



ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
110E0300	Remove Concrete Curb and/or Gutter	41	Ft
110E0500	Remove Pipe Culvert	8	Ft
110E1105	Remove Concrete Pavement	2.0	CuYd
110E1120	Remove Concrete Median Pavement	71.9	SqYd
110E1530	Remove Signal Pole Footing	1	Each
110E1540	Remove Luminaire Pole Footing	1	Each
110E5020	Salvage Traffic Sign	1	Each
110E5110	Salvage Signal Equipment	Lump Sum	LS
120E0010	Unclassified Excavation	71	CuYd
260E1010	Base Course	30.0	Ton
320E1200	Asphalt Concrete Composite	6.2	Ton
380E2708	8" Mountable Type Median PCC Pavement	49.3	SqYd
380E4060	8.5" PCC Fillet Section	51.6	SqYd
380E6110	Insert Steel Bar in PCC Pavement	71	Each
628E0200	Remove and Reset Crash Cushion	1	Each
632E3203	Flat Aluminum Sign, Nonremovable Copy High Intensity	30.0	SqFt
632E3520	Remove, Salvage, Relocate, and Reset Traffic Sign	16	Each
633E0010	Cold Applied Plastic Pavement Marking, 4"	1,561	Ft
633E0021	Cold Applied Plastic Pavement Marking (Contrast), 8"	750	Ft
633E0030	Cold Applied Plastic Pavement Marking, 24"	150	Ft
633E0040	Cold Applied Plastic Pavement Marking, Arrow	8	Each
633E5000	Grooving for Cold Applied Plastic Pavement Marking, 4"	1,561	Ft
633E5005	Grooving for Cold Applied Plastic Pavement Marking, 8"	750	Ft
633E5015	Grooving for Cold Applied Plastic Pavement Marking, 24"	150	Ft
633E5025	Grooving for Cold Applied Plastic Pavement Marking, Arrow	8	Each
634E0010	Flagging	200.0	Hour
634E0110	Traffic Control Signs	434.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0285	Type 3 Barricade, 8' Double Sided	10	Each
634E0420	Type C Advance Warning Arrow Board	2	Each
634E0560	Remove Pavement Marking, 4" or Equivalent	2,864	Ft
634E0565	Remove Pavement Marking, Arrow	3	Each
635E3340	Roadway Luminaire, 400 Watt with Photoelectric Cell	2	Each
635E4030	3 Section Vehicle Signal Head	2	Each
635E4080	3 Section Directional Vehicle Signal Head	8	Each
635E4100	5 Section Directional Vehicle Signal Head	2	Each
635E5020	2' Diameter Footing	8.0	Ft
635E5030	3' Diameter Footing	20.0	Ft
635E5301	Type 1 Electrical Junction Box	3	Each
635E5302	Type 2 Electrical Junction Box	1	Each
635E5303	Type 3 Electrical Junction Box	5	Each
635E5304	Type 4 Electrical Junction Box	1	Each
635E5390	Adjust Electrical Junction Box	2	Each
635E5515	Battery Backup System for Traffic Signal	1	Each
635E5800	Miscellaneous Signal Parts	Lump Sum	LS
635E6200	Miscellaneous, Electrical	Lump Sum	LS
635E7016	Install Signal Pole with Luminaire	1	Each
635E7500	Remove and Reset Luminaire Pole	1	Each
635E8120	2" Rigid Conduit, Schedule 40	220	Ft
635E8130	3" Rigid Conduit, Schedule 40	20	Ft
635E8150	5" Rigid Conduit, Schedule 40	60	Ft
635E8230	3" Rigid Conduit, Schedule 80	250	Ft

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635E8240	4" Rigid Conduit, Schedule 80	250	Ft
635E9014	1/C #4 AWG Copper Wire	1,685	Ft
635E9018	1/C #8 AWG Copper Wire	10,245	Ft
635E9512	12/C #14 AWG Copper Tray Cable, K2	235	Ft
635E9519	19/C #14 AWG Copper Tray Cable, K2	1,160	Ft
635E9530	30/C #14 AWG Copper Tray Cable, K2	350	Ft
635E9600	#16 AWG Copper Twisted Shielded Pair	8,275	Ft
635E9710	2/C #10 AWG Copper Pole and Bracket Cable	130	Ft
635E9800	Preemption Cable	1,155	Ft
650E1085	Type F68.5 Concrete Curb and Gutter	6	Ft
650E4685	Type P8.5 Concrete Gutter	10	Ft
651E0040	4" Concrete Sidewalk	3,455	SqFt
651E0140	4" Reinforced Concrete Sidewalk	80	SqFt
734E0010	Erosion Control	Lump Sum	LS

SPECIFICATIONS

Standard Specifications for Roads and Bridges, 2015 Edition and Required Provisions, Supplemental Specifications, and Special Provisions as included in the Proposal.

ENVIRONMENTAL COMMITMENTS

An Environmental Commitment is a measure that SDDOT commits to implement in order to avoid, minimize, and/or mitigate a real or potential environmental impact. Environmental commitments to various agencies and the public have been made to secure approval of this project. An agency mentioned below with permitting authority can influence a project if perceived environmental impacts have not been adequately addressed. Unless otherwise designated, the Contractor's primary contact regarding matters associated with these commitments will be the Project Engineer. These environmental commitments are not subject to change without prior written approval from the SDDOT Environmental Office. The environmental commitments associated with this project are as follows:

COMMITMENT E: STORM WATER

Construction activities constitute less than 1 acre of disturbance.

Action Taken/Required:

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

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COMMITMENT H: WASTE DISPOSAL SITE

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

Action Taken/Required:

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

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

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

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

1. Construction and/or demolition debris consisting of concrete, asphalt concrete, or other similar materials shall be buried in a trench completely separate from wood debris. The final cover over the construction and/or demolition debris shall consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the 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.

COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES

The SDDOT has obtained concurrence with the State Historical Preservation Office (SHPO or THPO) for all work included within the project limits and all department designated sources and designated option material sources, stockpile sites, storage areas, and waste sites provided within the plans.

Action Taken/Required:

All earth disturbing activities not designated within the plans require review of cultural resources impacts. This work includes, but is not limited to: Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas.

The Contractor shall arrange and pay for a cultural resource survey and/or records search. The Contractor has the option to contact the state Archaeological Research Center (ARC) at 605-394-1936 or another qualified archaeologist, to obtain either a records search or a cultural resources survey. A record search might be sufficient for review; however, a cultural resources survey may need to be conducted by a qualified archaeologist.

The Contractor shall provide ARC with the following: a topographical map or aerial view on which the site is clearly outlined, site dimensions, project number, and PCN. If applicable, provide evidence that the site has been previously disturbed by farming, mining, or construction activities with a landowner statement that artifacts have not been found on the site.

The Contractor shall submit the records search or cultural resources survey report and if the location of the site is within the current geographical or historic boundaries of any South Dakota reservation to SDDOT Environmental Engineer, 700 East Broadway Avenue, Pierre, SD 57501-2586 (605-773-3180). SDDOT will submit the information to the appropriate SHPO/THPO. Allow **30 Days** from the date this information is submitted to the Environmental Engineer for SHPO/THPO review.

If evidence for cultural resources is uncovered during project construction activities, then such activities shall cease and the Project Engineer shall be immediately notified. The Project Engineer will contact the SDDOT Environmental Engineer in order to determine an appropriate course of action.

SHPO/THPO review does not relieve the Contractor of the responsibility for obtaining any additional permits and clearances for Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas that affect wetlands, threatened and endangered species, or waterways. The Contractor shall provide the required permits and clearances to the Project Engineer at the preconstruction meeting.

COMMITMENT K: 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."

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.

Action Taken/Required:

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, SD 57501-3181  
Phone: 605-773-3151

The permit requires the Contractor to use reasonably available technology to control fugitive dust emissions. The Contractor is required to use control measures for track out, 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.

UTILITIES

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

COORDINATION WITH CITY PROJECT

The City of Rapid City will have a project on Catron Blvd. directly west of this project that will be occurring at the same time. The City project includes grading and resurfacing on Catron Blvd. The Contractor will be required to coordinate with the City project, so that the delay to the traveling public is minimized. The Contractor for this project shall utilize the traffic control provided on the City project to complete the work as directed by the Project Engineer. The contact for the City project is Todd Peckosh 394-4154. All costs associated with this coordination shall be incidental to the various bid items on the project.

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TABLE OF REMOVE CONCRETE

Sta.	L/R	Remove Concrete Median Pavement (SqYd)	Remove Concrete Pavement (CuYd)	Remove Concrete Curb and/or Gutter (Ft)	Remove Pipe Culvert (Ft)
7+55	L	63.6		8	8
7+75	R	8.3			
8+42	L		2	17	
9+90	L			16	
Total		71.9	2	41	8

UNCLASSIFIED EXCAVATION

The Contractor shall saw cut and remove the concrete median, concrete pavement, curb and gutter, portion of slotted pipe, asphalt surfacing and existing embankment material at the locations provided in the following table.

The Contractor shall use caution when removing concrete around existing junction boxes to be left as is. Any damage to the junction boxes shall be repaired by the Contractor at no additional cost to the State.

The depth of excavation shall be 2’ deep for the installation of 18” of Base Course and 6” Asphalt Concrete Composite. Compaction of the subgrade shall be to the satisfaction of the Engineer. All costs associated with the excavation of this material shall be incidental to the contract unit price per cubic yard for Unclassified Excavation.

Excess material shall be handled as waste and disposed of by the Contractor. The Contractor may use this material if needed to build embankment for the sidewalk construction.

TABLE OF UNCLASSIFIED EXCAVATION

Sta.		L	W	D	Unclassified Excavation	Description
			Avg.			
		(Ft)	(Ft)	(Ft)	CUYD	
7+55	L	20	12.5	2	19	Concrete Median
8+40	L	33	21.5	2	53	Concrete Curb and Gutter and Pavement
				Total	71	

REMOVE AND RESET CRASH CUSHION

The Contractor shall remove the existing signal pole crash cushion and reset in front of the new signal pole installation, 7+53.68-22.19' L. The Contractor shall inspect the existing crash cushion and order the necessary anchor bolts from the manufacturer. The crash cushion is a TRACC product manufactured by Trinity Highway Products. The Contractor shall anchor the crash cushion to the concrete median in accordance with the manufacturer's recommendations. The existing I-Beam shall also be removed and reset. All costs associated with this work shall be incidental to the contract unit price per each for "Remove and Reset Crash Cushion"

SLOTTED PIPE MODIFICATION

A portion of the slotted pipe in the median will require removal for the installation of new surfacing material. A concrete cap shall be poured to cap the end of the pipe.

The cap for the existing pipe shall be made by placing a 2' wide by 6" thick M6 concrete cap at the end of the pipe. The concrete cap shall be reinforced with 6x6 W2.9 x W2.9 wire mesh.

All costs for constructing the concrete cap including materials and labor shall be incidental to the contract unit price per foot for Remove Pipe Culvert.

8" MOUNTABLE TYPE MEDIAN PCC PAVEMENT

The Contractor shall install the 18" sloped portion of the Mountable Type Median PCC Pavement along the edge of the removal area in accordance with the typical section shown in these plans.

Forms will not be required for placement of concrete provided the saw cutting for removal is acceptable to the satisfaction of the Engineer.

TABLE OF MEDIAN PAVEMENT

				8" Mountable Type Median PCC Pavement
Sta.	L/R	L	W	SqYd
7+55	L	16	23.0	40.9
7+75	R	8	10	8.4
		Totals:		49.3

DETECTABLE WARNINGS

Detectable warnings as shown on standard plate 651.03 will not be required on this project.

INSERT STEEL BAR IN PCCP

The Contractor shall use 3/4" diameter x 1' – 6" dowels conforming to ASTM A615 Grade 60 to tie the new sidewalk to the concrete drop inlet. These bars shall be spaced 1' apart. It is estimated that 9 bars will be needed to complete this work.

The Contractor shall use 1 1/4" x 18" dowel bar to tie the new median pavement with existing median pavement. It is estimated that 44 bars will be needed to complete this work.

The Contractor shall use #5 bars as per the standard plates along the PCC Fillet Paving and Curb and Gutter replacement areas. It is estimated that 18 bars will be needed to complete this work.

STEEL BAR INSERTION

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

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

RATES OF MATERIALS

US 16B (MEDIAN WORK)

The Estimate of Quantities is based on the following quantities of materials per station.

ASPHALT CONCRETE COMPOSITE 2-3" LIFTS

1<sup>st</sup> – 3" Lift of Asphalt Concrete Composite at the rate of 3.1 ton for 165 sqft.

2<sup>nd</sup> – 3" Lift of Asphalt Concrete Composite at the rate of 3.1 ton for 165 sqft

Base Course shall be placed to a depth of 18" at the rate of 18.3 ton for 165 sqft.

Water shall be added to the Base Course at the rate of 12 gallons per ton. Watering shall be incidental to the contract unit price per ton for "Base Course".

The exact proportions of these materials will be determined on construction.

HORIZONTAL ALIGNMENT DATA

	STATION	NORTHING	EASTING
POB	-2+42.29 TL= 10.78	627922.880 S 66°58'35" E	1200470.526
PC	-2+31.51	627918.663	1200480.449
PI	-0+35.24 R= 1500.00	627841.898 Delta= 14°54'35" Left	1200661.089
PT	1+58.82 TL= 430.67	627814.196 S 81°53'10" E	1200855.400
PC	5+89.49	627753.410	1201281.761
PI	6+73.65 R= 7870.00	627741.533 Delta= 1°13'31" Right	1201365.074
PT	7+57.80 TL= 327.21	627727.876 S 80°39'39" E	1201448.114
POE	10+85.01	627674.776	1201770.990

The coordinates shown on this sheet are based on the State Plane NAD 1983 SOUTH Zone, Geoid 12A SF = .99998308

CONTROL DATA

POS           SDRC  
FCRD           N: 650865.404 E: 1208665.174 Z: 3277.426  
CODE   SDRC  
NOTES   RAPID CITY BASE

POS           RA1  
FCRD           N: 627789.886 E: 1202671.485 Z: 3781.876  
CODE   REFMRK  
NOTES   REBAR CAP RENNER CONTROL WB CATRON DEADEND  
APPROACH

POS           CAT1  
FCRD           N: 627756.598 E: 1201329.107 Z: 3767.155  
CODE   REFMRK  
NOTES   REBAR PLASTIC CAP NW CORNER INTERSECTION  
HWY16/CATRON

POS           CAT2  
FCRD           N: 629219.731 E: 1203681.194 Z: 3765.424  
CODE   REFMRK  
NOTES   PK END ASPHALT CULDESAC WB CATRON

COLD APPLIED PLASTIC PAVEMENT MARKING

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

The 8" contrast tape shall have a 4" wide white stripe bordered by a 2" black stripe on each side.

GROOVING FOR COLD APPLIED PLASTIC PAVEMENT MARKING

The Contractor shall establish a positive means for the removal of the grinding and/or grooving residue. Residue from dry grooving shall be vacuumed. Solid residue shall be removed from the pavement surfaces before being blown by traffic action or wind. Residue from wet grooving shall not be permitted to flow across lanes being used by public traffic or into gutter or drainage facilities. Residue, whether in solid or slurry form, shall be disposed of in a manner that will prevent it from reaching any waterway in a concentrated state. All costs for removal of grinding and/or grooving residue shall be included in the contract unit price per foot for "Grooving for Cold Applied Plastic Pavement Marking".

TABLE OF PAVEMENT MARKING

Location Description	Remove Pavement Marking, Arrow (Each)	Remove Pavement Marking, 4" or Equivalent (Ft)	Cold Applied Plastic Pavement Marking, 4" (Ft)	Cold Applied Plastic Pavement Marking (Contrast), 8" (Ft)	Cold Applied Plastic Pavement Marking, 24" (Ft)	Cold Applied Plastic Pavement Marking, Arrow (Each)
US16 Southbound Lanes Stop Bar		240			40	
US16 Southbound Left Turn Lane Stop Bar		120			20	
2' Skips for Northbound Left Turns			45			
2' Skips for Southbound Left Turns			42			
US16 Westbound Stop Bar		372			62	
New Right Turn Lane	3	1051	241			3
New Skips, 5+37 to 8+00		264	66			
New Left Turn Lane		67	266			5
New White Skips, 8+00 to 14+00		150		150		
New White Edgeline, 8+00 to 14+00		600		600		
New Left Turn Taper			48			
New Left Turn Taper			43			
New Yellow Edgeline, 9+70 to 14+00			430			
New Yellow Edgeline, 9+70 to 14+00			380			
New Yellow Median Marking, 9+70 to 14+00					28	
Total:	3	2864	1561	750	150	8

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TRAFFIC CONTROL – GENERAL NOTES

- Requests to deviate from the sequence of operations shall be submitted in writing to the Engineer for review. Approval of an alternate sequence of operations will only be allowed when the proposed changes meet with the Department’s intent for traffic control and sequencing of the work. An alternate sequence shall be submitted for review a minimum of one week prior to potential implementation.
- Unless otherwise stated in these plans, no work will be allowed during hours of darkness.
- Existing guide, route, informational logo, regulatory, warning signs and delineation shall be temporarily reset and maintained during construction as directed by the Engineer. Removing, relocating, salvaging and resetting of the above items shall be the responsibility of the Contractor.
- Non-applicable traffic control devices shall be completely covered or removed during periods of inactivity. Periods of inactivity shall be defined as no work taking place for a period of more than 2 calendar days.
- All regulatory signs shall have a minimum mounting height of 5’ in rural locations, even when mounted on portable supports.
- All materials and equipment shall be stored a minimum distance of 30’ from the traveled way during nonworking hours.
- The Contractor shall provide installation details at the preconstruction meeting for all breakaway sign support assemblies.
- All haul trucks shall be equipped with a second flashing amber light that is visible from the backside of the haul truck. The costs for the flashing amber lights shall be incidental to the various related contract bid items.
- All construction operations shall be conducted in the general direction of traffic movement.
- If there is a discrepancy between the traffic control plans, standard plates, and the MUTCD – whichever is more stringent shall be used, as determined by the Engineer.
- Temporary Flexible Vertical Markers (Tabs) shall be used for lane closure tapers or lane shift tapers and shall be installed at 5’ spacing. Tabs used for tapers and shifts will not be measured for payment. All costs associated to furnish, install, maintain (including replacement as required by the Engineer at no added cost to the Department), and remove all markers will be incidental to the contract lump sum price for Traffic Control, Miscellaneous.

SEQUENCE OF OPERATIONS

- This project will need to be coordinated with the City of Rapid City Project No. 16-2343 – Catron Boulevard Widening.
- Work that needs to be completed on Catron Boulevard for this project shall be completed under the City of Rapid City’s Project traffic control. The Contractor shall coordinate with the City of Rapid City’s Contractor to ensure that the work that needs to be completed under the City’s traffic control gets completed and is coordinated with the City’s work that is also taking place under the traffic control setup.
- The City of Rapid City’s Project will have temporary traffic control setup on Catron Blvd. on April 2, 2018 as depicted on the Traffic Control sheet.
- There are 2 traffic control lane closure setups on this project for any work that needs to be completed on US Highway 16 – northbound and southbound.
- The southbound lane closure will be in place for the duration of the project and the lane closure taper shall be located between Promise Road and Tucker St. The northbound lane closure will only be in place when there is an “All Way Stop” condition at the intersection of Catron Blvd. and US Highway 16. The northbound lane closure shall be located south of Addison Ave. due to sight conditions.
- The left turn lanes at the intersection on US Highway 16 will need to be narrowed to complete the work – drums at a 25’ spacing will be required to narrow the turn lanes.
- In order to complete the installation of the new traffic signal pole and removal of old traffic signal pole, relocation of the luminaire pole, re-wiring of the existing traffic signal poles, re-wiring of the existing traffic signal controller, and changing out the traffic signal heads, power will have to be turned off to the traffic signal and roadway lighting. When power is turned off to the traffic signal, an “All Way Stop” condition will be put in place at the intersection of Catron Blvd. and US Highway 16 as shown in the Traffic Control sheet.
- During the “All Way Stop” condition, all of the traffic lanes will be closed except for one through lane in each direction as shown in the Traffic Control sheet.
- Power will only be turned off to the traffic signal on Sunday mornings from Sunrise to 3 hours after Sunrise. During that time there will need to be 4 flaggers at the intersection to help traffic get through the intersection if long traffic queues start to occur. 3 hours will be the maximum time that the signal will be allowed to be powered down. If all of the work cannot be completed in one 3 hour timeframe, then the work shall be completed over multiple Sunday mornings.
- Installation of permanent pavement markings on Catron Blvd. on the east side of the intersection shall be coordinated with and installed at the same time as the City of Rapid City’s markings are being installed on the west side of the intersection under the City’s traffic control setups.

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ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R1-1	STOP	4	36"	7.5	30.0
R1-3P	ALL WAY (plaque)	4	36" x 30"	7.5	30.0
R3-20L	BEGIN LEFT TURN LANE	1	24" x 36"	6.0	6.0
W3-1	STOP AHEAD (symbol)	4	48" x 48"	16.0	64.0
W4-2	LEFT or RIGHT LANE ENDS (symbol)	4	48" x 48"	16.0	64.0
W20-1	ROAD WORK AHEAD	4	48" x 48"	16.0	64.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	4	48" x 48"	16.0	64.0
W20-7	FLAGGER (symbol)	4	48" x 48"	16.0	64.0
W21-5	SHOULDER WORK	2	48" x 48"	16.0	32.0
G20-2	END ROAD WORK	2	48" x 24"	8.0	16.0
		EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS SQFT			434.0

TYPE 3 BARRICADES

ITEM DESCRIPTION	QUANTITY
Type 3 Barricade, 8' Double Sided	10 Each

ARROW BOARDS

ITEM DESCRIPTION	QUANTITY
Type C Advance Warning Arrow Board	2 Each



SUPPLYING AS BUILT PLANS

If the traffic signal system is constructed differently than what is stated in the plans, the Contractor shall supply as built plans to the Engineer and a copy shall be sent to the Traffic Design Engineer. The as built plans may include conduit layouts, wiring diagrams, or other drawings depicting the changes from the original plans.

SHOP DRAWING AND CATALOG CUTS SUBMITTALS

The Contractor shall submit shop drawings and catalog cuts in accordance with Section 985 of the Specifications.

Adobe PDF submittals shall be sent to the following email addresses:

John.Less@state.sd.us  
Pete.Longman@state.sd.us

ON-SITE INSPECTION

An on-site inspection of the traffic signal shall be conducted before acceptance of the project, once the traffic signal modifications are completed. The on-site inspection shall be conducted by the Project Engineer or Region Traffic Engineer with the Contractor, City Traffic Engineer, and the Traffic Design Engineer present.

SALVAGE SIGNAL EQUIPMENT

All of the existing 4-Section signal heads shall be salvaged and delivered to the SDDOT Rapid City Region Office by the Contractor. The Contractor shall notify the Region Office 5 days before the delivery of the salvaged signal equipment; the Region Office contact is Nick Wuebben, 605.394.2221.

Existing signal pole ES1 including the 3-section signal heads, luminaire extension, and luminaire shall be salvaged and delivered to the Rapid City Traffic Operations Shop by the Contractor. The Contractor shall notify the city 5 days before the delivery of the salvaged signal equipment; the city contact is Steve Frooman, 605.394.4118.

All costs for work involved in the salvage and delivery of the existing signal equipment shall be incidental to the contract lump sum price for "Salvage Signal Equipment".

REMOVE LUMINAIRE POLE FOOTING

The footings of existing luminaire pole EL1 shall be removed by the Contractor to a minimum of 2' below the ground surface. Restoration of the disturbed area shall be to the satisfaction of the Engineer.

All costs for removing the footings of the existing luminaire poles shall be incidental to the contract unit price per each for "Remove Luminaire Pole Footing".

REMOVE AND RESET LUMINAIRE POLE

Existing luminaire pole EL1 shall be removed and reset as REL1 as shown on the plan sheets.

It shall be the Contractor's responsibility to obtain the bolt circle pattern and anchor bolts for the relocated poles from the pole manufacturer listed below. The poles were originally installed under Project PH 0016(00)64, shop drawing number SD4P11299.

Valmont Industries, Inc.  
P.O. Box 358  
Valley, NE 68064  
Phone (402) 359-2201

Luminaire poles and luminaires damaged during relocation shall be repaired or replaced by the Contractor at no cost to the State.

All costs involved with removing and resetting the existing luminaire poles including new anchor bolts with associated hardware, shall be incidental to the contract unit price per each for "Remove and Reset Luminaire Pole".

REMOVE SIGNAL POLE FOOTING

The footings of existing signal pole ES1 shall be removed by the Contractor to a minimum of 3' below the ground surface. Restoration of the disturbed area shall be to the satisfaction of the Engineer.

All costs for removing the footings of the existing signal pole shall be incidental to the contract unit price per each for "Remove Signal Pole Footing".

REMOVE EXISTING WIRE & CABLE

All costs associated with the removal & disposal of existing wire and cable called for on the plan shall be incidental to the contract unit price per each for the associated replacement item.

SUBSURFACE

A field investigation conducted within 15 feet of the proposed traffic signal location in October 2017 logged 10 feet of red silt-clay with gravel over 9 feet of gravel up to 1-1/2 inches in diameter. Beneath the gravel, maroon silt-clay was encountered to the bottom of the boring at 24.5 feet. At the time of drilling it was noted the gravel was very hard to drill through at 14 feet using a CME-55 and 4-1/2 inch continuous flight augers. Groundwater was not encountered at this location.

During construction of the cylindrical footings, concrete placement operations should closely follow excavation procedures. The longer the excavations are left open the more likely caving may occur.

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TABLE OF FOOTING DATA

Site Designation	Footing Diameter	* Footing Depth	**Spiral Diameter	**Spiral Length	Vertical Reinforcement
REL1	2' - 0"	8' - 0"	1' - 8"	54' - 9"	8-#7 x 7' - 6"
S1	3' - 0"	20' - 0"	2' - 8"	187' - 6"	14-#8 x 19' -6"

\* Footing depth shall be below ground level.

\*\* The size of all spirals shall be #3.

INSTALL SIGNAL POLE WITH LUMINAIRE

Signal pole S1 shall be furnished by the State and installed by the Contractor. The total cost of the furnished items for tax purposes is \$32,195.00. The pole, all necessary hardware, and anchor rods are located at the SDDOT South Maintenance Yard, SD79, Rapid City. The pole will be available for pick-up after March 30, 2018. Contact Rapid City Area Engineer Mike Carlson, Phone No. (605) 394-1635 a minimum of 5 business days in advance of desired pickup date. All costs associated with the pickup, delivery, and installation of signal pole S1 shall be incidental to the contract lump sum price for "Install Signal Pole with Luminaire."

LUMINAIRES

The luminaires for new signal pole S1 shall be high-pressure sodium, medium, semi-cutoff, type III.

The approved isofootcandle data for each case shall be used to determine the correct socket position at each site. Each luminaire shall be installed with its lamp socket in the proper position and in a level attitude.

CONDUIT CONNECTION TO TRAFFIC SIGNAL CABINET

The entrance point for new conduits shown as connecting to the traffic signal cabinet shall be created by carefully removing a portion of the existing concrete base at the rear corner of the cabinet and installing a 45-degree elbow. Gaps between the base and conduit shall be sealed using epoxy resin adhesive or approved equivalent method.

All costs for connecting the conduit to the traffic signal cabinet shall be incidental to the contract unit price per each for "5" Rigid Conduit, Schedule 40."

MULTICONDUCTOR CONTROL CABLE FOR SIGNAL CIRCUITS

The Conductor Jackets for the multiconductor control cables shall be color coded in accordance with ICEA S-73-532 Table E2.

**PREEMPTION CABLE**

Preemption cable consists of one 18 AWG (minimum) 2-conductor twisted shielded pair Belden 8762 or equal, and one #16 2-conductor traffic signal control cable. All costs associated with the installation of new preemption cable shall be incidental to the contract unit price per foot for “Preemption Cable.”

**MISCELLANEOUS SIGNAL PARTS**

The Contractor shall replace the existing signal backplates for the twelve signal heads to be retained at the intersection, to comply with the following specifications:

Signal backplates shall extend not less than 5 inches from the edge of the signal head at the top, bottom, and sides. Vehicle signal head backplates shall have a factory applied yellow retroreflective border, 2-inches wide. Sheeting for the border shall conform to the requirements of ASTM D4956 Type XI sheeting. The bottom of the backplate on vehicle signal faces mounted directly above pedestrian signal indications shall be sized to permit the separate adjustment of the vehicle and pedestrian signal indication and may be less than 4 inches.

All costs for furnishing and installing backplates with retroreflective border for the relocated signal heads shall be incidental to the contract lump sum price for “Miscellaneous Signal Parts.”

**CONTROLLER PROGRAMMING**

The existing controller shall be reprogrammed by a qualified technician to use the patterns and timings specified on the Signal Timing Sheets. All costs for reprogramming the controllers shall be incidental to the contract lump sum price for “Miscellaneous, Electrical.”

**MMU REPROGRAMMING**

The existing MMU shall be reprogrammed by a qualified technician to match the signal operation specified on the Signal Timing Sheets. All costs for reprogramming the MMU shall be incidental to the contract lump sum price for “Miscellaneous, Electrical.”

**REMOVE AND RESET EVP MICROPHONE & CONFIRMATION LIGHT**

The existing EVP microphone and confirmation light on existing signal pole ES1 shall be removed and reset on new signal pole S1. All costs for removing and resetting existing EVP microphone and confirmation light shall be incidental to the contract lump sum price for “Miscellaneous, Electrical.”

**EXISTING FIBER OPTIC CABLE & CONDUIT**

The existing fiber optic cable and conduit on the west side of US16 shall be intercepted by JB1. Prior to setting the new box, the Contractor shall carefully pull back the existing fiber optic cable an adequate distance. Once JB1 is in place, the Contractor shall pull the fiber optic cable to the existing traffic signal controller via JB3. Any damage to the fiber optic cable shall be repaired by the Contractor at no cost to the State. All costs associated with pulling the fiber optic cable to the traffic signal controller shall be incidental to the contract lump sum price for “Miscellaneous, Electrical.”

**TYPE 4 JUNCTION BOX**

The lid for the “Type 4 Electrical Junction Box” may be a two-piece style.

**SIGNAL JUNCTION BOXES**

The Contractor shall remove signal junction box EJB1 and install a new Type 3 junction box in its place. All costs associated with removing the existing junction box shall be incidental to the contract unit price per each for “Type 3 Electrical Junction Box.”

Signal junction boxes JB4 will be the connection point for the City of Rapid City’s new lighting conduit from the west. Signal junction box JB5 will be the connection point for the city’s new detector loops on the west approach.

Signal junction box JB2 shall be set on the existing conduit coming from the electric service for the luminaire extensions. All costs associated with intercepting the existing conduit shall be incidental to the contract unit price per each for “Type 2 Electrical Junction Box.”

Signal junction box JB9 shall be set on the existing conduit to ES4. All costs associated with intercepting the existing conduit shall be incidental to the contract unit price per each for “Type 3 Electrical Junction Box.”

**ADJUST ELECTRICAL JUNCTION BOX**

Existing junction boxes EJB2 and EJB8 shall be adjusted to match the grade of the new PCC fillet pavement.

**BATTERY BACKUP CABINET**

The Contractor shall supply a cabinet with concrete pad and footing for housing the battery backup at the traffic signal The cabinet shall be an aluminum NEMA Type 3R. The cabinet shall have a thermostatically controlled exhaust fan. The cabinet shall be securely attached to the concrete pad with steel anchors and to the back wall of the controller cabinet using chase nipples as approved by the Engineer.

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**DETECTOR WIRE LOOP SPLICING**

Detector loop wire splices shall be made using wire nuts over soldered connections, and sealed in 3M Scotchcast 3570G-N connector sealing packs or an approved equal.

**WIRE SPLICING FOR LIGHTING**

All wire splices for lighting shall be made using TE Connectivity GTAP connectors, NSI Industries Polaris Blue connectors, or an approved equal.



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	016WB-452	9	43

**PERMANENT SIGNING**

The Contractor shall furnish all signs, posts, stiffeners, bases, hardware, and labor for installation of permanent signs in size, type, and quantity as shown in these plans and/or as required by the Engineer.

The Contractor shall provide all labor and equipment necessary to install permanent signing, remove existing signs, and reset existing signs as detailed in these plans and/or as required by the Engineer. Payment for furnishing and installing permanent signs will be paid for at the contract unit price for each type of sign based on sheeting requirements per square foot of sign. All signs shall have Type IV (High Intensity) or XI (Super/Very High Intensity) sheeting as noted in the Table of Permanent Signing.

The Contractor shall stake the signs and the Engineer will verify the location prior to installation. The lateral distance from the roadway and the height of the sign shall be established by the Contractor according to the Standard Plates in the plans and the MUTCD.

Existing signing shall be replaced, left in place, or temporarily covered as needed to safely direct traffic through the project or as directed by the Engineer.

**REMOVE, SALVAGE, RELOCATE & RESET TRAFFIC SIGN**

The Contractor shall remove signs, posts, and bases for reset as shown in the table for Permanent Signing. All existing posts, bases, and signs listed in the table that are scheduled for Removal shall become the property of the Contractor. All bolts, nuts, and washers shall be placed in individual 5-gallon pails. Backing materials shall be separated from the signs and may be reused at the Contractor's discretion. Non-threaded connections (rivets) shall be cut when necessary to reduce sign sections to a 4' x 6' maximum size.

Salvaged signs shall be hauled to the SDDOT maintenance yard. Contact Bob Smith, Rapid City Maintenance Supervisor, 381-7174 to schedule delivery.

Payment for all existing signs to removed and reset shall include all cost for labor and equipment necessary to remove, dismantle, backfill holes (wooden posts only) and disposal of the sign materials shall be included in the contract unit price per each for REMOVE, SALVAGE, RELOCATE & RESET TRAFFIC SIGN.

**HARDWARE**

Aluminum U-Channel stiffeners shall be used on all standard highway signs greater than 36" in width and shall conform to the requirements of ASTM B221 Alloy 6063-T6 or 6061-T6. The U-Channel shall be 2 inches in width and free of holes. The U-Channel stiffeners shall also be used to connect various signs and perforated tube posts together so that an entire sign can be erected as a single installation. Stiffeners may be fastened to signs by use of 1/4" drive rivets with a minimum of one on each end and one centered between each post. Installation of the stiffeners shall be incidental to other contract items.

**FURNISH & INSTALL FLAT ALUMINUM SIGNS / NON-REMOVABLE COPY HIGH INTENSITY & SUPER/VERY HIGH INTENSITY**

Measurement of sign areas will include payment for the entire sign blank before trimming for rounded corners. The square unit measurement for each sign shall be as shown in the table of Permanent Signing. This payment for signs designated as Flat Alum. under the New Sign column in the table of Permanent Signing shall include all labor (including installing date decals), equipment, and materials to complete the work, and shall be paid for at the contract unit price per square foot for FLAT ALUMINUM SIGN / NON-REMOVABLE COPY HIGH INTENSITY and FLAT ALUMINUM SIGN / NON-REMOVABLE COPY SUPER/VERY HIGH INTENSITY.

**SHEETING REQUIREMENTS**

All legend and border utilizing the color black shall be vinyl or screen printed black, non-reflectorized material. All other legend and border shall be of same type of sheeting as the background of the same sign. All signs in the table for Permanent Signing shall utilize either Type IV or Type XI sheeting, as per ASTM 4956, as indicated in the table.

**SIGN LEGEND, BORDER, BACKGROUND, AND MOUNTING**

All sign material shall comply with Section 982 of the Specifications.

All upper case letters, lower case letters and all numerals shall be as shown in these plans.

The sign colors shall be as stipulated in the MUTCD and as shown in the sign details.

The border on all signs 3 feet or less in height shall be 1 inch wide. The border on all signs greater than 3 feet in height shall be 2 inches wide.

The corner radius on all signs 3 feet or less in height shall be 3 inches. The corner radius on all signs greater than 3 feet and less than 6 feet in height shall be 6 inches. The corner radius on all signs greater than 6 feet in height shall be 12 inches.

When signs are vertically mounted in succession, they shall be 1-2 inches apart. Lateral placement of signs shall be determined by the Engineer.

TABLE OF PERMANENT SIGNING

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
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EXISTING LOCATION	NEW LOCATION	SIGN								POST					SIGN DESCRIPTION	WORK TO BE DONE
		Sign Number	Width (in)	Height (in)	Facing Traffic	New Sign	Remove Existing	Square Footage	Sheeting Type	New	Post	Length (ft)	Size (in)	# of Posts		
SIGNS FOR MAINLINE																
64.19 + 0.000	SAME	R5-1	30	30	SOUTHBOUND	NO	YES		XI	NO			2		DO NOT ENTER	REMOVE AND RESET SIGN ON LUMINAIRE POST
64.25 + 0.005	SAME	R6-1L	48	18	EASTBOUND	NO	YES		IV	NO			2		ONE WAY ON LEFT ARROW	REMOVE AND RESET SIGN AND POSTS
64.25 + 0.005	SAME	R6-1R	36	12	EASTBOUND	NO	YES		IV	NO			2		ONE WAY ON RIGHT ARROW	REMOVE AND RESET SIGN AND POSTS
64.25 + 0.005	SAME	R6-3	30	24	EASTBOUND	NO	YES		IV	NO			2		DIVIDED HIGHWAY CROSSING THRU	REMOVE AND RESET SIGN AND POSTS
64.25 + 0.005	SAME	R5-1	30	30	EASTBOUND	NO	YES		XI	NO			2		DO NOT ENTER	REMOVE AND RESET SIGN AND POSTS
64.25 + 0.027	SAME	R5-1a	36	24	EASTBOUND	NO	YES		XI	NO			2		WRONG WAY	REMOVE AND RESET SIGN AND POSTS
64.25 + 0.056	SAME	W8-1	36	36	WESTBOUND	NO	YES		XI	NO			2		BUMP	REMOVE AND RESET SIGN AND POSTS
64.25 + 0.056	SAME	W13-1	18	18	WESTBOUND	NO	YES		XI	NO			2		ADVISORY SPEED PLATE 35 MPH	REMOVE AND RESET SIGN AND POSTS
64.25 + 0.085	SAME	D1-1R	84	24	WESTBOUND	NO	YES		IV	NO			2		RAPID CITY AND ARROW	REMOVE AND RESET SIGN AND POSTS
SIGNS FOR SIGNAL POLE W/ MAST ARM - US16B WESTBOUND AND EASTBOUND																
Existing Mast Arm	New Mast Arm	R3-6L	30	36	WESTBOUND	FLAT ALUM	NO	7.5	IV	N/A					OPTIONAL MOVEMENT LANE CONTROL - U-TURN & LEFT TURN	SALVAGE EXISTING SIGN & REPLACE WITH NEW ON NEW MAST ARM
Existing Mast Arm	New Mast Arm	R3-5L	30	36	WESTBOUND	FLAT ALUM	NO	7.5	IV	N/A					MANDATORY MOVEMENT LANE CONTROL - LEFT ONLY	ATTACH NEW ON NEW MAST ARM
Existing Mast Arm	New Mast Arm	R3-5L	30	36	EASTBOUND	FLAT ALUM	NO	7.5	IV	N/A					MANDATORY MOVEMENT LANE CONTROL - LEFT ONLY	ATTACH NEW ON NEW MAST ARM
Existing Mast Arm	New Mast Arm	R3-6L	30	36	EASTBOUND	FLAT ALUM	NO	7.5	IV	N/A					OPTIONAL MOVEMENT LANE CONTROL - U-TURN & LEFT TURN	ATTACH NEW ON NEW MAST ARM
Existing Mast Arm	New Mast Arm	D3-1	72	18	WESTBOUND	NO	YES		IV	N/A					STREET NAME - SOUTH HWY 16	RESET ON NEW MAST ARM
Existing Signal Pole	New Signal Pole	M1-5	24	24	WESTBOUND	NO	YES		IV	N/A					US ROUTE SIGN - US16	RESET ON NEW SIGNAL POLE
Existing Signal Pole	New Signal Pole	M1-5	24	24	WESTBOUND	NO	YES		IV	N/A					US ROUTE SIGN - US16	RESET ON NEW SIGNAL POLE
Existing Signal Pole	New Signal Pole	M3-4	24	12	WESTBOUND	NO	YES		IV	N/A					CARDINAL DIRECTION - WEST	RESET ON NEW SIGNAL POLE
Existing Signal Pole	New Signal Pole	M3-2	24	12	WESTBOUND	NO	YES		IV	N/A					CARDINAL DIRECTION - EAST	RESET ON NEW SIGNAL POLE
Existing Signal Pole	New Signal Pole	M6-1	21	15	WESTBOUND	NO	YES		IV	N/A					ADVANCE TURN ARROW SIGNS	RESET ON NEW SIGNAL POLE
Existing Signal Pole	New Signal Pole	M6-1	21	15	WESTBOUND	NO	YES		IV	N/A					ADVANCE TURN ARROW SIGNS	RESET ON NEW SIGNAL POLE
							TOTAL	30.0								

EROSION CONTROL

All costs for the erosion control work for furnishing, placing, and maintaining erosion control including equipment, labor, seeding, fertilizing, and fiber mulching shall be incidental to the contract lump sum price for “Erosion Control”.

The limits of erosion control work will be for all locations that have been disturbed during construction as determined by the Engineer.

MYCORRHIZAL INOCULUM

Mycorrhizal inoculum shall consist of mycorrhizal fungi spores and mycorrhizal fungi-infected root fragments in a solid carrier. The carrier may include organic materials, calcinated clay, or other materials consistent with application and good plant growth. The supplier shall provide certification of the fungal species claimed and the live propagule count. The inoculum shall include the following fungal species:

<i>Glomus intradices</i>	25%
<i>Glomus aggregatu</i>	25%
<i>Glomus mosseae</i>	25%
<i>Glomus etunicatum</i>	25%

All seed shall be inoculated by the seed supplier with a minimum of 100,000 live propagules of mycorrhizal fungi per acre. All costs of inoculating the seed shall be incidental to the contract lump sum price for Erosion Control.

The mycorrhizal inoculum shall be as shown below or an approved equal:

Product	Manufacturer
MycoApply	Mycorrhizal Applications, Inc. Grants Pass, OR Phone: 1-866-476-7800 <a href="http://www.mycorrhizae.com">www.mycorrhizae.com</a>

FERTILIZING

The Contractor shall apply an all-natural slow release fertilizer prior to seeding or placing sod. The all-natural fertilizer shall have a minimum guaranteed analysis of 4-6-4 and be USDA Certified BioBased. It should provide a minimum of 4% (N) nitrogen with a minimum water insoluble nitrogen (WIN) fraction of 3.2%, a minimum of 6% (P2O5) available phosphate, a minimum of 4% (K2O) soluble potash, and a maximum carbon to nitrogen ratio (C:N ratio) of 5:1. The all-natural fertilizer shall be free of weed-seed and pathogens accomplished through thermophilic composting, and not mechanical or chemical sterilization, to assure presence of beneficial soil microbiology. The fertilizer shall have a near neutral pH, a low salt index, a low biological oxygen demand, contain organic humic and fulvic acids, and have high aerobic organism counts. The fertilizer shall also be stable, free of bad odors, and be unattractive as a food source for animals. It should also be in a granular form that is easily spread.

The fertilizer shall be applied at a rate of 1,500 pounds per acre in accordance with the manufacturer's recommended method of application.

The all-natural slow release fertilizer shall be as shown below or an approved equal:

Product	Manufacturer
Sustane	Sustane Corporate Headquarters Cannon Falls, Minnesota Phone: 1-800-352-9245 <a href="http://www.sustane.com">www.sustane.com</a>
Perfect Blend	Perfect Blend, LLC Bellevue, WA Phone: 1-866-456-8890 <a href="http://www.perfect-blend.com">www.perfect-blend.com</a>

PERMANENT SEEDING

The areas to be seeded consist of disturbed areas within the project limits.

Type F Permanent Seed Mixture shall consist of the following:

Grass Species	Variety	Pure Live Seed (PLS) (Pounds/Acre)
Western Wheatgrass	Arriba, Flintlock, Rodan, Rosana	7
Green Needlegrass	Lodorm	4
Sideoats Grama	Butte, Killdeer, Pierre, Trailway	3
Blue Grama	Bad River, Willis	2
Oats or Spring Wheat: April through May; Winter Wheat: August through November		10
Total:		26

FIBER MULCHING

Fiber mulch shall be applied in a separate operation following permanent seeding.

The Contractor shall allow the fiber mulch to cure a minimum of 18 hours prior to watering or any storm event to ensure proper cohesion between the soil and fiber particles.

The fiber mulch provided shall be from the approved product list. The approved product list for fiber mulch may be viewed at the following internet site:

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	016WB-452	11	43

Plot Scale - 1:200

Plotted From - TRR011951

LEGEND

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	016WB-452	12	43

Plotting Date: 12/08/2017

Anchor		Highway R.O.W. Marker		Sidewalk		State and National Line	
Antenna		Interstate Close Gate		Sign Face		County Line	
Approach		Iron Pin		Sign Post		Section Line	
Assumed Corner		Irrigation Ditch		Slough Or Marsh		Quarter Line	
Azimuth Marker		Lake Edge		Spring		Sixteenth Line	
BBQ Grill/ Fireplace		Lawn Sprinkler		Stream Gauge		Property Line	
Bearing Tree		Mailbox		Street Marker		Construction Line	
Bench Mark		Manhole Electric		Subsurface Utility Exploration Test Hole		R. O. W. Line	
Box Culvert		Manhole Gas		Telephone Fiber Optics		New R. O. W. Line	
Bridge		Manhole Misc		Telephone Junction Box		Cut and Fill Limits	
Brush		Manhole Sanitary Sewer		Telephone Pole		Control of Access	
Buildings		Manhole Storm Sewer		Television Cable Jct Box		New Control of Access	
Bulk Tank		Manhole Telephone		Television Tower		Proposed ROW	
Cattle Guard		Manhole Water		Test Wells/Bore Holes		(After Property Disposal)	
Cemetery		Merry-Go-Round		Traffic Signal			
Centerline		Microwave Radio Tower		Trash Barrel			
Cistern		Misc. Line		Tree Belt		Drainage Arrow	
Clothes Line		Misc. Property Corner		Tree Coniferous			
Commercial Sign Double Face		Misc. Post		Tree Deciduous			
Commercial Sign One Post		Overhang Or Encroachment		Tree Stumps		Remove Concrete Pavement	
Commercial Sign Overhead		Overhead Utility Line		Triangulation Station		Remove Concrete Driveway Pavement	
Commercial Sign Two Post		Parking Meter		Underground Electric Line		Remove Asphalt Concrete Pavement	
Concrete Symbol		Pipe With End Section		Underground Gas Line		Remove Concrete Sidewalk	
Creek Edge		Pipe With Headwall		Underground High Pressure Gas Line		Remove Concrete Median Pavement	
Curb/Gutter		Pipe Without End Section		Underground Sanitary Sewer		Remove Concrete Curb and/or Gutter	
Curb		Playground Slide		Underground Storm Sewer			
Dam Grade/Dike/Levee		Playground Swing		Underground Tank			
Deck Edge		Power And Light Pole		Underground Telephone Line			
Ditch Block		Power And Telephone Pole		Underground Television Cable			
Doorway Threshold		Power Meter		Underground Water Line			
Drainage Profile		Power Pole		Warning Sign One Post			
Drop Inlet		Power Pole And Transformer		Warning Sign Two Post			
Edge Of Asphalt		Power Tower Structure		Water Fountain			
Edge Of Concrete		Propane Tank		Water Hydrant			
Edge Of Gravel		Property Pipe		Water Meter			
Edge Of Other		Property Pipe With Cap		Water Tower			
Edge Of Shoulder		Property Stone		Water Valve			
Elec. Trans./Power Jct. Box		Public Telephone		Water Well			
Fence Barbwire		Railroad Crossing Signal		Weir Rock		Detectable Warning	
Fence Chainlink		Railroad Milepost Marker		Windmill		Pedestrian Push Button Pole	
Fence Electric		Railroad Profile		Wingwall		and 30" x 48" Clear Space	
Fence Misc.		Railroad R.O.W. Marker		Witness Corner		with 1.5% slope	
Fence Rock		Railroad Signs					
Fence Snow		Railroad Switch					
Fence Wood		Railroad Track					
Fence Woven		Railroad Trestle					
Fire Hydrant		Rebar					
Flag Pole		Rebar With Cap					
Flower Bed		Reference Mark					
Gas Valve Or Meter		Regulatory Sign One Post					
Gas Pump Island		Regulatory Sign Two Post					
Grain Bin		Retaining Wall					
Guardrail		Riprap					
Guide Sign One Post		River Edge					
Guide Sign Two Post		Rock And Wire Baskets					
Gutter		Rockpiles					
Guy Pole		Satellite Dish					
Haystack		Septic Tank					
Hedge		Shrub Tree					

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	016WB-452	13	43

Plotting Date: 01/11/2018

Sec. 27 - T1N - R7E

7+53 L  
Remove and Reset  
Crash Cushion at  
New Signal Pole Location

7+55 L  
Remove Concrete Median, Curb and Gutter,  
Slotted Pipe and Asphalt Surfacing

7+55 L  
(New WB Driving Lane)  
Install Asphalt Surfacing  
and Mountable Type  
Median PCC Pavement

7+75 R  
Install Mountable Type  
Median PCC Pavement for  
new junction box

8+42 L (51.6 SQYDS)  
Install PCC Fillet Section 30' Radius  
with Type F Curb and Gutter

8+65 L, Begin 5' Wide 4" Sidewalk, 736', 3535 sqft.  
3+11 to 10+00 L (PCN 6875 Stationing on Pavement Marking Sheets)

BEGIN SHOULDER  
WIDENING  
(City Project)

PI -0+35.24  
N 627841.90  
E 1200661.09  
Del 14°54'35" L  
Dc 3°49'11"  
T 196.28'  
L 390.33'  
R 1500.00'

END SHOULDER  
WIDENING  
(City Project)

PI 6+73.65  
N 627741.53  
E 1201365.07  
Del 1°13'31" R  
Dc 0°43'41"  
T 84.16'  
L 168.30'  
R 7870.00'

PCC Fillet Paving with  
No Curb and Gutter

8' Curb Taper to Transition Sidewalk  
to PCC Fillet Paving with no curb and  
gutter. This will provide flatter slopes  
near the signal pole.

Sec. 26 - T1N - R7E

Plot Scale - 1:100

Plotted From - TRR011951

File - ...v010.dgn

PLOT SCALE - 1:8

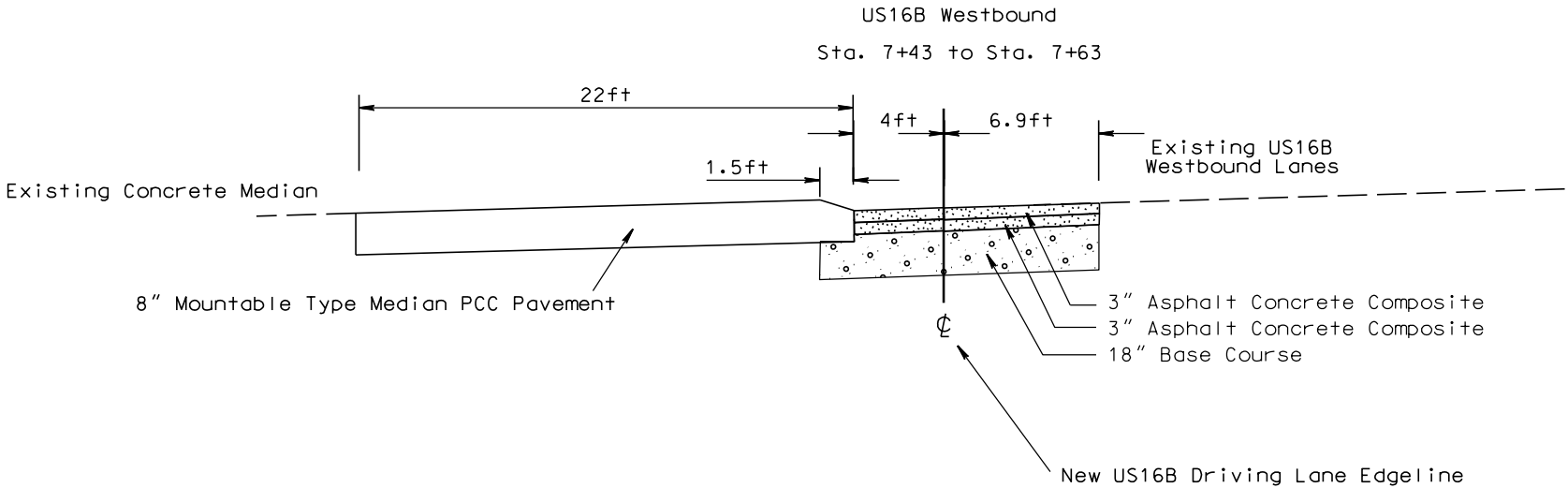
PLOTTED FROM - TRRC11951

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	016WB-452	14	43

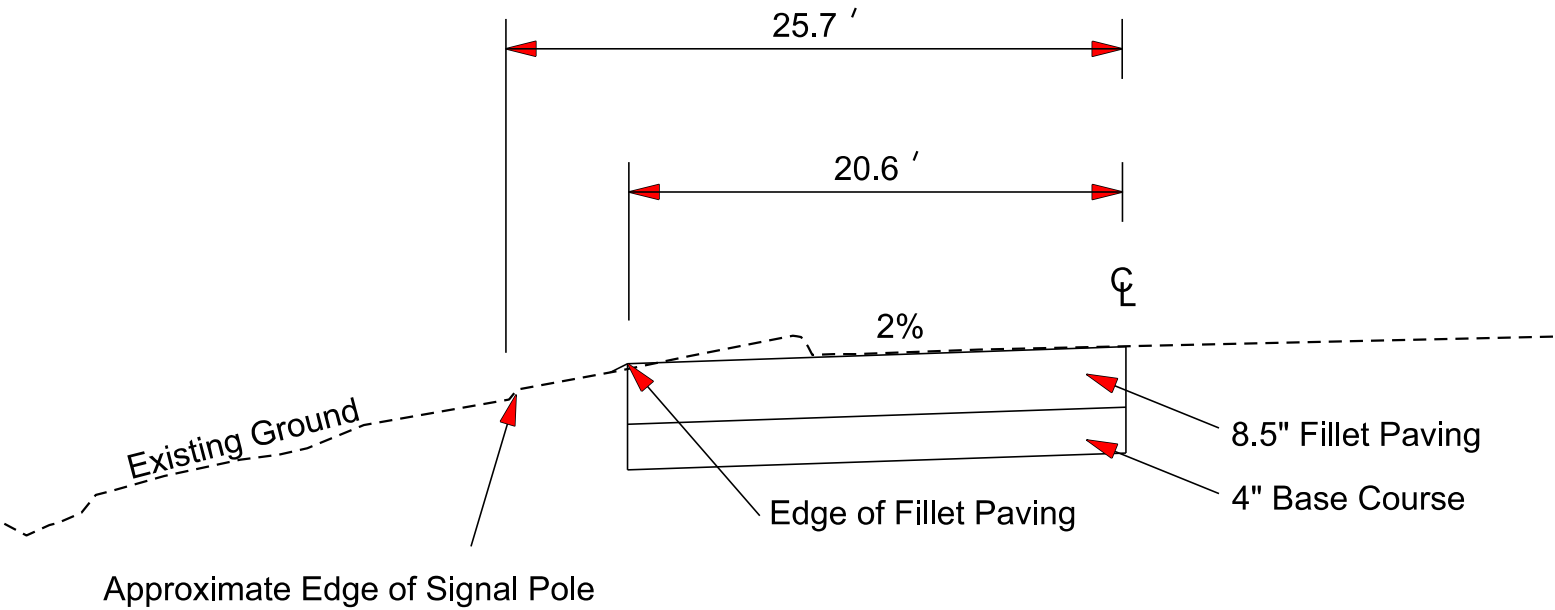
Plotting Date: 01/09/2018

# TYPICAL GRADING AND SURFACING SECTIONS

## MEDIAN MODIFICATION



### Fillet Paving In Front of Signal Pole 8+56 L



PLOT NAME - 7

FILE - ... \TYPICAL SECTION\MEDIANMODIFICATION.DGN

CONDUIT AND CABLE QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	016WB-452	15	43

Plotting Date: 01/11/2018

Location to Location		Rigid Conduit					Copper Wire		Copper Tray Cable, K2							Twisted Shielded Pair		Pole and Bracket Cable		Preemption Cable																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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Plotted From - TRR011951

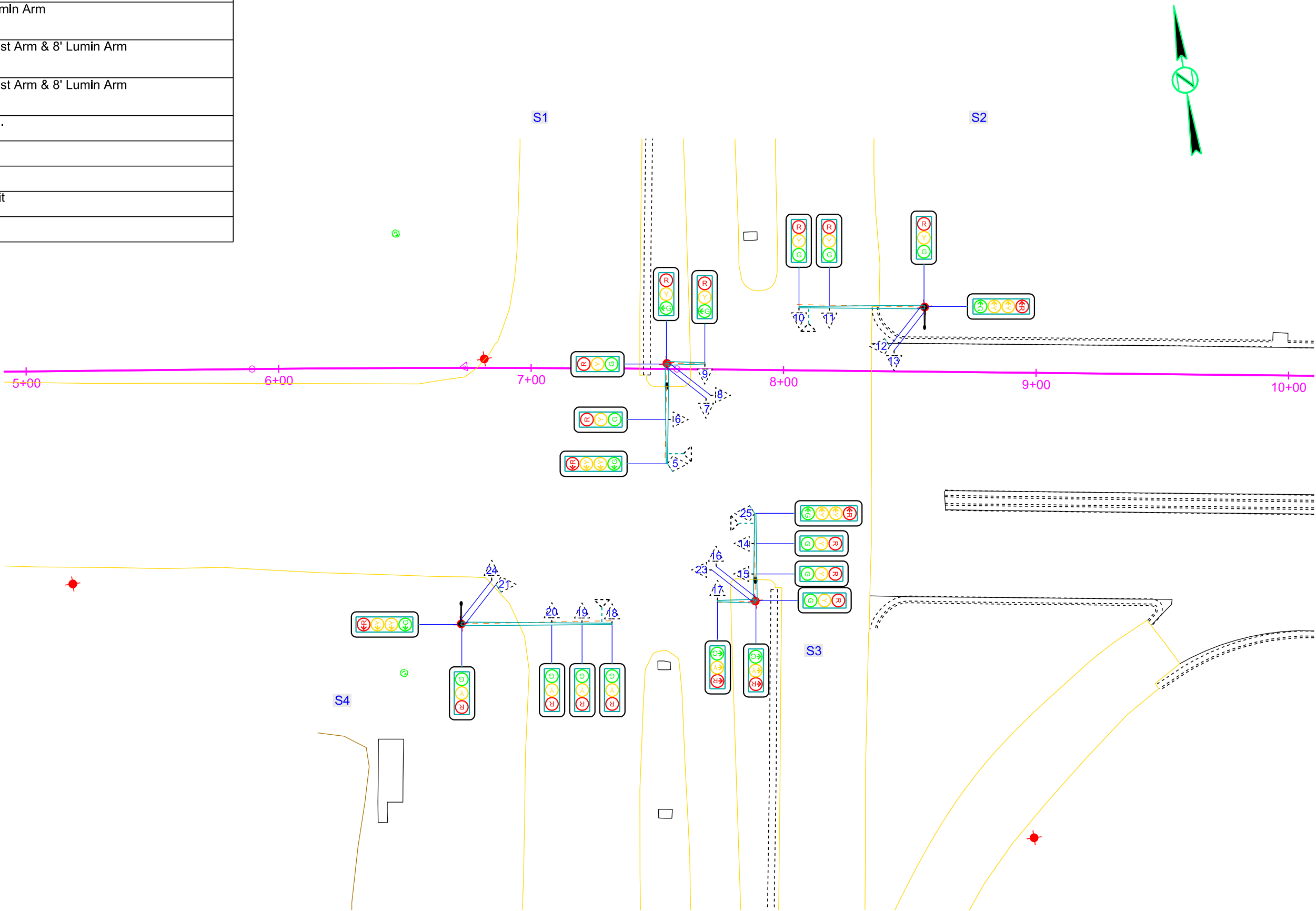
EXISTING ITEMS	
KEY	ITEM
	Signal Pole w/50' Mast Arm & 8' Lumin Arm (S2)
	Signal Pole w/60' Mast Arm & 8' Lumin Arm (S4)
	Signal Pole w/40' Mast Arm, 15' Mast Arm & 8' Lumin Arm (S1)
	Signal Pole w/35' Mast Arm, 15' Mast Arm & 8' Lumin Arm (S3)
	Roadway Luminaire, 400w with P.E. (S1,S2,S3,S4)
	3 Section Vehicle Signal Head (6-11,13-20,24)
	4 Section Vehicle Signal Head (5,12,21,25)
	Emergency Vehicle Preemption Unit (4-Channel)
	Optical Detector

# EXISTING SIGNAL LAYOUT

## US16 & US16B

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	016WB-452	16	43

Plotting Date: 01/11/2018



## Plot Scale - 1:40

Plotted From - TRRC11951

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LIST OF QUANTITIES		
ITEM	EST QUANT	UNIT
Arm, Lumin	1	EACH
D with P.E.	2	EACH
T Head	10	EACH
T Head	2	EACH

Plot Scale - 1:40

Plotted From - TRR011951





# CONDUIT LAYOUT

























## US16 & US16B

### (QUANTITY TABLES)

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	016WB-452	18	43

Plotting Date: 01/11/2018

EXISTING ITEMS	
KEY	ITEM
	Electrical Junction Box (EJB1-EJB8)
	Traffic Signal Controller
	Preformed Detector Loop
	2" Rigid Conduit, Schedule 40
	Fiber Optic Cable

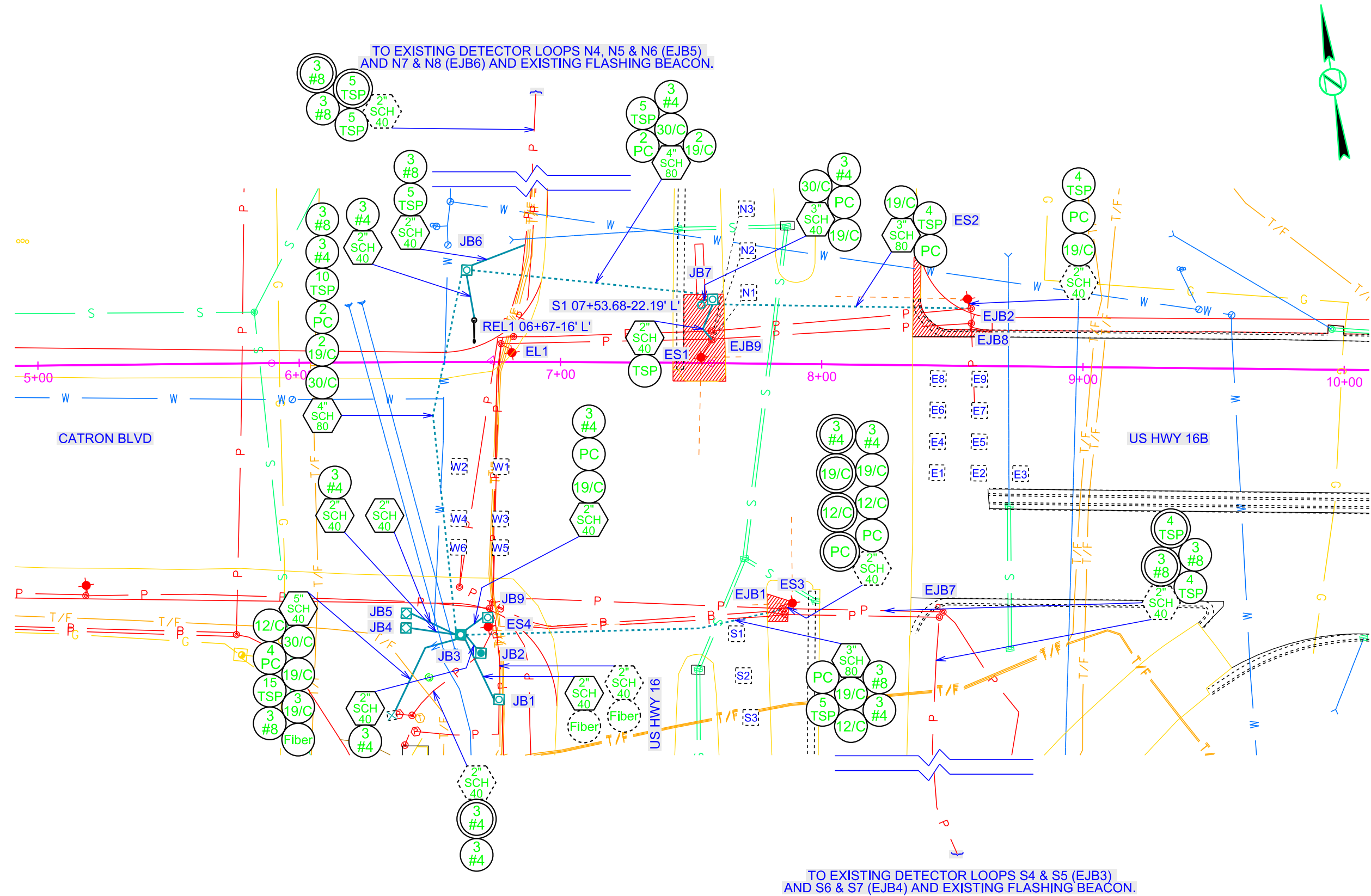
ESTIMATE OF QUANTITIES			
KEY	ITEM	EST QUANT	UNIT
	Remove Signal Equipment	LUMP SUM	LS
	Remove Signal Pole (ES1)	1	EACH
	Reset Luminaire Pole (EL1)	1	EACH
	Remove Luminaire Pole Footing (EL1)	1	EACH
	Remove Signal Pole Footing (ES1)	1	EACH
	Preformed Detector Loop (N1-N3)	3	EACH
	2' Diameter Footing (REL1)	8	FT
	3' Diameter Footing (S1)	20	FT
	Type 1 Electrical Junction Box (JB4,JB5,JB8)	3	EACH
	Type 2 Electrical Junction Box (JB2)	1	EACH
	Type 3 Electrical Junction Box (EJB1,JB1,JB6,JB7,JB9)	5	EACH
	Type 4 Electrical Junction Box (JB3)	1	EACH
	2" Rigid Conduit, Schedule 40	220	FT
	3" Rigid Conduit, Schedule 40	20	FT
	5" Rigid Conduit, Schedule 40	60	FT
	3" Rigid Conduit, Schedule 80	250	FT
	4" Rigid Conduit, Schedule 80	250	FT
	1/C #4 AWG Copper Wire	1,685	FT
	1/C #8 AWG Copper Wire	10,245	FT
	4/C #14 AWG Copper Tray Cable, K2	280	FT
	7/C #14 AWG Copper Tray Cable, K2	60	FT
	12/C #14 AWG Copper Tray Cable, K2	235	FT
	19/C #14 AWG Copper Tray Cable, K2	1,160	FT
	30/C #14 AWG Copper Tray Cable, K2	350	FT
	#16 AWG Copper Twisted Shielded Pair	8,275	FT
	2/C #10 AWG Copper Pole & Bracket Cable	130	FT
	Preemption Cable	1,155	FT
	Remove Traffic Signal Cable	LUMP SUM	LS

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## Plot Scale - 1:40

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Plot Scale -  
Plotted From - TRRC11951

# TRAFFIC SIGNAL WIRING TABLES

US 16 & US 16B

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	016WB-452	20	43

Plotting Date: 01/11/2018

POLE: S1 CABLE SIZE: 30/C

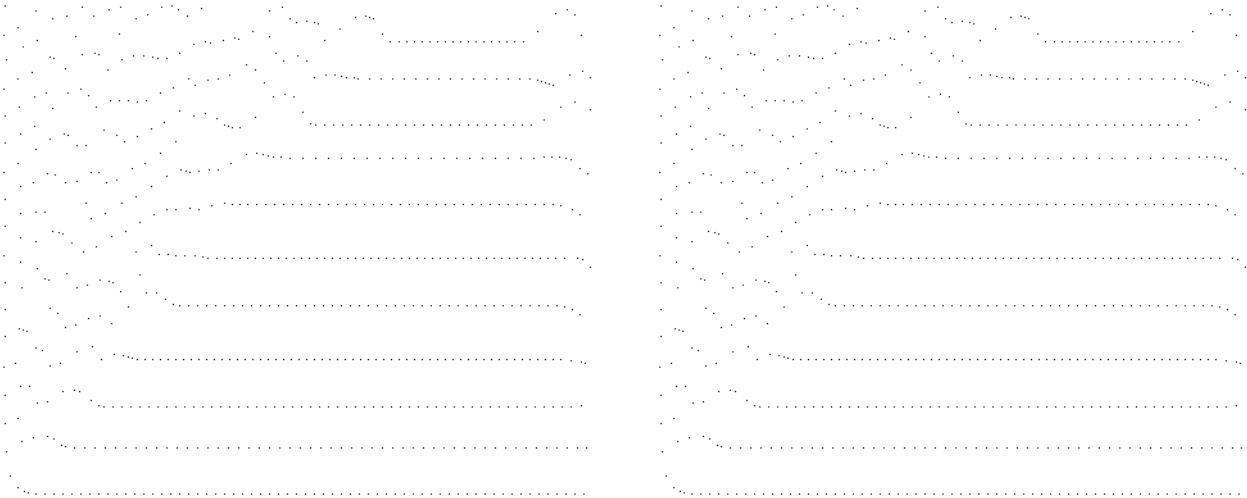
CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
3R	Red/Blue	R	RA	2	3
3Y	Orange/Blue	O	YA	2	3
3G	Yellow/Blue	BL	GA	2	3
N	Brown/Black	BK	N	2	3
3R	Yellow/Red	R	RA	4	3
3Y	Orange/Red	O	YA	4	3
3G	Brown/Blue	BL	GA	4	3
N	Black/Yellow	BK	N	4	3
8R	Red	R	R	5	8
8Y	Orange	O	Y	5	8
8G	Blue	BL	G	5	8
N	Black	BK	N	5	8
8R	Red/Black	R	R	6	8
8Y	Orange/Black	O	Y	6	8
8G	Blue/Black	BL	G	6	8
N	Yellow/Black	BK	N	6	8
3R	Red/Orange	R	R	22	3
3Y	Orange/Yellow	O	Y	22	3
3G	Blue/Yellow	BL	G	22	3
16Y	Yellow/Orange	Y	YA	22	OLD
16G	Brown	BR	GA	22	OLD
N	Black/Blue	BK	N	22	3
3R	Red/Yellow	R	R	8	3
3Y	Brown/Orange	O	Y	8	3
3G	Blue/Orange	BL	G	8	3
16Y	Yellow	Y	YA	8	OLD
16G	Brown/Red	BR	GA	8	OLD
N	Black/Orange	BK	N	8	3
	Black/Red				
	Blue/Red				

POLE: S1 CABLE SIZE: 19/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
3R	Red	R	RA	1	3
3G	Blue	BL	GA	1	3
3Y	Orange	O	YA	1	3
N	Black	BK	N	1	3
3R	Red/Black	R	RA	3	3
3Y	Orange/Black	O	YA	3	3
3G	Blue/Black	BL	GA	3	3
N	Brown/Black	BK	N	3	3
1R	Brown/Red	R	RA	7	1
1Y	Orange/Red	O	YA	7	1
1G	Blue/Red	BL	GA	7	1
N	Yellow/Black	BK	N	7	1
1R	Red/Blue	R	RA	9	1
1Y	Orange/Blue	O	YA	9	1
1G	Black/Blue	BL	GA	9	1
N	Black/Red	BK	N	9	1
	Yellow				
	Brown				
	Yellow/Red				
	Yellow/Blue				

POLE: ES2 CABLE SIZE: 19/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	ø
6R	Red	R	R	10	6
6Y	Orange	O	Y	10	6
6G	Blue	BL	G	10	6
N	Black	BK	N	10	6
6R	Red/Black	R	R	11	6
6Y	Orange/Black	O	Y	11	6
6G	Blue/Black	BL	G	11	6
N	Yellow/Black	BK	N	11	6
6R	Red/Blue	R	R	13	6
6Y	Orange/Blue	O	Y	13	6
6G	Blue/Red	BL	G	13	6
N	Black/Red	BK	N	13	6
7R	Yellow/Red	R	RA	12	7
7Y	Orange/Red	O	YA	12	7
7G	Black/Blue	BL	GA	12	7
N	Brown/Black	BK	N	12	7
	Yellow				
	Brown				
	Brown/Red				



Plot Scale - 1:200

Plotted From - TRRC-1951

# TRAFFIC SIGNAL WIRING TABLES

US 16 & US 16B

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	016WB-452	21	43

Plotting Date: 01/11/2018

POLE: ES3 CABLE SIZE: 19/C

POLE: ES4 CABLE SIZE: 19/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	Ø
4R	Red	R	R	14	4
4Y	Orange	O	Y	14	4
4G	Blue	BL	G	14	4
N	Black	BK	N	14	4
4R	Red/Black	R	R	15	4
4Y	Orange/Black	O	Y	15	4
4G	Blue/Black	BL	G	15	4
N	Yellow/Black	BK	N	15	4
4R	Red/Blue	R	R	23	4
4Y	Orange/Blue	O	Y	23	4
4G	Blue/Red	BL	G	23	4
N	Black/Blue	BK	N	23	4
	Yellow				
	Brown				
	Brown/Black				
	Black/Red				
	Orange/Red				
	Yellow/Red				
	Brown/Red				

POLE: ES3 CABLE SIZE: 12/C

CABINET TERM.	CABLE CONDUCTOR COLOR	POLE COND. COLOR	HEAD TERM.	HEAD NO.	Ø
5R	Red	R	R	16	5
5Y	Orange	O	Y	16	5
5G	Blue	BL	G	16	5
N	Black	BK	N	16	5
5R	Red/Black	R	R	17	5
5Y	Orange/Black	O	Y	17	5
5G	Blue/Black	BL	G	17	5
N	Black/Red	BK	N	17	5
	Yellow				
	Brown				
	Yellow/Black				
	Brown/Black				

Plot Scale - 1:40

Plotted From - TRR011951

SIGNAL TIMING REVISIONS

US16 & US16B

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	016WB-452	22	43

Plotting Date: 12/11/2017

REVISIONS TO BASIC INTERVALS								
Phase	1	2	3	4	5	6	7	8
Movement			WBLT				EBLT	
Lag			X					
Min Green								
Extension								
Max 1								
Max 2								
Time Before								
Time to Reduce								
Minimum Gap								
Yellow	5.5		4.5	5.5	5.5		4.5	5.5
All Red	2.5		3.5		2.5		3.5	
Walk								
Ped Clearance								
Recall								
Prog Flash Display								
Start Up Ø								

REVISED RING AND BARRIER DESIGN			
Φ1	Φ2	Φ3	Φ4
Φ5	Φ6	Φ7	Φ8

OVERLAP DEFINITIONS
OLD = 2

CATRON BLVD.

US16

US16B

OLD

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## Plot Scale - 1:40

Plotted From - TRRC11951

Plotting Date: 01/09/2018

SCALE  
1" = 40'



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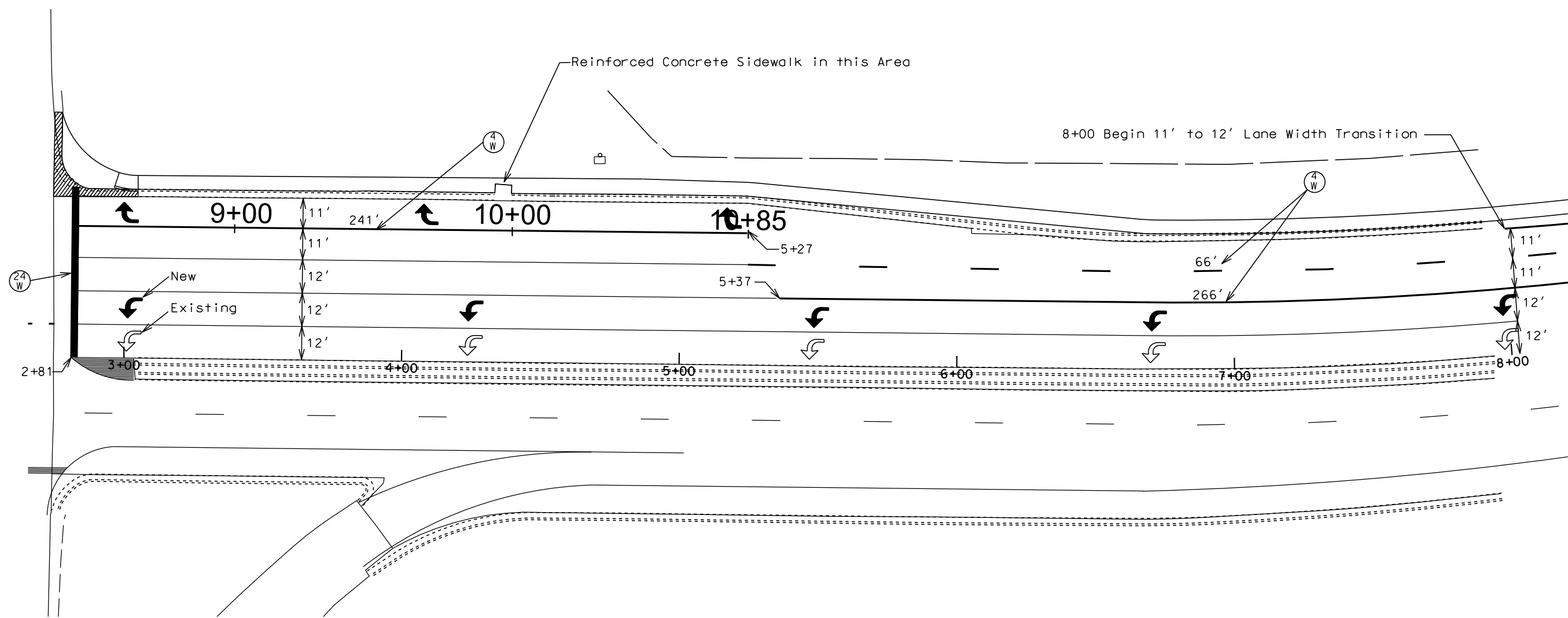
# PAVEMENT MARKING LAYOUT

US HWY 16B

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	016WB-452	24	43

Plotting Date: 01/09/2018

SCALE  
1" = 40'



Plot Scale - 1:40

Plotted From - TRRC-1951

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# PAVEMENT MARKING LAYOUT

US HWY 16B

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	016WB-452	25	43

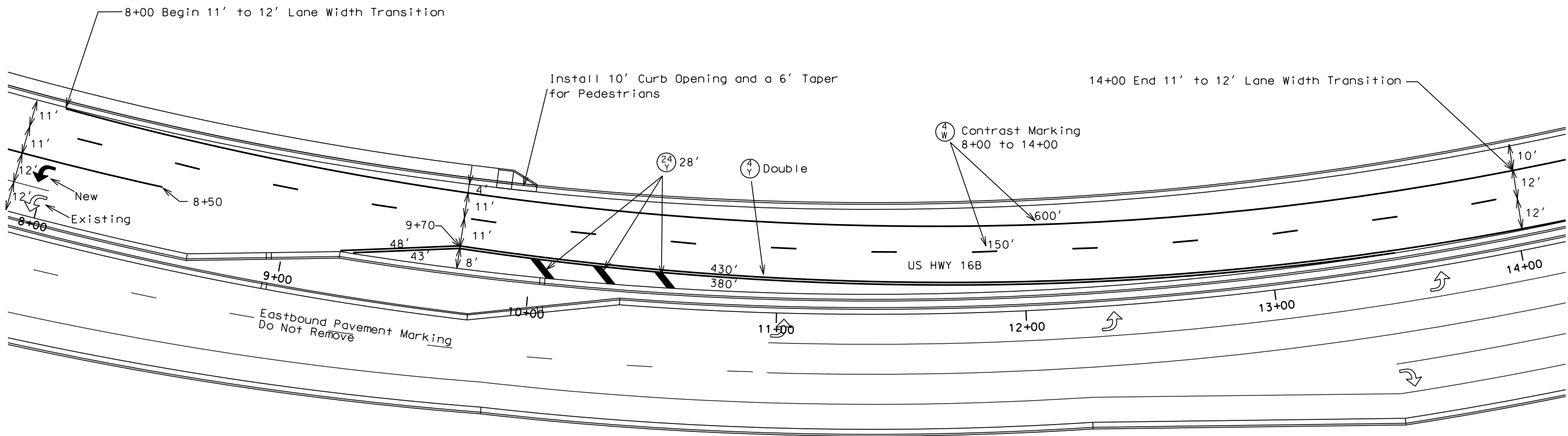
Plotting Date: 01/09/2018

SCALE  
1" = 40'



Plot Scale - 1:40

Plotted From - TRRC11951



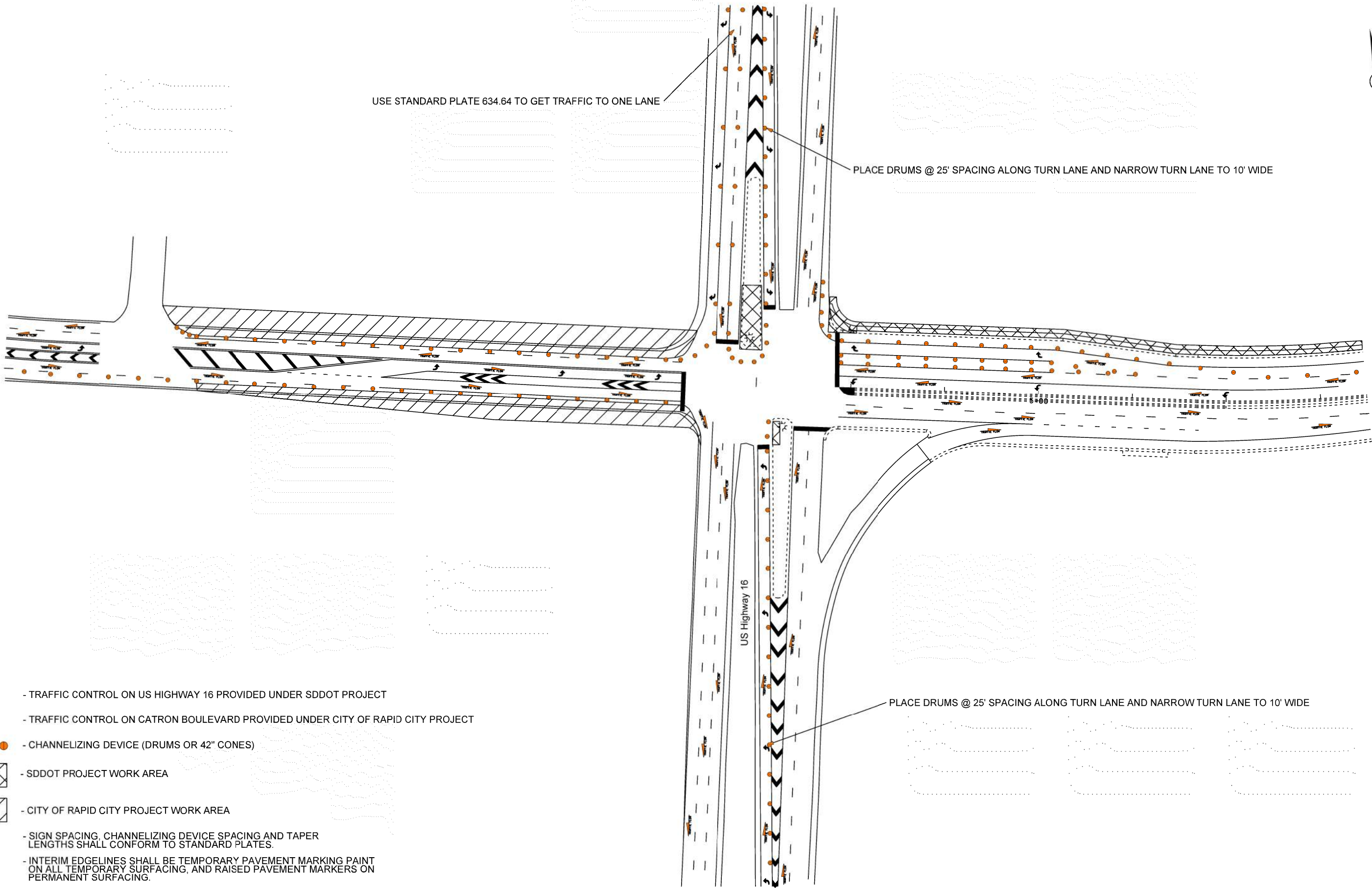
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# TRAFFIC CONTROL

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	016WB-452	27	43

Plotting Date: 01/09/2018



USE STANDARD PLATE 634.64 TO GET TRAFFIC TO ONE LANE

PLACE DRUMS @ 25' SPACING ALONG TURN LANE AND NARROW TURN LANE TO 10' WIDE

PLACE DRUMS @ 25' SPACING ALONG TURN LANE AND NARROW TURN LANE TO 10' WIDE

- TRAFFIC CONTROL ON US HIGHWAY 16 PROVIDED UNDER SDDOT PROJECT
- TRAFFIC CONTROL ON CATRON BOULEVARD PROVIDED UNDER CITY OF RAPID CITY PROJECT
- CHANNELIZING DEVICE (DRUMS OR 42" CONES)



- SDDOT PROJECT WORK AREA



- CITY OF RAPID CITY PROJECT WORK AREA

- SIGN SPACING, CHANNELIZING DEVICE SPACING AND TAPER LENGTHS SHALL CONFORM TO STANDARD PLATES.
- INTERIM EDGELINES SHALL BE TEMPORARY PAVEMENT MARKING PAINT ON ALL TEMPORARY SURFACING, AND RAISED PAVEMENT MARKERS ON PERMANENT SURFACING.

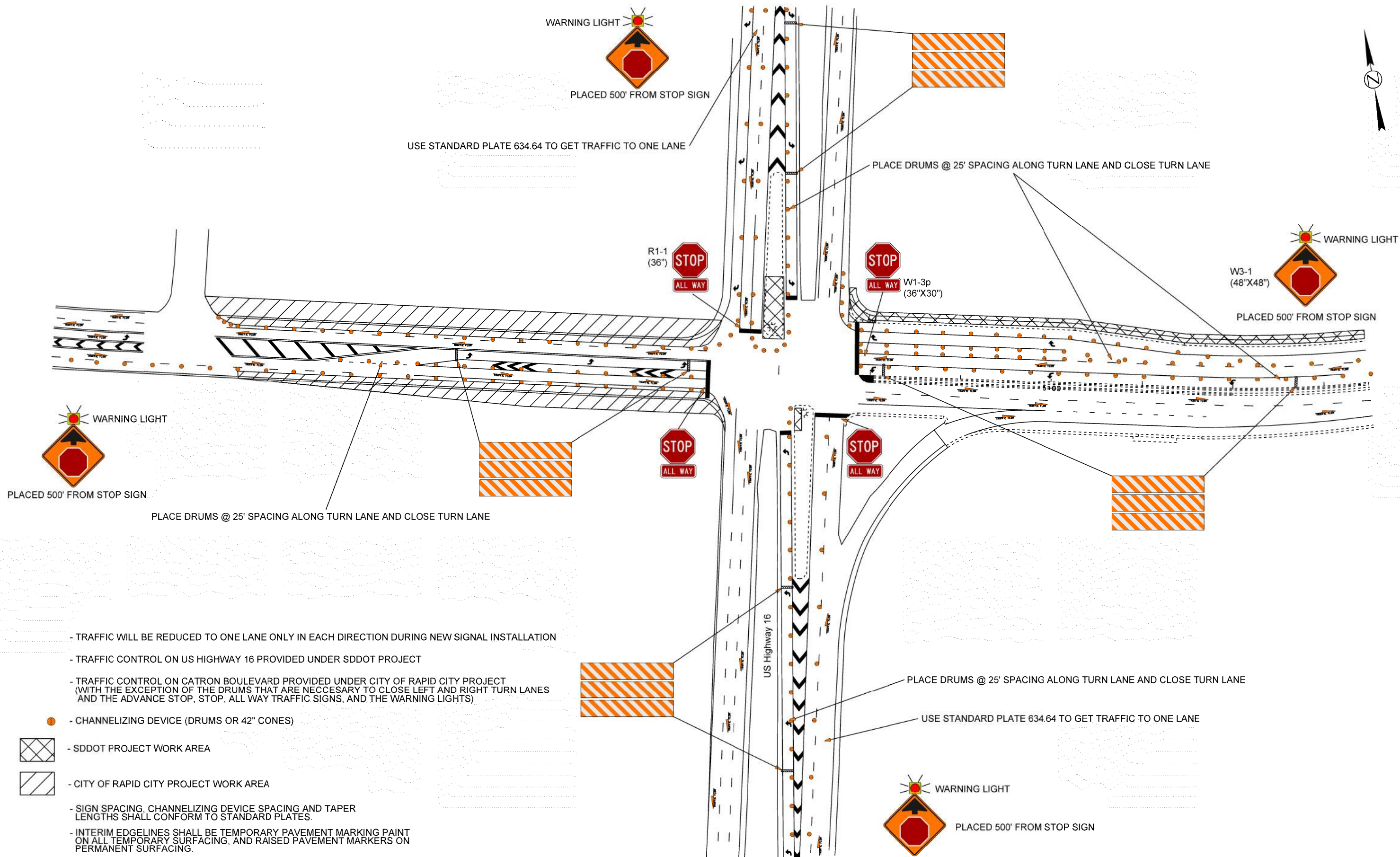


STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	016WB-452	28	43

Plotting Date: 01/09/2018

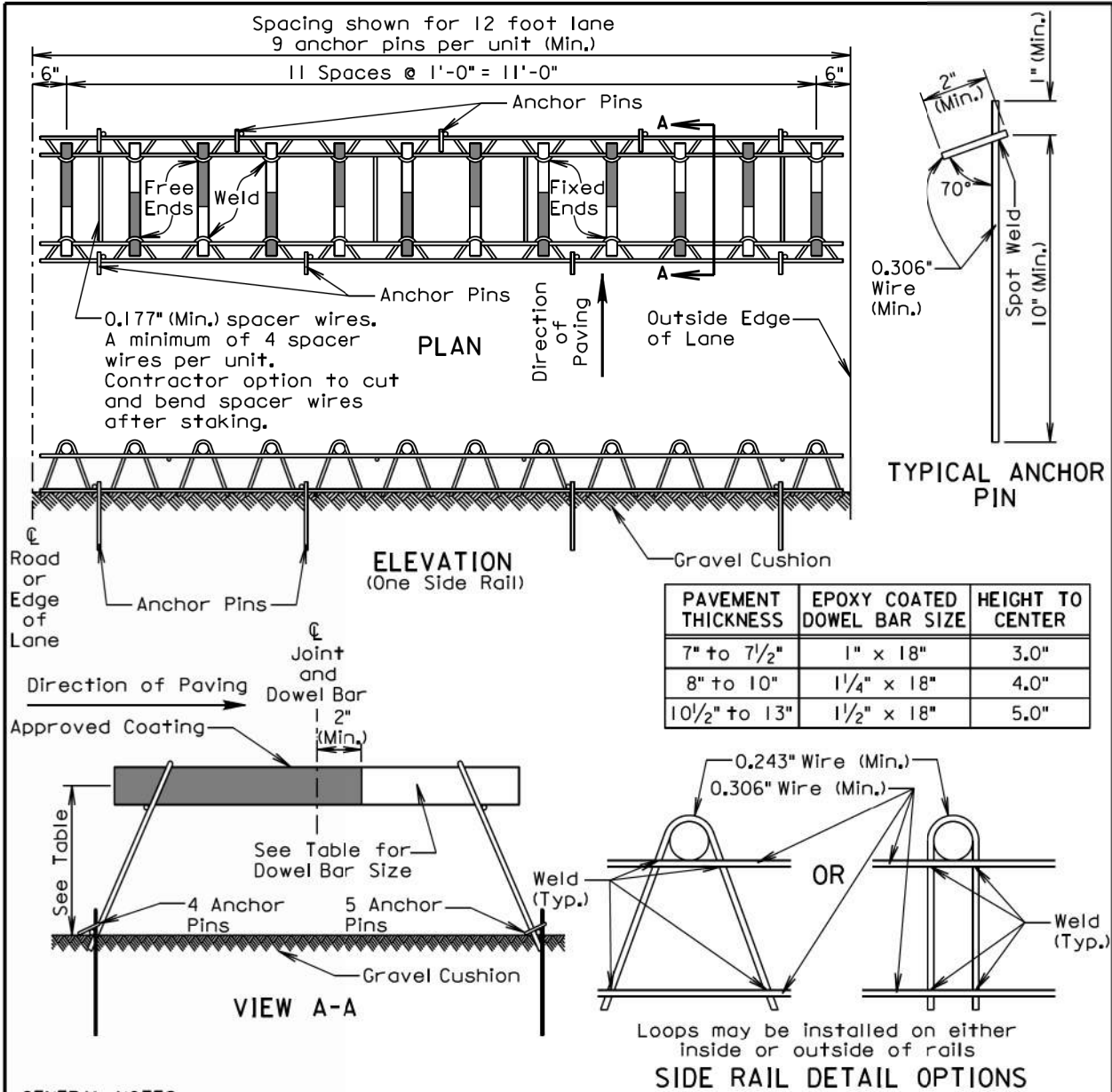
# TRAFFIC CONTROL

## NEW SIGNAL INSTALLATION



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	016WB-452	29	43

Plotting Date: 01/04/2018



**GENERAL NOTES:**

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

Centerline of individual dowel bars shall be parallel to top of subgrade  $\pm 1/8$  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  $\pm 1$  inch.

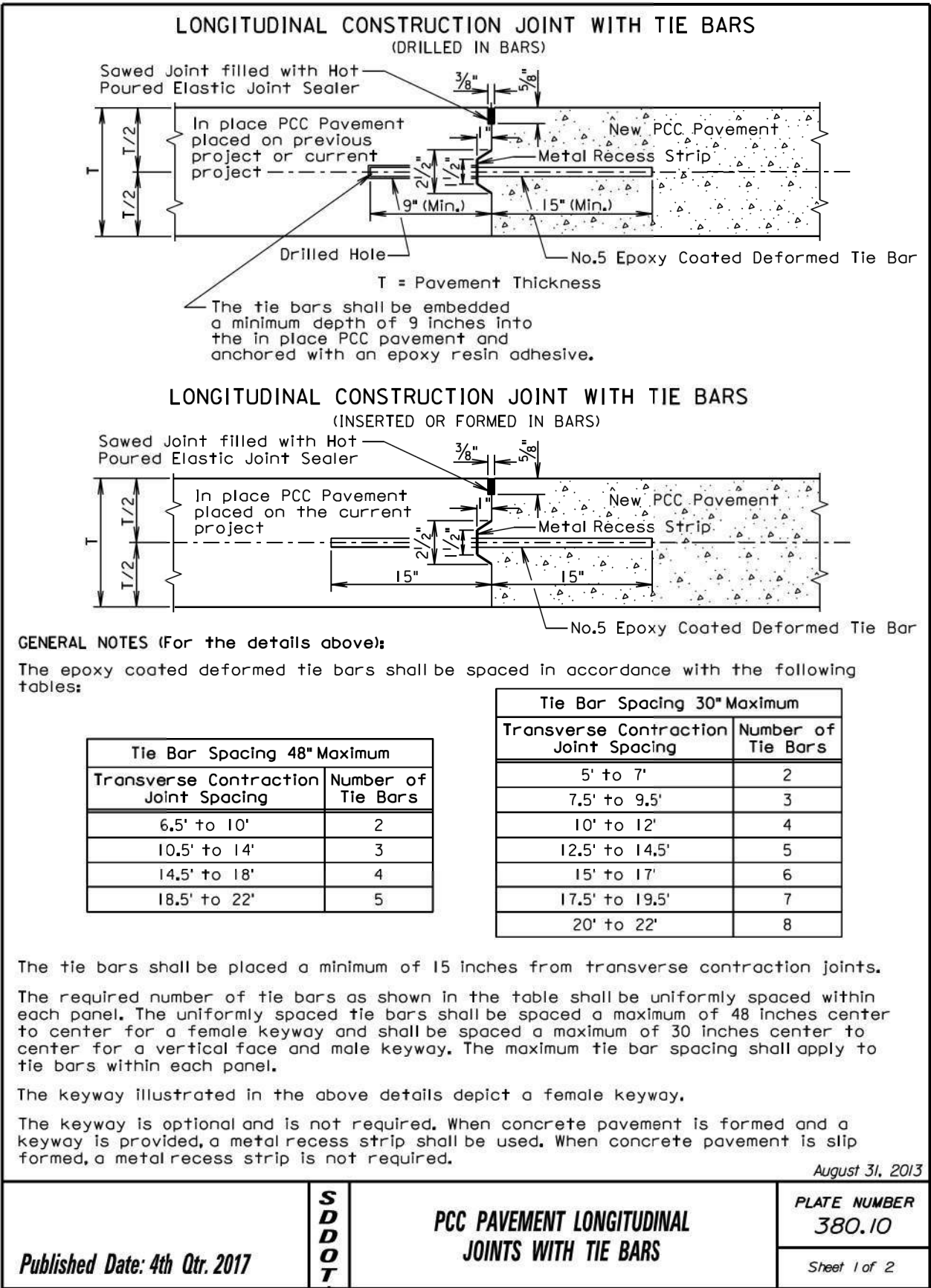
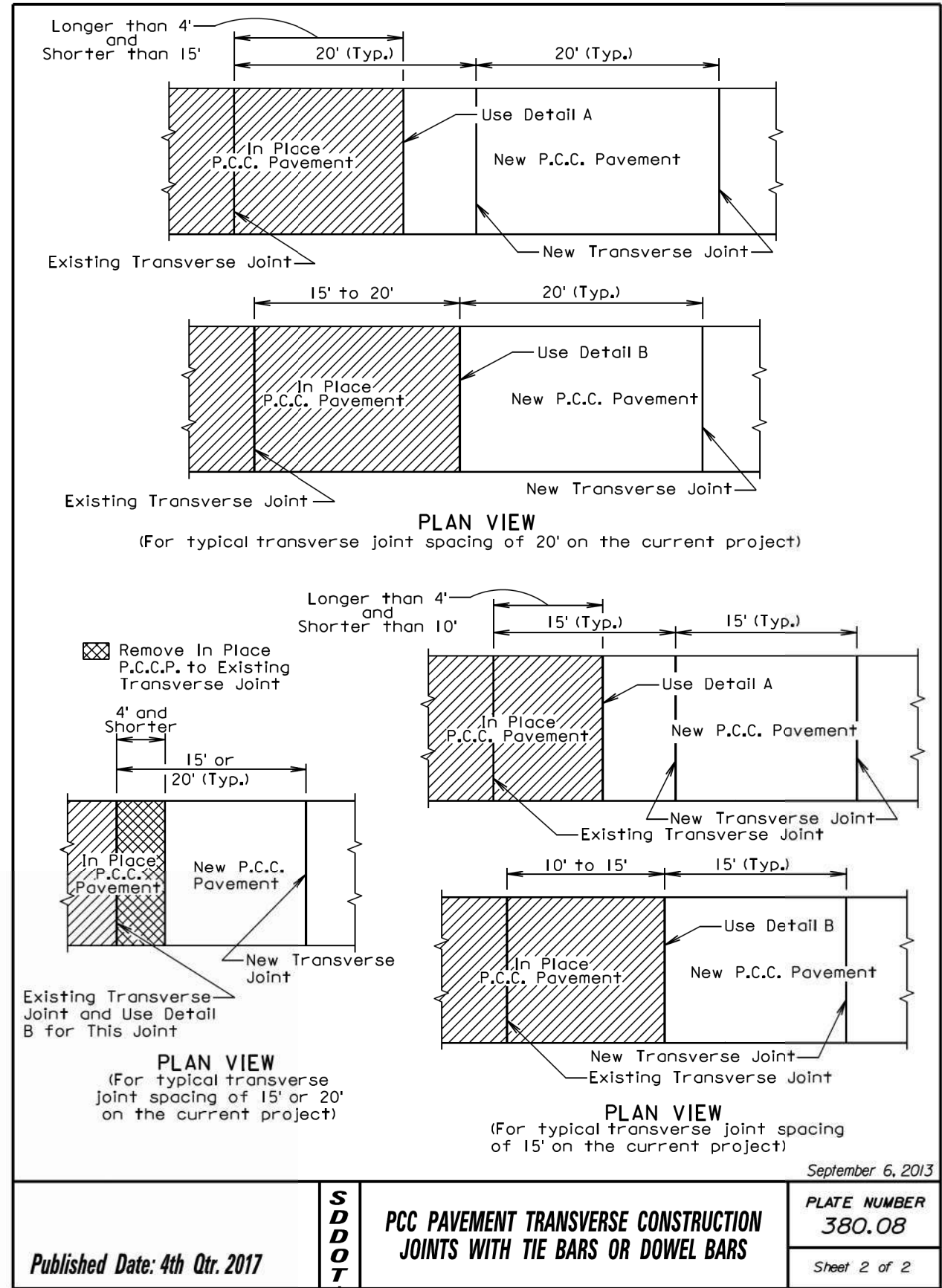
Supporting devices as shown on this sheet, or equivalent as approved by the Engineer, shall be used to maintain proper horizontal and vertical alignment of the dowel bars.

June 9, 2017

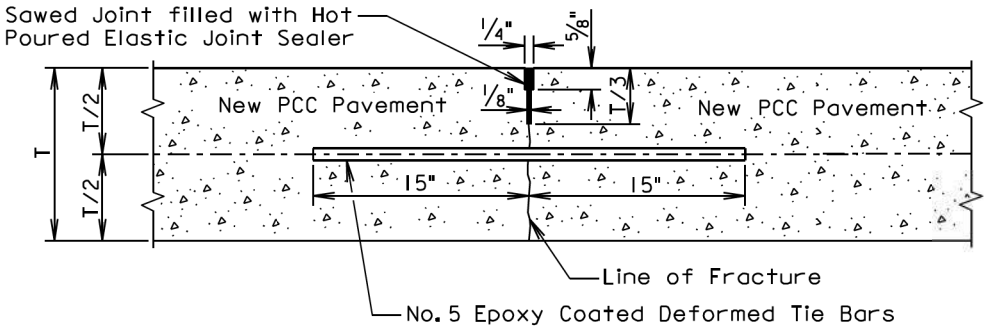
Published Date: 4th Qtr. 2017	S D D O T	PCC PAVEMENT DOWEL BAR ASSEMBLY FOR TRANSVERSE CONTRACTION JOINTS 12 Bar Assembly on Granular Base Material	PLATE NUMBER 380.01
			Sheet 1 of 1







SAWED LONGITUDINAL JOINT WITH TIE BARS  
(POURED MONOLITHICALLY)



T = Pavement Thickness

GENERAL NOTES (For the detail above):

The epoxy coated deformed tie bars shall be spaced in accordance with the following table:

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

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

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

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

August 31, 2013

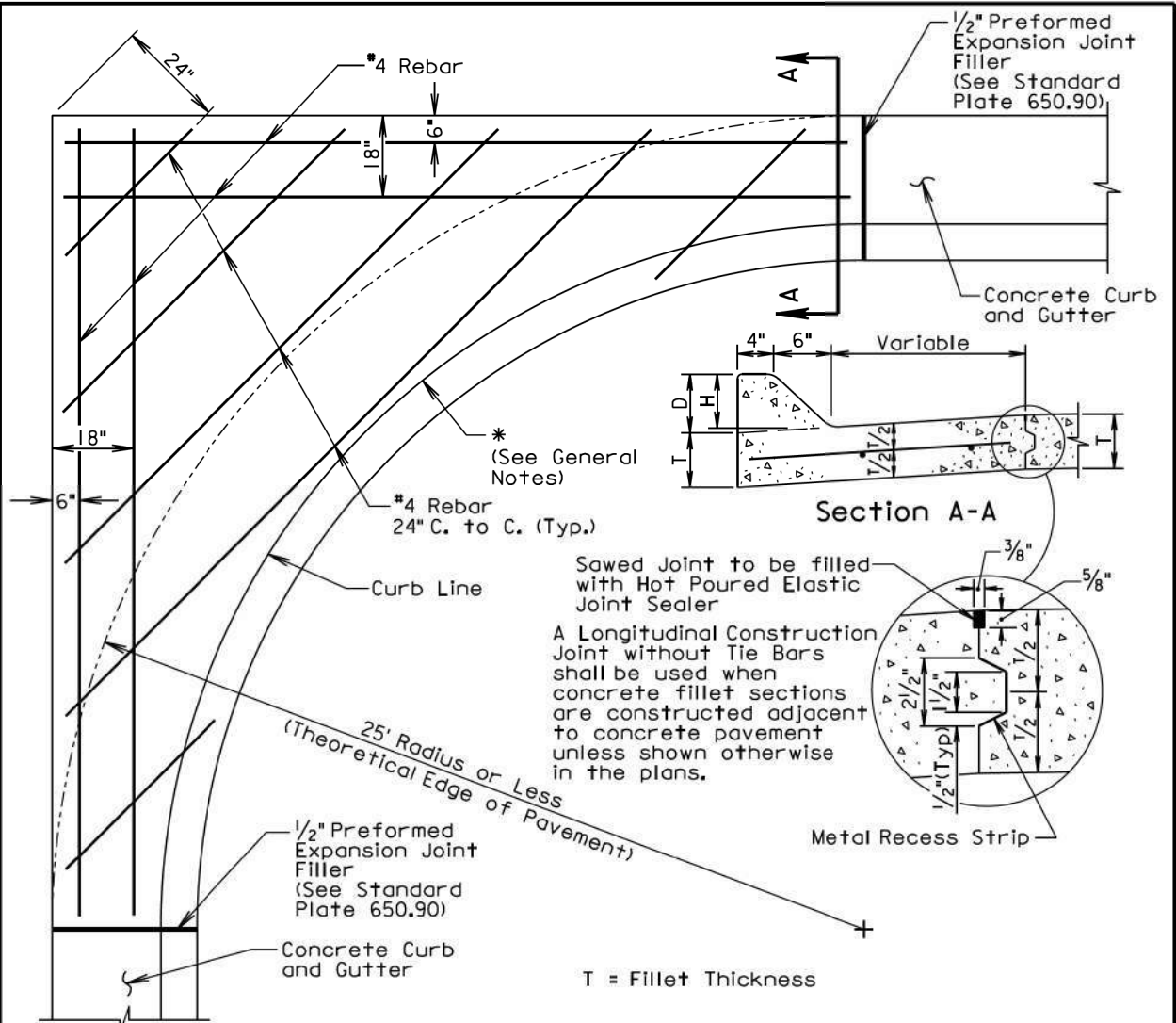
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PCC PAVEMENT LONGITUDINAL  
JOINTS WITH TIE BARS

PLATE NUMBER  
380.10

Sheet 2 of 2

Published Date: 4th Qtr. 2017



GENERAL NOTES:

\* If a curb ramp is constructed adjacent to a PCC fillet section, the curb will need to be modified. Refer to the corresponding curb ramp standard plate or other special details in the plans for modification of the PCC fillet section.

Dimensions D, H, and T shall conform to those shown on the appropriate curb and gutter standard plate.

All rebar shall be in conformance with Sections 480 and 1010 of the Specifications. All rebar shall have a minimum of 3" clear cover.

Class M6 Concrete shall be used in construction of the fillets.

The concrete curb shall be monolithic with the concrete fillet. No separate payment for this curb will be made as the curb is considered a part of the fillet.

Joints shall be constructed at 10' intervals except when fillets are constructed adjacent to PCC Pavement. If there is adjacent PCC Pavement the joints shall be extended from edge of pavement through the fillet section as directed by the Engineer.

The cost for all materials, labor, and incidentals necessary to construct the PCC fillet section with curb and gutter shall be incidental to the contract unit price per square yard for the corresponding PCC fillet section bid item.

June 26, 2015

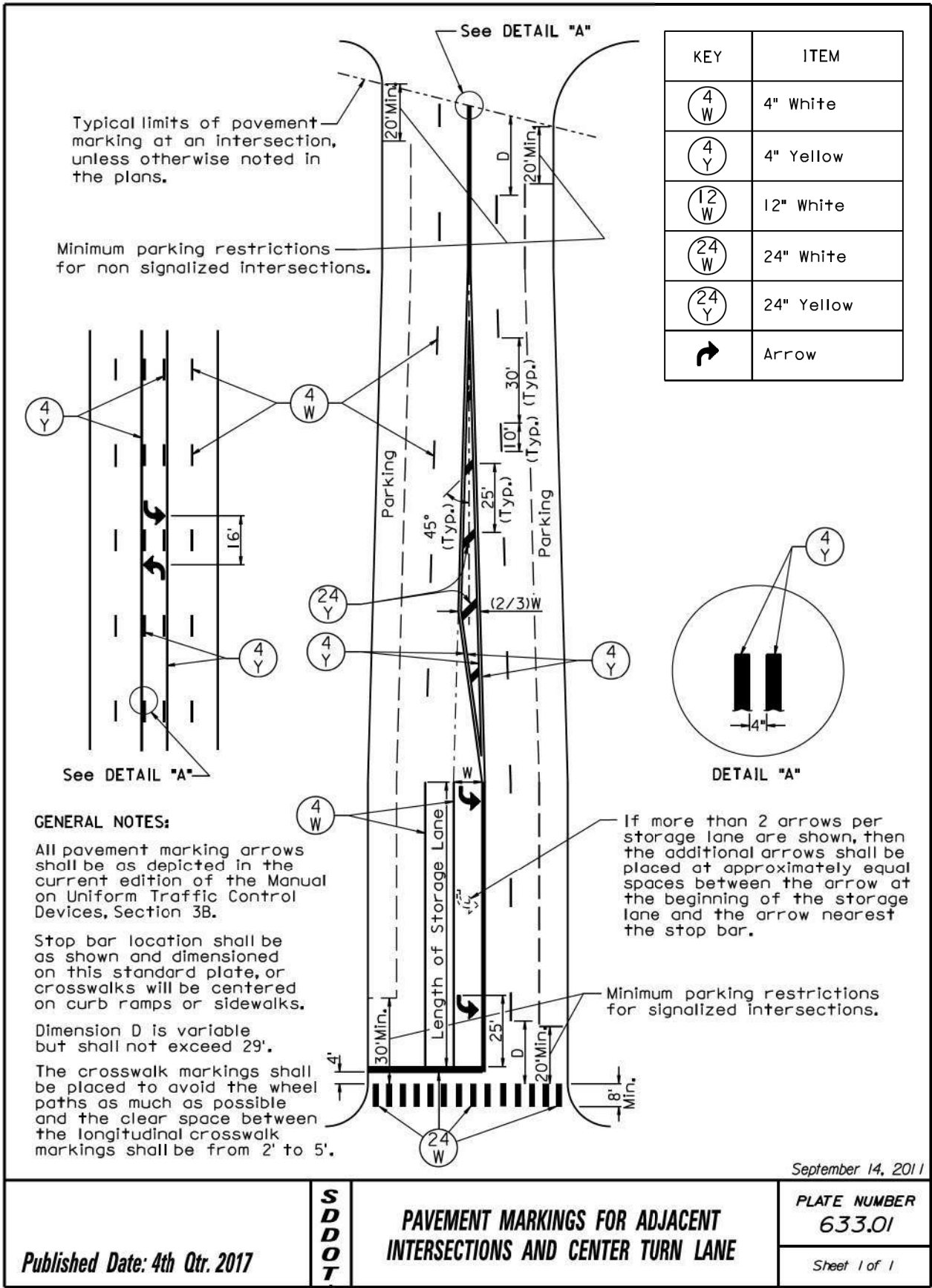
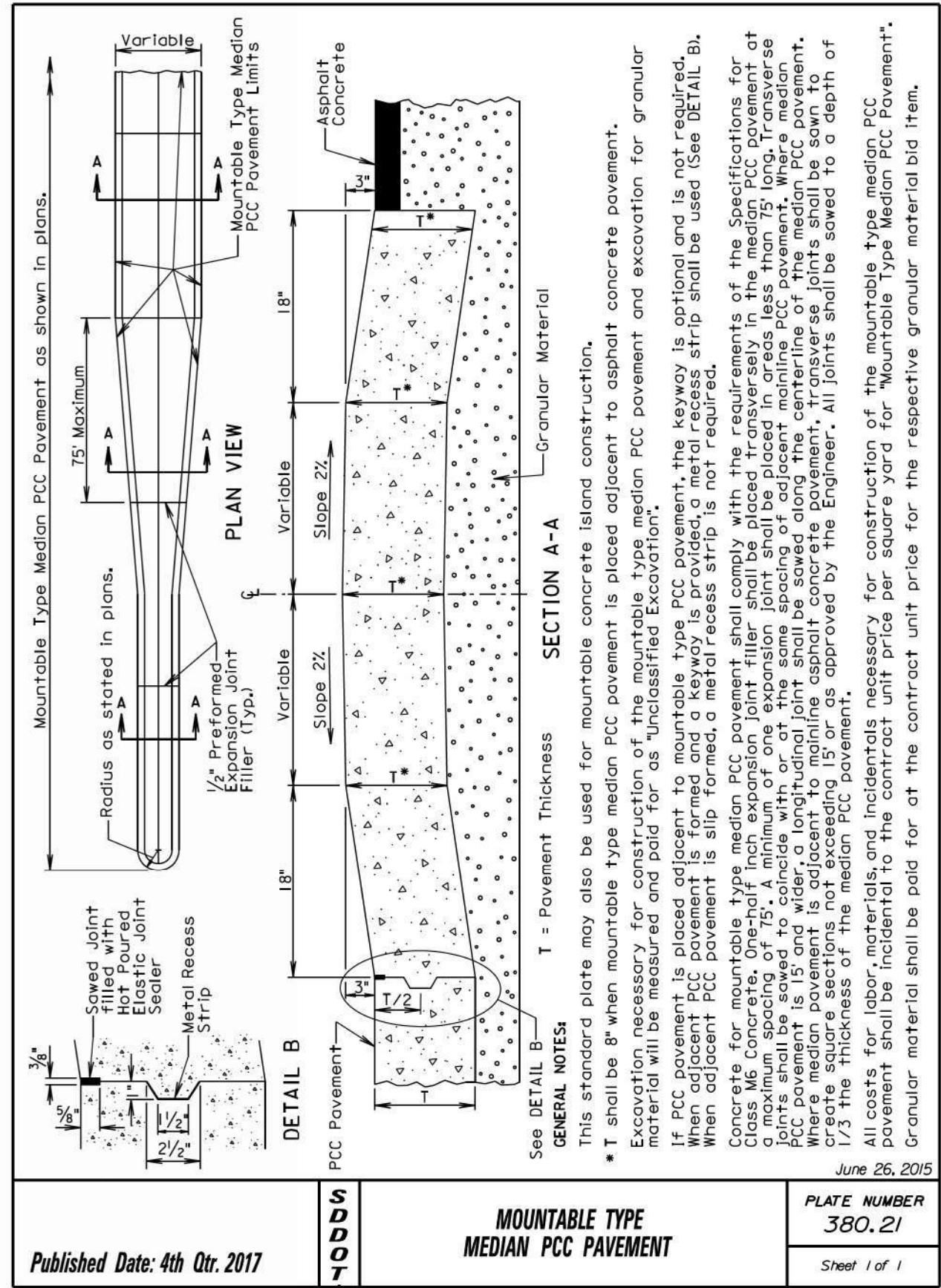
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PCC FILLET SECTION WITH  
TYPE F CURB AND GUTTER

PLATE NUMBER  
380.17

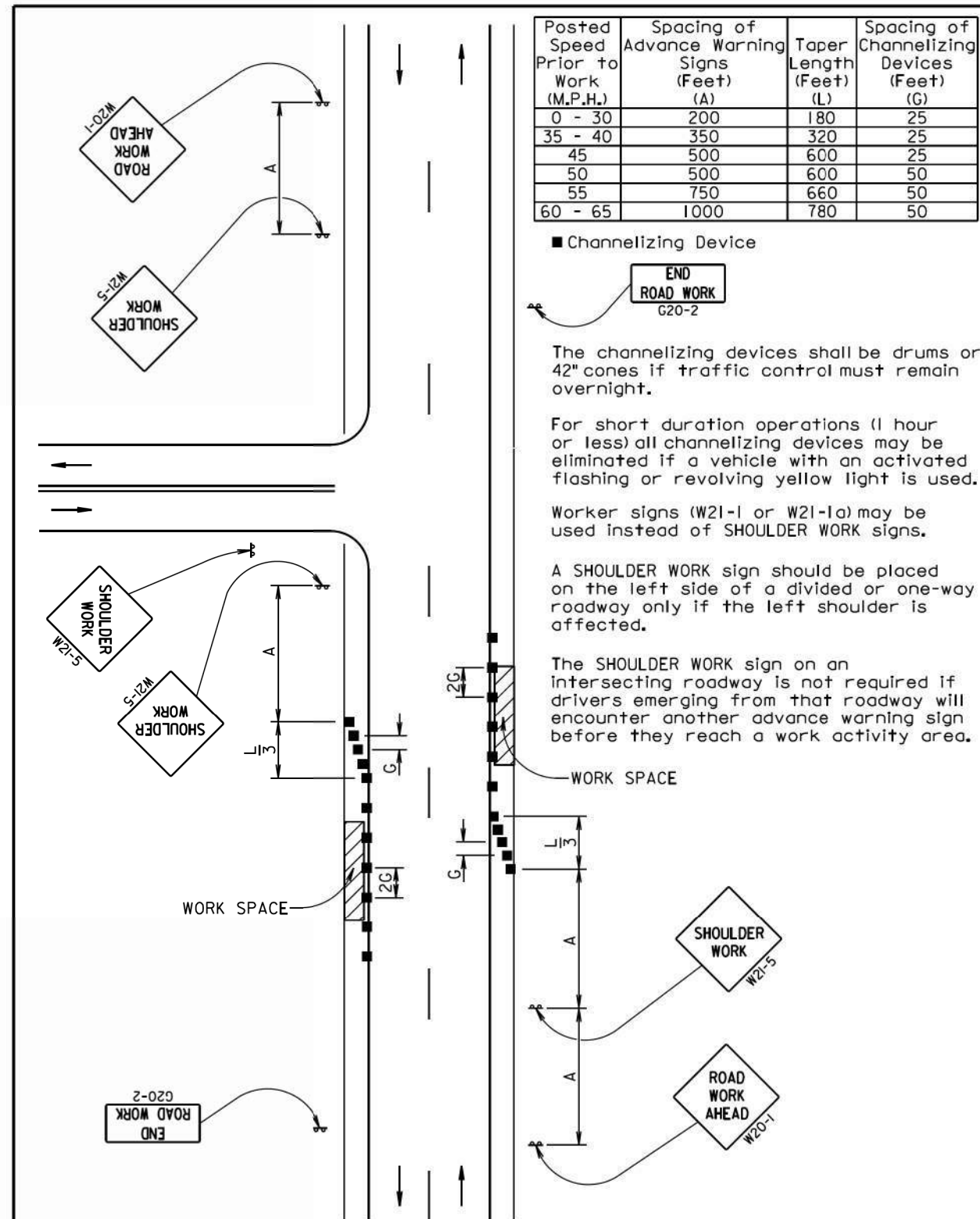
Sheet 1 of 1

Published Date: 4th Qtr. 2017





Plotting Date: 12/11/2017



June 3, 2016

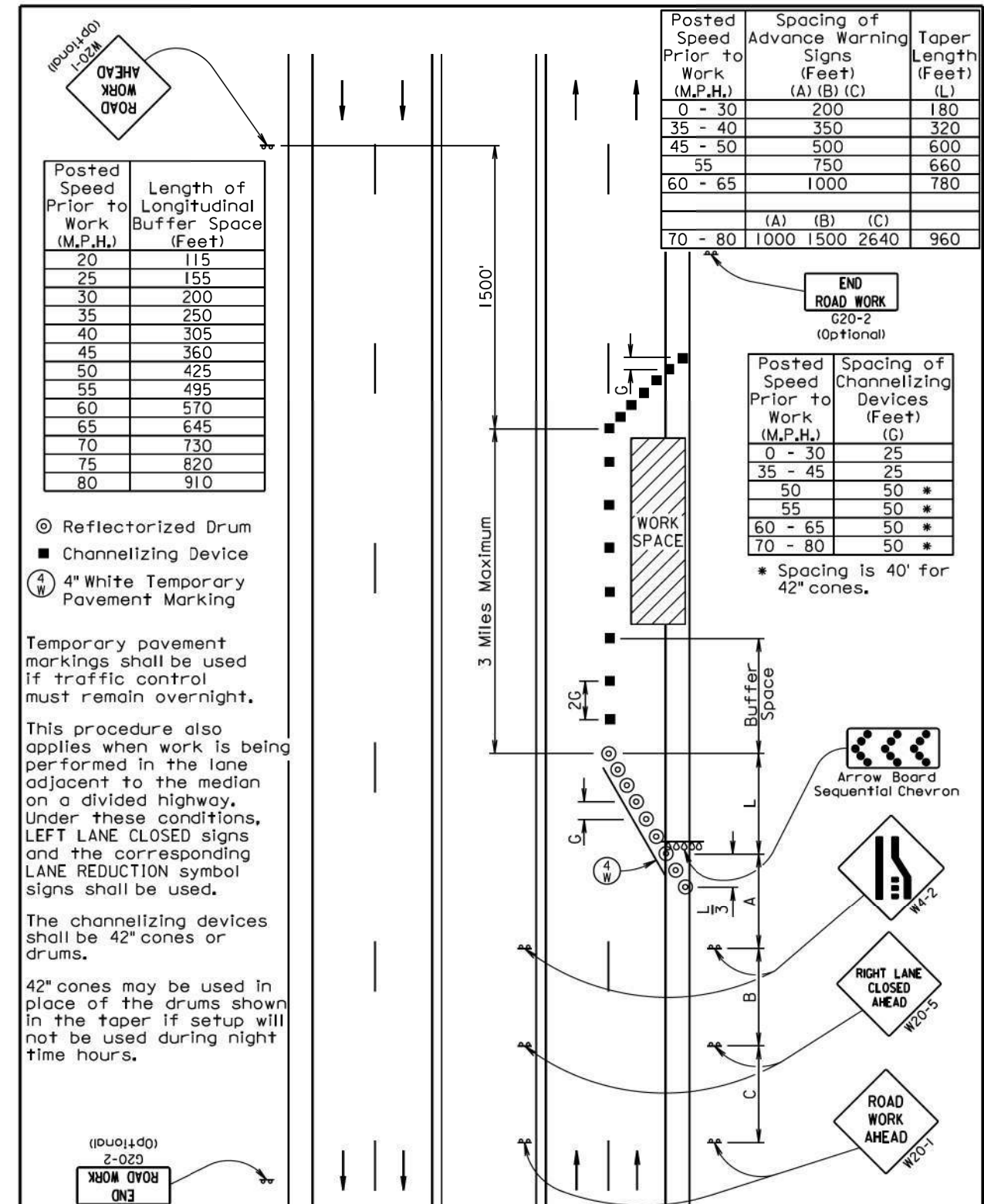
**Published Date: 4th Qtr. 2017**

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## GUIDES FOR TRAFFIC CONTROL DEVICES WORK ON SHOULDERS

PLATE NUMBER  
634.03

Sheet 1 of 1



June 9, 2017

**Published Date: 4th Qtr. 2017**

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## GUIDES FOR TRAFFIC CONTROL DEVICES

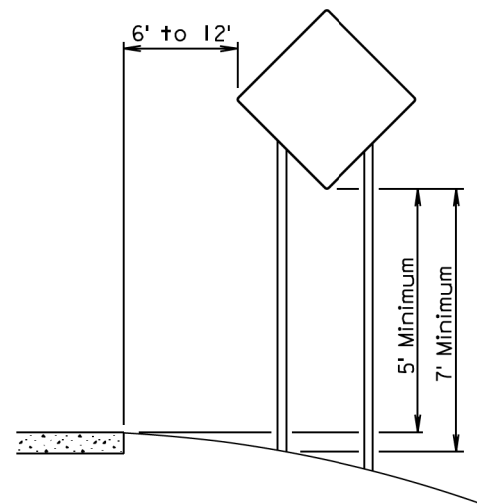
### LANE CLOSURE WITHOUT BARRIER

PLATE NUMBER  
634.64

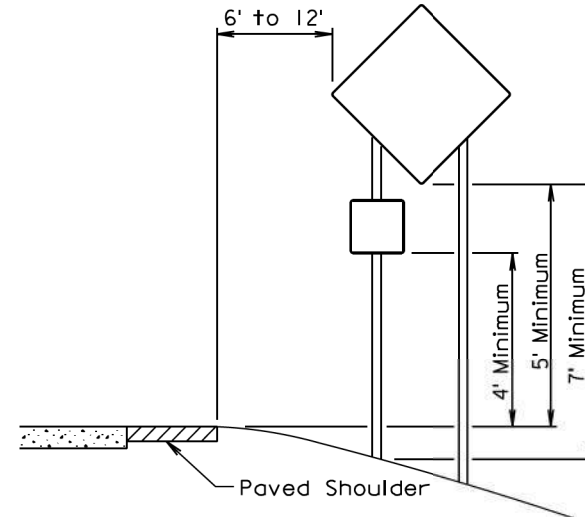
Sheet 1 of 1

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	016WB-452	35	43

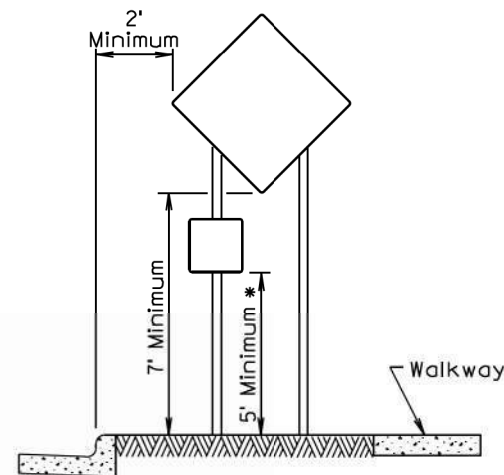
Plotting Date: 12/11/2017



RURAL DISTRICT

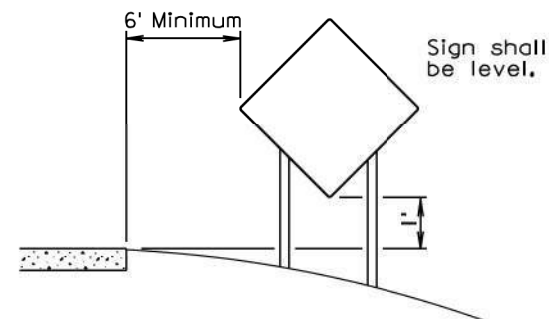


RURAL DISTRICT WITH  
SUPPLEMENTAL PLATE



URBAN DISTRICT

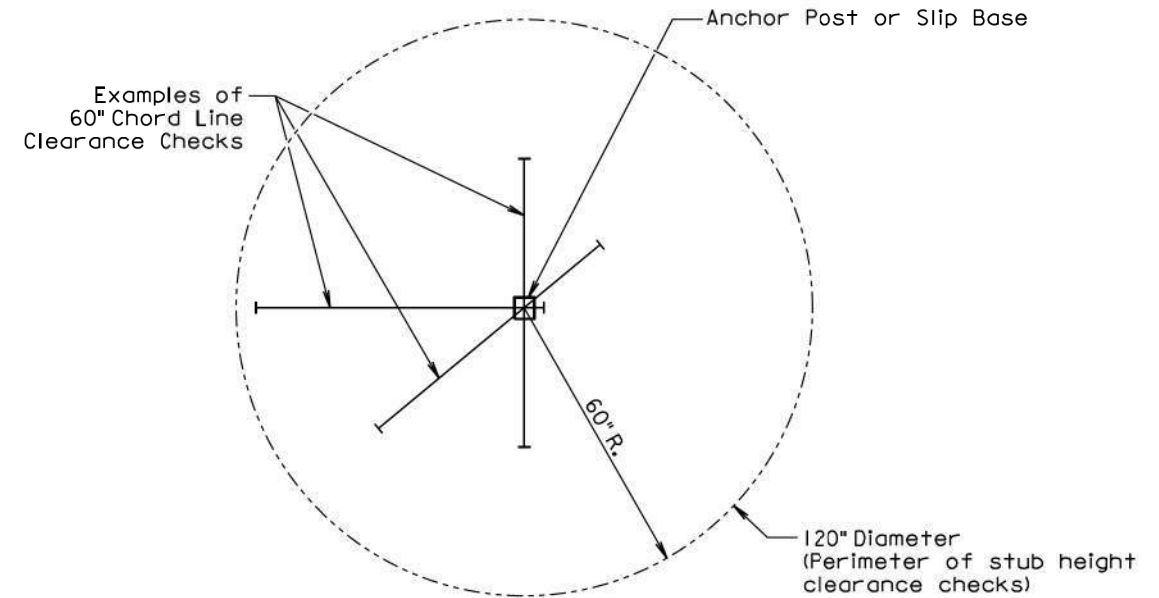
\* If the bottom of supplemental plate is mounted lower than 7 feet above a pedestrian walkway, the supplemental plate should not project more than 4" into the pedestrian facility.



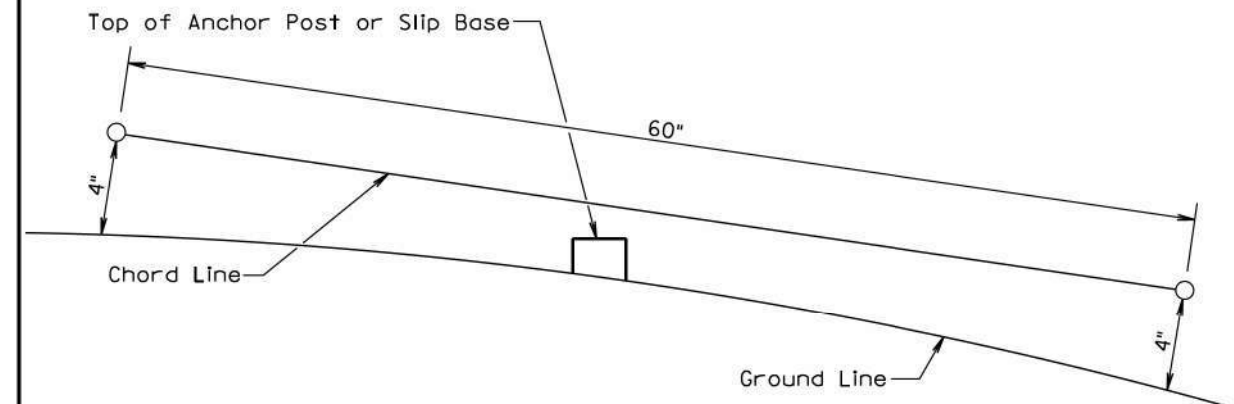
RURAL DISTRICT  
3 DAY MAXIMUM  
(Not applicable to regulatory signs)

September 22, 2014

Published Date: 4th Qtr. 2017	S D D O T	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85
			Sheet 1 of 1



PLAN VIEW  
(Examples of stub height clearance checks)



ELEVATION VIEW

GENERAL NOTES:

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

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

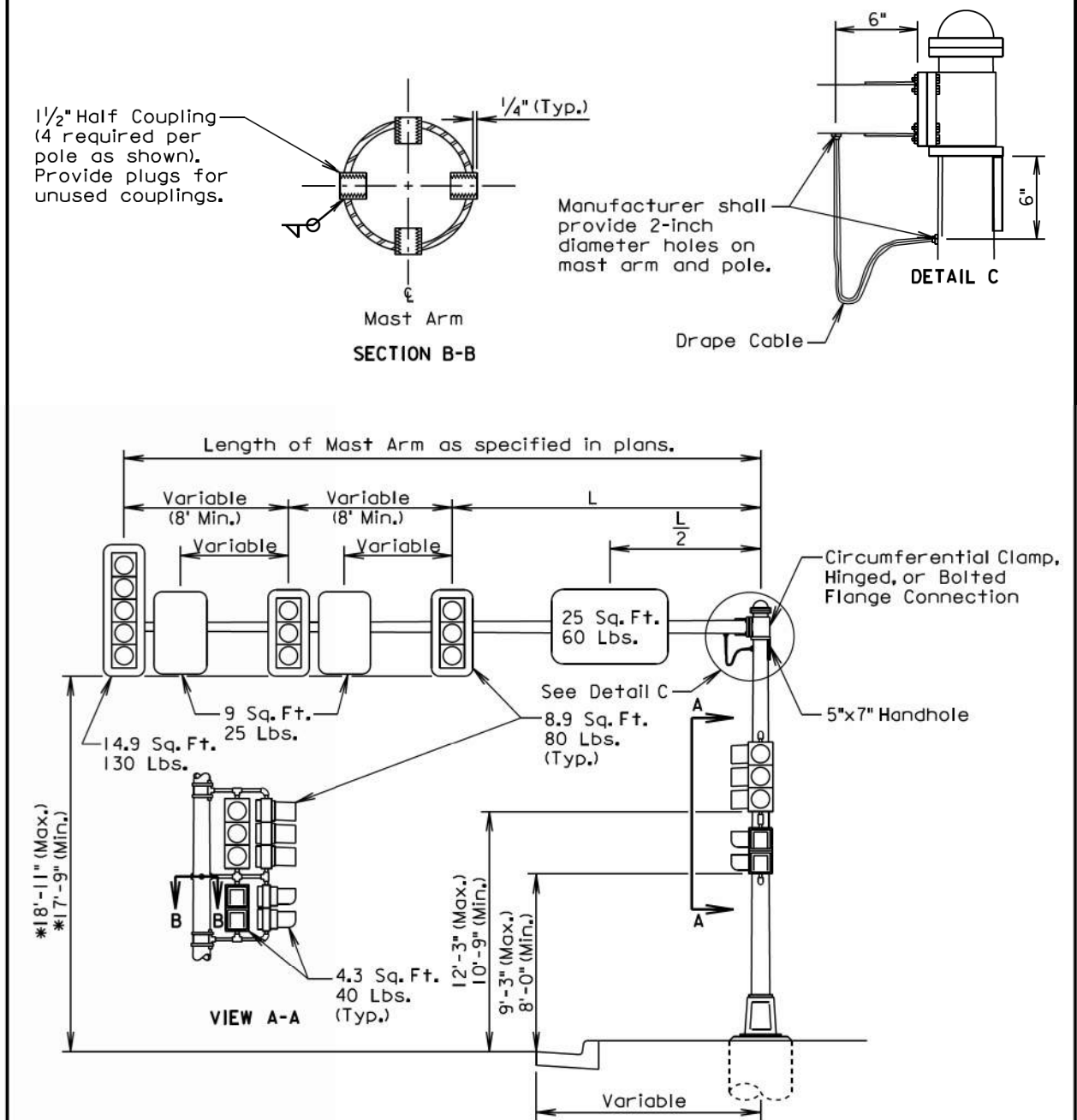
The 4" stub height clearance is not necessary for U-channel lap splices where the support is designed to yield (bend) at the base.

July 1, 2005

Published Date: 4th Qtr. 2017	S D D O T	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
			Sheet 1 of 1

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	016WB-452	36	43

Plotting Date: 01/11/2018



GENERAL NOTES:

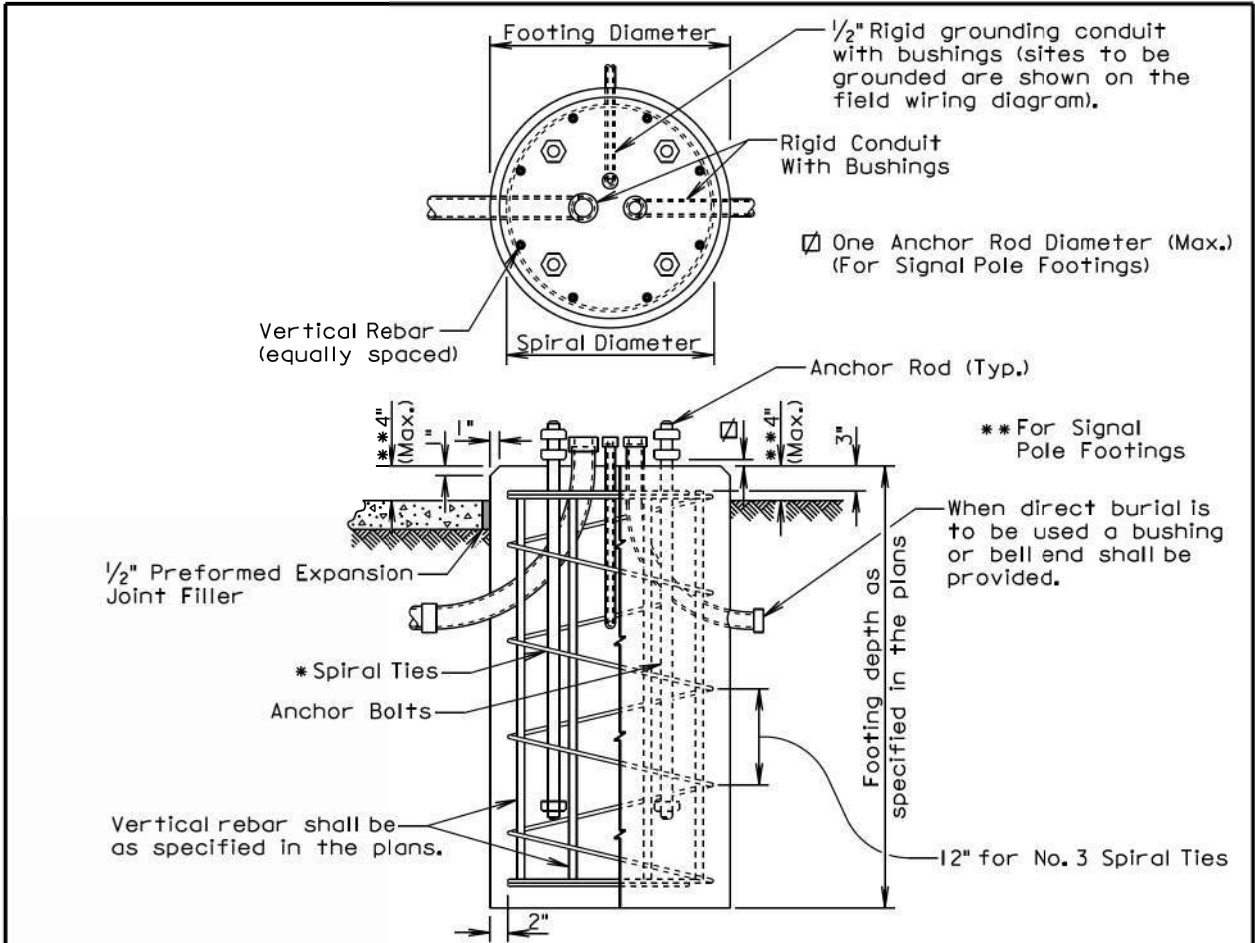
Some of the signal heads are shown with backplates removed so that the mounting hardware is visible.

\*The signal height allowances shown above are based on a horizontal distance greater than 53' between the signals and stop line. For horizontal distance of 53' and less between the signals and the stop line, the height allowances shall be as specified in Section 4D.15 of the MUTCD.

June 26, 2016

Published Date: 4th Qtr. 2017	S D D O T	SIGNAL POLE (WITH MAST ARM)	PLATE NUMBER 635.31
			Sheet 1 of 1



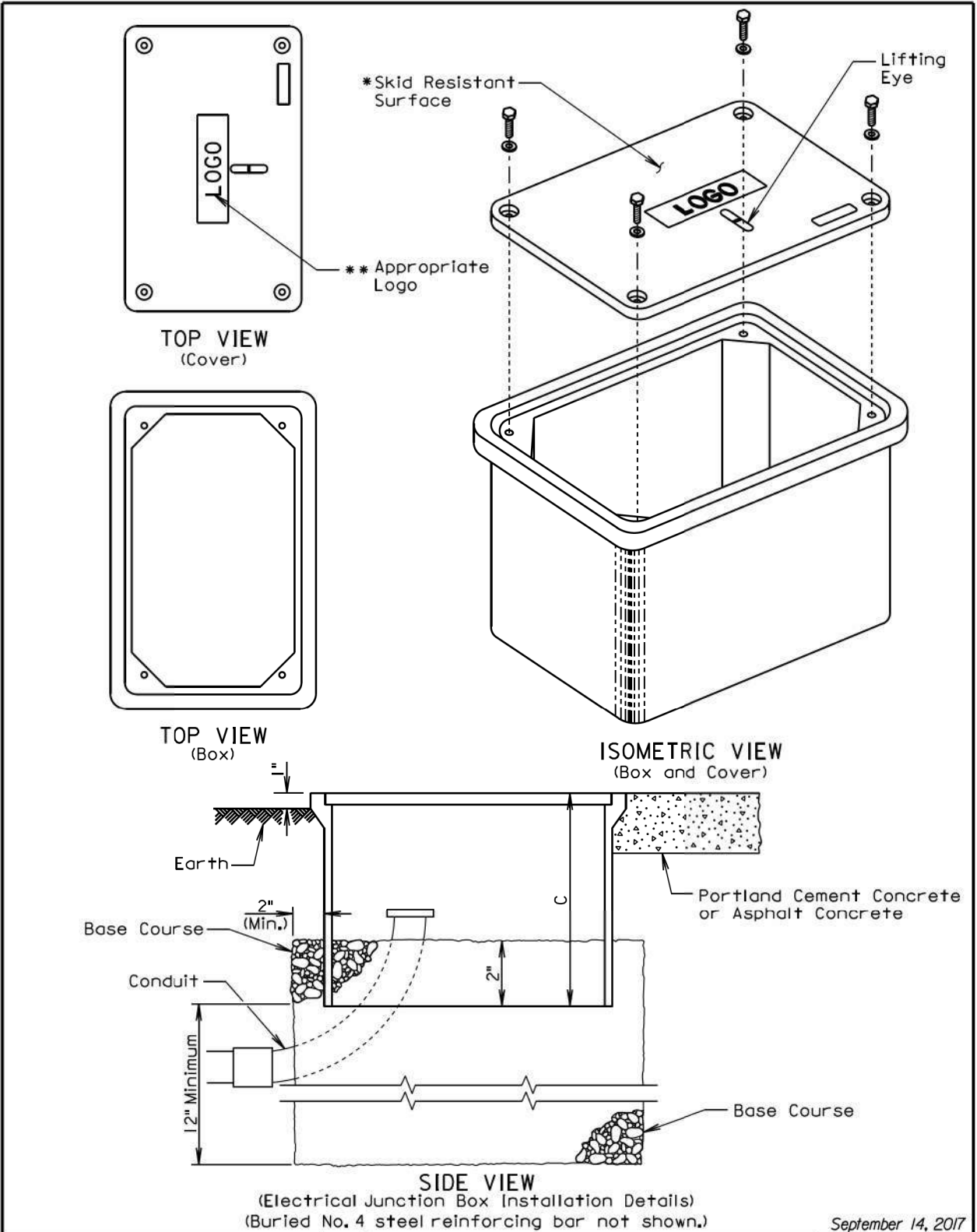


GENERAL NOTES:

- \* Circular ties may be used in lieu of the spiral ties. The No. 3 ties shall be spaced 12 inches apart except for the top two which shall be spaced 6 inches apart. The ties shall be lapped 18 inches and the laps shall be staggered around the cage.
- Spiral ties shall have 1-1/2 extra turns at each end.
- See Section 985 of the Specifications for footing materials.
- Conduits and bushings may project 2 1/2 inches to 6 inches above footing for fixed base poles but shall not project above the slip plane or fracture plane for breakaway poles.
- Conduits shall be sealed water-tight during all phases of construction until poles are in place.
- The anchor rods shall fit inside the reinforcing steel cage. If the anchor rods designed by the Pole Manufacturer do not fit, contact the Office of Bridge Design for footing redesign. No additional payment will be made for the redesigned footing.
- Costs of conduit and conduit bushings shown on footing detail shall be incidental to the footing bid item(s).
- The pole shall not be installed until the concrete has attained design strength (4000 psi).
- The contour of the area surrounding the breakaway pole shall be flat, though not necessarily level for a distance of 5 feet in all directions. The Contractor may be required to provide finish grading at some breakaway pole locations.

June 26, 2015

Published Date: 4th Qtr. 2017	S D D O T	POLE FOOTING	PLATE NUMBER 635.55
			Sheet 1 of 1



September 14, 2017

Published Date: 4th Qtr. 2017	S D D O T	ELECTRICAL JUNCTION BOXES TYPE 1 THROUGH TYPE 4	PLATE NUMBER 635.65
			Sheet 1 of 2

### ELECTRICAL JUNCTION BOX

TYPE	DESCRIPTION	APPROXIMATE COVER SIZE	MINIMUM DEPTH (C)
1	Open Bottom with Gasket	11"x18"	18"
2	Open Bottom with Gasket	13"x24"	18"
3	Open Bottom with Gasket	17"x30"	18"
4	Open Bottom with Gasket	30"x48"	24"

#### GENERAL NOTES:

The cover shall be gasketed with a minimum of two stainless steel bolts and washers.

The cover shall have a lifting eye.

\*The surface of the cover shall have a minimum wet and dry coefficient of friction value of 0.5 as determined by ASTM F609.

\*\*The cover of the junction box shall have the appropriate logo in one inch size letters and shall be recessed. When the junction box contains cables or wires for a traffic signal then the logo shall be "Signal". When the junction box contains lighting conductors then the logo shall be "Lighting".

The electrical junction boxes shall comply with the American National Standards Institute (ANSI)/Society of Cable Telecommunications Engineers (SCTE) 77 2007 Specification for Underground Enclosure Integrity. The loading requirement for all the electrical junction boxes shall be Tier 8 of ANSI/SCTE 77 2007.

The electrical junction boxes shall be UL listed.

For junction boxes located outside of pavement, a No. 4 steel reinforcing bar with a minimum length of 18" shall be buried adjacent to the long side of the junction box. All costs associated with furnishing and placing the steel reinforcing bar shall be incidental to the contract unit price per each for "Type - Electrical Junction Box".

September 14, 2017

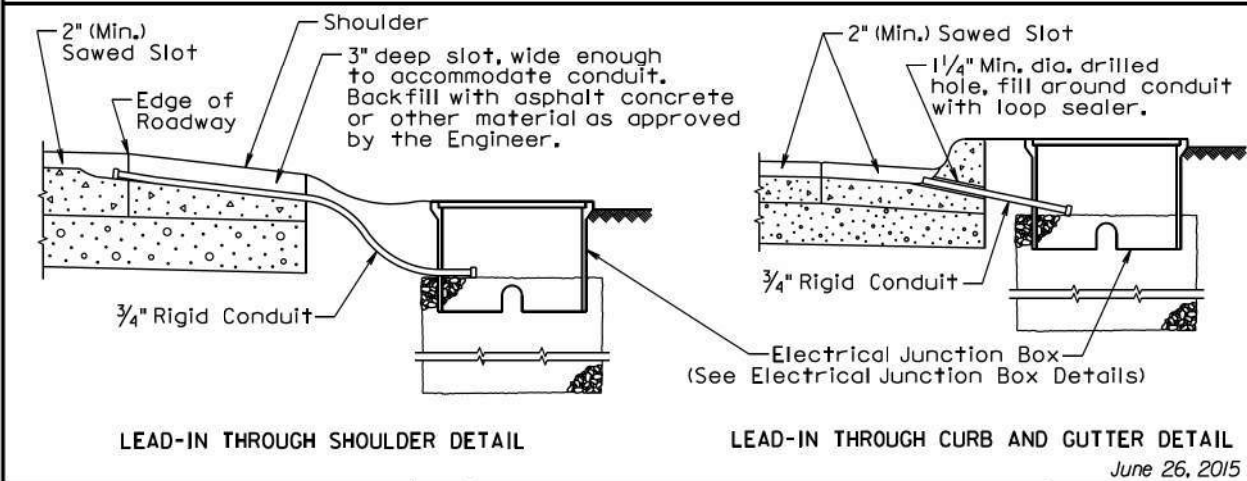
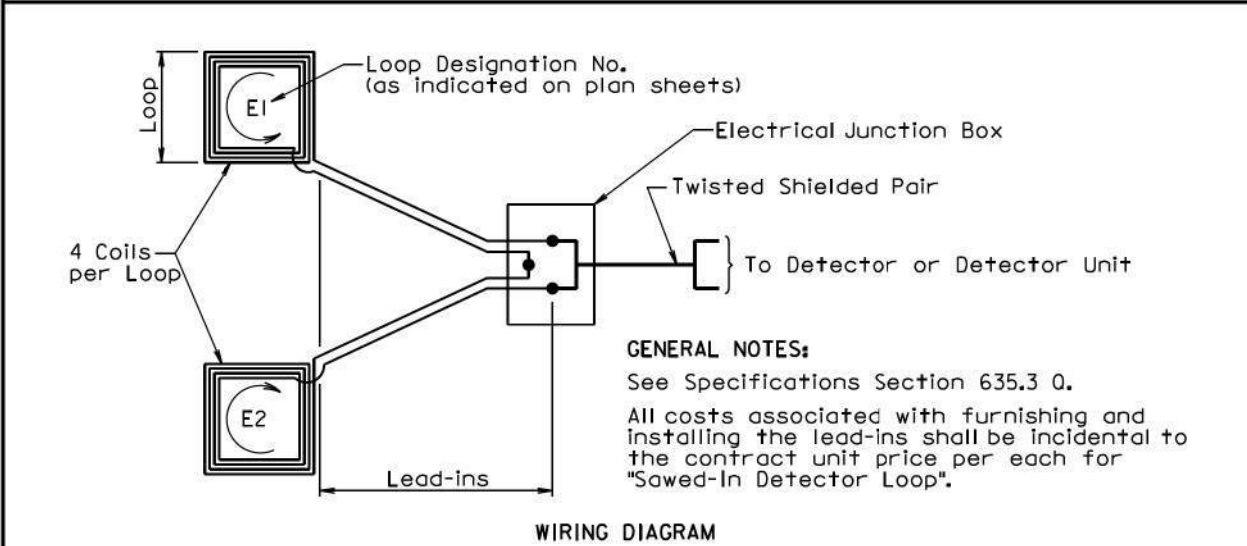
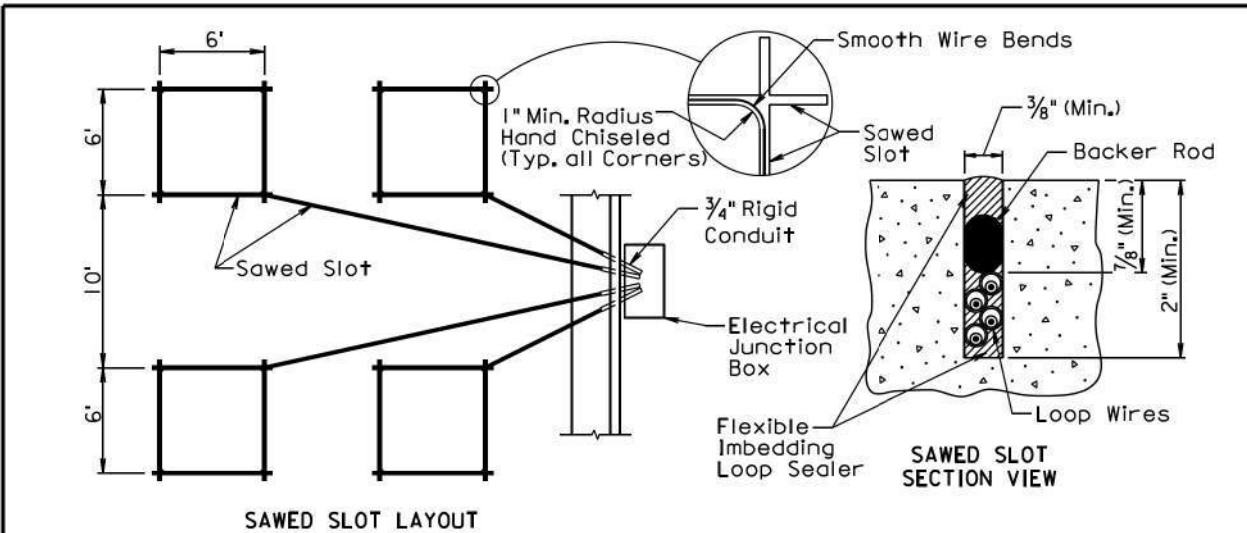
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### ELECTRICAL JUNCTION BOXES TYPE 1 THROUGH TYPE 4

PLATE NUMBER  
635.65

Sheet 2 of 2

Published Date: 4th Qtr. 2017



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### SAWED-IN DETECTOR LOOP

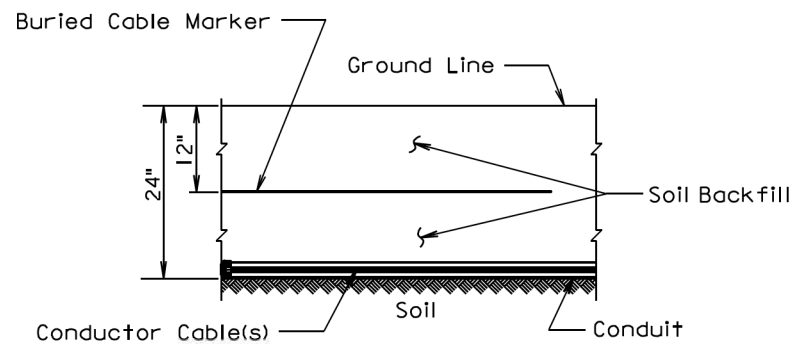
PLATE NUMBER  
635.71

Sheet 1 of 1

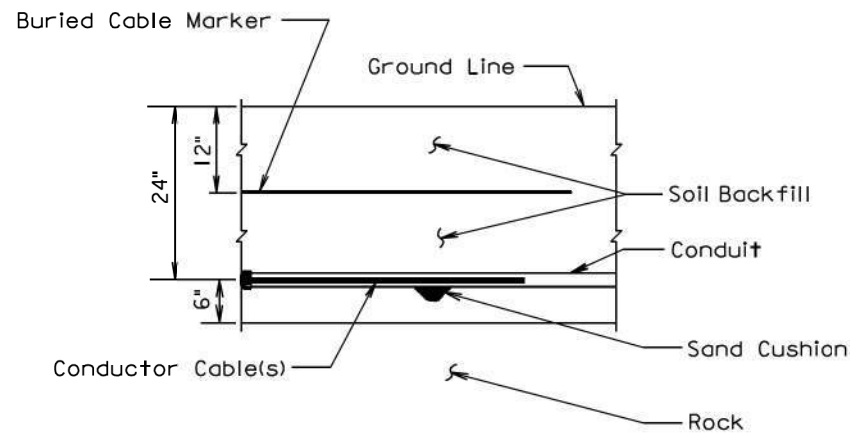
Published Date: 4th Qtr. 2017

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	016WB-452	39	43

Plotting Date: 12/11/2017



SECTION VIEW



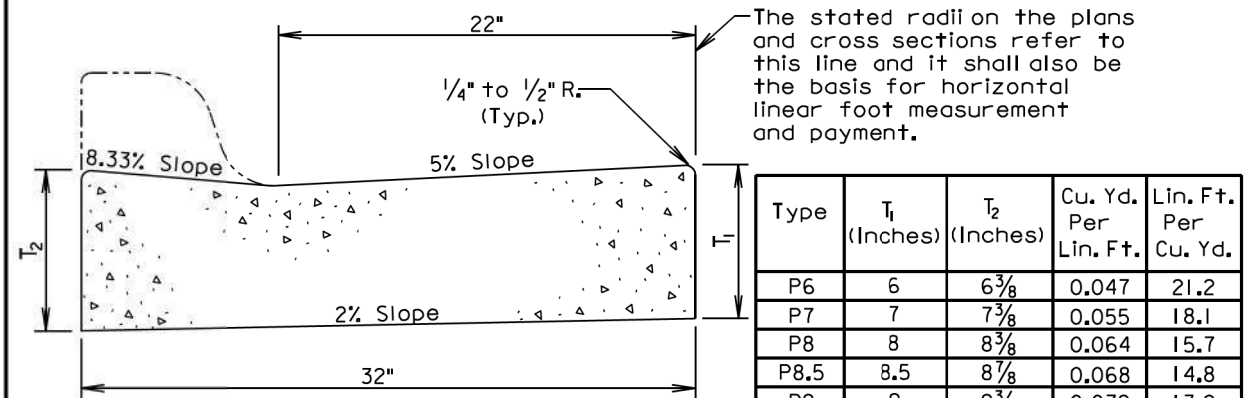
SECTION VIEW

**GENERAL NOTE:**

The Buried Cable Marker shall be plastic, approximately 6" wide, and shall be capable of sustaining a minimum of a 350% tolerance of elongation without tearing. The Buried Cable Marker shall have a life expectancy approximately equal to that of the conductor(s) beneath it. A phrase indicating the presence of a buried electric circuit below shall be printed in a contrasting color on the cable marker. The Buried Cable Marker shall be subject to approval by the Engineer. All costs associated with furnishing and installing the Buried Cable Marker shall be incidental to the contract unit price per Foot for the bid item used for the electrical conductor.

March 31, 2000

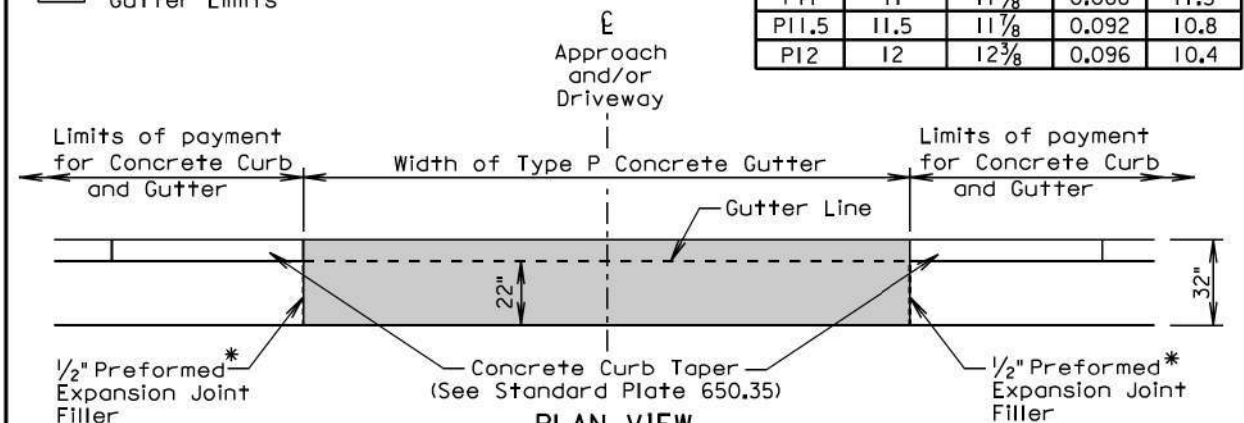
Published Date: 4th Qtr. 2017	S D D O T	CONDUIT INSTALLATION	PLATE NUMBER 635.76
			Sheet 1 of 1



TRANSVERSE SECTION

Type P Concrete  
Gutter Limits

Type	T <sub>1</sub> (Inches)	T <sub>2</sub> (Inches)	Cu. Yd. Per Lin. Ft.	Lin. Ft. Per Cu. Yd.
P6	6	6 3/8	0.047	21.2
P7	7	7 3/8	0.055	18.1
P8	8	8 3/8	0.064	15.7
P8.5	8.5	8 7/8	0.068	14.8
P9	9	9 3/8	0.072	13.9
P9.5	9.5	9 7/8	0.076	13.2
P10	10	10 3/8	0.080	12.5
P10.5	10.5	10 7/8	0.084	11.9
P11	11	11 3/8	0.088	11.3
P11.5	11.5	11 7/8	0.092	10.8
P12	12	12 3/8	0.096	10.4



PLAN VIEW

\* Joint will not be needed if concrete curb and gutter and type P concrete gutter is placed at the same time. If the 1/2" Preformed Expansion Joint Filler is provided, then the joint shall be sealed in accordance with Standard Plate 650.90.

**GENERAL NOTES:**

The concrete for the Type P Concrete Gutter shall comply with the requirements of the 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.

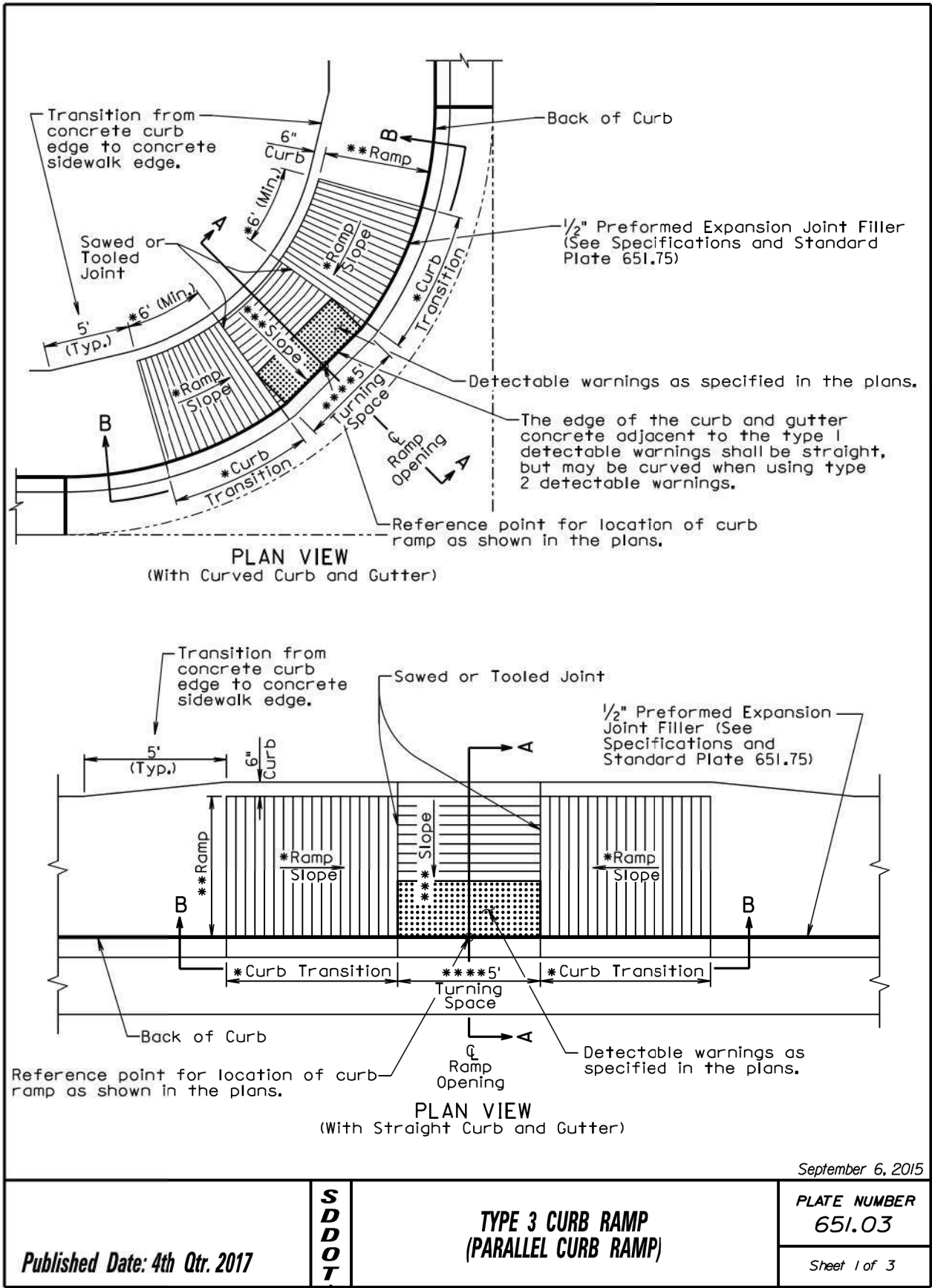
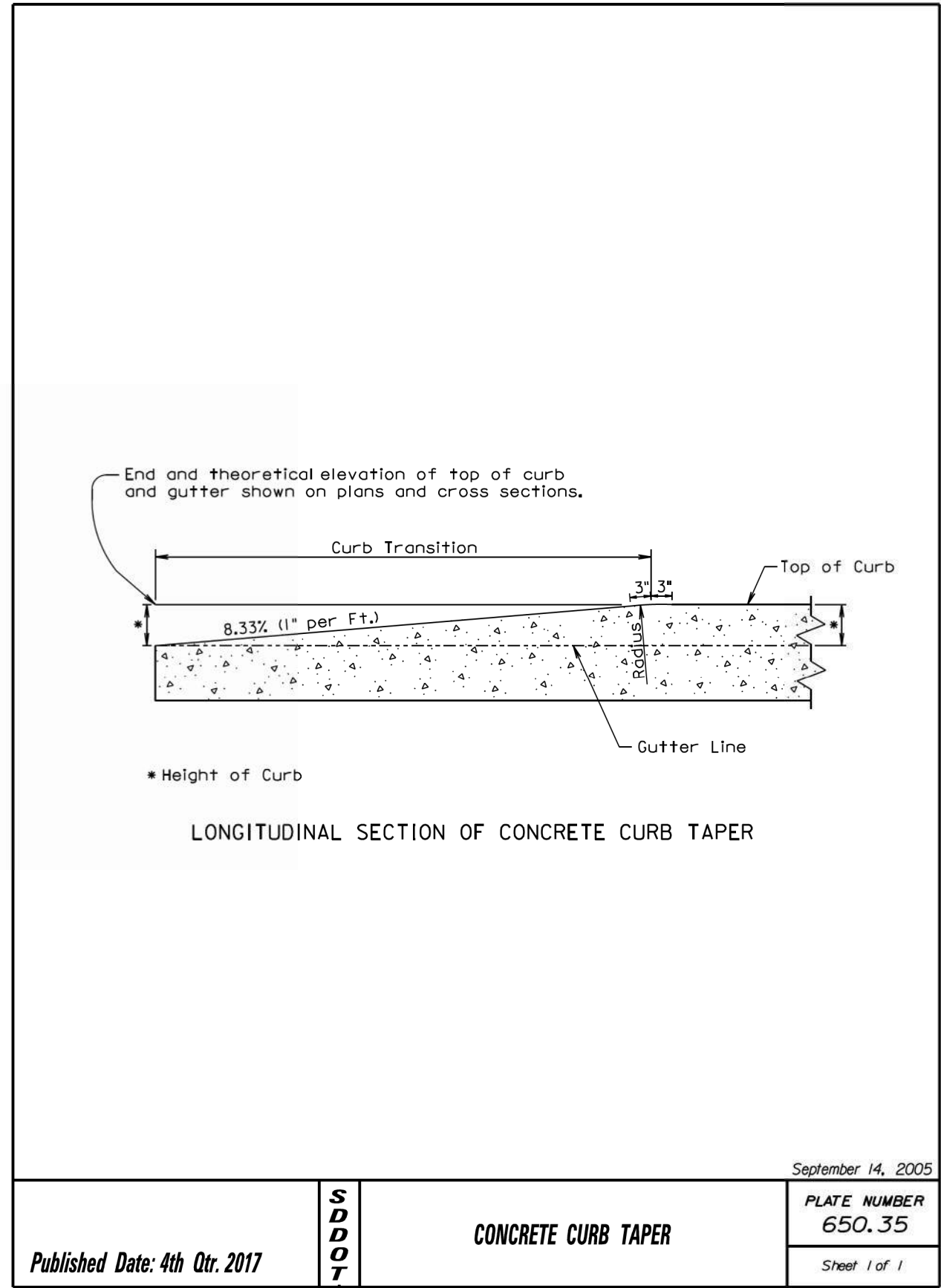
Transverse contraction joints shall be constructed at 10' intervals in the concrete gutter except when concrete gutter is constructed adjacent to mainline PCC pavement. When concrete gutter is constructed adjacent to mainline PCC pavement, a transverse contraction joint shall be constructed in the concrete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

June 26, 2015

Published Date: 4th Qtr. 2017	S D D O T	TYPE P CONCRETE GUTTER	PLATE NUMBER 650.30
			Sheet 1 of 1

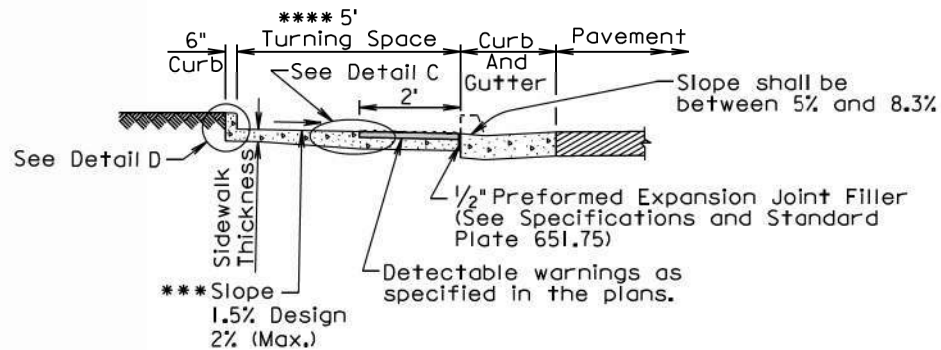




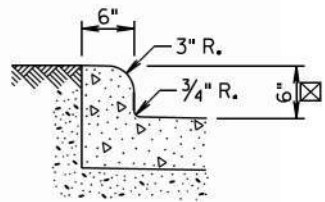
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	016WB-452	41	43

Plotting Date: 12/11/2017

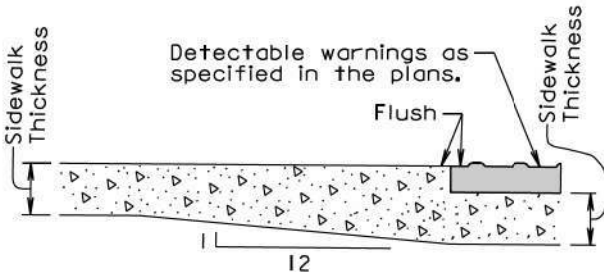
- \* The curb transition slope shall match the curb ramp slope. Curb ramp slopes are designed at 7.5% unless stated otherwise in the plans. The curb ramp may have a maximum slope of 8.3% at any location of the curb ramp and shall not exceed 15' in length unless stated otherwise in the plans. The curb transitions and curb ramp lengths shall be adjusted as necessary to meet all slope and length requirements based on field geometrics.
- \*\* The cross slope of the ramp shall not be steeper than 2% and the ramp width is 5' unless stated otherwise in the plans. Plans are designed using a 1.5% cross slope for the ramp unless stated otherwise in the plans.
- \*\*\* The slope in the turning space shall not be steeper than 2% in any direction of pedestrian travel. Plans are designed using a 1.5% slope unless stated otherwise in the plans.
- \*\*\*\* The turning space is 5' x 5' unless stated otherwise in the plans.
- ☒ The curb height shall be 6" unless stated otherwise in the plans.



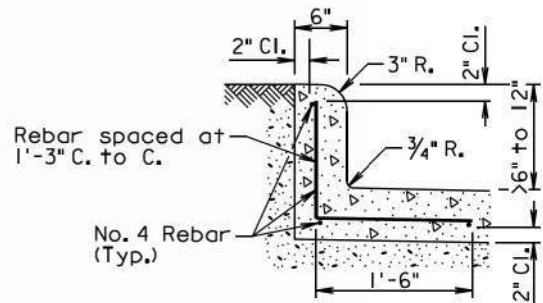
SECTION A-A



DETAIL D

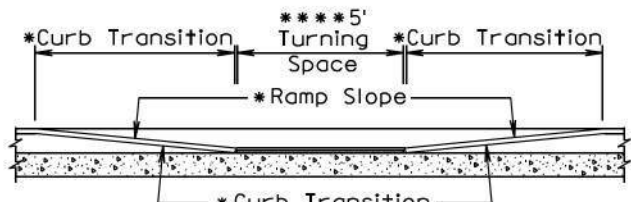


DETAIL C



DETAIL D

(Use this detail when the curb height is greater than 6" and less than 12")



SECTIONAL VIEW B-B

September 6, 2015

<b>S D D O T</b>	<b>TYPE 3 CURB RAMP (PARALLEL CURB RAMP)</b>	PLATE NUMBER 651.03
		Sheet 2 of 3
		Published Date: 4th Qtr. 2017

GENERAL NOTES:

For illustrative purpose only, type 1 detectable warnings are shown in the drawings.

For illustrative purpose only, a PCC fillet section is shown in one of the drawings. The curb ramp depicted on this standard plate may be used with a PCC fillet section or with curb and gutter.

The curb ramp shall be placed at the location stated in the plans.

Sidewalk adjacent to the curb ramp shall be as shown in the plans.

Care shall be taken to ensure a uniform grade on the curb ramp, free of sags and short grade changes.

Surface texture of the curb ramp shall be obtained by coarse brooming transverse to the slope of the curb ramp.

The normal gutter line profile shall be maintained through the area of the ramp opening.

Joints shall be sawed or tooled into the concrete adjacent to the detectable warnings to alleviate possible corner cracking (see plan view for joint location).

Care shall be taken to ensure that the surface of the detectable warnings are clean and maintains a uniform color.

The detectable warnings shall be cut as necessary to fit the plan specified limits of the detectable warnings. Cost for cutting the detectable warnings shall be incidental to the corresponding detectable warning bid item.

When curb height is greater than 6" and less than 12", reinforcing steel is required in accordance with the detail on sheet 2 of 3. The reinforcing steel shall conform to ASTM A615, Grade 60. Cost for furnishing and installing the reinforcing steel shall be incidental to the contract unit price per square foot for the corresponding concrete sidewalk bid item.

There will be no separate payment for curb ramps. The curb ramp shall be measured and paid for at the contract unit price per square foot for the corresponding concrete sidewalk bid item. The square foot area of the detectable warnings and the curb along the short radius shall be included in the measured and paid for quantity of sidewalk.

The curb transitions and ramp opening shall be measured and paid for at the contract unit price per foot for the corresponding curb and gutter bid item when curb and gutter is used. The curb transitions and ramp opening shall be measured and paid for at the contract unit price per square yard for the corresponding PCC fillet section bid item when a PCC fillet section is used.

The type 1 detectable warnings shall be measured to the nearest square foot. All costs for furnishing and installing the type 1 detectable warnings including labor, equipment, materials, and incidentals shall be paid for at the contract unit price per square foot for "Type 1 Detectable Warnings".

The type 2 detectable warnings shall be measured to the nearest square foot. All costs for furnishing and installing the type 2 detectable warnings including labor, equipment, and materials, including adhesive, necessary sealant or grout, and necessary grinding shall be paid for at the contract unit price per square foot for "Type 2 Detectable Warnings".

September 6, 2015

<b>S D D O T</b>	<b>TYPE 3 CURB RAMP (PARALLEL CURB RAMP)</b>	PLATE NUMBER 651.03
		Sheet 3 of 3
		Published Date: 4th Qtr. 2017

