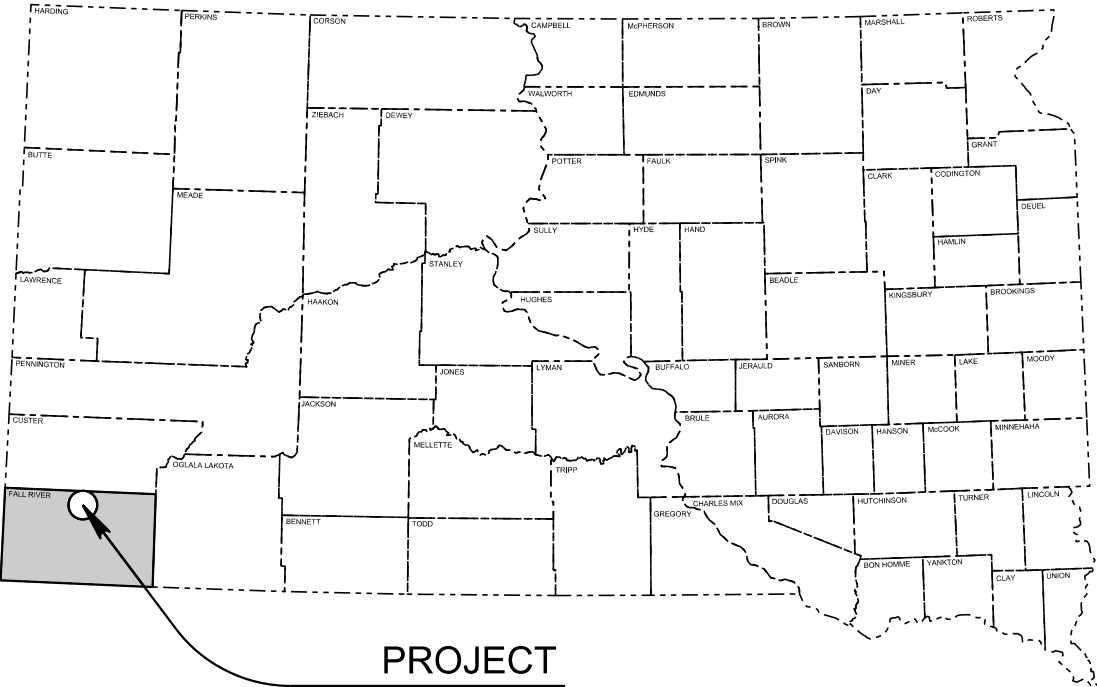


Plot Scale - 1:200

Plotted From - TRR011626



STATE OF SOUTH DAKOTA  
DEPARTMENT OF TRANSPORTATION  
PLANS FOR PROPOSED

PROJECT 018 B-492  
US HIGHWAY 18B  
FALL RIVER COUNTY

INSTALL RIGHT TURN LANE  
PCN i5gy

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	018 B-492	1	29

Plotting Date: 04/16/2019

INDEX OF SHEETS

1	General Layout with Index
2-8	Estimate with General Notes & Tables
9	Control & Horizontal Alignment Data
10	Legend
11-12	Plan Sheets
13-16	Cross Sections
17	Special Detail Sheet
18-29	Standard Plates

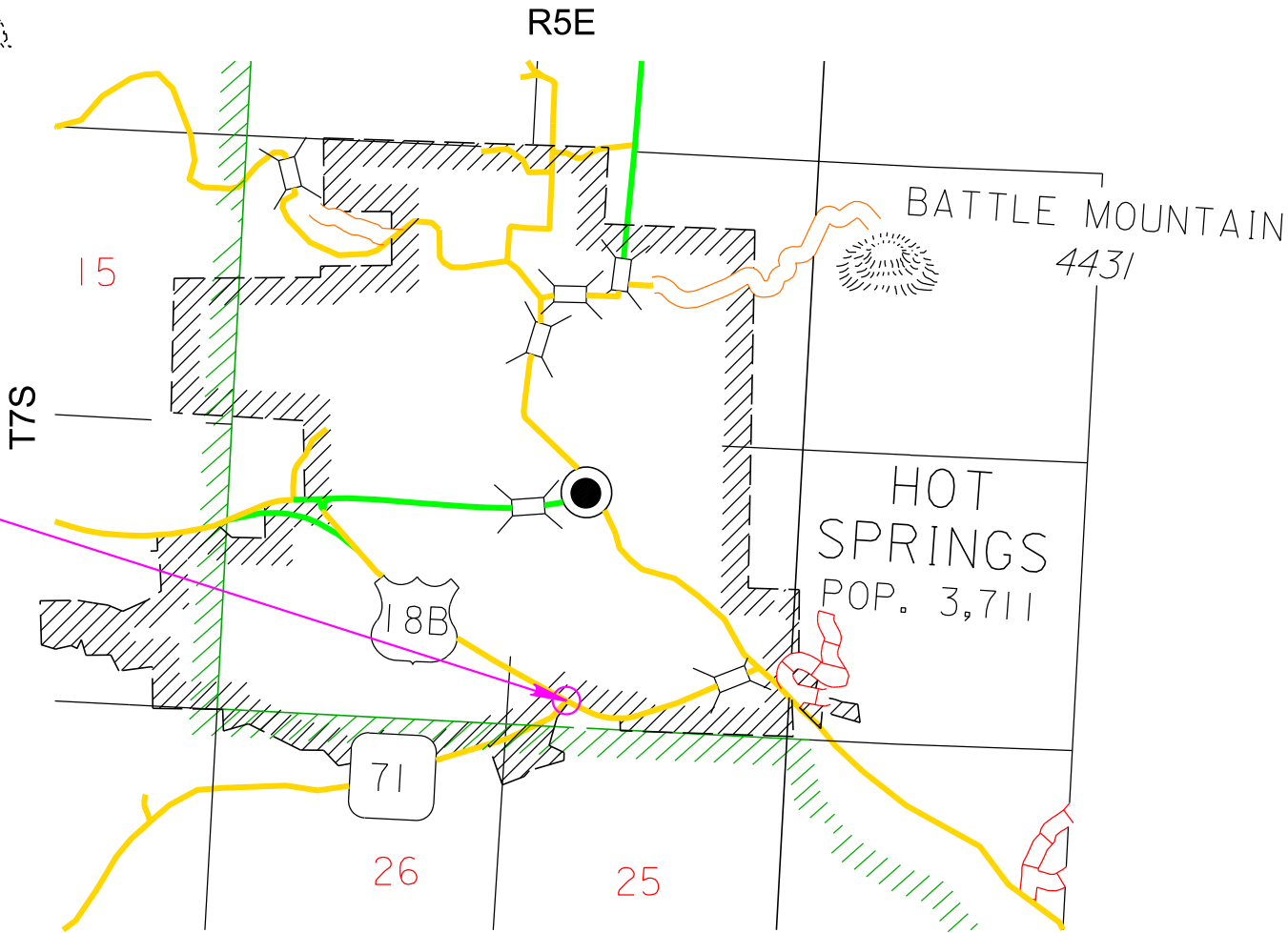
PROJECT 018 B-492  
MRM 39.8

DESIGN DESIGNATION

AADT (2018)	3975
AADT (2038)	5036
DHV	1279
D	51%
DHV T%	9.9%
AADT T%	21.8%
V	45 mph

STORM WATER PERMIT

None Required



File - ...title.dgn

ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
110E1010	Remove Asphalt Concrete Pavement	685.0	SqYd
110E1540	Remove Luminaire Pole Footing	1	Each
110E1700	Remove Silt Fence	25	Ft
110E7150	Remove Sign for Reset	2	Each
110E7510	Remove Pipe End Section for Reset	2	Each
120E0010	Unclassified Excavation	899	CuYd
120E0600	Contractor Furnished Borrow Excavation	560	CuYd
120E2000	Undercutting	479	CuYd
230E0100	Remove and Replace Topsoil	Lump Sum	LS
260E1010	Base Course	1,146.0	Ton
320E1200	Asphalt Concrete Composite	482.0	Ton
450E0262	84" RCP Class 2, Furnish	12	Ft
450E0270	84" RCP, Install	12	Ft
450E9001	Reset Pipe End Section	2	Each
464E0100	Controlled Density Fill	0.7	CuYd
632E3500	Reset Sign	2	Each
633E0010	Cold Applied Plastic Pavement Marking, 4"	744	Ft
633E0030	Cold Applied Plastic Pavement Marking, 24"	92	Ft
633E0040	Cold Applied Plastic Pavement Marking, Arrow	2	Each
633E1200	Waterborne Pavement Marking Paint with High Grade Polymer, White	3	Gal
633E5000	Grooving for Cold Applied Plastic Pavement Marking, 4"	744	Ft
633E5015	Grooving for Cold Applied Plastic Pavement Marking, 24"	92	Ft
633E5025	Grooving for Cold Applied Plastic Pavement Marking, Arrow	2	Each
634E0010	Flagging	40.0	Hour
634E0110	Traffic Control Signs	179.8	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0275	Type 3 Barricade	2	Each
634E0310	Temporary Flexible Vertical Markers (Tabs)	1,700	Ft
634E0420	Type C Advance Warning Arrow Board	1	Each
635E5020	2' Diameter Footing	9.0	Ft
635E7500	Remove and Reset Luminaire Pole	1	Each
635E8220	2" Rigid Conduit, Schedule 80	35	Ft
635E9016	1/C #6 AWG Copper Wire	340	Ft
720E1015	Bank and Channel Protection Gabion	42.0	CuYd
730E0210	Type F Permanent Seed Mixture	13	Lb
731E0100	Fertilizing	750	Lb
732E0250	Fiber Mulching	1,000	Lb
734E0154	12" Diameter Erosion Control Wattle	550	Ft
734E0602	Low Flow Silt Fence	100	Ft

ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
734E0610	Mucking Silt Fence	25	CuYd
734E0620	Repair Silt Fence	25	Ft
831E0110	Type B Drainage Fabric	109	SqYd

SPECIFICATIONS

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

ENVIRONMENTAL COMMITMENTS

The SDDOT is committed to protecting the environment and uses Section A Environmental Commitments as a communication tool for the Engineer and Contractor to ensure that attention is given to avoid, minimize, and/or mitigate an environmental impact. Environmental commitments to various agencies and the public have been made to secure approval of this project. An agency with permitting authority can delay a project if identified 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.

Additional guidance on SDDOT's Environmental Commitments can be accessed through the Environmental Procedures Manual found at: <http://www.sddot.com/resources/Manuals/EnvironProcManual.pdf>

For questions regarding change orders in the field that may have an effect on an Environmental Commitment, the Project Engineer will contact the Environmental Office at 605-773-3098 or 605-773-4336 to determine whether an environmental analysis and/or resource agency coordination is necessary.

COMMITMENT C: WATER SOURCE

The Contractor will not withdraw water with equipment previously used outside the State of South Dakota or previously used in aquatic invasive species waters within South Dakota without prior approval from the SDDOT Environmental Office. Thoroughly wash all construction equipment to prevent and control the introduction and spread of invasive species into the project vicinity.

The Contractor will not withdraw water directly from streams of the James, Big Sioux, and Vermillion watersheds without prior approval from the SDDOT Environmental Office.

Action Taken/Required:

The Contractor will obtain the necessary permits from the regulatory agencies such as the South Dakota Department of Environment and Natural Resources (DENR) and the United States Army Corps of Engineers (USACE) prior to water extraction activities.

Additional information and mapping of Aquatic Invasive Species in South Dakota can be accessed at: <http://sdleastwanted.com/maps/default.aspx>.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
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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.

COMMITMENT H: WASTE DISPOSAL SITE

The Contractor will 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 Public ROW.

The waste disposal site(s) will 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) will 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 Environmental Office and the Project Engineer.

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

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

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

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

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) will be incidental to the various contract items.

COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES

State Historical Preservation Office (SHPO or THPO) concurrence has not been obtained for this project.

Action Taken/Required:

All earth disturbing activities require a cultural resource review prior to scheduling the pre-construction meeting. 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 will arrange and pay for a record search and when necessary, a cultural resource survey. 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 if the site was previously surveyed; however, a cultural resources survey may need to be conducted by a qualified archaeologist.

The Contractor will provide ARC with the following: a topographical map or aerial view of 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 will submit the cultural resources survey report to SDDOT Environmental Office, 700 East Broadway Avenue, Pierre, SD 57501-2586. 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.

In the event of an inadvertent discovery of human remains, funerary objects, or if evidence of cultural resources is identified during project construction activities, then such activities will immediately cease and the Project Engineer will be immediately notified. The Project Engineer will contact the SDDOT Environmental Office to determine an appropriate course of action.

The Contractor is responsible 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 will not utilize a site known or suspected of having contaminated soil or water. The Contractor will provide the required permits and clearances to the Project Engineer at the preconstruction meeting.

UTILITIES

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

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

UNCLASSIFIED EXCAVATION

Unclassified Excavation is provided on the project for constructing the right turn lane in accordance with the typical sections and cross sections.

Plans quantity shall be the basis of payment for the Unclassified Excavation quantity. If changes are made in the field during construction, measurements shall be taken and the quantity shall be adjusted accordingly.

Water for Embankment is estimated at the rate of 10 gallons of water per cubic yard of Embankment minus Waste. No separate payment will be made for the Water for Embankment and all costs associated will be incidental to the contract unit price per cubic yard of “Unclassified Excavation”.

UNDERCUTTING

In all cut sections the earthen subgrade shall be undercut 1 foot below the finished subgrade. Shallow embankment sections, fills less than 1 feet in height measured at the finished subgrade shoulders, shall be undercut to assure a minimum height of 1 feet of earth embankment for the entire width of the roadbed. The undercut material or other suitable material, as directed by the engineer, shall then be replaced and recompacted to the density specified for the section being constructed.

The undercut should be tapered to match the in-place surfacing over a distance of 50 feet.

The plan shown quantity will be the basis of payment. However, if there are additional areas of undercut other than what is shown in the plans, the Engineer shall direct removal of these areas and the additional areas will be measured according to the Engineer.

CONTRACTOR FURNISHED BORROW EXCAVATION

The Contractor will provide a suitable site for Contractor Furnished Borrow Excavation material. The Contractor is responsible for obtaining all required permits and clearances for the borrow site. The borrow material will be approved by the Engineer. The plans quantity for “Contractor Furnished Borrow Excavation” as shown in the Estimate of Quantities will be the basis of payment for this item.

Restoration of the Contractor furnished borrow excavation site will be the responsibility of the Contractor.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
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REMOVAL OF EXISTING ASPHALT CONCRETE PAVEMENT

The removal of the existing asphalt concrete shoulder shall be paid for at the contract unit price per square yard for Remove Asphalt Concrete Pavement. The salvaged asphalt shoulder material may be placed in the embankment or as directed by the Engineer.

SURFACING THICKNESS DIMENSIONS

Plans tonnage shall be applied even though the thickness may vary from that shown in the plans. At those locations where material must be placed to achieve a required elevation, plans tonnage may be varied to achieve the required elevation.

BASE COURSE

Base Course shall be placed on the shoulders in 4 inch maximum layers and compacted according to Section 260.3 B of the Specifications except that a pneumatic tire roller shall be used. At the time of compaction, the material placed on the shoulders shall have approximately 4 percent moisture uniformly blended throughout the depth of material. The percent moisture may be adjusted by the Engineer.

All remaining requirements of the Specifications for Base Course shall apply, except that in Section 260.3 A, the requirement for mixing the Base Course with water by a central plant and placed on the shoulder by an approved spreader shall be waived

The cost of water for compaction of the Base Course shall be incidental to the contract unit price per ton for Base Course.

SHRINKAGE FACTOR: Embankment +30%

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	018 B-492	4	29

TABLE OF QUANTITIES

Station to Station	Excavation	Undercut	Contractor Furnished Borrow	Saw Joint in Asphalt Concrete	Remove Asphalt Concrete Pavement	Base Course	Asphalt Concrete Composite
	(CuYd)	(CuYd)	(CuYd)	(Ft)	(SqYd)	(Ton)	(Ton)
54+50 to 59+65	420	479	560	660	685	1146	482

TABLE OF UNCLASSIFIED EXCAVATION

Excavation	420
Undercut	479
Total	899

CONCRETE PIPE CONNECTIONS

Pipe connections to existing pipes will be done by inserting the pipe and a concrete collar will then be poured around the pipe in the area of the connection.

When it is not possible to use a normal pipe joint (male-female ends), connections to existing pipe will be made by placing a 2' wide by 6" thick M6 concrete collar around the outside of the connection. The concrete collar will be reinforced with 6x6 W2.9 x W2.9 wire mesh.

All costs for constructing the concrete collars including materials and labor will be incidental to the contract unit price per foot for the corresponding pipe bid item.

TIE BOLTS FOR RCP CULVERT EXTENSIONS

On the twin pipe extension, all pipe sections shall be tied in accordance with Standard Plate 450.18. This includes ties between the existing pipe section and the new pipe extension. All costs for drilling tie bolt holes and furnishing and installing tie bolts shall be incidental to the contract unit price per foot for the installations of the appropriate size of RCP.

TABLE OF PIPE QUANTITIES

Station	Reinforced Concrete Circular 84" Cl. 2 (Ft)	Remove Pipe End Section for Reset (Each)	Reset Pipe End Section (Each)
59+38 – 106' R	6	1	1
59+39 – 116' R	6	1	1
Total:	12.0	2	2

CONTROLLED DENSITY FILL FOR PIPE

Controlled density fill will be in conformance with Section 464 of the Specifications.

The controlled density fill will be placed between the pipes from the base of pipe elevation to the haunch of the pipes and extend to the end of the end section.

TABLE OF CONTROLLED DENSITY FILL FOR PIPE

Station	Quantity (CuYd)
59+37–111' R	0.7
Total:	0.7

TABLE OF BANK AND CHANNEL  
PROTECTION GABIONS AND DRAINAGE FABRIC

Station	L/R	Bank and Channel Protection Gabion (CuYd)	Type B Drainage Fabric (SqYd)
59+30	111' R	42	109
Totals:		42	109

REMOVE SIGN FOR RESET & RESET SIGN

The Contractor shall remove for reset and reset the sign assemblies at the locations identified in the plans.

All costs for labor, equipment, and materials necessary to remove and reset the existing posts, ladder, and existing signs at the new locations shall be included in the contract unit price per each for Remove Sign for Reset” and “Reset Sign”.

TABLE FOR REMOVE SIGN FOR RESET & RESET SIGN

Station	L/R	Remove Sign for Reset (Each)	Reset Sign (Each)
55+30	54' R	1	1
58+62	70' R	1	1
Totals:		2	2

PAVEMENT MARKING PAINT

All materials will be applied as per the manufacturer’s recommendations.

All pavement markings shall be a Waterborne Pavement Marking Paint with High Grade Polymer.

Traffic Control shall be incidental to the cost of application. The striper and advance or trailing warning vehicle shall be equipped with flashing amber lights or advance warning arrow panel.

WATERBORNE PAVEMENT MARKING PAINT WITH HIGH GRADE POLYMER

All materials will be applied as per manufacturer’s recommendations.

This material will consist of a durable high build, low VOC, fast drying, waterborne traffic paint with a 100% acrylic polymer (Dow DT-400 or Dow HD-21A or equivalent). The Contractor will provide certification that the material is one of the following products or an equivalent as approved by the Operations Traffic Engineer:

- Diamond Vogel's Waterborne High Build Polymer Marking Paint
- Ennis-Flint’s High Build Polymer Marking Paint

No further testing of this material will be required. Reflective media will consist of glass beads.

RATES OF MATERIALS FOR WATERBORNE PAVEMENT MARKING PAINT WITH HIGH GRADE POLYMER

Solid 4” line = 27.8 Gals/Mile  
Glass Beads = 8 Lbs/Gal.

All cost for materials, labor and equipment necessary to furnish and install the pavement markings will be incidental to the contract unit price per gallon for “Waterborne Pavement Marking Paint with High Grade Polymer, White”.

COLD APPLIED PLASTIC PAVEMENT MARKING

All materials will be applied as per the manufacturer’s recommendations.

GROOVING FOR COLD APPLIED PLASTIC PAVEMENT MARKING

The Contractor will establish a positive means for the removal of the grinding and/or grooving residue. Residue from dry grooving will be vacuumed. Solid residue will be removed from the pavement surfaces before being blown by traffic action or wind. The Contractor will conduct this work to control and minimize airborne dust and similar debris that may become a hazard to motor vehicle operation or nuisance to property owners. Residue from wet grooving will 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, will 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 will be included in the contract unit price per foot for “Grooving for Cold Applied Plastic Pavement Marking”.

TABLE OF PAVEMENT MARKING QUANTITIES

			Waterborne Pavement Marking Paint with High Grade Polymer, White	Cold Applied Plastic Pavement Marking, 4" White	Cold Applied Plastic Pavement Marking, 24" White	Cold Applied Plastic Pavement Marking, Arrow	Grooving for Cold Applied Plastic Pavement Marking, 4"	Grooving for Cold Applied Plastic Pavement Marking, 24"	Grooving for Cold Applied Plastic Pavement Marking, Arrow
Station	to	Station	(Gal)	(Ft)	(Ft)	(Each)	(Ft)	(Ft)	(Each)
54+50		59+65	3	744	92	2	744	92	2



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

All temporary traffic control sign locations will be set in the field by the Contractor and verified by the Engineer prior to installation.

All temporary speed limit signs will have a minimum mounting height of 5 feet in rural locations, even when mounted on portable supports. Portable sign supports will not be located on sidewalks, bicycle facilities, or other areas designated for pedestrian or bicycle traffic.

All construction operations will 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 will be used, as determined by the Engineer.

Unless otherwise stated in these plans, work will not be allowed during hours of darkness.

Traffic Control Signs, as shown in the Estimate of Quantities, are estimates. Contractor's operation may require adjustments in quantities, either more or less. Payment will be for those signs actually ordered by the Engineer and used.

Fixed location signing placed more than 4 calendar days prior to the start of construction will be covered or laid down until the time of construction. The covers must be approved by the Engineer prior to installation. The cost of materials, labor, and equipment necessary to complete this work will be incidental to other contract items. No separate payment will be made.

All fixed location signs, sign posts, and breakaway bases will be removed within 7 calendar days following pavement marking.

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

TEMPORARY FLEXIBLE VERTICAL MARKERS (TABS)

Temporary flexible vertical markers (tabs) will be used for marking edge lines, and lane lines. Temporary flexible vertical markers (tabs) will be used on all new permanent surfacing sections of roadway and on existing surfacing where temporary marking locations are different than existing marking locations, unless noted or as directed by the Engineer.

All costs to furnish, install, replace if necessary, and remove the markers will be incidental to the contract unit price per foot for "Temporary Flexible Vertical Markers (Tabs)".

TABLE OF TEMPORARY FLEXIBLE VERTICAL MARKERS (TABS)

Standard Plate No.	Flexible Vertical Markers (Tabs) (Feet)
634.47	800
634.53	900
TOTAL	1700

SHEETING FOR TRAFFIC CONTROL SIGNS

All fluorescent orange background material on traffic control signs, all temporary delineators, and all temporary STOP (R1-1), YIELD (R1-2), DO NOT ENTER (R5-1), and WRONG WAY (R5-1a) signs will conform to the requirements of ASTM D4956 Type IX or XI. All other traffic control signs and background colors will conform to the requirements of ASTM D4956 Type IV.

INVENTORY OF TRAFFIC CONTROL DEVICES

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD			
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W1-4	REVERSE CURVE (L or R)	1	48" x 48"	16.0	16.0
W4-2	LEFT or RIGHT LANE ENDS (symbol)	1	48" x 48"	16.0	16.0
W9-3	CENTER LANE CLOSED AHEAD	1	48" x 48"	16.0	16.0
W13-1P	ADVISORY SPEED (plaque)	1	30" x 30"	6.3	6.3
W20-1	ROAD WORK AHEAD	4	48" x 48"	16.0	64.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	1	48" x 48"	16.0	16.0
W20-7	FLAGGER (symbol)	2	48" x 48"	16.0	32.0
G20-2	END ROAD WORK	3	36" x 18"	4.5	13.5
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			
		179.8			

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	018 B-492	6	29

SEQUENCE OF OPERATIONS

1. Set up traffic control to close right lane.
2. Install erosion control measures.
3. Complete culvert extensions.
4. Complete embankment for right turn lane.
5. Complete surfacing.
6. Install permanent pavement markings and permanent signing.
7. Remove traffic control devices.

REMOVE AND REPLACE TOPSOIL

Prior to beginning the construction of the turn lane embankment, a 4” depth of topsoil will be removed or bladed down the respective inslope and left in a windrow at the edge of the work limits. Following completion of construction, topsoil will be spread evenly over the disturbed areas.

All costs associated with removing and replacing the topsoil along areas to be resurfaced will be incidental to the contract lump sum price for “Remove and Replace Topsoil”.

MYCORRHIZAL INOCULUM

Mycorrhizal inoculum will 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 will provide certification of the fungal species claimed and the live propagule count. The inoculum will include the following fungal species:

- 25% Glomus intraradices
- 25% Glomus aggregatum or deserticola
- 25% Glomus mosseae
- 25% Glomus etunicatum

All seed will 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 will be incidental to the contract unit price per pound for the corresponding permanent seed mixture.

The mycorrhizal inoculum will 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>
AM 120 Multi Species Blend	Reforestation Technologies Int. Gilroy, CA Phone: 1-800-784-4769 <a href="http://www.reforest.com">www.reforest.com</a>

FERTILIZING

The Contractor will apply an all-natural slow release fertilizer prior to seeding or placing sod. The all-natural fertilizer will have a minimum guaranteed analysis of 4-4-4 and be USDA Certified BioBased. It should provide a minimum of 4% (N) nitrogen with a minimum water insoluble nitrogen (WIN) fraction of 2.07%, a minimum of 4% (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 will 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 will 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 will 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 will 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 will 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 with Type F Permanent Seed Mixture shall comprise of the newly graded 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	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

All costs for seeding including equipment, labor, and materials which include the water and seed, shall be incidental to the contract unit price per pound for “Type F Permanent Seed Mixture”.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	018 B-492	7	29

FIBER MULCHING

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

An additional 2% by weight of tackifier will be added to the fiber mulch product selected from the approved product list. If the product selected has guar gum tackifier included, then the additional 2% of tackifier will be guar gum. If the product selected has synthetic tackifier included, then the additional 2% of tackifier will be synthetic.

The Contractor will 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.

All costs for the additional tackifier added to the fiber mulch including labor, equipment, and materials will be incidental to the contract unit price per pound for “Fiber Mulching”.

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

<http://sddot.com/business/certification/products/Default.aspx>

TABLE OF SEEDING, FIBER MULCH, & FERTILIZING

		Area (Acres)	Type F Seed Mixture (Lb)	Fiber Mulch (Lb)	Fertilizing (Lb)
Sta. 54+50	Sta. 59+65	0.5	13	1000	750

EROSION CONTROL WATTLE

Erosion control wattles for restraining the flow of runoff and sediment shall be installed at locations noted in the table and at locations determined by the Engineer during construction. Refer to Standard Plate 734.06 for details.

The Contractor shall provide certification that the erosion control wattles do not contain noxious weed seeds.

Erosion control wattles will remain on the project to decompose.

The erosion control wattle provided will be from the approved product list. The approved product list for erosion control wattle may be viewed at the following internet site:

http://sddot.com/business/certification/products/Default.aspx

TABLE OF EROSION CONTROL WATTLE

Station	L/R	Diameter (Inch)	Location	Quantity (Ft)
54+50 to 59+65	R	12	Perimeter Control	550

LOW FLOW SILT FENCE

The low flow silt fence fabric provided will be from the approved product list. The approved product list for low flow silt fence may be viewed at the following internet site:

http://sddot.com/business/certification/products/Default.aspx

Low flow silt fence will be placed at the locations noted in the table and at locations that will minimize siltation of adjacent streams, lakes, dams, or drainage areas as determined by the Engineer during construction. Refer to Standard Plate 734.04 for details.

TABLE OF LOW FLOW SILT FENCE

Station	L/R	Location	Quantity (Ft)
59+30	R	Inlet End of Pipe	100

REMOVE AND RESET LUMINAIRE POLE

Existing luminaire pole EL30 shall be removed and reset as REL30 as shown on the plan sheet. The Contractor shall coordinate with the pole manufacturer to determine the necessary anchor rod dimensions to conform to Section 972.2 C of Specifications. Manufacturer certification of the anchor rod design shall be provided to the Engineer.

It shall be the Contractor's responsibility to obtain the bolt circle pattern for the relocated pole from the pole manufacturer listed below. The poles were originally installed under Project NH 018B(01)38, Drawing No. 10B471.

Millerbernd Manufacturing  
P.O. Box 98  
Winsted, MN 55395  
Phone: (320) 485-2111

Luminaire pole and luminaire 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 pole including new anchor bolts with associated hardware, shall be incidental to the contract unit price per each for "Remove and Reset Luminaire Pole".

TABLE OF FOOTING DATA

Site Designation	Footing Diameter	* Footing Depth	**Spiral Diameter	**Spiral Length	Vertical Reinforcement
L30	2' - 0"	9' - 0"	1' - 8"	60' - 0"	8-#7 x 8' - 6"

- \* Footing depth shall be below ground level.  
\*\* The size of all spirals shall be #3.

REMOVE LUMINAIRE POLE FOOTING

The footing of the existing luminaire pole EL30 will be removed by the Contractor to a minimum of 2' below the ground surface. Restoration of the disturbed area will be to the satisfaction of the Engineer.

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

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	018 B-492	8	29

SUBSURFACE

Subsurface soils consist of the following:

Red clay-silt with sand containing thin seams to massive beds of gypsum (Spearfish Formation). Borings conducted within this zone were dry and caved between 10.6 and 11.2 feet below the surface.

The Spearfish Formation at this project location contains thin seams to massive beds of gypsum. It is likely that some gypsum will be encountered during the drilling of the footings. It is anticipated that the gypsum may need to be prebored with a smaller diameter bit then drilled to the final footing diameter.

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.

Concrete shall not be dropped through standing water. If water is present in the excavation it shall be removed prior to concrete placement or the concrete shall be tremied.

CONDUIT BETWEEN JUNCTION BOX AND LUMINAIRE POLE

The Contractor shall install 2" rigid conduit to intercept existing conduit north of the relocated luminaire pole REL30 as indicated on the plan sheet.

No spice shall be allowed between the junction box EJL14 and the luminaire pole REL30. The Contractor shall install new #6 AWG wire between the junction box and the luminaire pole to energize REL30.

All work involved with installing new conduit to intercept the existing conduit shall be incidental to the contract unit price per each for "2" Rigid Conduit Schedule 80".

WIRE SPLICING FOR LIGHTING

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

TABLE OF CONDUIT AND LIGHTING

		Rigid Conduit Schedule 80 2"	Copper Wire 1/C #6	2' Diameter Footing	Remove Luminaire Pole Footing Each	Remove and Reset Luminaire Pole Each
Location to Location		Ft	Ft	Ft		
EJL14	REL30	35	340			
EL30	REL30			9	1	1
TOTAL		35	340	9	1	1



CONTROL DATA

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	018 B-492	9	29

HORIZONTAL AND VERTICAL CONTROL POINTS						
POINT	STATION	OFFSET	DESCRIPTION	NORTHING	EASTING	ELEVATION
CP1	21+64	47' R	5/8" Rebar with Aluminum Cap	413974.981	1130216.035	3598.820

HORIZONTAL ALIGNMENT DATA

US 18B

Type	Station			Northing	Easting
POB	46+32.00			412633.101	1132288.006
		TL= 1381.09	S 62°48'10" E		
POE	60+13.09			412001.869	1133516.404

SD 71

Type	Station			Northing	Easting
POB	0+00.00			412001.869	1133516.404
		TL= 145.97	S 36°17'16" W		
POE	1+45.97			411884.213	1133430.016

The coordinates shown on this sheet are based on the South Dakota State Plane Coordinate System. South Zone (NAD 83/2011); epoch 2010.00  
Geoid 12A; SF = 0.9997475259

Plot Scale - 1:200

Plotted From - TRR011626

Plot Scale - 1:200

LEGEND

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	018 B-492	10	29

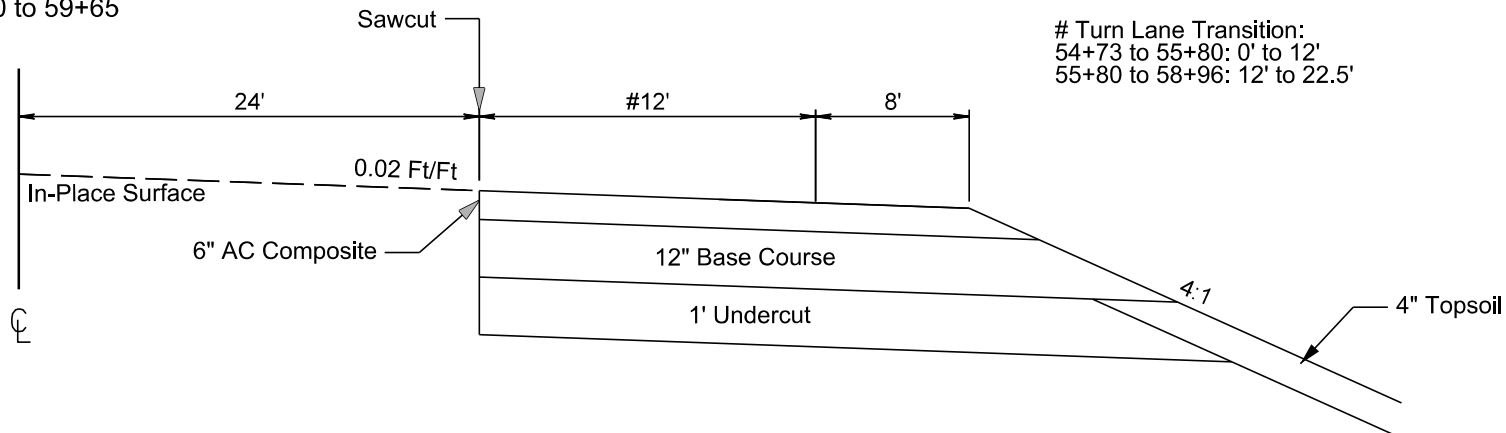
Plotting Date: 04/16/2019

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

Plot Scale - 1:40

Plotted From - TRR011626

US18B Turning Lane  
54+50 to 59+65



# Turn Lane Transition:  
54+73 to 55+80: 0' to 12'  
55+80 to 58+96: 12' to 22.5'

59+30 - 111' R  
Install Bank and Channel  
Protection Gabions (42 CuYd)  
and Type B Drainage Fabric  
(109 SqYd)

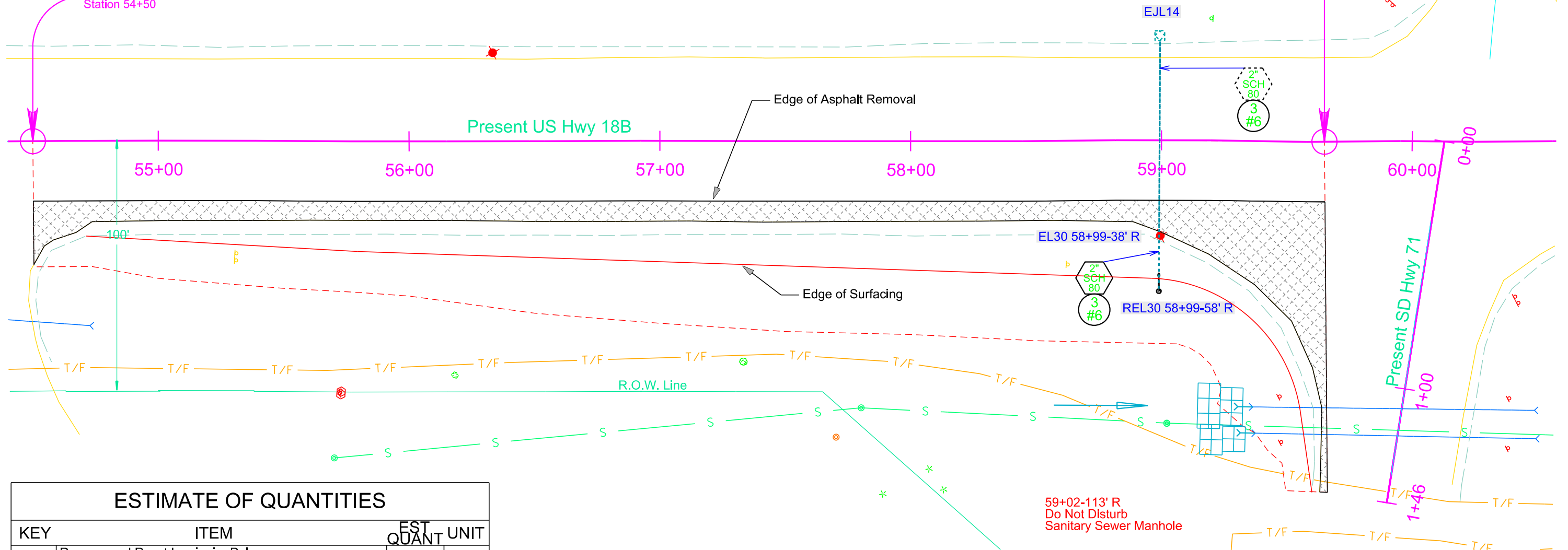
59+30 - 106' R  
Remove for Reset  
& Reset 84" RCP End Section  
& Install 84" - 6' RCP

59+31 - 116' R  
Remove for Reset  
& Reset 84" RCP End Section  
& Install 84" - 6' RCP

Remove Sign for Reset  
& Reset Sign at the  
following locations:  
55+30 - 54' R  
58+62 - 70' R

END 018 B-492  
Station 59+65 (US 18B)  
Station 1+46 (SD 71)

BEGIN 018 B-492  
Station 54+50



## ESTIMATE OF QUANTITIES

KEY	ITEM	EST QUANT	UNIT
	Remove and Reset Luminaire Pole (REL30)	1	EACH
	Remove Luminaire Pole Footing (EL30)	1	EACH
	2' Diameter Footing (REL30)	9	FT
	2" Rigid Conduit, Schedule 80	35	FT
	1/C #6 AWG Copper Wire	340	FT

Remove Asphalt Concrete Pavement

STATE OF SOUTH DAKOTA	PROJECT 018 B-492	SHEET 11	TOTAL SHEETS 29
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Plotting Date: 04/16/2019

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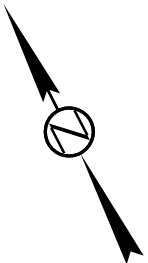
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Plotted From - TRRC11626

# INTERSECTION LAYOUT & PAVEMENT MARKING

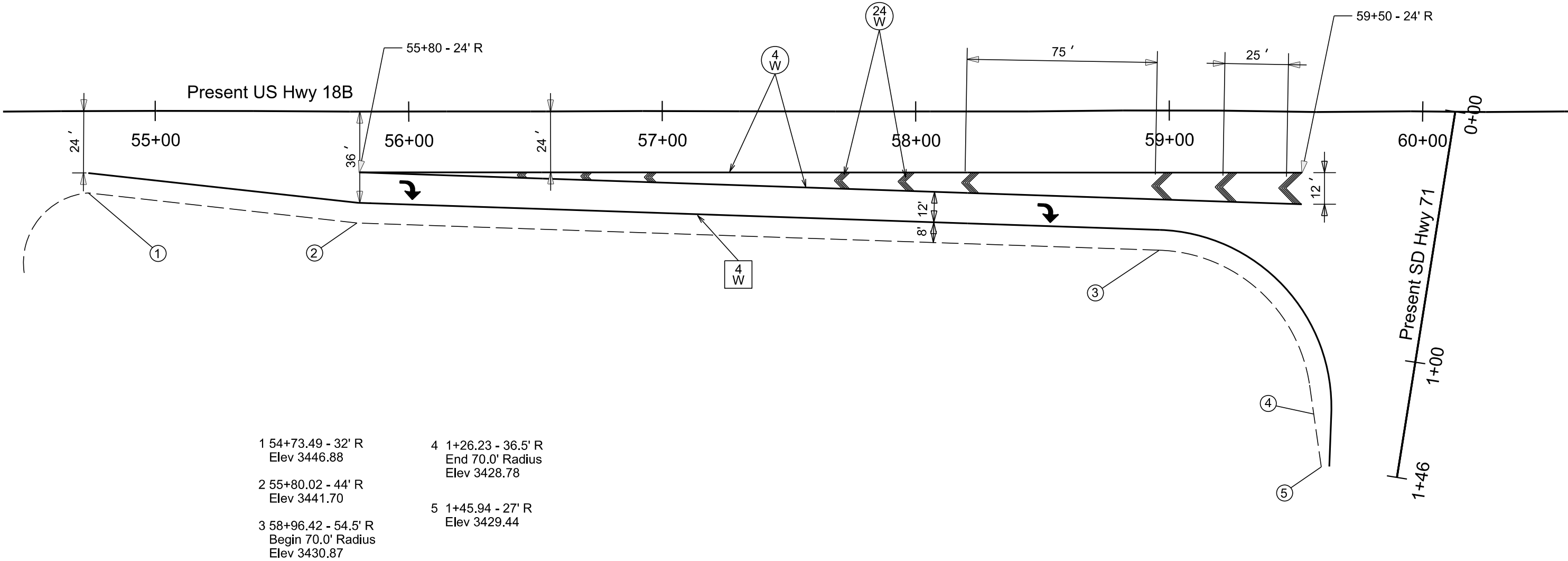
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	018 B-492	12	29

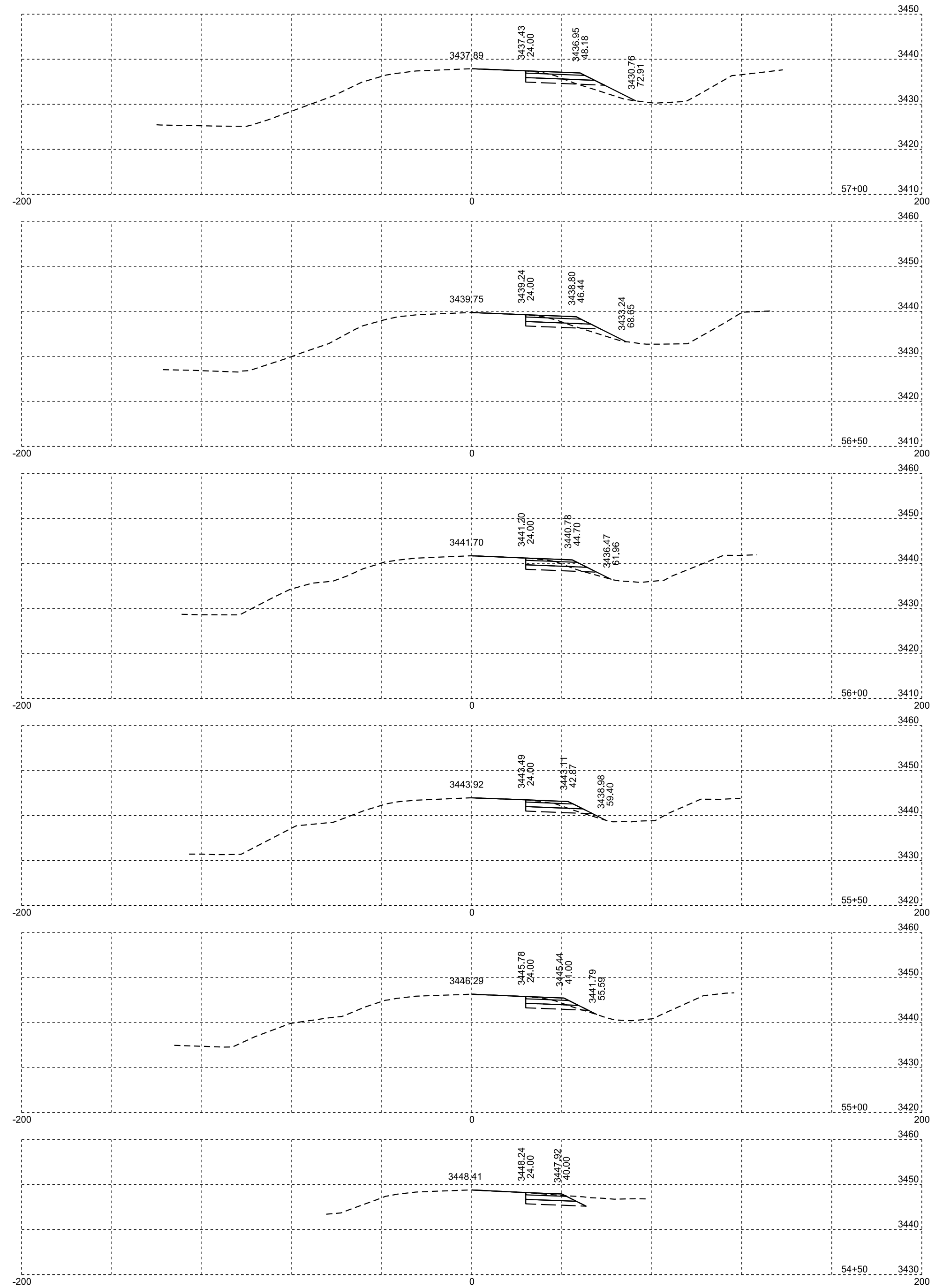
Plotting Date: 04/16/2019



— — — Edge of Surfacing

ESTIMATE OF QUANTITIES			
KEY	ITEM	EST QUANT	UNIT
	Waterborne Pavement Marking Paint with High Grade Polymer, 4" White	3	GAL
	Cold Applied Plastic Pavement Marking, 4" White	744	FT
	Cold Applied Plastic Pavement Marking, 24" White	92	FT
	Cold Applied Plastic Pavement Marking, Arrow (Right)	2	EACH
	Grooving For Cold Applied Plastic Pavement Marking, 4"	744	FT
	Grooving For Cold Applied Plastic Pavement Marking, 24"	92	FT
	Grooving For Cold Applied Plastic Pavement Marking, Arrow (Right)	2	EACH



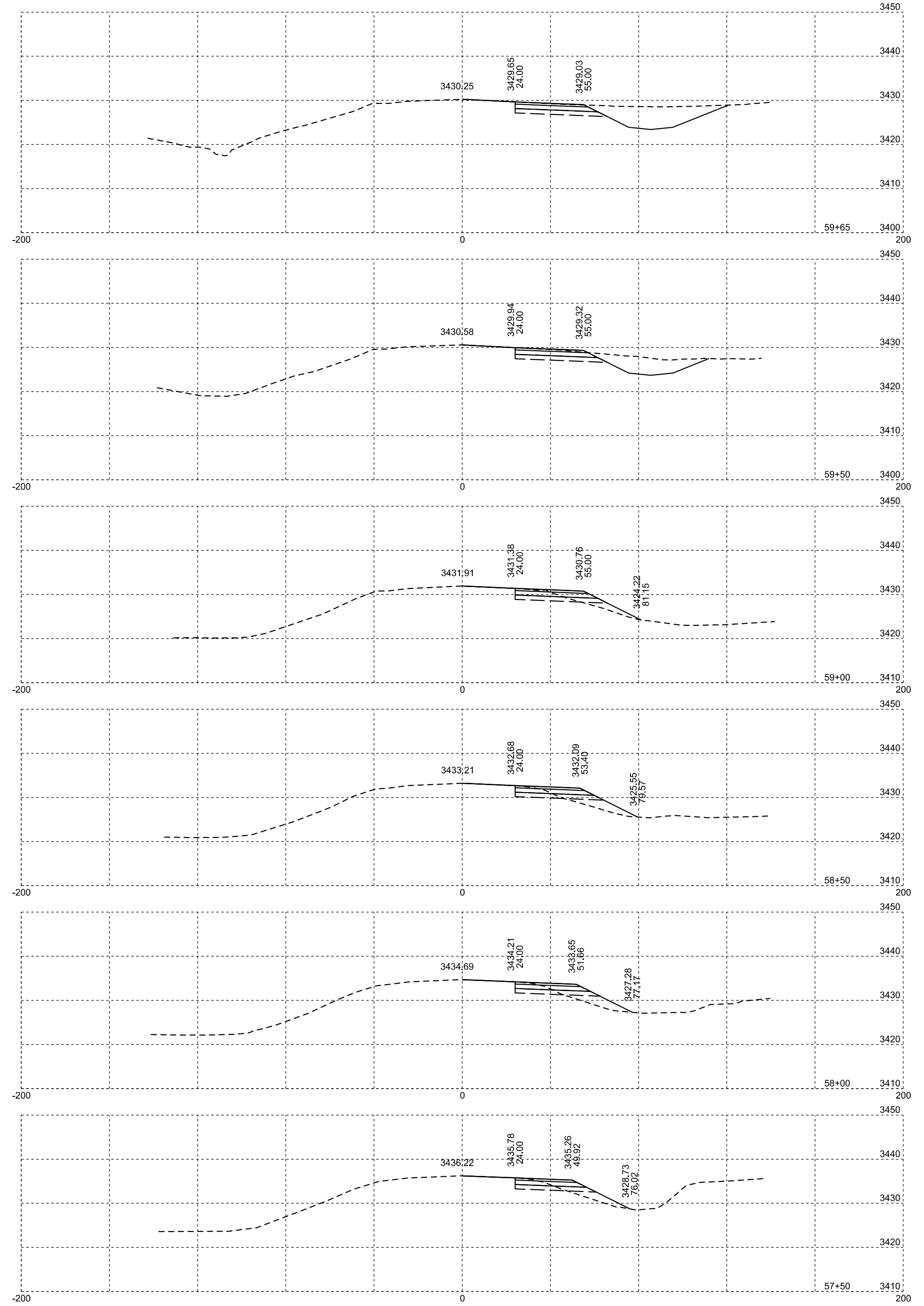


US 18B

Plotting Date: 04/16/2019

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	018 B-492	13	29

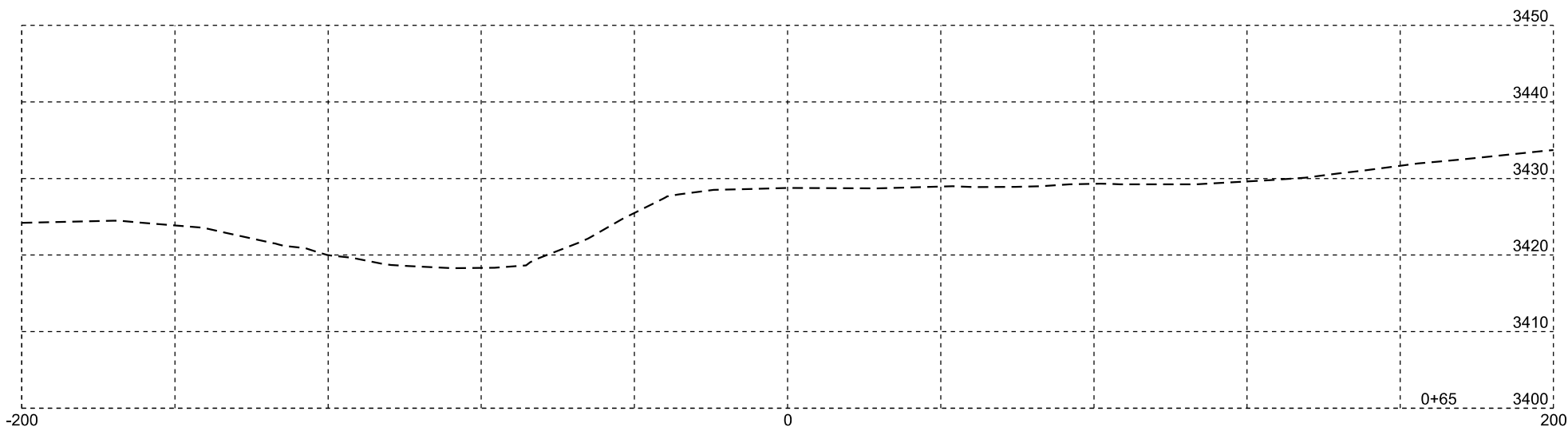
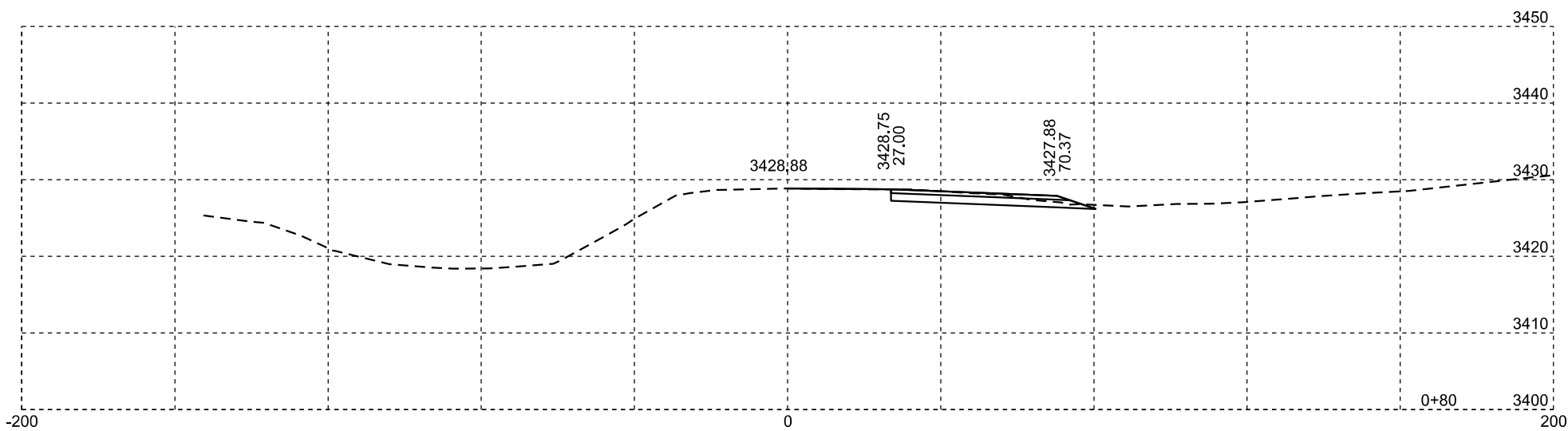
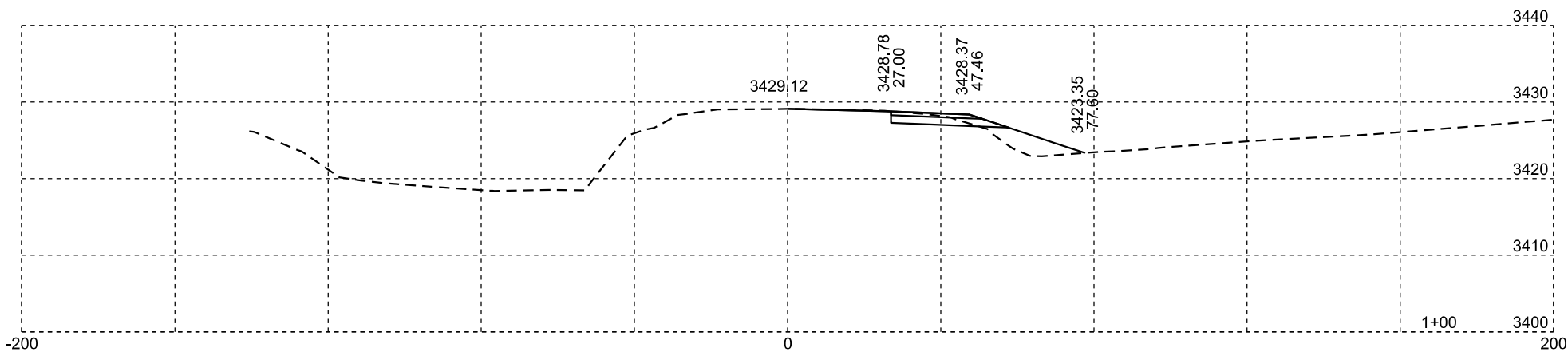
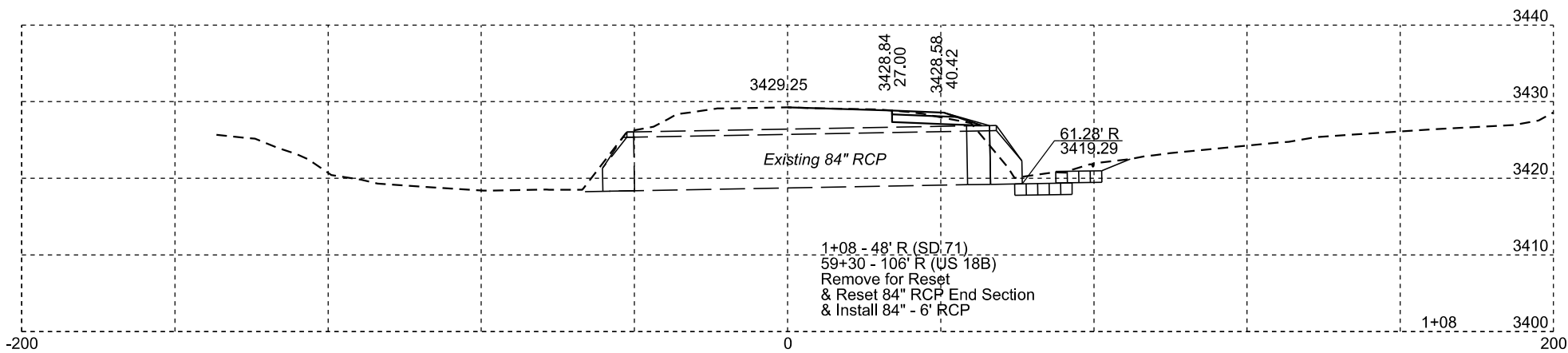
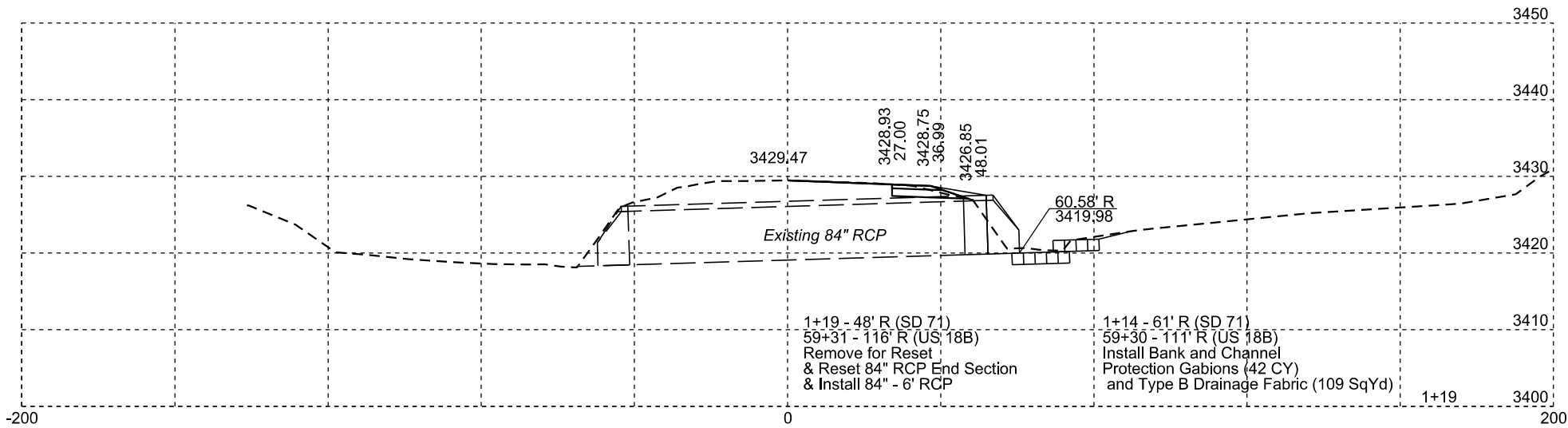
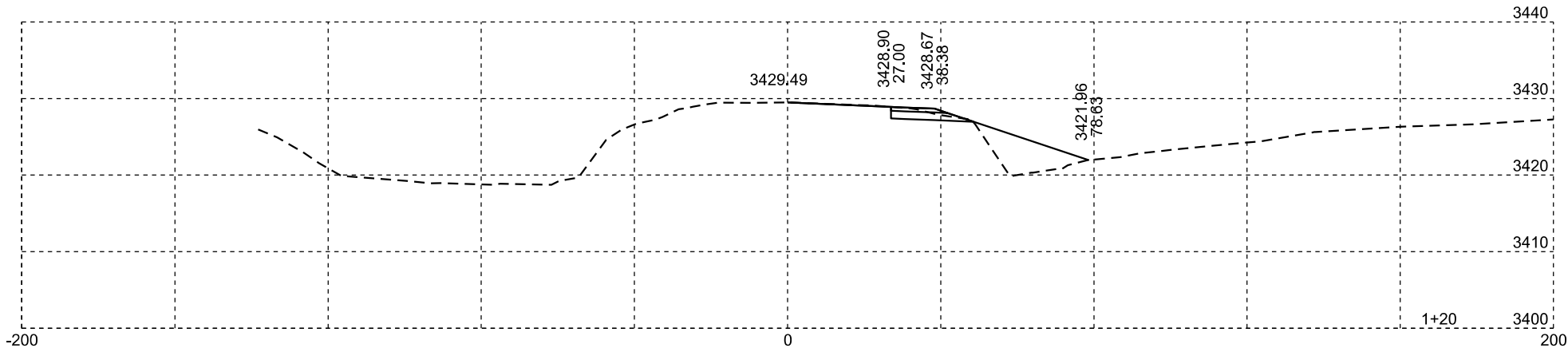




US 18B

Plotting Date: 04/16/2019

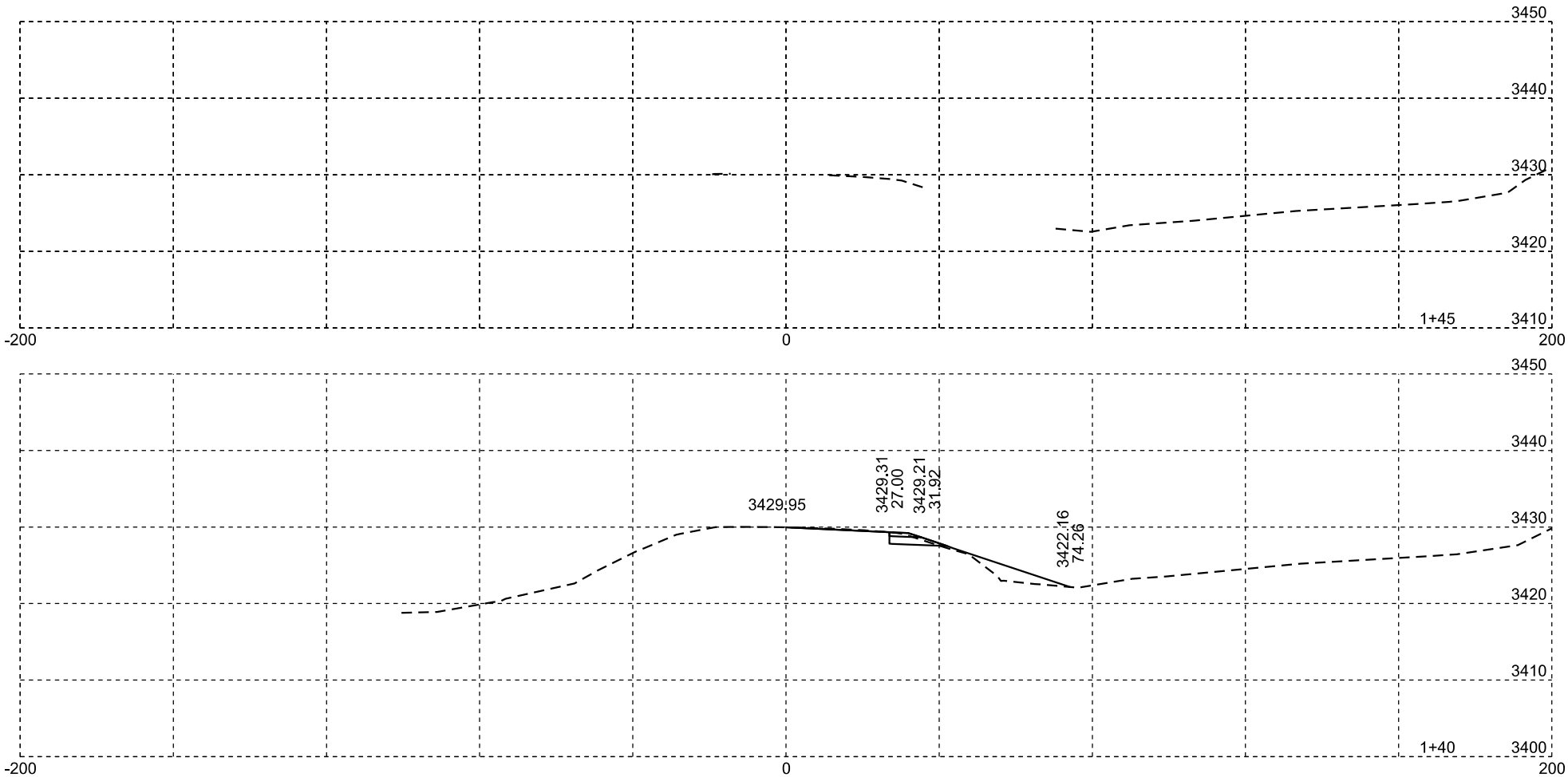
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
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SD 71

Plotting Date: 04/16/2019

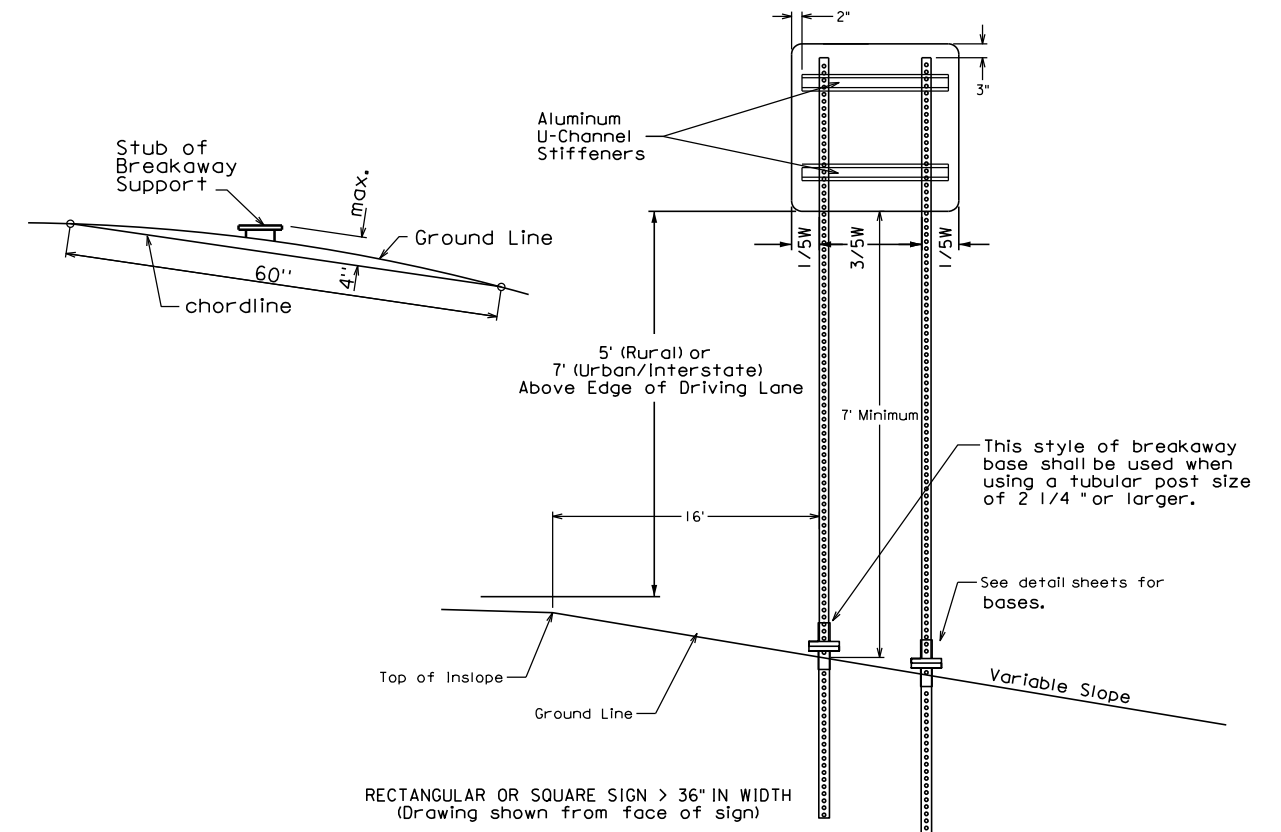
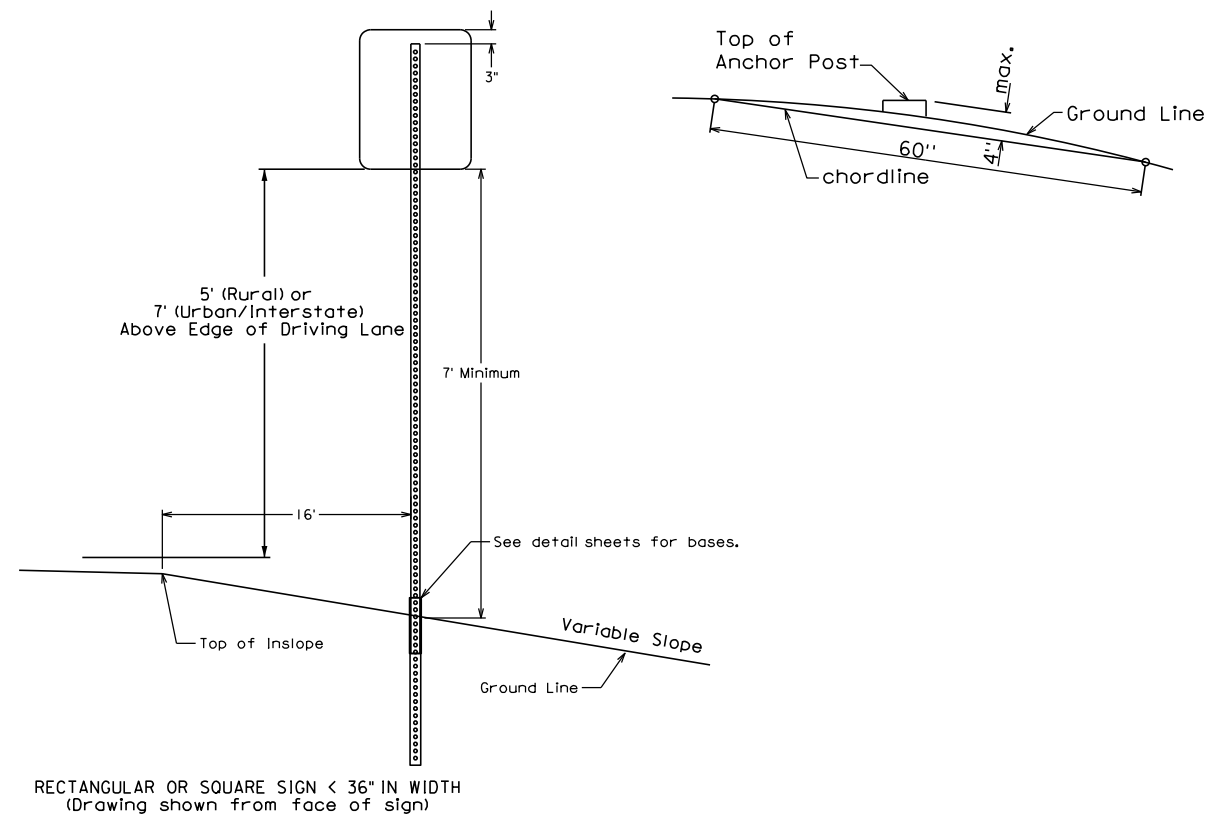
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	018 B-492	16	29



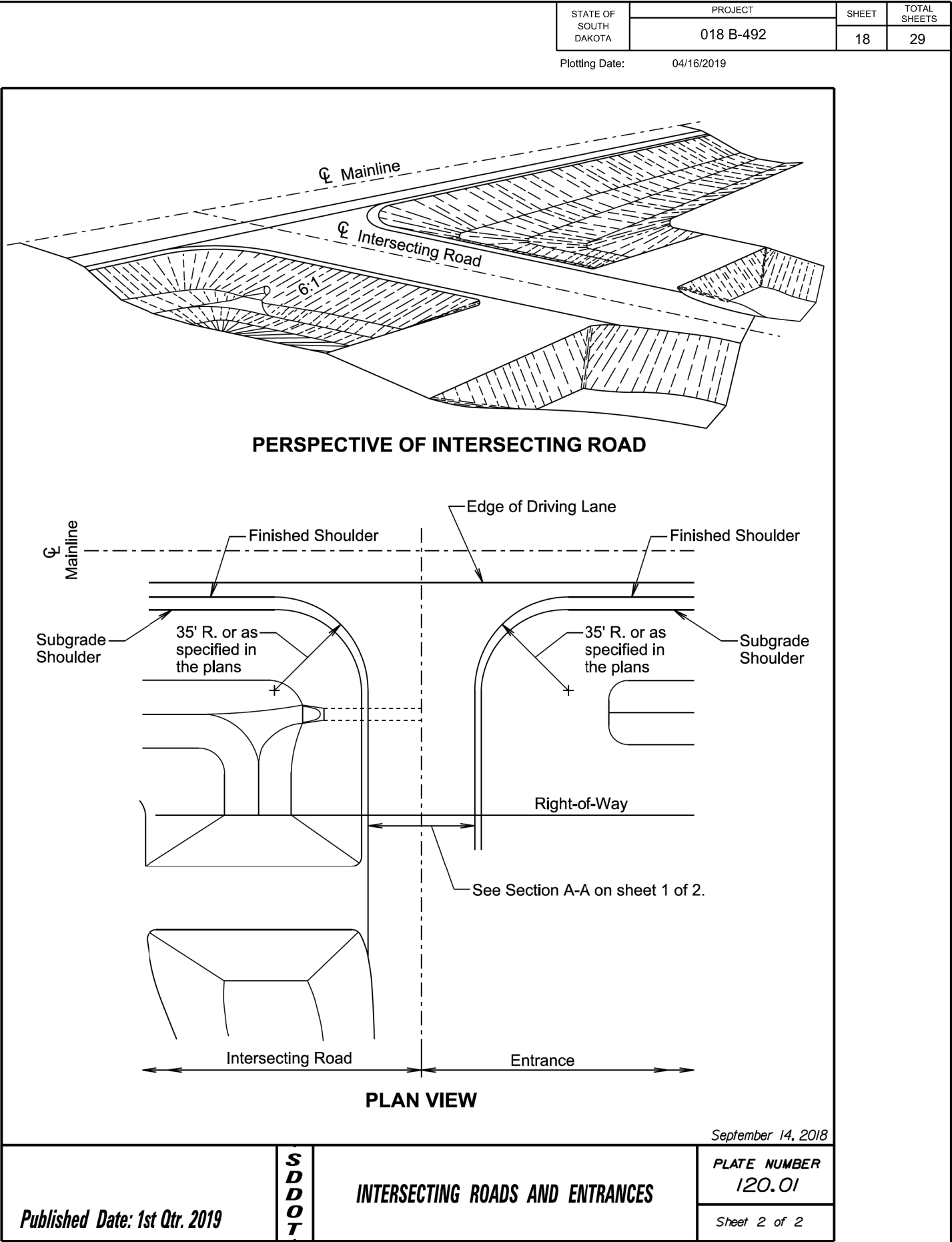
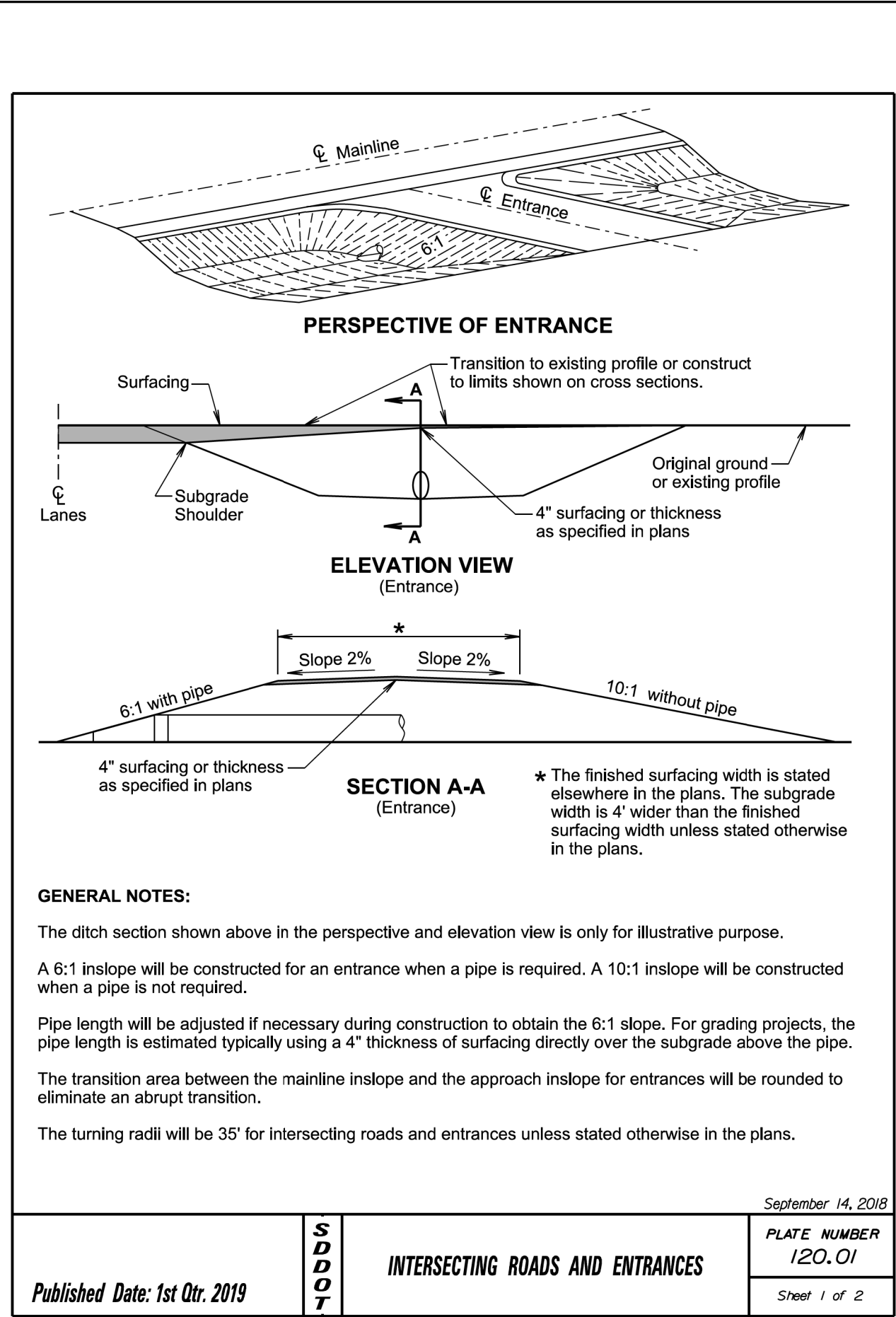
# INSTALLATION DETAILS FOR MULTIPLE SIGN ASSEMBLIES

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	018 B-492	17	29

Plotting Date: 04/16/2019

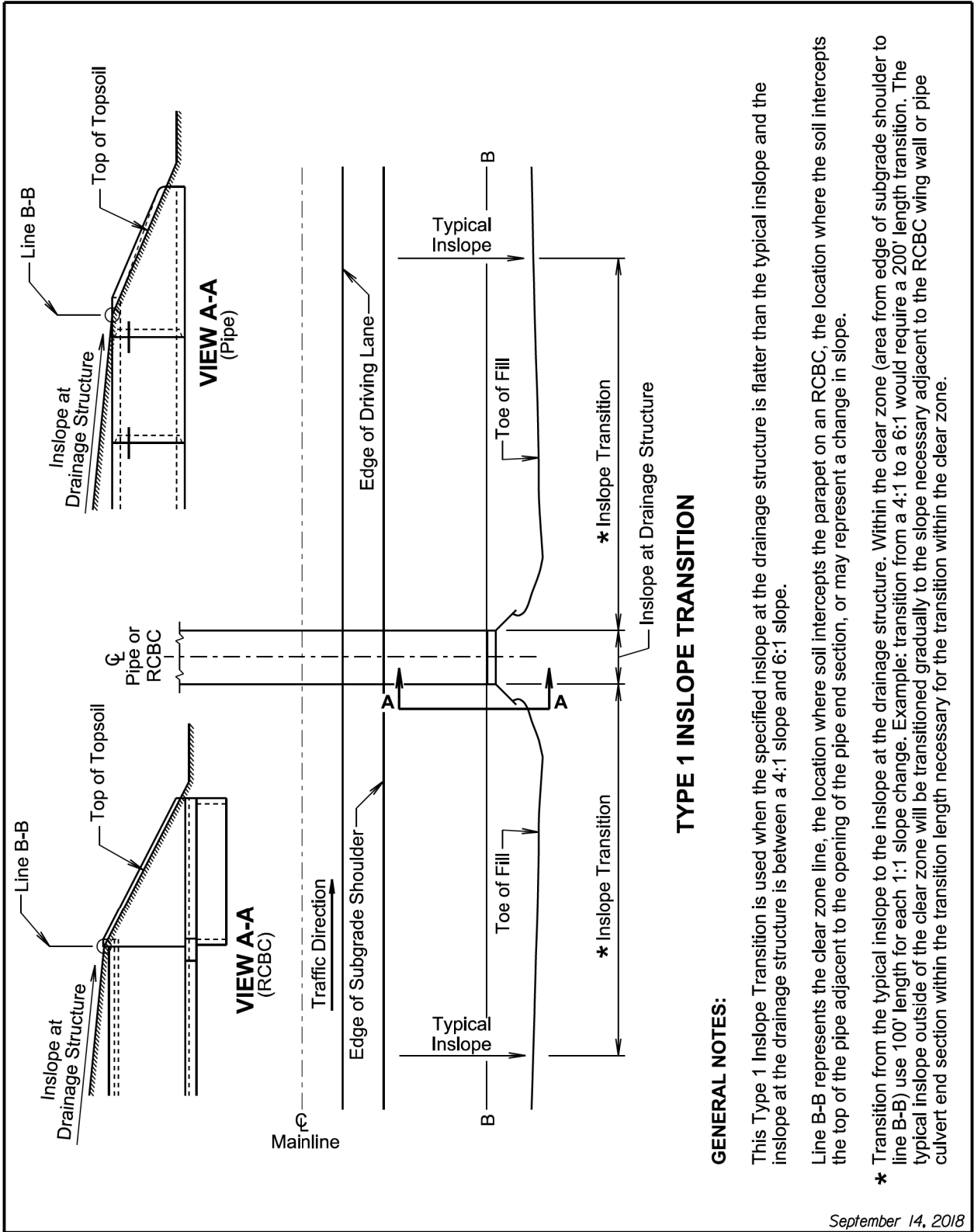


**TYPICAL ERECTION DETAILS FOR SQUARE  
OR RECTANGULAR SIGNS**





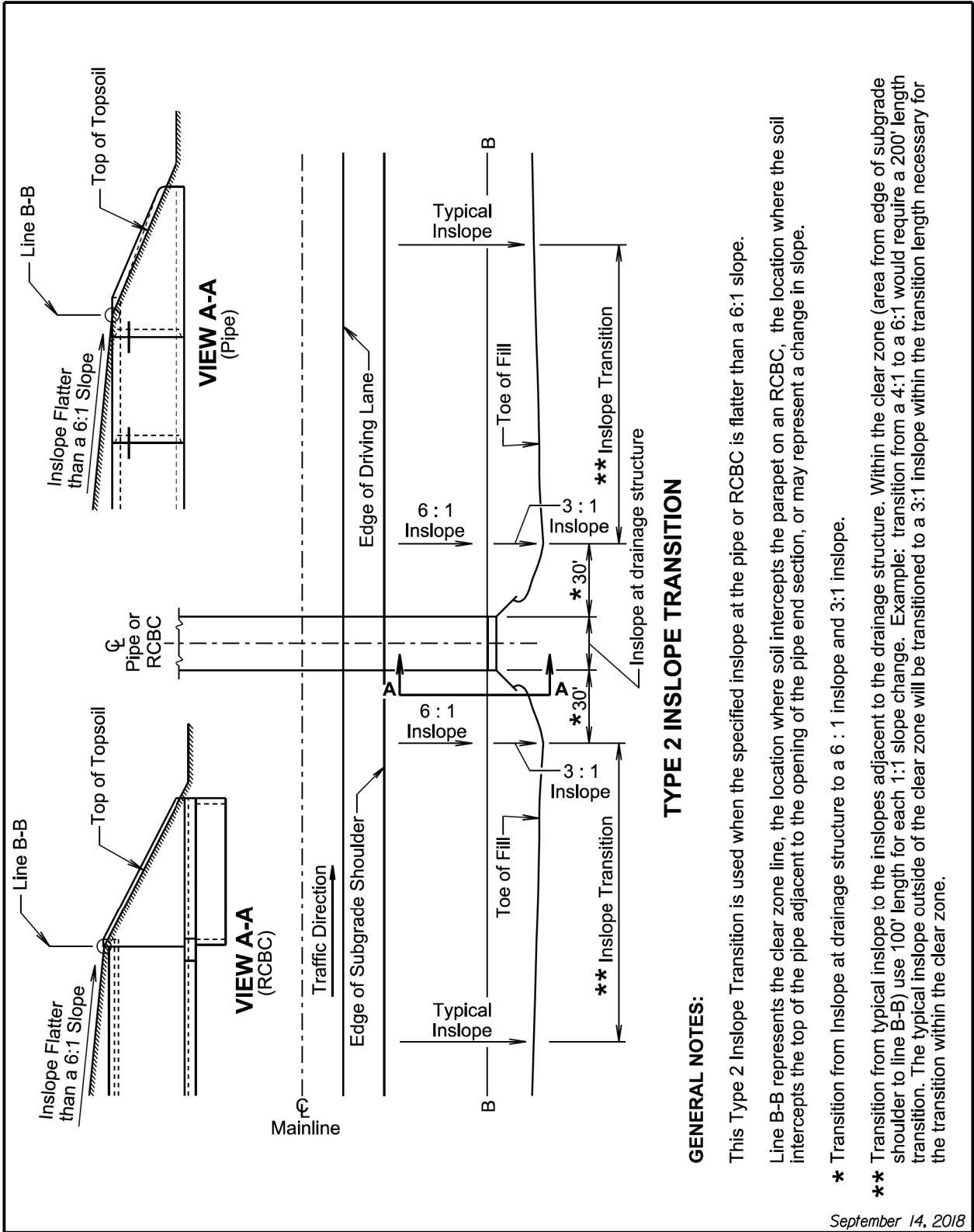
Published Date: 1st Qtr. 2019	SDOT	INSLOPE TRANSITIONS AT PIPE CULVERTS OR REINFORCED CONCRETE BOX CULVERTS	PLATE NUMBER 120.05
			Sheet 1 of 2
			September 14, 2018



GENERAL NOTES:

- This Type 1 Inslope Transition is used when the specified inslope at the drainage structure is flatter than the typical inslope and the inslope at the drainage structure is between a 4:1 slope and 6:1 slope.
- Line B-B represents the clear zone line, the location where soil intercepts the parapet on an RCBC, the location where the soil intercepts the top of the pipe adjacent to the opening of the pipe end section, or may represent a change in slope.
- \* Transition from the typical inslope to the inslope at the drainage structure. Within the clear zone (area from edge of subgrade shoulder to line B-B) use 100' length for each 1:1 slope change. Example: transition from a 4:1 to a 6:1 would require a 200' length transition. The typical inslope outside of the clear zone will be transitioned gradually to the slope necessary adjacent to the RCBC wing wall or pipe culvert end section within the transition length necessary for the transition within the clear zone.

Published Date: 1st Qtr. 2019	SDOT	INSLOPE TRANSITIONS AT PIPE CULVERTS OR REINFORCED CONCRETE BOX CULVERTS	PLATE NUMBER 120.05
			Sheet 2 of 2
			September 14, 2018

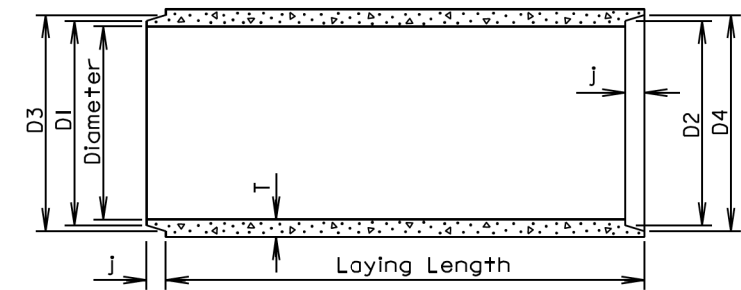


GENERAL NOTES:

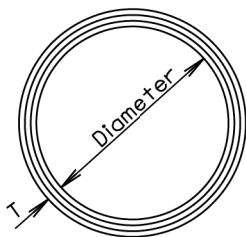
- This Type 2 Inslope Transition is used when the specified inslope at the pipe or RCBC is flatter than a 6:1 slope.
- Line B-B represents the clear zone line, the location where soil intercepts the parapet on an RCBC, the location where the soil intercepts the top of the pipe adjacent to the opening of the pipe end section, or may represent a change in slope.
- \* Transition from inslope at drainage structure to a 6 : 1 inslope and 3:1 inslope.
  - \*\* Transition from typical inslope to the inslopes adjacent to the drainage structure. Within the clear zone (area from edge of subgrade shoulder to line B-B) use 100' length for each 1:1 slope change. Example: transition from a 4:1 to a 6:1 would require a 200' length transition. The typical inslope outside of the clear zone will be transitioned to a 3:1 inslope within the transition length necessary for the transition within the clear zone.

TOLERANCES IN DIMENSIONS

Diameter:  $\pm 1.5\%$  for 24" Dia. or less and  $\pm 1\%$  or  $\frac{3}{8}"$  whichever is more for 27" Dia. or greater.  
Diameters at joints:  $\pm \frac{3}{16}"$  for 30" Dia. or less and  $\pm \frac{1}{4}"$  for 36" or greater.  
Length of joint (J):  $\pm \frac{1}{4}"$ .  
Wall thickness (T): not less than design T by more than 5% or  $\frac{3}{16}"$ , whichever is greater.  
Laying length: shall not underrun by more than  $\frac{1}{2}"$ .



LONGITUDINAL SECTION



END VIEW

GENERAL NOTES:

Construction of R.C.P. shall conform to the requirements of Section 990 of the Specifications.  
Not more than 2 four-foot sections shall be permitted near the ends of any culvert. Four-foot lengths shall be used only to secure the required length of culvert.

Diam. (in.)	Approx. Wt. /Ft. (lb.)	T (in.)	J (in.)	D1 (in.)	D2 (in.)	D3 (in.)	D4 (in.)
12	92	2	1 3/4	13 1/4	13 5/8	13 7/8	14 1/4
15	127	2 1/4	2	16 1/2	16 7/8	17 1/4	17 5/8
18	168	2 1/2	2 1/4	19 5/8	20	20 3/8	20 3/4
21	214	2 3/4	2 1/2	22 7/8	23 1/4	23 3/4	24 1/8
24	265	3	2 3/4	26	26 3/8	27	27 3/8
27	322	3 1/4	3	29 1/4	29 5/8	30 1/4	30 5/8
30	384	3 1/2	3 1/4	32 3/8	32 3/4	33 1/2	33 7/8
36	524	4	3 3/4	38 3/4	39 1/4	40	40 1/2
42	685	4 1/2	4	45 1/8	45 5/8	46 1/2	47
48	867	5	4 1/2	51 1/2	52	53	53 1/2
54	1070	5 1/2	4 1/2	57 7/8	58 3/8	59 3/8	59 7/8
60	1296	6	5	64 1/4	64 3/4	66	66 1/2
66	1542	6 1/2	5 1/2	70 5/8	71 1/8	72 1/2	73
72	1810	7	6	77	77 1/2	79	79 1/2
78	2098	7 1/2	6 1/2	83 3/8	83 7/8	85 5/8	86 1/8
84	2410	8	7	89 3/4	90 1/4	92 1/8	92 5/8
90	2740	8 1/2	7	95 3/4	96 1/4	98 7/8	98 5/8
96	2950	9	7	102 5/8	102 5/8	104 1/2	105
102	3075	9 1/2	7 1/2	109	109 1/2	111 1/2	112
108	3870	10	7 1/2	115 1/2	116	118	118 1/2

June 26, 2015

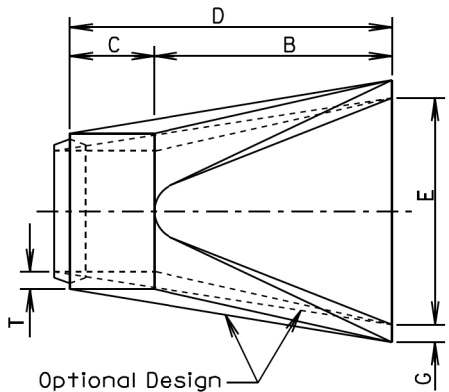
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REINFORCED CONCRETE PIPE

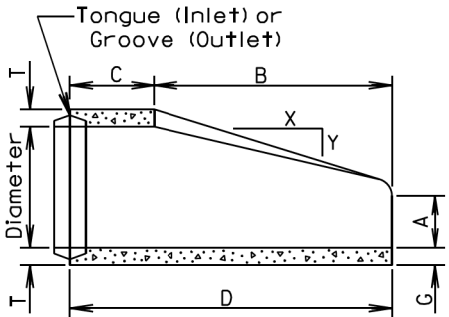
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450.01

Sheet 1 of 1

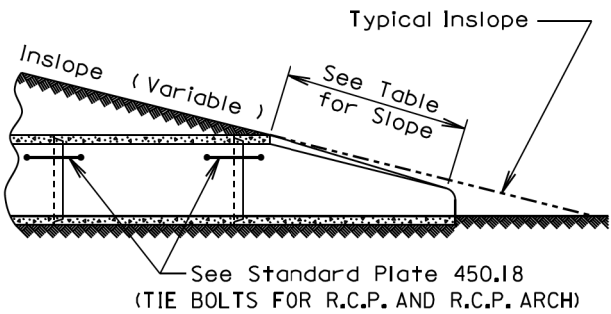
Published Date: 1st Qtr. 2019



TOP VIEW



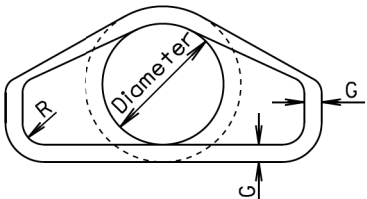
LONGITUDINAL SECTION



SLOPE DETAIL

GENERAL NOTES:

Lengths of concrete pipe shown on plan sheets are between flared ends only.  
Construction of R.C.P. Flared End shall conform to the requirements of Section 990 of the Specifications.



END VIEW

Dia. (in.)	Approx. Wt. of Section (lbs.)	Approx. Slope (X to Y)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	G (in.)	R (in.)
12	530	2.4: 1	2	4	24	48 7/8	72 7/8	24	2	1 1/2
15	740	2.4: 1	2 1/4	6	27	46	73	30	2 1/4	1 1/2
18	990	2.3: 1	2 1/2	9	27	46	73	36	2 1/2	1 1/2
21	1280	2.4: 1	2 3/4	9	36	37 1/2	73 1/2	42	2 3/4	1 1/2
24	1520	2.5: 1	3	9 1/2	43 1/2	30	73 1/2	48	3	1 1/2
27	1930	2.5: 1	3 1/4	10 1/2	49 1/2	24	73 1/2	54	3 1/4	1 1/2
30	2190	2.5: 1	3 1/2	12	54	19 3/4	73 3/4	60	3 1/2	1 1/2
36	4100	2.5: 1	4	15	63	34 3/4	97 3/4	72	4	1 1/2
42	5380	2.5: 1	4 1/2	21	63	35	98	78	4 1/2	1 1/2
48	6550	2.5: 1	5	24	72	26	98	84	5	1 1/2
54	8240	2: 1	5 1/2	27	65	33 1/4	98 1/4	90	5 1/2	1 1/2
60	8730	1.9: 1	6	35	60	39	99	96	5	1 1/2
66	10710	1.7: 1	6 1/2	30	72	27	99	102	5 1/2	1 1/2
72	12520	1.8: 1	7	36	78	21	99	108	6	1 1/2
78	14770	1.8: 1	7 1/2	36	90	21	111	114	6 1/2	1 1/2
84	18160	1.6: 1	8	36	90 1/2	21	111 1/2	120	6 1/2	1 1/2
90	20900	1.5: 1	8 1/2	41	87 1/2	24	111 1/2	132	6 1/2	6

June 26, 2015

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R. C. P. FLARED ENDS

PLATE NUMBER  
450.10

Sheet 1 of 1

Published Date: 1st Qtr. 2019



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

\* Spacing is 40' for 42" cones.

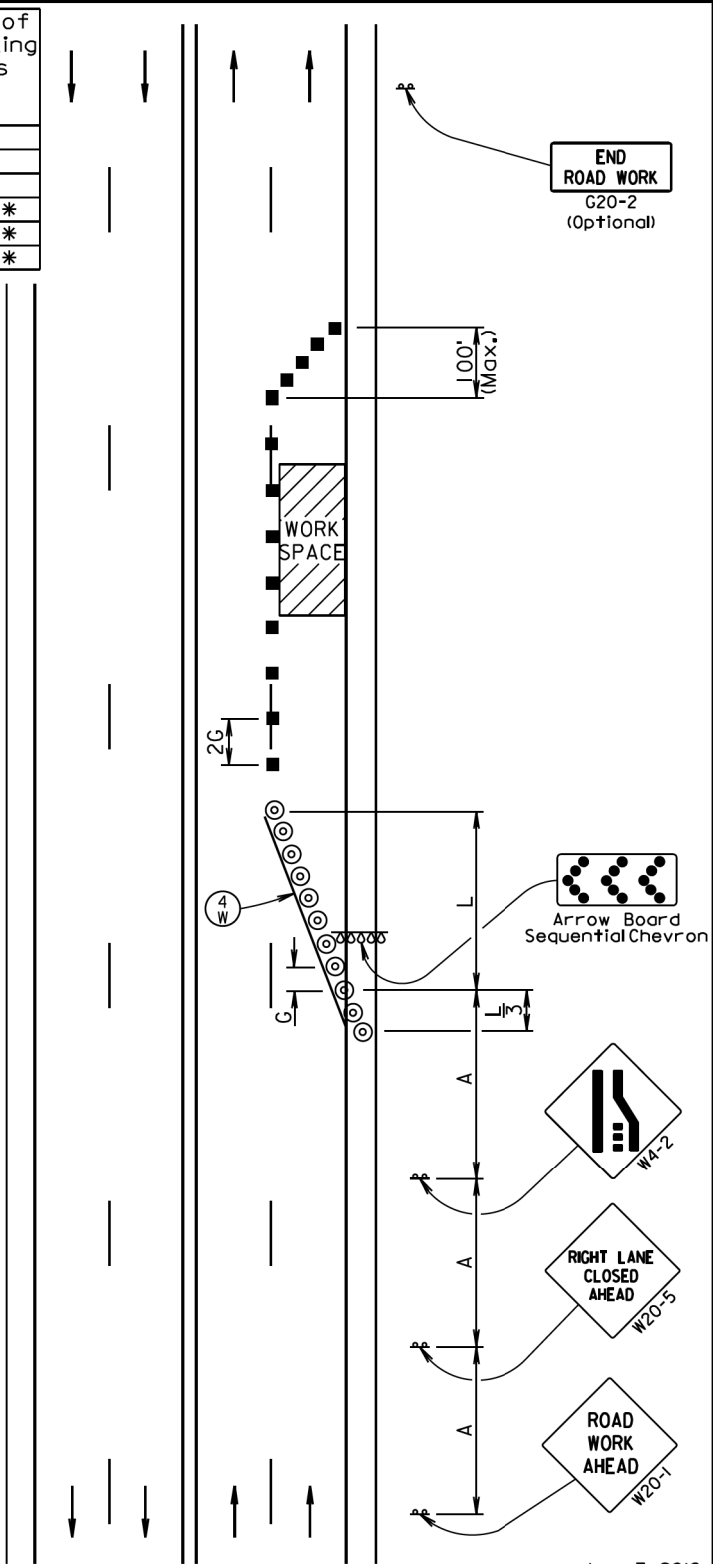
- ⊙ Reflectorized Drum
- Channelizing Device
- ④ 4" White Temporary Pavement Marking

The channelizing devices shall be 42" cones or drums.

42" cones may be used in place of the drums shown in the taper if setup will not be used during night time hours.

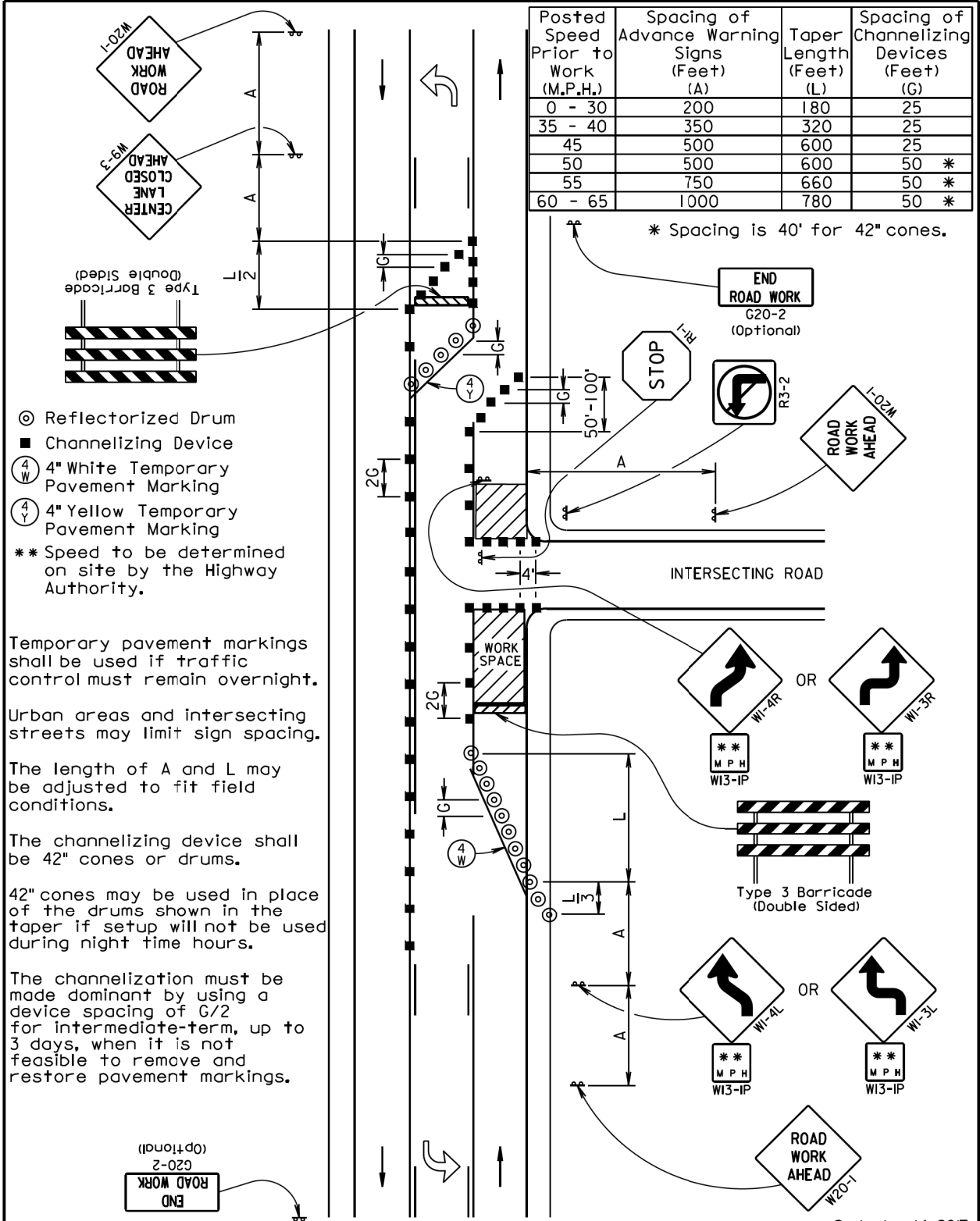
Temporary pavement markings shall be used if traffic control must remain overnight.

The length of A and L may be adjusted to fit field conditions.



June 3, 2016

Published Date: 1st Qtr. 2019	S D D O T	GUIDES FOR TRAFFIC CONTROL DEVICES 4-LANE UNDIVIDED, RIGHT LANE CLOSED	PLATE NUMBER 634.47
		Sheet 1 of 1	

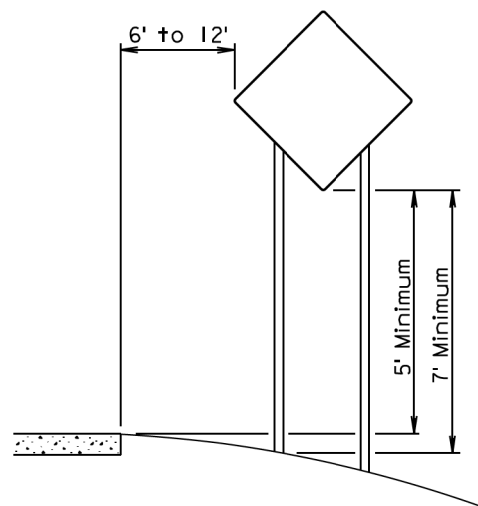


September 14, 2017

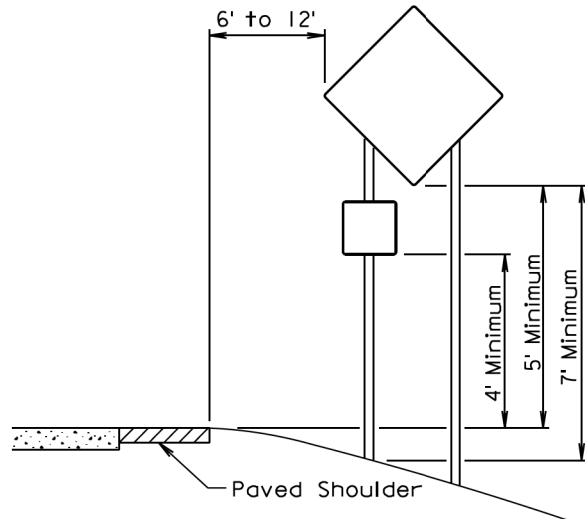
Published Date: 1st Qtr. 2019	S D D O T	GUIDES FOR TRAFFIC CONTROL DEVICES 3-LANE, OUTSIDE LANE CLOSED	PLATE NUMBER 634.53
		Sheet 1 of 1	

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	018 B-492	23	29

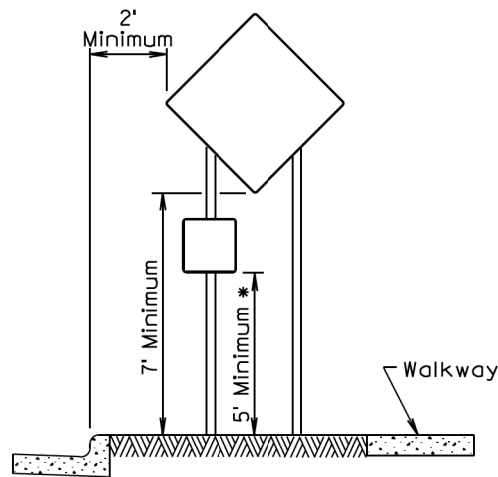
Plotting Date: 04/16/2019



RURAL DISTRICT

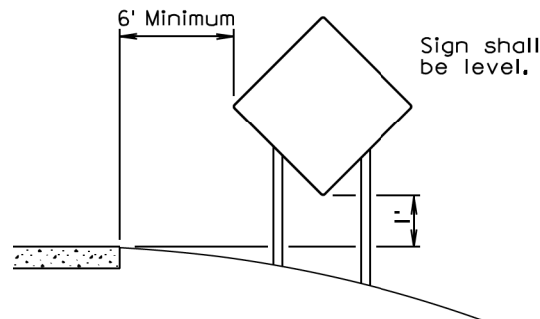


RURAL DISTRICT WITH  
SUPPLEMENTAL PLATE



URBAN DISTRICT

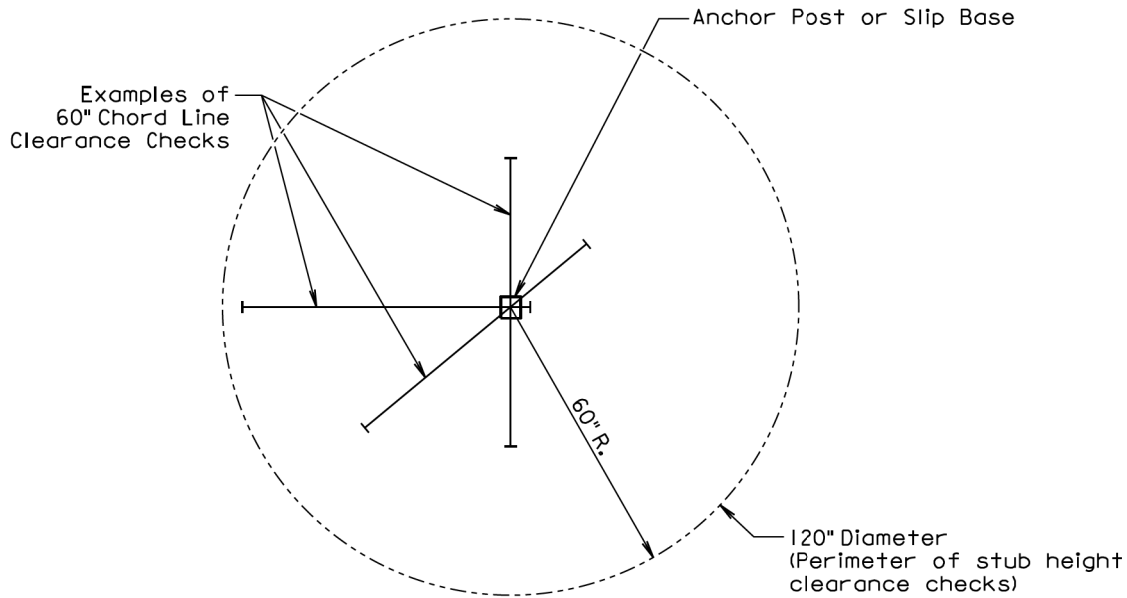
\* If the bottom of supplemental plate is mounted lower than 7 feet above a pedestrian walkway, the supplemental plate should not project more than 4" into the pedestrian facility.



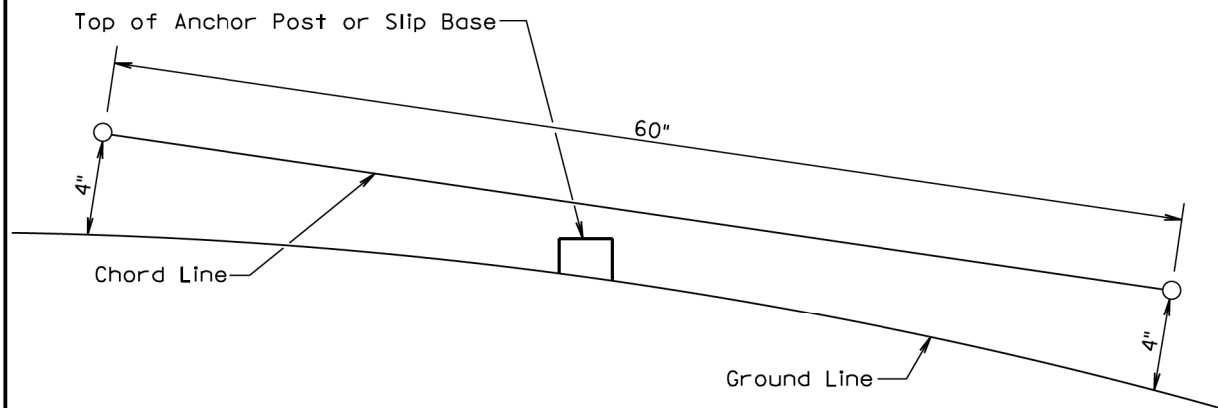
RURAL DISTRICT  
3 DAY MAXIMUM  
(Not applicable to regulatory signs)

September 22, 2014

Published Date: 1st Qtr. 2019	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.

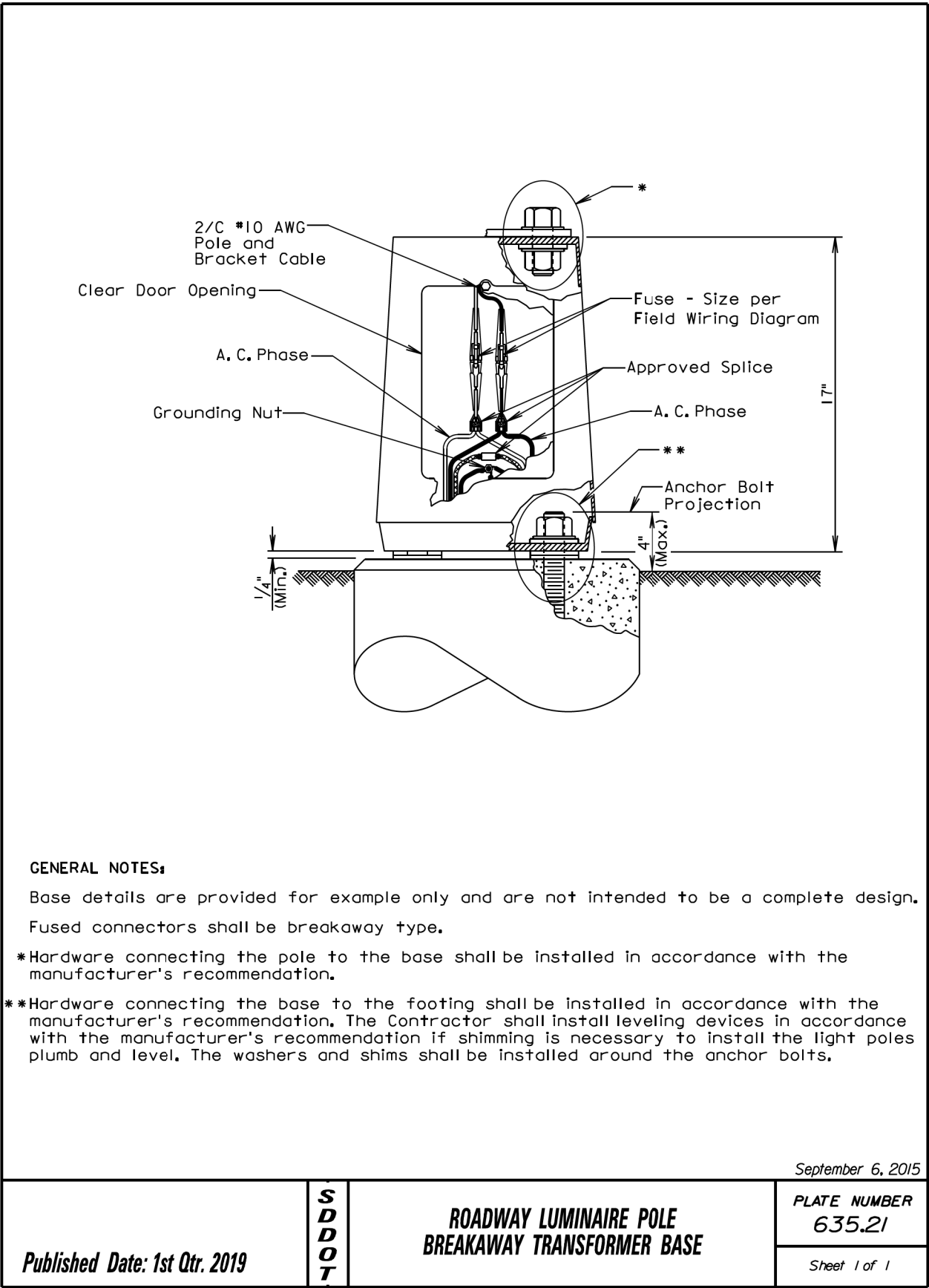
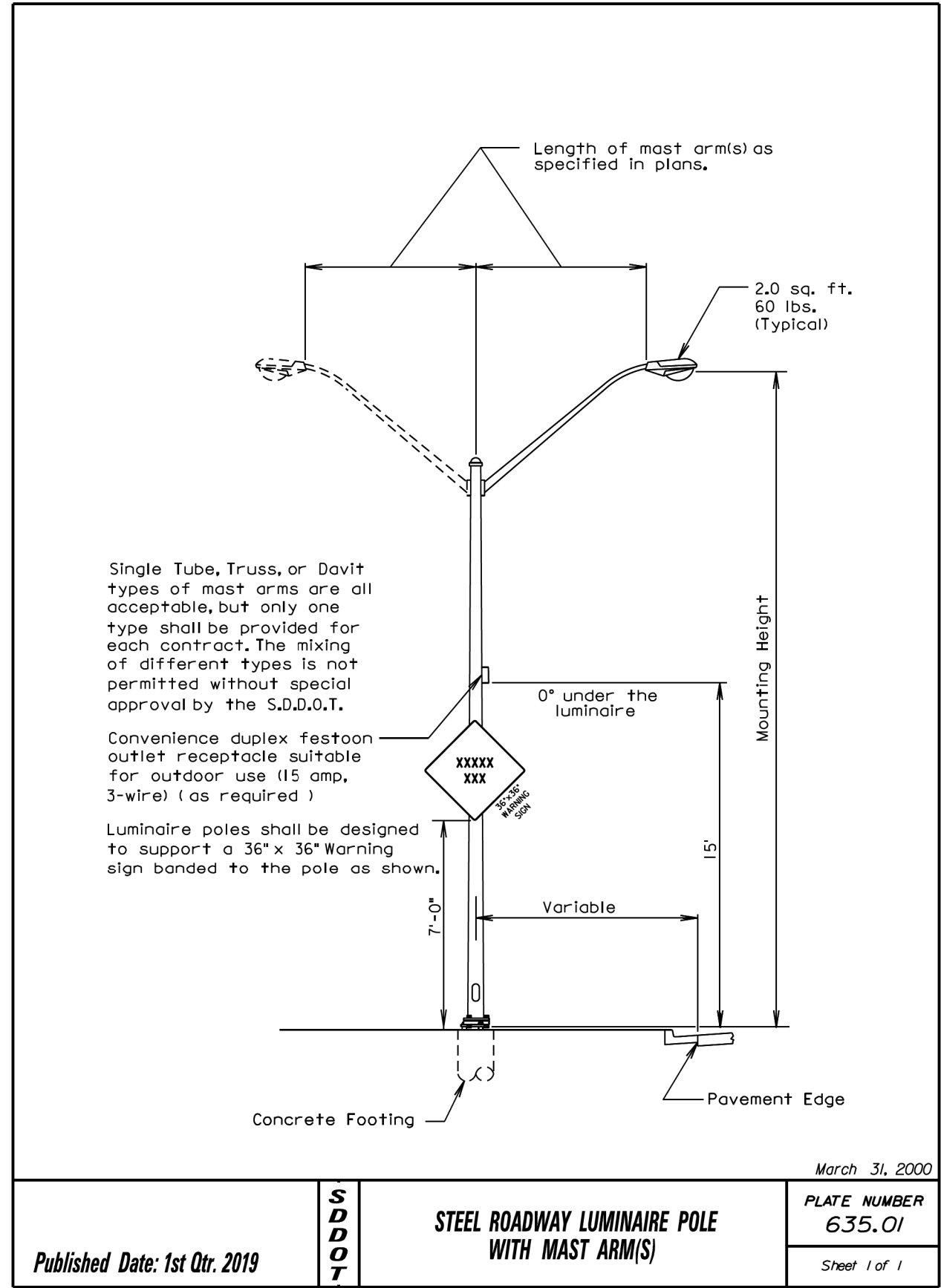
At locations where there is curb and gutter adjacent to the breakaway sign support, the stub height shall be a maximum of 4" above the ground line at the localized area adjacent to the breakaway support stub.

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

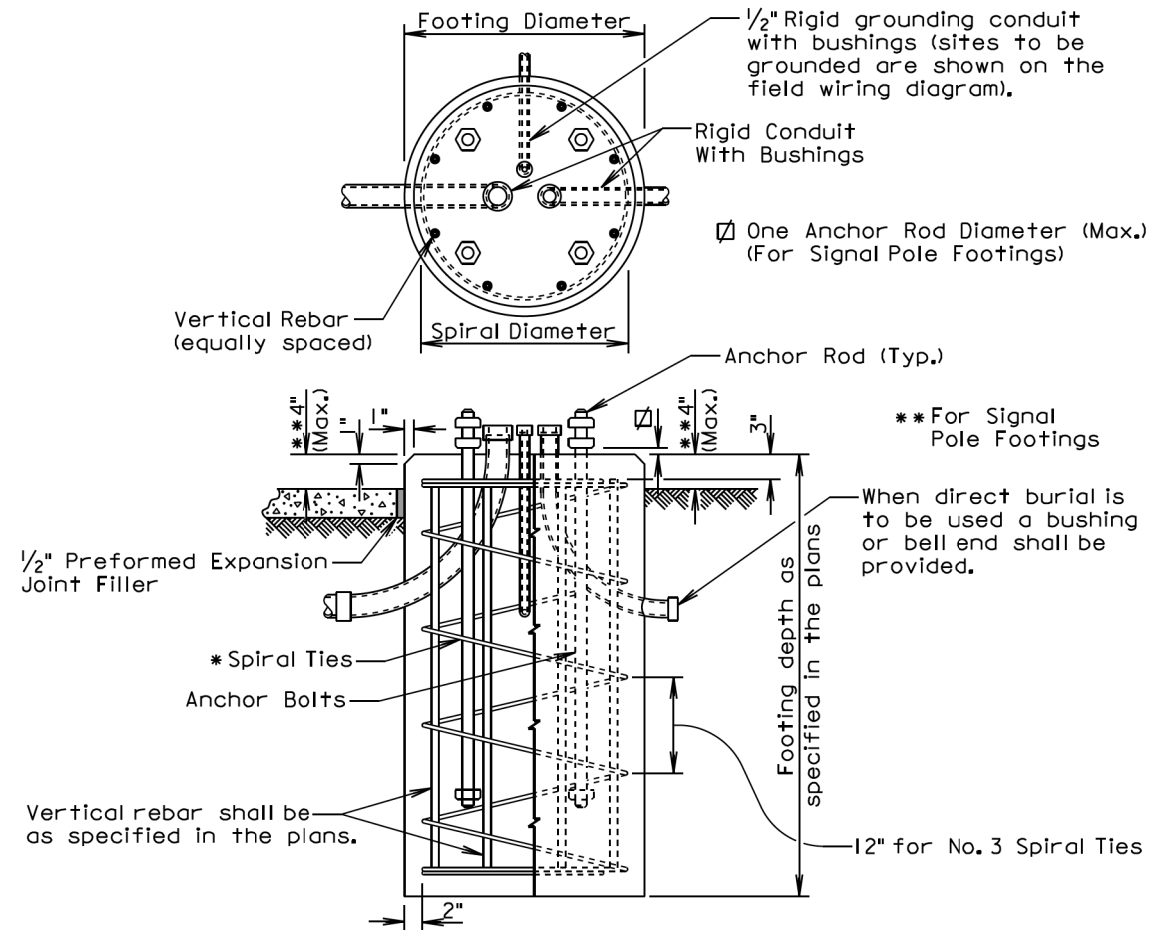
Published Date: 1st Qtr. 2019	S D D O T	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
			Sheet 1 of 1





STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	018 B-492		

Plotting Date: 04/16/2019

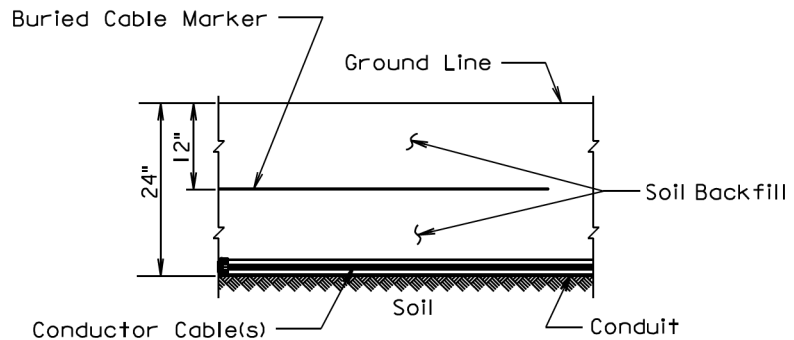


**GENERAL NOTES:**

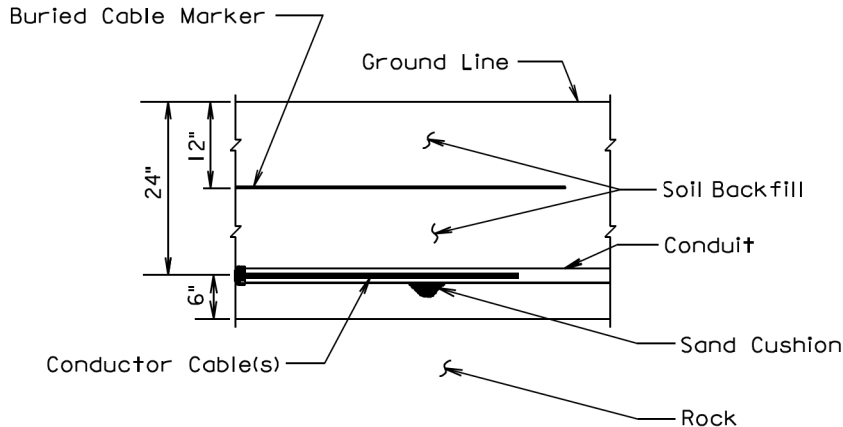
- \* Circular ties may be used in lieu of the spiral ties. The No. 3 ties shall be spaced 12 inches apart except for the top two which shall be spaced 6 inches apart. The ties shall be lapped 18 inches and the laps shall be staggered around the cage.
- Spiral ties shall have 1-1/2 extra turns at each 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

<b>Published Date: 1st Qtr. 2019</b>	<b>S D D O T</b>	<b>POLE FOOTING</b>	<b>PLATE NUMBER</b> 635.55
			Sheet 1 of 1



**SECTION VIEW**



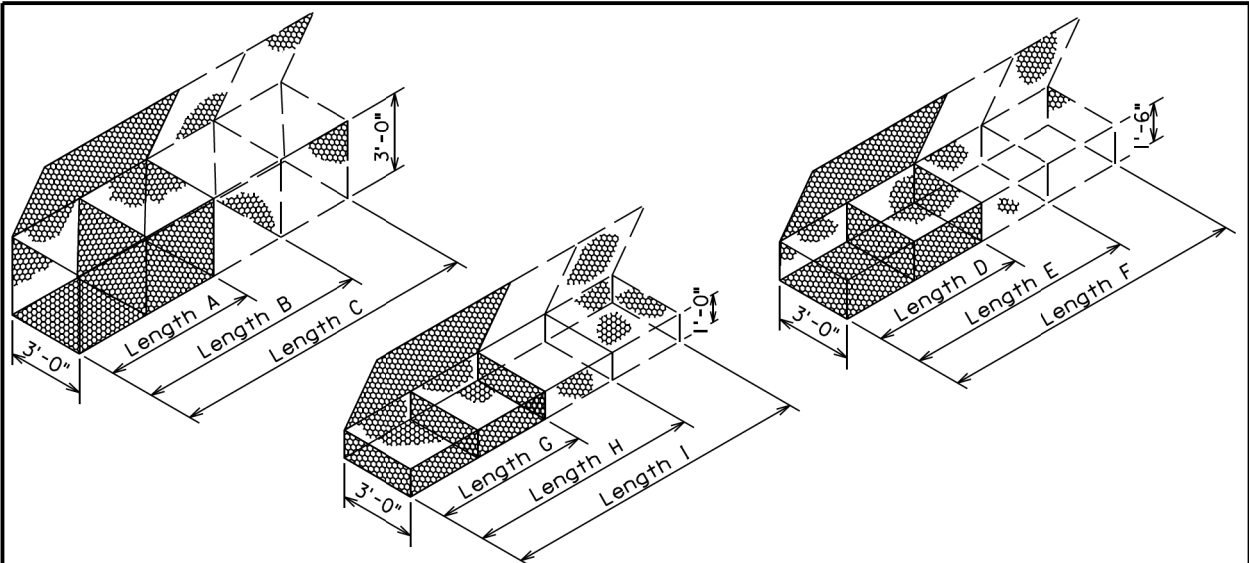
**SECTION VIEW**

**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

<b>Published Date: 1st Qtr. 2019</b>	<b>S D D O T</b>	<b>CONDUIT INSTALLATION</b>	<b>PLATE NUMBER</b> 635.76
			Sheet 1 of 1



GABION DETAILS  
STANDARD SIZES

SIZE	LENGTH	WIDTH	HEIGHT	NUMBER OF CELLS	CAPACITY, Cu. Yd.
A	6'-0"	3'-0"	3'-0"	2	2.0
B	9'-0"	3'-0"	3'-0"	3	3.0
C	12'-0"	3'-0"	3'-0"	4	4.0
D	6'-0"	3'-0"	1'-6"	2	1.0
E	9'-0"	3'-0"	1'-6"	3	1.5
F	12'-0"	3'-0"	1'-6"	4	2.0
G	6'-0"	3'-0"	1'-0"	2	0.7
H	9'-0"	3'-0"	1'-0"	3	1.0
I	12'-0"	3'-0"	1'-0"	4	1.3

Above Dimensions subject to mill tolerances.

GENERAL NOTES:

Lacing and internal connecting wire shall be 0.0866 inch diameter steel wire ASTM A641 Class 3 soft temper measured after galvanizing and for PVC coated gabions shall be 0.0866 inch diameter steel wire measured after galvanizing but before PVC coating.

The lacing procedure is as follows:

1. Cut a length of lacing wire approximately 1 1/2 times the distance to be laced but not exceeding 5 feet.
2. Secure the wire terminal at the corner by looping and twisting.
3. Proceed lacing with alternating single and double loops at a spacing not to exceed 6 inches.
4. Securely fasten the other lacing wire terminal.

Wire lacing or interlocking type fasteners shall be used for gabion assembly and final construction of gabion structures. Interlocking fasteners for galvanized gabions shall be high tensile 0.120 inch diameter galvanized steel wire measured after galvanizing. The galvanizing shall conform to ASTM A641-92 Class 3 coating. Fasteners shall also be in accordance with ASTM A764, Class II, Type III.

Interlocking fasteners for PVC coated gabions shall be high tensile 0.120 inch diameter stainless steel wire conforming to ASTM A313, Type 302, Class I. The spacing of the interlocking fasteners during all phases of assembly and construction shall not exceed 6 inches. All fasteners shall be placed where the mesh weaves around the selvage wire at the vertical and horizontal joints.

June 26, 2001

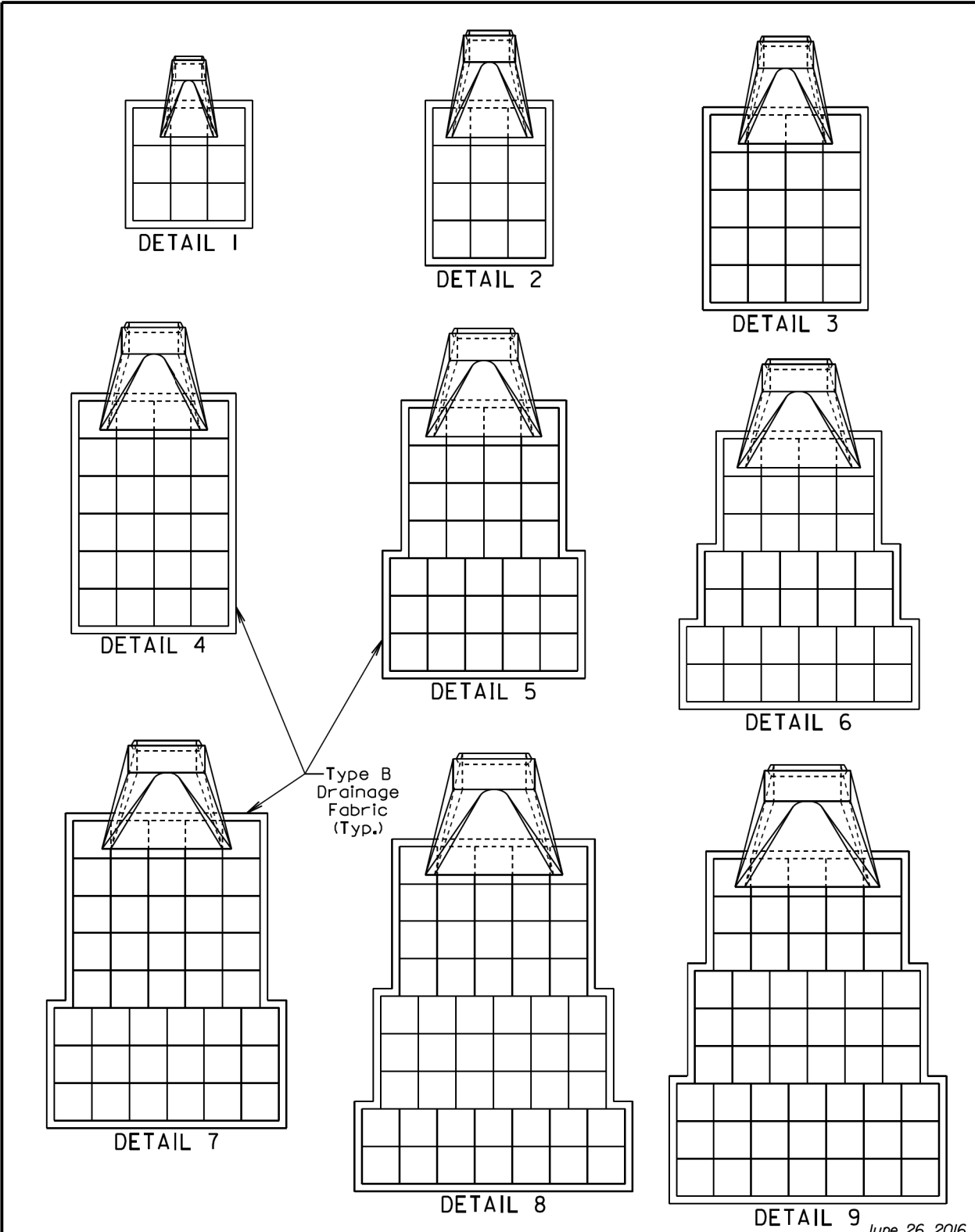
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BANK AND CHANNEL PROTECTION GABIONS

PLATE NUMBER  
720.01

Sheet 1 of 1

Published Date: 1st Qtr. 2019



June 26, 2016

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BANK AND CHANNEL PROTECTION GABION  
PLACEMENT UNDER PIPE END SECTIONS

PLATE NUMBER  
720.03

Sheet 1 of 2

Published Date: 1st Qtr. 2019

ESTIMATED QUANTITIES *				
	Detail	Pipe Diameter (Inches)	Gabion (Cu. Yd.)	Type B Drainage Fabric (Sq. Yd.)
RCP, RCP Arch, CMP, and CMP Arch	1	12, 18, and 24	4.5	15
	2	30 and 36	6.0	19
	3	42	10.0	29
	4	48 and 54	12.0	34
	5	60	15.5	43
	6	66	17.0	47
	7	72	21.5	57
	8	78	26.0	68
	9	84	27.0	70

**GENERAL NOTES:**

Gabions at outlets of CMP and RCP shall be placed under the end section a distance of 2' from the outlet end. For CMP end section installations, the upper fabric of the gabions shall be modified to accommodate the metal end section as approved by the Engineer.

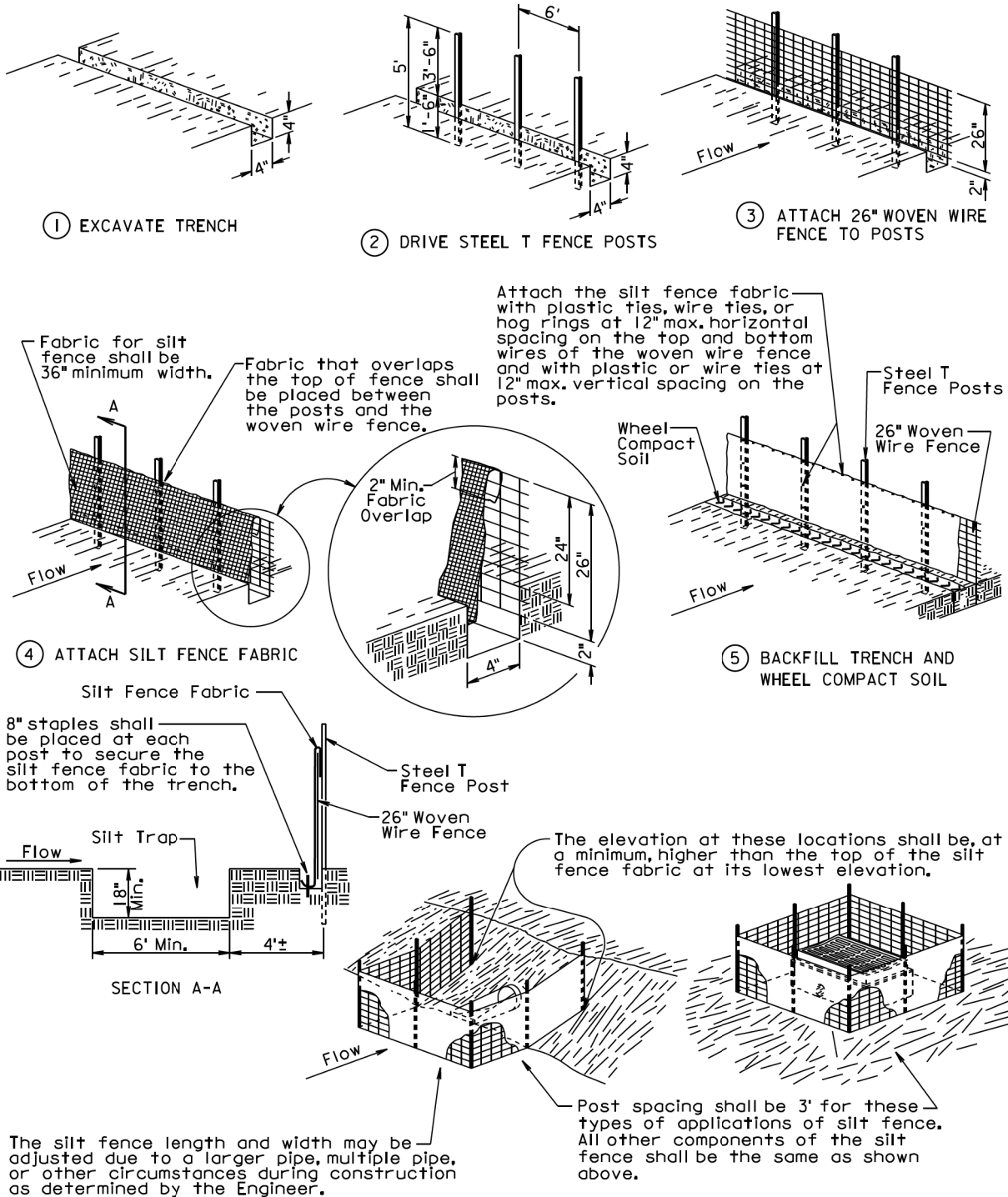
\* Gabion and type B drainage fabric quantities on this standard plate are based on standard gabion sizes D, E, and F as depicted on Standard Plate 720.01.

Type B drainage fabric shall be placed under the gabions and around the exterior sides (perimeter) of the gabions as approved by the Engineer. The type B drainage fabric shall be in conformance with Section 831 of the Specifications. Measurement and payment of the type B drainage fabric shall be in conformance with Section 720 of the Specifications.

June 26, 2016

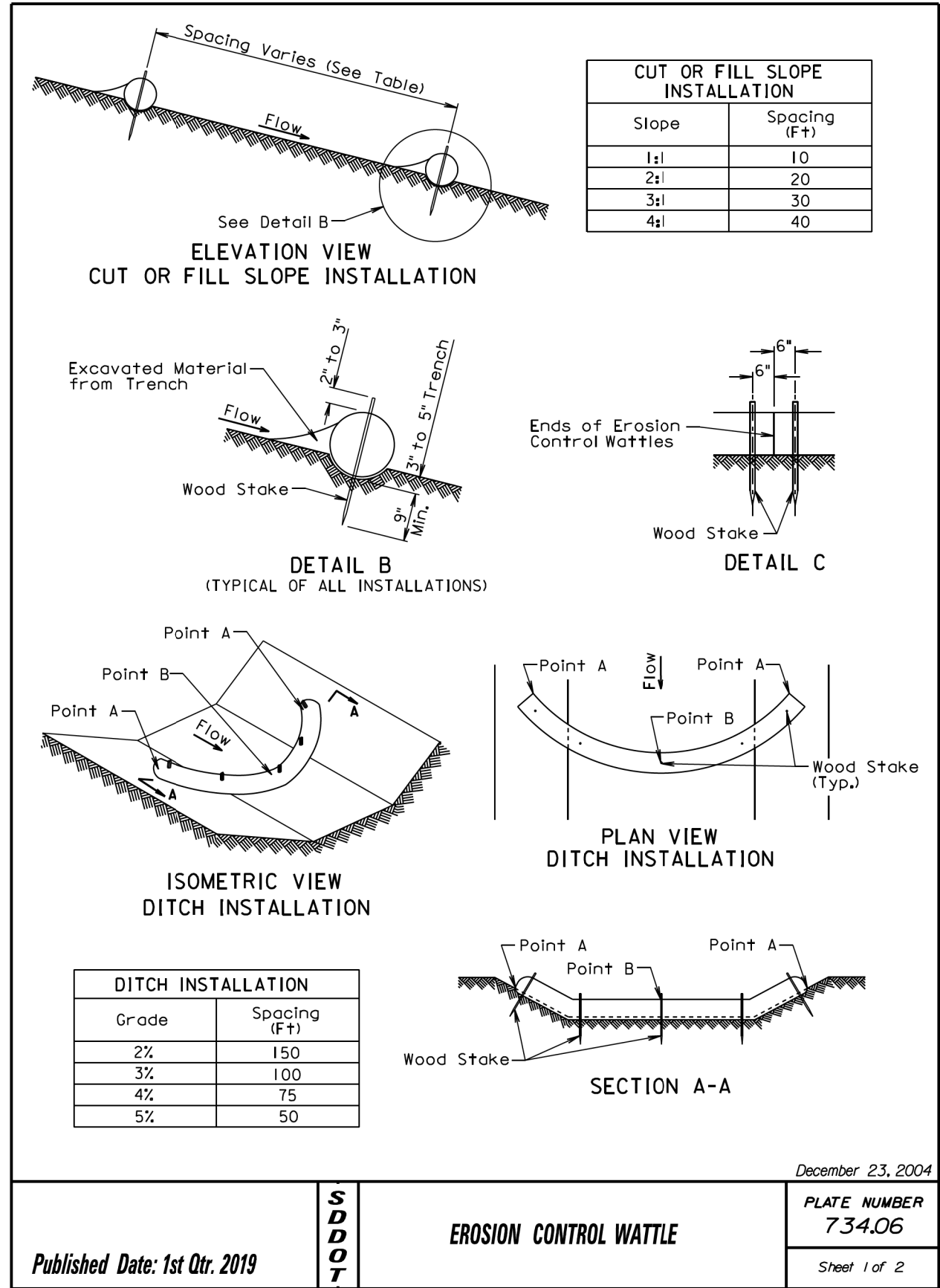
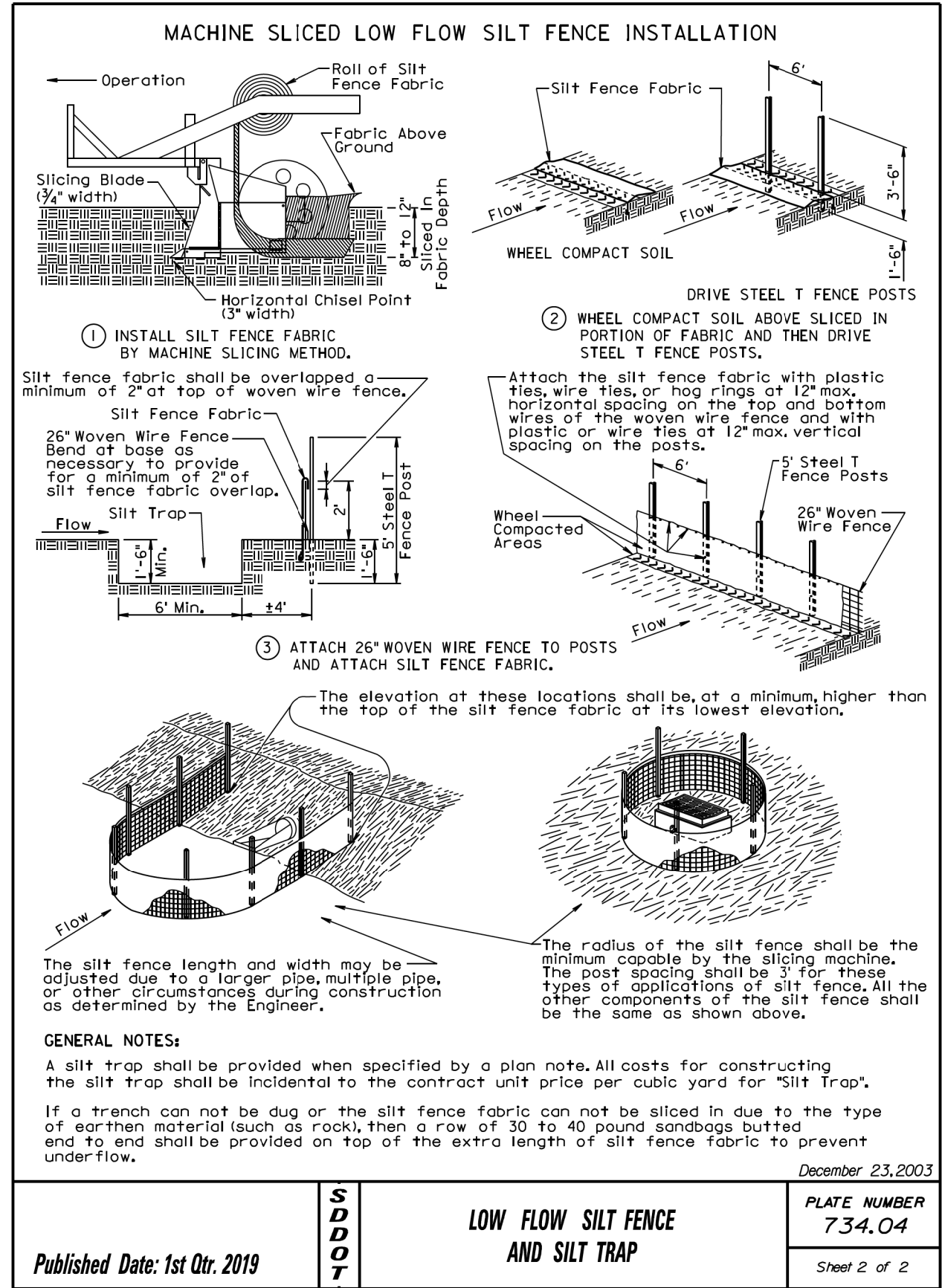
Published Date: 1st Qtr. 2019	S D D O T	BANK AND CHANNEL PROTECTION GABION PLACEMENT UNDER PIPE END SECTIONS	PLATE NUMBER 720.03
			Sheet 2 of 2

**MANUAL LOW FLOW SILT FENCE INSTALLATION**



December 23, 2003

Published Date: 1st Qtr. 2019	S D D O T	LOW FLOW SILT FENCE AND SILT TRAP	PLATE NUMBER 734.04
			Sheet 1 of 2



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	018 B-492	29	29

Plotting Date: 04/16/2019

**GENERAL NOTES:**

At cut or fill slope installations, wattles shall be installed along the contour and perpendicular to the water flow.

At ditch installations, point A must be higher than point B to ensure that water flows over the wattle and not around the ends.

The Contractor shall dig a 3" to 5" trench, install the wattle tightly in the trench so that daylight can not be seen under the wattle, and then compact the soil excavated from the trench against the wattle on the uphill side. See Detail B.

The stakes shall be 1"x2" or 2"x2" wood stakes, however, other types of stakes such as rebar may be used only if approved by the Engineer. The stakes shall be placed 6" from the ends of the wattles and the spacing of the stakes along the wattles shall be 3' to 4'.

Where installing running lengths of wattles, the Contractor shall butt the second wattle tightly against the first and shall not overlap the ends. See Detail C.

The Contractor and Engineer shall inspect the erosion control wattles once every week and within 24 hours after every rainfall event greater than 1/2". The Contractor shall remove, dispose, or reshape the accumulated sediment when necessary as determined by the Engineer.

Sediment removal, disposal, or necessary shaping shall be as directed by the Engineer. All costs for removing accumulated sediment, disposal of sediment, and necessary shaping shall be incidental to the contract unit price per cubic yard for "Remove Sediment".

All costs for furnishing and installing the erosion control wattles including labor, equipment, and materials shall be incidental to the contract unit price per foot for the corresponding erosion control wattle bid item.

All costs for removing the erosion control wattle from the project including labor, equipment, and materials shall be incidental to the contract unit price per foot for "Remove Erosion Control Wattle".

December 23, 2004

<i>Published Date: 1st Qtr. 2019</i>	<b>S D D O T</b>	<b>EROSION CONTROL WATTLE</b>	<i>PLATE NUMBER</i> <b>734.06</b>
			<i>Sheet 2 of 2</i>