

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

SD DOT	PROJECT	SECTION	SHEET
	NH 0042(100)	Non	1/18

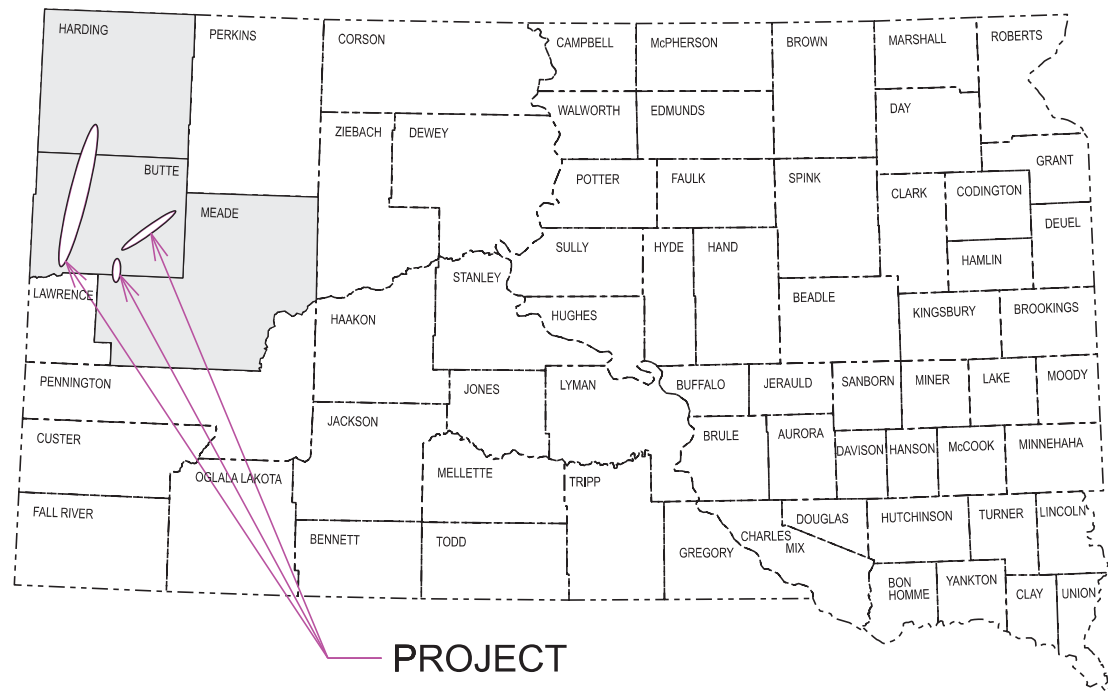
Plotting Date: 02/18/2025

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NH 0042(100)
U.S. HIGHWAYS 85 & 212
S.D. HIGHWAY 79
BUTTE, HARDING AND
MEADE COUNTIES

PIPE WORK
PCN 09VD



PROJECT

END US HWY 212
MRM 59.0 + 0.080

END SD HWY 79
MRM 128.0 + 0.023

DESIGN DESIGNATION (SD79)

ADT (2023)	2100
ADT (2043)	3249
DHV	518
D	50 %
T DHV	5.2 %
T ADT	11.4 %
V	65 MPH

DESIGN DESIGNATION (US212)

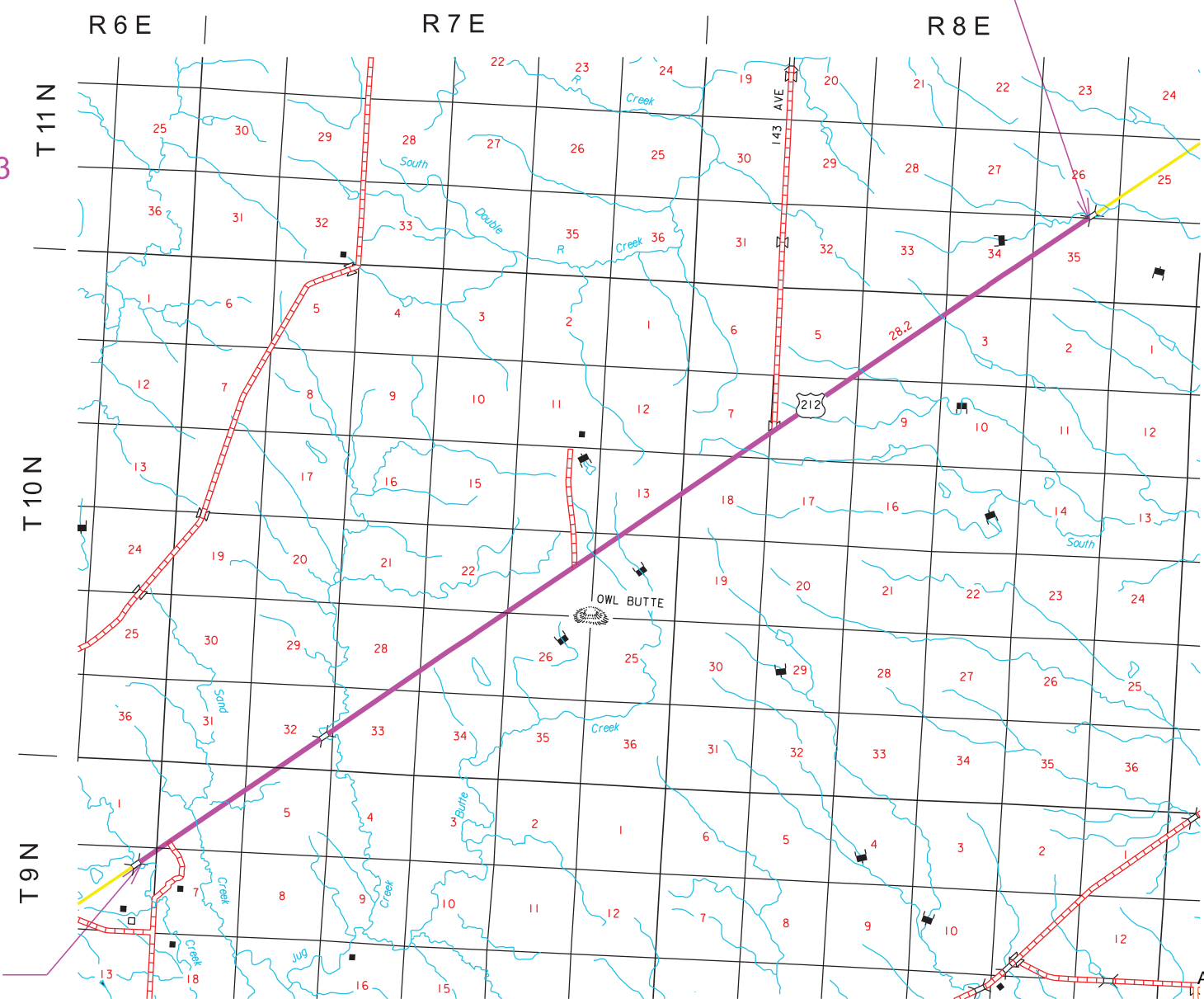
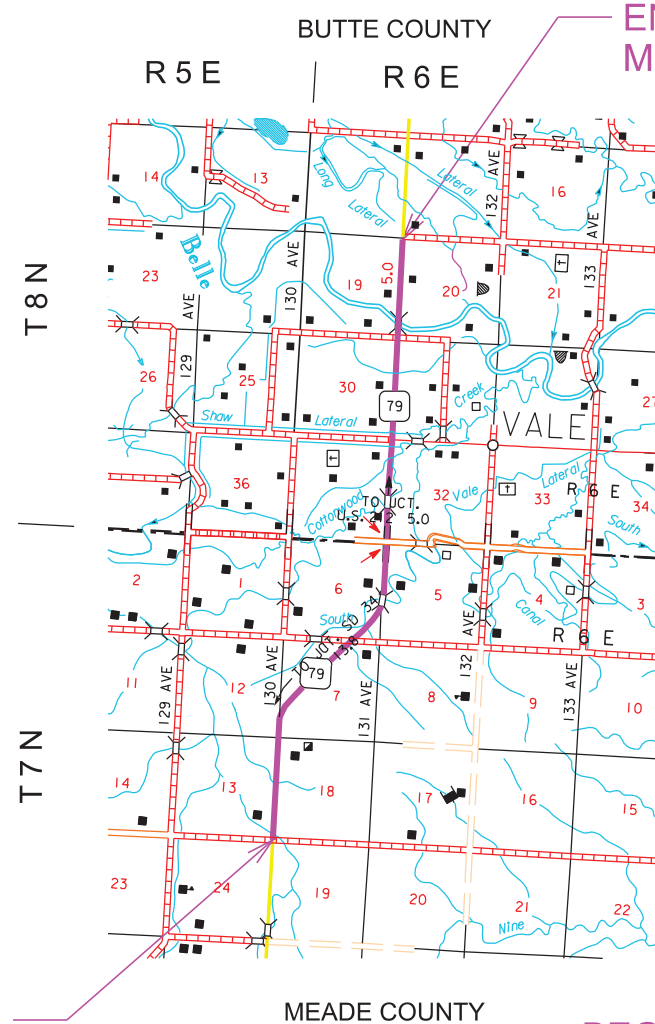
ADT (2023)	494
ADT (2043)	709
DHV	113
D	50 %
T DHV	11.4 %
T ADT	25.1 %
V	65 MPH

STORM WATER PERMIT

No Permit Required

BEGIN SD HWY 79
MRM 122.0 + 0.434

BEGIN US HWY 212
MRM 45.0 + 0.434



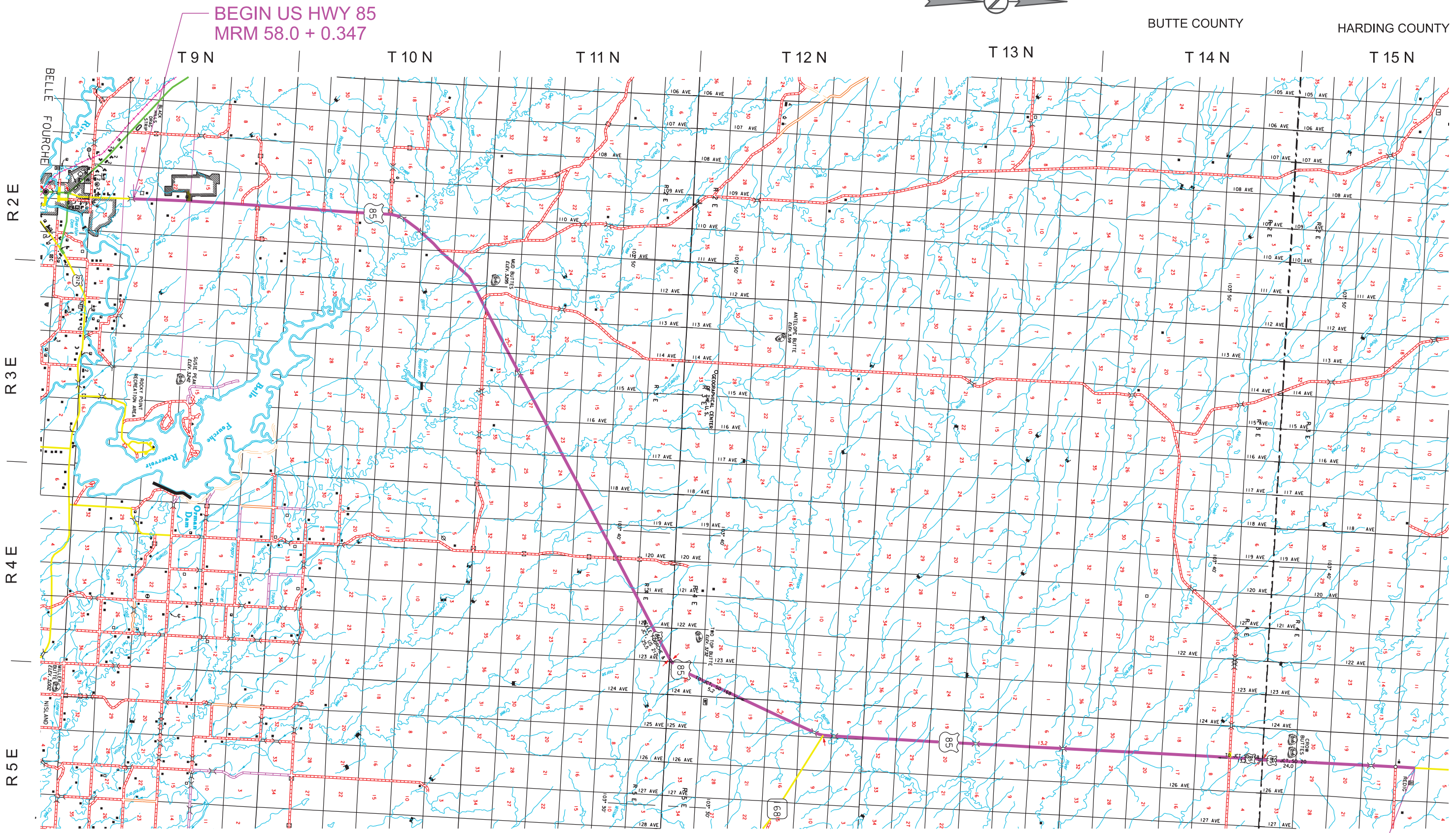
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April 2, 2025

Plotting Date: 02/18/2025



BUTTE COUNTY HARDING COUNTY



BEGIN US HWY 85
MRM 58.0 + 0.347

END US HWY 85
MRM 106.0 + 0.820

DESIGN DESIGNATION (US85)

ADT (2023)	1226
ADT (2043)	1759
DHV	232
D	50 %
T DHV	12 %
T ADT	26.0 %
V	65 MPH

ESTIMATE OF QUANTITIES

Non-Section Method

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
110E0500	Remove Pipe Culvert	45	Ft
110E0510	Remove Pipe End Section	33	Each
230E0020	Contractor Furnished Topsoil	50	CuYd
450E2008	18" RCP Flared End, Furnish	2	Each
450E2009	18" RCP Flared End, Install	2	Each
450E2200	24" RCP Sloped End, Furnish	1	Each
450E2201	24" RCP Sloped End, Install	1	Each
450E2204	30" RCP Sloped End, Furnish	1	Each
450E2205	30" RCP Sloped End, Install	1	Each
450E5030	42" CMP Elbow, Furnish	1	Each
450E5031	42" CMP Elbow, Install	1	Each
450E5223	36" CMP Flared End, Furnish	4	Each
450E5224	36" CMP Flared End, Install	4	Each
450E5227	42" CMP Flared End, Furnish	4	Each
450E5228	42" CMP Flared End, Install	4	Each
450E5306	18" CMP Sloped End, Furnish	2	Each
450E5307	18" CMP Sloped End, Install	2	Each
450E5310	24" CMP Sloped End, Furnish	13	Each
450E5311	24" CMP Sloped End, Install	13	Each
450E5314	30" CMP Sloped End, Furnish	5	Each
450E5315	30" CMP Sloped End, Install	5	Each
450E8910	Cleanout for Culvert Treatment	23	Each
450E9518	18" Cured in Place Pipe	564	Ft
450E9524	24" Cured in Place Pipe	1,272	Ft
450E9526	30" Cured in Place Pipe	430	Ft
450E9528	36" Cured in Place Pipe	176	Ft
450E9530	42" Cured in Place Pipe	366	Ft
450E9532	48" Cured in Place Pipe	98	Ft
634E0010	Flagging	350.0	Hour
634E0020	Pilot Car	150.0	Hour
634E0110	Traffic Control Signs	755.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
720E1015	Bank and Channel Protection Gabion	6.0	CuYd
734E0010	Erosion Control	Lump Sum	LS
831E0110	Type B Drainage Fabric	19	SqYd

SPECIFICATIONS

Standard Specifications for Roads & 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 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. During construction, the Project Engineer will verify that the Contractor has met Environmental Commitment requirements. 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: <<https://dot.sd.gov/media/documents/EnvironmentalProceduresManual.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 Engineer at 605-773-3180 or 605-773-4336 to determine whether an environmental analysis and/or resource agency coordination is necessary.

Once construction is complete, the Project Engineer will review all environmental commitments for the project and document their completion.

COMMITMENT B2: WHOOPING CRANE

The Whooping Crane is a spring and fall migratory bird in South Dakota that is about 5 feet tall and typically stops on wetlands, rivers, and agricultural lands along their migration route. An adult Whooping Crane is white with a red crown and a long, dark, pointed bill. Immature Whooping Cranes are cinnamon brown. While in flight, their long necks are kept straight and their long dark legs trail behind. Adult Whooping Cranes' black wing tips are visible during flight.

Action Taken/Required:

Harassment or other measures to cause the Whooping Crane to leave the site is a violation of the Endangered Species Act. If a Whooping Crane is sighted roosting in the vicinity of the project, borrow pits, or staging areas associated with the project, cease construction activities in the affected area until the Whooping Crane departs and immediately contact the Project Engineer. The Project Engineer will contact the Environmental Office so that the sighting can be reported to USFWS.

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 (AIS) positive waters within South Dakota without prior approval from the SDDOT Environmental Office. To prevent and control the introduction and spread of invasive species into the project vicinity, all equipment will be power washed with hot water (≥140 °F) and completely dried for a minimum of 7 days prior to subsequent use. South Dakota administrative rule 41:10:04:02 forbids the possession and transport of AIS; therefore, all attached dirt, mud, debris and vegetation must be removed and all compartments and tanks capable of holding standing water must be drained. This includes, but is not limited to, all equipment, pumps, lines, hoses and holding tanks.

STATE OF SOUTH DAKOTA	PROJECT	SECTION	SHEET
	NH 0042(100)	Non	3/18

Revised: 02-18-2025

Action Taken/Required:

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

Additional information and mapping of water sources impacted by Aquatic Invasive Species in South Dakota can be accessed at: <<https://sdleastwanted.sd.gov/maps/default.aspx>>

< [South Dakota Administrative Rule 41:10:04 Aquatic Invasive Species: https://sdlegislature.gov/rules/DisplayRule.aspx?Rule=41:10:04](https://sdlegislature.gov/rules/DisplayRule.aspx?Rule=41:10:04) >

COMMITMENT D: WATER QUALITY STANDARDS

COMMITMENT D1: SURFACE WATER QUALITY

This project may be in the vicinity of multiple streams and wetlands. These waters are considered waters of the state and are protected under Administrative Rules of South Dakota (ARSD) Chapter 74:51. Special construction measures may have to be taken to ensure that this water body is not impacted.

Action Taken/Required:

The Contractor is advised that the South Dakota Surface Water Quality Standards, administered by the South Dakota Department of Agriculture and Natural Resources (DANR), apply to this project. Special construction measures will be taken to ensure the above standard(s) of the surface waters are maintained and protected.

COMMITMENT D2: SURFACE WATER DISCHARGE

The DANR General Permit for Temporary Discharge is required for temporary dewatering and discharges to waters of the state. The effluent limit for total suspended solids will be 90 mg/L 30-day average. The effluent limit applies to discharges to all waters of the state except discharges to waters classified as cold water permanent fish life propagation waters according to the ARSD 74:51:01:45. For discharges to waters of the state classified as cold water permanent fish life propagation waters, the effluent limit for total suspended solids will be 53 mg/L daily maximum.

The permittee has the option of completing effluent testing or implementing a pollution prevention plan for compliance with this permit. If the permittee develops a pollution prevention plan instead of total suspended solids sampling, the plan must be developed and implemented prior to discontinuing total suspended solids sampling. Refer to Section 4.0 of the permit. If any pollutants are suspected of being discharged, a sample must be taken for those parameters listed in Section 3.4 of the permit.

Refer to Commitment D1: Surface Water Quality for stream classification.

COMMITMENT D2: SURFACE WATER DISCHARGE(CONTINUED)

Action Taken/Required:

If construction dewatering is required and this project is not required to be covered under a General Permit for Stormwater Discharges Associated with Construction Activities, the Contractor will obtain the General Permit for Temporary Discharge Activities from the DANR Surface Water Program, 605-773-3351.

<
https://danr.sd.gov/OfficeOfWater/SurfaceWaterQuality/docs/DANR_TemporaryDischargeNOI2018Fillable.pdf >

The Contractor will provide a copy of the approved permit or the submitted dewatering information to the Project Engineer prior to proceeding with any dewatering activities. The approved permit or submitted dewatering information must be kept on-site and as part of the project records.

Effluent monitoring, as a result of dewatering activities, will be summarized for each month and recorded on a separate Discharge Monitoring Report (DMR) and submitted to DANR monthly. Additional information can be found at:

<
<https://danr.sd.gov/OfficeOfWater/SurfaceWaterQuality/swdpermitting/Ereporting.aspx> >

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 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 Agriculture 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 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 not to exceed the duration of the project. Prior to project completion, the waste will 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: HISTORIC PRESERVATION OFFICE CLEARANCES

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

Action Taken/Required:

All earth disturbing activities not designated within the plans require 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 in 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 within 150 feet of the inadvertent discovery will immediately cease and the Project Engineer will be immediately notified. The Project Engineer will contact the SDDOT Environmental Office, who will contact the appropriate SHPO/THPO within 48 hours of the discovery to determine an appropriate course of action.

SHPO review does not relieve the Contractor of the responsibility for obtaining any additional permits and clearances for Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas that affect wetlands, threatened and endangered species, or waterways. The Contractor 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.

SEQUENCE OF OPERATIONS

The Contractor will submit a sequence of operations for approval two weeks prior to the preconstruction meeting. If changes to the sequence of operations are proposed during the project, these must be submitted for review a minimum of one week prior to potential implementation. Approval for changes to the 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.

UTILITIES

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

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 will contact the Project Engineer to determine modifications that will be necessary to avoid utility impacts.

GENERAL TRAFFIC CONTROL

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 construction operations will be conducted in the general direction of traffic movement.

Prior to nightfall, all traffic control will be removed from the roadway.

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.

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.

Lane closures will be limited to 1 mile in length.

FLAGGING

Operations will be conducted so that the traveling public will not have to wait longer than 15 minutes at the flagger station.

Additional flagger warning signs and flagger hours have been included in the Estimate of Quantities for use on intersecting roads. These flaggers will be used as directed by the Engineer and will be used primarily during daytime hours. Also included in the Estimate of Quantities are WAIT FOLLOW PILOT CAR signs for use on low volume intersecting roads as determined by the Engineer. WAIT FOLLOW PILOT CAR signs will not block the view of the stop sign.



FLAGGING (CONTINUED)

It is required that the flaggers and pilot car operators be able to communicate with one another. If an emergency vehicle needs to pass through the project, the Contractor will be required to expedite traffic movement. All costs associated with this will be incidental to the contract unit price per hour for "Flagging".

TRAFFIC CONTROL SIGNS

Traffic control signs have been included in a table for each route. Payment will only be for those signs used on each route.

SD79, MRM 122.0 + 0.434 to MRM 128.0 + 0.023

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD			
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W3-4	BE PREPARED TO STOP	2	48" x 48"	16.0	32.0
W20-1	ROAD WORK AHEAD	2	48" x 48"	16.0	32.0
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	2	48" x 48"	16.0	32.0
W21-5	SHOULDER WORK	2	48" x 48"	16.0	32.0
SPECIAL	WAIT FOLLOW PILOT CAR	2	30" x 18"	3.8	7.6
G20-2	END ROAD WORK	2	36" x 18"	4.5	9.0
CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT					176.6

US85, MRM 58.0 + 0.347 to MRM 106.0 + 0.820

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD			
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W3-4	BE PREPARED TO STOP	2	48" x 48"	16.0	32.0
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
W20-7	FLAGGER (symbol)	2	48" x 48"	16.0	32.0
W21-5	SHOULDER WORK	6	48" x 48"	16.0	96.0
SPECIAL	WAIT FOLLOW PILOT CAR	4	30" x 18"	3.8	15.2
G20-2	END ROAD WORK	6	36" x 18"	4.5	27.0
CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT					330.2

US212, MRM 45.0 + 0.434 to MRM 59.0 + 0.080

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD			
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W3-4	BE PREPARED TO STOP	2	48" x 48"	16.0	32.0
W20-1	ROAD WORK AHEAD	4	48" x 48"	16.0	64.0
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	2	48" x 48"	16.0	32.0
W21-5	SHOULDER WORK	4	48" x 48"	16.0	64.0
SPECIAL	WAIT FOLLOW PILOT CAR	4	30" x 18"	3.8	15.2
G20-2	END ROAD WORK	2	36" x 18"	4.5	9.0
CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT					248.2

CLEANOUT FOR CULVERT TREATMENT

Cleanout of pipe culvert will be done in advance of the culvert lining.

Material in existing pipe culvert will be cleaned out by water flushing or other approved methods.

Material removed from the pipe culvert will become property of the Contractor for disposal.

The Contractor will implement appropriate sediment control measures prior to water flushing to prevent discharges from the project boundaries.

The pipe culvert will be cleaned to the satisfaction of the Engineer.

All costs to dewater, clean pipe, and dispose of removed materials will be incidental to the contract unit price per each for "Cleanout For Culvert Treatment".

CURED-IN-PLACE PIPE (CIPP)

This work consists of rehabilitating existing drainage culverts by furnishing and installing Glass Reinforced thermosetting Plastic (GRP) Cured-in-Place Pipe (CIPP) liners using Ultraviolet (UV) cure methods. See Special Provision for specifications related to this work.

PIPE WORK AT SD HIGHWAY 79 MRM 127.801 AND 128.023

These two locations have PVC irrigation pipes connecting the CMP cross pipe to the concrete irrigation vaults near the R.O.W. The Contractor will excavate and remove the PVC irrigation pipe and any unsound CMP as directed by the Engineer. Once the removal is complete, the Contractor will prepare the open trench to receive the CIPP liner. The Contractor will clean and prepare the CMP cross pipe, install the CIPP liner through the CMP cross pipe, and extend it into the open trench to connect the irrigation vaults at the R.O.W. line. Once the CIPP liner is cured, the trench will be backfilled, and the ditch line will be restored to its original cross-section. The completed work will connect the two irrigation vaults with a continuous CIPP liner.

All costs for excavating, removing grout, cutting, and disposing of the PVC pipe will be incidental to the Remove Pipe Culvert bid item. All costs for cutting, removing, disposing of any CMP pieces, increasing the opening size in the vault, and connecting the CIPP liner to the irrigation vaults will be incidental to the various bid items for the project.

BELLE FOURCHE IRRIGATION DISTRICT

For the pipe work at SD Highway 79 MRM 127.801 and 128.023 the Contractor will contact the Belle Fourche Irrigation District (605-456-2541) and any necessary landowners to coordinate pipe work with irrigation season. (To be completed after October 3, 2025, when irrigation water is turned off.)

Prior to backfilling, a 6" vertical ventilation pipe will be installed by the Belle Fourche Irrigation District at each pipe at SD Highway 79 MRM 127.801 and 128.023. The Contractor will coordinate this work with the Belle Fourche Irrigation District.

All work will be completed inside the highway right-of-way. Work outside the highway right-of-way will be performed by the Belle Fourche Irrigation District. All costs associated with this coordination will be incidental to the various bid items on the project.

PIPE END SECTIONS

Remove and reset Type 2 object markers at the ends of each pipe. All costs for removing and resetting the Type 2 object markers will be incidental to the contract bid item "Install Pipe End Section".

REMOVE AND RESET FENCE

All costs for removing and resetting fence necessary to complete the work will be incidental to the various bid items on the project. All fence will be reset at the end of each work day and when no work is being performed.

CONTRACTOR FURNISHED TOPSOIL

The Contractor will be required to furnish and place topsoil around new pipe end sections indicated in the table of pipe quantities.

Contractor furnished topsoil will be free from stones, coarse gravel, or similar objects larger than 3/4 inch in diameter. Brush, stumps, roots, wood, objectionable weeds, liter, or any other material which may be harmful to plant growth will not be allowed. Organic material will be decomposed.

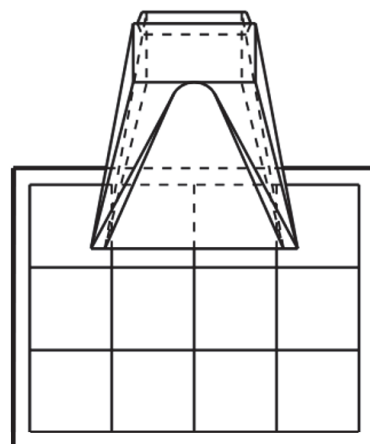
All costs to furnish and place the Contractor furnished topsoil will be incidental to the contract unit price per cubic yard for "Contractor Furnished Topsoil".

The plans quantity for "Contractor Furnished Topsoil" as shown in the Estimate of Quantities will be the basis of payment for this item without further field measurement. If changes are necessary in construction, the altered quantities will be measured for payment.

TABLE OF BANK AND CHANNEL PROTECTION GABIONS AND DRAINAGE FABRIC

US85 MRM	L/R	Bank and Channel Protection Gabion (CuYd)	Type B Drainage Fabric (SqYd)
79.957(12'x9'x1.5')	L	6.0	19
Totals:		6.0	19

Bank and Channel Protection Gabions will be a custom orientation shown below.



EROSION CONTROL

The estimated area requiring erosion control is 4500 square feet. All costs for the erosion control work for furnishing, placing, and maintaining erosion control including equipment, labor, and seeding will 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.

PERMANENT SEEDING

The areas to be seeded consist of all newly graded areas within the project limits except for the top of roadway, temporary easements under cultivation, and areas designated to be sod.

Type F Permanent Seed Mixture will 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

Table of Pipe Quantities																								
Location	Disp.	Lt/Rt	In	Remove Pipe End Section	18" CMP Sloped End, Furnish	18" CMP Sloped End, Install	24" CMP Sloped End, Furnish	24" CMP Sloped End, Install	30" CMP Sloped End, Furnish	30" CMP Sloped End, Install	36" CMP Flared End, Furnish	36" CMP Flared End, Install	42" CMP Flared End, Furnish	42" CMP Flared End, Install	42" CMP 45° Elbow, Furnish	42" CMP 45° Elbow, Install	Contractor Furnished Top Soil	Cleanout for Culvert Treatment	18" CIPP	24" CIPP	30" CIPP	36" CIPP	42" CIPP	
MRM	Disp.	Lt/Rt	In	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	CuYd	Each	Ft	Ft	Ft	Ft	Ft	
US HWY 85																								
58	0.347	Lt	24	1			1	1									2	1		122				
62	0.034		36	2							2	2						1				176		
63	0.538		24	2			2	2									4	1		80				
64	0.870	Lt	24	1			1	1									2	1		98				
66	0.584	Lt	24	1			1	1									2	1		124				
69	0.824	Rt	24	1			1	1									2	1		120				
79	0.557		42	2									2	2				1						190
* 79	0.957	Rt	42	2									2	2	1	1	4	1						176
81	0.382		24	2			2	2									2	1		142				
82	0.922		24	2			2	2									4	1		106				
83	0.844	Lt	24	1			1	1									4	1		108				
94	0.308		30	2					2	2							4	1			84			
95	0.442		36	2							2	2												
96	0.355		24	2			2	2									4	1		100				
97	0.272		18	2	2	2											4	1	82					
106	0.820		30	2					2	2							4	1				200		
Total				27	2	2	13	13	4	4	4	4	4	4	1	1	42	15	82	1000	284	176	366	

* The 42" CMP 45° Elbow will be installed on the right as directed by the Engineer.

Table of Pipe Quantities																
Location	Disp.	Lt/Rt	In	Remove Pipe End Section	18" RCP Flared End, Furnish	18" RCP Flared End, Install	24" RCP Sloped End, Furnish	24" RCP Sloped End, Install	30" RCP Sloped End, Furnish	30" RCP Sloped End, Install	Contractor Furnished Top Soil	Cleanout for Culvert Treatment	18" CIPP	24" CIPP	30" CIPP	48" CIPP
MRM	Disp.	Lt/Rt	In	Each	Each	Each	Each	Each	Each	Each	CuYd	Each	Ft	Ft	Ft	Ft
US HWY 212																
45	0.435	Rt	24	1			1	1			2	1		112		
46	0.031	Lt	18	1	1	1						1	124			
48	0.283	Lt	18	1	1	1						1	198			
52	0.865	Lt	30	1					1	1	2	1		82		
59	0.080		48									1				98
Total				4	2	2	1	1	1	1	4	5	322	112	82	98

Table of Pipe Quantities												
Location	Disp.	Lt/Rt	In	Remove Pipe End Section	Remove Pipe Culvert	30" CMP Sloped End, Furnish	30" CMP Sloped End, Install	Contractor Furnished Top Soil	Cleanout for Culvert Treatment	18" CIPP	24" CIPP	30" CIPP
MRM	Disp.	Lt/Rt	In	Each	Ft	Each	Each	CuYd	Each	Ft	Ft	Ft
US HWY 79												
122	0.434	Lt	30	2		1	1	4	1			64
127	0.801	Lt	24		15				1		160	
128	0.023		18		30				1	160		
Total				2	45	1	1	4	3	160	160	64

LEGEND

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

SD HWY 79 MRM 127.15 + 0.651

SD DOT	PROJECT	SECTION	SHEET
	NH 0042(100)	Non	9/18

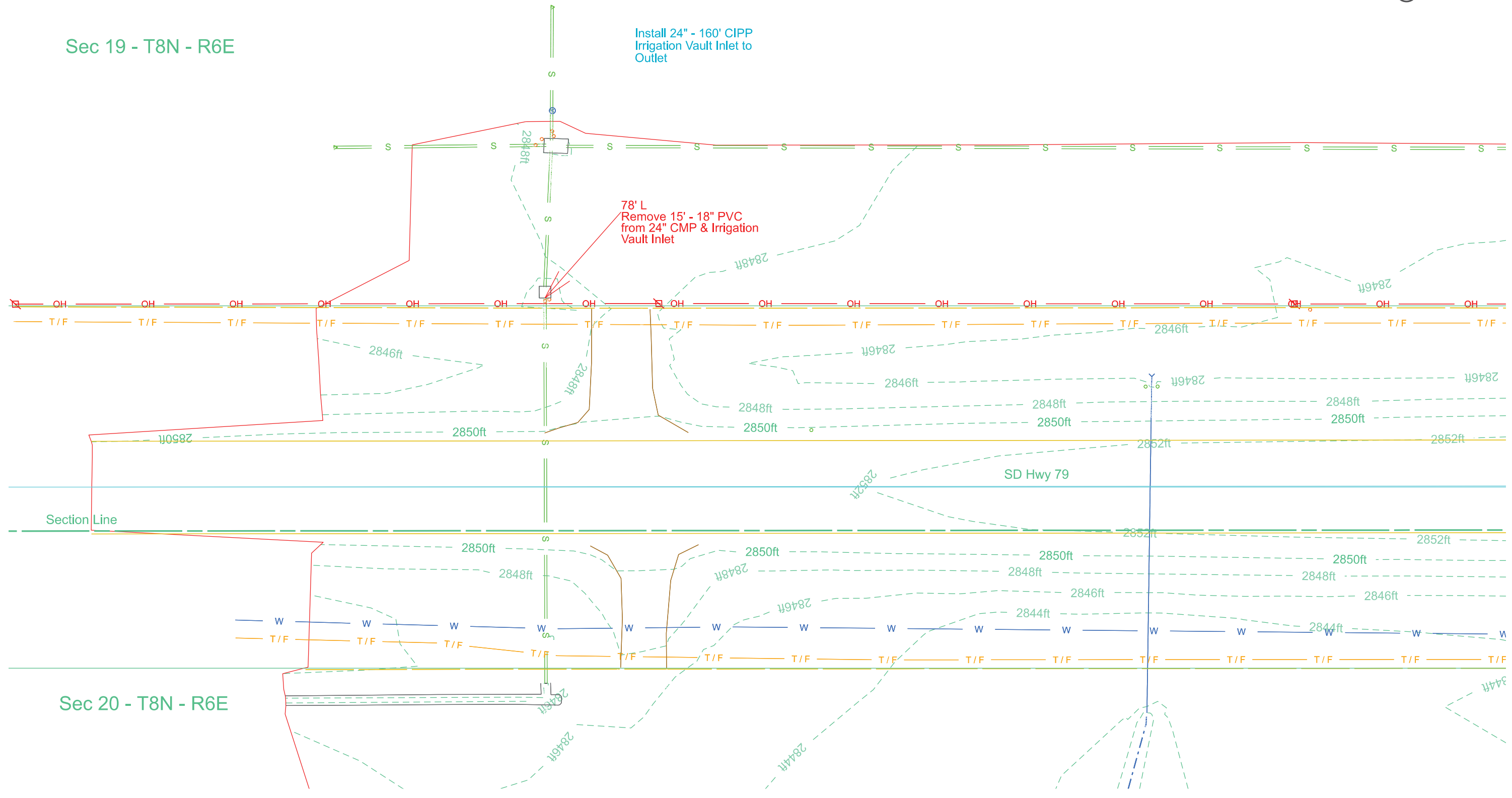
Plotting Date: 1/10/2025



Sec 19 - T8N - R6E

Install 24" - 160' CIPP
Irrigation Vault Inlet to
Outlet

78' L
Remove 15' - 18" PVC
from 24" CMP & Irrigation
Vault Inlet



Sec 20 - T8N - R6E

SD HWY 79 MRM 128.0 + 0.023

SD DOT	PROJECT	SECTION	SHEET
	NH 0042(100)	Non	10/18

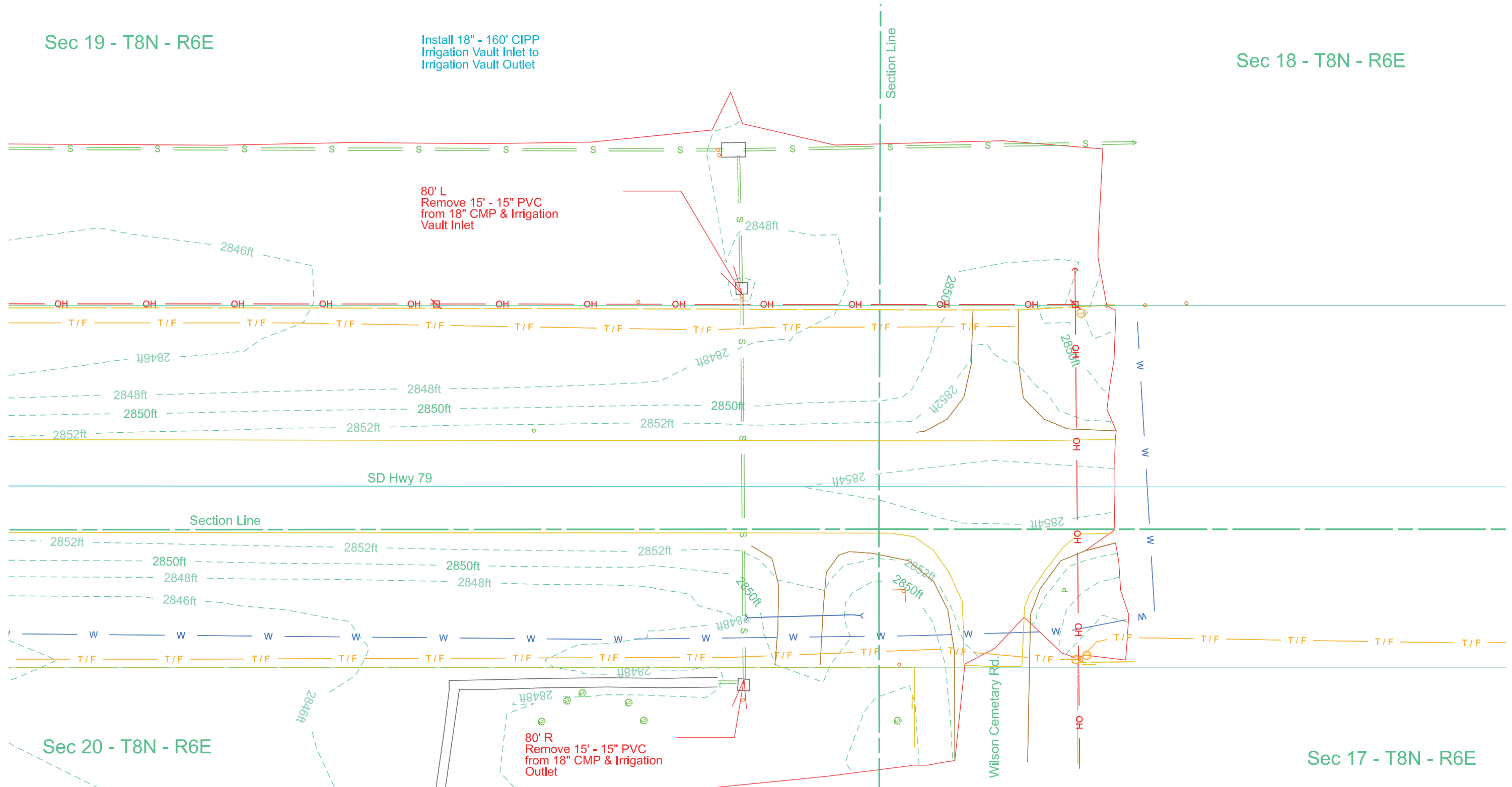
Plotting Date: 1/10/2025



Sec 19 - T8N - R6E

Install 18" - 160' CIPP
Irrigation Vault Inlet to
Irrigation Vault Outlet

Sec 18 - T8N - R6E



Sec 20 - T8N - R6E

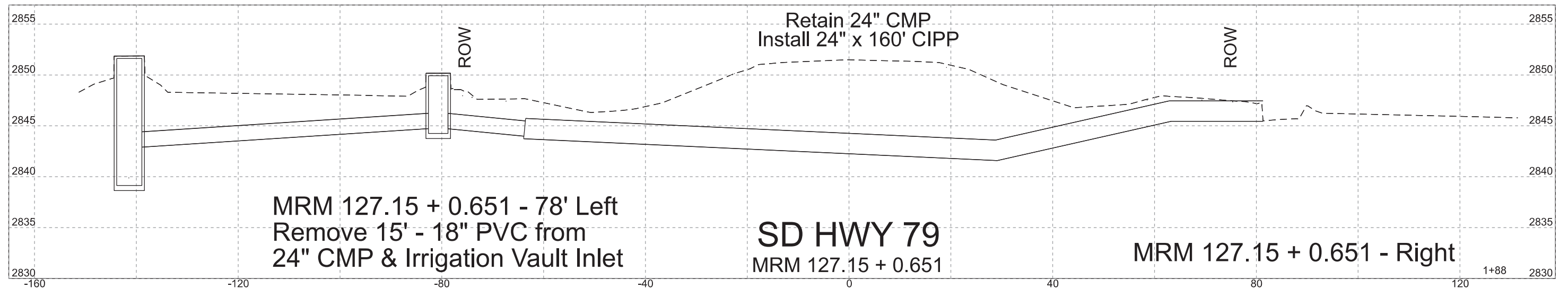
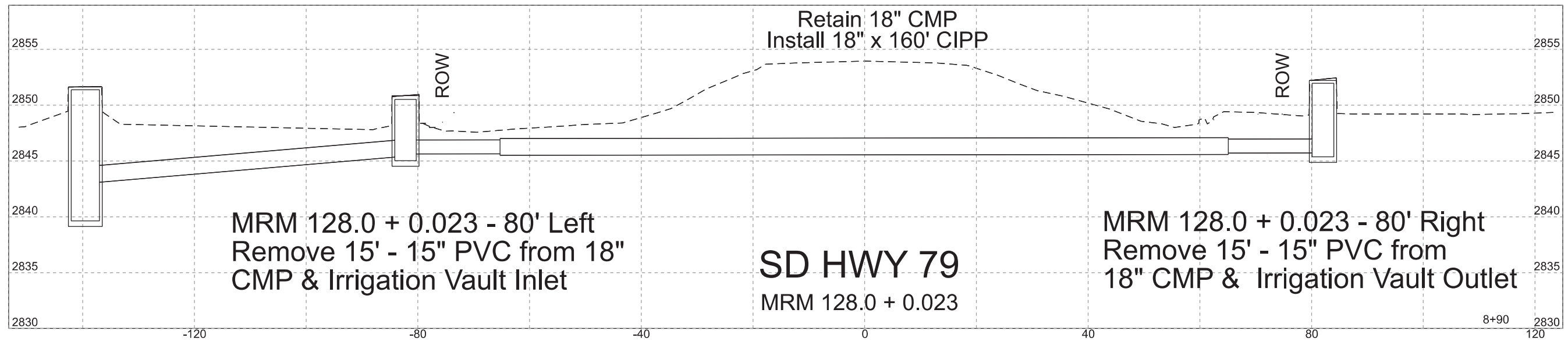
80' R
Remove 15' - 15" PVC
from 18" CMP & Irrigation
Outlet

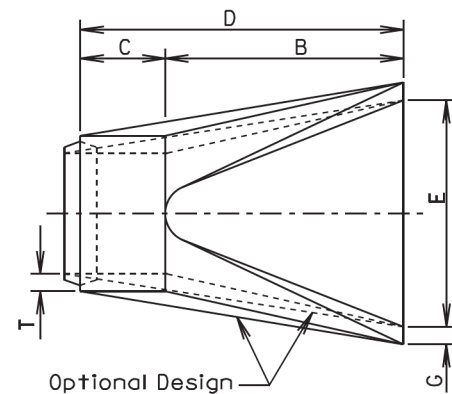
Sec 17 - T8N - R6E



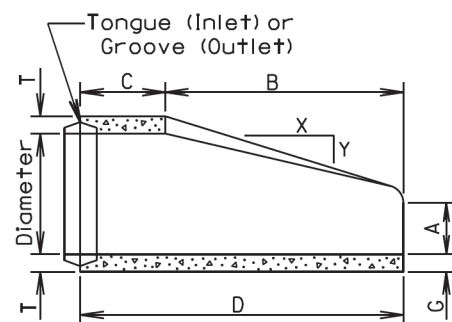
PROJECT	SECTION	SHEET
NH 0042(100)	Non	11/18

Plotting Date: 1/10/2025

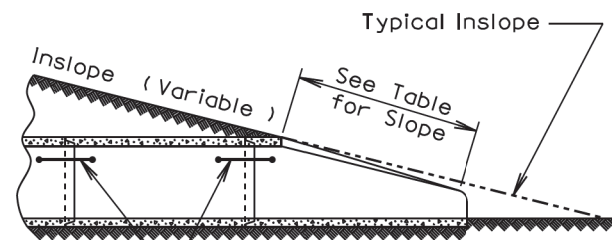




TOP VIEW



LONGITUDINAL SECTION



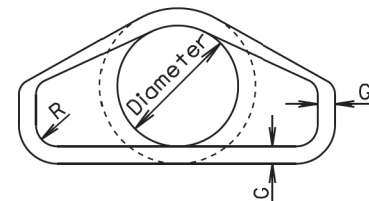
See Standard Plate 450.18
(TIE BOLTS FOR R.C.P. AND R.C.P. ARCH)

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

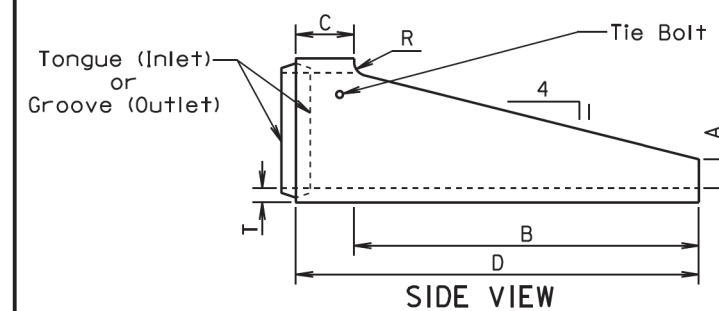
SD
DOT

R. C. P. FLARED ENDS

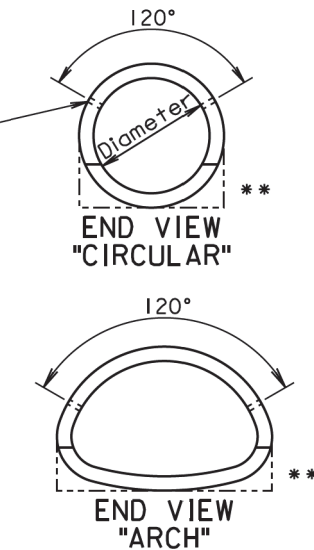
PLATE NUMBER
450.10

Sheet 1 of 1

Published Date: 2025



SIDE VIEW



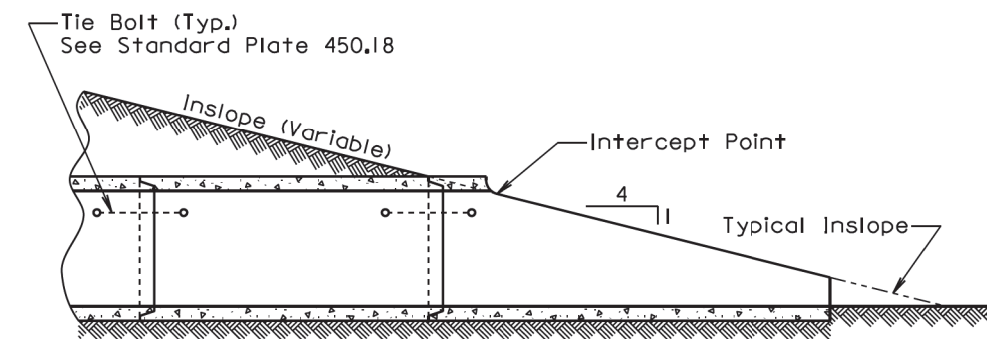
ALTERNATE

Dia. (in.)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	R (in.)
FOR CIRCULAR PIPE						
24	3	6	72	12	84	3
30	3 1/2	7 1/2	90	12	102	3 1/2
FOR ARCH PIPE						
* 24	3	6	48	12	60	3
* 30	3 1/2	7 1/2	60	12	72	3 1/2
* 36	4 1/2	8 5/8	66	30	96	0
* 42	4 1/2	10	77 1/4	18 3/4	96	0

Dia. (in.)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	R (in.)
FOR CIRCULAR PIPE						
24	3	9	72	12	84	0
30	3 1/2	11	90	12	102	0
FOR ARCH PIPE						
* 24	3	9	48	12	60	0
* 30	3 1/2	11	60	12	72	0

* Equivalent Diameter of Circular R.C.P.

** Acceptable Flat Bottom Alternate.



SECTION
(Along Centerline of Pipe)

GENERAL NOTE:

The length of concrete pipe shown in the construction plans is between sloped ends.

September 22, 2006

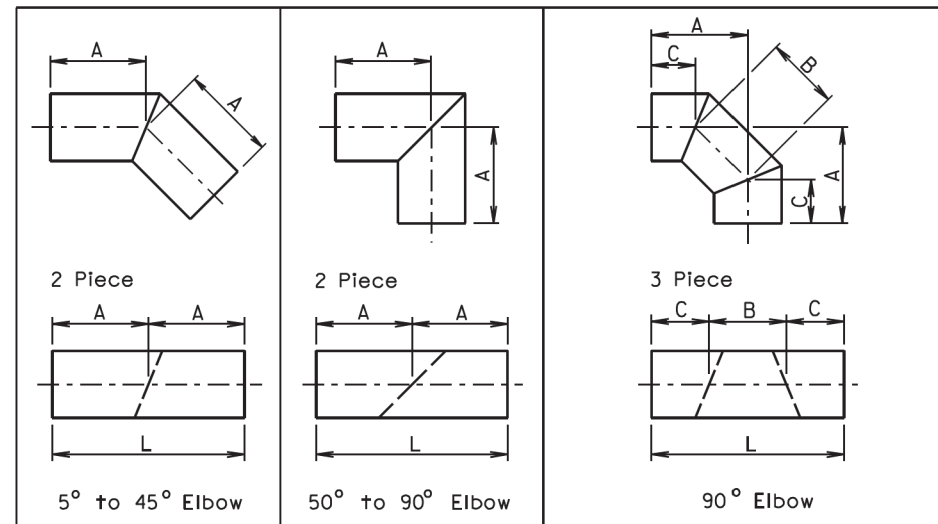
SD
DOT

R. C. P. SLOPED ENDS

PLATE NUMBER
450.13

Sheet 1 of 1

Published Date: 2025



Diameter	A	L	Diameter	A	L	Diameter	A	B	C	L
Inches	Feet	Feet	Inches	Feet	Feet	Inches	Inches			Feet
12	1	2	12	2	4	12	25 1/2	11	18 1/2	4
15	1	2	15	2	4	15	26 1/2	12	18	4
18	1	2	18	2	4	18	27	14	17	4
21	2	4	21	2	4	21	27	15	16 1/2	4
24	2	4	24	2	4	24	27 1/2	16	16	4
27	2	4	27	2	4	27	27 1/2	17	15 1/2	4
30	2	4	30	3	6	30	40	19	26 1/2	6
33	2	4	33	3	6	33	40	20	26	6
36	2	4	36	3	6	36	40 1/2	21	25 1/2	6
42	2	4	42	3	6	42	41	23	24 1/2	6
48	2	4	48	4	8	48	53 1/2	26	35	8
54	3	6	54	4	8	54	54	28	34	8
60	3	6	60	4	8	60	54 1/2	31	32 1/2	8
66	3	6	66	4	8	66	54	33	31 1/2	8
72	3	6	72	5	10	72	67 1/2	36	42	10
78	3	6	78	5	10	78	68	39	40 1/2	10
84	3	6	84	5	10	84	68 1/2	41	39 1/2	10
90	3	6	90	6	12	90	70	46	37	10
96	3	6	96	6	12	96	82	46	49	12

FABRICATED ELBOW LENGTHS FOR ALL CORRUGATIONS

GENERAL NOTES:

All dimensions shown are nominal.

L = Linear Feet of C.M.P. required to fabricate fitting.

June 26, 2001

Published Date: 2025

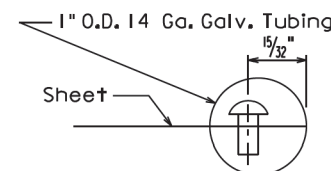
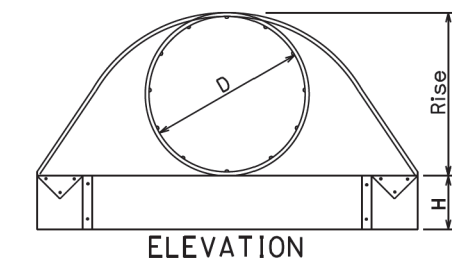
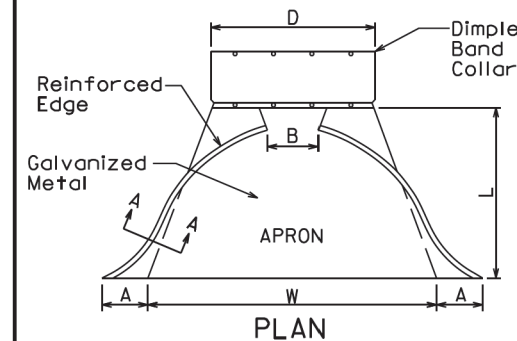
SD
DOT

C.M.P. FABRICATED LENGTHS FOR ELBOWS

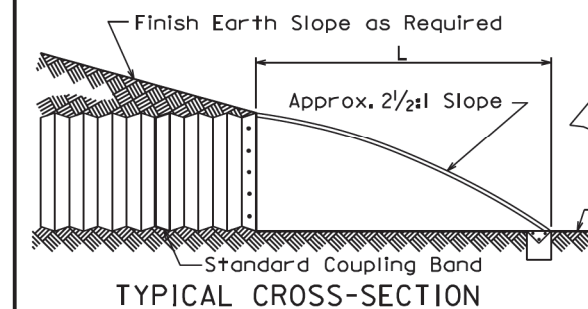
PLATE NUMBER
450.32

Sheet 1 of 1

Alternate Type Connector Sections may be used with approval of the Engineer.



TUBING ATTACHMENT DETAILS SECTION A-A



GENERAL NOTES:

All 3 pc. bodies shall have 12 Ga. sides and 10 Ga. center panels. Width of center panels shall be greater than 20% of the pipe periphery. Multiple panel bodies to have lap seams tightly joined by 3/8" Dia. galvanized rivets or bolts.

For 60" through 84" sizes, reinforced edges shall be supplemented with galvanized stiffener angles. The angles will be 2" x 2" x 1/4" for 60" through 72" diameters and 2 1/2" x 2 1/2" x 1/4" for 78" and 84" diameters. The angles shall be attached by 3/8" diameter galvanized nuts and bolts.

Rivets and Bolts shall be 3/8" Dia. Min. for 10 Ga. and 12 Ga. sheet, and 5/16" Dia. Min. for 14 Ga. and 16 Ga. sheets. Tighten nuts with torque wrench to 25 lbs. torque.

March 31, 2000

Published Date: 2025

SD
DOT

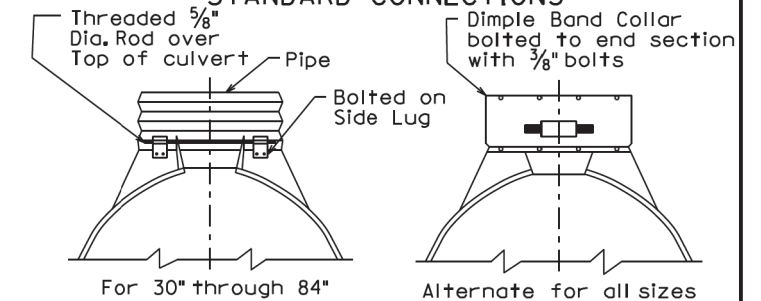
C.M.P. FLARED ENDS

PLATE NUMBER
450.35

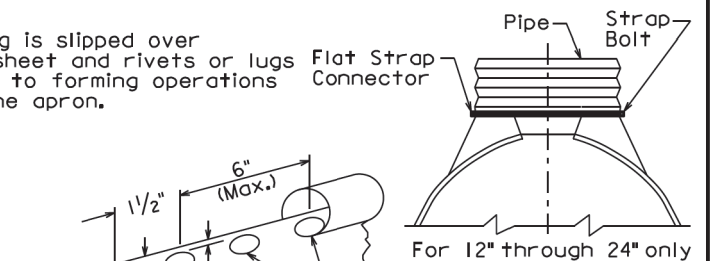
Sheet 1 of 1

Dia. D (in.)	Ga.	DIMENSIONS (in.)					Approx. Slope	Body
		A	B	H	L	W		
12	16	6	6	6	21	24	2 1/2:1	1 Pc.
15	16	7	8	6	26	30	2 1/2:1	1 Pc.
18	16	8	10	6	31	36	2 1/2:1	1 Pc.
21	16	9	12	6	36	42	2 1/2:1	1 Pc.
24	16	10	13	6	41	48	2 1/2:1	1 Pc.
30	14	12	16	8	46	60	2 1/2:1	1 Pc.
36	14	14	19	9	51	72	2 1/2:1	2 Pc.
42	12	16	22	11	60	84	2 1/2:1	2 Pc.
48	12	18	27	12	69	90	2 1/4:1	2 Pc.
54	12	18	30	12	78	102	2:1	3 Pc.
60	12	18	33	12	84	114	1 3/4:1	3 Pc.
66	12	18	36	12	87	120	1 1/2:1	3 Pc.
72	12	18	39	12	87	126	1 1/3:1	3 Pc.
78	12	18	42	12	87	132	1 1/4:1	3 Pc.
84	12	18	45	12	87	138	1 1/6:1	3 Pc.

STANDARD CONNECTIONS



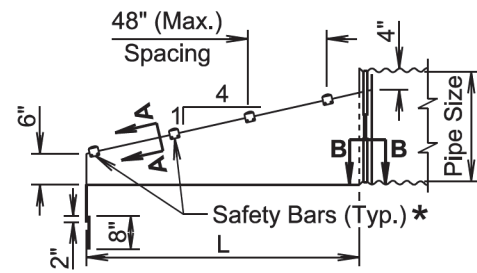
NOTE: Tubing is slipped over the sheet and rivets or lugs prior to forming operations of the apron.



SECTION A-A (alternate)



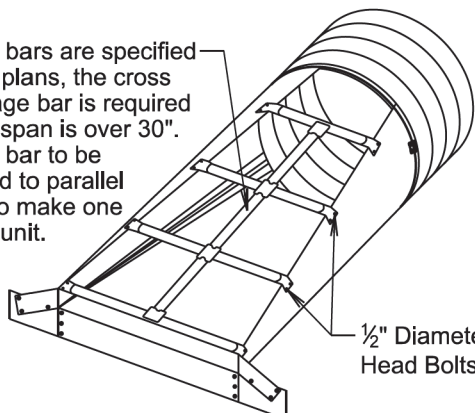
SECTION A-A (alternate)



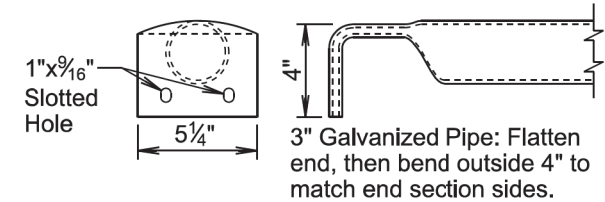
* Number of bars required will vary depending on the length of the end section.

ELEVATION VIEW

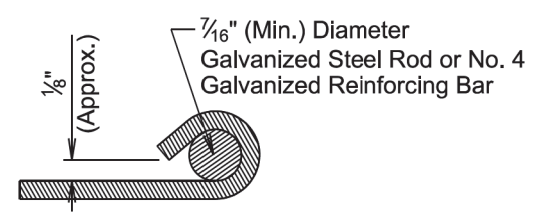
When bars are specified in the plans, the cross drainage bar is required when span is over 30". Cross bar to be welded to parallel bars to make one piece unit.



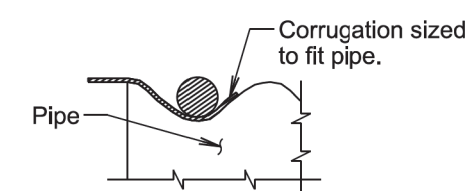
ISOMETRIC VIEW



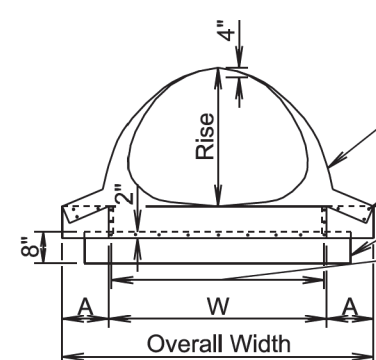
DETAIL OF SAFETY BARS



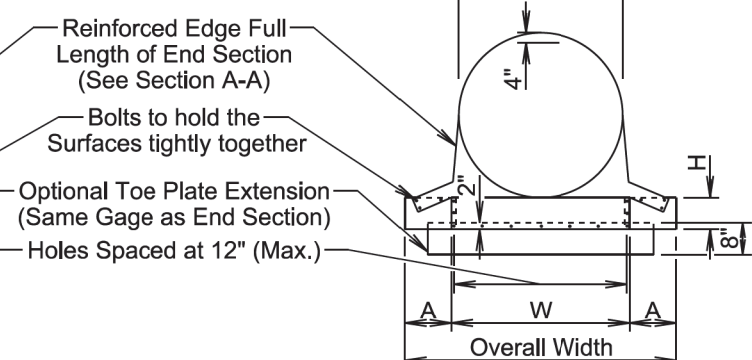
SECTION A-A



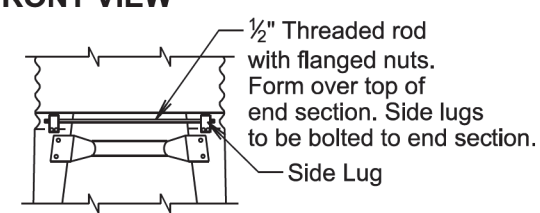
SECTION B-B



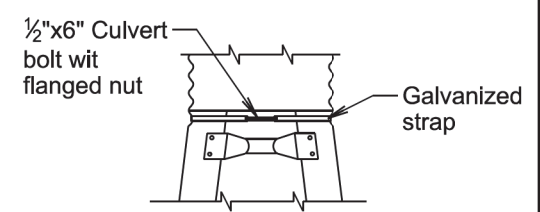
FRONT VIEW



FRONT VIEW



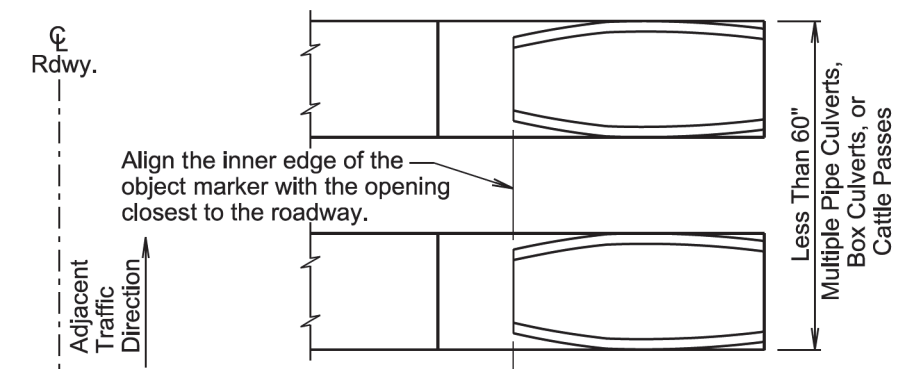
TYPE #2 CONNECTOR DETAIL
(For 30" and Larger)
(For 21"x15" and Larger)



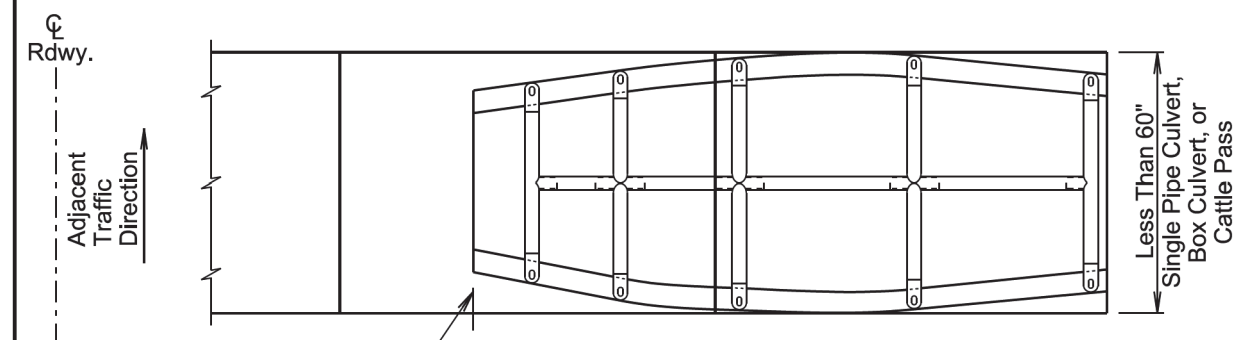
TYPE #1 CONNECTOR DETAIL
(For 15" Through 24")

August 31, 2022

Published Date: 2025	SD DOT	C.M.P. SLOPED ENDS	PLATE NUMBER 450.37
			Sheet 1 of 2



PLAN VIEW
(For Multiple Pipe Culverts, Box Culverts, and Cattle Passes)
(Pipe culverts shown for illustrative purpose.)
(Embankment is not shown.)



PLAN VIEW
(For Single Pipe Culvert, Box Culvert, and Cattle Pass)
(Pipe culvert shown for illustrative purpose.)
(Embankment is not shown.)

GENERAL NOTES:

- This standard plate will be used in conjunction with standard plate 632.01.
- * The type 2 object markers will be installed at the locations shown above. The type 2 object markers, single faced or back to back, will be as specified in the plans.

Published Date: 2025	SD DOT	TYPE 2 OBJECT MARKER AT PIPE CULVERTS, BOX CULVERTS, AND CATTLE PASSES (Less than 60" Overall Width)	PLATE NUMBER 632.03
			Sheet 1 of 1

December 23, 2019

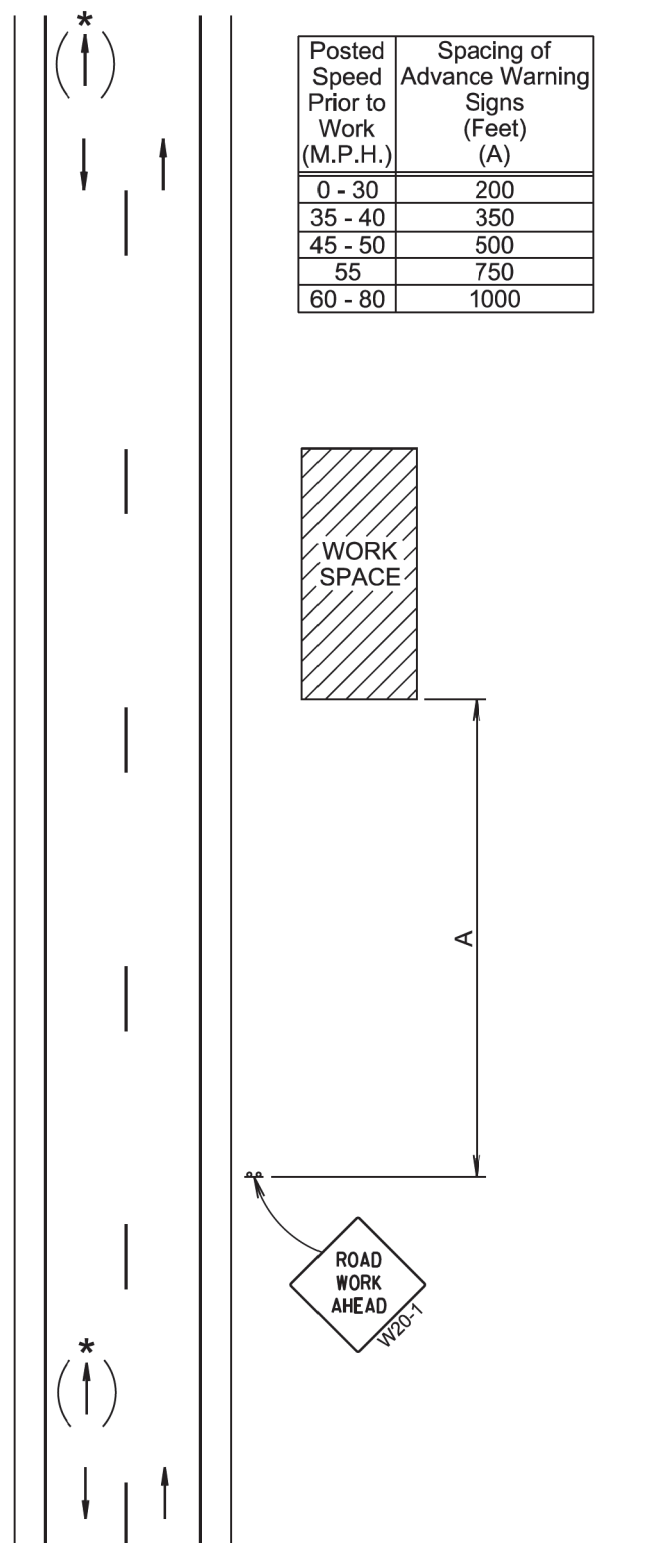
The signs illustrated are not required if the work space is behind a barrier, more than 2 feet behind the curb, or 15 feet or more from the edge of any roadway.

The signs illustrated will be used where there are distracting situations; such as: vehicles parked on shoulder, vehicles accessing the work site via the highway, and equipment traveling on or crossing the roadway to perform work operations.

The ROAD WORK AHEAD sign may be replaced with other appropriate signs, such as the SHOULDER WORK sign. The SHOULDER WORK sign may be used for work adjacent to the shoulder.

* If the work space is on a divided highway, an advance warning sign should also be placed on the left side of the directional roadway.

For short term, short duration, or mobile operations, all signs and channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.



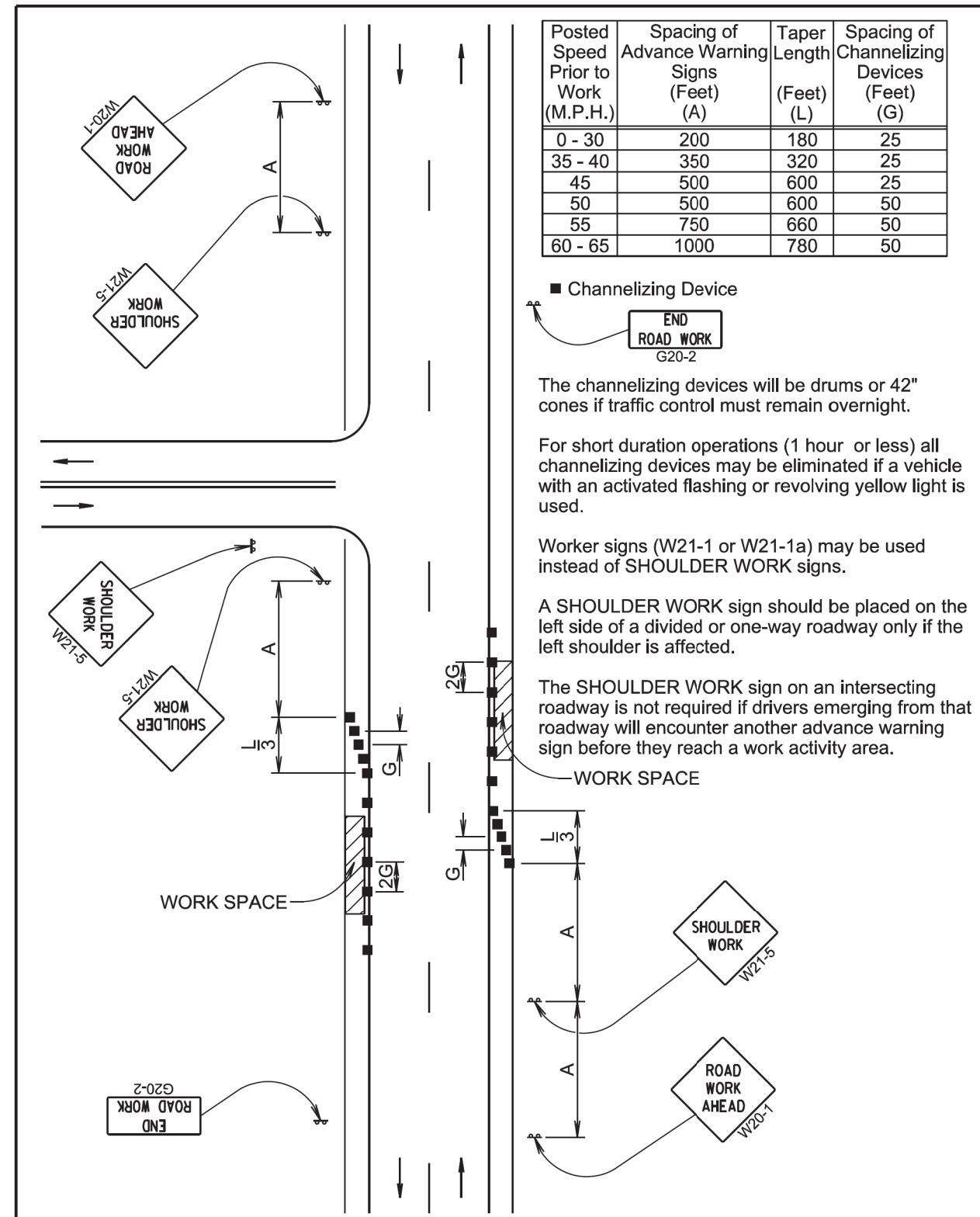
Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)
0 - 30	200
35 - 40	350
45 - 50	500
55	750
60 - 80	1000



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SD DOT	WORK BEYOND THE SHOULDER	PLATE NUMBER 634.01
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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

■ Channelizing Device



The channelizing devices will be drums or 42" cones if traffic control must remain overnight.

For short duration operations (1 hour or less) all channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.

Worker signs (W21-1 or W21-1a) may be used instead of SHOULDER WORK signs.

A SHOULDER WORK sign should be placed on the left side of a divided or one-way roadway only if the left shoulder is affected.

The SHOULDER WORK sign on an intersecting roadway is not required if drivers emerging from that roadway will encounter another advance warning sign before they reach a work activity area.

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SD DOT	WORK ON SHOULDERS	PLATE NUMBER 634.03
		Sheet 1 of 1

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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.

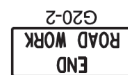
The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (1 hour or less).

For tack and/or flush seal operations, when flaggers are not being used, the FRESH OIL sign (W21-2) will 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 will 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.

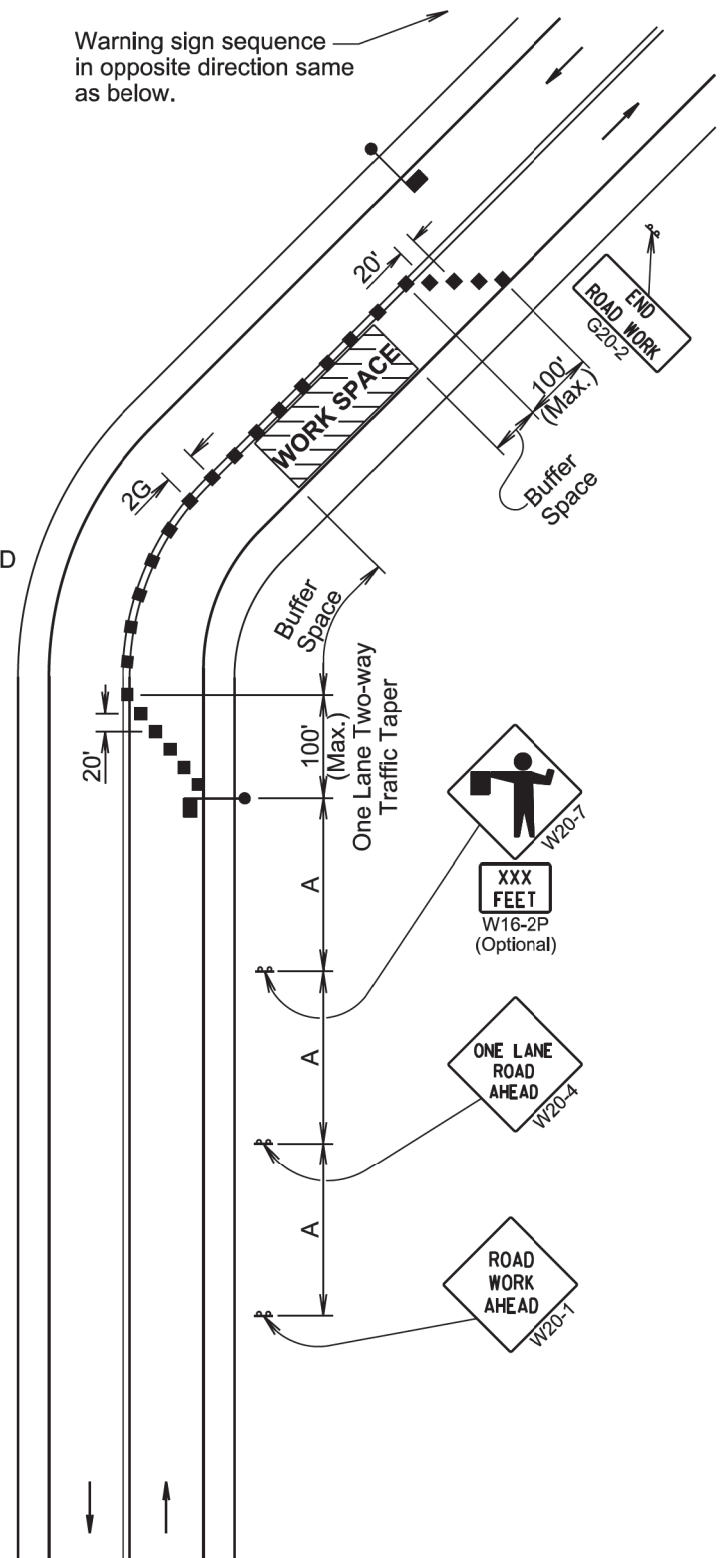


Channelizing devices and flaggers will be used at intersecting roads to control intersecting road traffic as required.

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.

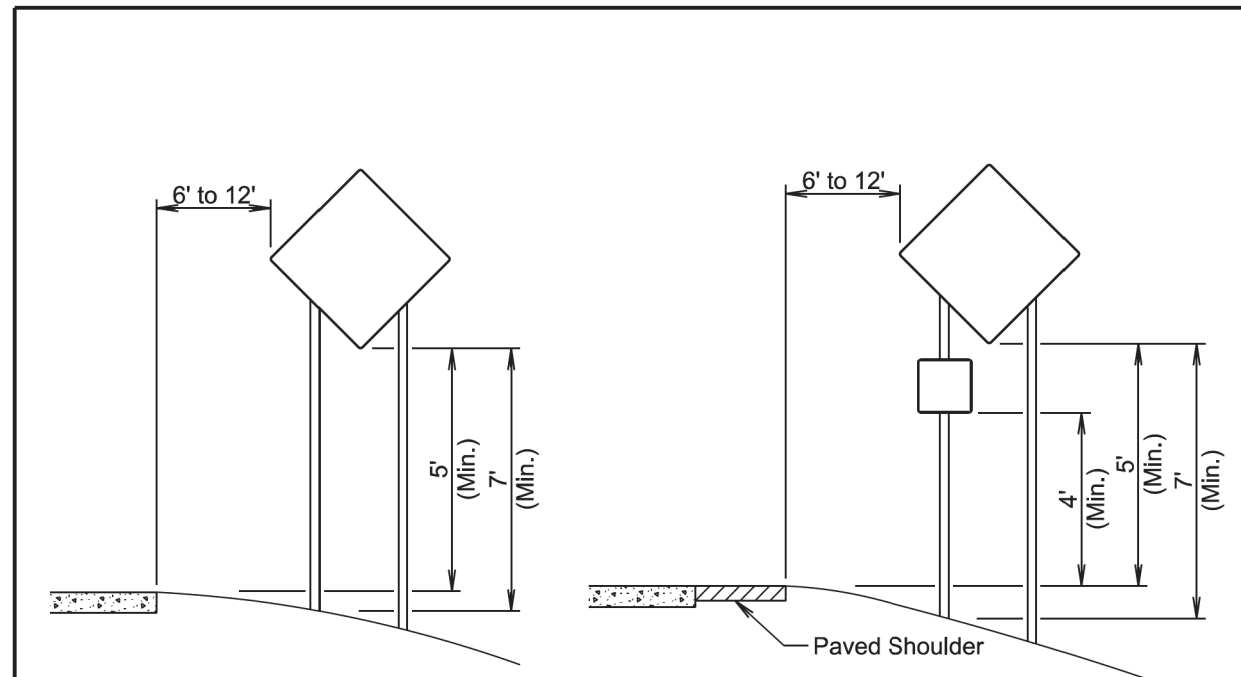
The length of A may be adjusted to fit field conditions.

Warning sign sequence in opposite direction same as below.



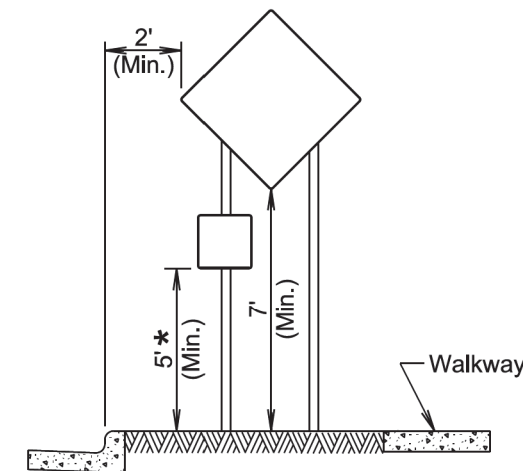
January 22, 2021

SD DOT	LANE CLOSURE WITH FLAGGER PROVIDED	PLATE NUMBER 634.23
		Sheet 1 of 1
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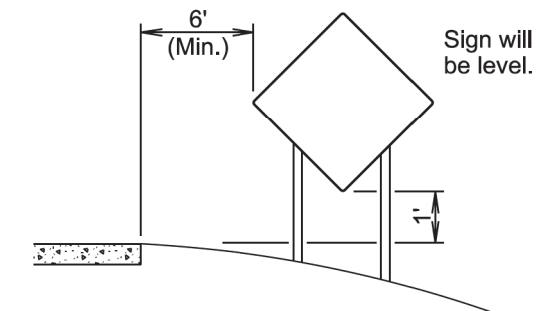


RURAL DISTRICT

RURAL DISTRICT WITH SUPPLEMENTAL PLATE



URBAN DISTRICT



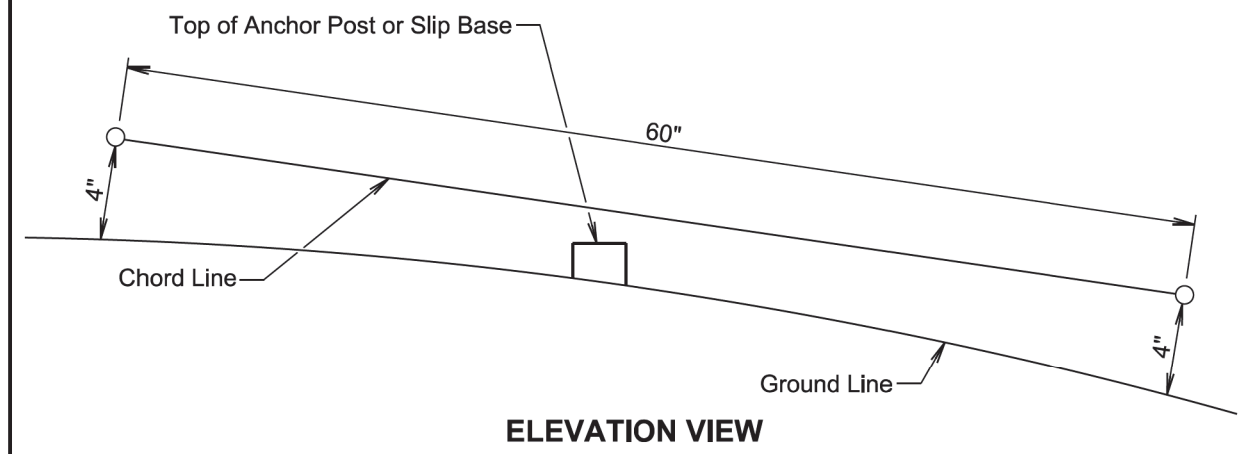
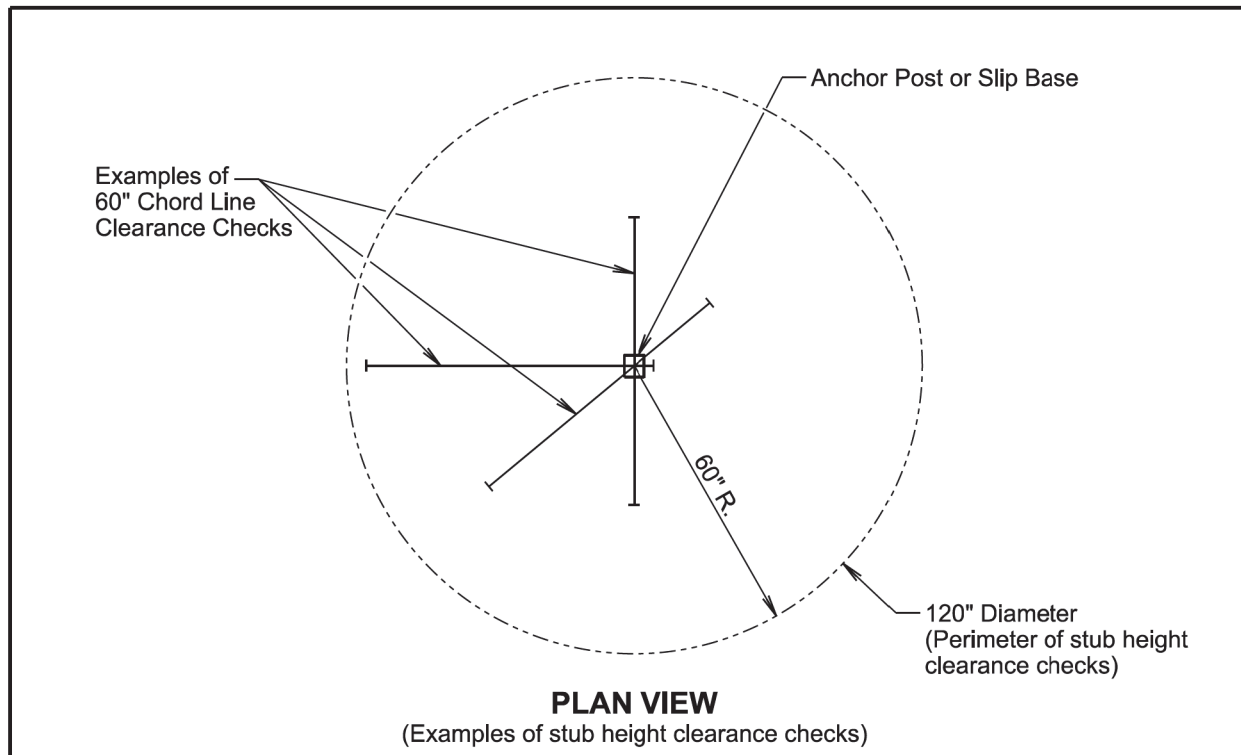
RURAL DISTRICT 3 DAY MAXIMUM

(Not applicable to regulatory signs)

* 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.

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SD DOT	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85
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GENERAL NOTES:

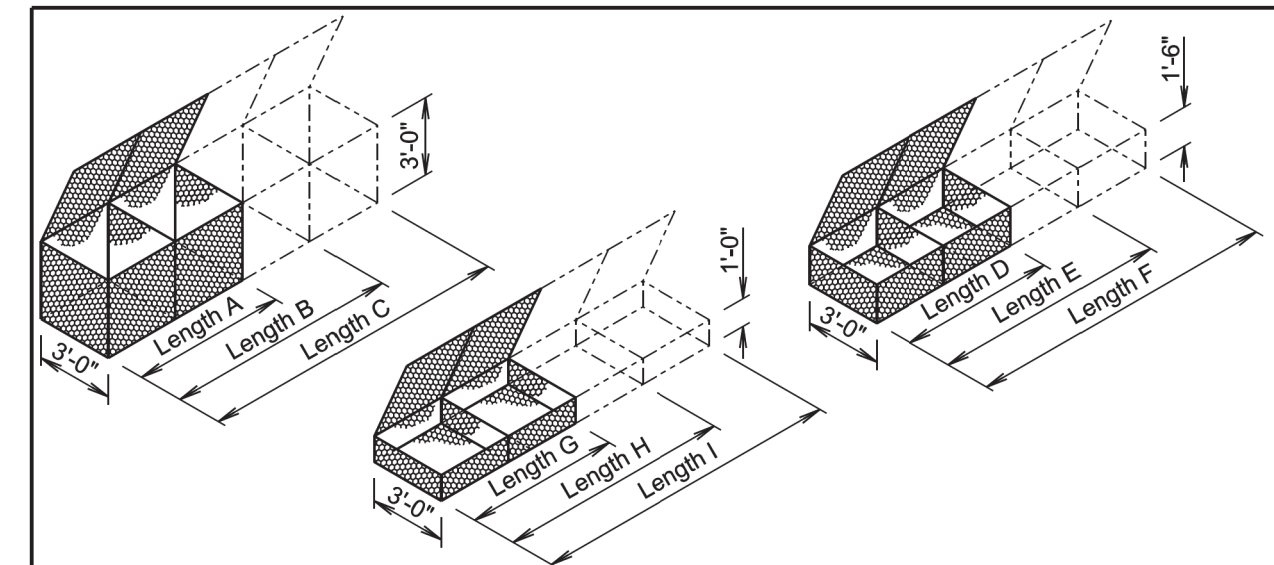
The top of anchor posts and slip bases WILL NOT extend above a 60" chord line within a 120" diameter circle around the post with ends 4" above the ground.

At locations where there is curb and gutter adjacent to the breakaway sign support, the stub height will 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.

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	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
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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

GENERAL NOTES:

Above dimensions subject to mill tolerances.

Lacing and internal connecting wire will be 0.0866 inch diameter steel wire ASTM A641, Class 3 soft temper measured after galvanizing and for PVC coated gabions will 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 1½ 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.

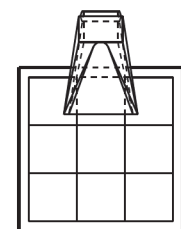
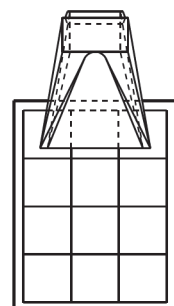
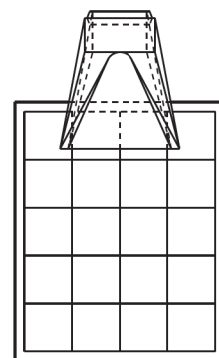
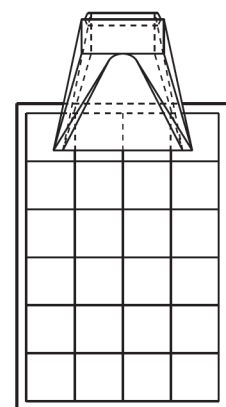
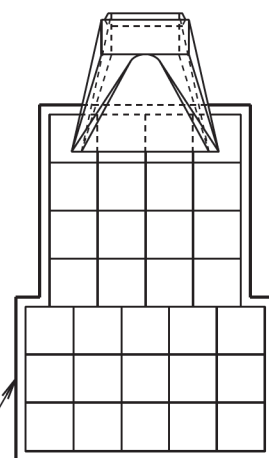
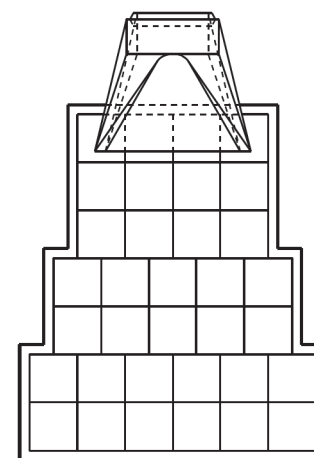
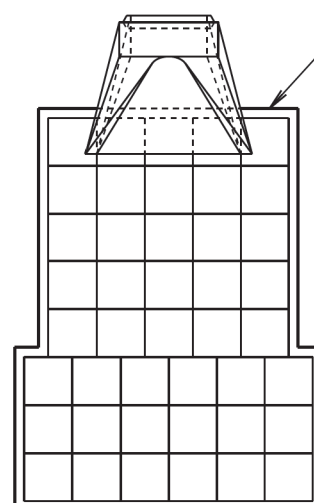
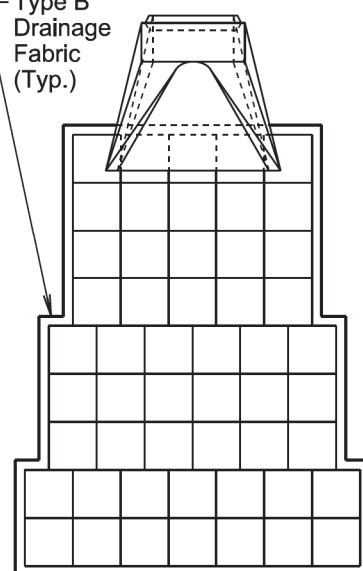
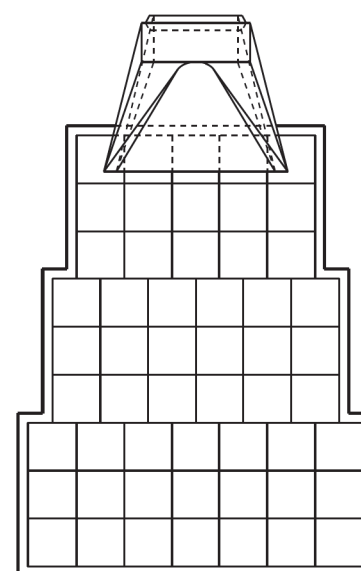
Wire lacing or interlocking type fasteners will be used for gabion assembly and final construction of gabion structures. Interlocking fasteners for galvanized gabions will be high tensile 0.120 inch diameter galvanized steel wire measured after galvanizing. The galvanizing will conform to ASTM A641-92,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

Interlocking fasteners for PVC coated gabions will be high tensile 0.120 inch diameter stainless steel wire conforming to ASTM A313, Type 302, Class 1. The spacing of the interlocking fasteners during all phases of assembly and construction will not exceed 6 inches.

All fasteners will be placed where the mesh weaves around the selvage wire at the vertical and horizontal joints.

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	BANK AND CHANNEL PROTECTION GABIONS	PLATE NUMBER 720.01
		Sheet 1 of 1
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DETAIL 1

DETAIL 2

DETAIL 3

DETAIL 4

DETAIL 5

DETAIL 6

DETAIL 7

DETAIL 8

DETAIL 9

 Type B
 Drainage
 Fabric
 (Typ.)

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**BANK AND CHANNEL PROTECTION GABION
 PLACEMENT UNDER PIPE END SECTIONS**

 PLATE NUMBER
 720.03

Sheet 1 of 2

*** ESTIMATED QUANTITIES**

Detail	Pipe Diameter (Inches)	Gabion (Cu. Yd.)	Type B Drainage Fabric (Sq. Yd.)
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

 RCP, RCP Arch,
 CMP, and CMP Arch

GENERAL NOTES:

Gabions at outlets of CMP and RCP will be placed under the end section a distance of 2 feet from the outlet end. For CMP end section installations, the upper fabric of the gabions will 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 will be placed under the gabions and around the exterior sides (perimeter) of the gabions as approved by the Engineer. The type B drainage fabric will be in conformance with Section 831 of the Specifications. Measurement and payment of the type B drainage fabric will be in conformance with Section 720 of the Specifications.

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**BANK AND CHANNEL PROTECTION GABION
 PLACEMENT UNDER PIPE END SECTIONS**

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Sheet 2 of 2