84	
59.054	64.0	64.0	14	199.1			36			112	
** 64.980	24.0	24.0	14	74.7			36			56	
TOTAL:				672.0			144			392	
*ADDITIONAL QUANTITIES:											
GRAND TOTAL:				672.0			144			392	

* Additional Quantities to be used, as needed, at the discretion of the Engineer.
 ** Location has been previously Foam Jacked. Jacking Foam shall be removed at no additional expense and replaced with Gravel Cushion.

**P 0038(00)300, P 3038(00)302 & 037-252
DAVISON, HANSON & HUTCHINSON COUNTIES**

SPECIFICATIONS

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

SCOPE OF WORK

This project consists of full depth replacement of concrete pavement in areas where concrete pavement blowups or major failures have occurred. Full depth areas vary in length and width, however the minimum length is 6 feet. In addition to concrete repair on SD 38 & SD 38P, the transverse joints shall be resealed and the random cracks sealed.

COMPLETION DATE

All work on SD 37 shall be completed on or before October 15, 2006.

All work on SD 38 & SD 38P shall be completed on or before July 27, 2007.

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 (Right-of-Way) ROW.

All construction/demolition debris generated by this project shall be cleaned up and disposed of by the Contractor.

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. 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.

Cost for furnishing waste disposal site(s), disposing of waste, maintaining control of access (fence, gates & signs) and reclamation of the waste disposal site(s) shall be incidental to the contract unit prices for the various items.

POLYMER MODIFIED ASPHALT GROWTH JOINT

The existing growth joints that are identified in the Table for PCC Pavement Repair shall be removed and replaced with a Polymer Modified Asphalt Growth Joint.

The asphalt concrete in the existing growth joint and a minimum of 6' of adjacent PCC Pavement shall be removed. New PCC Pavement shall be formed at the growth joint as shown on the Layout for Polymer Modified Asphalt Growth Joint. Cost for removing the existing asphalt concrete and adjacent PCC Pavement and placing new PCC Pavement shall be incidental to the contract unit price per square yard for Fast Track Concrete for PCC Pavement Repair.

The new growth joints shall be filled with 6 inches of Asphalt Concrete Composite placed in lifts not to exceed 3 inches and compacted to the satisfaction of the Engineer, and 3 inches of combined Aggregate and Polymer Modified Asphalt. See Layout for Polymer Modified Asphalt Growth Joint for details.

Included in the Estimate of Quantities are 7 tons of Asphalt Concrete Composite to accomplish this work.

RESTORATION OF GRAVEL CUSHION

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

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

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

EXISTING PCC PAVEMENT

The existing pavement on SD 38 is 8" Nonreinforced PCC Pavement.

Existing contraction joints are spaced at approximately 20'. Longitudinal joints are reinforced with No. 4 x 30" deformed tie bars spaced 48" center to center. Transverse joints are reinforced with 1¼" x 18" plain round dowel bars spaced 12" center to center.

The existing pavement on SD 38P is 9" Nonreinforced PCC Pavement.

The existing 9" PCC Pavement is reinforced with welded wire fabric. The welded wire fabric weighs not less than 60 pounds per 100 square feet, the longitudinal wires are No. 1 gauge and are spaced 6" center to center and the transverse wires are No. 4 gauge and are spaced 12" center to center.

Existing contraction joints are spaced at approximately 46.5'. Longitudinal joints are reinforced with No. 5 x 24" deformed tie bars spaced 30" to 48" center to center. Transverse joints are reinforced with 1¼" x 18" plain round dowel bars and with No. 9/10 x 18" deformed tie bars spaced 12" to 18" center to center.

The existing pavement on SD 37 is 8" Nonreinforced PCC Pavement.

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

The aggregate in the existing 8" & 9" PCC Pavement is quartzite.

NONREINFORCED PCC PAVEMENT REPAIR - GENERAL

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

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

**P 0038(00)300, P 3038(00)302 & 037-252
DAVISON, HANSON & HUTCHINSON COUNTIES**

NONREINFORCED PCC PAVEMENT REPAIR – GENERAL (CONTINUED)

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

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

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 new hot-mix asphalt.

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 will be sawed and sealed in accordance with the details shown in these plans. Refer to Saw and Seal Joints notes.

NONREINFORCED PCC PAVEMENT REPAIR

New pavement thickness shall be a minimum thickness of 8" where the existing pavement thickness is 8".

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

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. 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. In lieu of submitting a mix design the Contractor may use one of the following dependent upon type of cement to be used:

	<u>LB./CU.YD.</u>	<u>LB./CU.YD.</u>
CEMENT	800 (TYPE I or II)	710 (TYPE III)
WATER	282	300
FINE AGGREGATE	1039	1114
COARSE AGGREGATE	1726	1668

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

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, to ensure that strength of 4,000 psi is attained prior to opening to traffic.

Cost for performing the aforementioned work including sawing and removing concrete, furnishing and placing concrete, sawing and sealing joints, repairing asphalt shoulders, labor, tools and equipment shall be included in the contract unit price per square yard for Nonreinforced PCC Pavement Repair.

**P 0038(00)300, P 3038(00)302 & 037-252
DAVISON, HANSON & HUTCHINSON COUNTIES**

FAST TRACK CONCRETE FOR PCC PAVEMENT REPAIR

New pavement thickness shall be a minimum thickness of 8" where the existing pavement thickness is 8" and 9" where the existing pavement thickness is 9".

Fast Track Concrete shall be used for two-lane roadway repair locations to ensure that the pavement repair area can be opened to traffic within 6 to 8 hours after placement.

The slump requirement prior to use of a set accelerator or super-plasticizer will be limited to 2" maximum and the concrete shall contain 4.5% to 7.0% entrained air. Coarse aggregate shall be crushed ledge rock, Size No. 1. 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. In lieu of submitting a mix design the Contractor may use the following:

	<u>LB./CU.YD.</u>
CEMENT (TYPE II or III)	784
FINE AGGREGATE	1162
COARSE AGGREGATE	1650

The use of a set accelerator and super-plasticizer at manufacturer's recommended dosage will be required. The super-plasticizer shall be added at the project site.

The special mix has been designed to produce a minimum compressive strength of 3,800 psi in 6 to 8 hours of curing time.

Fast Track Concrete shall be cured with white pigmented curing compound (AASHTO M148, Type 2) applied as soon as practical at a rate of 125 square feet per gallon. In addition, the concrete shall be immediately covered with suitable insulation blanket consisting of a layer of closed cell polystyrene foam protected by at least one layer of plastic. The insulation blanket shall have an R value of at least 0.5, as rated by the manufacturer. The insulation blanket shall be left in place, except for joint sawing operations, until the 3,800 psi strength is attained.

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

On SD 38 & SD 38P the concrete repair area shall be removed, replaced, and opened to traffic in the same day during daylight hours. If the repair cannot be accomplished within the same day the Contractor shall place and compact gravel cushion within the repair area prior to night fall and the roadway shall be open to normal traffic. The Contractor shall be responsible for the additional cost for providing, placing and compacting the gravel cushion.

On SD 37 the concrete repair area shall be removed, replaced, and opened to traffic within 24 hours. If the repair cannot be accomplished within 24 hours the Contractor shall place and compact gravel cushion within the repair area and open to normal traffic. The Contractor shall be responsible for the additional cost for providing, placing and compacting the gravel cushion.

Cost for performing the aforementioned work including sawing and removing concrete, furnishing and placing Fast Track Concrete, sawing and sealing joints, repairing asphalt shoulders, labor, tools and equipment shall be included in the contract unit price per square yard for Fast Track Concrete for PCC Pavement Repair.

CONCRETE REMOVAL AROUND DROP INLETS

At locations where drop inlets are within the areas for Curb and Gutter replacement, the Frames and Grates shall be removed prior to the removal of the adjacent Curb and Gutter and reset after the adjacent Curb and Gutter has been replaced.

Costs for performing this work shall be included in the contract unit prices per each for Remove Drop Inlet Frame and Grate Assembly for Reset and Reset Drop Inlet Frame and Grate Assembly.

**P 0038(00)300, P 3038(00)302 & 037-252
DAVISON, HANSON & HUTCHINSON COUNTIES**

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.

On 8" concrete repair areas:

The Contractor shall insert the steel bars (1" x 18" epoxy coated plain round dowel bars and No. 8 x 18" epoxy coated deformed tie bars for transverse joints and No. 5 x 24" epoxy coated deformed tie bars for longitudinal joints) into drilled holes in the existing concrete pavement. An epoxy resin adhesive must be used to anchor the steel bar in the drilled hole.

On 9" concrete repair areas:

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).

Steel bars shall be inserted in the transverse joint on 18" centers. The first steel bar in the transverse joint shall be placed 9" from the outside edge of the slab. Steel bars shall be inserted in the longitudinal joint on 30" centers and shall be a minimum of 15" from either transverse joint. A typical one-lane patch 12' wide and 6' long will require 18 steel bars (8 in each transverse joint and 2 in the longitudinal joint).

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.

SAW AND SEAL JOINTS

All longitudinal and transverse joints at concrete repair areas shall be sawed and sealed. The transverse joints on SD37 shall be sawed and sealed as shown on Standard Plate 380.04. The transverse joints on SD38 and SD38P shall be sawed and sealed as shown on Standard Plate 380.03.

Joints shall not be sealed unless they are thoroughly clean and dry. Cleaning shall be accomplished by sand blasting and other tools as necessary. Just prior to sealing, each joint shall be blown out using a jet of compressed air to remove all traces of dust.

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

**P 0038(00)300, P 3038(00)302 & 037-252
DAVISON, HANSON & HUTCHINSON COUNTIES**

SAW AND SEAL JOINTS (CONTINUED)

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

RESEAL PCC PAVEMENT JOINTS

All transverse joints on SD38 and SD38P will be resealed.

The longitudinal joint on SD38 between the eastbound lane and the right turn lane on to SD38P will be resealed.

The existing transverse and longitudinal joints shall be cleaned of incompressibles and joint sealant to the satisfaction of the Engineer. The Contractor shall remove the joint sealant by sawing adjacent to the sides of the joint with a minimum of two blades that are set to the width that will clean the joint and joint faces. It is not essential that all of the sealant be removed. Remaining sealant adhering to the sides may remain in place if the Engineer determines that it is not detrimental to the joint.

Just prior to sealing, the joints shall be sandblasted and cleaned with compressed air.

In certain areas the joint may be wider than the original construction. It may be necessary to provide backer rod in the wide areas. Any additional cost to perform this work shall be at no additional cost to the State. The Contractor shall be responsible to verify joint widths prior to establishing the contract unit price.

Transverse joints on SD38 shall be sealed with Low Modulus Silicone Sealant. Transverse joints on SD38P shall be sealed with Hot Poured Elastic Joint Sealer on original joints and Low Modulus Silicone Sealant on joints resulting from previous repair. Longitudinal joints shall be sealed with Hot Poured Elastic Joint Sealer.

Cost for removing, cleaning, and resealing the transverse and longitudinal joints shall be incidental to the contract unit price per foot for Reseal PCC Pavement Joint.

SEAL RANDOM CRACKS IN PCC PAVEMENT

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

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

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

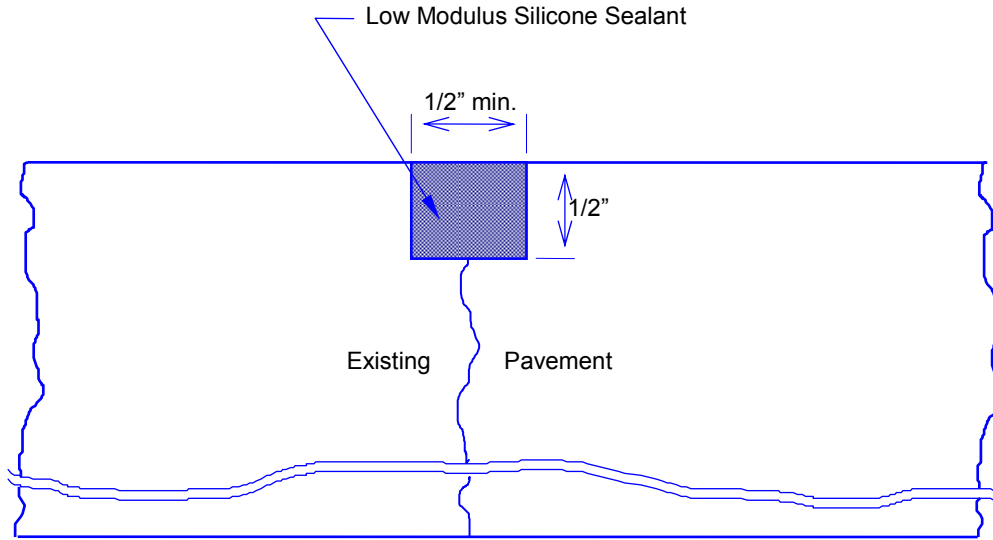
Random cracks narrower than ½ inch shall be routed and sealed ½ inch wide by ½ inch deep. Random cracks wider than ½ inch may require the placement of a backer rod prior to sealing.

Sealant shall be placed in the routed reservoir with equipment and by methods that insure complete and uniform filling. Sealant shall be placed level with the driving surface of the concrete. Any excess or overrun of sealant shall be removed by the Contractor at no additional cost to the state.

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

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

SEALING RANDOM CRACKS



CONCRETE CURB AND GUTTER AND SIDEWALK

Existing concrete curb and gutter and sidewalk shall be removed and replaced as detailed in these plans or as directed by the Engineer. If the end of any section to be removed does not fall on an existing joint, a sawed joint (3" to 4" deep) must be made to provide a vertical face with the new joint.

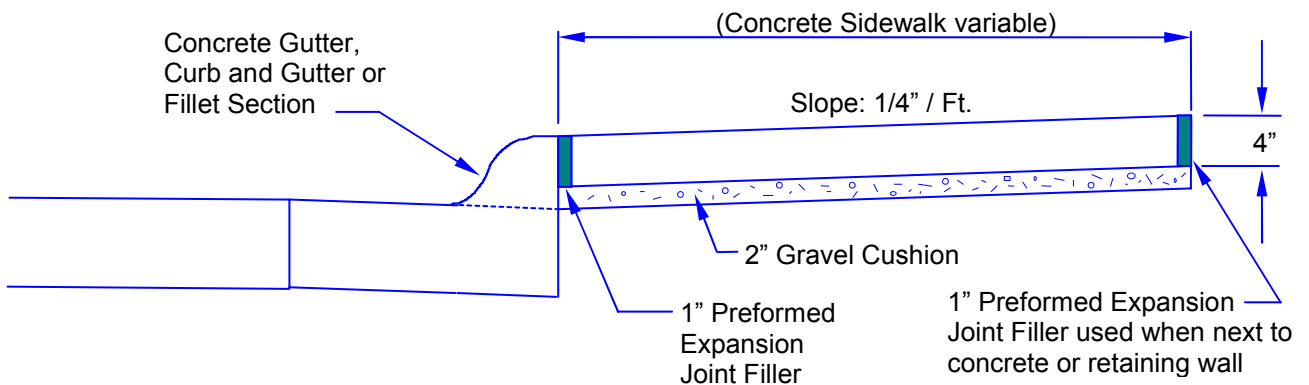
Existing foundation material shall be shaped and compacted to a firm, uniform bearing surface, conforming to the existing section or established grades as set by the Engineer. Unsuitable foundation material shall be removed and replaced as directed. Cushion material shall be furnished, placed, and compacted by the Contractor.

Cost for labor, equipment, material and incidentals required for excavation and providing cushion material shall be incidental to the contract unit prices for the various items.

Curb and Gutter shall be tied to existing PCC pavement with drilled in No. 5 x 24" epoxy coated deformed tie bars spaced 30" center to center. Refer to the notes for Steel Bar Insertion.

Cost for this work shall be included in the contract unit price per each for Insert Steel Bar in Concrete Pavement.

The Contractor shall satisfactorily restore all disturbed areas adjacent to the new concrete placement to the satisfaction of the Engineer. Cost for this restoration work shall be incidental to the contract unit prices for the various items.



**P 0038(00)300, P 3038(00)302 & 037-252
DAVISON, HANSON & HUTCHINSON COUNTIES**

TABLE OF SIDEWALK REPLACEMENT

MRM SD38	L/R	Quantity (SqYd)
300.594	L	14
300.594	R	14
*Miscellaneous		56
Total:		84

*Locations will be determined by the Engineer.

ASPHALT CONCRETE COMPOSITE

Mineral aggregate for the Asphalt Concrete Composite shall conform to the requirements of the Standard Specifications for Class E, Type 1; Class G, Type1; Asphalt Concrete Class Q low traffic volume, Asphalt Concrete Class Q medium traffic volume; Asphalt Concrete Class Q high traffic volume or Asphalt Concrete Superpave 12.5mm specifications.

All other requirements in the Standard Specifications for Asphalt Concrete Composite shall apply.

The asphalt binder used in the mixture shall be either a PG 58-28, PG 64-22, PG 64-28 or PG 64-34 Asphalt Binder.

PERMANENT PAVEMENT MARKING

The Contractor shall advise the Engineer a minimum of 2 weeks prior to opening the roadway to traffic to allow the State to apply permanent pavement marking.

GENERAL MAINTENANCE OF TRAFFIC

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

Storage of vehicles and equipment shall be outside the clear zone and as near as possible to the right-of-way line. Contractor's employees should mobilize at a location off the right-of-way and arrive at the work sites in a minimum number of vehicles necessary to perform the work.

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

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

Sufficient traffic control devices have been included in these plans to sign two workspaces for 2-lane road and one workspace for 4-lane road. If the Contractor elects to work on additional sites, the cost for additional traffic control devices shall be incidental to the contract unit price per unit for Traffic Control.

MAINTENANCE OF TRAFFIC – PCC PAVEMENT REPAIR

A Type III Barricade shall be installed at the end of a lane closure taper as detailed in these plans. Additional Type III Barricades shall be installed facing traffic within the closed lane at a spacing of 1/4 mile. Each mainline concrete repair location from which the in place concrete has been removed shall be marked with a minimum of two drums. In areas containing numerous concrete repair locations, drums should be installed at a spacing of 660' alternating with the Type III Barricades.

Signs may be mounted on portable supports.

Construction workspaces on two lane roadways shall be limited to 300 - 400 feet in length. Contractor shall work on one lane at a time with the adjacent lane open to traffic. Drivers in two-way traffic workspaces must be able to see approaching traffic through and beyond the work zone.

**P 0038(00)300, P 3038(00)302 & 037-252
DAVISON, HANSON & HUTCHINSON COUNTIES**

MAINTENANCE OF TRAFFIC – PCC PAVEMENT REPAIR (CONTINUED)

At construction workspaces on two lane roadways, the Contractor will be required to use Flaggers at each lane closure during peak traffic hours. Peak traffic hours are assumed to be between 7:00 AM to 8:00 AM, 11:30 AM to 1:00 PM and from 4:30 PM to 6:00 PM.

Holes adjacent to centerline in the lane open to traffic created during removal and replacement of PCC Pavement repair areas shall be filled with cold asphalt mix during the cure of concrete placed in a repair area, and until the lane open to traffic is closed. Cold asphalt mix can be obtained from the Department of Transportation Maintenance shop located in Mitchell.

Holes in the asphalt shoulders created during removal and replacement of PCC Pavement repair areas shall be filled with hot-mix asphalt concrete prior to opening the lane to traffic. Hot-mix asphalt concrete shall be furnished by the Contractor.

Cost for furnishing asphalt concrete, hauling and placing asphalt shall be incidental to the contract unit price per square yard for Nonreinforced PCC Pavement Repair or Fast Track Concrete for PCC Pavement Repair.

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

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

Joints in approaches to signalized intersections containing vehicle detector loops shall not be sawed, sealed or otherwise disturbed.



The Contractor will be required to contact the Mitchell Region Traffic Office a minimum of two weeks prior to the need to adjust signal timings to accommodate traffic when a lane is closed near a signalized intersection.

Tall reflectorized cones (42" minimum height) or Reflectorized drums or Type II Barricades shall be used to maintain a minimum of two-way traffic at intersecting streets. The Contractor shall mark and maintain alternating one-way access to businesses and residences along the project with cones, drums or Type I Barricades. The Contractor shall advise affected businesses before restriction and anticipated duration of construction time.

The Contractor shall maintain pedestrian access at crosswalk locations. Additional traffic control devices shall be used as necessary to accommodate the pedestrian traffic if work activities block an existing crosswalk.

**P 0038(00)300, P 3038(00)302 & 037-252
DAVISON, HANSON & HUTCHINSON COUNTIES**

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

-  Flagger
-  Channelizing Device

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

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

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

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

The channelizing devices shall be drums or type II barricades if traffic control must remain overnight or longer. 42" cones may be used in lieu of drums or type II barricades only along the centerline.

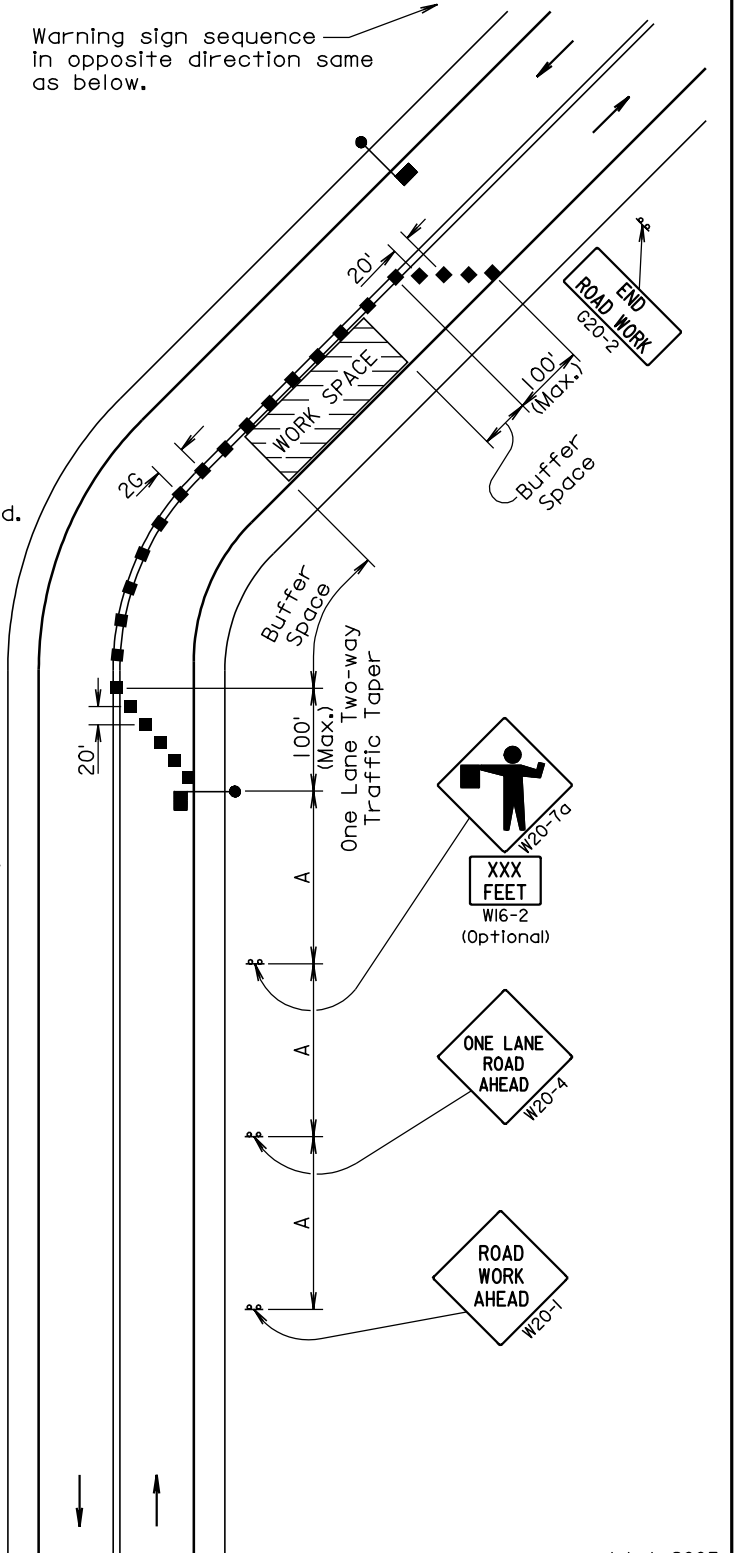
END
ROAD WORK
G20-2

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

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

The buffer space shall be a sufficient length so that the channelizing devices are visible to approaching traffic.

Warning sign sequence in opposite direction same as below.



July 1, 2005

Published Date: 2nd Qtr. 2006

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**GUIDES FOR TRAFFIC CONTROL DEVICES
LANE CLOSURE WITH FLAGGER PROVIDED**

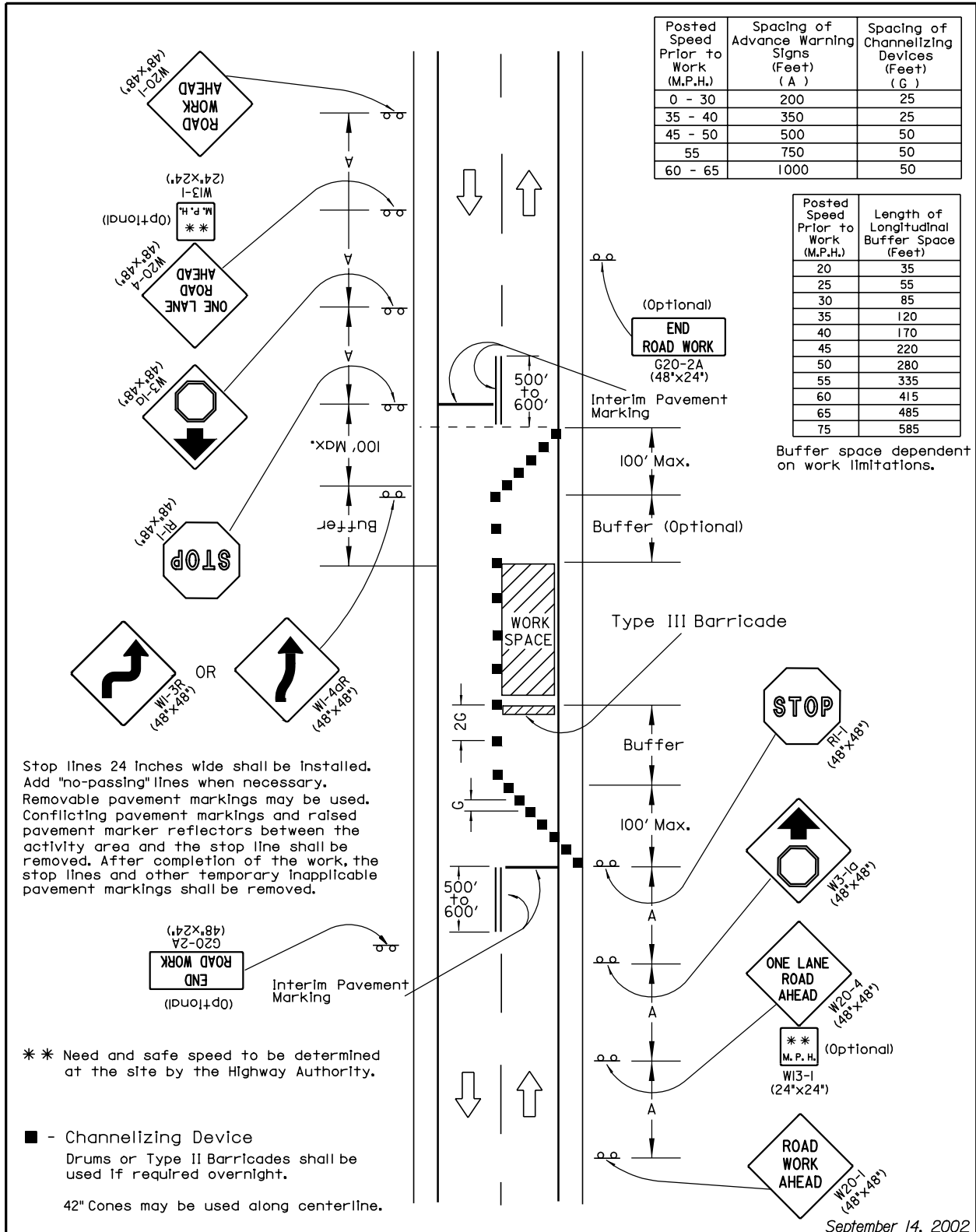
PLATE NUMBER
634.23

Sheet 1 of 1

Plotting Date: 22-JUN-2006

Username - TRM11118

P 0038(00)300, P 3038(00)302 & 037-252
 DAVISON, HANSON & HUTCHINSON COUNTIES



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

Posted Speed Prior to Work (M.P.H.)	Length of Longitudinal Buffer Space (Feet)
20	35
25	55
30	85
35	120
40	170
45	220
50	280
55	335
60	415
65	485
75	585

Buffer space dependent on work limitations.

Stop lines 24 inches wide shall be installed. Add "no-passing" lines when necessary. Removable pavement markings may be used. Conflicting pavement markings and raised pavement marker reflectors between the activity area and the stop line shall be removed. After completion of the work, the stop lines and other temporary applicable pavement markings shall be removed.

** Need and safe speed to be determined at the site by the Highway Authority.

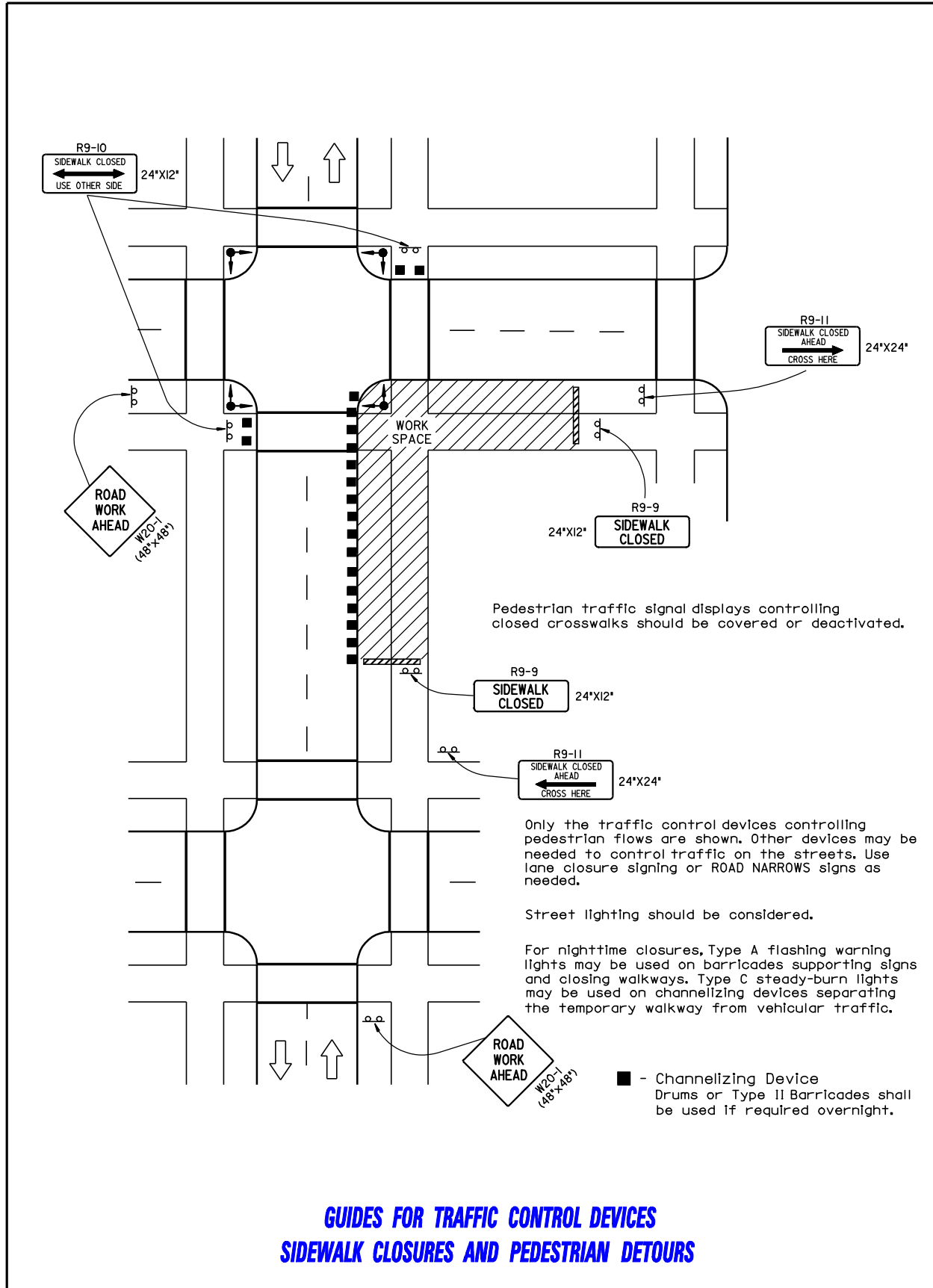
- - Channelizing Device
Drums or Type II Barricades shall be used if required overnight.
- 42" Cones may be used along centerline.

	GUIDES FOR TRAFFIC CONTROL DEVICES LANE CLOSURE USING STOP SIGNS	PLATE NUMBER 634.25
	Published Date: 2nd Qtr. 2006	Sheet 1 of 1

Plotting Date: 22-JUN-2006

Username - TRM11118

September 14, 2002

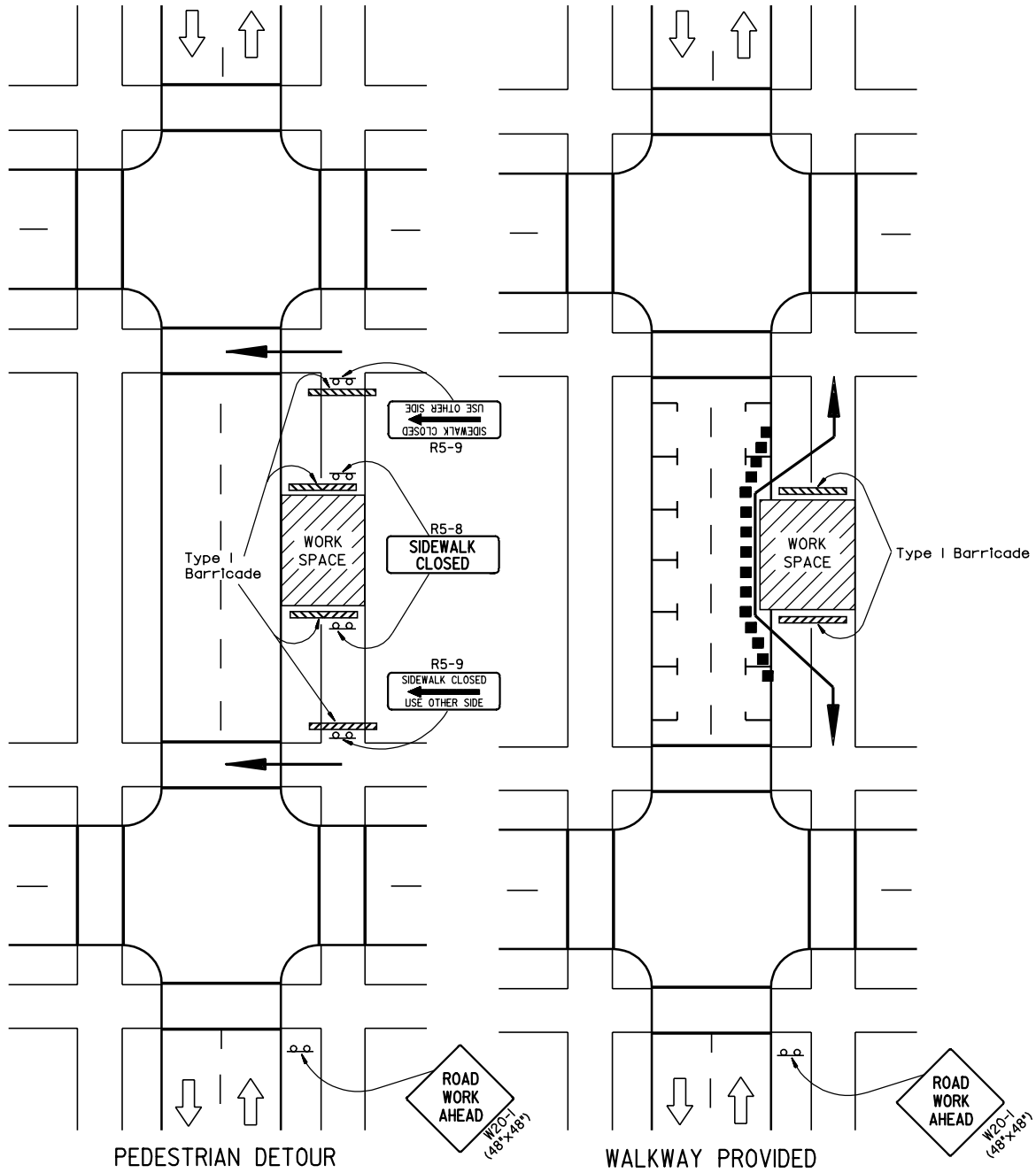


**GUIDES FOR TRAFFIC CONTROL DEVICES
 SIDEWALK CLOSURES AND PEDESTRIAN DETOURS**

**P 0038(00)300, P 3038(00)302 & 037-252
DAVISON, HANSON & HUTCHINSON COUNTIES**

1. Only the traffic control devices controlling pedestrian flows are shown. Other devices may be needed to control traffic on the streets. Use lane closure signing or ROAD NARROWS signs, as needed.
2. Signs may be placed along a temporary walkway to guide or direct pedestrians. Examples include KEEP RIGHT and KEEP LEFT signs.
3. Additional advance warning may be necessary.

4. For nighttime closures, Type A flashing warning lights may be used on barricades supporting signs and closing walkways. Type C steady-burn lights may be used on channelizing devices separating the temporary walkway from vehicular traffic.
5. Where high speeds may be anticipated, use a barrier to separate the temporary walkway from vehicular traffic.
6. Street lighting should be considered.



March 31, 2000

S D D O T	GUIDES FOR TRAFFIC CONTROL DEVICES SIDEWALK CLOSURES AND BYPASS WALKWAY		PLATE NUMBER 634.35
			Sheet 1 of 1

Published Date: 2nd Qtr. 2006

Plotting Date: 22-JUN-2006

Username - TRM11118

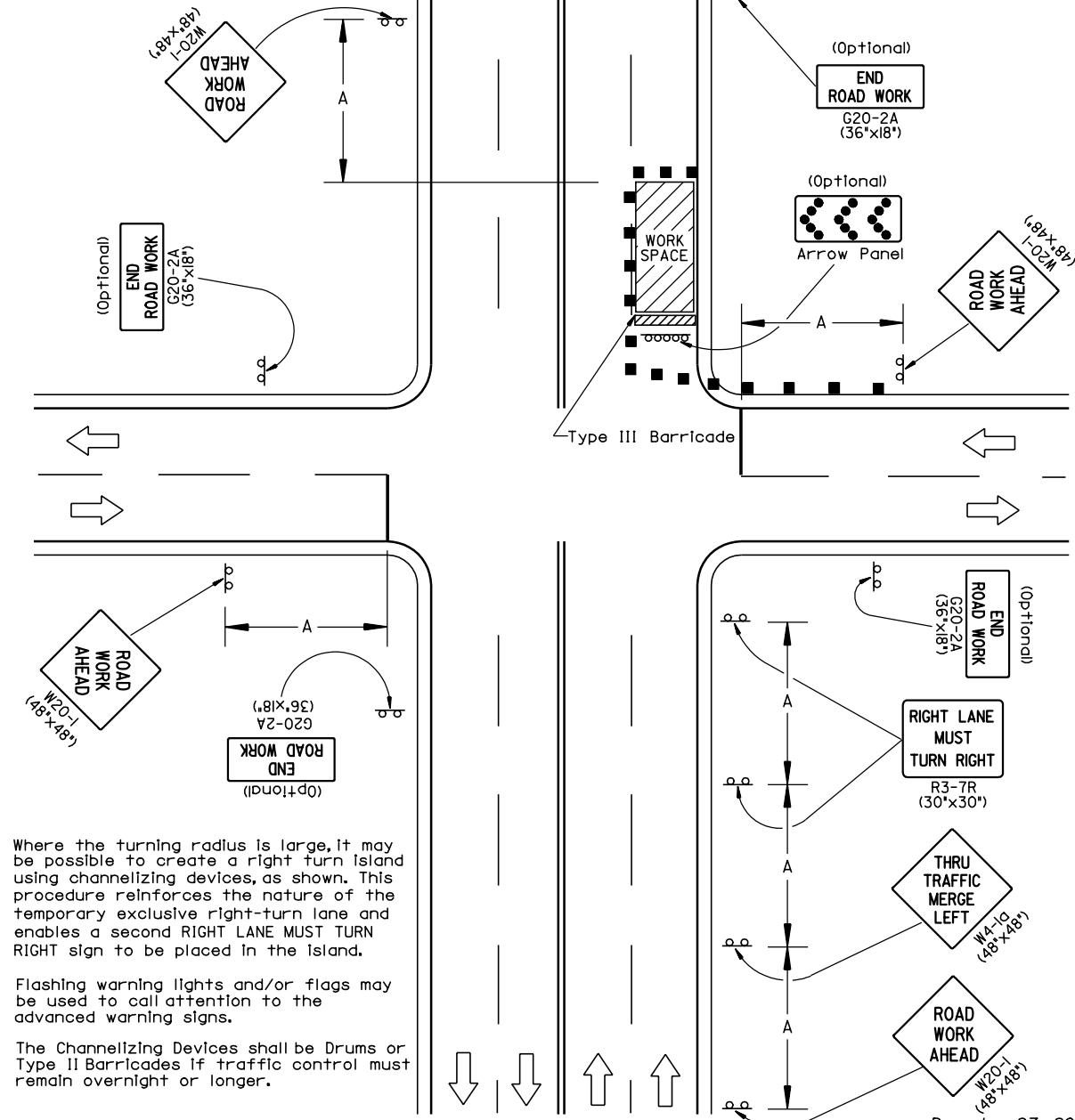
**P 0038(00)300, P 3038(00)302 & 037-252
DAVISON, HANSON & HUTCHINSON COUNTIES**

For intersection approaches reduced to a single lane, left-turning movements may be prohibited to maintain capacity for through traffic.

The standard procedure is to close on near side of the intersection any lane that is not carried through the intersection. However, when this results in the closing of a right lane having significant right-turning movements, then the right lane may be restricted to right turns only, as shown.

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)
0 - 30	200
35 - 40	350
45 - 50	500

■ Channelizing Device



Where the turning radius is large, it may be possible to create a right turn island using channelizing devices, as shown. This procedure reinforces the nature of the temporary exclusive right-turn lane and enables a second RIGHT LANE MUST TURN RIGHT sign to be placed in the island.

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

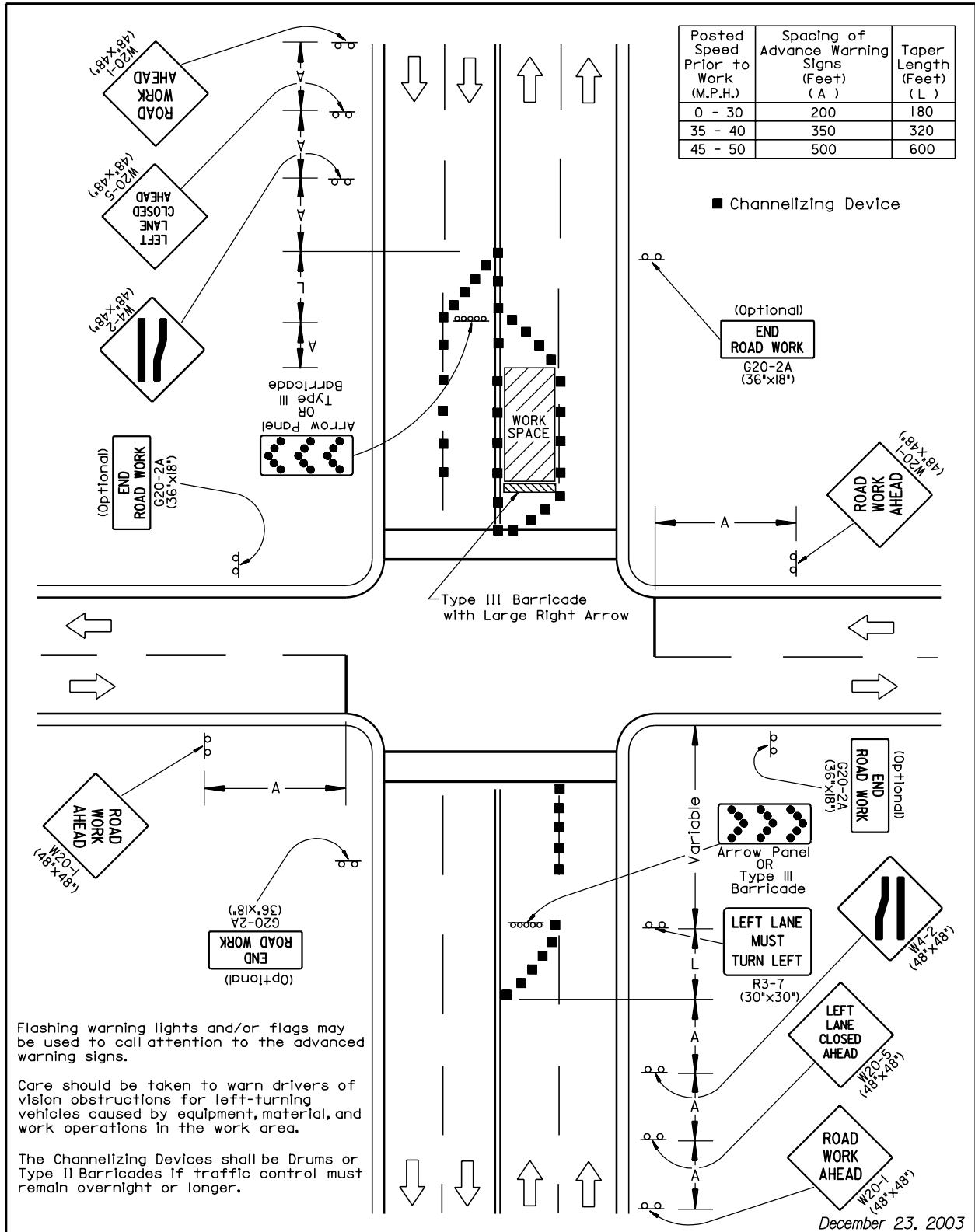
The Channelizing Devices shall be Drums or Type II Barricades if traffic control must remain overnight or longer.

December 23, 2003

SDOT <i>Published Date: 2nd Qtr. 2006</i>	GUIDES FOR TRAFFIC CONTROL DEVICES RIGHT LANE CLOSURE FAR SIDE OF INTERSECTION		PLATE NUMBER 634.42
			Sheet 1 of 1

Plotting Date: 22-JUN-2006

**P 0038(00)300, P 3038(00)302 & 037-252
DAVISON, HANSON & HUTCHINSON COUNTIES**



Published Date: 2nd Qtr. 2006.

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**GUIDES FOR TRAFFIC CONTROL DEVICES
LEFT LANE CLOSURE FAR SIDE OF INTERSECTION**

PLATE NUMBER
634.43

Sheet 1 of 1

Plotting Date: 22-JUN-2006

**P 0038(00)300, P 3038(00)302 & 037-252
DAVISON, HANSON & HUTCHINSON COUNTIES**

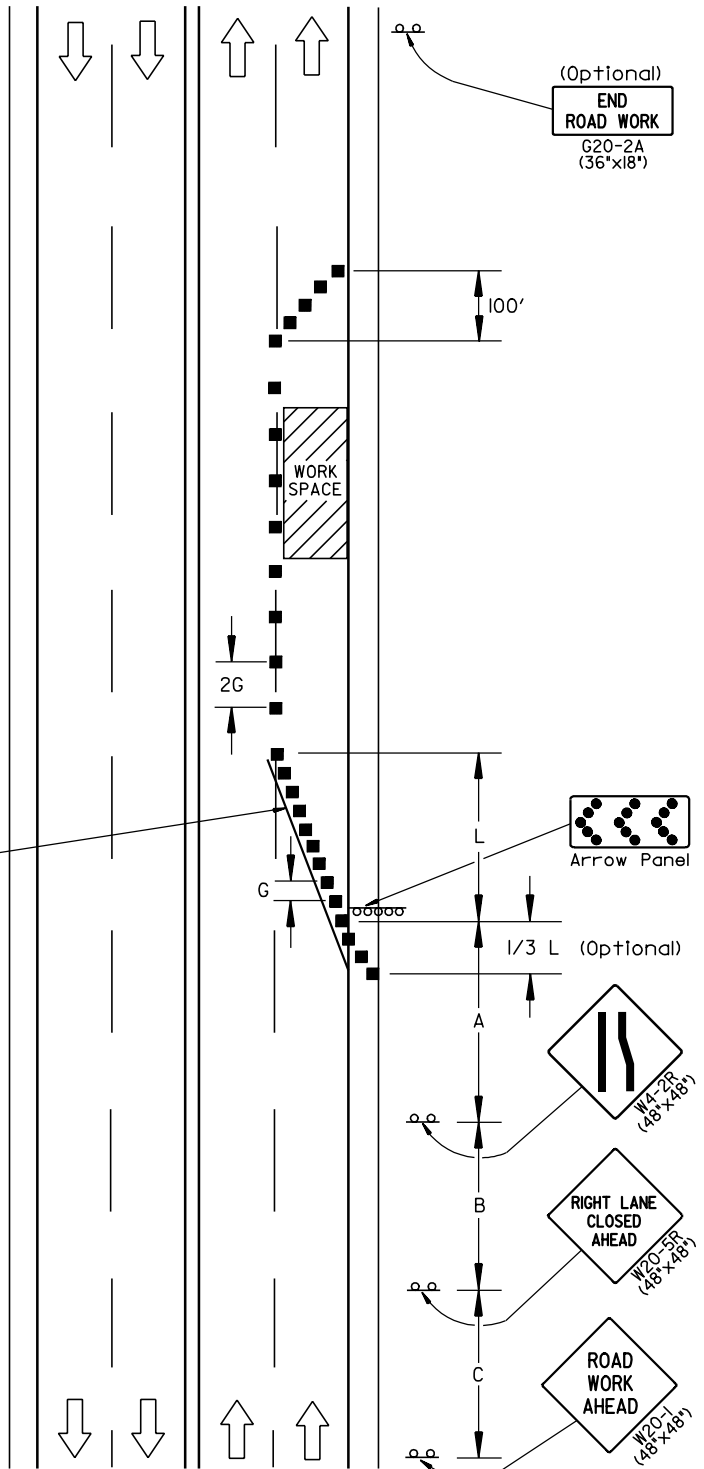
Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet)			Taper Length (Feet) (L)	Spacing of Channelizing Devices (Feet) (G)
	(A)	(B)	(C)		
0 - 30	200			180	25
35 - 40	350			320	25
45 - 50	500			600	50
55	750			660	50
60 - 65	1000			780	50

■ Channelizing Device

The Channelizing Devices shall be drums or type II barricades if traffic control must remain overnight or longer, however, 42" cones may be used in lieu of drums or type II barricades only 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.



December 23, 2003

Published Date: 2nd Qtr. 2006.

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**GUIDES FOR TRAFFIC CONTROL DEVICES
4-LANE UNDIVIDED, RIGHT LANE CLOSED**

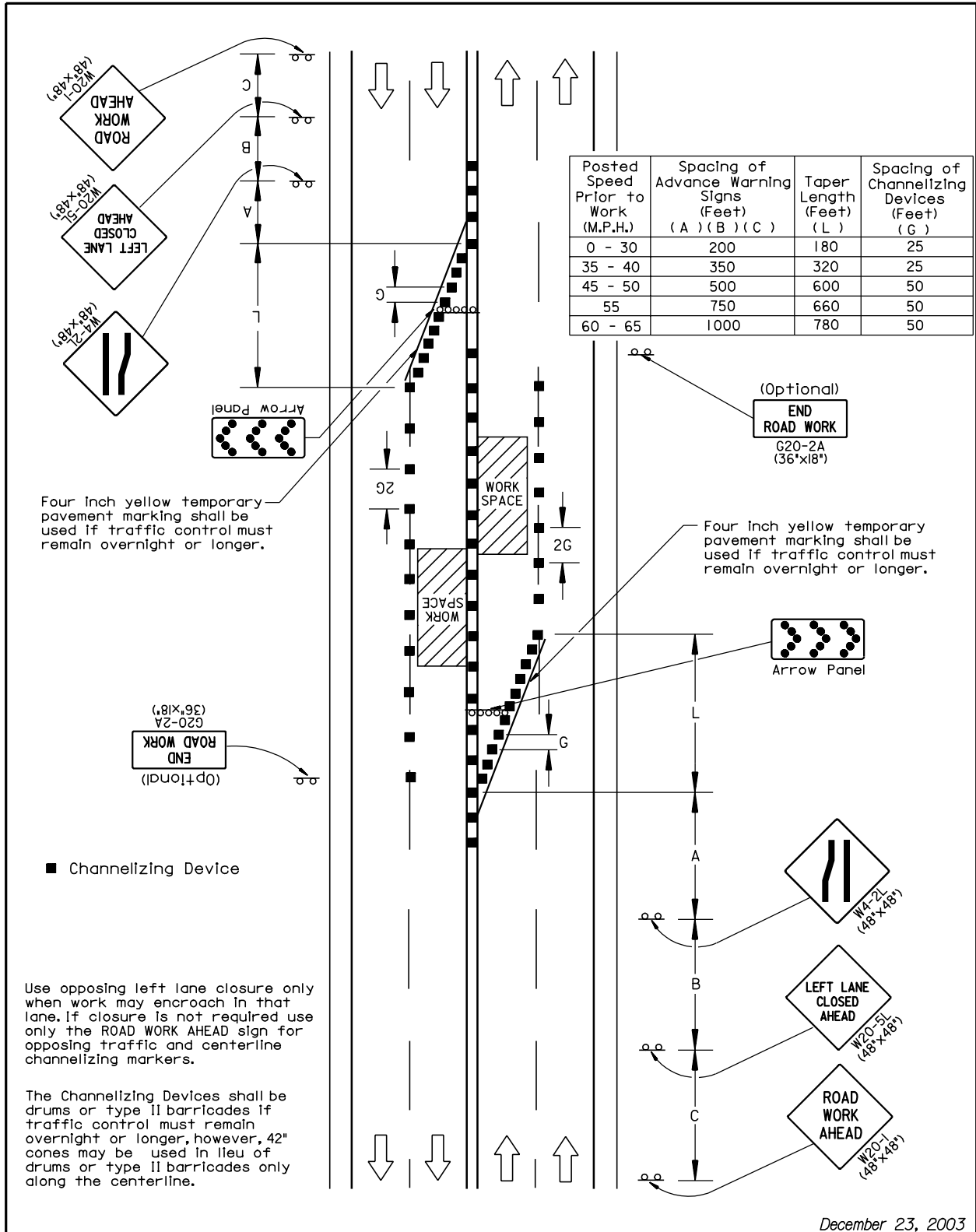
**PLATE NUMBER
634.47**

Sheet 1 of 1


Plotting Date: 22-JUN-2006

Username - TRM11118

P 0038(00)300, P 3038(00)302 & 037-252
 DAVISON, HANSON & HUTCHINSON COUNTIES

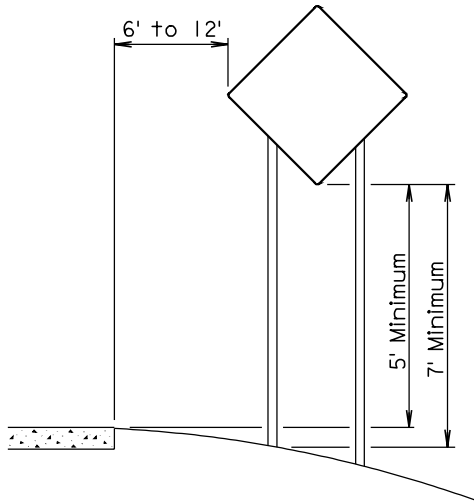


December 23, 2003

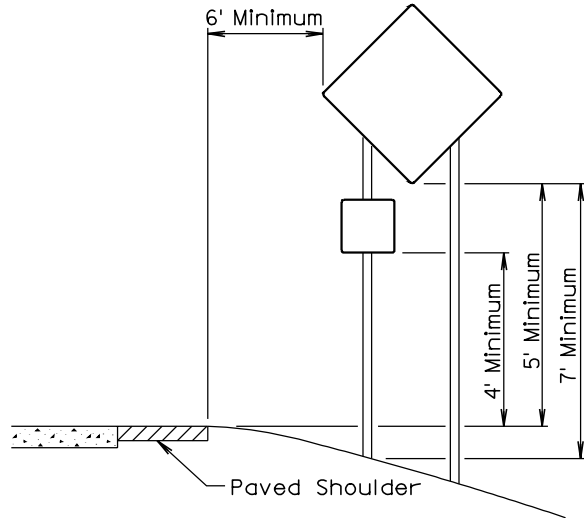
	GUIDES FOR TRAFFIC CONTROL DEVICES 4-LANE UNDIVIDED, LEFT LANE CLOSED	PLATE NUMBER 634.48
	Published Date: 2nd Qtr. 2006	Sheet 1 of 1

Plotting Date: 22-JUN-2006

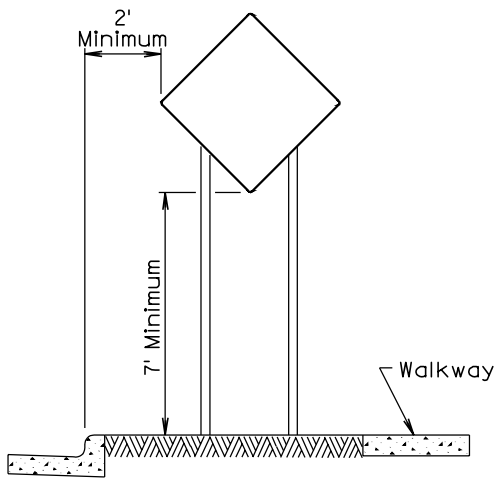
Username - TRM11118



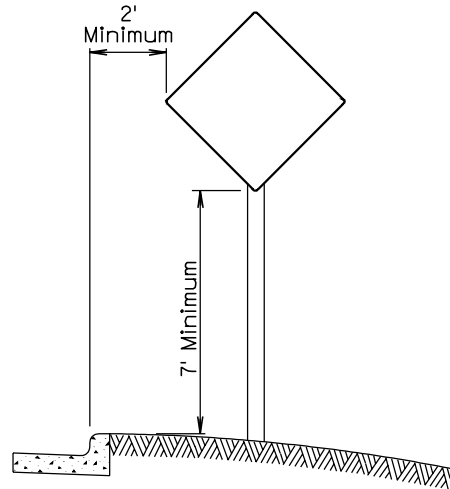
RURAL DISTRICT



RURAL DISTRICT WITH
 SUPPLEMENTAL PLATE



URBAN DISTRICT



URBAN DISTRICT

December 23, 2003

Published Date: 2nd Qtr. 2006.

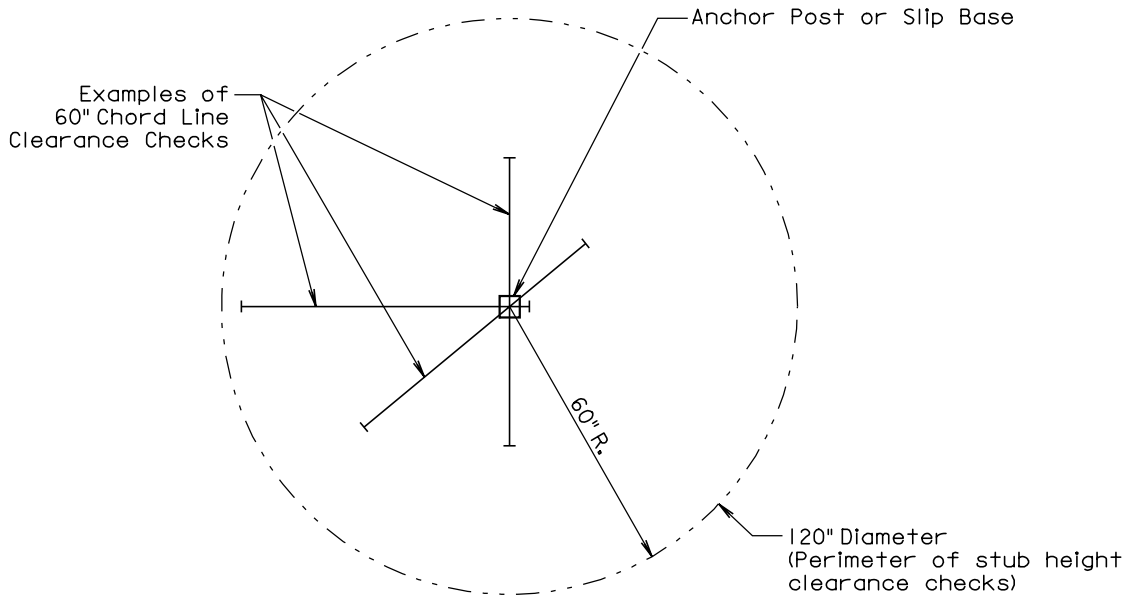
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BREAKAWAY SIGN SUPPORTS
 (Typical Construction Signing)

PLATE NUMBER
 634.85

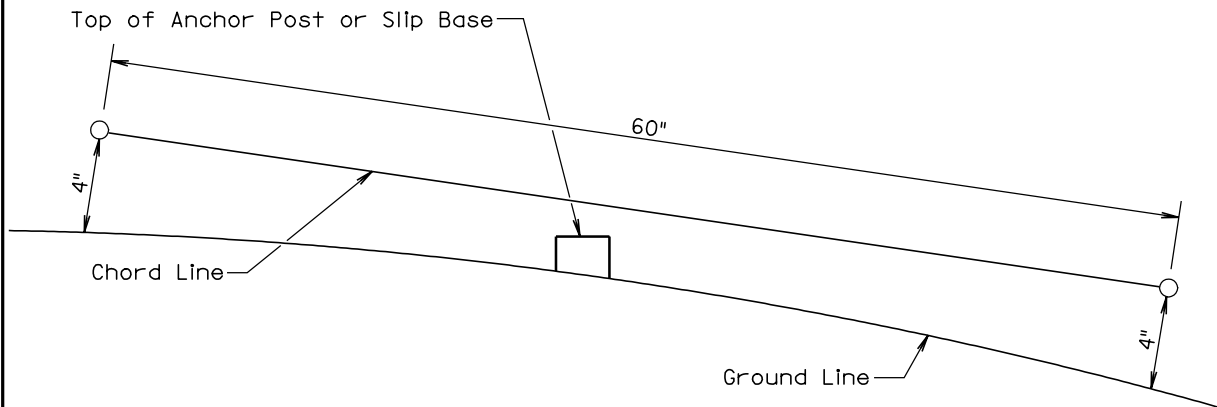
Sheet 1 of 1

Plotting Date: 22-JUN-2006



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

	<p>BREAKAWAY SUPPORT STUB CLEARANCE</p>	<p>PLATE NUMBER 634.99</p>
		<p>Sheet 1 of 1</p>

Published Date: 2nd Qtr. 2006

Plotting Date: 22-JUN-2006

**P 0038(00)300, P 3038(00)302 & 037-252
DAVISON, HANSON & HUTCHINSON COUNTIES**

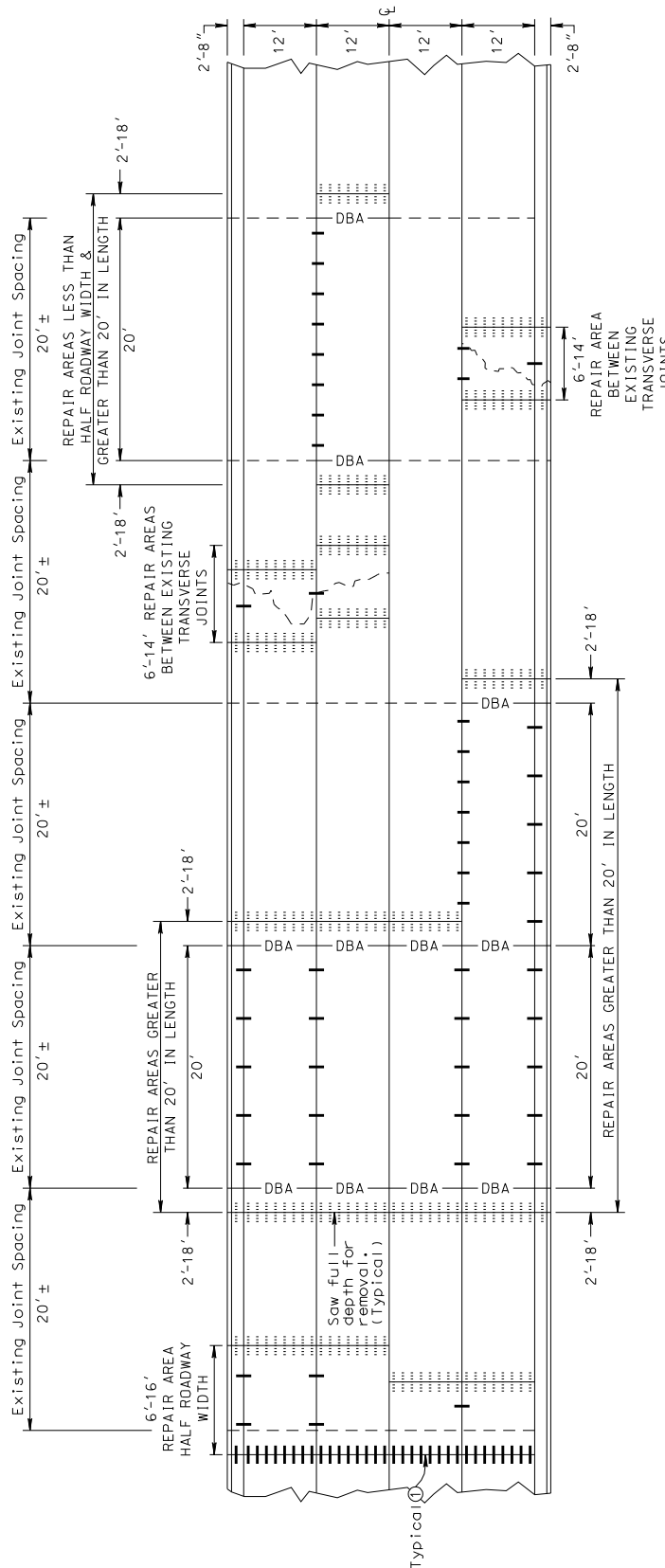
ITEMIZED LIST FOR TRAFFIC CONTROL

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
G20-2a	36" x 18"	END ROAD WORK	4	17	68
R1-1	48" x 48"	STOP	4	34	136
R1-2	48" x 48"	YIELD		34	
R2-1	30" x 36"	SPEED LIMIT __		23	
R3-7	30" x 30"	LEFT LANE MUST TURN LEFT	1	21	21
R3-7R	30" x 30"	RIGHT LANE MUST TURN RIGHT	2	21	42
R4-7	24" x 30"	KEEP RIGHT (SYMBOL)		18	
R5-1	48" x 48"	DO NOT ENTER		34	
R5-1a	48" x 36"	WRONG WAY		29	
R9-9	24" x 12"	SIDEWALK CLOSED	2	15	30
R9-10	24" x 12"	SIDEWALK CLOSED, ARROW, USE OTHER SIDE	2	15	30
R9-11	24" x 12"	SIDEWALK CLOSED AHEAD, ARROW, CROSS HERE	2	15	30
R10-6	24" x 36"	STOP HERE ON RED		20	
R11-2	48" x 30"	ROAD CLOSED		27	
R11-3a	60" x 30"	ROAD CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY		30	
R11-4	60" x 30"	ROAD CLOSED TO THRU TRAFFIC		30	
SW12-1b	120" x 60"	HIGHWAY WORKERS GIVE'EM A BRAKE		80	
W1-1	48" x 48"	LEFT OR RIGHT TURN ARROW		34	
W1-2	48" x 48"	LEFT OR RIGHT CURVE ARROW		34	
W1-3	48" x 48"	REVERSE TURN SIGN (LEFT OR RIGHT)	2	34	68
W1-4a	48" x 48"	REVERSE CURVE SIGN (LEFT OR RIGHT)		34	
W3-1a	48" x 48"	STOP AHEAD (SYMBOL)	4	34	136
W3-2a	48" x 48"	YIELD AHEAD (SYMBOL)		34	
W3-3	48" x 48"	SIGNAL AHEAD (SYMBOL)		34	
W3-5	48" x 48"	SPEED REDUCTION (__ MPH)		34	
W4-1a	48" x 48"	THRU TRAFFIC MERGE LEFT	1	34	34
W4-2	48" x 48"	LEFT OR RIGHT LANE ENDS (SYMBOL)	2	34	68
W5-2	48" x 48"	NARROW BRIDGE		34	
W5-3	48" x 48"	ONE LANE BRIDGE		34	
W7-3a	30" x 24"	NEXT __ MILES		18	
W8-1	36" x 36"	BUMP		27	
W8-6	48" x 48"	TRUCK CROSSING		34	
W8-7	36" x 36"	LOOSE GRAVEL		27	
W8-9a	48" x 48"	SHOULDER DROP-OFF		34	
W8-11	48" x 48"	UNEVEN LANES		34	
W13-1	24" x 24"	ADVISORY SPEED PLATE		16	
W20-1	48" x 48"	ROAD WORK AHEAD	6	34	204
W20-2	48" x 48"	DETOUR AHEAD		34	
W20-3	48" x 48"	ROAD CLOSED AHEAD		34	
W20-4	48" x 48"	ONE LANE ROAD AHEAD	4	34	136
W20-5	48" x 48"	LT. OR RT. LANE CLOSED AHEAD	2	34	68
W20-7a	48" x 48"	FLAGGER	4	34	136
W20-7b	48" x 48"	BE PREPARED TO STOP		34	
W21-1a	48" x 48"	WORKERS (SYMBOL)		34	
W21-2	36" x 36"	FRESH OIL		27	
W21-3	48" x 48"	ROAD MACHINERY AHEAD		34	
W21-5	48" x 48"	SHOULDER WORK		34	
W21-5a	48" x 48"	RIGHT SHOULDER CLOSED		34	
W21-5b	48" x 48"	RIGHT SHOULDER CLOSED AHEAD		34	
SPECIAL	30" x 24"	FINES DOUBLED		18	
****	12" x 36"	TYPE III OBJECT MARKER		15	
****	****	TYPE III BARRICADE - 8 FT. SINGLE SIDED	7	40	280
****	****	TYPE III BARRICADE - 8 FT. DOUBLE SIDED		56	
TOTAL UNITS					1,487

NONREINFORCED PCC PAVEMENT REPAIR

FOUR LANE UNDIVIDED HIGHWAY IN CURB & GUTTER SECTION

TYPICAL REPAIR AREAS



KEY:

Steel Bars for Longitudinal Joints (for repair areas greater than 5 feet in length)

- ▬ No. 5 x 30" epoxy coated deformed tie bars.
- ▬ Sawed Joint - spaced 48" center to center.
- ▬ Construction Joint - spaced 48" center to center.
- ▬ No. 5 x 24" epoxy coated deformed tie bars.
- ▬ Drilled In - spaced 30" center to center.

Steel Bars for Transverse Joints

- ▬ Drilled in 1" x 18" epoxy coated plain round dowel bars spaced 18" center to center.
- ▬ Drilled in No. 8 x 18" epoxy coated deformed tie bars spaced 18" center to center.

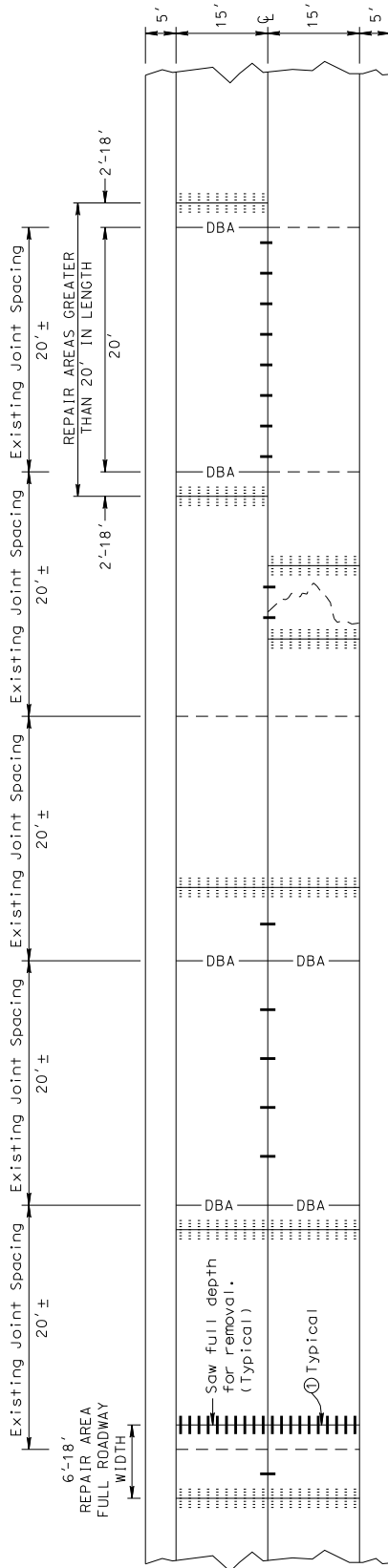
DBA Dowel Bar Assembly (for repair areas greater than 20' in length)

NOTE:

- ① Where possible, transverse joints shall be constructed full roadway width.

NONREINFORCED PCC PAVEMENT REPAIR

TWO LANE - TYPICAL REPAIR AREAS



KEY:

- Steel Bars for Longitudinal Joints** (for repair areas greater than 4 feet in length)
- ▬ No. 5 x 30" epoxy coated deformed tie bars.
 - ▬ Sawn Joint - spaced 48" center to center.
 - ▬ Construction Joint - spaced 48" center to center.
 - ▬ No. 5 x 24" epoxy coated deformed tie bars.
 - ▬ Drilled In - spaced 30" center to center.
- Steel Bars for Transverse Joints**
- ▬ Drilled in 1" x 18" epoxy coated plain round dowel bars spaced 18" center to center.
 - Drilled in No. 8 x 18" epoxy coated deformed tie bars spaced 18" center to center.

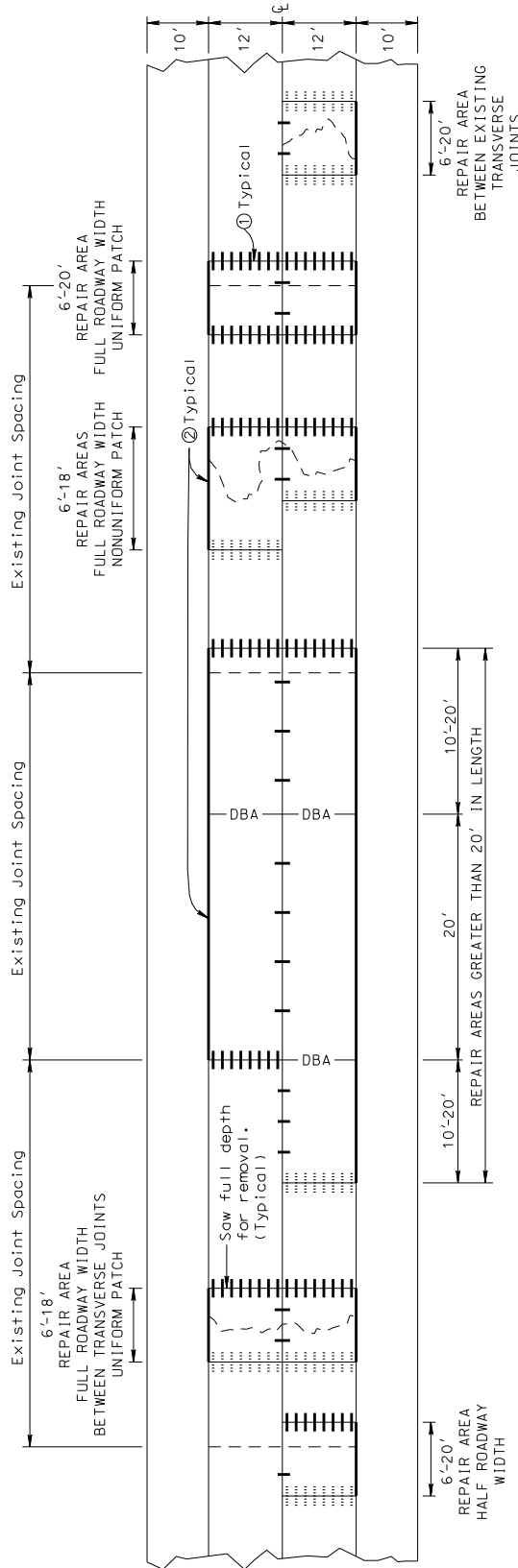
NOTE:

- ① Where possible, transverse joints shall be constructed full roadway width.

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

NONREINFORCED PCC PAVEMENT REPAIR

TWO LANE - TYPICAL REPAIR AREAS



KEY:

Steel Bars for Longitudinal Joints

- No. 5 x 30" epoxy coated deformed tie bars. Sawed Joint - spaced 48" center to center. Construction Joint - spaced 48" center to center.
- No. 5 x 24" epoxy coated deformed tie bars. Drilled In - spaced 30" center to center.

Steel Bars for Transverse Joints

- Drilled in 1/4" x 18" epoxy coated plain round dowel bars spaced 18" center to center.
- Drilled in No. 9 x 18" epoxy coated deformed tie bars spaced 18" center to center.

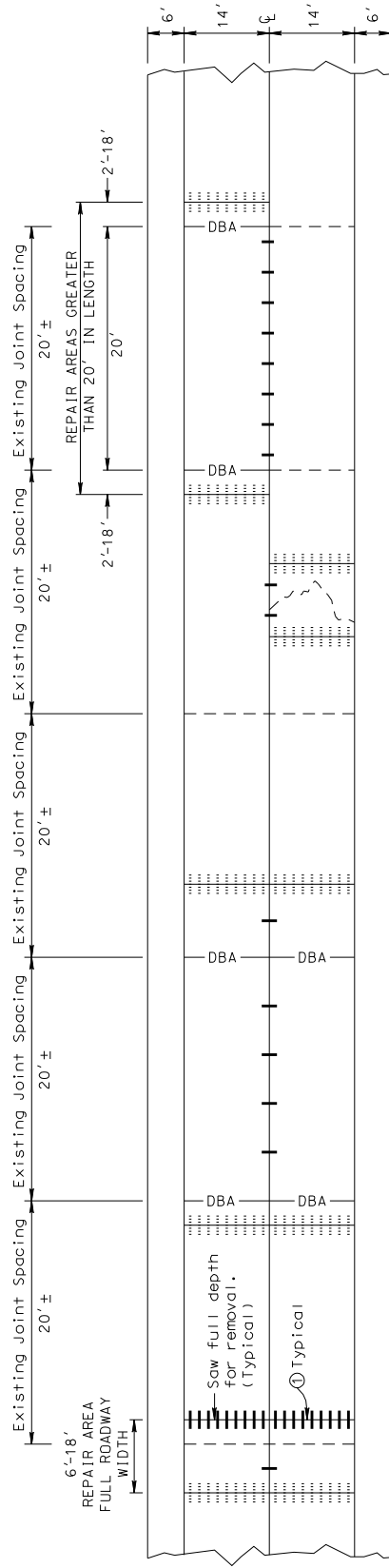
DBA Dowel Bar Assembly (for repair areas greater than 20' in length)

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.

NONREINFORCED PCC PAVEMENT REPAIR

TWO LANE - TYPICAL REPAIR AREAS



KEY:

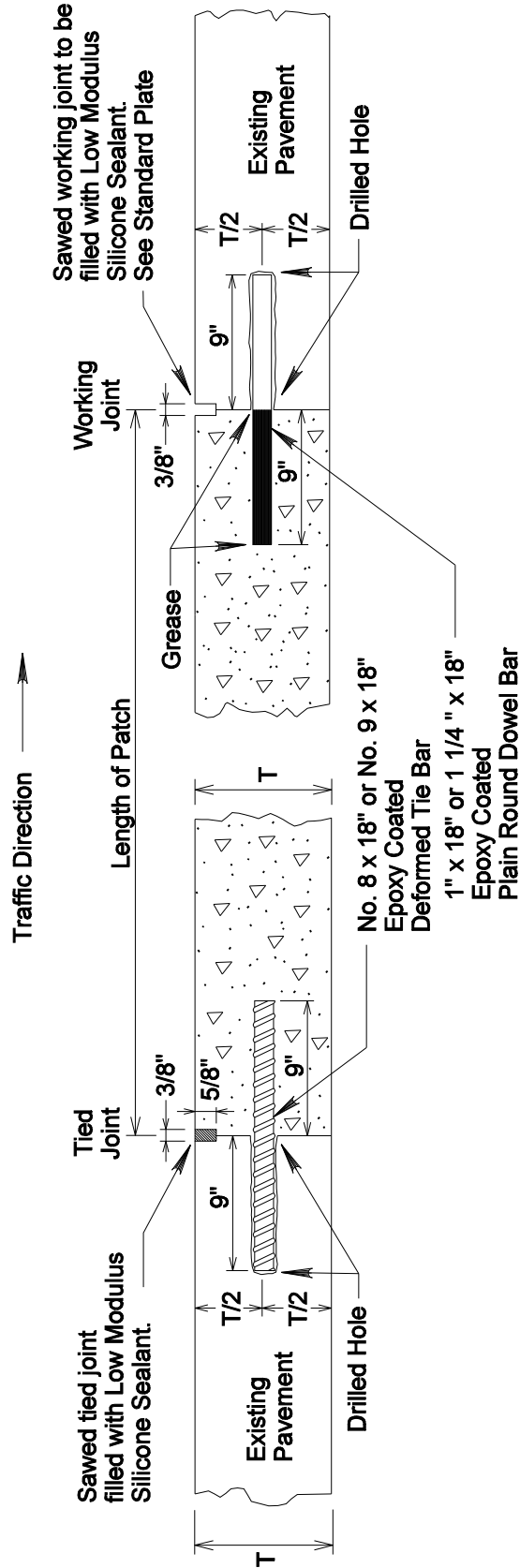
- Steel Bars for Longitudinal Joints (for repair areas greater than 4 feet in length)
- ▬ No. 5 x 30" epoxy coated deformed tie bars.
 - ▬ Sawn Joint - spaced 48" center to center.
 - ▬ Construction Joint - spaced 48" center to center.
 - ▬ No. 5 x 24" epoxy coated deformed tie bars.
 - ▬ Drilled In - spaced 30" center to center.
- Steel Bars for Transverse Joints
- ▬ Drilled in 1" x 18" epoxy coated plain round dowel bars spaced 18" center to center.
 - ▬ Drilled in No. 8 x 18" epoxy coated deformed tie bars spaced 18" center to center.

NOTE:

- ① Where possible, transverse joints shall be constructed full roadway width.

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

NONREINFORCED PCC PAVEMENT REPAIR STEEL BAR INSERTION (ONE TIED JOINT AND ONE WORKING JOINT)



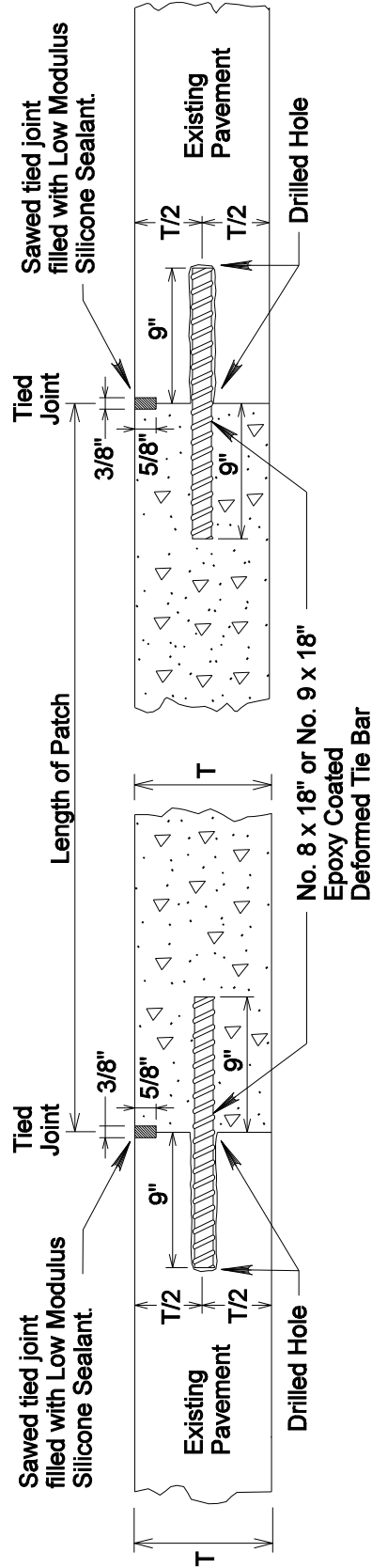
T = Existing and new pavement thickness.

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

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

NONREINFORCED PCC PAVEMENT REPAIR

DEFORMED TIE BAR INSERTION (TWO TIED JOINTS)



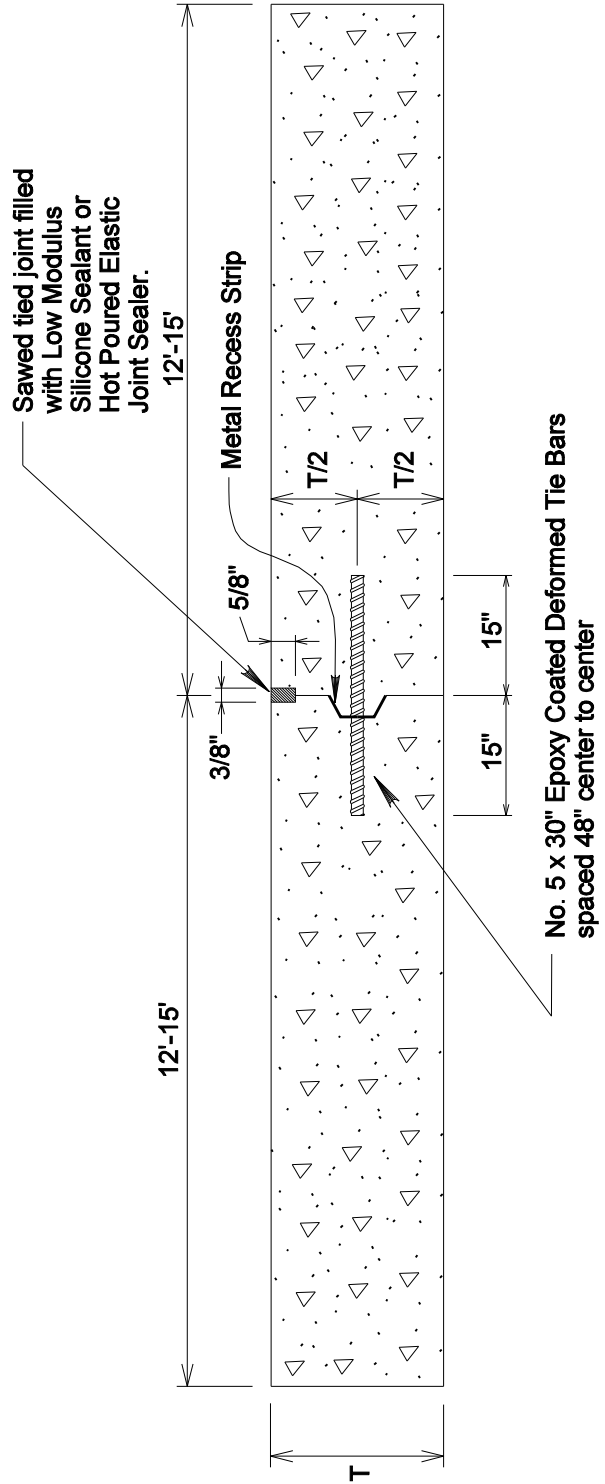
T = Existing and new pavement thickness.

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

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

NONREINFORCED PCC PAVEMENT REPAIR

LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS & KEYWAY



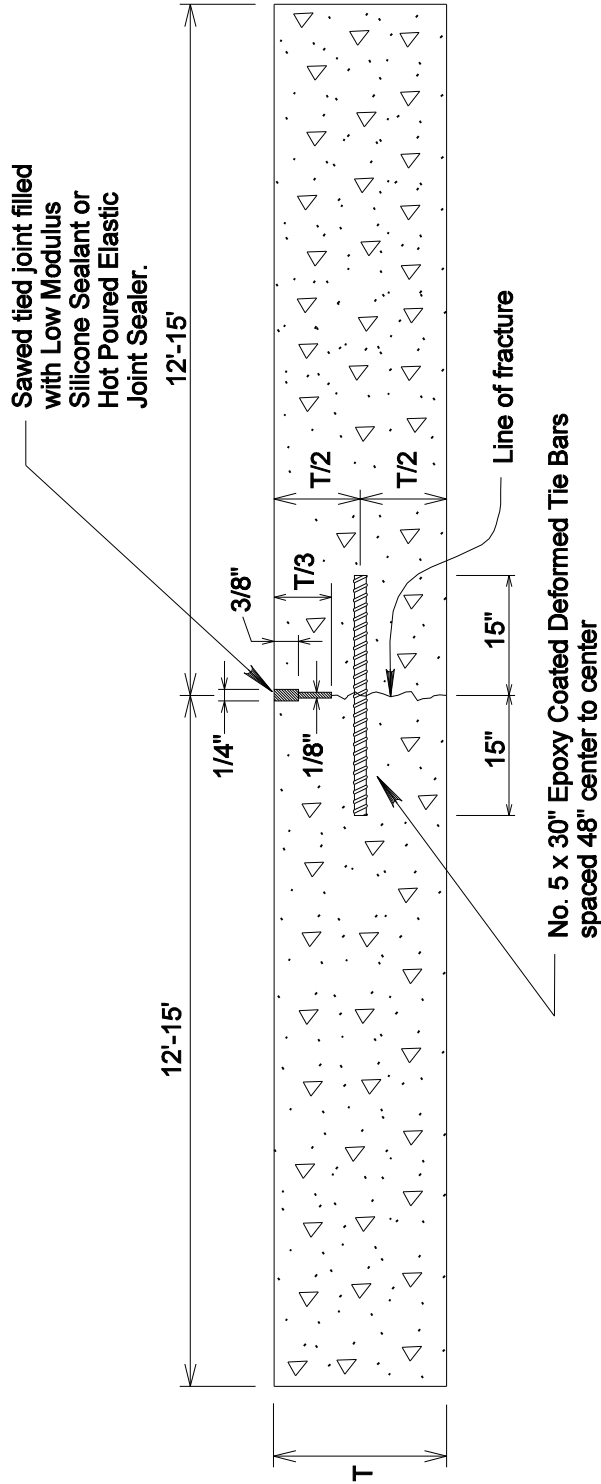
T = New pavement thickness.

Deformed tie bars will only be inserted on centerline when there is full width pavement removal.

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

NONREINFORCED PCC PAVEMENT REPAIR

SAWED LONGITUDINAL JOINT



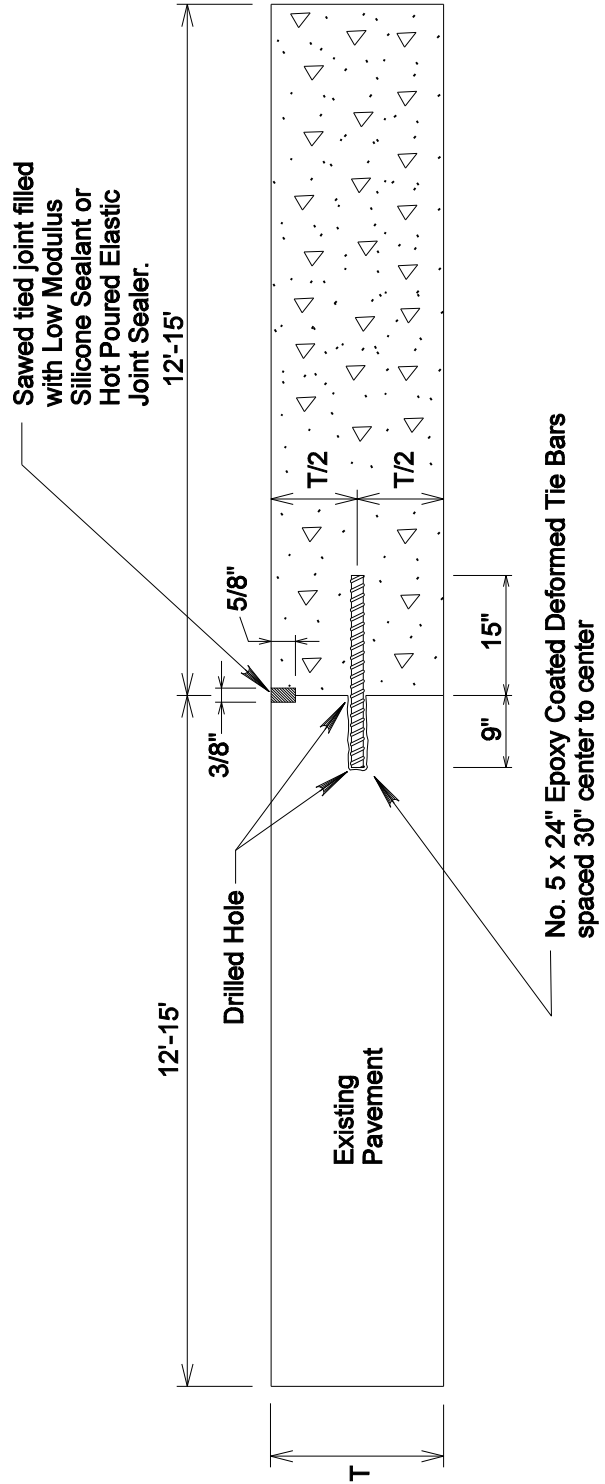
T = New pavement thickness.

The first saw cut to control cracking shall be a minimum of 1/3 the depth of the pavement. Additional sawing for widening the saw cut to provide the width for the installation of the Low Modulus Silicone Sealant will be necessary.

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

NONREINFORCED PCC PAVEMENT REPAIR

LONGITUDINAL CONSTRUCTION JOINT WITH DRILLED IN TIE BARS



T = Existing and new pavement thickness.

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

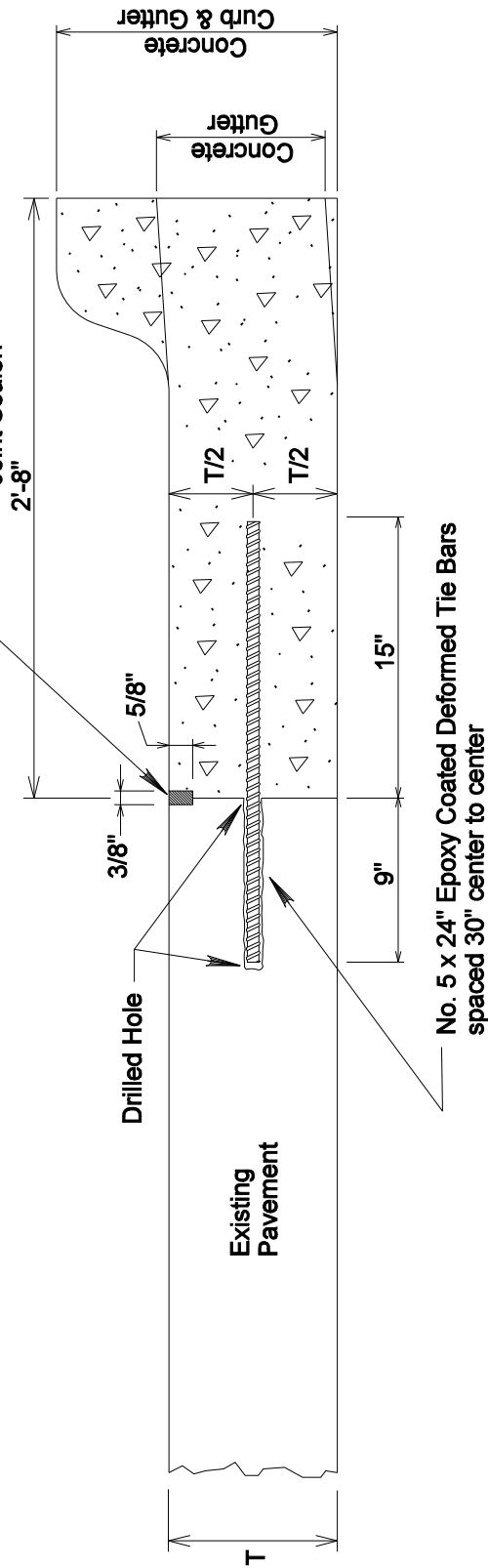
Bars shall be placed a minimum of 15 inches from existing transverse contraction joints.

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

NONREINFORCED PCC PAVEMENT REPAIR

LONGITUDINAL CONSTRUCTION JOINT WITH DRILLED IN TIE BARS

Sawed tied joint filled with Low Modulus Silicone Sealant or Hot Poured Elastic Joint Sealer.



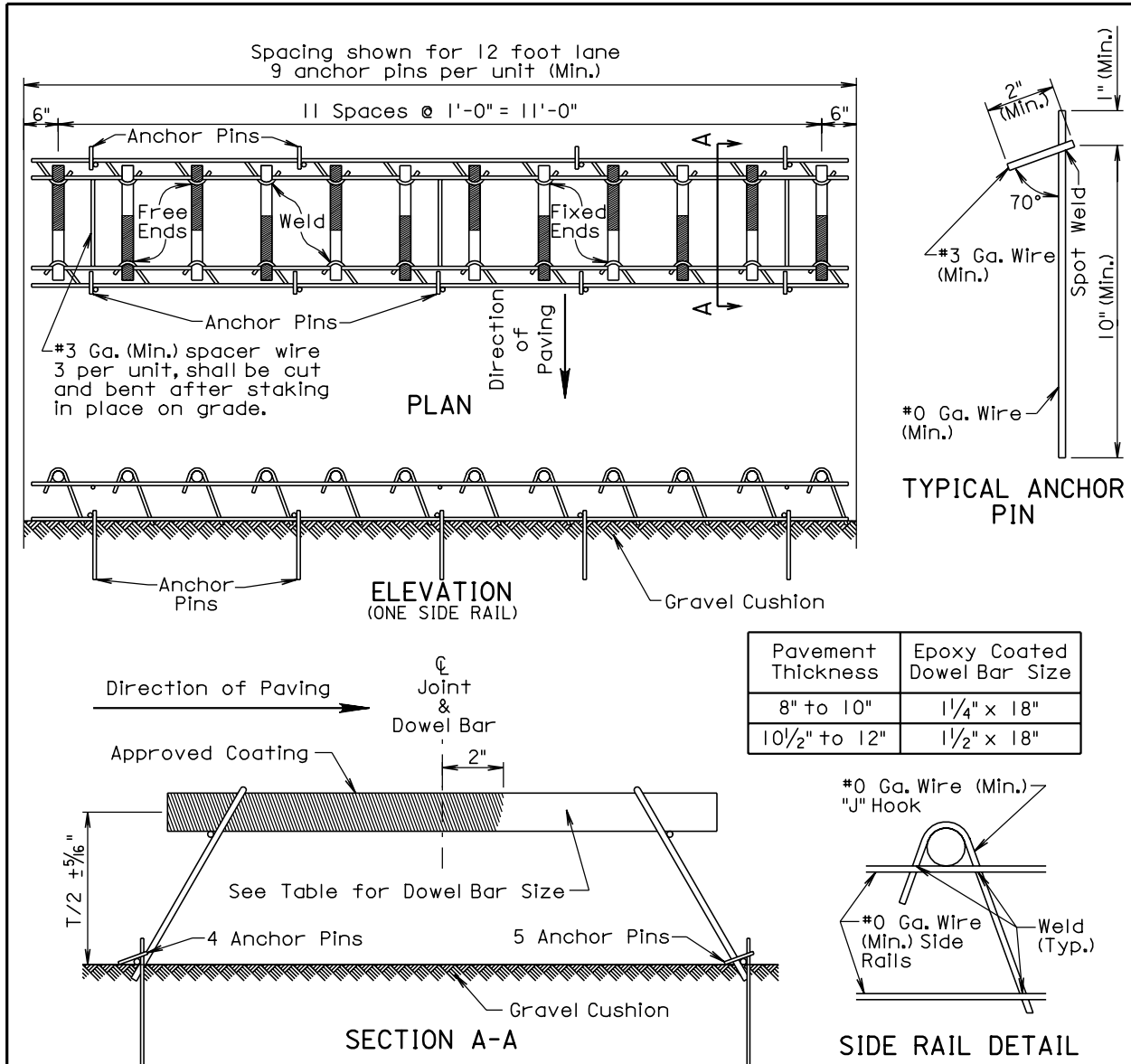
T = Existing and new pavement thickness.

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

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

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

**P 0038(00)300, P 3038(00)302 & 037-252
DAVISON, HANSON & HUTCHINSON COUNTIES**



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.

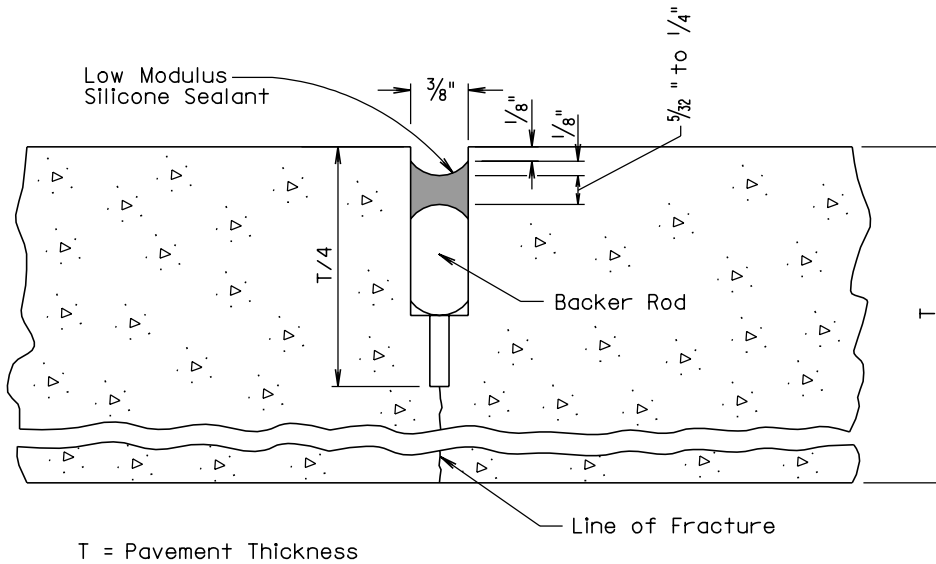
December 23, 2004

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. 2006

Plotting Date: 22-JUN-2006

P 0038(00)300, P 3038(00)302 & 037-252
 DAVISON, HANSON & HUTCHINSON COUNTIES



GENERAL NOTES:

The first saw cut to control cracking shall be a minimum of $\frac{1}{4}$ the thickness of the pavement. Additional sawing for widening the saw cut to provide the width for the installation of the low modulus silicone joint sealant will be necessary.

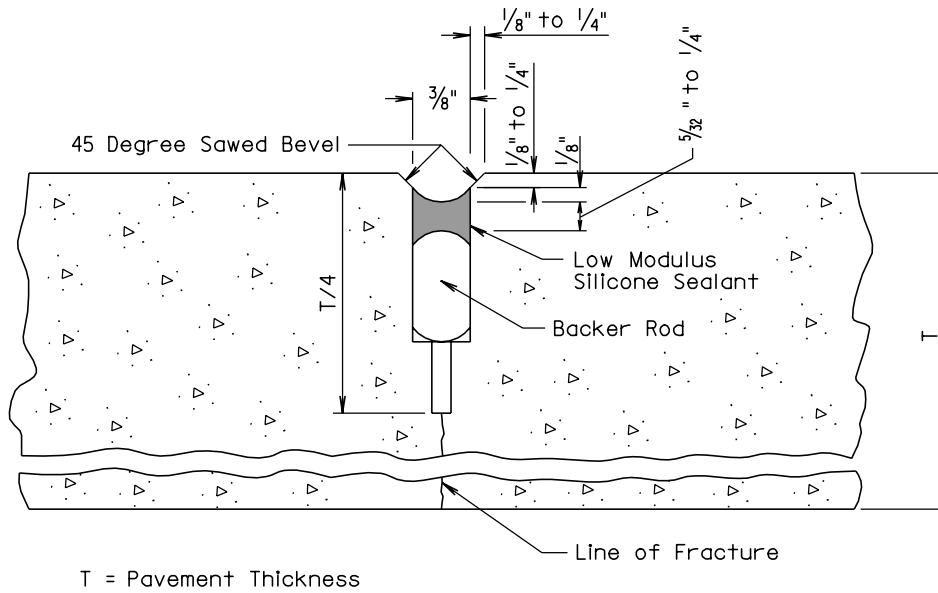
The backer rod shall be a nonmoisture absorbing resilient material approximately 25% larger in diameter than the width of the joint to be sealed.

September 14, 2001

<p><i>Published Date: 2nd Qtr. 2006.</i></p>	<p>S D D O T</p>	<p>PCC PAVEMENT TRANSVERSE CONTRACTION JOINT WITH OR WITHOUT DOWEL BAR ASSEMBLY</p>	<p>PLATE NUMBER 380.03</p>
			<p>Sheet 1 of 1</p>

Plotting Date: 22-JUN-2006

P 0038(00)300, P 3038(00)302 & 037-252
 DAVISON, HANSON & HUTCHINSON COUNTIES



GENERAL NOTES:

The first saw cut to control cracking shall be a minimum of $\frac{1}{4}$ the thickness of the pavement. Additional sawing for widening the saw cut to provide the width for the installation of the low modulus silicone joint sealant will be necessary.

The backer rod shall be a nonmoisture absorbing resilient material approximately 25% larger in diameter than the width of the joint to be sealed.

September 14, 2001

Published Date: 2nd Qtr. 2006

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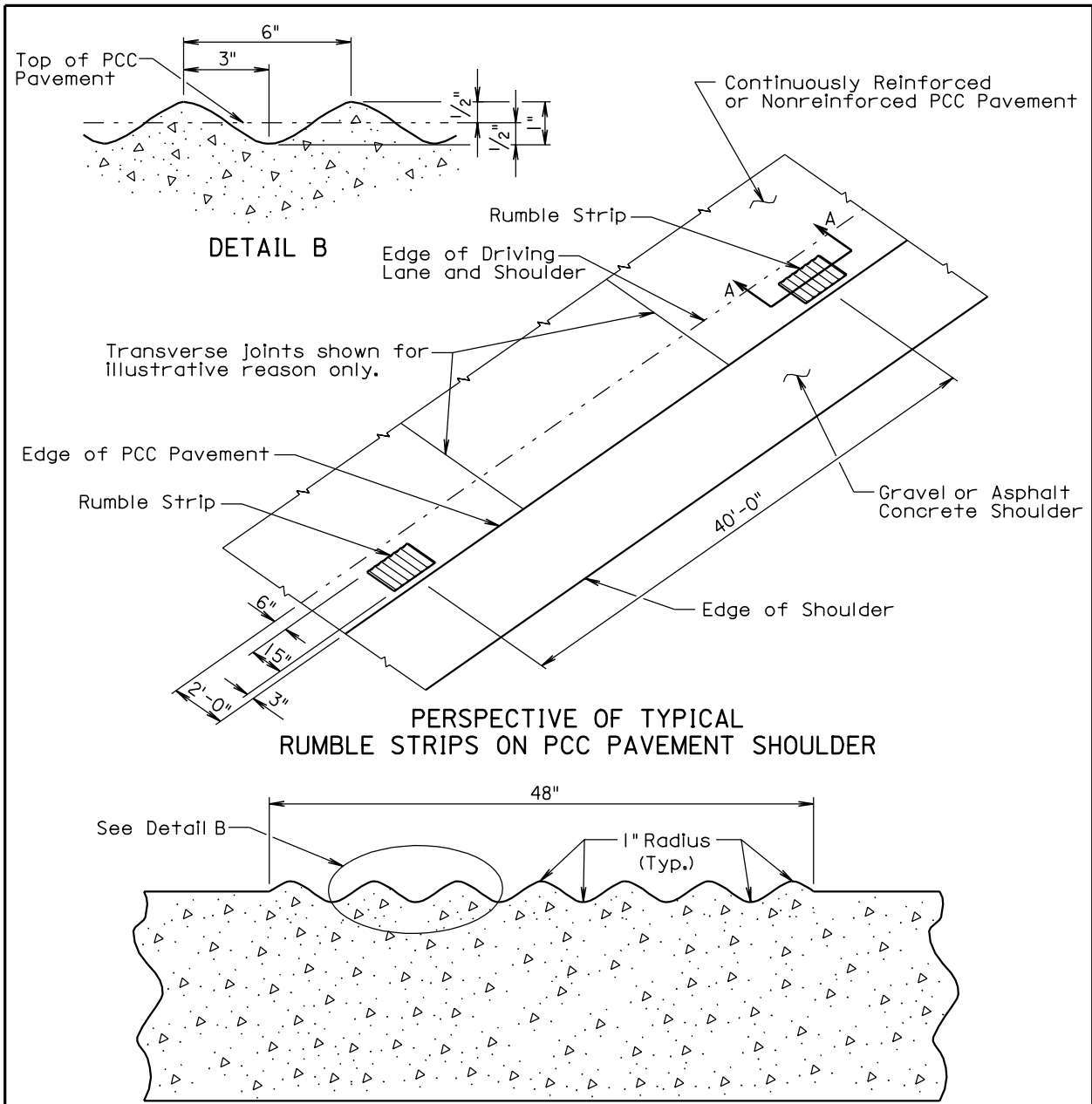
**PCC PAVEMENT BEVELED TRANSVERSE
 CONTRACTION JOINT WITH OR WITHOUT
 DOWEL BAR ASSEMBLY**

**PLATE NUMBER
 380.04**

Sheet 1 of 1

Plotting Date: 22-JUN-2006

P 0038(00)300, P 3038(00)302 & 037-252
 DAVISON, HANSON & HUTCHINSON COUNTIES



GENERAL NOTES:

The rumble strips shall be spaced 40' center to center and shall not coincide with any transverse contraction joints.

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

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

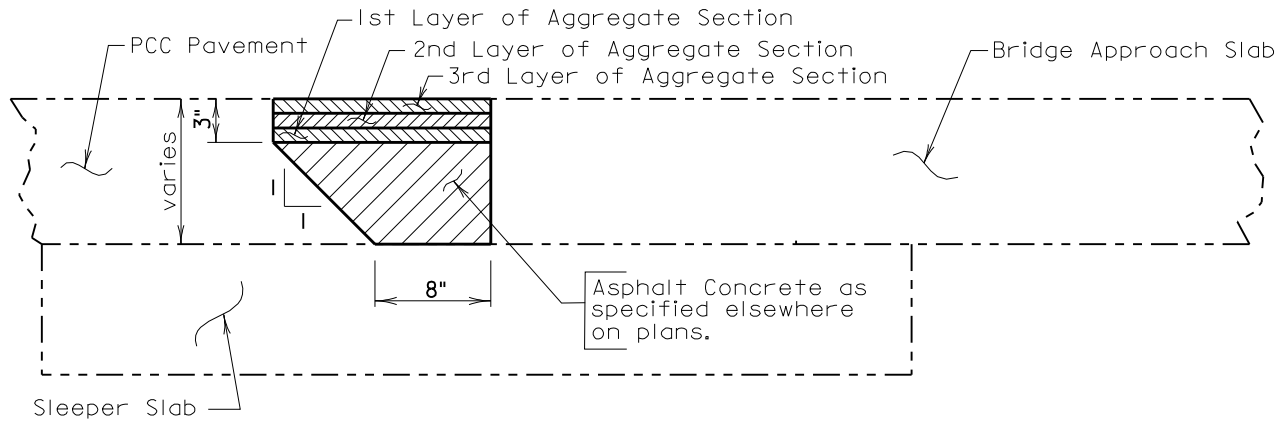
September 14, 2005

	<p>RUMBLE STRIP ON PCC PAVEMENT SHOULDER</p>	<p>PLATE NUMBER 380.15</p>
		<p>Sheet 1 of 1</p>

Published Date: 2nd Qtr. 2006

Plotting Date: 22-JUN-2006

LAYOUT FOR POLYMER MODIFIED ASPHALT GROWTH JOINT

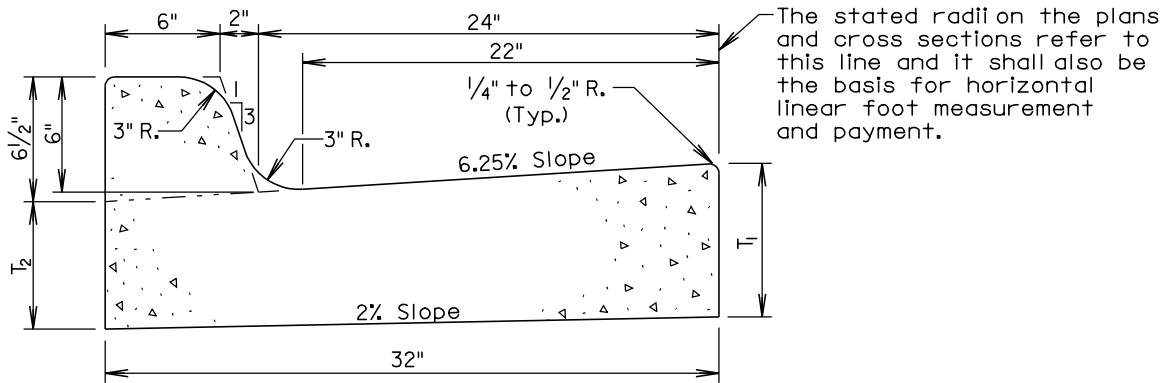


POLYMER MODIFIED ASPHALT GROWTH JOINT

GENERAL NOTE:

The Asphalt Growth Joint shall be constructed as shown and detailed above. The top 3 inches of the growth joint shall conform to the S.D. Standard Specifications for Polymer Modified Asphalt Growth Joint. The remaining portion of the growth joint shall be constructed of asphalt concrete as used elsewhere on the project or specified elsewhere in the plans for the asphalt growth joint.

**P 0038(00)300, P 3038(00)302 & 037-252
DAVISON, HANSON & HUTCHINSON COUNTIES**



Type	T ₁ (Inches)	T ₂ (Inches)	Cu. Yd. Per Lin. Ft.	Lin. Ft. Per Cu. Yd.
B66	6	4 ⁵ / ₈	0.055	18.2
B67	7	5 ⁵ / ₈	0.063	15.9
B68	8	6 ⁵ / ₈	0.071	14.1
B68.5	8.5	7 ¹ / ₈	0.075	13.3
B69	9	7 ⁵ / ₈	0.079	12.7
B69.5	9.5	8 ¹ / ₈	0.084	11.9
B610	10	8 ⁵ / ₈	0.088	11.4
B610.5	10.5	9 ¹ / ₈	0.092	10.9
B611	11	9 ⁵ / ₈	0.096	10.4
B611.5	11.5	10 ¹ / ₈	0.100	10.0
B612	12	10 ⁵ / ₈	0.104	9.6

GENERAL NOTES:

When concrete curb and gutter longitudinally adjoins new concrete pavement, the method of attachment shall be by one of the methods shown on Standard Plate 380.11.

A 1/2" preformed expansion joint filler shall be placed transversely in the curb and gutter at the following locations:

1. At each junction between the radius return of curb and gutter and curb and gutter which is parallel to the project centerline.
2. At each junction between new curb and gutter and existing curb and gutter.

Transverse contraction joints shall be constructed at 10' intervals in the concrete curb and gutter except when the concrete curb and gutter is constructed adjacent to mainline PCC pavement. When concrete curb and gutter is constructed adjacent to mainline PCC pavement, a transverse contraction joint shall be constructed in the concrete curb and gutter at each mainline PCC pavement transverse contraction joint location.

When concrete curb and gutter is placed monolithically with mainline PCC pavement, the transverse contraction joints in the concrete curb and gutter shall be sawed and sealed the same as the transverse contraction joints in the mainline PCC pavement.

When concrete curb and gutter is not placed monolithically with the mainline PCC pavement and when the adjacent mainline surfacing is not PCC concrete, the transverse contraction joints in the concrete curb and gutter shall be 1 1/2 inches deep if formed in the fresh concrete using a suitable grooving tool. If a saw is used to cut the contraction joints, then the depth of the joint shall be at least 1/4 the thickness of the concrete.

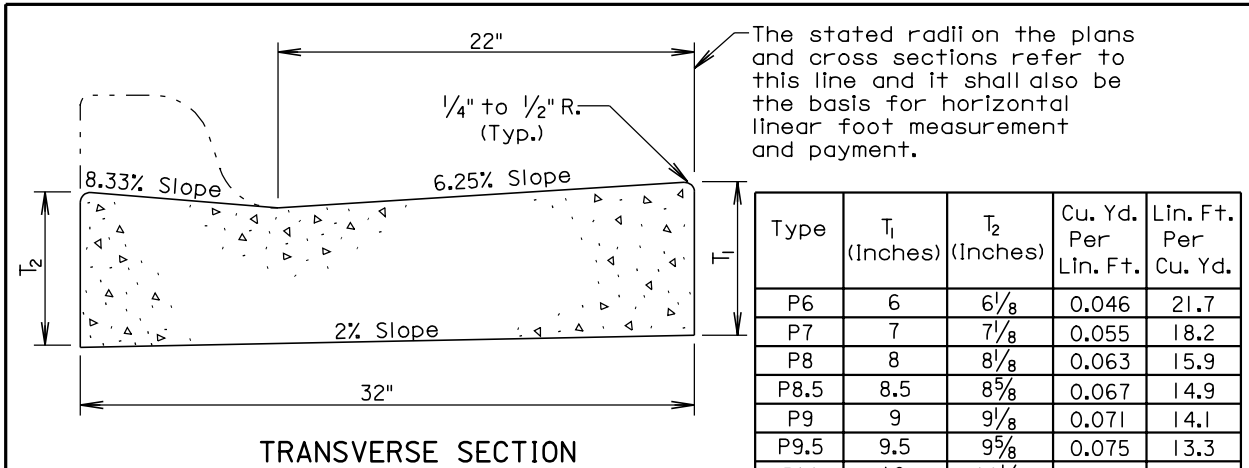
September 14, 2005

SDOT	TYPE B CONCRETE CURB AND GUTTER	PLATE NUMBER 650.01
		Sheet 1 of 1

Published Date: 2nd Qtr. 2006

Plotting Date: 22-JUN-2006

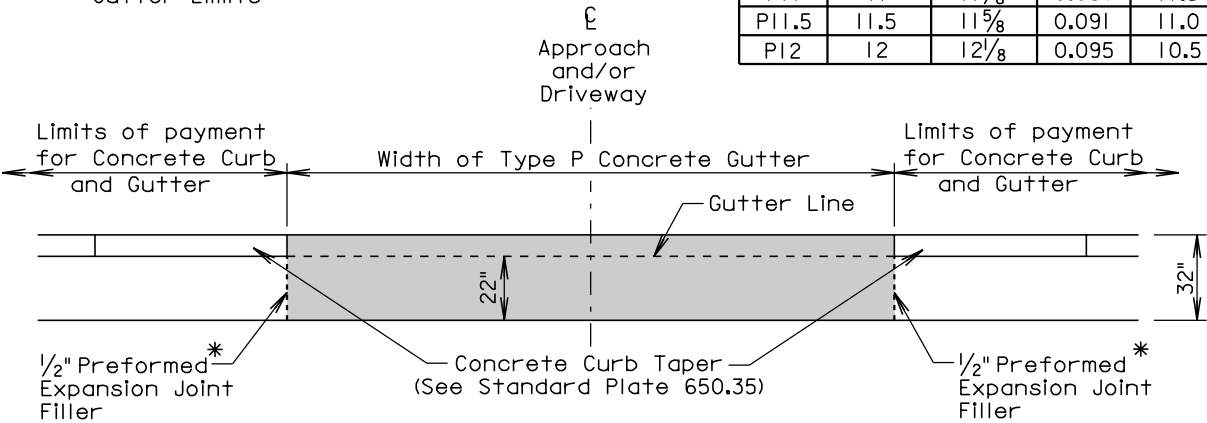
**P 0038(00)300, P 3038(00)302 & 037-252
DAVISON, HANSON & HUTCHINSON COUNTIES**



The stated radii on the plans and cross sections refer to this line and it shall also be the basis for horizontal linear foot measurement and payment.

Type	T ₁ (Inches)	T ₂ (Inches)	Cu. Yd. Per Lin. Ft.	Lin. Ft. Per Cu. Yd.
P6	6	6 ¹ / ₈	0.046	21.7
P7	7	7 ¹ / ₈	0.055	18.2
P8	8	8 ¹ / ₈	0.063	15.9
P8.5	8.5	8 ⁵ / ₈	0.067	14.9
P9	9	9 ¹ / ₈	0.071	14.1
P9.5	9.5	9 ⁵ / ₈	0.075	13.3
P10	10	10 ¹ / ₈	0.079	12.7
P10.5	10.5	10 ⁵ / ₈	0.083	12.0
P11	11	11 ¹ / ₈	0.087	11.5
P11.5	11.5	11 ⁵ / ₈	0.091	11.0
P12	12	12 ¹ / ₈	0.095	10.5

■ Type P Concrete Gutter Limits



PLAN VIEW

* Joint will not be needed if concrete curb & gutter and type P concrete gutter is placed at the same time.

GENERAL NOTES:

The concrete for the Type P Concrete Gutter shall comply with the requirements of the Standard Specifications for Class M6 Concrete.

When concrete gutter longitudinally adjoins new concrete pavement, the method of attachment shall be by one of the methods shown on Standard Plate 380.11.

Transverse contraction joints shall be constructed at 10' intervals in the concrete gutter except when concrete gutter is constructed adjacent to mainline PCC pavement. When concrete gutter is constructed adjacent to mainline PCC pavement, a transverse contraction joint shall be constructed in the concrete gutter at each mainline PCC pavement transverse contraction joint location.

When concrete gutter is placed monolithically with mainline PCC pavement, the transverse contraction joints in the concrete gutter shall be sawed and sealed the same as the transverse contraction joints in the mainline PCC pavement.

When concrete gutter is not placed monolithically with the mainline pavement and when the adjacent mainline surfacing is not PCC concrete, the transverse contraction joints in the concrete gutter shall be 1 1/2 inches deep if formed in the fresh concrete using a suitable grooving tool. If a saw is used to cut the contraction joints, then the depth of the joint shall be at least 1/4 the thickness of the concrete.

September 14, 2005

S D D O T	TYPE P CONCRETE GUTTER	PLATE NUMBER 650.30
		Sheet 1 of 1

Published Date: 2nd Qtr. 2006

Plotting Date: 22-JUN-2006

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