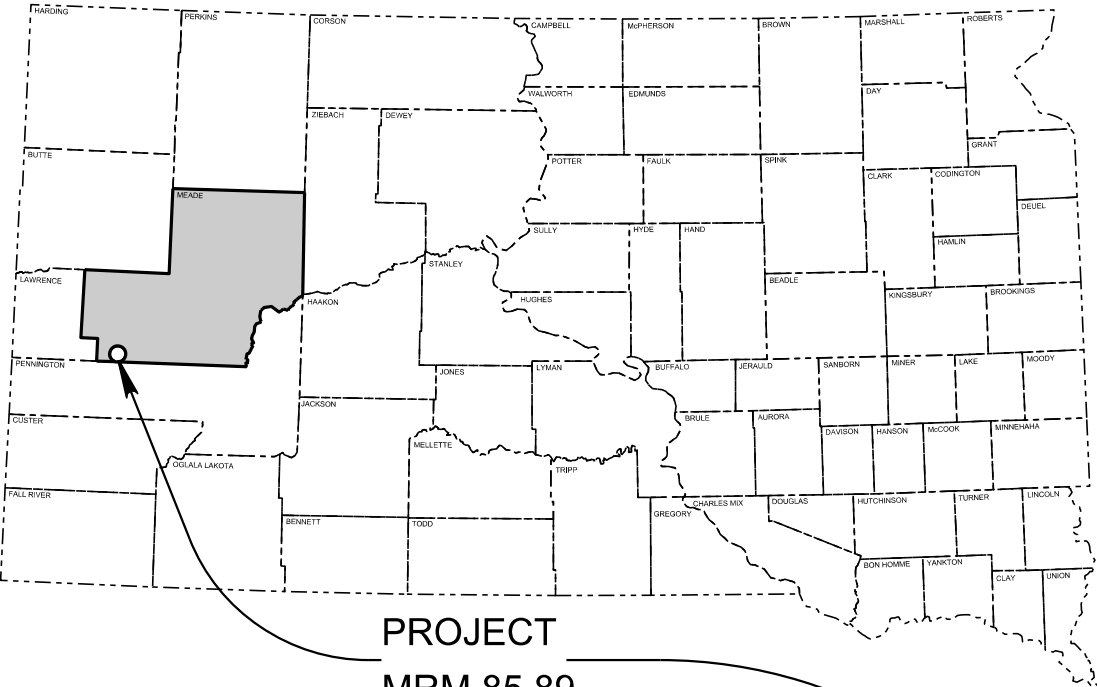


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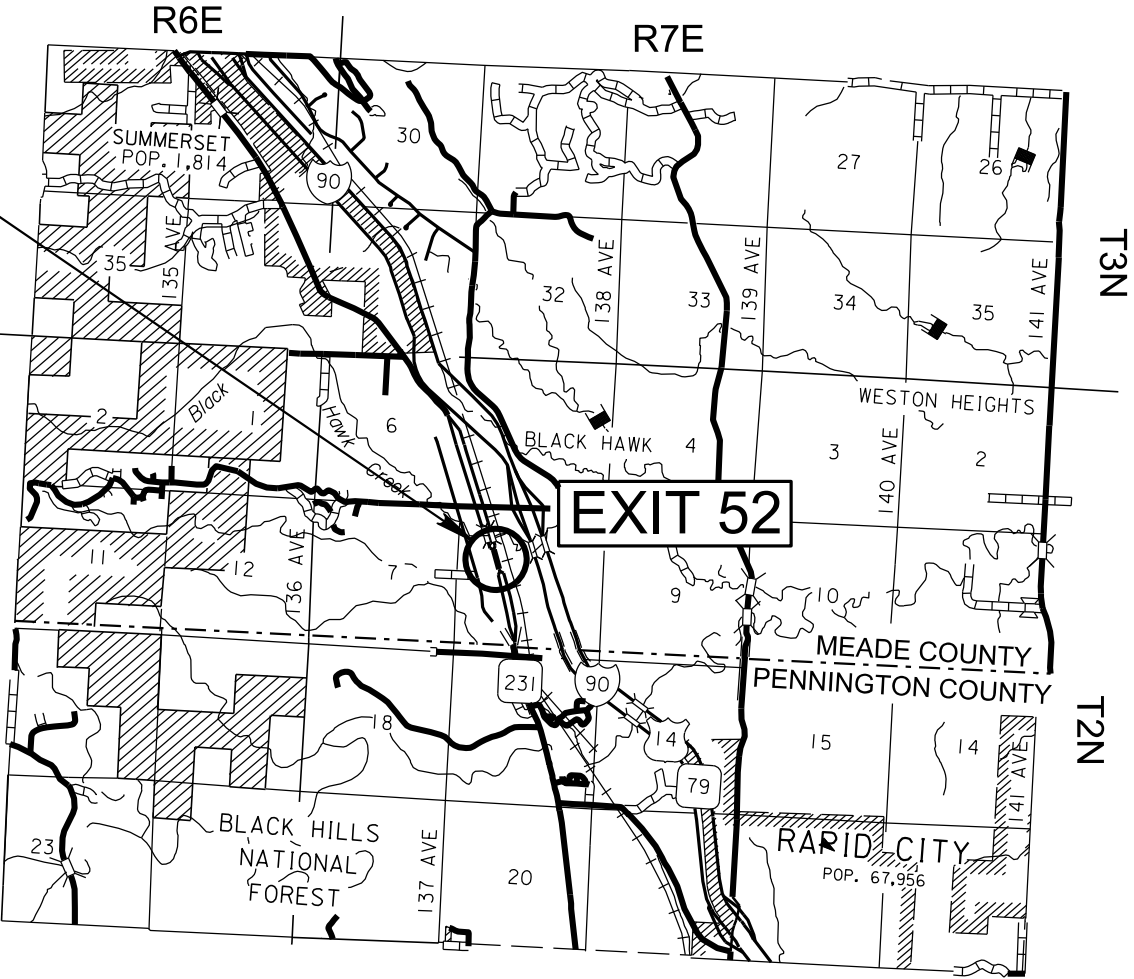
Plotted From - trc11626



PROJECT
MRM 85.89

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED
PROJECT 231N-452
SD HIGHWAY 231
MEADE COUNTY

MEDIAN DRAINAGE
PCN i4xa



DESIGN DESIGNATION

AADT (2017)	7352
AADT (2037)	9080
DHV	1416
D	50%
DHV T%	1.2%
AADT T%	2.7%
V	55 mph

STORM WATER PERMIT
(None Required)

Gross Length	1800 Feet	0.3409 Miles
Length of Exceptions	Feet	Miles
Net Length	1800 Feet	0.3409 Miles

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	231N-452	1	28

Plotting Date: 05/17/2018

INDEX OF SHEETS

1	General Layout with Index
2-7	Estimate with General Notes & Tables
8	Typical Grading Sections
9-11	Plan Sheets
12-14	Pavement Removal Layouts
15-16	Pipe Sections
17-28	Standard Plates

ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
110E0510	Remove Pipe End Section	1	Each
110E1100	Remove Concrete Pavement	185.8	SqYd
110E7500	Remove Pipe for Reset	8	Ft
120E0010	Unclassified Excavation	261	CuYd
250E0020	Incidental Work, Grading	Lump Sum	LS
260E1010	Base Course	112.2	Ton
320E1200	Asphalt Concrete Composite	53.9	Ton
450E0142	24" RCP Class 2, Furnish	50	Ft
450E0150	24" RCP, Install	50	Ft
450E2016	24" RCP Flared End, Furnish	1	Each
450E2017	24" RCP Flared End, Install	1	Each
450E2024	30" RCP Flared End, Furnish	1	Each
450E2025	30" RCP Flared End, Install	1	Each
450E4699	Tie Bolts for RCP	4	Each
450E9000	Reset Pipe	8	Ft
462E0100	Class M6 Concrete	5.4	CuYd
480E0100	Reinforcing Steel	962	Lb
633E0010	Cold Applied Plastic Pavement Marking, 4"	52	Ft
633E1400	Pavement Marking Paint, 4" White	69	Ft
633E1405	Pavement Marking Paint, 4" Yellow	54	Ft
633E1430	Pavement Marking Paint, 24" White	24	Ft
633E5000	Grooving for Cold Applied Plastic Pavement Marking, 4"	52	Ft
634E0010	Flagging	80.0	Hour
634E0110	Traffic Control Signs	384.6	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0285	Type 3 Barricade, 8' Double Sided	12	Each
634E0420	Type C Advance Warning Arrow Board	4	Each
650E0060	Type B66 Concrete Curb and Gutter	28	Ft
670E1200	Type B Frame and Grate Assembly	2	Each
670E2200	Type C Frame and Grate	2	Each
670E5400	Precast Drop Inlet Collar	2	Each
734E0010	Erosion Control	Lump Sum	LS
734E0154	12" Diameter Erosion Control Wattle	76	Ft
734E0845	Sediment Control at Inlet with Frame and Grate	1	Each

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 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.

Action Taken/Required:

The DENR General Permit for Storm Water Discharges Associated with Construction Activities is required for construction activity disturbing one or more acres of earth and work in a waterway. The SDDOT is the owner of this permit and will submit the NOI to DENR 15 days prior to project start in order to obtain coverage under the General Permit. Work can begin once the DENR letter of approval is received.

The Contractor must adhere to the "Special Provision Regarding Storm Water Discharges to Waters of the State."

The Contractor will complete the DENR Contractor Certification Form prior to the pre-construction meeting. The form certifies under penalty of law that the Contractor understands and will comply with the terms and conditions of the permit for this project. Work may not begin on this project until this form is signed and submitted to DENR.

The form can be found at: <http://denr.sd.gov/des/sw/eforms/E2110LDV1-ContractorCertification.pdf>

The Contractor is advised that permit coverage may also be required for off-site activities, such as borrow and staging areas, which are the responsibility of the Contractor.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	231N-452	2	28

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:

1. 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".

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) 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.

HORIZONTAL ALIGNMENT DATA

Type	Station	Northing	Easting
POB	1096+65.91	134387.250	1100114.946
	TL= 3272.70 S 18°02'36" E		
PC	1129+38.61	131275.493	1101128.613
PI	1133+95.96 R = 5730.00 Delta = 9°07'37" R	130840.629	1101270.272
PT	1138+51.38	130388.800	1101341.157
	TL= 620.00 S 8°54'58" E		
POE	1144+71.38	129776.296	1101437.249

SEQUENCE OF OPERATIONS

Variations from this sequence shall be submitted to the Engineer for approval.

1. Set up Traffic Control.
2. Excavate for Drop Inlets and Pipe Installation.
3. Install Drop Inlets and Pipes.
4. Place Fill, Base Course, and Pavement.
5. Install Permanent Pavement Markings.
6. Remove Traffic Control.

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 removing existing surfacing and base material, so the drop inlets and pipe can be installed in accordance with the typical sections.

Unclassified excavation material may be used on the project at the discretion of the Engineer. Any unclassified material not used shall become the property of the Contractor for their disposal in accordance with the Environmental Commitments. The estimate of quantities provides 260.6 cubic yards of Unclassified Excavation for performing this work.

All excavation along the existing surfacing edge shall be performed, so that a shoulder drop off does not exist adjacent to lanes open to the traveling public. The Contractor shall provide a temporary 3:1 slope adjacent to the existing surfacing if the excavation and placement of material cannot be completed prior to nightfall. All costs associated with providing and removing this temporary slope shall be incidental to the various bid items on the project.

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.

Compaction shall be to the satisfaction of the Engineer.

BASE COURSE

Included in the Estimate of Quantities is 104.4 tons of Base Course for backfilling the subgrade repair.

Base Course shall be Contractor furnished.

Compaction of the Base Course shall be to the satisfaction of the Engineer.

WATER FOR COMPACTION

Water for Granular Material shall be provided at a rate of 20 gallons per cubic yard of Base Course.

The cost of water for compaction of the Base Course shall be incidental to the contract unit price per ton for Base Course. Four percent, plus or minus, moisture will be required at the time of compaction unless otherwise directed by the Engineer.

SAWING EXISTING ASPHALT CONCRETE

Where new asphalt concrete is placed adjacent to existing asphalt concrete or portland cement concrete the existing asphalt concrete or portland cement concrete shall be sawed full depth to a true line with a vertical face.

No separate payment shall be made for sawing and shall be incidental to the various asphalt concrete bid items on the project.

ASPHALT CONCRETE COMPOSITE

Included in the Estimate of Quantities is 53.9 tons of Asphalt Concrete Composite for surfacing after the installation of the drop inlets and pipe.

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.

REMOVAL OF EXISTING CONCRETE PAVEMENT

Existing asphalt concrete and/or existing asphalt concrete patch work that was placed above the existing concrete pavement is included in the quantity for "Remove Concrete Pavement". The Contractor shall dispose of the concrete pavement and asphalt concrete at a site approved by the Engineer.

All costs associated with removing the existing concrete curb and gutter and asphalt concrete median pavement at Sta. 1126+79 shall be incidental to the contract unit price per foot for "Remove Concrete Pavement".

INCIDENTAL WORK, GRADING

Station	L/R	Remarks
1108+18	R	Take Out 30" - 6' RCP
1108+18	L	Take Out 30" RCP End Section
1126+79	R	Take Out 24" - 15' RCP

*Lengths may be adjusted in the field based on locations of pipe joints.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	231N-452	3	28

TABLE OF QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	231N-452	4	28

MRM	Station	Length (Ft)	Width (Ft)	Depth (Ft)	Depth of Base Course (Ft)	Depth of Asphalt Concrete (Ft)	Remove Concrete Pavement (SqYd)	Unclassified Excavation (CuYd)	Base Course (Tons)	Asphalt Concrete Composite (Tons)
86+0.087	1108+18	13	12	4.5	1	0.5	17.3	21.1	9.5	5.0
85.89	1116+06	20	59	5.0	1	0.5	131.1	183.6	80.5	40.6
85.38+0.332	1126+79	14	24	5.5	1	0.5	37.3	55.9	22.2	8.3
Totals:							185.8	260.6	112.2	53.9

CONCRETE PIPE CONNECTIONS

Connections to existing pipes shall be done by removing segments of the existing pipe and inserting the drop inlet. Concrete collars shall be poured around the pipe in the areas of the connections.

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

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

STORM SEWER

Reinforced concrete pipe may be bell and spigot. The pipe sections shall be adjoined such that the ends are fully entered and the inner surfaces are reasonably flush and even.

Lift holes in the reinforced concrete pipe shall be plugged with grout.

Watertight joints are required for reinforced concrete pipe, drop inlets, manholes, and junction boxes where storm sewers run parallel to and within 10 feet horizontally from existing or proposed water mains.

Watertight joints are required where reinforced concrete pipes, drop inlets, manholes, or junction boxes cross water mains and are separated a distance of 18 inches or less, above or below, the water main.

If watertight joints are required then the watertight joints shall extend for a distance of 10 feet beyond the water main. This measurement shall be from the sealed concrete joint to the outer most surface of the water main.

Watertight joint seals shall conform to the following requirements:

1. Reinforced Concrete Pipe (Circular): Gasketed pipe shall conform to the requirements of ASTM C443 and the gasket shall be in conformance with Section 990 of the Specifications. Non-gasketed concrete pipe shall be sealed with a mastic joint seal conforming to the requirements of ASTM C990 and encased with a minimum 2' wide by 6" thick M6 concrete collar reinforced with 6x6 W2.9 x W2.9 wire mesh.

2. Reinforced Concrete Pipe (Arch): Gasketed pipe shall conform to the requirements of ASTM C443 and the gasket shall be in conformance with Section 990 of the Specifications. Non-gasketed concrete pipe joints shall be sealed with a hydrophilic flexible water stop seal and wrapped with a 1-foot wide strip of fabric above the cradle. The fabric shall conform to the requirements of Section 831 of the Specifications for Type A Drainage Fabric. The hydrophilic flexible water stop shall be from the list below.
3. Drop Inlets, Manholes, and Junction Boxes: Joints shall be sealed with one of the following methods:
- A. A flexible strip seal placed in the joints conforming to the requirements of ASTM C990 and the perimeter encased with a minimum 2' wide by 6" thick M6 concrete collar reinforced with 6x6 W2.9 x W2.9 wire mesh.
- B. A hydrophilic flexible water stop seal placed in the joints and a 1-foot wide strip of fabric wrapped around the perimeter of the pipe. The fabric shall conform to the requirements of Section 831 of the Specifications for Type A Drainage Fabric. The hydrophilic flexible water stop shall be from the list below.
- C. A self-adhesive external joint seal wrap. The seal wrap shall be from the list below.

Approved List of Self-adhesive Joint Wrap

Product	Manufacturer
Mar Mac Seal Wrap	Mar Mac Construction Products McBee, SC 843-335-5909 www.marmac.com
ConWrap CS-217	Concrete Sealants, Inc. Tipp City, OH 800-332-7325 conseal.com

Approved List of Hydrophilic Flexible Water Stop Seal:

Product	Manufacturer
Waterstop RX	Cetco Hoffman Estates, IL 800-527-9948 www.cetco.com
Conseal CS-231	Concrete Sealants, Inc. Tipp City, OH 800-332-7325 conseal.com

Gaskets and seals (mastic, waterstop, and seal wraps) shall be installed in accordance with the manufacturer's recommendations.

The cost for furnishing and installing all gaskets, mastic joint seal, water stop seal, seal wrap, concrete collars, and for plugging the lift holes shall be incidental to the contract unit price per foot for the corresponding pipe bid item.

TIE BOLTS FOR RCP

The pipe segment and end section at Sta 1108+18 (38' L) shall have tie bolts installed. One tie bolt per side of each barrel shall be installed. Tie bolt assembly details are shown on Standard Plate 450.18. The Contractor shall drill holes at an angle as to cause the legs of the tie bolt to bind against the outside face of the hole upon tie bolt tightening. Bending of the tie bolt legs may need to be done in order to achieve this. Prior to inserting the tie bolt the Contractor shall fill the hole with epoxy resin. The epoxy resin mixture shall be of a type for bonding steel to hardened concrete and shall conform to AASHTO M235 Type IV, (Equivalent to ASTM C881, Type IV). The Contractor shall allow the resin to properly set-up prior to the final tightening of the tie bolts. All cost for drilling tie bolt holes, epoxy resin, and furnishing and installing the tie bolts shall be incidental to the contract unit price per each for "Tie Bolts for RCP".

For informational purposes: Field drilling will be required to install the tie bolts on pipe sections. All cost for removing/resetting existing tie bolts, drilling tie bolt holes, and furnishing and installing the tie bolts shall be incidental to the respective remove/reset or furnish/install bid items for that location.

TABLE OF PIPE QUANITIES

Station	24" RCP, Class 2 (Ft)	24" RCP Flared End (Each)	30" RCP Flared End (Each)	Tie Bolts for RCP (Each)	Remove and Reset RCP (Ft)
1108+18 - 38' L			1	4	8
1116+06 - 7.4' R to 50' L	48	1			
1126+79 - 0.1' R to 4.4' R	2				
Totals:	50	1	1	4	8

DROP INLETS

Where drop inlets are constructed within areas of curb and gutter, the Contractor shall construct weep holes of at least 3 inches in diameter in the drop inlet walls. The weep holes shall be constructed at the same elevation as the adjacent top of the earthen subgrade and shall be maintained clean and open at all times until the permanent surfacing is placed. The drop inlets shall be covered throughout construction operations as necessary with an Engineer approved cover to provide safe travel for motorists and to prevent materials from entering the storm sewer system. After the permanent surfacing has been placed, the Contractor shall seal the weep holes with grout and remove all debris from the drop inlet. All costs involved with the coverings, weep holes, and removing debris from the drop inlets shall be incidental to the contract unit prices for the components of the drop inlets.

The plan shown quantities of the drop inlet components such as Class M6 Concrete, Reinforcing Steel, Frame and Grate Assemblies, and Precast Drop Inlet Collars will be the basis of payment for these items.

If additions or reductions to the number of drop inlets are ordered by the Engineer, payment for the components required to construct the drop inlets will be made at the contract unit prices for the components of the drop inlets.

TABLE OF DROP INLETS AND QUANTITIES

Station	L/R	Drop Inlet Size	Drop Inlet Type	Class M6 Concrete CuYd	Precast		
					Rein. Steel Lb	Drop Inlet Collar (Each)	Frame and Grate/Lid Type
1108+18	12' R	3'x4'	C	1.18	230		1
1116+06	7.4' R	4'x5'	C	2.37	352		1
1126+79	0.1' R	2'x3'	B	0.92	193	1	1
1126+79	4.4' R	2'x3'	B	0.87	187	1	1
Totals:				5.34	962	2	4

Total Type B Frame and Grate Assembly2

Total Type C Frame and Grate2

* Drop inlet requires watertight joints in accordance with the STORM SEWER notes.

TABLE OF TYPE B66 CONCRETE CURB AND GUTTER

Station	to	Station	L/R	Quantity (Ft)
1126+72		1126+86	R	28
Total:				28

PERMANENT PAVEMENT MARKING – GENERAL NOTES

The Contractor shall repaint all the existing pavement marking paint including centerline, edge line, lane lines, arrows, gore areas, etc. The Contractor will be required to inventory and mark, with appropriately colored tabs, the extent and location of the existing lines, gore areas, etc. before the markings are obliterated. Locations of pavement marking tape shall be masked. All costs associated with this work shall be incidental to the various pavement marking bid items.

Application of permanent pavement marking paint shall be completed within 14 calendar days following the completion of the flush seal. A minimum 7 day cure time shall be required for the Flush Seal prior to pavement marking paint application.

All pavement marking paint 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 shall be applied as per manufacturer’s recommendations.

This material shall 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 shall 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 consisting of glass beads as well as bonded core reflective elements shall be adhered to the paint.

The bonded core reflective elements shall contain either clear or yellow tinted microcrystalline ceramic beads bonded to the outer surface. All microcrystalline ceramic beads bonded to reflective elements shall have a minimum index of refraction of 1.8 when tested using the liquid oil immersion method.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
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RATES OF MATERIALS FOR WATERBORNE PAVEMENT MARKING PAINT WITH HIGH GRADE POLYMER

Solid 4” line = 27.8 Gals/Mile
Glass Beads = 5.3 Lbs/Gal.
Composite Reflective Elements = 2.1 Lbs/Gal.

All cost for materials, labor and equipment necessary to furnish and install the pavement markings shall be incidental to the contract unit price per foot for “Pavement Marking Paint, White or Yellow”.

COLD APPLIED PLASTIC PAVEMENT MARKING

Cold applied plastic pavement markings shall be placed into a recessed groove on the surface.

Final locations of markings will be determined by Engineer.

GROOVE PAVEMENT FOR COLD APPLIED PLASTIC MARKINGS

The grooving shall be completed within the following tolerance:

Depth of Groove: 100 mils, ± 10 mils.

The bottom of the groove shall be uniform and free of loose material. The groove shall be flat and of uniform depth for the entire width of the groove.

The Contractor shall establish a positive means for the removal of the grinding and/or grooving residue. Solid residue shall be removed from the pavement surfaces before being blown by traffic action or wind. Residue 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.

If damage to joints, joint sealant material, backer rod, etc. occurs, the grooving operation shall be stopped and modifications shall be made to the grooving operation to prevent further damage. The Contractor may be required to use specially prepared circular diamond blade cutting heads to prevent damage at the joints. Damage caused to joints, the joint sealant material, backer rod, etc. shall be repaired or replaced by the Contractor, as directed by the Engineer. No additional payment will be made for the repair work or any reapplication of the pavement marking in the area of the repair.

Grooving on bridge decks will not be required. The Contractor shall not damage bridge joints near any pavement marking grooving. Markings on bridge decks shall be surface applied.

TABLE OF PAVEMENT MARKING QUANTITIES

Location		Pavement Marking Paint, 4" Yellow (Ft)	Pavement Marking Paint, 4" White (Ft)	Pavement Marking Paint, 24" White (Ft)	Cold Applied Plastic Pavement Marking, 4" Yellow (Ft)	Grooving for Cold Applied Plastic Pavement Marking (Ft)
MRM	Station					
86+0.087	1108+18	-	-	-	52	52
85.89	1116+40	40	65	24	-	-
85.38+0.332	1126+16	14	4	-	-	-
Totals:		54	69	24	52	52

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.

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

Existing guide, route, informational logo, regulatory, 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.

All non-applicable existing signing and temporary traffic control devices shall be covered or removed during periods of inactivity. Periods of inactivity shall be defined as no work taking place for a period of more than 48 hours. The cost of removing or covering non-applicable signs and temporary traffic control devices shall be incidental to the contract lump sum price for Traffic Control, Miscellaneous.

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

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

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 construction plans, standard plates, and the MUTCD – whichever is more stringent shall be used, as determined by the Engineer.

All costs associated with the traffic control for mobile operation including signs, arrow panels and equipment shall be incidental to the contract lump sum price for “Traffic Control, Miscellaneous”.

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.

Bump Signs (W8-1, black on orange) with appropriate Advisory Speed Plaque (W13-1P, black on orange) shall be placed 500’ in advance of the bump or as approved by the Engineer for adequate sight distance. Type I Object Markers (orange - 18”x18”) shall be placed at the bump location.

INVENTORY OF TRAFFIC CONTROL DEVICES

		CONVENTIONAL ROAD			
SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W4-2	LEFT or RIGHT LANE ENDS (symbol)	5	48" x 48"	16.0	80.0
W8-1	BUMP	2	48" x 48"	16.0	32.0
W16-2P	FEET (supplemental distance plaque)	2	30" x 24"	5.0	10.0
W20-1	ROAD WORK AHEAD	6	48" x 48"	16.0	96.0
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	16.0	32.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	5	48" x 48"	16.0	80.0
W20-7	FLAGGER (symbol)	2	48" x 48"	16.0	32.0
G20-2	END ROAD WORK	4	36" x 18"	4.5	18.0
-	TYPE 1 YELLOW OBJECT MARKER	2	18" x 18"	2.3	4.6
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS			384.6
		SQFT			

TYPE 3 BARRICADES

ITEM DESCRIPTION	QUANTITY
Type 3 Barricade, 8' Double Sided	12 Each

ARROW BOARDS

ITEM DESCRIPTION	QUANTITY
Type C Advance Warning Arrow Board	4 Each

PRESS RELEASE ANNOUNCEMENTS

The SDDOT will prepare a Press Release to be released 5 days prior to any phase change or any other major change that affects traffic flow. The SDDOT will be responsible to keep law enforcement, emergency services, and the traveling public notified of changes in project access. The Contractor shall provide the Engineer with pertinent information 7 days prior to any phase change or any other major changes that affect traffic flow.

EROSION CONTROL

The estimated area requiring erosion control is 1,000 square feet. All costs for the erosion control work for furnishing, placing, and maintaining erosion control including equipment, labor, seeding, fertilizing, mycorrhizal inoculum, and mulching shall be incidental to the contract lump sum price for “Erosion Control”.

The limits of erosion control work will be determined by the Engineer during construction.

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:

Glomus intraradices	25%
Glomus aggregatu	25%
Glomus mosseae	25%
Glomus etunicatum	25%

All seed shall be inoculated with a minimum of 100,000 live propagules of mycorrhizal fungi per acre.

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 application rate is 1500 pounds per acre.

The all-natural slow release fertilizer shall be from the list below or an approved equal:

Product	Manufacturer
Sustane	Sustane Corporate Headquarters Cannon Falls, Minnesota Phone: 1-800-352-9245 http://www.sustane.com/

Hydroseeding

The areas to be seeded consist of all newly disturbed areas within the project limits except for the top of roadways and temporary easements under cultivation.

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.

All costs for the fiber mulch including labor, equipment, and materials shall be incidental to the contract lump sum price for “Erosion Control”.

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:

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

SEDIMENT CONTROL AT INLETS WITH FRAMES AND GRATES

This type of sediment control device should be used where there is pavement in the vicinity of the drop inlets and storm water or sediment could possibly enter the frame and grate. Sediment Control at Inlet with Frame and Grate shall be installed prior to working in the vicinity of the drop inlets.

The Contractor shall be responsible for maintaining and repairing the sediment control device for the duration of the project for which sediment control measures are required. Maintenance shall be scheduled to prevent storm water from backing up into the driving lane.

“Sediment Control at Inlet with Frame and Grate” will be paid for one time at each location, regardless of the number of times the sediment control devices are installed, inspected, cleaned, removed, repaired, or replaced. All costs associated with furnishing, installing, inspecting, maintaining, cleaning, sediment removal, and repairing Sediment Control at Inlet with Frame and Grate shall be incidental to the contract unit price per each for “Sediment Control at Inlet with Frame and Grate”.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	231N-452	7	28

Sediment collection device shall be:

A sediment control device as shown on Standard Plate 734.10. Filter fabric used for constructing the sediment control at inlets with frames and grates shall be the same type of fabric that is used in high flow silt fence from the approved product list. The approved product list may be viewed at the following internet site:

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

TABLE OF SEDIMENT CONTROL AT INLETS WITH FRAMES AND GRATES

Station	L/R	Quantity (Each)
1105+25	R	1
Total:		1

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.

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

Erosion control wattles shall remain on the project to decompose.

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

TABLE OF EROSION CONTROL WATTLE

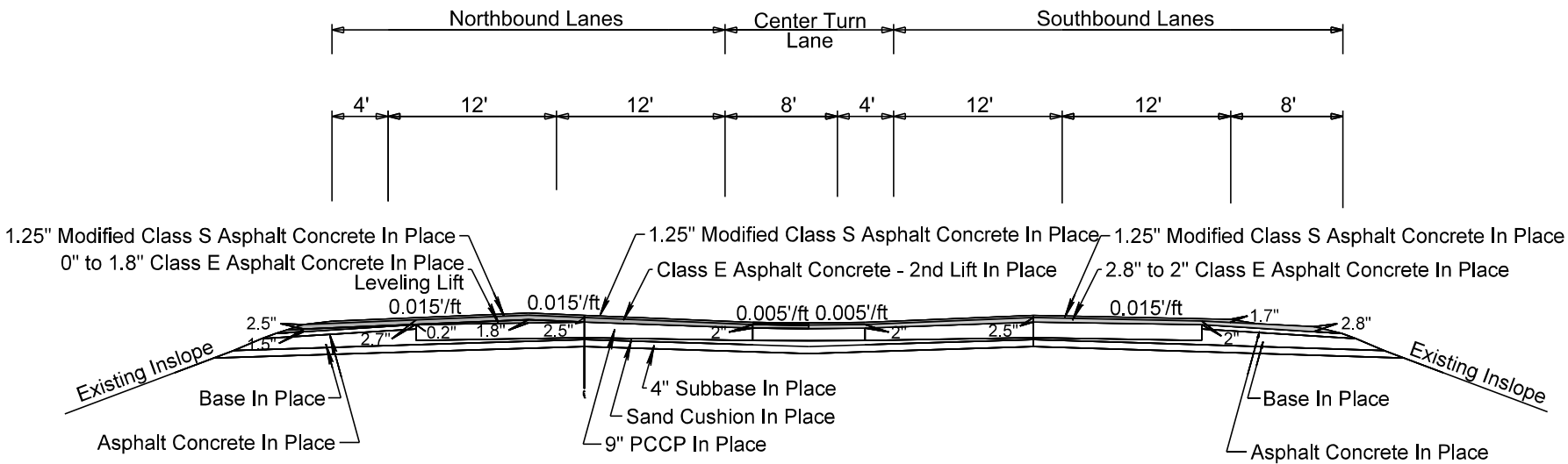
MRM	L/R	Description	12" Diameter Erosion Control Wattle (Ft)
86+0.087	L	Outlet End of Pipe	18
85.89	L	Outlet End of Pipe	40
85.38+0.332	L	Outlet End of Pipe	18
Total			76

EXISTING TYPICAL SECTION

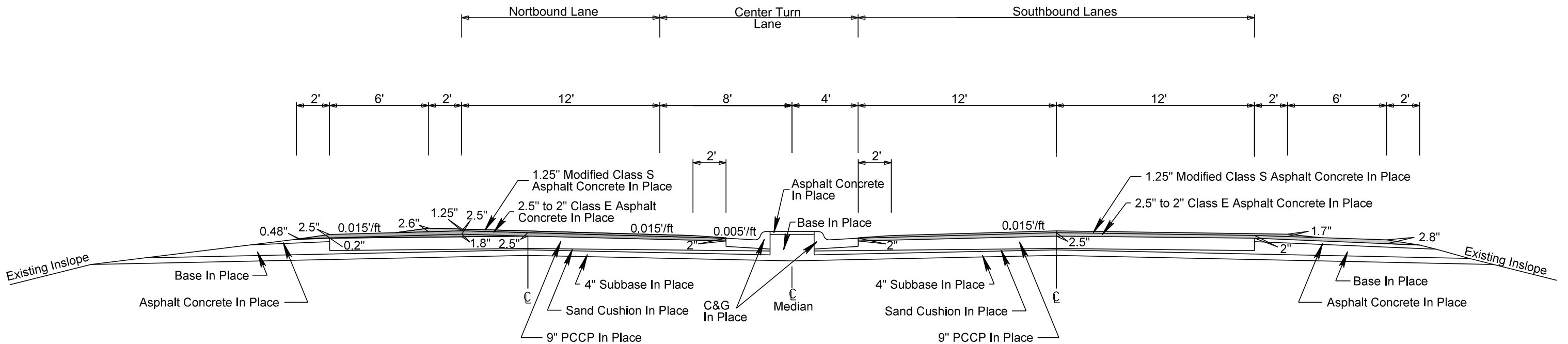
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	231N-452	8	28

Plotting Date: 05/17/2018

SD231 (Sturgis Road)
Sta 1101+27 to Sta 1116+36



SD231 (Sturgis Road)
Sta 1116+36 to Sta 1133+57



Plot Scale - 1"=200'

Plotted From - Irrc11626

File - ...typ.dgn

Plot Scale - 1"=40'

Plotted From - tnc11626

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	231N-452	9	28

Plotting Date: 05/17/2018

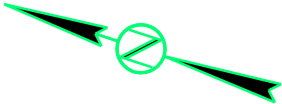
- 1108+18 - 12' R
Take Out 30" - 6' RCP
(Incidental Work, Grading)

1108+18 - 12' R
Install 3'x4' Type C Drop Inlet
with Type C Frame and Grate

1108+18 L & R
Retain 30"- 92' RCP
- 1108+18 - 38' L
Take Out 30" RCP End Section
(Incidental Work, Grading)

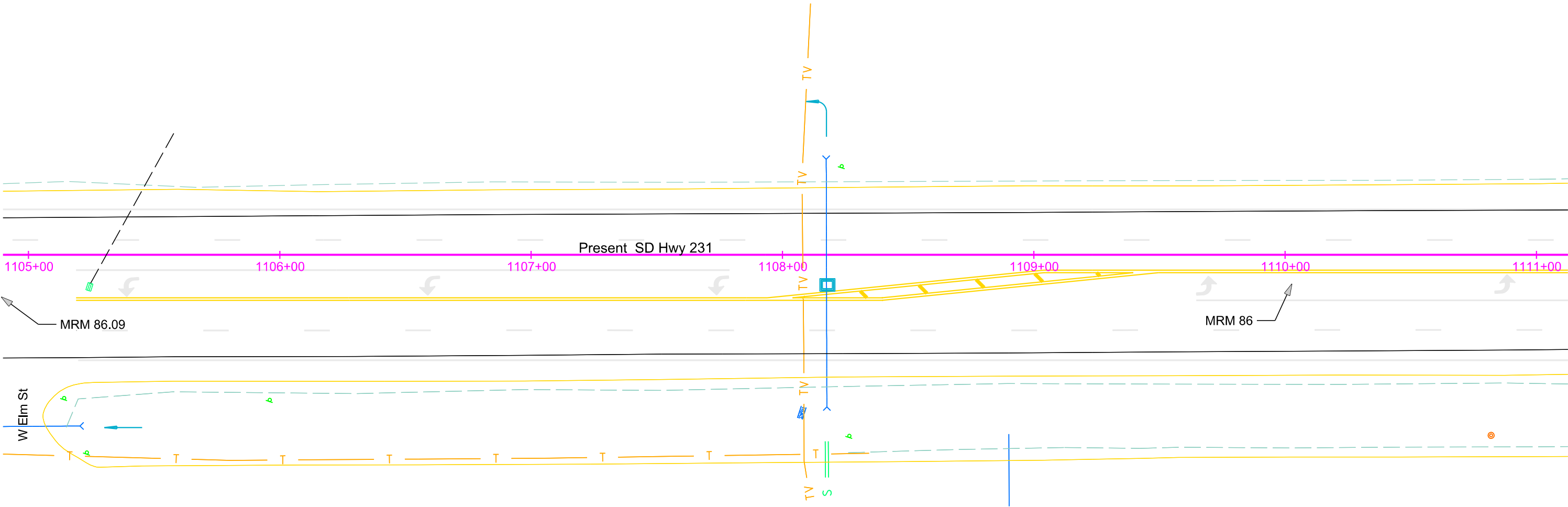
1108+18 - 38' L
Remove for Reset
& Reset 24" - 8' RCP

1108+18 - 38' L
Install 30" RCP Flared End



Sec. 8 - T2N - R7E

MRM 86+0.087

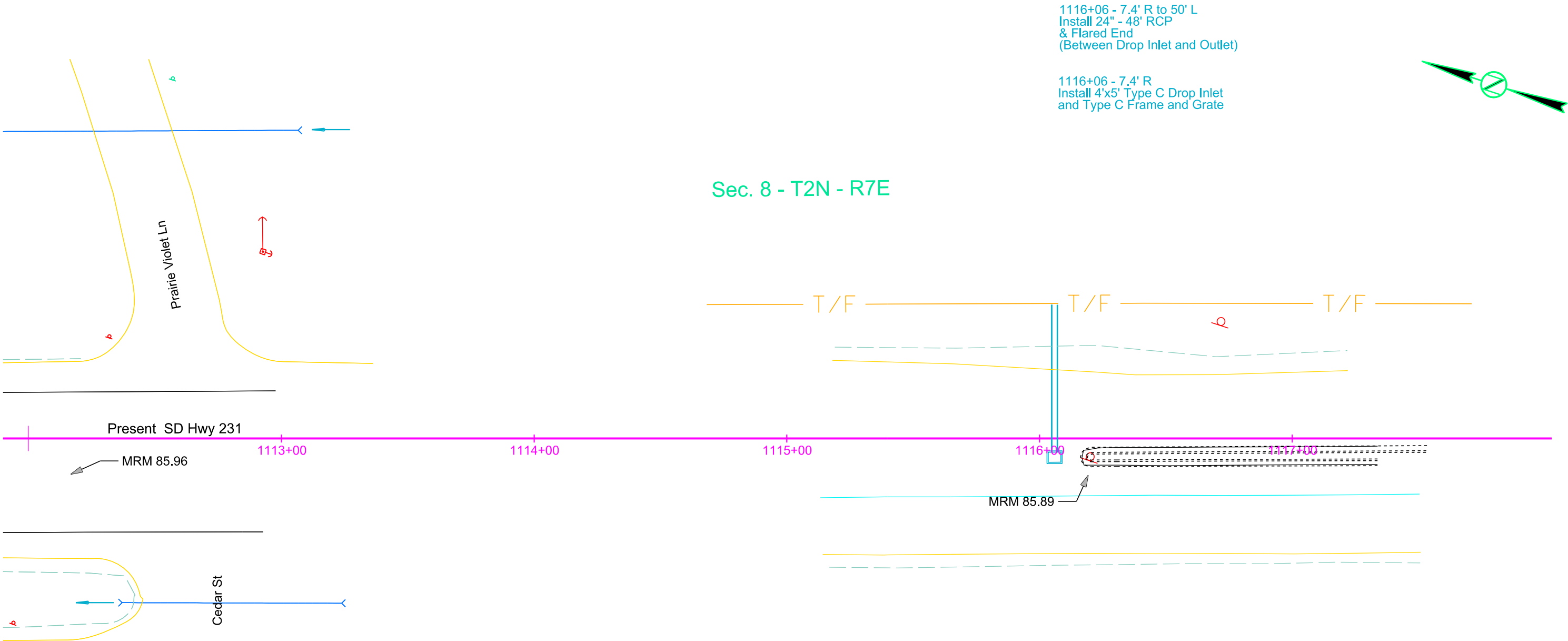


Plot Scale - 1:40

Plotted From - trc11626

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	231N-452	10	28

Plotting Date: 05/17/2018

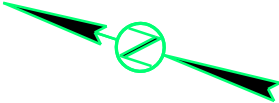


Plot Scale - 1:40

Plotted From - lrrc11626

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	231N-452	11	28

Plotting Date: 05/17/2018



Sec. 8 - T2N - R7E

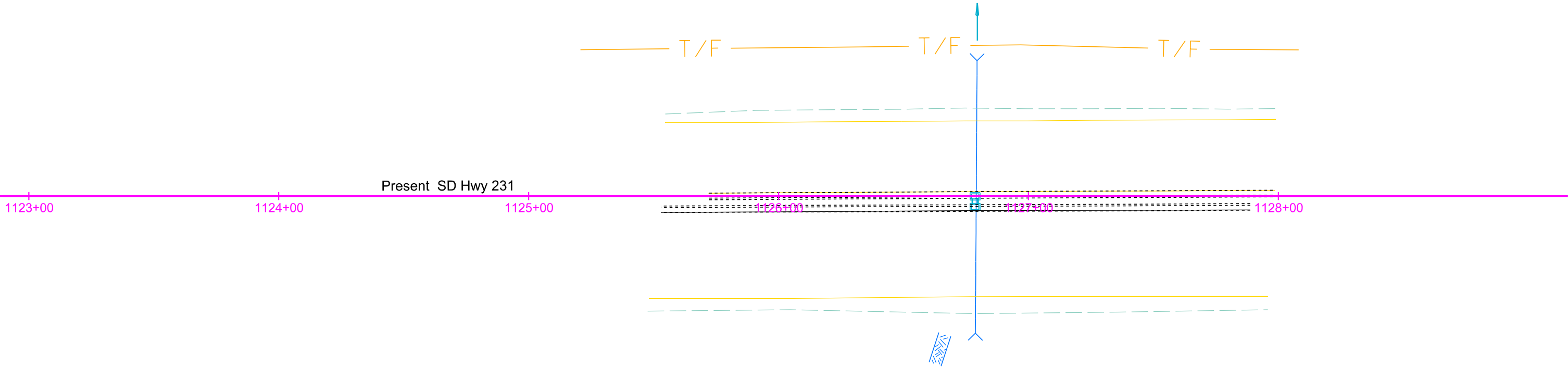
1126+79
Take Out 24" - 15' RCP
(Incidental Work, Grading)

Install 2'x3' Type B Drop Inlet
with 6" Concrete Collar and
Type B Frame and Grate at the
following locations:
1126+79 - 4.4' R
1126+79 - 0.1' R

1126+79 - 0.1' R to 4.4' R
Install 24" - 2' RCP
(Between Drop Inlets)

1126+79 L & R
Retain 24" - 94' RCP
& 2 End Sections

MRM 85.38+0.332

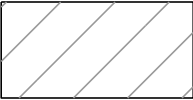
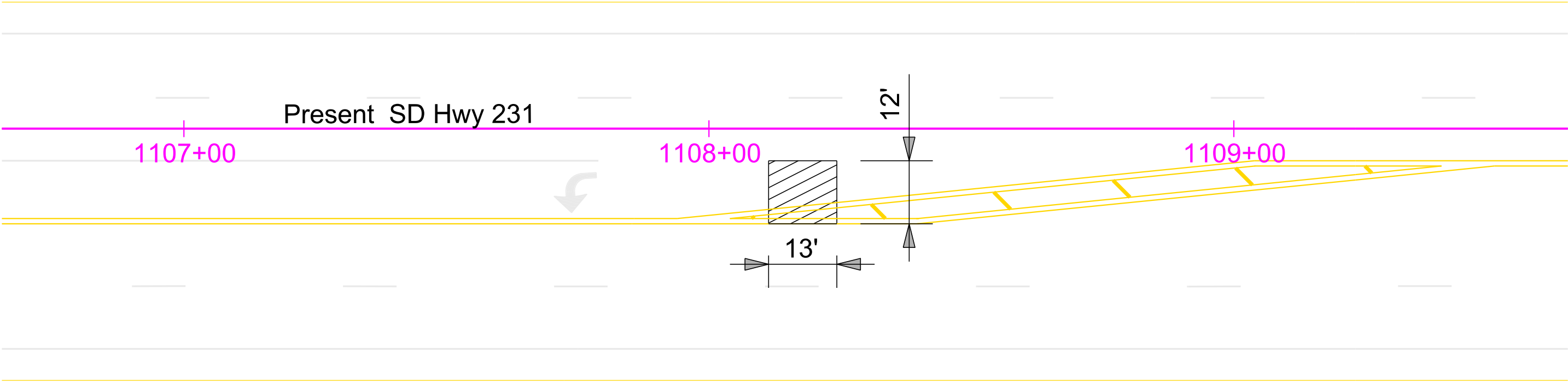
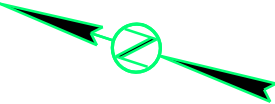


PAVEMENT REMOVAL LAYOUT

1108+18 (MRM 86+0.087)

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	231N-452	12	28

Plotting Date: 05/17/2018



Remove Concrete Pavement

Plot Scale - 1:20

Plotted From - lrrc11626

File - ...lpr1108.dgn

PAVEMENT REMOVAL LAYOUT

1116+06 (MRM 85.89)

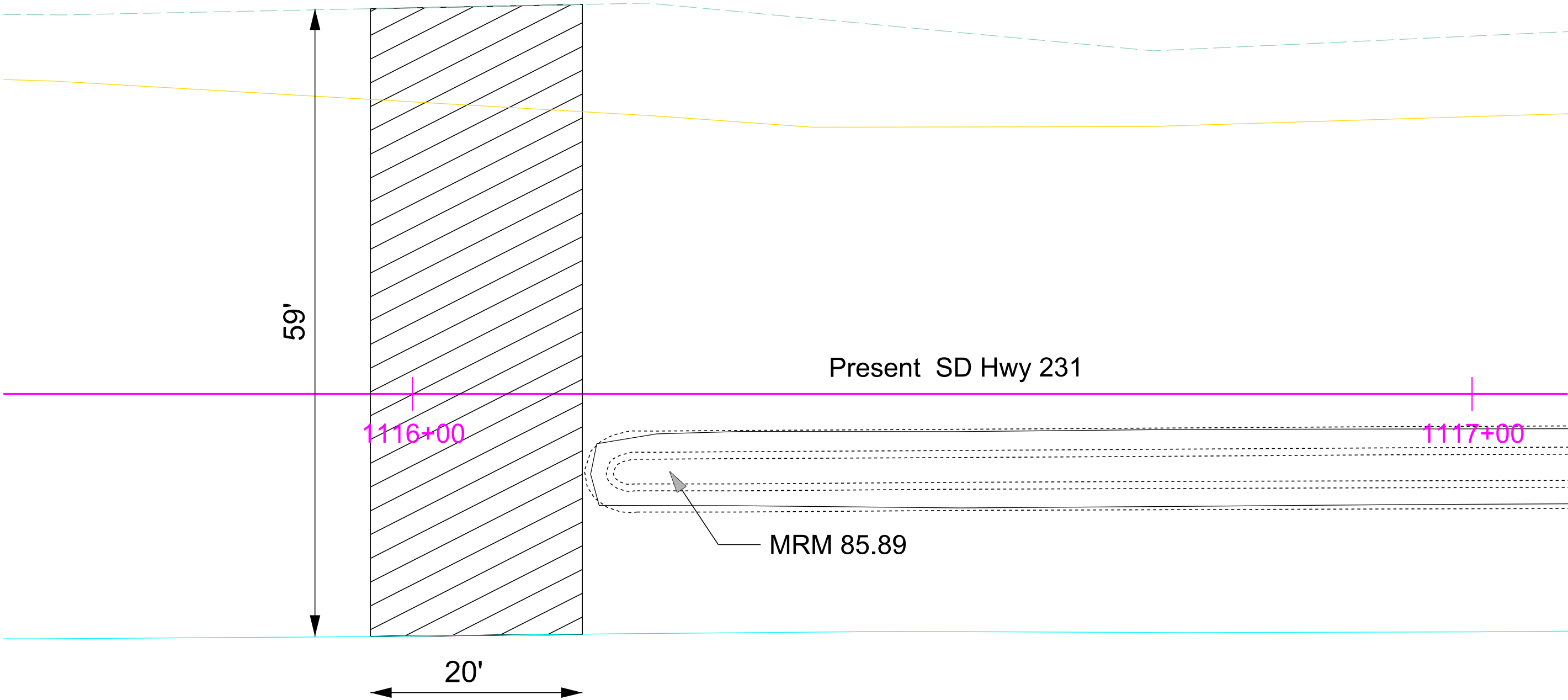
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	231N-452	13	28

Plotting Date: 05/17/2018

Plot Scale - 1:10

Plotted From - lrrc11626

File - ...lpr1117.dgn



Remove Concrete Pavement

Plot Scale - 1:20

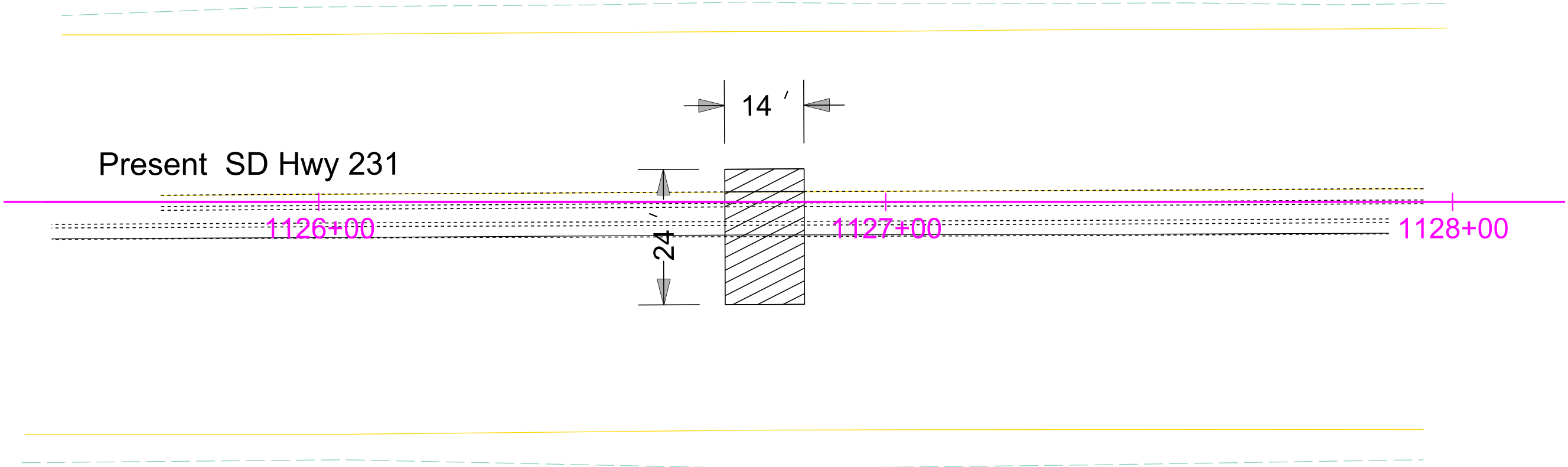
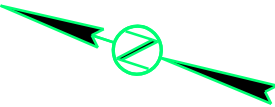
Plotted From - lrrc11626

PAVEMENT REMOVAL LAYOUT

1126+79 (MRM 85.38+0.332)

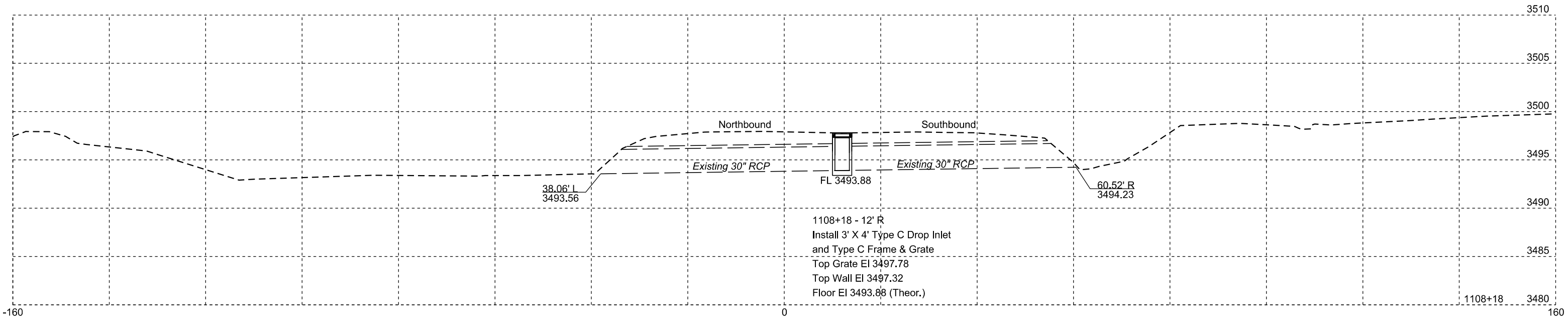
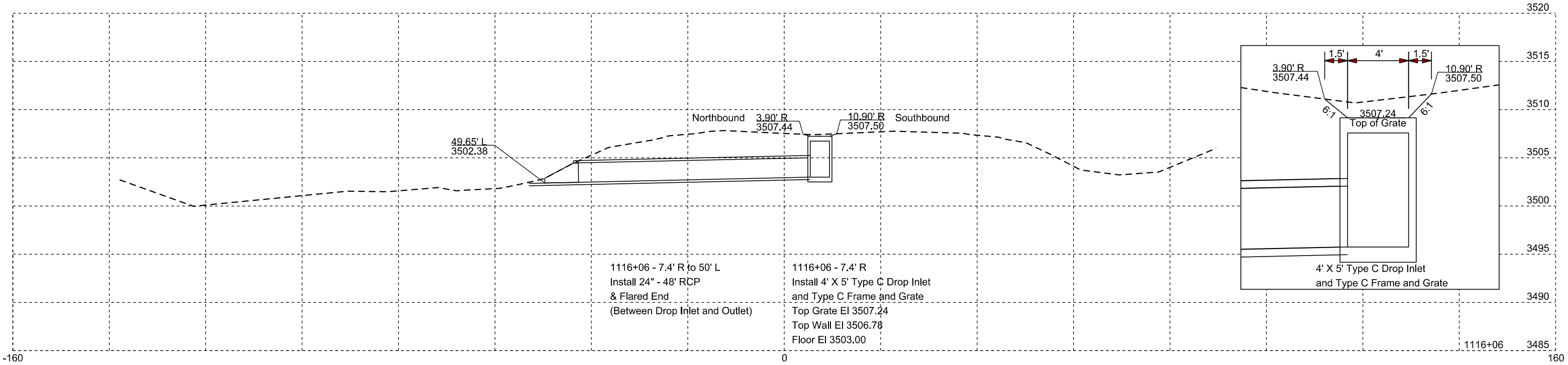
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	231N-452	14	28

Plotting Date: 05/17/2018

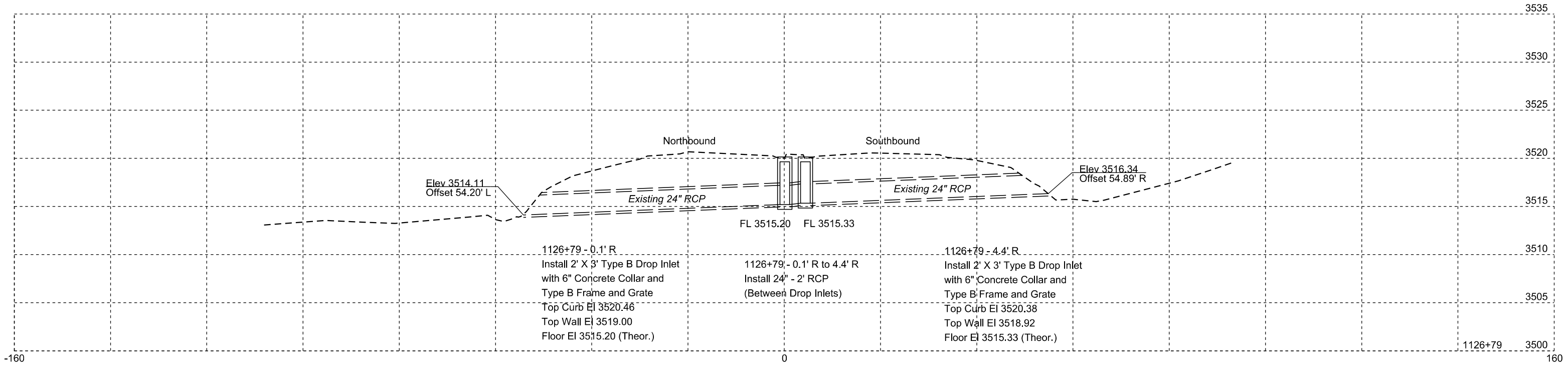


Remove Concrete Pavement

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	231N-452	15	28

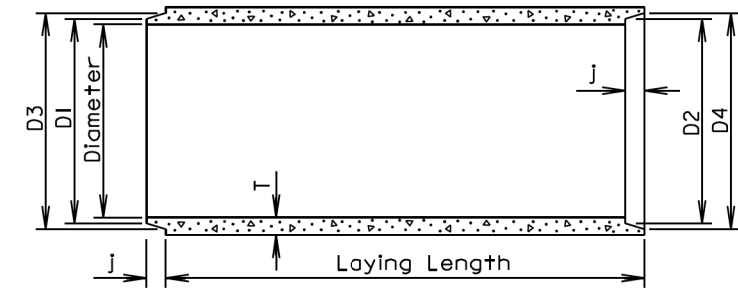


STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	231N-452	16	28

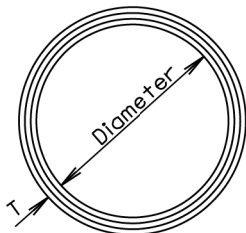


TOLERANCES IN DIMENSIONS

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 1/8	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 1/8	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 1/8	98 5/8
96	2950	9	7	102 1/8	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

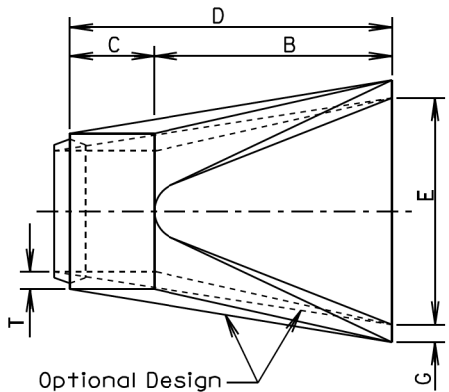
S
D
D
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T

REINFORCED CONCRETE PIPE

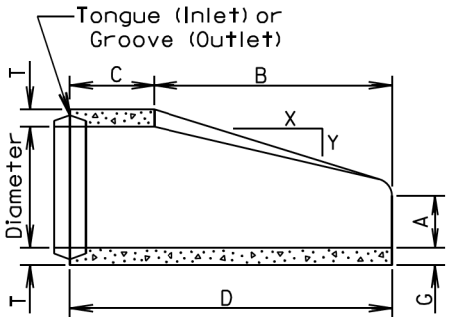
PLATE NUMBER
450.01

Sheet 1 of 1

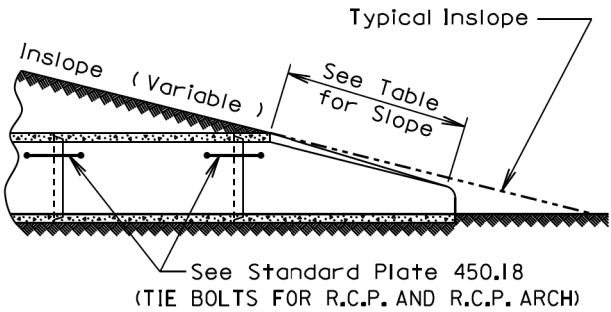
Published Date: 2nd Qtr. 2018



TOP VIEW



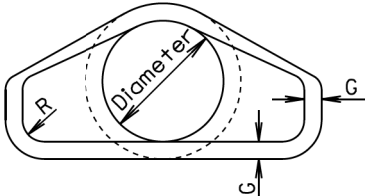
LONGITUDINAL SECTION



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: 2nd Qtr. 2018

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	231N-452	18	28

Plotting Date: 05/17/2018

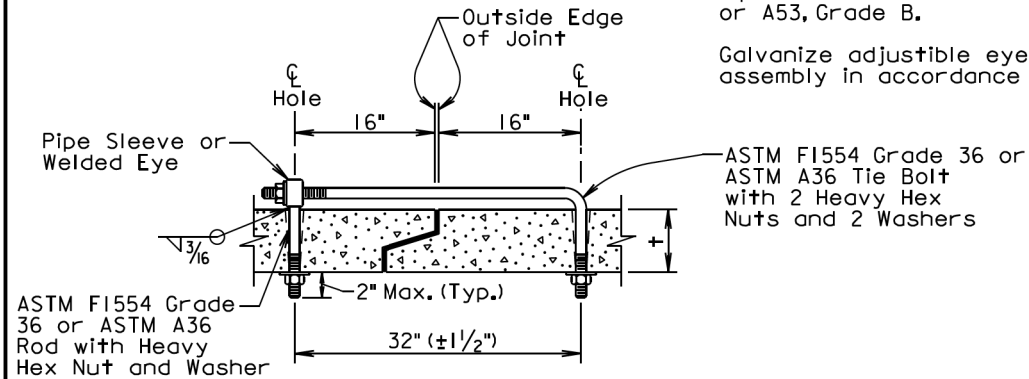
Wall "t" (in.)	Rod Dia. (in.)	Pipe Sleeve Dia. (nominal)
$\leq 3\frac{1}{4}$	$\frac{5}{8}$	$\frac{3}{4}$
$3\frac{1}{2}$ - $6\frac{1}{2}$	$\frac{3}{4}$	1
≥ 7	1	$1\frac{1}{4}$

GENERAL NOTES:

Tie bolts shall conform to ASTM F1554 Grade 36 or ASTM A36. Nuts shall be heavy hex conforming to ASTM A563. Washers shall conform to ASTM F436.

Pipe Sleeve shall conform to ASTM A500 or A53, Grade B.

Galvanize adjustable eye bolt tie assembly in accordance with ASTM A153.



ADJUSTABLE EYE BOLT TIE

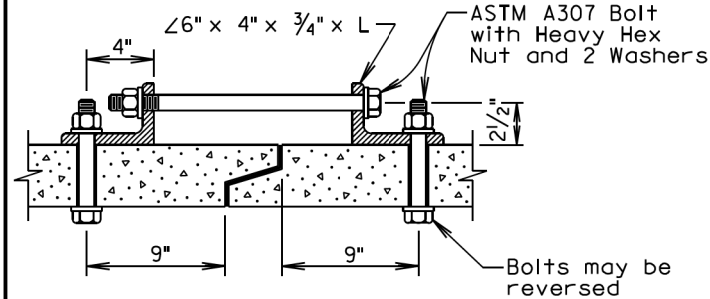
Pipe Dia. (in.)	"L" (in.)	Bolt Dia. (in.)
≤ 48	4	$\frac{3}{4}$
> 48	6	1

GENERAL NOTES:

Angles shall conform to ASTM A36.

Bolts shall conform to ASTM A307. Nuts shall be heavy hex conforming to ASTM A563. Washers shall conform to ASTM F436.

Galvanize angles, bolts, nuts, and washers in accordance with ASTM A153.



ANGLE AND BOLT TIE

GENERAL NOTES:

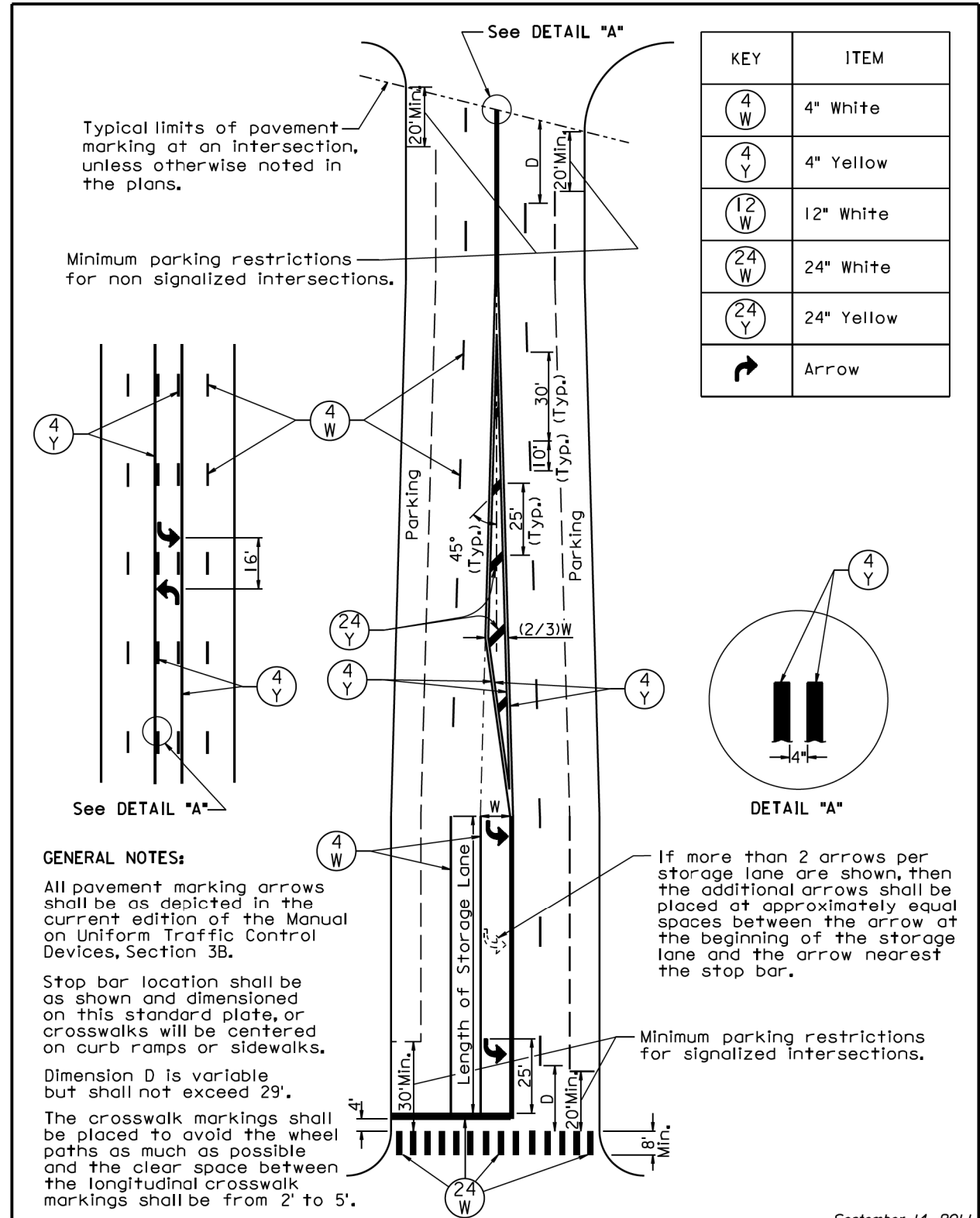
In lieu of the tie bolts detailed above other types of tie bolt connections may be installed as approved by the Office of Bridge Design.

All pipe sections of R.C.P. and R.C.P. Arch shall be tied with tie bolts except for pipe located between drop inlets, manholes, and junction boxes. All pipe sections of pipes that only enter or exit drop inlets, manhole, and junction boxes shall be tied with tie bolts.

There will be no separate measurement or payment for the tie bolts. The cost for furnishing and installing the tie bolts shall be incidental to the contract unit price per foot for the corresponding bid item for R.C.P. or R.C.P. Arch.

February 28, 2013

Published Date: 2nd Qtr. 2018	S D D O T	TIE BOLTS FOR R.C.P. AND R.C.P. ARCH	PLATE NUMBER 450.18
			Sheet 1 of 1



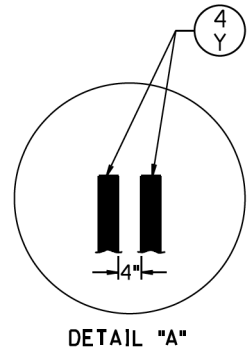
See DETAIL "A"

Typical limits of pavement marking at an intersection, unless otherwise noted in the plans.

Minimum parking restrictions for non signalized intersections.

See DETAIL "A"

KEY	ITEM
(4 W)	4" White
(4 Y)	4" Yellow
(12 W)	12" White
(24 W)	24" White
(24 Y)	24" Yellow
↩	Arrow



GENERAL NOTES:

All pavement marking arrows shall be as depicted in the current edition of the Manual on Uniform Traffic Control Devices, Section 3B.

Stop bar location shall be as shown and dimensioned on this standard plate, or crosswalks will be centered on curb ramps or sidewalks.

Dimension D is variable but shall not exceed 29'.

The crosswalk markings shall be placed to avoid the wheel paths as much as possible and the clear space between the longitudinal crosswalk markings shall be from 2' to 5'.

If more than 2 arrows per storage lane are shown, then the additional arrows shall be placed at approximately equal spaces between the arrow at the beginning of the storage lane and the arrow nearest the stop bar.

Minimum parking restrictions for signalized intersections.

September 14, 2011

Published Date: 2nd Qtr. 2018	S D D O T	PAVEMENT MARKINGS FOR ADJACENT INTERSECTIONS AND CENTER TURN LANE	PLATE NUMBER 633.01
			Sheet 1 of 1

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

- Flagger
- Channelizing Device

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

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

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

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

The channelizing devices shall be drums or 42" cones.

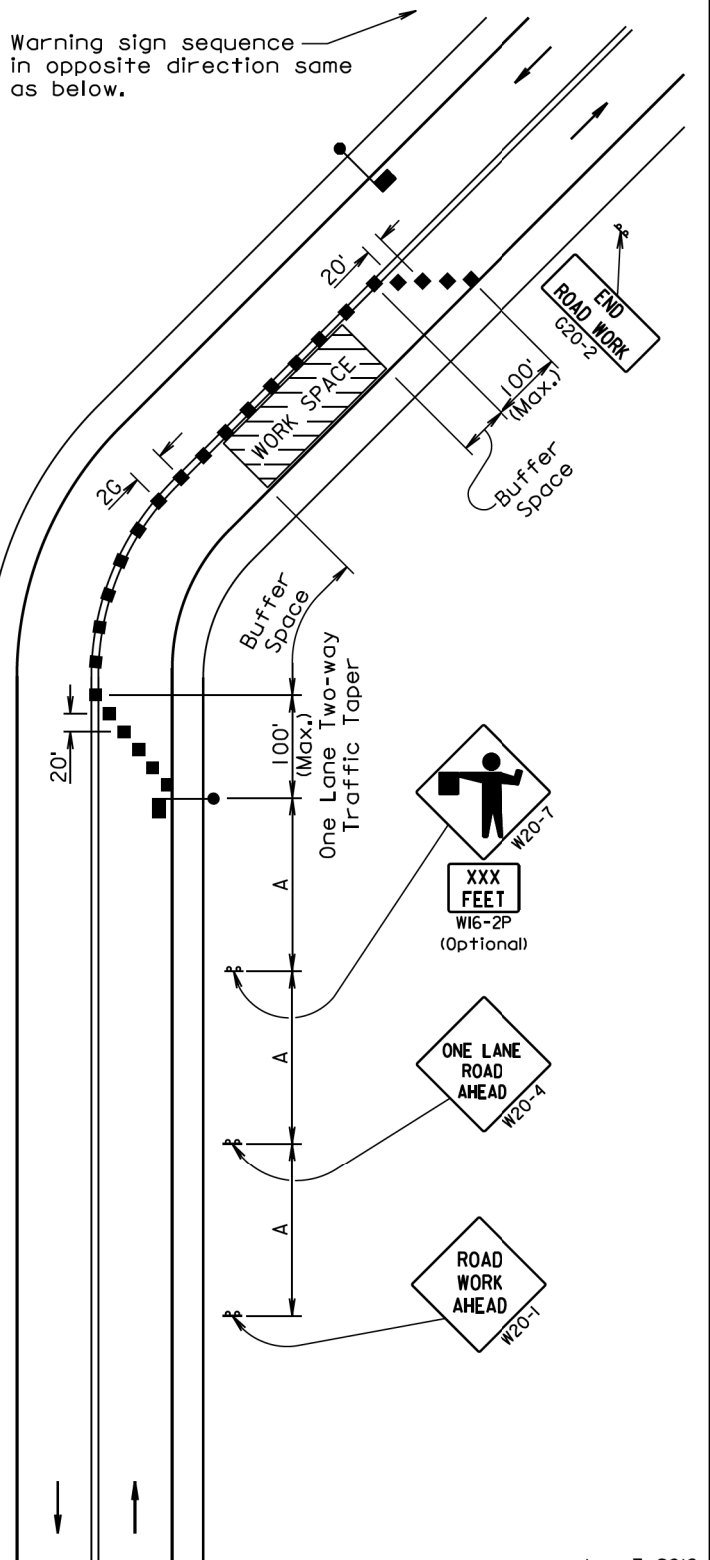
Channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.

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

The buffer space should be extended so that the two-way traffic taper is placed before a horizontal or vertical curve to provide adequate sight distance for the flagger and queue of stopped vehicles.

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

Warning sign sequence in opposite direction same as below.



June 3, 2016

Published Date: 2nd Qtr. 2018	S D D O T	GUIDES FOR TRAFFIC CONTROL DEVICES	PLATE NUMBER
		LANE CLOSURE WITH FLAGGER PROVIDED	634.23
			Sheet 1 of 1

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.

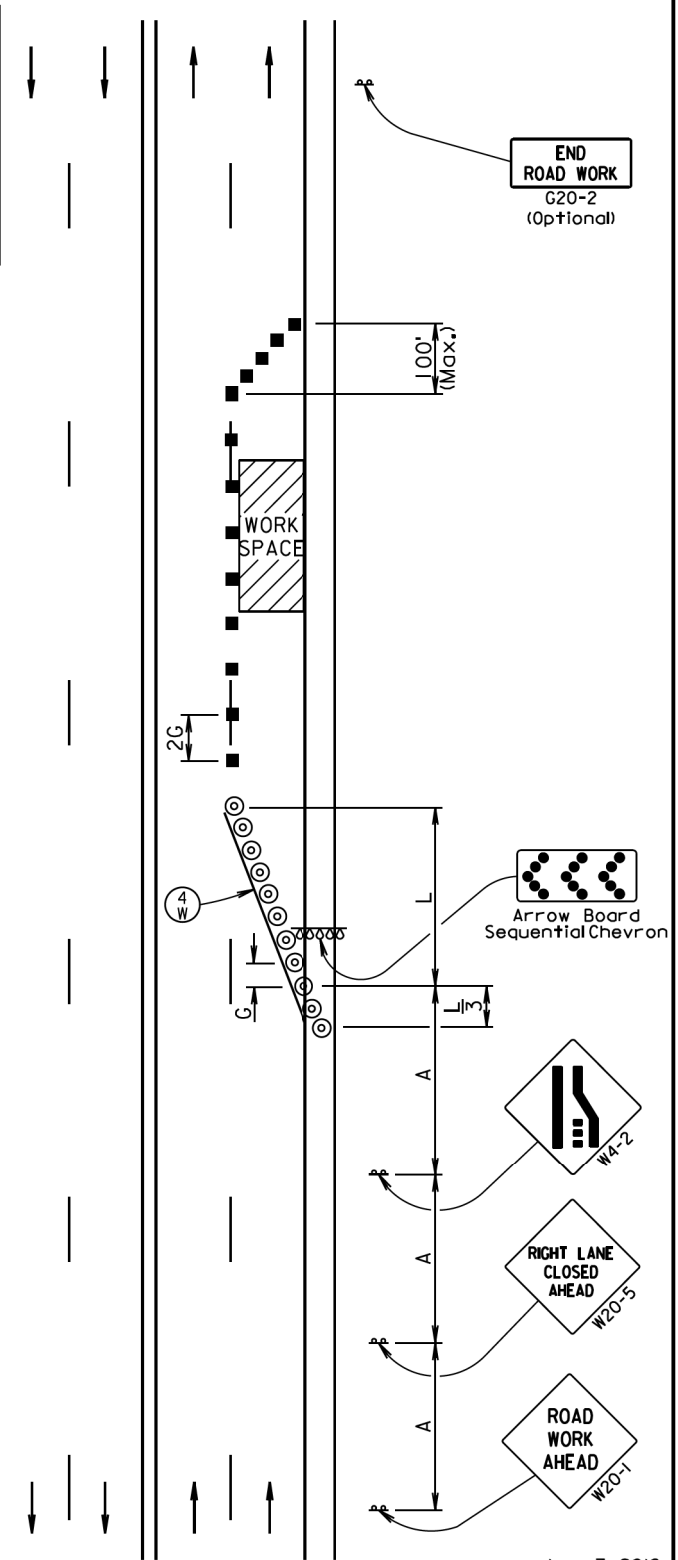
- ⊙ Reflectorized Drum
- Channelizing Device
- ④ 4" White Temporary Pavement Marking

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.

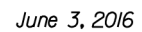
Temporary pavement markings shall be used if traffic control must remain overnight.

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



June 3, 2016

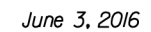
Published Date: 2nd Qtr. 2018	S D D O T	GUIDES FOR TRAFFIC CONTROL DEVICES	PLATE NUMBER
		4-LANE UNDIVIDED, RIGHT LANE CLOSED	634.47
			Sheet 1 of 1



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PLATE NUMBER
634.48

Sheet 1 of 1



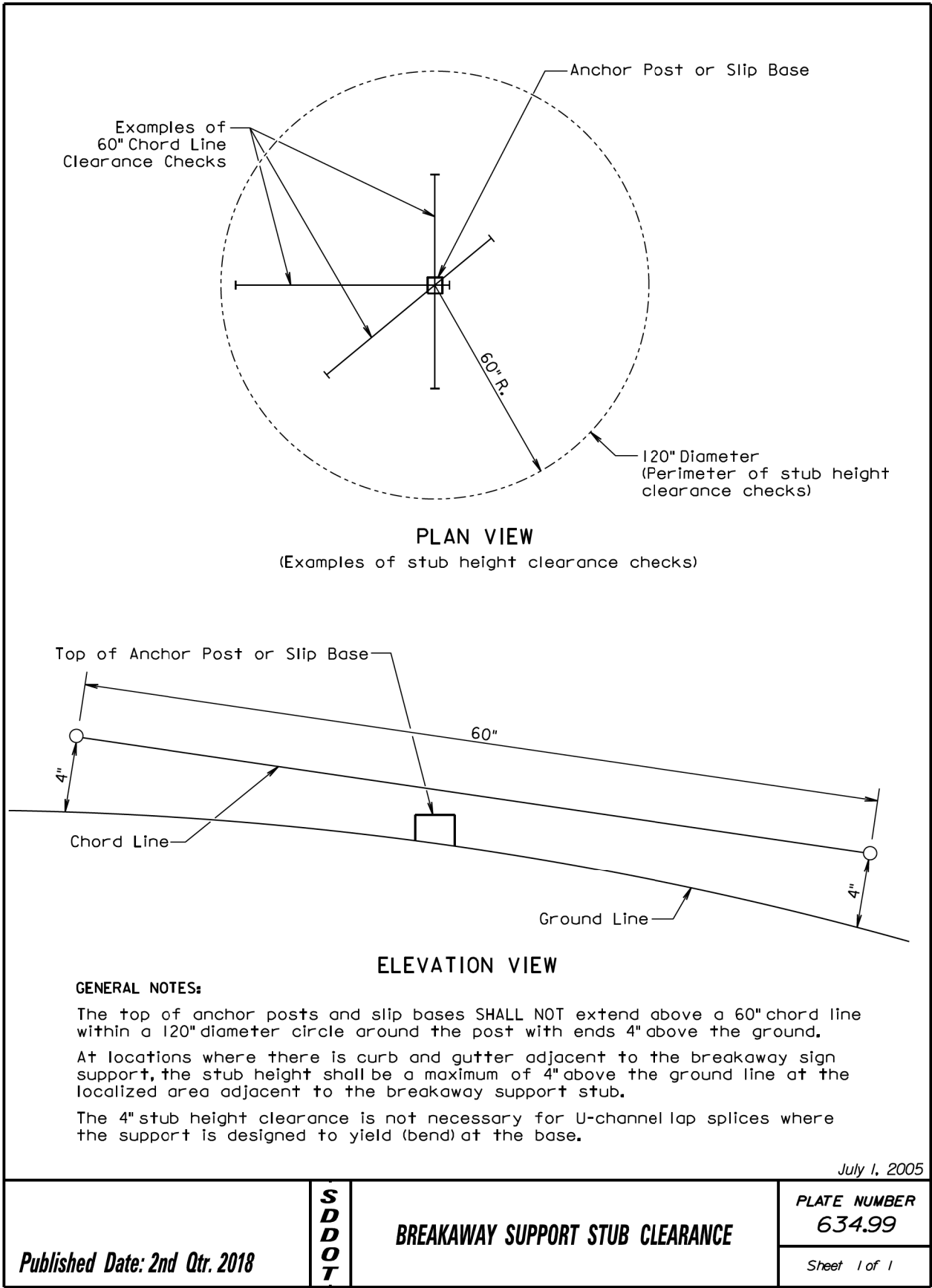
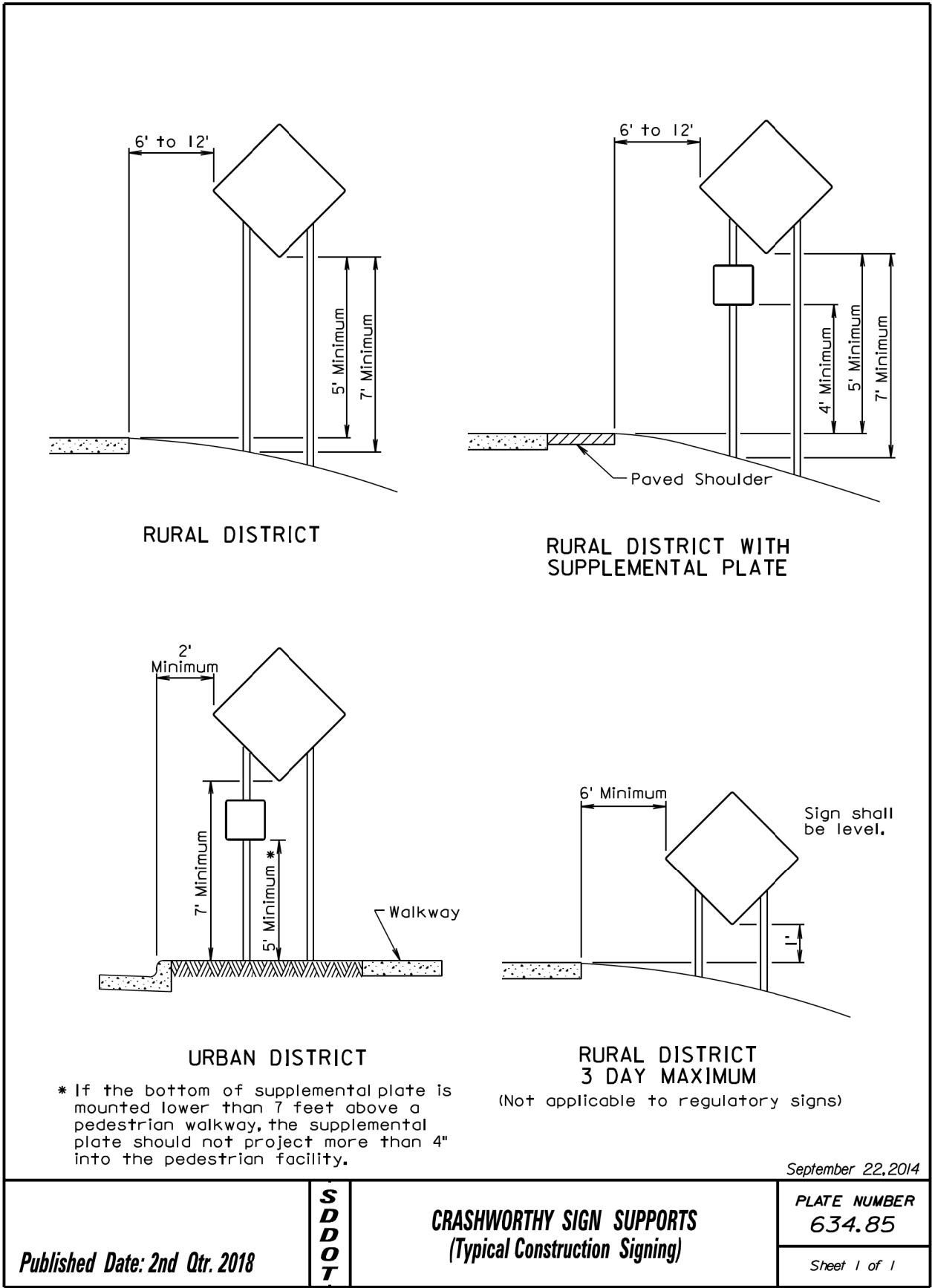
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PLATE NUMBER
634.57

Sheet 1 of 1

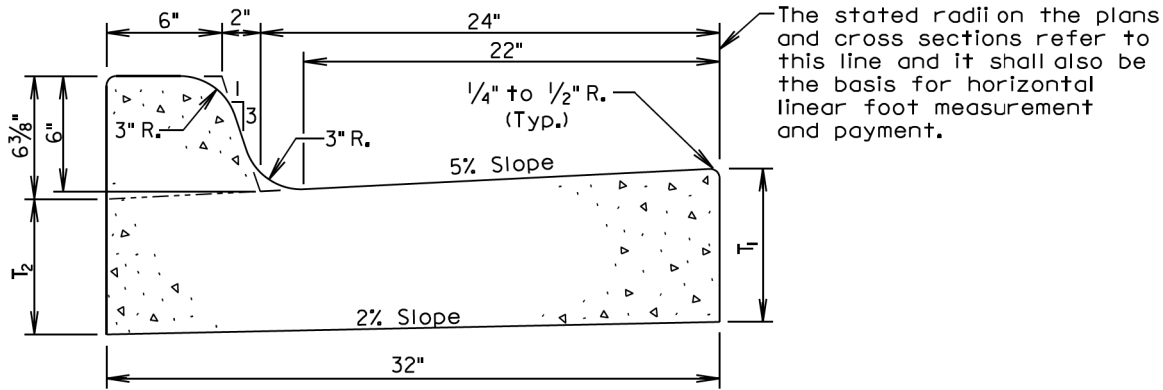
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	231N-452	21	28

Plotting Date: 05/17/2018



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	231N-452	22	28

Plotting Date: 05/17/2018



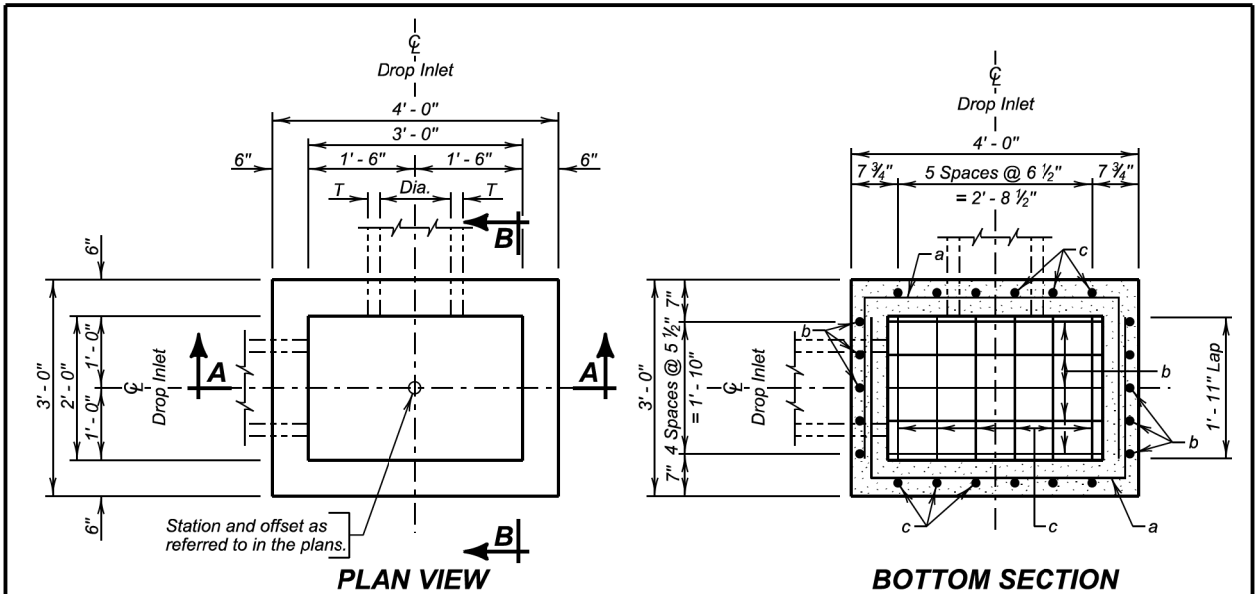
Type	T ₁ (Inches)	T ₂ (Inches)	Cu. Yd. Per Lin. Ft.	Lin. Ft. Per Cu. Yd.
B66	6	5 1/16	0.057	17.7
B67	7	6 1/16	0.065	15.4
B68	8	7 1/16	0.073	13.7
B68.5	8.5	7 9/16	0.077	13.0
B69	9	8 1/16	0.081	12.3
B69.5	9.5	8 9/16	0.085	11.7
B610	10	9 1/16	0.090	11.2
B610.5	10.5	9 9/16	0.094	10.7
B611	11	10 1/16	0.098	10.2
B611.5	11.5	10 9/16	0.102	9.8
B612	12	11 1/16	0.106	9.4

GENERAL NOTES:

When concrete curb and gutter longitudinally adjoins new concrete pavement, the method of attachment shall be by one of the methods shown on Standard Plate 380.11.
See Standard Plate 650.90 for expansion and contraction joints in the curb and gutter.

September 6, 2008

Published Date: 2nd Qtr. 2018	S D D O T	TYPE B CONCRETE CURB AND GUTTER	PLATE NUMBER 650.01
			Sheet 1 of 1



ESTIMATED QUANTITIES			
ITEM	UNIT	CONSTANT QUANTITY	VARIABLE QUANTITY
* Class M6 Concrete	Cu. Yd.	0.26	0.22H
Reinforcing Steel	Lb.	83.03	28.97H
Frame and Grate Assembly	Each	1	

DROP INLETS FOR 12" TO 24" DIAMETER PIPE

SPECIFICATIONS

Design Specifications: AASHTO LRFD Bridge Design Specifications, 2012 Edition.

Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, Current Edition and required Provisions, Supplemental Specifications, and Special Provisions as included in the Proposal.

GENERAL NOTES:

Design Live Load: HL-93. No construction loading in excess of legal load was considered.

Reinforcing steel shall conform to ASTM A615 grade 60. The d bars shall be lapped 12 inches with the b and c bars. Cut and bend reinforcing steel as required to place pipe(s) through the drop inlet wall.

Drop inlet may be precast. If precast drop inlet details differ from this standard plate, submit a checked design done by a SD registered P.E. and shop plans to the Office of Bridge Design for approval.

* Reduce total quantities of concrete by the amount of concrete displaced by the pipe(s). The total quantity of concrete shall be computed to the nearest hundredth of a cubic yard. The total quantity of reinforcing steel shall be computed to the nearest pound.

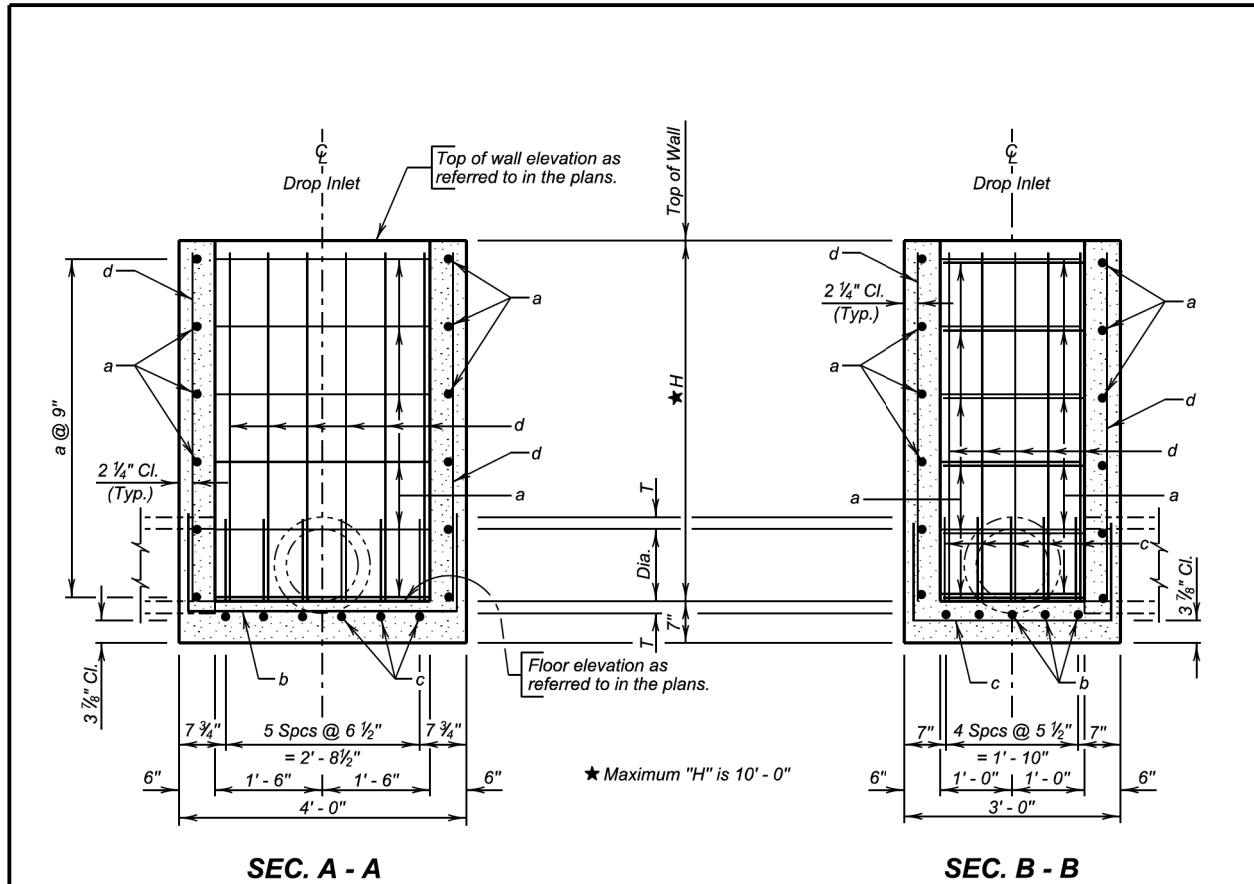
Drop inlet shown may be modified by the addition or omission of connecting pipes as noted elsewhere in the plans. All pipes entering drop inlet must fit between the inside face of walls and shall not enter through the corners.

Maximum R.C.P. diameter shall not exceed 18 inches on the 2-foot wide side and shall not exceed 24 inches (24 inches for R.C. arch) on the 3-foot wide side of the drop inlet.

The dimension of H is in feet. Maximum H is 10 feet.

December 16, 2015

Published Date: 2nd Qtr. 2018	S D D O T	2' X 3' TYPE B REINFORCED CONCRETE DROP INLET	PLATE NUMBER 670.01
			Sheet 1 of 2



REINFORCING SCHEDULE				
Mk.	No.	Size	Length	Type
a	2.67H	4	8'-0"	17
b	5	5	6'-3"	17
c	6	4	5'-3"	17
d	22	4	H-2"	Str.

NOTE:
All dimensions are out to out of bars.

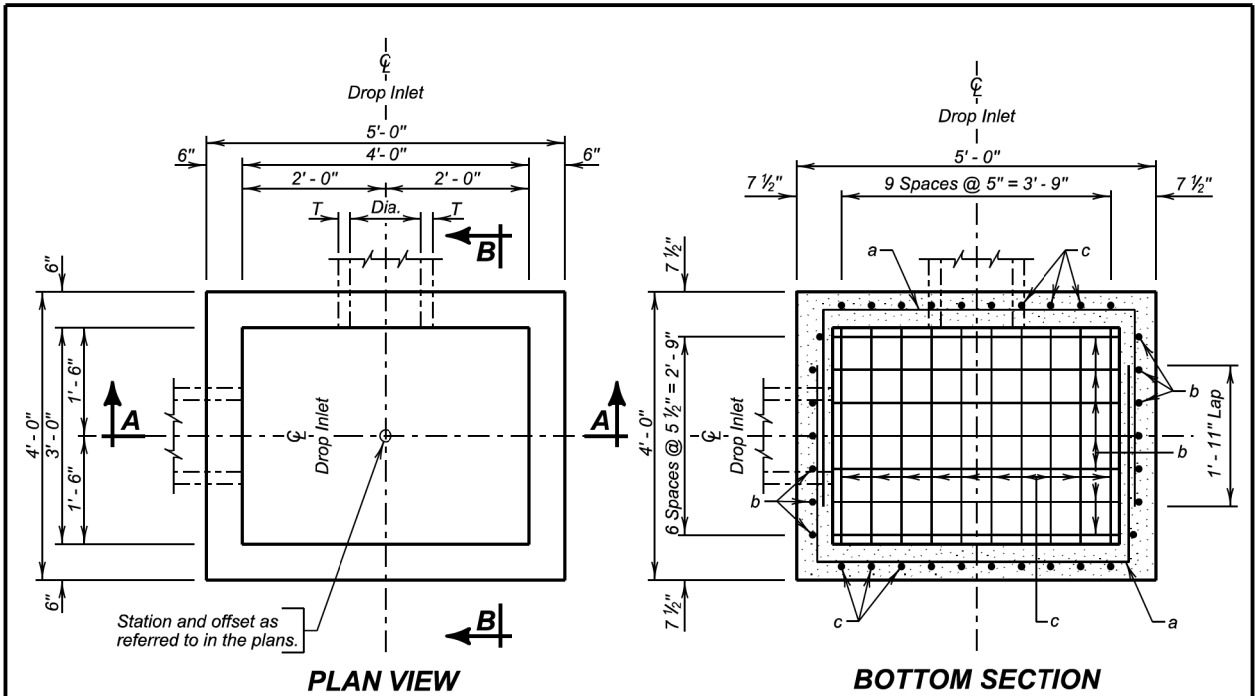
Type 17

2'-7 1/2"
3'-7 1/2"
3'-6 1/2"

a 2'-2 1/2"
b 1'-3 1/2"
c 1'-3 1/2"

December 16, 2015

Published Date: 2nd Qtr. 2018	S D D O T	2' X 3' TYPE B REINFORCED CONCRETE DROP INLET	PLATE NUMBER 670.01
			Sheet 2 of 2



ESTIMATED QUANTITIES			
ITEM	UNIT	CONSTANT QUANTITY	VARIABLE QUANTITY
★ Class M6 Concrete	Cu. Yd.	0.43	0.30H
Reinforcing Steel	Lb.	90.90	40.53H
Frame and Grate Assembly	Each	1	

DROP INLETS FOR 12" TO 36" DIAMETER PIPE

SPECIFICATIONS

Design Specifications: AASHTO LRFD Bridge Design Specifications, 2012 Edition.

Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, Current Edition and required Provisions, Supplemental Specifications, and Special Provisions as included in the Proposal.

GENERAL NOTES:

Design Live Load: HL-93. No construction loading in excess of legal load was considered.

Reinforcing steel shall conform to ASTM A615 grade 60. The d bars shall be lapped 12 inches with the b and c bars. Cut and bend reinforcing steel as required to place pipe(s) through the drop inlet wall.

Drop inlet may be precast. If precast drop inlet details differ from this standard plate, submit a checked design done by a SD registered P.E. and shop plans to the Office of Bridge Design for approval.

★ Reduce total quantities of concrete by the amount of concrete displaced by the pipe(s). The total quantity of concrete shall be computed to the nearest hundredth of a cubic yard. The total quantity of reinforcing steel shall be computed to the nearest pound.

Drop inlet shown may be modified by the addition or omission of connecting pipes as noted elsewhere in the plans. All pipes entering drop inlet must fit between the inside face of walls and shall not enter through the corners.

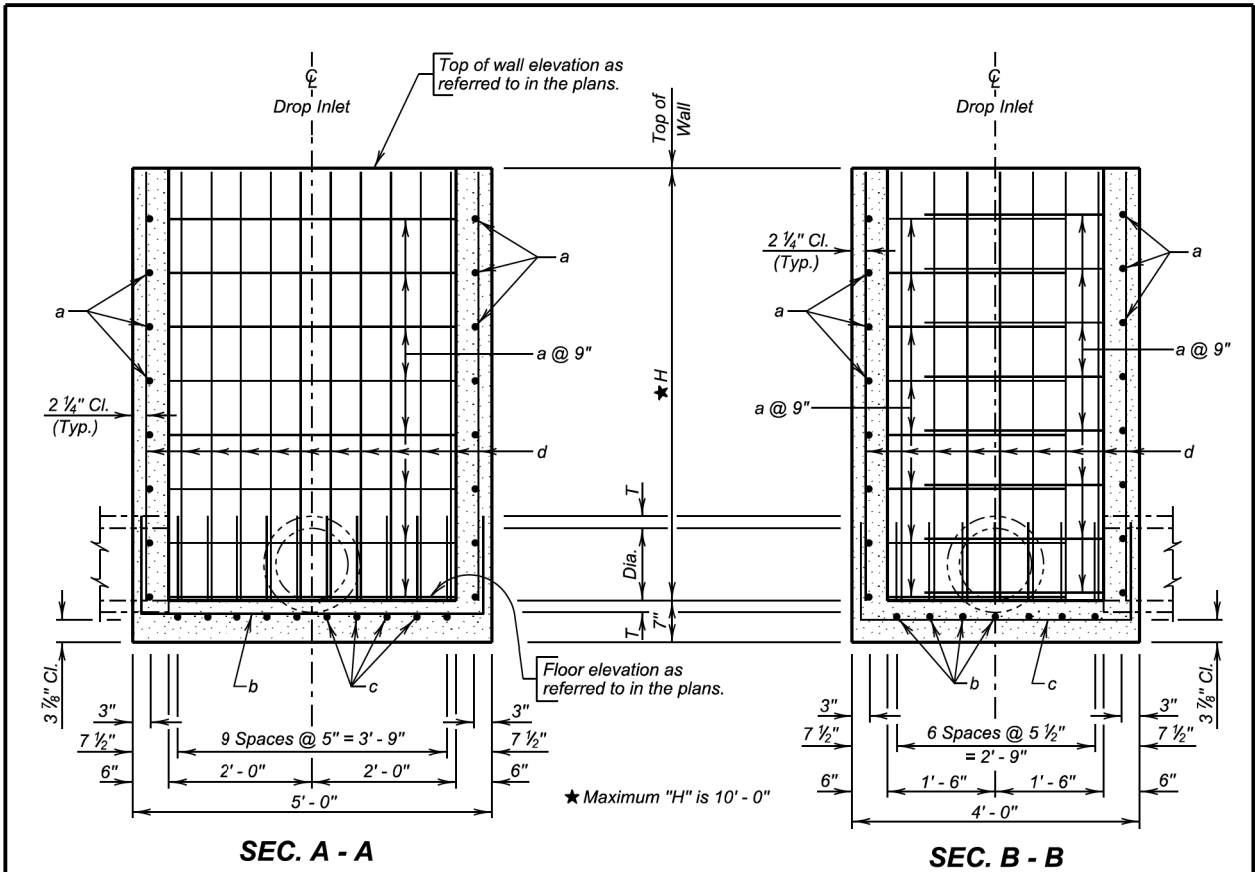
Maximum R.C.P. diameter shall not exceed 24 inches (24 inches for R. C. arch) on the 3-foot wide side and shall not exceed 36 inches (30 inches for R. C. arch) on the 4-foot wide side of the drop inlet.

The dimension of H is in feet. Maximum H is 10 feet.

PIPE DISPLACEMENT REDUCTIONS		
Diameter (Inches)	Wall T (Inches)	Class M6 Concrete (Cu. Yd.)
12	2	0.03
15	2 1/4	0.04
18	2 1/2	0.05
24	3	0.09
30	3 1/2	0.14
36	4	0.20
18	2 1/2	0.05
24	3 1/2	0.09
30	4	0.14

December 16, 2015

Published Date: 2nd Qtr. 2018	S D D O T	3' X 4' TYPE C REINFORCED CONCRETE DROP INLET	PLATE NUMBER 670.10
			Sheet 1 of 2

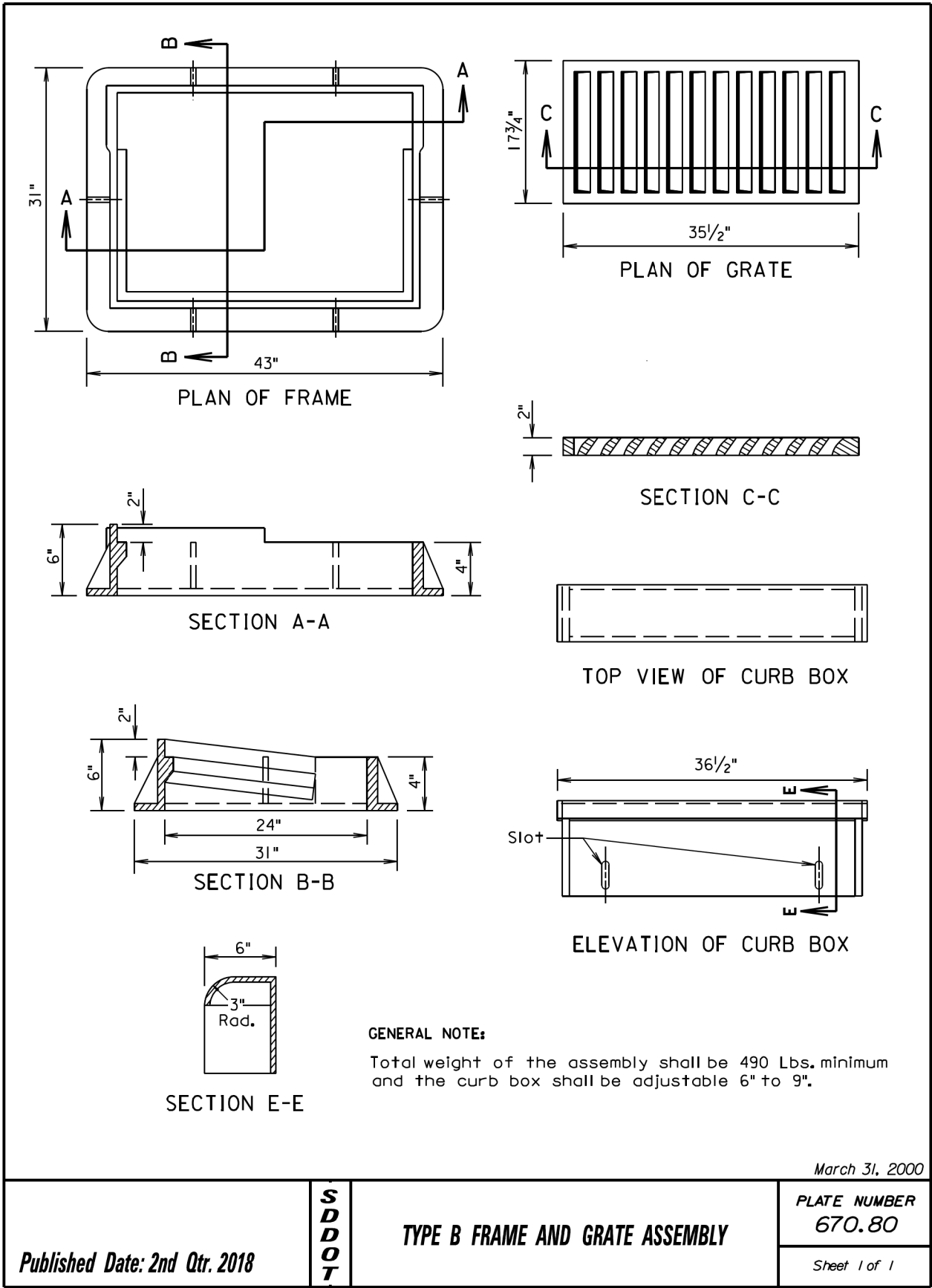
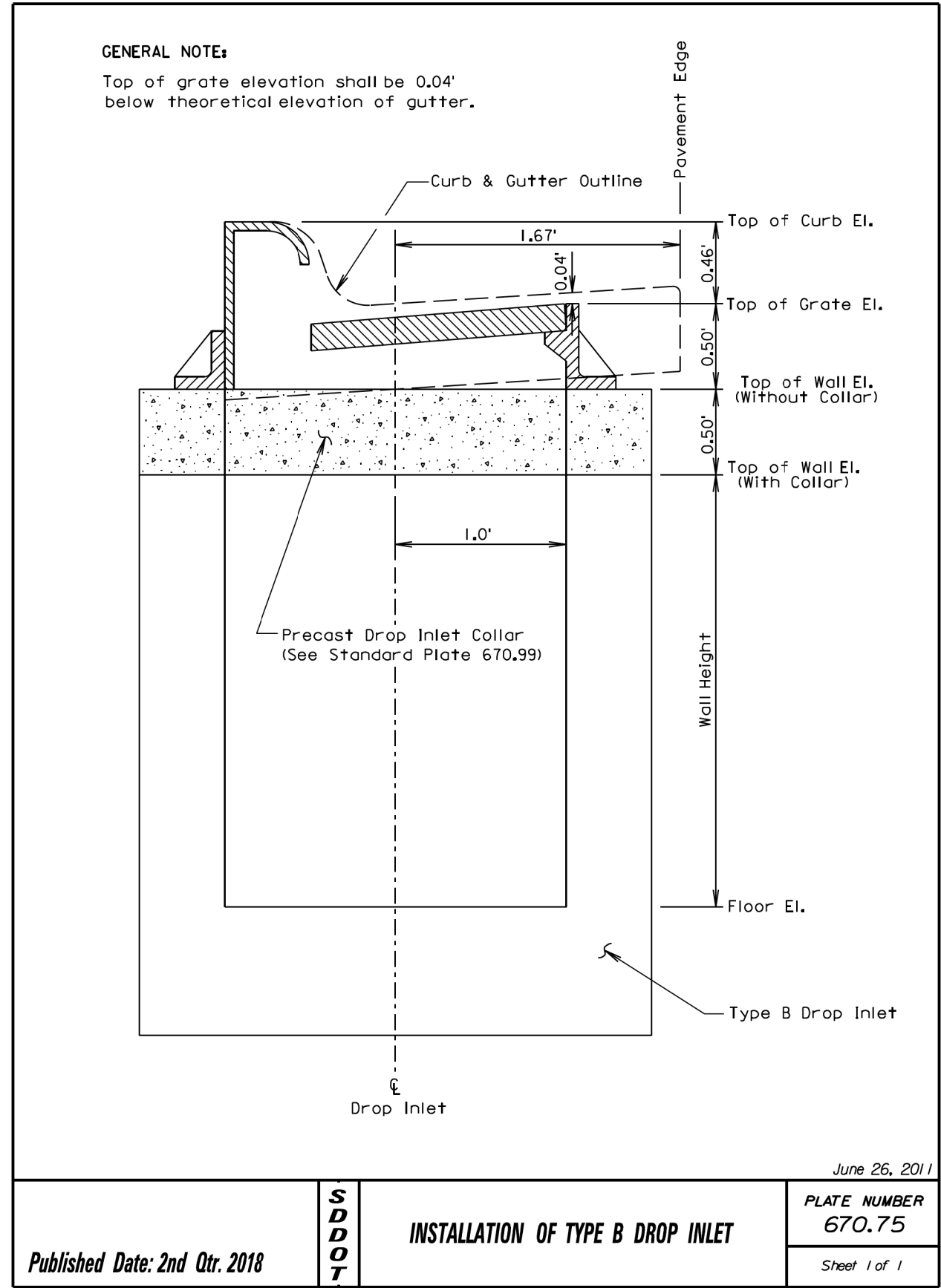


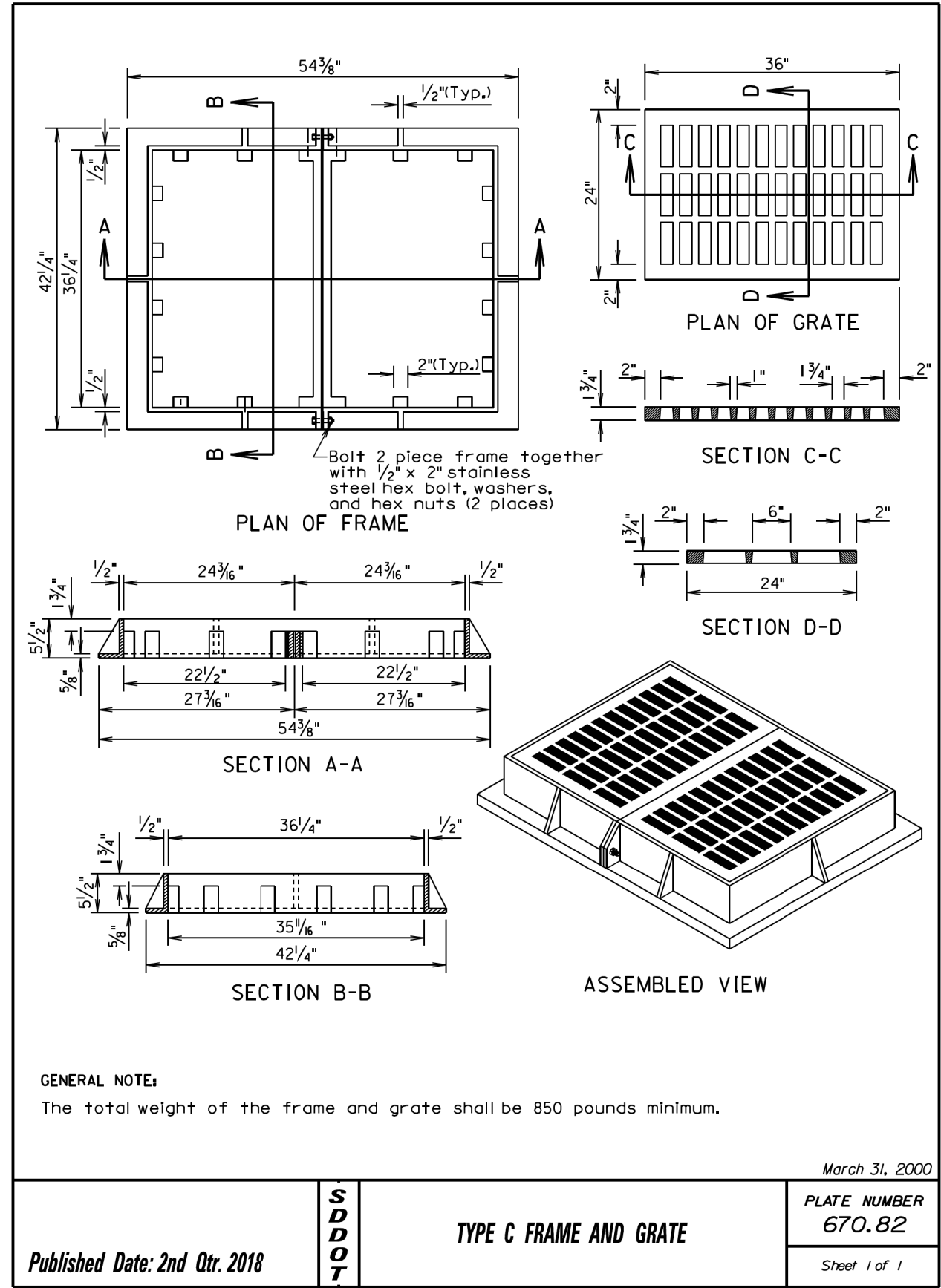
REINFORCING SCHEDULE				
Mk.	No.	Size	Length	Type
a	2.67H	4	10' - 0"	17
b	7	5	7' - 3"	17
c	10	4	6' - 3"	17
d	34	4	H - 2"	Str.

NOTE:
All dimensions are out to out of bars.

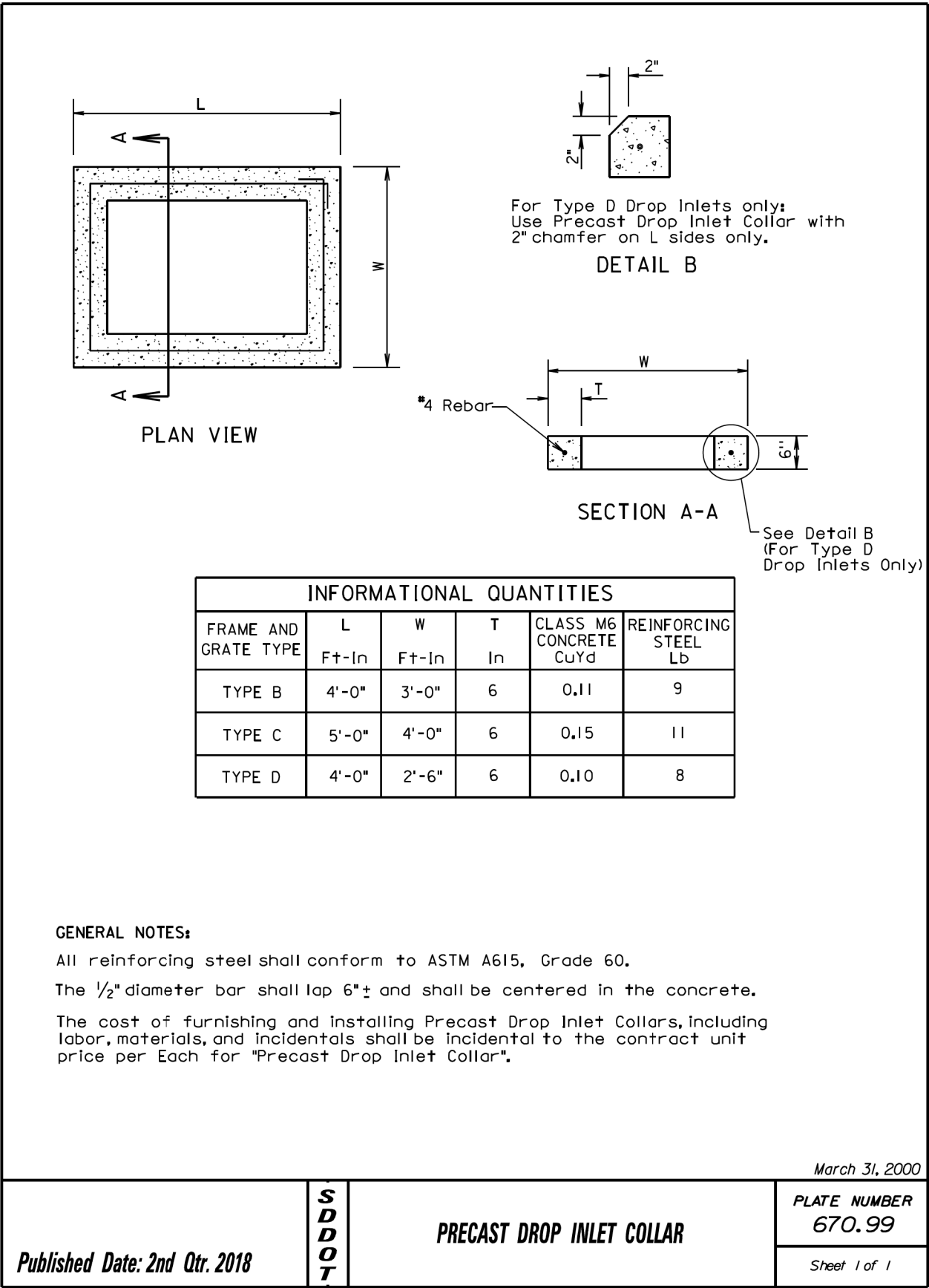
December 16, 2015

Published Date: 2nd Qtr. 2018	S D D O T	3' X 4' TYPE C REINFORCED CONCRETE DROP INLET	PLATE NUMBER 670.10
			Sheet 2 of 2





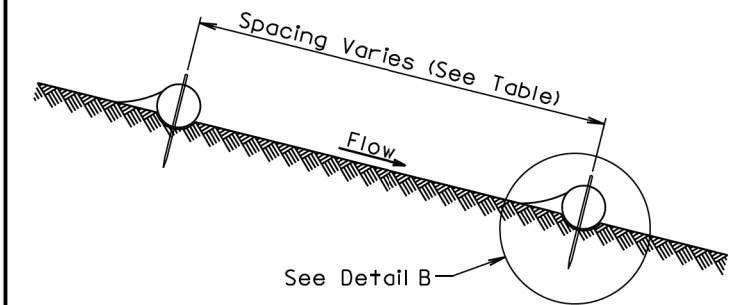
S D D O T	TYPE C FRAME AND GRATE	PLATE NUMBER 670.82
		Sheet 1 of 1
		Published Date: 2nd Qtr. 2018



S D D O T	PRECAST DROP INLET COLLAR	PLATE NUMBER 670.99
		Sheet 1 of 1
		Published Date: 2nd Qtr. 2018

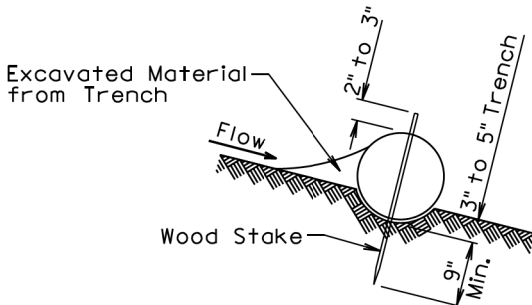
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	231N-452		

Plotting Date: 05/17/2018

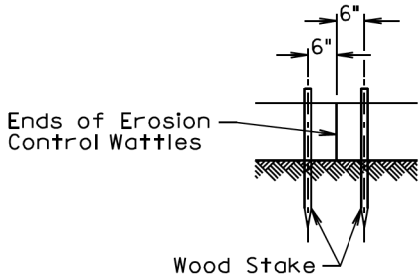


ELEVATION VIEW
CUT OR FILL SLOPE INSTALLATION

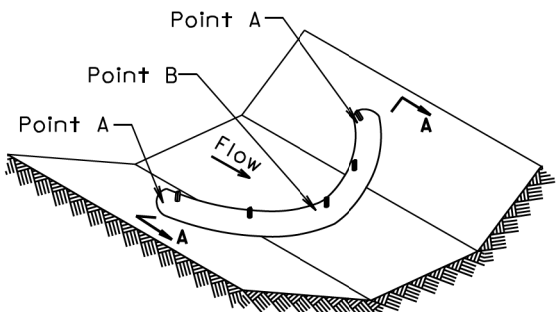
CUT OR FILL SLOPE INSTALLATION	
Slope	Spacing (Ft)
1:1	10
2:1	20
3:1	30
4:1	40



DETAIL B
(TYPICAL OF ALL INSTALLATIONS)

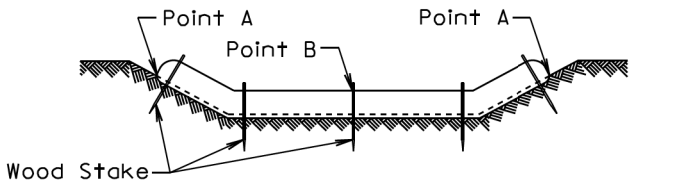


DETAIL C

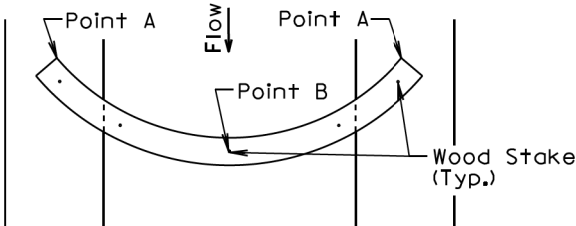


ISOMETRIC VIEW
DITCH INSTALLATION

DITCH INSTALLATION	
Grade	Spacing (Ft)
2%	150
3%	100
4%	75
5%	50



SECTION A-A



PLAN VIEW
DITCH INSTALLATION

December 23, 2004

Published Date: 2nd Qtr. 2018	S D D O T	EROSION CONTROL WATTLE	PLATE NUMBER 734.06
			Sheet 1 of 2

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

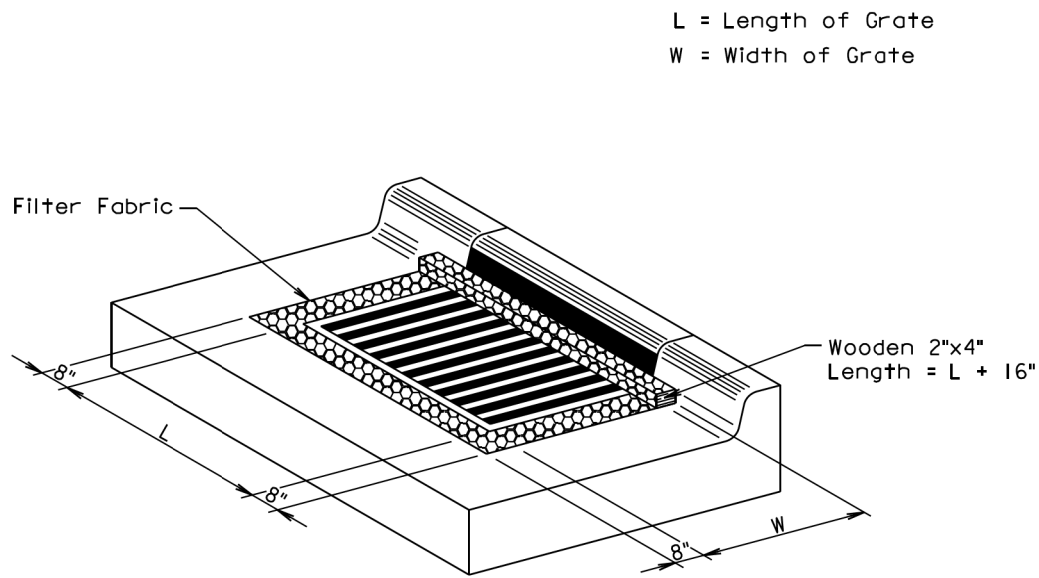
Published Date: 2nd Qtr. 2018	S D D O T	EROSION CONTROL WATTLE	PLATE NUMBER 734.06
			Sheet 2 of 2

1:200
Plot Scale -

trc11626
- Plotted From -

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	231N-452	28	28

Plotting Date: 05/17/2018



ISOMETRIC VIEW

GENERAL NOTES:

- The grate and curb and gutter shown are for illustrative purposes only.
- The sediment control at inlet with frame and grate shall be placed at locations stated in the plans or at locations determined by the Engineer.
- The filter fabric shall be the type specified in the plans.
- The filter fabric shall be placed in the inlet opening prior to placing the grate. Approximately 18 inches of excess filter fabric shall be wrapped around the 2"x4" and stapled securely to the 2"x4" after the grate has been placed.
- The Contractor shall inspect and maintain the sediment control device once every week and within 24 hours after every rainfall event. The Contractor shall maintain the sediment control device by removing accumulated sediment and replacing torn filter fabric with new filter fabric.
- The removed sediment shall be placed at a location away from the drop inlet where the sediment will not be washed back into the drop inlet or other storm sewer system.
- All costs for furnishing, installing, inspecting, maintaining, removing, and replacing the sediment control device at the inlet including labor, equipment, and materials shall be incidental to the contract unit price per each for "Sediment Control at Inlet with Frame and Grate".

September 14, 2005

<i>Published Date: 2nd Qtr. 2018</i>	S D D O T	SEDIMENT CONTROL AT INLETS WITH FRAMES AND GRATES	PLATE NUMBER 734.10
			Sheet 1 of 1

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